Empirical Data and Thanatological Perspectives on Ba`ja's Late PPNB Sepulchral Environments: a Synthesis

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Introduction

Death and the dead were an essential, integral part of early sedentary communities in the Near East (*e.g*., Kurth and Röhrer-Ertl 1981; Belfer-Cohen 1988; Hodder 1990; Goring-Morris 2000; Moore and Molleson 2000; Rollefson 2000; Mahasneh 2001; Özkaya and Coşkun 2011; Baird *et al.* 2012; Molist *et al*. 2013; Khawam 2014; Özbaşaran *et al.* 2018; Anton 2020; Gebel *et al*. 2020; Ackerfeld and Gopher 2022). Sub-floor burials in Near Eastern Epipalaeolithic and early Neolithic sites attest to close relationships between the living and dead (*e.g.*, Düring 2008; Bocquentin 2021). The many infant burials that were uncovered during the *Household and Death Project* at the Late Pre-Pottery Neolithic site of Ba`ja, in southern Jordan indicate that death was a perpetual companion, whereas extraordinary ornaments and artefacts in the graves suggest prosperity, strong emotional attachment, and relations that were created between the living community and at least some of their late members (Benz *et al.* 2023). Neither the relation to, nor the treatment of death and the dead can be understood without understanding daily life at Ba`ja, and equally, it is impossible to conceive life within this community about 9000 years ago without the close relation to the dead.

The second volume of the *Household and Death Project*[1] presents the main results of our transdisciplinary studies on burial practices at Ba`ja. During this project, eleven new burials were uncovered. They represent the main data upon which we base our interpretations. The empirical data are described in Part 2 of this volume. Results of former seasons were only included as far as they were related to the topic of death, ornaments, and grave assemblages. Investigations on household activities will be published in Volume 1 and on ethos in Ba`ja in Volume 3 (Gebel and Benz forthcoming a, forthcoming b).

The Late Pre-Pottery Neolithic B (PPNB) site of Ba`ja is located at 35°27'45" E, 30°24'55" N (altitude: 1140-1175 m a.s.l.), approximately 11km north of the modern town of Wadi Musa (Petra; Fig. 1). The settlement rests on a former intra-montane basin, secluded by up to 70m deep gorges (Siq al-Ba`ja). Discovered by Hans Georg K. Gebel in 1983, Ba`ja has continually provided new thought-provoking evidence for the early Neolithic period (for further references and research history see Gebel *et al.* 2017, 2020). Despite its small size of only about 1.5ha, the settlement's agglutinating, multi-story architecture and a purportedly high population density of 500-1000 inhabitants classify Ba`ja as a mega-site, *i.e*., a densely populated settlement approaching the size of towns, but lacking clear hierarchical structures and superordinated administrative institutions in the broadest sense (Bienert *et al.* 2004b).

Former excavations revealed three collective burials and one isolated female burial (Gebel and Hermansen 2001, 2004; Gebel *et al.* 2006). However, deep cuts were rare due to research questions primarily focusing on architecture and technology. In most cases excavations halted when encountering plastered floors in the basements of buildings. A feasibility study in 2016 led to the discovery of an elaborate single adult burial beneath such a plaster surface (Gebel *et al.* 2017; Benz *et al.* 2019). It turned out that

[1] The project was co-directed by Hans Georg K. Gebel, Christoph Purschwitz and Marion Benz. It was hosted by Dominik Bonatz, ordinarius of the Institute of Near Eastern Archaeology at the Free University of Berlin, from 2018 to 2021, and generously granted by the Germany Research Foundation (BO 1599/16-1). The pilot study was granted by the German Research Foundation too (BO 1599/14-1) and directed by Hans Georg K. Gebel.

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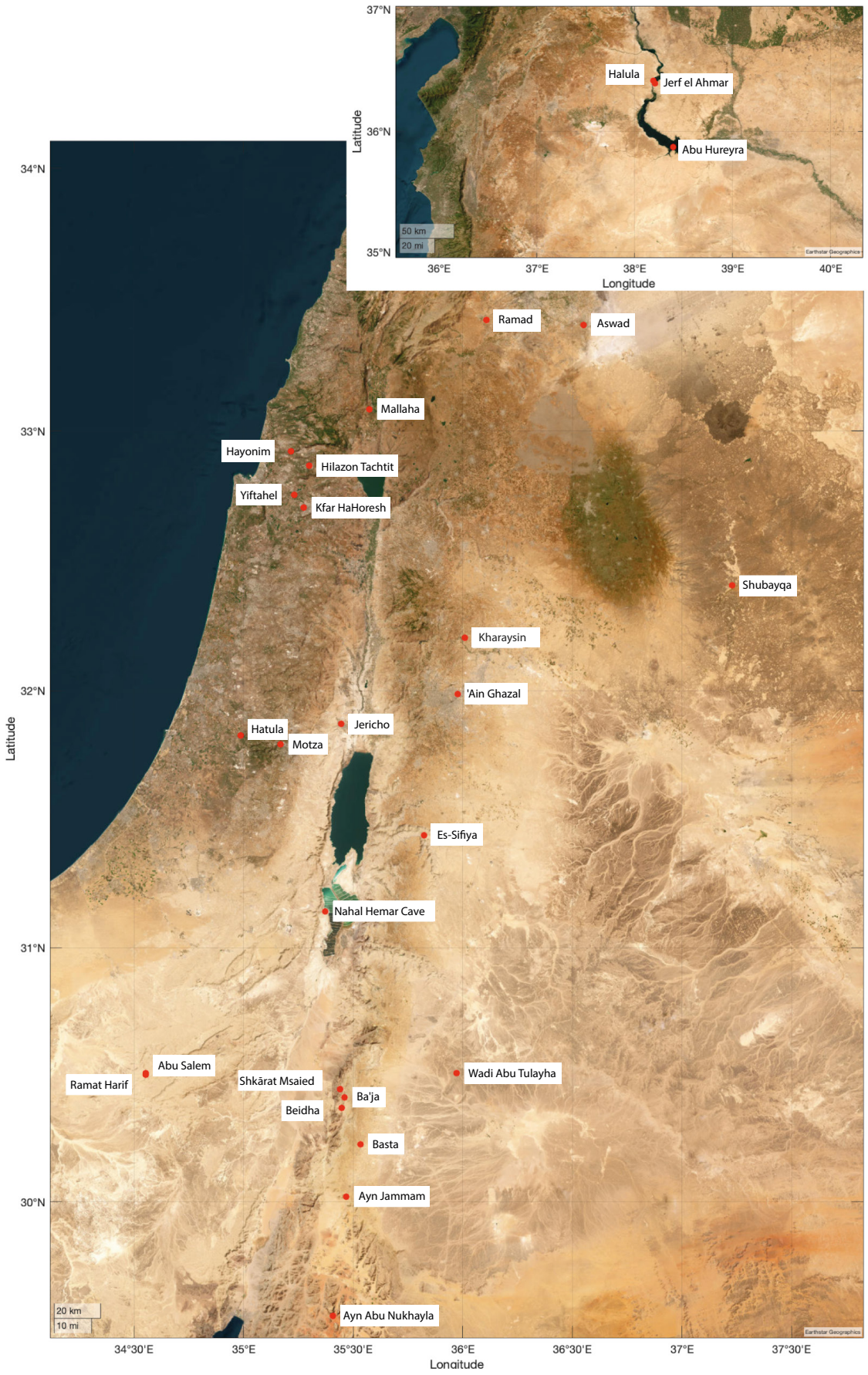

Fig. 1 Location of Ba`ja and other Middle and Late PPNB sites mentioned in the text. (Map Design: J. Benz; based on Esri)

9000 years ago, people covered their burials with the same grit and limestone plaster used for the floors (in fact, they had cut a pit through the plaster floors and probably recycled this material for the grave cover). This observation indicated the possibility of more burials with similar characteristics. During the same season, two more burials were discovered, including a double child burial, which we were able to excavate.

The discoveries made during the 2016 season proved the site's potential for a new three-year project, the *Household and Death in Ba`ja Project*. This project aimed to explore questions about daily life and to investigate burial rituals, grave 'goods', and the relationship of living communities to their deceased members. As mentioned above, this new project, including the 2016 season, led to the uncovering of eleven new burials of various types and isolated human bones. Additionally, we had the opportunity to analyse the human bones from the collective burial in Area C, which had been excavated in 2005. Further human remains were discovered in autumn 2021, including a well-articulated and richly decorated adolescent individual.[2]

The synthesis comprises three main parts: The first section (*General Methodological Reflections*) discusses our research perspectives and fundamentals of our interpretations exploring the significance of burials as empiric prehistoric archives (*Burials as Prehistoric Archives*). It also describes the advancements in thanatological research (*Perspectives of Research – on the Way to an Integrative Thanatoarchaeology*) and in social neurosciences (*Combining Social Neurosciences and Phenomenology*).

In the second part of the synthesis, we will thoroughly examine the empirical evidence of burial practices at Ba`ja, presenting a comprehensive summary of the empirical observations (*Summary of the Empirical Observations*). In the third part (*Thanatoarchaeological Theses and Interpretations*), we aim to provide answers to the main questions posed by the *Household and Death Project*. Through the application of a holistic transdisciplinary approach, which was methodically developed during the course of the *Household and Death Project*, we will evaluate and interpret the different burial practices at Ba`ja. The thanatoarchaeological theses and the epistemological framework recently presented by Gebel *et al*. (2022b) will facilitate a systematic interpretation of major aspects. The primary focus of this volume is to understand the burial practices and decipher their meanings for the early Neolithic communities from a 'supposedly emic'[3] perspective.

General Methodological Reflections

As Mike Parker Pearson (1999) pointed out, graves can hardly be considered a direct mirror of society. Although rituals have a high potential to unveil "what moves [men] most" (Wilson cited in Turner 2009: 6), we should seriously consider Monica Wilson's continuation of her statement: "… since the form of expression is conventionalized and obligatory, it is the values of the group that are revealed". In other words, archaeological data on burial rituals have undergone two interpretations: first, by the prehistoric communities, reflecting how they wanted to represent their dead and death, regardless of whether it matched daily reality or not; and second by modern perspectives.

Moreover, the archaeological records are often short excerpts, pale and blurred, with enormous gaps that leave us stumbling while interpreting the empirical descriptions and raising more questions than we can answer. This lack of clarity in the picture omits many relevant aspects of death, especially the feelings and rituals that accompanied the passing of a person. It not only denies insights into certain fields of knowledge, such as vanished organic materials, but also drags entire areas of interpretation into the unfathomable. As a result, there is rarely only one definitive interpretation of what we have found – even though public scientific reports often present 'facts' and a straightforward 'narrative'. For instance, interpreting lavishly

[2] The analyses of the latter bones are still going on and will be the subject of later publications. Human remains of Burials CG12, DG1, and TU7G1 that were excavated during former seasons are stored at the Zentrum für Anatomie in Göttingen and were not available to be studied in the frame of the *Household and Death Project.*

[3] 'Emic' means that our approach aims to adopt the perspective of an early sedentary farming and/ or herding community as well as possible. Evidently, the critiques that hold true for all ethnographic descriptions, also concern our description: namely that even the foreign language and, above all, the foreign perspective, always biases the descriptions of another community. The description may be as dense as possible (Geertz 1987) – it remains an approach from a certain perspective of the researcher at a certain point of time.

decorated burials solely as evidence of social hierarchies, oversimplifies the prehistoric complexity. Instead, we must come to terms with this ambiguity and incompleteness in our interpretations. Our conclusions should be seen as a range of possibilities, where we learn to navigate probabilities. Probabilities are an integral part of everyday archaeological research, acknowledging that with each new discovery and method, fresh insights can emerge. Our interpretations remain chains of evidence, with some being more likely than others within the current frameworks and paradigms of research (Kuhn 1993).

In the *Household and Death Project* we tried to bridge the severe gaps through a consistently transdisciplinary work. Our transdisciplinary research aims were based on the integration of various approaches such as social neurosciences, ethology, archaeology, and anthropology from the project's design to the interpretations. This volume attests to the various perspectives and methods we applied to gain as much information as possible on the way the inhabitants of Ba`ja may have related life and death. These approaches included XRF-analyses of raw materials (Gerlitzki and Martin this volume), anthropological and palaeopathological data (Gresky this volume), analyses of non-metric traits on teeth (Krauß *et al*. this volume) and ancient DNA (Skourtanioti and Feldman this volume), histotaphonomic and stable isotope analyses (Haddow this volume; Knipper *et al.* this volume) as well as micromorphological investigations (Reifarth *et al.* this volume), archaeozoological analyses (Prust this volume) and investigations on use-wear (Alarashi a, b this volume). It is essential to acknowledge that both, the body (*i.e.*, its biological conditions) and the various natural and socio-cultural environments, significantly influence a person's perception and experiences of the world (van Buuren 2018). Individual results of our research were interpreted by considering the other 'life worlds' of the prehistoric inhabitants.

Evidently, our purportedly 'emic' perspective must remain an approximation, as is always the case with ethnographic studies – we can view archaeology as an ethnographic study of the past. Nevertheless, it can never truly capture the emic essence of personal experiences. The investigators' enculturation inevitably biases their questions, perspectives, and descriptions, as they are bound by modern language conventions to ensure understanding. Although our research perspective may complicate our understanding of other cultures, our close genetic relationship enables us to empathise with others, observe and interpret their practices. Human nature compels us to relate the unknown to the known, enabling us to assess spatial and temporal situations in the broadest sense. Without the ability to comparatively attribute meaning, each situation and object would require constant re-evaluation, making it impossible to act confidently in the present. Hence, there is a compelling need to diligently endeavour – albeit challenging – to dissociate from our own lifeworld in pursuit of achieving a comprehensive description (Geertz 1987). The history of research on Neolithisation has revealed the difficulty in fully accomplishing this task, as ethnographic analogies invariably influence our perceptions of the past (Benz 2000). Nevertheless, acknowledging and using these influences to broaden our horizons can lead us to embrace the seemingly strange, unexpected, and uncommon aspects of our studies.

The new data on the graves from Ba`ja will demonstrate the significance of liberating ourselves from preconceived assumptions in various aspects. One example worth mentioning is that the burial ground was not a segregated area from the living space, a pattern likely shared by numerous other early Neolithic communities. Graves were reopened, and the bodies of deceased persons were either reburied, reinterred, or even disposed of, leaving nothing but isolated and dislocated bones behind. Bo D. Hermansen (2017) previously proposed similar multi-stage burial rituals for the slightly earlier settlement of Shkārat Msaied, situated only a few kilometres from Ba`ja. Recent advancements in histological methods (see Haddow this volume) and research at Çatalhöyük (Haddow *et al*. 2021), along with new findings from secondary burials at Shakara (publ. comm. C.A. Makarewicz and B. Finlayson), support the observation of repeated handling of human bones during the Late PPNB. Consequently, the sealed graves found at Ba`ja, such as CG2, CG4, G7, CG8, and G10, seem to represent snapshots of much longer burial processes, or they may have been intentionally hermetically sealed, requiring considerable effort and potentially violent disturbance of the grave cover to reopen them.

Burials as Prehistoric Archives

Despite the aforementioned limitations, burials remain among the most crucial archives of

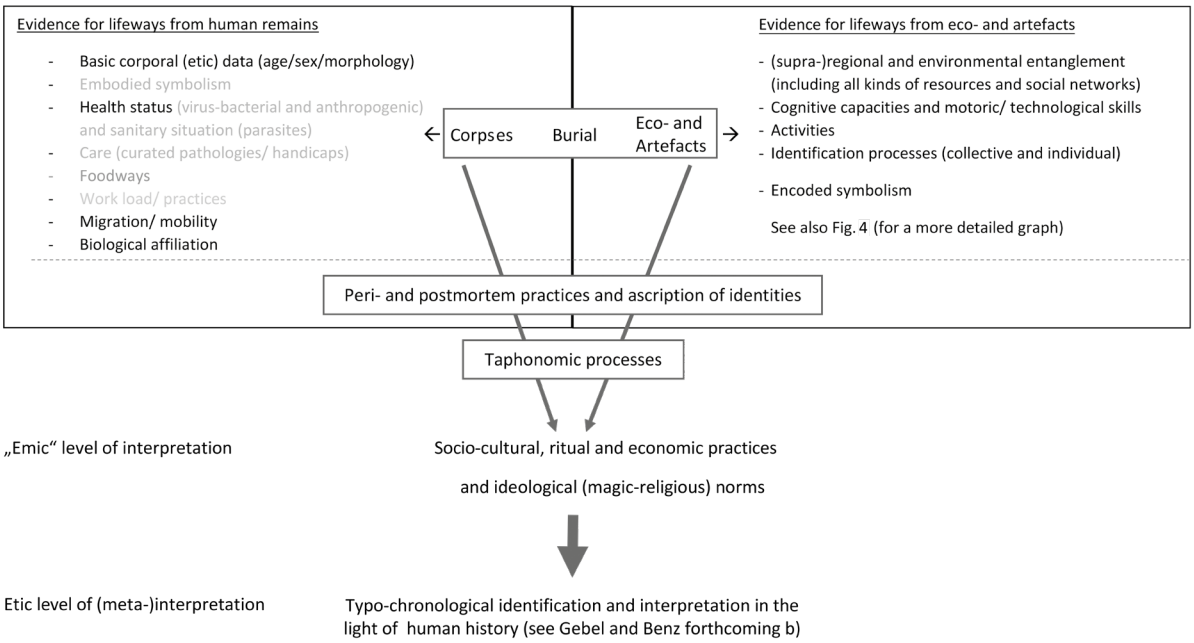

Fig. 2 Insights that can generally be gained from burials. For areas of inquiry written in grey, we lack clear evidence from Ba`ja. (Graph: M. Benz, Ba`ja N.P.)

prehistory (Fig. 2). They not only offer artefacts within a relatively closed context, serving as essential typo-chronological markers for archaeologists on an etic level, but they also bridge two areas of knowledge that can be heuristically categorised as 'things' and 'people'. It is important to note that such a categorial taxonomy does not align with prehistoric concepts, where things can be considered animated (see *e.g.*, Bird-David 1999; Descola 2022). However, for a cultural-historical meta-interpretation, it has been demonstrated that evaluating and weighing both categories against each other makes sense (*e.g.*, Benz *et al*. 2016). The integral assessment of both categories of evidence creates the tension in archaeological findings. Idealised concepts and norms may find reflection in burials, but they must be evaluated in light of the prehistoric 'reality'. Filtered through taphonomic processes (and our perspectives!), the dead bodies and all items within and around the burials can provide clues about how the deceased were handled. Furthermore, the peri- and postmortem practices offer insights into relationships between the dead and those who were left behind (grief, care, sorrow *etc*.). They might provide evidence of spontaneous reactions and shed light on the identities that the community attributed to the deceased. These aspects were interwoven with idealised concepts of how the deceased should be displayed and buried.

The corpse itself (Fig. 3; Gresky this volume) stands as the first significant source of knowledge. In many archaeological studies, skeletal remains are assessed primarily in terms of death rituals and post-mortem corpse handling, or indirectly used to glean information about social identifications, activities, or paleo-diets. The person's body itself and the resulting changing perspectives and actions during their lifetime are rarely considered, mainly due to incomplete data and a lack of comprehensive taphonomic examinations. While this corporeality takes a backseat in subsequent studies, it is not because it lacks importance, but rather because the three-year project's framework did not permit the presentation of individual body biographies. Such an approach is time-consuming and costly, exceeding the financial and time constraints of this project.

Important characteristics such as age, sex, and morphology, which are fundamental to anthropological studies, are currently considered purely taxonomic etic categorisations. These biological classifications can provide clues to biological identities or even unveil apparent contradictions such as when a child is buried with grave 'goods' typically associated with adults or when a person anthropologically identified as female is buried with equipment characteristic of a male individual. However, the identities associated with these categories

and their significance within a society can only be revealed through the interplay of transdisciplinary investigations. Due to the low number of interments, it is not possible to detect such "contradictions" for the community of Ba`ja.

Biochemical analyses represent another crucial cornerstone of anthropological assessments of human remains. Meticulous investigations on bone treatments and histotaphonomic analyses have allowed for more precise clarification of questions concerning post-mortem treatments of the deceased and decomposition processes (*e.g.*, Erdal 2015; Gresky *et al.* 2017; Haddow this volume). Ground-breaking advances in medical-biochemical analysis have elevated skeletons to essential primary sources for archaeological research. New methods for systematically evaluating non-morphometric traits (*e.g.*, Alt *et al.* 2013, 2015), along with palaeogenetic (*e.g.*, Haak *et al.* 2005; Lazaridis *et al.* 2016; Yakar *et al.* 2021) and stable isotope analyses (*e.g.*, Lösch *et al.* 2006; Knipper *et al.* 2014; Itahashi *et al.* 2021; Santana *et al.* 2021), as well as palaeomedical and biochemical studies (*e.g.*, Baker *et al.* 2017; Schultz and Schmidt-Schultz 2019; Itahashi *et al.* 2020, 2021), have transformed the deceased – paradoxically – to the archive of life.

The second empirical area, from which insights can be drawn, encompasses all items within and surrounding the grave (construction, filling, grave 'goods'; Fig. 4).[4] These elements can provide valuable clues about the lifeworld of the burying community and the deceased, ranging from the procurement of raw materials to their final disposition. The anthropogenic selection of objects within the grave is evident, particularly for artefacts, as well as for archaeobotanical and faunal remains. It appears that the people of Ba`ja even adhered to a certain ritual 'script' when choosing specific stones and sediments. Animal bones and plant remains are subject to selection in various ways, and therefore, they cannot be interpreted solely as reflections of the actual environment. This selection process is multidimensional. On the one hand, plants and animals could have been specifically chosen for the burial ritual, possibly due to their rarity, exceptionality, healing or magical properties (see *e.g.*, Grosman *et al*. 2008), or simply because of aesthetic preferences. On the other hand, animal

[4] The areas of the living worlds (left on Fig. 4) are mentioned in this volume only briefly but are the subject of Volume 1 (see Gebel and Benz forthcoming a).

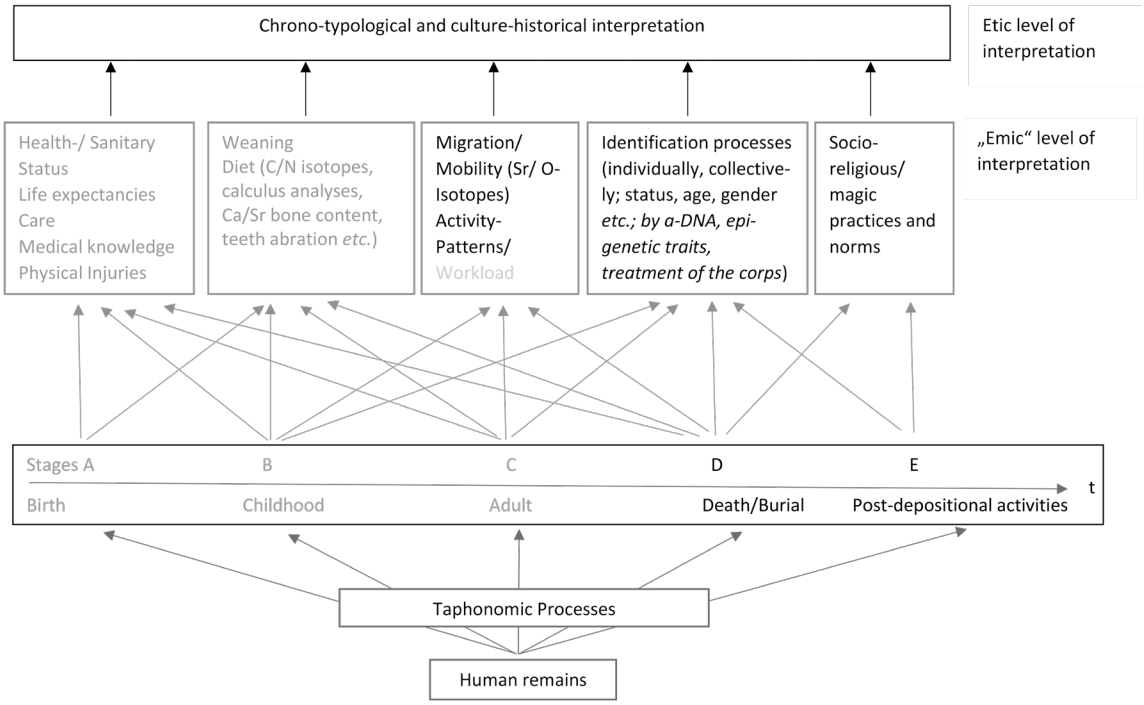

Fig. 3 Insights that can be gained from the human remains themselves. For the areas written in grey, information is either missing due to poor preservation or they were outside the scope of the *Household and Death Project*. (Graph: M. Benz, Ba`ja N.P.)

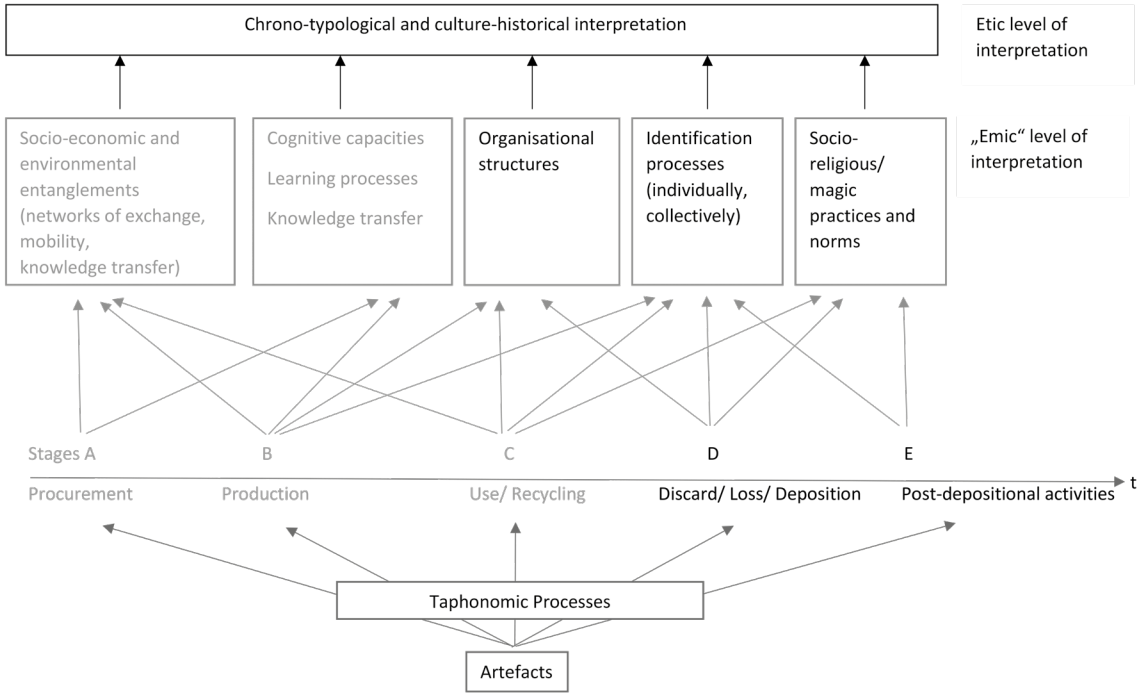

Fig. 4 Insights that can be gained from eco- and artefacts in the grave. (Graph: M. Benz, Ba`ja N.P.)

or plant remains from the immediate vicinity of the settlement might have been placed in the grave by chance during the filling process. In both cases, anthropogenic selection was involved. Therefore, the grave contents must be compared with domestic contexts and ideally, also with the wild flora and fauna to discern any deliberate selection and understand certain death and burial practices (see Prust this volume).

The raw materials offer valuable insights into the access to resources and integration into regional and supra-regional exchange networks (Gerlitzki and Martin this volume). Moreover, artefacts can provide information about cognitive and technical skills, such as the production of daggers (Gebel a this volume), domestic activities *(e.g.*, the use of grinding stones), and the symbol systems encoded in objects, including collective and social identifications (Benz 2017). Ornamental items buried with the dead (Alarashi a, b, and Alarashi and Benz this volume) and tomb constructions hold invaluable data for understanding symbolic systems and ascribed identities. In particular, it is crucial to examine whether the 'assemblage' of items found in the tomb was intentionally composed (Kümmel *et al*. 2008: 13). This appears to be the case for Ba`ja, as certain combinations were consistently found in most burials.

The practices during burying rituals may have modified the meaning of things. In Ba`ja, it appears that possessing something did not necessarily bestow prestige, but rather the act of burying costly or valued items expressed appreciation and esteem, and created or enhanced social relations within the community and between the living and the dead. Some artefacts might have been specially crafted for the burial ritual or for ex-commodification, meaning that the artefact itself might not have been of primary importance and lost its previous function. Instead, the communal production, display, and use during the burial ritual, along with the act of de- and ex-commodification, held significance (Gebel 2010; a this volume). Some of these artefacts were deliberately broken and deposited. Even though these items were rendered 'useless' for the living community, they held a powerful potential for creating communal memories. Interestingly, the knowledge, stories, or memories associated with owning or affording 'costly' objects or conducting elaborate burial rituals hold greater significance than the mere physical display of the object. Such memories generate an immaterial value for the community: on the one hand contributing to the transcendental immortality of the deceased and on the other perhaps generating communality and bestowing power – as well as possibly respect – upon those

who were capable of giving away esteemed artefacts. As detailed below, many activities related to death and the dead aimed at generating collective moments of memory, contributing to the 'mémoire collective' (Halbwachs 1967 [1950]) of Ba`ja's inhabitants (Assmann 1999; Benz *et al.* 2023). The construction of a grave can solidify the commemoration spatially, transforming it into a memorial (Renfrew 1998: 5) that triggers mental re-experience of the ritual and even past memories of the deceased by activating different spheres of memory (semantic, procedural, and episodic). At Ba`ja, there is some evidence suggesting that burials were marked, or that commemoration was used to retain the knowledge of burial locations (see Benz *et al.* this volume). Unless we possess personal records (and even then, their authenticity in reflecting true feelings and memories is highly questionable), reconstructing what someone remembered or thought remains impossible. We regard these collective experiences during burial rituals as affordances or catalysts for certain emotions or memories to be more likely than others, but not as a guarantee that such emotions or memories genuinely emerged.

Taken together, both areas of evidence, encompassing things including plants and animals, as well as people, allow us to gain further insights into the spheres of life of early Neolithic societies and reconstruct concepts and practices related to death and the deceased. From an etic perspective – *i.e.*, an external evaluation – it is also possible to situate the early Neolithic societies of Ba`ja in the context of the historical process by comparing them with other cultural areas and time periods. Before we summarise the empirical results presented in detail in Part 2 of this volume, it is essential to acknowledge that the research perspective of the *Household and Death Project* is built upon the foundations laid by influential thanatological research. The following paragraphs provide a brief summary of the key cornerstones in thanatological research that have shaped our perspective and interpretations.

Perspectives of Research: on the Way to an Integrative Thanatoarchaeology

Our research perspective builds upon more than a hundred years of thanatological research, with Robert Hertz (1907) often regarded as the initiator. As a student of Émile Durkheim, Robert Hertz was strongly influenced by the sociological perspective, and many of his thoughts on the social impact of death and the dead were ahead of his time. Basic ideas of transitional phases of death rituals were later generalised by Arnold van Gennep. We combine this historical foundation with new scientific and archaeological methods, along with a phenomenological social-neuroscientific perspective.

Burials as "un fait social total"

While 19th-century excavations of burials mainly focused on grave 'goods', the era of colonialism and increased encounters with foreign burial rites, sparked a growing interest in the burial rituals of prehistoric cultures. The works of Robert Hertz (1907), Émile Durkheim, and especially Arnold van Gennep (1909) elevated the study of dealing with the dead to the concept of "un fait social total" (a total social fact). Hertz and later van Gennep emphasised the three stages of exclusion (rites de séparation), liminality (rites de marge), and reintegration (rites d'agrégation) as characteristic elements of rites of passage, including funeral rites. Hertz shed light on the social significance of death and burial rituals for a community. During the functionalist era in ethnology, the functional significance of rituals was increasingly emphasised. For example, the ethnologist Radcliff-Brown stated: "A person occupies a *definite* position in society [...]. His death constitutes a partial destruction of social cohesion, [...], the social equilibrium is disturbed. After the death the society has to organise itself anew and reach a new condition of equilibrium" (Radcliffe-Brown 1922: 285; italics MB). Although this strictly functionalist interpretation and the conception of a static ("definite position") are no longer tenable today, these early writings laid important foundations for the social and ethological interpretation of funeral rites, as reflected in the ethological and ontological dispositions mentioned in the third part of our synthesis. Regarding the social function of burial rites and their agency and impact on the burying community, as Hertz had emphasised, the death of a member may be a critical period; not only for closely related people but for the entire community if the integrative forces of this member are lost. However, the integrative, stabilising, and identity-forming aspects of burial rites can help overcome this crisis and restore the cohesion of the community (*e.g.*, Hofmann 2008: 357-358; Grosman and Munro 2016: 311).

Further elaborating on these social functions, our synthesis will also consider the social tensions that may arise during such funeral rites.

The ambivalence of rituals, which is particularly evident in early Neolithic burials, is often overlooked due to the assumption of a restitution. However, it is especially in burial rituals that discrepancies between appearance and reality become apparent (Benz and Gramsch 2006; Benz *et al*. 2016, 2019). Usually, after the actual performance of the ritual, these discrepancies may manifest in dissonances, open conflicts, or even friction within the group. As Alexander Gramsch emphasised: "If we consider ritual as communication about social identities, it becomes evident that this communication designs an idealised picture that may possibly ignore or even conceal existing differences" (Gramsch 2008: 348, translation MB).

Paradoxically, it was in the *Processual* Archaeology of the 1960s that the *process* of burial rituals was relegated to the background of archaeological research. The positivist view and the search for regularities led to a static interpretation of social structures based on burials (see references in Veit 2008). Clifford Geertz had already emphasised that burial rites not only represented social identities and relationships but could also serve as models for them (Gramsch 2008: 348). It was only with the emergence of Postprocessual Archaeology, particularly with the work of Mike Parker Pearson (1999), that the notion of the grave as a mirror of society came under fundamental critique. However, abandoning burial rites altogether as a source of social interpretation would be akin to the famous adage of throwing out the baby with the bathwater. They still provide essential evidence for social structures (*e.g*., Kuijt *et al*. 2011; Benz *et al*. 2016). Nevertheless – and this marks a fundamental difference from previous research – the focus is no longer solely on the furnishings or the effort that went into a burial. Instead, it is crucial to understand the overall context of the rites (*e.g*., Bocquentin 2003; Hodder 2006; Kümmel *et al*. 2008; Benz 2012; Benz *et al*. 2016, 2017; Grosman and Munro 2016; Knüsel 2021; Gebel *et al*. 2022b). In this sense, Kerstin Hofmann (2008: 358) concludes that "attitudes towards death emerge from the dynamic changing interaction between individuals and the environment and are linked to the individual and collective image of man, nature, and society." The integration and commemoration of the dead are seen as essential means to claim power and express entitlement, as well as a means of spatial or social identification (Bocquentin 2021: 15). Whether burial rituals can actually trigger changes in social structures or merely serve as amplifiers for certain changes, is an open debate.

Through "Archéothanatologie" Back to Ritual Processes

Parallel to these socio-functionalist approaches, a more precise research focus on burials developed under the influence of prehistoric French archaeology. Especially through the meticulous field methods of André Leroi-Gourhan and French anthropology, the excavations and documentation methods for burials developed enormously. Seminal publications, such as the detailed descriptions of the burials at 'Ain Mallaha (Perrot *et al.* 1988), Hayonim Cave (Belfer-Cohen 1988), Hayonim Terrace (Valla 1991), and Hatoula (Le Mort 1994; Le Mort *et al.* 1994), greatly contributed to the prehistory of the Near East. Henri Duday (2012; Duday *et al*. 1990), one of the founding fathers of the "archéothanatologie" in France, was a teacher and colleague of Françoise Le Mort, and Jean Perrot was the editor of the series "Mémoires et Travaux du Centre de Recherche Français de Jérusalem", in which both, the burials of 'Ain Mallaha and Hatoula, were published. This forensic approach necessitated the presence of anthropologists on excavations from the very beginning. Precise taphonomic studies were conducted to reconstruct, in as much detail as possible, the original position of the skeletons, thus shedding light on the burial rituals and handling of the deceased (Duday 2012; Bocquentin 2021). Pioneers of this approach in Southwestern Asia include notable archaeologists and anthropologists such as Danielle Stordeur (Jerf el-Ahmar, Aswad), Anna Belfer-Cohen (Hayonim Cave), Leore Grosman (Hilzon Tachtit), and Fanny Bocquentin (Beisamoun), known for her compilation of Natufian burials. Anthropological investigations at sites like Çatalhöyük (Haddow and Knüsel 2017), Beisamoun (Bocquentin *et al*. 2014), and Aswad (Khawam 2014) exemplify the continuation of the French tradition in this field. Through this "archéo-forensic" methodology, the performative aspects of burial rituals (see Gramsch 2008) and the underlying cultural intentions and dispositions have once again come into the focus of research. The taphonomic-biographical approach forms one of the cornerstones of the empirical field of thanatoarchaeology (Gebel *et al.* 2022b), and is also pursued in this study. However, our approach goes beyond this by interpreting the results of all empirical investigations within the framework of anthropological studies – in

the broadest sense of the word – incorporating insights from social, cultural, ethological, and socio-neuroscientific investigations.

Combining Social Neurosciences and Phenomenology

In addition to focusing on the processual aspects of burial rituals, the perspective of the *Household and Death Project* combines scientific palaeoanthropology with research results from social neurosciences and phenomenology. Unlike purely phenomenological approaches (*e.g*., Merlau-Ponty, as summarised by Kastl 2021), which prioritise subjective perception, archaeology can only explore basic phylogenetic dispositions and ontological practices. As previously mentioned, it is indisputable that in prehistoric archaeology, reconstructing feelings or perceptions is impossible. Even in communities with written records, textually expressed perceptions and feelings and actual sensations may not corroborate. Therefore, this study considers the range of general neuroscientific patterns of perception and emotional reactions within the prehistoric milieu of an early sedentary settlement community. It aims to shed some light on possible meanings of burial rituals for these communities and thus gain a deeper understanding of the significance of dealing with the dead and death 9000 years ago (Gebel *et al*. 2022b).

Advancements in social neuroscience and transdisciplinary research on the interaction of environmental influences, genetics, neurotransmitters, nutrition, and social behaviour have led to unprecedented insights into various aspects of human societies. Before 1990, these understandings would have been inconceivable (*e.g*., Dunbar 1992; Ekman 1992; Damasío 1994; Eisenberg 1995; Franks and Smith 1999; Bauer 2005, 2008, 2011; Domes *et al*. 2007; Tomasello 2009; Edelson *et al*. 2011; van Wingen *et al*. 2011; Doyen *et al*. 2012). Key moments in this research include 1) the detection of the influence of social interactions on the activity of behaviourally relevant genes and on brain structures (Eisenberg 1995; Bauer 2015), 2) the discovery of the neurobiological basis of empathy including the mirror neuron system (Rizzolatti and Sinigaglia 2008) and 3) the understanding of limited cognitive capacities in managing trustworthy contacts with more than about 150 (± 50) people, known as Dunbar's number (Dunbar *et al.* 2010). These ground-breaking discoveries help us understand potential feelings of deprivation or anxieties of people living in early permanent settlements exceeding 200 inhabitants (Benz and Bauer 2013). We assume that humans are phylogenetically more similar to each other than to any other living being, *i.e*., from an evolutionary perspective the last 11,000 years, when sedentary life in farming communities became established, did not change the phylogenetic basics of humankind. This allows for comparing basic reactions, cognitive developments, and abilities.

Recent findings in social neurosciences also support the notion that the separation of body and mind, as proposed by Descartes, is not sensible (Bauer 2015, 2019; see also Kastl 2021). Humans perceive their environments and interpret them through their bodies, whose boundaries can be regarded as "fuzzy" in the sense of Knappett (2005). Perception is influenced by the milieu, current situation, constitution, social experiences, and memory. Humans use symbols, especially language, and imagery not only to interpret but also to create the world they inhabit (Searle 1995; Rappaport 1999: 8-9; Watkins 2004, 2012). Neurobiological and medical research has demonstrated that environmental influences can permanently alter the body's biology. Neurotransmitters, which are produced – or not – are influenced by a complex interplay of external influences, emotional arousal, and individual constitution. They also impact our perception, assessment of situations, and decision-making processes (Domes *et al*. 2007; Edelson *et al*. 2011; van Wingen *et al*. 2011; Trumble *et al*. 2014).

Due to neuronal plasticity, the enculturation of humans into a community is crucial. From a neuroscientific perspective, humans are born prematurely and, as a result, dependent on others for their development. This dependence gives rise to two cognitive properties that are essential for our interpretation and that characterise humans (Bauer 2019): 1) Intuitive empathy and learning through imitation, 2) The ability to reflect on and consciously change perspectives, mirroring the viewpoints of others. Consequently, there is a significant overlap between the activation of neuronal self-networks and the neuronal representations of influential others, especially idols and "teachers" in the broadest sense of the term. A brief discussion of these abilities is important because they have significant implications – in different ways – for the subsequent interpretations of burial rituals. Central to both abilities are the mirror neurons,

which confer a distinct capacity for imitation and empathy (Rizzolatti and Sinigaglia 2008).

1. The need for care, particularly during infancy, stimulates attention and empathy. Positive attraction is achieved, in part, through processes of imitation and resemblance. This often occurs unconsciously through gestures and facial expressions, and sometimes more consciously through external similarity (Lakin *et al*. 2008; Haun *et al*. 2014; Hirst *et al*. 2018). Émile Durkheim recognised the negative effects of deviant appearance and behaviour more than 100 years ago (Brennan 2017: 16-17). However, as societies became more specialised and socially differentiated, the means of distinguishing oneself or one's group from others gained importance. Consequently, identities are often torn between assimilation and distinction. As shown below, burial rituals, and especially the adornment of the corpses, reflect both aspects of these socially significant processes. Apart from their individual effects, clothing – symbolically meaningful attire – may have also gained importance on an intra- and intergroup level, especially when face-to-face knowledge and trust declined, and alienation became a significant concern (Dunbar 2013; Benz *et al*. 2017, 2020; see also Gilligan 2019).
2. Humans are born to learn. Their brains are constantly changing based on the crucial principle of "use it or lose it". This phenomenon, known as "neuronal plasticity" in neurosciences, is both a curse and a blessing. It makes humans highly adaptable to mental transformations, especially during socialisation into a specific culture, and even in later stages of life when adopting perspectives from peer groups or influential authorities. This means that the human brain is highly open to manipulation. Neuroscientific studies have demonstrated how habits and activities can influence not only the mind but also the brain itself (for a summary, see Bauer 2019). As mentioned earlier, one of the strengths of humans is their ability to selectively perceive information. This selective perception is essential as it prevents individuals from being overwhelmed by irrelevant information and enables them to make decisions and take action. However, what information is deemed relevant and how it is interpreted largely depends on enculturation. As a result, environments, particularly social environments, play a fundamental role in shaping how and what humans perceive (*e.g*., Renfrew 1998; Kay *et al*. 2004; see also Descola 2022). These cognitive filters are decisive for the power a ritual can have and which sensory impressions are stored. In a society where, *e.g.*, the death of a child is part of everyday life, death and the dead will be perceived differently than in a medically sophisticated world where we try hard to ignore death conceptionally and separate it also spatially from life. The relation to death and dying can be influenced by various circumstances and lead – even within one community – to different actions and rituals (Schiefenhövel 2007). Due to the overlapping neuronal representations of self and others, the loss of a community member becomes increasingly devastating when that person held greater significance in one's life. In other words, the more the neuronal representations overlap and the stronger the identification with the other individual, the more pronounced the destructive impact of her/ his death.

The Role of Collective Memories and Identification

The outcome of neuronal plasticity and the inclination for similarity is that, as discussed in the earlier chapter, our perception is selective, susceptible to influence, and biased. This also holds true for memories (as recently summarised by Hirst *et al*. 2018), which are far from being stable. They can be manipulated and are influenced by social factors. Group pressure and the desire to "assimilate" play a significant role in shaping the construction of the past but also for the lives within a community (Hornsey and Jetten 2012; Haun *et al.* 2014; Over 2015; see also Benz *et al.* 2020). In particular, within a relational, *habitus*-ruled group, such as the Early Neolithic communities in southern Jordan (Gebel 2017; see also Bauer 2021), it is suggested that learning processes and memory formation primarily occur through observation, imitation, and implicit personal mediation rather than explicit teaching (Bauer and Benz 2013: 66; Purschwitz 2022). Albert Bandura (1977) referred to this type of learning as "observational learning" and "imitative learning".

Displayed practices as a model and orally transmitted stories have undeniably played a significant role in shaping the understanding of the past in the past. Even though oral traditions

appear more vulnerable and fleeting in terms of their transmission duration (Whitehouse and Hodder 2010: 122-124), they leave little room for interpretation given the binding nature of spoken words compared to non-personally transmitted knowledge such as in a written text or symbols. The spoken word is closely associated with individuals, typically authoritative figures to whom learners listen. Often, these interactions are accompanied by personal connections. A sense of commitment is fostered between the narrators and their listeners, particularly the younger audience, in the broadest sense (Knüsel 2021: 215). Breaking this trust has far more profound emotional consequences than merely reinterpreting or disregarding information that was not conveyed personally. Aspects of an imagistic and doctrinal mode (of religion) as elaborated by Harvey Whitehouse overlap here, although it must be noted that – as conceived by Whitehouse (2000) himself – this distinction is equivalent to two extremes. Both modes have probably always occurred, and continue to occur, in varying proportions within most cultures. In communities where identification is above all relational, *i.e*., dependent on relations to others, and fluid (Descola 2022), there were presumably no fixed roles for 'teachers' or 'students' and no fixed doctrine. Nonetheless, situations of implicit learning likely emerged in specific and temporary contexts. As noted in Whitehouse's later writings (Whitehouse and Hodder 2010), the doctrinal mode of religion is not necessarily tied to the use of writing but is based on a widely understood overarching symbolic system. Both modes also involve different types of memory. The imagistic mode of religion relies on episodic memory, where distinct memories are formed based on strong, emotionally arousing moments, creating semantic links, whereas the doctrinal mode of religion primarily relies on procedural memory through constant repetition, and to some extent, it also activates semantic memory.

However, the power of rituals rarely arises from semantic memory but rather from procedural or episodic memory. The key lies in engaging as many senses as possible to create lasting associations and, consequently, memories (Tambini *et al*. 2017). Procedural memory is reinforced through jointly performed automated movement sequences, the semantic meaning of which was likely not fully understood or only vaguely known to most participants. This observation is supported by ethnographic studies in which participants from traditional communities were asked about the religious significance of the ritual they took part in (Boyer publ. comm. 2013). Hence, the emotional responses, synchronicities, and socialisation associated with a ritual appear to wield more influence on identification and significance than the ritual's semantic meaning. As we shall see below, elements of both modes of religion, as defined by Whitehouse, are evident in early Neolithic funerary rites, with both repetitive sequences of action reflecting automated elements in the funerary ritual and activities suggesting emotionally charged moments.

The synchronisation of movements during rituals means that these are usually remembered more strongly than individual experiences, at least in procedural memory, unless the latter were traumatising (Winkelman 2002; Tarr *et al.* 2015). The emotional effects of ritualised practices, which are performed collectively, were described by Radcliffe-Brown (cited in Rappaport 1999: 221) a hundred years ago as a state "of elation in which [the dancer] feels himself filled with an energy beyond his ordinary state ... at the same time, finding himself in complete and ecstatic harmony with all the fellow-members of his community." Victor Turner (2009 [first edition 1969]) later defined this emerging felt community based on communally practiced rituals as "*communitas*". Indeed, social neurosciences have since proven that feelings of community extend beyond the people who participate in physically practising the ritual. Emotional reactions may spread and affect the audience. Prosocial behaviour is enhanced by synchronically practised rituals even to non-participants (Reddish *et al*. 2016), corroborating the mitigating impact of burial rituals. It may be assumed that early Neolithic funerary rituals comprised emotionally effective staging.

Following the pioneering research by Sarah Tarlow on grief in historical societies, Karina Croucher (*e.g.*, 2010, 2019) has highlighted the importance of grief and bereavement for the interpretation of burial rituals. Such emotionally touching moments that are out-off-the-ordinary were possibly more intensively remembered than routines of every day. We will come back to this point, especially when reviewing the use of pigments or colours and fire in burials.

Embodied Symbols

Burial rituals transfer the semantic power of symbols into embodied semantics and, therefore,

into procedural memory which becomes automatic and long-lasting with repetitive practice. In many cases, the appeal of rituals lies in their facilitation through procedurally automated processes, as participants are relieved from making decisions or reflecting on courses of action. However, this 'freedom' comes at a high cost: it leads to traditions being adopted more unreflectively and finding their way into the construction of 'reality' more easily than if they were only conveyed through abstract coding (writing/language). Consequently, cultural constructions are naturalised. This kind of control takes place consciously or unconsciously in funeral rituals on many levels.

Thus, the dead body is purposefully positioned within the framework of the funeral ritual (Kümmel *et al*. 2008: 13). It serves as a projection surface for the social roles, ideals, intentions, and wishes of the burying community (Knüsel *et al*. 2010). Nevertheless, the deceased person's body, biography, and identity also play a significant role in determining the type of burial. Especially for individuals who were not closely related to the deceased during their lifetime, the way the funeral is staged and the narrative surrounding the deceased individual can greatly influence the memory and ascribed identity of the deceased. The appearance, thus, becomes ingrained in the collective – and possibly personal – memory. On a collective level, the communal ritual fosters a sense of cohesion, belonging, equality, comfort, and order (Hertz 1907). The power of this impression can influence everyday life, but only if it is repeatedly revitalised, often supported by symbolic artefacts or gestures (Sütterlin 2000; Wulf 2005), and if oppositions and contradictions are not too pronounced. Otherwise, the impact of the ritual remains fleeting, and it may devolve into a masquerade or even a caricature.

A Matter of Time

As a final remark, time should be considered, even though we can only briefly mention two aspects that seem decisive for understanding burial rituals in a prehistoric community. The first aspect is methodological, while the second involves concepts of time within prehistoric communities. Following Cornelius Holtorf (2005), we view a grave as a multitemporal snapshot. At first glance, this may appear contradictory, but upon closer examination, it becomes clear that the moment of excavation freezes a very specific stage in the tomb's decay process, or rather, it exponentially accelerates that process. What we perceive are snapshots in which multiple timelines coincide. Therefore, reconstructing burial rituals requires considering several of these "snapshots" to gain a comprehensive understanding of burial rituals within a community.

In all societies, biological transience and death represent a linear experience of time that can only be transcended through cultural constructs. As Jan Assmann (2005: 8) stated, "Man is the animal that knows about the finiteness of his life because he can think not only beyond the moment but even beyond his lifetime". Having cited this quote by Assmann, who delved into the construction of memories, history, religion, and death like few others before, we may add that, of course, we can contemplate the afterlife, but it remains a matter of faith and a purely cultural construct. Our search for explanations of the uncontrollable was likely a strong impetus for spirituality and belief in otherworldly powers. Choreographed burials, as we believe in observing at Ba`ja, might have even served as a strong incentive for religion – authoritative, institutionalised collective belief systems in otherworldly powers.

As briefly outlined above, certain deceased individuals in early Neolithic communities were kept in the settlement for at least a specific period. The absent was thus not only thought to be present but literally re-presented. This is especially evident with the well-known plastered skulls (Kuijt 2008). These dead could become a focal point for later burials (Benz 2012; Khawam 2014) or, as observed in the settlement of Çatalhöyük, they served as "*mort d'accompagnement*" for other deceased individuals (Haddow and Knüsel 2017), not necessarily as "servitude volontaire" as Alain Testart (2004) suggested, but through various forms of secondary or delayed interments. Physical decay was thus negated, and the linearity of time was suspended in an 'eternal' present. While such skull burials have not yet been uncovered at Ba`ja, a strong presence of the deceased in the lives of the early Neolithic inhabitants of Ba`ja is highly likely. However, whether this was integrated into a cyclical or linear concept of time and history is mostly beyond our knowledge and cannot be discussed in detail here (Weidenhaus 2015; Benz 2020; *cf.* Müller 2005). Whether, and to what extent, early Neolithic communities were already constructing history or – as is widely assumed – the making of history only began in hierarchical societies (Müller 2005; *cf*. Düring 2008; Hodder

and Pels 2010; Benz 2012; Benz *et al*. 2018), remains a topic for further discussion.

In summary of the methodological introductory notes, our methodology is based on scientific empiric data from a wide panoply of research fields. We endeavour to evaluate and reconstruct burial rituals from as many perspectives as possible, focusing not only on the burial itself, but also on the relations between the living and the dead. The interpretation of these raw data is based on assessing their interdependence within an 'emic' socio-cultural network along with fundamental ethological and socio-neurobiological dispositions. In contrast to pure phenomenological approaches, our goal is not to reconstruct personal experiences. Instead, we aim to integrate human-specific dispositions with the affordances and constraints arising from enculturation in the Late PPNB communities of Ba`ja. The primary objectives of our investigations are to understand the burial rituals, assess their potential impact, and reconstruct the socio-cultural concepts governing the interactions between the living society and their deceased members.

Summary of the Empirical Observations

In the second part of the synthesis, we summarise and evaluate the empiric data elaborated in detail in Part 2 of this volume. The evaluation of the data follows the sequence of the eventology reconstructed for the most elaborate Burials CG7 and CG10 (see Benz *et al.* this volume: Appendix 1), *i.e.*, we describe first the location, then the burial construction, the treatment of the corpse, the filling and sealing of the grave and finally, possible markings or post-funeral events. In total, 15 graves were excavated (Benz *et al.* this volume: Table 1), of which three collective burials (CG1, CG12, DG1) and one single burial (TU7G1) had already been uncovered before the *Household and Death Project* (Gebel and Hermansen 2001, 2004; Gebel *et al.* 2006). The minimum number of all buried individuals amounts to 57 (Benz *et al*. this volume). Almost 75% (MNI=42) were buried in collective/multiple burials and 15 individuals in single or double burials, whereby Burial CG6 is a special case in which an infant had been buried, most probably in a grave pit of a more ancient burial of an adult and subadults who had been removed. Most of the bones of the more ancient interments were missing. All other adult remains were uncovered in collective burials, except for a few more isolated adult bones from household contexts, and two primary single interments of adults (CG10 and TU7G1). Taken together, it is obvious that most of the adult individuals are missing and that our sample is considerably biased, with male adults in collective burials and subadults in single and double burials being overrepresented (Gresky this volume).

Location of the Burials and Preparation of the Burial Grounds

All human remains were located in Area C, except for three burials (DG1, DG2, TU7G1) and a few isolated human bones in Rooms DR22 and DR30 (see Benz *et al.* this volume: Fig. 2). As former excavations mostly stopped when reaching the plastered floors, it is very likely that more burials will also be uncovered in area D and B in future campaigns. Therefore, the high concentration of burials in Area C probably represents the state of excavation and not a prehistoric preference for a certain place within the settlement.

All burials with three exceptions (CG2, DG2, and TU7G1) were located close to or immediately below a window-like wall opening (Fig. 5), suggesting that this choice of location close to a possible access was deliberate. It, therefore, seems likely that access to the graves was of some importance. In contrast to other PPN sites, there was no preference for a special part inside the house where the dead were buried. Whereas at the contemporaneous site of Halula (Guerrero *et al*. 2009) a preference for the southern part of the house was observed, at Abu Hureyra (Moore and Molleson 2000), Nevalı Çori (pers. comm. Hauptmann 2008), Boncuklu (Baird *et al*. 2012) and Çatalhöyük (Hodder 2006) rather the northern parts of the house were chosen for interments. At Ba`ja, the only preference seems to be close to a wall, sometimes even undercutting the wall, whereby the plaster cover was running up onto the walls, proving that the wall existed before the interment (CG6, CG7, CG10).

Many of the corpses were buried in pits that were cut through the plastered floors (Gebel *et al.* 2017: Fig. 5). The collective Burial CG12 and the upper layers of the collective Burial CG11 are exceptions, but excavations in 2021 confirmed that beneath the layers of mingled bones in CG11, further burials had been cut through the lowest plaster floor. Beneath the collective Burial CG12, there were no further burials uncovered, at least in the area west of the

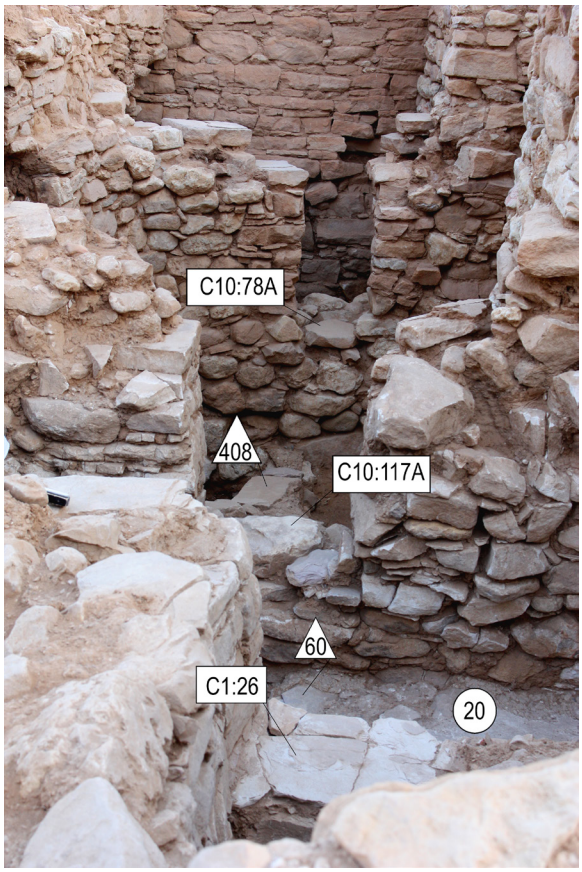

Fig. 5 Most of the burials were located close to window-like wall openings, suggesting that access to the burials was important. (Photo: M. Benz, Ba`ja N.P.)

buttress, which covered the southeastern part of the burial. Excavating the skeletons beneath the buttress was impossible.

The floor of the chamber of the collective Burial DG1 was entirely covered with stone slabs. It remains uncertain whether these slabs were part of the burial or had once belonged to the room into which the grave was built. No further human remains were uncovered beneath these slabs. The following two scenarios are possible: On the one hand, considering it had been an extraordinary room with a wall painting (see Gebel *et al.* 2006; Gebel b this volume), such a well-made floor is not unexpected. Similar floors made of stone slabs were found at Ba`ja in Area G (Gebel *et al.* 2020) and at the nearby Middle PPNB settlement of Shkārat Msaied (Kinzel 2013). On the other hand, this floor might have been constructed solely for the burial chamber. Stratigraphically, it was beneath the surrounding walls and the vertical stone slabs of the burial chamber, but without further excavations, it is impossible to determine the relationship between the floor's stone slabs and the more ancient walls of Room D11/12/21/22:26.2.

The infant Burial DG2, the double Burial CG5, and the burial of a female adult in TU7G1 represent three further exceptions. They were all interred in rather shallow pits that were dug into room-filling sediment and a midden area, respectively. The case of the single infant Burial CG3, is not entirely clear, but the burial pit was most probably dug through the floor too.

In the collective Burial CG11, the more recent depositions were placed on top of an earthen floor or grave cover, which sealed the more ancient interments (see above). In the Burial CG12, the corpses were deposited immediately above a red-stained plaster floor, and, as it seems, they remained there for some while without being covered.

For at least three burials, CG6, CG7, and CG10, existing walls were undercut for some centimetres, risking the collapse of these walls. The plaster cover of the burials, which runs up onto the walls, proves that the burials were younger than the walls they undercut.

Except for the single infant Burial CG6, no overlapping of burial pits was observed. The burial pit Loc. CR6:22 for the infant in Burial CG6 far exceeded the baby's size. Given the presence of some isolated adult and further infant bones, it may be suggested, that most of the bones of the adult and subadult individuals had been removed, and the grave was sealed by a pile of stones and stone slabs. On top of this grave cover, another child's burial was observed in a crossed position to the infant buried below it. This spatial relation is so far the only example of its kind. Given the extremely elaborate burial cover and/ or sub-construction of well-chosen stones and sandstone slabs for this burial sequence, the position of the more recent burial does not seem arbitrary. It seems that the white stones that surrounded the burial in a demi-circle were intentionally chosen to build a contrast with the red sandstone slabs which covered the more ancient burial (Benz *et al.* this volume: Fig. 29).

The collective burial grounds and the multiple/ collective burials represent another close spatial relationship between several people, but preliminary results of genetic data do not confirm close parental relations between individuals buried in the same collective burial. However,

this does not exclude that close social relations may have existed. One individual buried in the collective Burial CG11 attests to the rather close genetic relations of his parents (Skourtanioti and Feldman this volume: Fig. 3).

The absence of any random or accidental destruction of earlier burials, on the one hand, and the existence of possibly intentional spatial relations and emptying of former burials, on the other hand, lead us to suggest that certain rules on how to handle former burials and possibly memorisation of the location of graves existed and that spatial relations were probably created intentionally. The repetitive association of wall passages next to graves underlines the importance of the accessibility of the graves and thus supports the idea of commemorating the dead.

Grave Constructions

Only three graves comprised constructional elements inside the burial pit and were clearly segregated from the remaining room by a small wall (DG1, CG7, and CG10). The grave construction of the collective Burial DG1 and the grave cist of CG7 ("Jamila") seem to be the most elaborate encountered so far at Ba`ja. The case of the grave chamber of the collective Burial DG1 is unique (Benz *et al*. this volume: Figs. 69-70). It was built with one large and one smaller vertical stone slab and three walls. Together, they constructed a burial chamber set into an existing small room, covering a mural that existed in the room before (see Gebel and Hermansen 2000). The burial cist of "Jamila's" grave was hardly less elaborate, with two vertical slabs, one large covering slab, and an L-shaped wall segregating the burial from the rest of the room (Benz *et al*. this volume: Fig. 36). Similarly, the grave of "Usaid" (CG10) was segregated from the rest of the room by a *c*. 10cm high wall. Additionally, two vertical stone slabs fixed the southern border of this grave pit.

Enigmatically, five burials (CG1, CG6, CG7, CG9, CG10) were filled with rather sterile silty sand, containing tiny pieces of charcoal, some small snails, and limestone congregations but hardly any other inclusions, whereas the other burials were filled with rather brown to dark-brown silty sand mixed with more organic remains and charcoal. In the case of the Burial CG10, it is remarkable that the sand filled the pit completely up to the large covering stone slabs. However, because the skull was dislocated the sand must have been added at a later point in time (Benz *et al.* 2019). Histological studies indicate that the burial may have been open for some while or that the corps was dried outside the grave before being buried (see Haddow this volume). For the construction of "Jamila's" burial, in addition to the grave cist and the filling of the red sand, white chalky stones of non-local origin were put on top of the western, elevated part of the burial pit to create a firm support for the main covering stone slabs.

More than half of the graves were covered with one or up to three very large stone slabs (CG1, CG2, CG4, CG6, CG7, CG9[?], CG10, DG1[?]). Some of these slabs were so thin versus their size and weight that two broke when they were removed during the excavation (Loc. C1:39.1 and one of the three slabs covering the Burial CG10, Loc. CR35:408.5). Generally, some of the sandstone slabs were in a poor condition. For the Burials CG9 and DG1, large stone slabs were found only in their vicinity, not immediately on top of them. So, it may be possible, that the graves were reopened, and the covering slabs taken off. For CG9, it cannot be excluded that the large, dislocated stone slab that was found just north of the burial pit belongs to another, yet unexcavated grave. For DG1 only the rather similar heights of the upper borders of the grave construction suggest that they may have served as a support for the covering slabs. However, none has been found *in situ*. The double Burial CG8 of two subadults was also covered with one stone slab, but it was rather small. It resembled the size of the deliberately destroyed stone slabs found on some burials.

Three burials were covered with layers of deliberately destroyed stone slabs. These were always made of white glittering Ordovician sandstone (CG2, CG7, CG9) (Benz *et al.* this volume: Figs. 9, 39 and 82a). When freshly broken, their shine in daylight must have been brilliant to the eyes. Some of the slab fragments were turned upside down and separated from each other, but the edges of some fragments were sharp and matched perfectly. This led us to suggest that these slabs were deliberately broken shortly before covering the burial (Gebel *et al.* 2019; Benz *et al.* 2020). Other slab fragments were also found. However as they did not match, this suggests they are bits and pieces from various origins that were brought together/ collected and deposited. In the case of Burials CG2 and CG7, these slabs were piled up in several layers on top of a large slab that covered the burial. In

contrast, the white fragmented slabs of Burial CG9 were deposited immediately above the silty sand filling, whereas – as mentioned above – a large stone slab was only found next to but not on top of this burial. The sequence of covering events for this burial is thus unusual. Further excavations of its surroundings are necessary for a better understanding.

Most of the other burials were covered with unworked or hardly worked angular and round stones up to 15 x 10cm large. The most striking examples of this practice are the single adult Burial CG10 ("Usaid") (Gebel *et al.* 2017; Benz *et al.* 2019) and the large pit of the infant Burial CG6, which was completely filled with stones. In both cases, grave 'goods' – even of possibly high prestigious value due to their exotic material, rarity, and sophisticated technical skills, such as the dagger (see Gebel a this volume) – were embedded in the grave cover (for the 'assemblages' see below). The pit of the lower layer of the collective Burial CG11 (Loc. *CR17:117* [2018]) was also covered with a densely packed layer of stones (Loc. *CR17:115* [2018]). According to these observations, it can be suggested that the stone layers of CG2, CG11, CG12 and DG1 were not just room fills but deliberate covers of the burials.

It is questionable whether the stone cover of the isolated female adult Burial TU7G1 was also part of a ritual. It rather seems that this was a thick rubble layer, accumulated on top of the burial (Gebel *et al.* 2006). In some cases, it was observed that isolated stones probably had fallen into the burial pits from the sub-constructions of the floors that had been cut through (*e.g.*, CG1, CG8, CG9). However, in most of the burials that were excavated in the frame of the *Household and Death Project* the densely packed stone layers above the burials seem to mark one of the last stages – if not the last – of the burial ritual.

At least three burials had been covered by the same limestone/ chert grit as had been used for the 'terrazzo-like' floors (CG6, CG7, CG10). Patches of grit were also observed on top of the collective Burial CG11, layers Loc. CR17:133-137, and possibly also on top of the collective Burial DG1, even though in both latter cases, the remains were not as dense as for the former three graves. The cover of Burials CG6, CG7, and CG10 had additionally been painted with white lime plaster (for the analyses, see Reifarth *et al*. this volume). For the Burials of "Jamila" (CG7) and "Usaid" (CG10), this finish was well preserved and sealed the graves so firmly that at first, it was not even identified as a grave cover but as remains of a floor.

Finally, the evidence that there were markings for the graves is poor. Due to this uncertainty, this aspect has not been included in the statistics, but for the sake of completeness, it will be briefly summarised. Grave markings may be suggested for at least two cases (CG5/6 and CG10). For the burial sequence of CG5/6 an eye-catching, obviously naturally coloured (pers. comm. H.G.K. Gebel), white/ red stone was inserted into the wall just above the burial (Fig. 6). It should also be mentioned that the burial cover of CG6 was very elaborate. The child, Loc. CR6:23a (CG5), who was buried on top of this grave cover, was deposited in a crossed position to the infant buried beneath in CG6 (Benz *et al.* this volume: Figs. 23 and 29). As argued above, this was a deliberate succession. One further observation should be mentioned for Room CR6: a small pit (Loc. CR6:25) filled with stones and a celt was uncovered close to the north-eastern border of the large burial pit of CG6 (middle right in Fig. 6A). This pit might have served as a foundation for a post that could have marked either of the Burials CG4 or CG6. Notably, at Ba`ja, a magical practice of inserting celts into walls has been observed in several instances (Gebel 2002a). The pit with the celt may, therefore, imply an apotropaic function, either to protect the corpses or transfer the celt's strength to them, but this remains speculative.

For the cover of "Usaid's" Grave (CG10), a well-formed gap in the otherwise very dense grit cover may suggest the presence of a standing stone. Similarly, a stone slab found obliquely in the cover of the collective Burial DG1 could also be interpreted as a standing stone. Moreover, the elevations of both Burials CG7 and CG10, along with their white plaster, served as visible reminders inside the room that were impossible to ignore, unless they were covered, or the memories and stories about the dead and the burials had vanished. The importance of the colour white during the PPNB has been highlighted by Joanne Clarke (2012).

The burial of "Jamila" had become a structuring part of Room CR36.1. The top row of the western-most stone slabs that covered her burial had not been covered by grit and plaster, as if they were used for a deliberate passage from one wall opening in the south to the other one, north of the burial, giving access to the Burials CG8

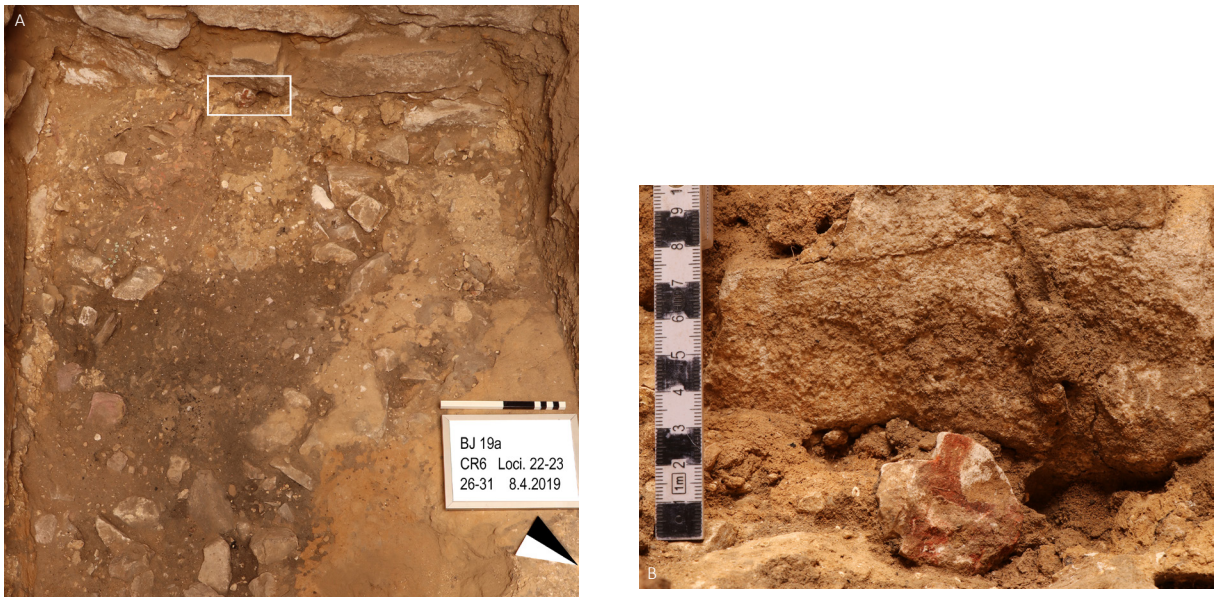

Fig. 6 *A* The position (white rectangle), *B* close up of the naturally coloured stone inserted in wall Loc. C22:10 just above the sequence of Burials CG5/6. (Photos: M. Benz, Ba`ja N.P.)

and CG10 in the adjacent Room CR35 (Fig. 7). Possibly, the double subadult Burial CG2 was also a rather impressive installation, irrespective of whether the heap of stones above the stone slabs was an integral part of the grave cover, or not. No other markings of organic remains, evidenced by postholes or similar negative gaps in the floors, were observed.

Eco- and Artefacts Associated with Burials

Regarding the eco- and artefacts associated with burials, there appeared to be a clear distinction between ornaments (1) and other eco- and artefacts (2). Therefore, we will discuss them separately, recognising that the boundaries between the two categories are blurred and situational. Some other decorative and prestigious objects might have served as adornments during the buried person's lifetime. All burial goods are

Fig. 7 The western most row of stone slabs that covered the burial of "Jamila" (CG7) was not covered by grit and white lime plaster, as if these slabs should mark a passage from one wall-opening to the other, crossing the room of the burial. (Photo: M. Benz, Ba`ja N.P.)

represented in Part 2 of this volume (Benz *et al*. this volume).

Ornaments

Most of the ornaments were associated with a specific individual, even in collective burials, unless they were moved aside during subsequent burial events (Alarashi a and b this volume; Benz *et al*. this volume; Costes and Fisher this volume). This latter process was clearly observed in Burial DG1, where most of the beads and other artefacts were shifted to the edges of the grave, with only a few bones, beads, and a mother-of-pearl "paillette" remaining *in situ* (Benz *et al*. this volume: Fig. 76). In contrast, for example, in Burial CG9, almost all beads were associated with a specific child and infant. Since conducting a detailed analysis for the collective burials, except for CG1, was not feasible within the scope of the *Household and Death Project*, the ornaments of the collective burials will be considered, as a whole, for each collective burial.[5] We are well aware that this approach may create a distorted picture for the collective burials, but it seemed to us the most appropriate course of action. There is some evidence that some of the individuals deposited in the collective burials had ornaments, whereas others had none – as was the case, for example, with the multiple/ collective Burial CG9 and the double Burial CG5. Therefore, dividing the number of beads by the number of individuals would not yield meaningful results. Rather, it would obscure individuality in favour of a methodologically induced egalitarianism. Hence, it appeared more appropriate to acknowledge that the collective burials should not be directly compared with the single and double burials.

The empirical evaluation of all burials reveals the existence of three categories of ornaments, although the limited number of burials does not permit statistically significant results. Other categories of adornments, such as earplugs/ labrets or bone (finger?) rings, have not been discovered within a burial context thus far (see Alarashi a this volume; Alarashi and Benz this volume). This indicates that there was a deliberate selection of ornaments deemed appropriate for burial, or some of these ornaments might have been specifically crafted for the burial ritual.

a. Bangles[6]: bangles of mother-of-pearl (F.no. 904007) and of composite nature (four marl and one mother-of-pearl ring) (F.no. 91264) were restricted to the only male adult who was buried individually (CG10, "Usaid") (Benz *et al*. this volume: Fig. 57-58). The *in situ* position of both objects proves that they were worn on the left (F.no. 91264) and right (F.no. 90400) upper arm, respectively. None of the other graves contained fragments or complete bangles of this kind. Isolated fragments of sandstone rings were found in the grave filling of CG1, CG4, CG11, CG12, DG1, DG2? and TU7G1, but do not seem to have been deliberate grave 'goods'. Whether these sandstone rings were worn during lifetime at all, has been a matter of debate (see Gebel forthcoming a; *cf*. al Nahar 2014). Excavations at Motza confirmed that at least, some of the rings were used at this contemporary site for the adornment of the dead (Vardi *et al*. 2020: 111-114).
b. Mother-of-pearl pendants, buttons, and "paillettes": These are specific, almost standardised objects (see Alarashi a this volume: Figs. 16-18; Benz *et al*. this volume: Fig. 77), consisting mainly of a mother-of-pearl ring with at least two perforations (in Burials CG7, CG11, DG1) or of cross-shaped pendants (in Burials CG9, CG11). One type of these rings (so-called "paillettes") had additionally four appendixes with further drillings. They probably served as spacers in a necklace as in the case of "Jamila's" necklace (CG7), described by Alarashi b (this volume: Figs. 17-19 and 23; Benz *et al.* 2020), and Costes and Fischer (this volume: Figs. 1-2, 11, and 13). At Ba`ja these "paillettes" were exclusively associated with subadults. A similar, albeit slightly smaller, ring was discovered in connection with an infant burial at the Late PPNB site of Basta. Plain rings without appendices were also uncovered with infants (DG1, CG11). However in one case, at Basta, the attribution to an

[5] Unfortunately, the field diary for the collective Burial CG1 did not record the beads individually and with their precise association to a specific bone. It was therefore not possible to attribute the beads to a specific individual, although the bones were investigated and sorted.

[6] MB is grateful to Daniella Bar-Yosef Mayer for the valuable information that these ornaments should be called bangles (public communication 1.12.21).

[7] For all find numbers of ornamental elements see Alarashi and Benz this volume: Appendix 1.

infant is uncertain, because the ring may also have been associated with the woman as the child was buried close to her body (Hermansen 2004, n.d.; *cf.* Schultz in Bienert *et al.* 2004; Gebel *et al.* 2022b). Cross-shaped pendants found at Ba`ja (Benz *et al*. 2020; Gebel *et al*. 2020) are currently unique to this site and have not been discovered in any other archaeological site. In one case (F.no. 110414) within Burial CG9, it was associated with the 3-4 year-old child (Loc. CR28.2:122a). It was either a component of a necklace or part of the child's chest ornamentation, possibly sewn onto some form of cloth. The larger cross-shaped pendant (F.no. 110412) was found without any clear association in the lower part of the collective Burial CG11. However, a final assessment must await the analyses of this burial, keeping in mind that the data given in the empirical section are preliminary and that a comprehensive analysis of this large collective burial was impossible in the *Household and Death Project*.

A small and poorly preserved example was uncovered on top of the torso of an adolescent in the eastern part of the collective Burial CG11 during the 2021 excavations. This artefact could not be studied anymore within the *Household and Death Project*, but it is shown in Fig. 8. The preserved parts of this pendant are almost identical in size and shape to the example of Burial CG9.

Our contextual analysis reveals that there is no clear association of mother-of-pearl pendants with adult individuals at Ba`ja. Complete mother-of-pearl pendants have only been found inside graves. Outside of burials, only fragments of such ornaments were uncovered. One of these fragments found in Area B (F.no. 20407) may have belonged to a cross-shaped pendant, and another remarkably similar piece was discovered in Sounding 1 in 1984 (Gebel 1988: Fig. 11.6). Additionally, isolated mother-of-pearl ring fragments were found in several locations (see Alarashi and Benz this volume: Appendix 1). A tiny (*c*. 1.5cm long x 0.8cm) mother-of-pearl serrated pendant with three perforations, possibly a (re-used) fragment, was uncovered at the contemporaneous site of Basta, underlining the close cultural ties between both sites (Nissen *et al*. 1987: 114, Fig. 18.13).

c. Beads and small mother-of-pearl pendants/ buttons: by far, the largest category of ornaments at Ba`ja consisted of beads and small pendants (Fig. 9A-B). The chapters on ornaments provide a comprehensive analysis of the various ornamental element

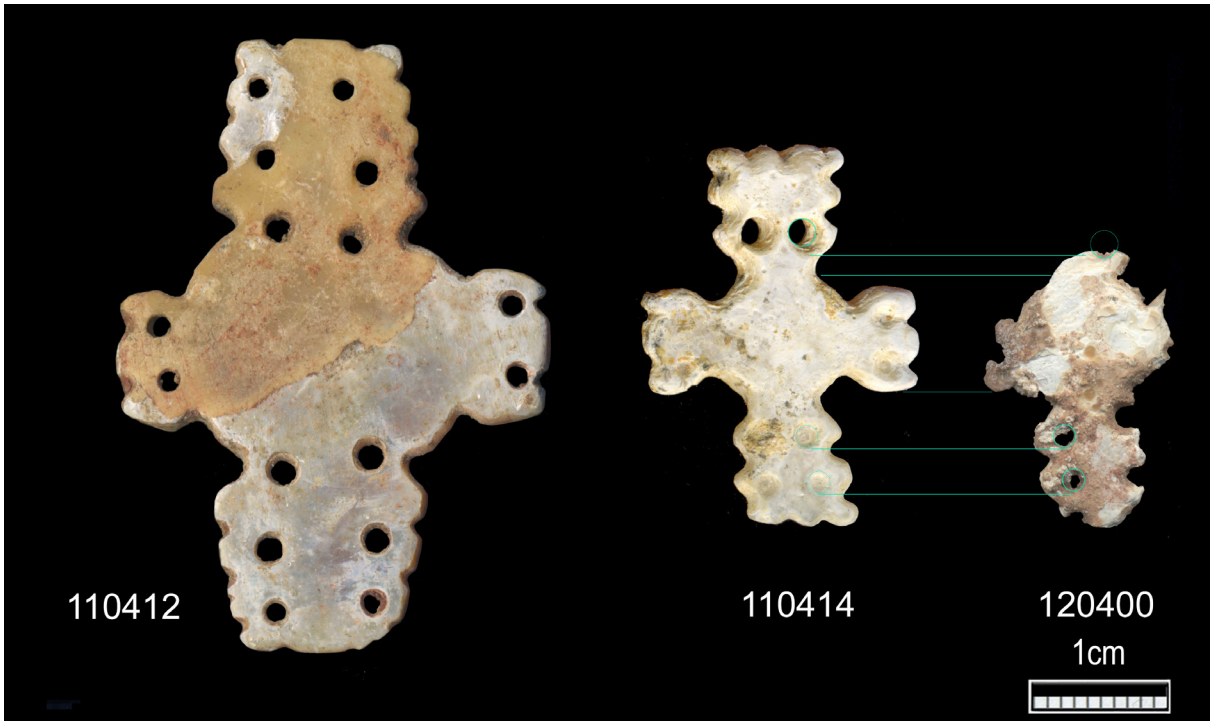

Fig. 8 Cross-shaped MOP pendants found in Burial CG9 (F.no. 110414) and in the collective Burial CG11 (F.nos.110412, 120400) in Area C. (Photos: H.G.K. Gebel, Ba`ja N.P.)

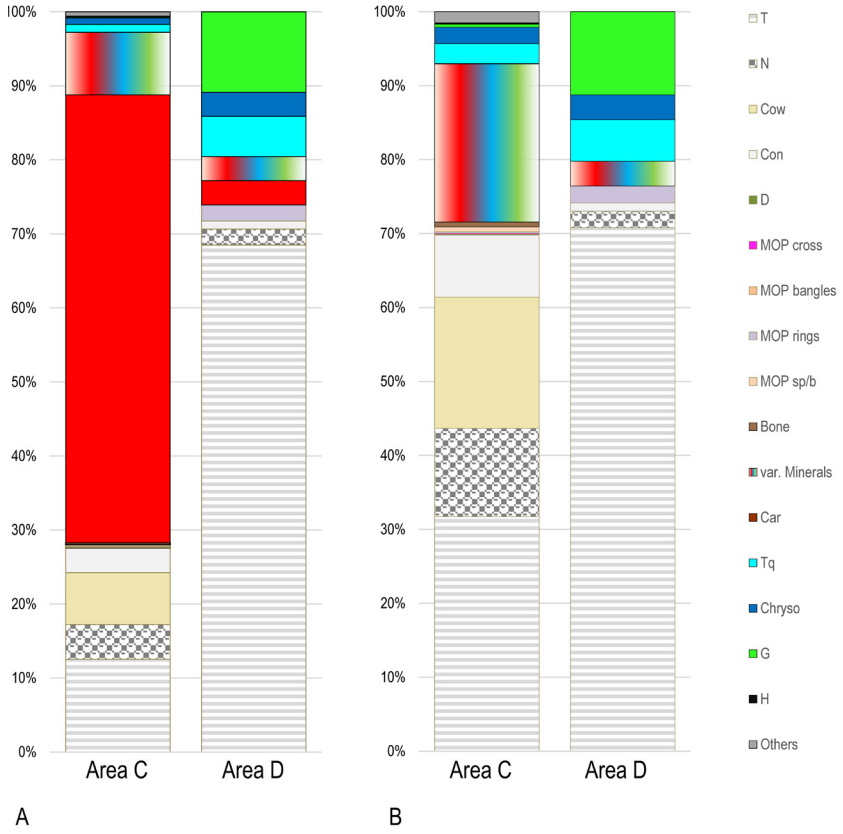

Fig. 9 Distribution of beads and pendants in burials of Areas C (n=3867) and D (n=92), sorted according to raw material: *A* with the red limestone beads, *B* without red limestone beads. For the legend see Table 1. (Graph: M. Benz, Ba`ja N.P.)

types and their distribution (Alarashi a this volume, Alarashi and Benz this volume). Here, we only summarise the results and concentrate on the relationship between bead and pendant types and anthropological data. Small mother-of-pearl "buttons" and pendants were mostly found closely associated with beads. However, CG6 stands out in this regard, as a serrated mother-of-pearl "button" was found isolated in the grave filling. Although it has been attributed to the infant (Loc. CR6:40), it cannot be excluded that it originally belonged to a more ancient child burial (Loc. CR6:41b) that was removed or disturbed for the infant's burial. It appears that the small mother-of-pearl ornamental elements did not have a different use than the beads (for similar observations at Çatalhöyük, see Vasić 2020: Fig. 88). So far, we have no clear evidence that they may have been used as buttons or perhaps buckles, but future detailed use-wear analyses may yield more evidence.

The compilation of ornamental elements from burials sorted according to areas (Table 1, Fig. 9A-B)[8] shows that – if the red limestone beads were not taken into consideration (Fig. 9B) – the overall distribution of bead types is quite similar, even though some differences occur. The percentage of shell items is about 71-75% in both areas (Fig. 10B). Similar to ornamental elements in domestic contexts in Area D, where cowries are very rare (n=1), cowries are inexistent in the two burials of this area, and red limestone beads are also rare in Area D, even though we have to keep in mind that the burial of "Jamila" (CG7) is exceptional and distorts all statistics. If this burial had not been uncovered, red limestone beads would

[8] Note that slight differences in the total number of beads compared to all beads in grave contexts (see Alarashi and Benz this volume: Table 1 and Appendix 1) result from the burials CG1 and CG12 which could not be considered here due to missing analyses. Preliminary information for Appendix 1 was taken from the field diaries.

Table 1 Distribution of raw materials of main bead and pendant types in all investigated burials. MOP=mother-of-pearl, sp/ b=small pendant/ button, N=*Nerita* sp., Cow=cowrie, Con=Conidae, D=*Dentalium* sp., T=*Tridacna* sp., Red L=red limestone, Var. minerals=various minerals, Car=carnelian, Tq=turquoise, Chryso=chrysocolla, G="greenstones", H=hematite. * Not considered in the statistics due to uncertain attribution.

	CG 2	CG 3	CG 4	CG 5	CG6 Loc. 41a-b	CG6 Loc. 40	CG 7	CG 8	CG 9	CG 10	CG 11	DG 1	DG 2	TU7 G1	Total Area C	Total Area D
MOP cross									1		1				2	
MOP rings							1				2	2			3	2
MOP bangles										3					3	
MOP sp/ b		3				1			4		2				10	
Bone					10										10	
N					1	1			144		36	1	1		182	2
Cow									268		3				271	
Con						1	4		118	2	3	1			128	1
D							1		1						2	
T							232		243	2	7	63		1*	484	63
Red L							2337		1			3			2338	3
Var. minerals		1		1					324			3		1*	326	3
Car										1					1	
Tq				30			5			6		4	1		40	5
Chryso				1					32		1	3			34	3
G				2					2	2		10			7	10
H							3								3	
Others							2		20	1					23	
Total		**4**		**34**	**11**	**3**	**2585**		**1158**	**14**	**55**	**89**	**2**	**2***	**3867**	**92**

have been rare in Area C, with only further examples in Burial CG9. It should be noted that the ornaments found in the pelvis area of both children in CG9 comprised orange to reddish disc beads that may have been made of limestone. However, they seem to be made of a coarser variety containing more silicate components (attributed to "various minerals").

The observed differences might be due to chronological developments, especially because they corroborate differences in raw material procurement observed by Purschwitz (2017a) and confirmed by his new in-depth analysis during the *Household and Death Project* (Purschwitz forthcoming). Without further direct dating of the bones, the suggested chronological development of burials remains hypothetical. In light of the very individualistic choices for ornamental compositions (see below) these differences should not be overrated, especially due to the much lower number of beads and burials from Area D.

Despite these rough similarities, the number of ornamental elements (Fig. 10A) as well as the composition of ornamental elements (Fig. 10B) is unique in Area C. In terms of the absolute number of items, the necklace of "Jamila" and the lavish decoration of the two children of Burial CG9 exceed all other ornaments and hinder any statistical evaluation (note the logarithmic scale of Fig. 10A). "Jamila's" necklace is the only ornament where red limestone beads make up more than 90%. There is no exclusive use of bead types with a few exceptions: two spherical hematite beads and one hematite buckle from "Jamila's" necklace, two resin beads from her necklace as well, one carnelian bead from the burial of "Usaid" (CG10) (see below), and some unidentified "greenstone" beads from the collective Burial DG1. Furthermore, during the recently continued excavations of the collective Burial CG11, new pendant and bead types were uncovered, but their analyses are pending.

The most common bead types were made of shell. Excluding the red limestone beads, shell items constituted approximately 71% (Area C) and 75% (Area D) of the

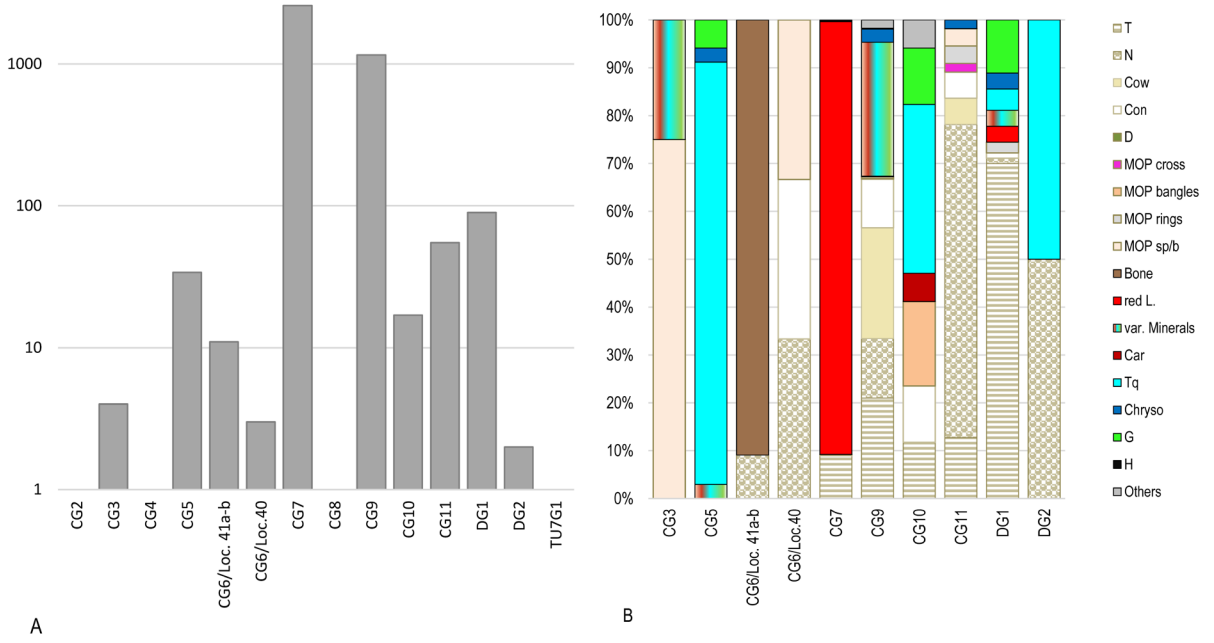

Fig. 10 Distribution of beads and pendants in burials: *A* total number of ornamental elements (log. scale), *B* sorted according to raw material in each burial of Areas C and D. For the legend see Table 1. (Graph: M. Benz, Ba`ja N.P.)

ornaments (Fig. 9B). Beads of various shapes, made of *Tridacna*, were found in five of the decorated burials. Additionally, one *Tridacna* bead was found in each of the supposed grave covers of TU7G1 and CG12, but their association with the burials remains uncertain. Nerite beads were quite ubiquitous (CG6 [Loc. CR6:40 and CR6:41], CG9, CG11, DG1, DG2). A high concentration of cowries was found in the multiple/ collective Burial CG9. However, apart from this burial, cowries were rare, but they were found in or next to two more burials of Area C (CG11, CG12?). Interestingly, neither nerites nor cowrie shells were used in "Jamila's" (CG7) or "Usaid's" (CG10) ornaments. Disc beads made of the apex of Conus shell were also used in many burials (CG6, CG7, CG9, CG11, DG1), but primarily in the decoration of the hip area of the two children in Burial CG9. Dentalium or other shells were generally rare in burials. Small mother-of-pearl pendants and buttons were associated with infants (CG3, CG6) and children (CG9).

Although the combination of mineral beads was specific for each ornament (see also Gerlitzki and Martin this volume), their usage was not exclusive. Red to pale pink and white to grey sand- and limestone beads were found in many burials (CG3, CG5, CG7, CG9, DG1, DG2, TU7G1?); as mentioned above – if the burial of "Jamila" had not been excavated, red to pale pink limestone beads would have been very rare (CG7, CG9, DG1). Turquoise ornamental elements were found associated with children and adults in both Areas C and D (CG5, CG7, CG10, DG1, DG2); chrysocolla was concentrated in Burial CG9 but was also found in the collective burial DG1, possibly in CG5, and in the uppermost burial layer of CG11. The "greenstone" bead ornament, probably a bracelet associated with a 3-4 year-old child (Loc. CR6:23a, in Burial CG5), is remarkable. It was made of 33 beads of various "greenstones", with a high number of turquoises but also including chrysocolla and possibly amazonite, as well as one crème-coloured limestone bead. A grand variety of "greenstones" was found scattered in the collective Burial DG1, including turquoise and chrysocolla, and at least two types that had not been identified before, possibly plancheite/ malachite, and chlorite. This overview indicates that the selection of bead and pendant types cannot be explained by restricted access, but rather represents a deliberate cultural choice. This is further supported by a relatively homogenous distribution of beads in domestic contexts (Alarashi and Benz this volume). Despite the limited number of individual burials, some observations can be made: infants were mostly buried without or

with only a few ornamental items, mainly made of shells. For instance, a rosé limestone bead associated with the infant bones at Loc. CR28.2:123a was likely dislocated from the older child on whose right shoulder the baby bones were deposited. In contrast, children aged three and older were the most lavishly decorated individuals with the extreme case of "Jamila" and the two children of CG9. Their ornaments contained many local marl, sand- and limestone beads, as well as exotic raw materials like turquoise, chrysocolla, amazonite, and possibly malachite. However, some children received no ornaments at all (CG2, CG4, CG8). Interpreting this as a measure of social ranking would miss the point, as in the case of CG4, the presence of a pinkish (exotic) miniature projectile point and a large stone slab on top of this child suggest that other distinctive criteria were responsible for the choice of grave 'goods' (see below).

The beads of the young adult male "Usaid" (CG10) (Benz *et al*. this volume: Fig. 56) comprised amazonite, turquoise, and a rather large carnelian bead, which is exceptional. Preliminary observations from the adolescent burial discovered at the bottom of the collective Burial CG11 in 2021 (Gebel *et al*. forthcoming) support the idea that carnelian was a rare but sought-after stone: seven cut-cone-shaped to sub-spherical beads of the ornament of this individual were made of a translucent mineral but intensively painted red, perhaps to imitate the quality of carnelian (Fig. 11). Generally, carnelian beads were very scarce at Ba`ja, but lumps of the raw material (F.no. 107806.1-6, from Loc. C11:42; F.no. 107839.1, from Loc. D12:65), and two other beads (F.no. 20807, from Area D, Loc. D12:38; 100804, from Area D, Loc. D32:39) found in room fillings suggest that carnelian beads may have been produced at the site. Compared to turquoise and chrysocolla, carnelian is a silicate mineral and much harder (Purschwitz 2017b). Recent use-wear studies of lithic tools may provide evidence of a bead workshop in Area C (pers. comm. D. Štefanisko; see also similar evidence at other Pre-Pottery Neolithic sites Garfinkel 1987; Rollefson and Parker 2002; Maier 2008; Erim-Özdoğan 2011: Fig. 67; Thuesen and Kinzel 2018). Various mineral remains from "greenstones" may also suggest the production of "greenstone" beads.

Fig. 11 Selection of some ornamental elements uncovered in 2021 in the collective Burial CG11, associated with an adolescent individual. Seven red-painted translucent mineral beads may have imitated red carnelian beads as the one from the Burial CG10. One "greenstone" bead resembles the beads from the Late PPNB site of Nahal Issaron (see Fig. 13), and another translucent whitish pendant may have imitated a carnivore canine tooth. The numbers in the photo indicate the ID of each element with the general find number (F.no. 120800). (Photos: H.G.K. Gebel, Ba`ja N.P.)

Only a few bone beads were uncovered in burials. As far as it was possible to observe, they were exclusively associated with adults (CG6, Loc. CR6:41a and CG1, with a young adult represented in dark blue; see Benz *et al*. this volume: Fig. 100C). The discovery of a complete bone bead necklace (Nielsen 2009: 36-38) from Area B North, Room 17, Loc. 118 indicates that bone beads were possibly more common than the few grave 'goods' suggest (Alarashi and Benz this volume: Fig. 1). However, it seems that they were not considered appropriate grave 'goods' for subadults and were only used for a few adults. Moreover, bone beads have not been found mixed with mineral beads so far in an ornament; in Burial CG6, the ten bone beads were uncovered around an isolated adult ulna (Loc. CR6:41a), probably forming a bracelet. Interestingly, so-called "finger rings", of which many fragments were found at Ba`ja, have never been found inside a grave, even though observations from two children's burials at Çatalhöyük prove that these rings were used to decorate children's fingers (Nielsen 2009: 39; Vasić 2020: 73). It thus seems that at Ba`ja, there was a clear distinction between bone ornaments on the one hand and shell and mineral beads on the other hand.

Overall, these observations lead us to suggest that there was a very individualistic, distinctive

composition of ornaments per burial, but beads and pendants were taken from a common repertoire. Similar observations were made by Milena Vasić (2020: 76) for the burials of Çatalhöyük. Access to and use of raw materials or bead types was obviously not restricted to a specific group of people or individuals. This may be supported by the intensive use and even recycling of some beads (Benz *et al.* 2019; Alarashi a this volume), indicating that beads were recombined in several instances. It cannot be excluded that some individuals' adornments were specially produced for the burial by recombining old and new items (see Alarashi b this volume).

The specific choice of ornaments does not only concern the type of beads but also the combination of colours. While some adornments were deliberately very colourful (CG9, decoration/ belt/ bag in the pelvis areas of both children), others represented a highly patterned selection of a few hues only: white and red (CG7), almost pure white with a few chrysocolla and reddish-rosé-coloured beads (CG3, CG9 headgear/ chest adornment), white and green (DG1) or only green-blue, intersected by one crème-coloured limestone for the bracelet of the child in Burial CG5. We do not know how the people of Ba`ja perceived these colours (Gebel b this volume; see also Bar-Yosef Mayer and Porat 2008; Clarke 2012), and we cannot exclude the possibility that some shell beads were coloured, as it has been shown for beads at Nahal Hemar Cave (Bar-Yosef and Alon 1988) or bone and clay beads from Barcın and Köşk Höyük, respectively (Öztan 2012: 37; Bursali *et al*. 2017). Nonetheless we have argued elsewhere that the specific selection of material, type, and colour had a meaning that goes beyond a purely aesthetic choice (Benz *et al.* 2020: 103). Furthermore, it is interesting to note that from a neurophysiological perspective, two aspects of colours seem to be significant cross-culturally, irrespective of the type of colour: their shininess or brilliance and the colour patterning (Jones and MacGregor 2002: 14; Finlay 2007: 55, 68). Both aspects are evident in the adornments of the corpses at Ba`ja. The iridescence of the mother-of-pearl objects and the porcelain-like surface of some shells were probably striking. It may even be suggested that the *Tridacna* shells were deliberately cut vertically to display the changing white patterns of the annual growth lines, thus provoking a sparkling effect due to differently reflected light. As outlined above, both shining and patterning aspects not only concern the ornamentation of the corpses but also the selection of raw materials for the burial constructions.

On the one hand, individualistic traits of each ornament were observed, perhaps creating tensions between corporate identities and the manifestation of individuality (Benz *et al.* 2020: 104), especially in a community that has been interpreted as a *habitus* community, as suggested by Gebel (2017; but see also Belfer-Cohen and Goring-Morris 2017 for similar observations in Natufian communities). On the other hand, as shown for the two children in Burial CG9, the composition of some adornments was so similar that it likely demonstrates a close social affinity or even parental relations (for a more detailed description, see the empiric description of Burial CG9; Benz *et al.* this volume). Highly standardised types of ornamental elements, such as the decorated or plain mother-of-pearl rings and cross-shaped pendants, also suggest that some communal identity might be expressed by these items. However, it seems premature to consider the two different shapes of mother-of-pearl ornaments – ring- and cross-shaped – as indicating segregated group affiliations. Decorated and plain rings were found in both Areas C and D. Plain rings and a large cross-shaped mother-of-pearl ornament were both found in the collective Burial CG11. Even if complete cross-shaped mother-of-pearl pendants have been uncovered only in Area C so far, possible fragments were uncovered in Areas A and B in non-burial contexts.

Three individuals stood out significantly from the others (CG7, CG10 and CG9:Loc. CR28.2:122a), either due to their high number of beads (CG7, CG9) or the presence of unique raw materials and ornament types, such as arm rings (CG10) (see also Benz *et al.* 2019; 2023). Their close spatial proximity in the western part of Area C and notable similarities in grave construction may suggest close social affinities. However, due to the low number of burials and their concentration in Area C, any conclusion regarding the spatial distribution remains uncertain.

While young infants were hardly decorated at Ba`ja (for similar observations see Mithen *et al*. 2018: Table 44.1), some children were richly adorned during burial rituals. In contrast, adults were never decorated with beads or beaded cloths to the extent that children were. As mentioned earlier, bone beads were exclusively associated with adults. It seems that age

categories played a certain role in the choice of adornments. Unfortunately, isotope analyses of bones failed to provide information on weaning practices. It is possible that full integration into the social group and the privilege of being adorned with a lot of shell and stone ornaments only began after the weaning period.

Mother-of-pearl rings, which were found almost exclusively with newborns or children[9], and possibly, other age-specific attributes, such as yellow ochre or arrowheads (as discussed below), emphasise the role of age at death in determining the type of adornments. Similar observations were made at Halula (Kuijt *et al.* 2011; Molist *et al.* 2013; Alarashi 2014), where the number of beads per burial increased from the Middle to the Late PPNB, with children generally receiving more beads (n_{max}=444) than adults (n_{max}=64). At Aswad, although the number of beads in burials was generally rather low, the individual with the most beads was a juvenile (10-14 years) buried with a necklace of 45 pieces (Alarashi 2014; Khawam 2014). In the PPNB site of Ganj Dareh, in the western Zagros, grave 'goods' were generally very rare, with only subadults being associated with ornaments (Riel-Salvatore *et al.* 2021). At Çatalhöyük, some age-specific adornments were also identified: adolescents and older adults had the highest variety of raw materials in their adornments (Bains 2012: 202), and Nerissa Russell (2019) observed that items made of bird bones were only associated with newborns. In contrast, during the Late PPNB occupation at Aşıklı, subadults and adults over 30 years old were adorned with ornaments, whereas adolescents and young adults were not; both male and female adults were adorned with most of the beads and the highest variety (Yelözer and Özsbaşaran 2022: 307, Figs. 4-5).

At Basta, a woman was buried with a necklace made of 184 shell and over 230 coral beads. In the same burial, partly on top of this woman, a newborn was interred close to a hoard of more than 400 mother-of-pearl disc beads. Additionally, in this burial also one complete mother-of-pearl ring (possibly associated to the woman) and three fragments were uncovered (Gebel *et al.* 2022b). These rings were almost identical to the larger examples of the plain mother-of-pearl rings found in the collective Burials DG1 and CG11 at Ba`ja (Gebel and Hermansen 2001; Gebel *et al.* 2006, 2020). Another infant from Basta was decorated with 351 Conidae beads (F.no. 10903) and a mother-of-pearl "paillette" (Nissen *et al.* 1987). Although much smaller, the style of this "paillette" resembles the two items found in Burial DG1 and the Burial of "Jamila" (CG7) at Ba`ja. To date, mother-of-pearl "paillettes" or rings with double perforations have not been found at any other site except for Ba`ja and Basta. At the Middle PPNB site of Ghwayr 1, Wadi Faynan, an infant was buried with a perforated mother-of-pearl disc pendant beneath the floor of one of the buildings (pers. comm. A. Simmons; Simmons and Najjar 2006: 90). A double perforated small ring (external diameter: *c*. 1.2cm) and a similar disc were reported from the Late PPNB site of Nahal Issaron (=Biq'at 'Uvdah N°14) (Goring-Morris and Gopher 1983: Fig.4). An approximately 5cm large, ¾ disc-shaped pendant with four perforations on the upper rim was uncovered at the PPNB site of Kfar Hahoresh (publ. comm. D. Bar-Yosef Mayer, December 1st, 2021).

At 'Ain Ghazal, the most lavishly decorated burial was that of an adult female who wore a necklace of over 90 carnelian beads (Grindell 1998). Similarly, at the early Holocene site of Körtik Tepe, a preliminary analysis has shown that children may belong to the most richly decorated individuals, but the individual with the most beads was a young man (Özkaya and Coşkun 2011; Benz *et al*. 2016, pers. observations).

Even if there seems to be a trend to adorn children with many beads, this is not exclusive, and it may be by chance that, so far at Ba`ja, no lavishly adorned baby or adult has been found. Unfortunately, due to the lack of a larger sample, especially of individual adult burials, it is not yet possible to observe such a detailed age-specific way of adorning the dead as has been suggested for Aşıklı (Yelözer and Özbaşaran 2018).

Taking into consideration the specific selection of ornamentation for the corpses, it should be noticed that there were some artefacts that did not find their way into the burials at all, even though they are considered body ornaments. Beside the above-mentioned sandstone rings and bone finger rings, this includes the so-called "ear plugs"/ tokens (Alarashi a this volume; Alarashi

[9] The association of a mother-of-pearl "paillette" without appendices with a female adult (described below) in a multiple burial at Basta seems to be an exception but it may be possible that the mother-of-pearl belonged to the child who rested partly on the adult (Gebel *et al.* 2004; *cf.* Hermansen n.d.).

and Benz this volume). None of them have been found so far in a burial at Ba`ja (*cf.* Kodaş 2019).

In the collective burials, beads were scattered more widely. Nonetheless, it seems that they had once been attributed to an individual (as attested to in CG1, CG5, and CG9). The scattering of disentangled beads as a collective gift is difficult to prove with the current data at hand, but it seems less probable. In all cases where *in situ* documentation was possible, ornaments were very closely related to the corpses, often clearly indicating how they had been worn. It seems that at least for the single and double burials – in contrast to other objects – ornaments were originally buried intact and worn.

Comparing the number of beads and bead fragments from sediments with the number of beads inside the graves, the relation is 1:10. Moreover, the raw material and bead types differ in both contexts, suggesting that some beads were primarily used in burial rituals (Alarashi and Benz this volume), in contrast to what has been observed at Çatalhöyük by Milena Vasić (2020: 45). If beads were regularly worn or produced at Ba`ja, one would expect to find more discarded or lost beads and bead fragments (see *e.g.*, Bains *et al*. 2013: 340). This underrepresentation of beads in room fills or midden areas can partly be explained by the size of the sieves' meshes (4mm) used to sieve ordinary sediments. However, it seems more likely that at least the multi-beaded ornaments were not worn daily but only on rare occasions, if at all. Considering the sheer size of some of the composite ornaments, it is even more unlikely that children wore these regularly. The slight use-wear traces of the red limestone beads of "Jamila's" necklace corroborate this.

Similarly, the size of the upper arm rings of "Usaid" (CG10; inner diameter *c*. 70mm) was so small, that it may suggest a very gracile person. Alternatively, according to taphonomic studies, the corpse appears either to have dried somewhere else or in a very dry environment within the open grave (Haddow this volume). It may, therefore, be possible that the bangles were put on the dry natural "mummy". At least, the fragility of the marl rings suggests that these rings were only put on for the burial.

Besides some artefacts that were either explicitly made for or primarily used during burial rituals (Gebel *et al*. 2022a; Gebel this volume), many of the beads were intensively worn and even recycled (Alarashi a and b this volume). At first, this seems contradictory unless they were valued so much that they were transmitted over a long time and then re-used. The intensively used hematite buckle of "Jamila's" necklace might be such an ancient piece (Alarashi b this volume: Fig. 15), considering that this type of object is rather rare and said to be characteristic for the Natufian/ Harifian Period (Goring-Morris 1991; Bar-Yosef Mayer and Porat 2008). However, similar objects made of shell and stone, with two parallel perforations, were also reported from more recent sites, such as Jerf el Ahmar (PPNA; Alarashi 2014: Fig. 8.6), 'Ain Abu Nukhayla (LPPNB; Spatz *et al.* 2014: Figs. 16.1, 16.3a), and Çayönü (PPNB phase (?); Erim-Özdoğan 2011: Fig. 71). In light of the intensive use-wear traces and the supposed long use, the ex-commodification in a burial seems all the more extraordinary. Interestingly, another object seems to be of a very ancient date. In 2021, an almost identical mineral bead as the Harifian "turquoise teardrop pendants" from Ramat Harif and Abu Salem (Fig. 12; Goring-Morris[10] 1987: 319, 322; 1991: Fig. 19) was uncovered in the ornament of the adolescent individual in Burial CG11 (Fig. 11, F.no. 120800.8). However, the item of Ba`ja was perforated as if it had been worn in a different way. The similarities are all the more striking as from the same Harifian sites an oval double perforated "spacer" made of malachite was recorded, recalling the hematite buckle of "Jamila's" necklace.

Fig. 12 "Teardrop pendants" from the Harifian sites of Ramat Harif and Abu Salem (published without scale). (Photo: Z. Radovan)

[10] I am grateful to Nigel Goring-Morris for providing the coloured photo of the three ornamental items.

In light of these observations, it is questionable whether the ornaments in burials indeed represented "personal ornaments" (Bains *et al*. 2013), *i.e*., that they had been worn by the buried individual during their lifetime, or whether they should instead be considered adornments offered by the burying community to the deceased – either once worn by someone else or specially made for the burial. The identity of the deceased individual and the concepts of the burying community may have both played a certain role in the choice of specific adornments. As shown above, age at death played a role, but it was certainly not the only factor influencing the selection of ornaments.

In contrast to the beads, many mother-of-pearl fragments were found outside burials in non-burial contexts (76%, n_{total}=148) (see Alarashi and Benz this volume: Table 2). There may be several reasons for this. Perhaps mother-of-pearl was also used to decorate other objects. An on-site production may be surmised for this object category. Irrespective of where the beads were produced, their shape and use suggest highly sophisticated technical skills, a specific selection according to context, and manifests a profound knowledge of raw materials (Alarashi a this volume).

Moreover, the presence of exotic raw materials hints at intensive exchange networks involving shells from the Red Sea, chrysocolla, and malachite possibly from Wadi Faynan and Timna[11], turquoise possibly from the Negev and/ or Sinai[12], and amazonite from the south-eastern steppe (Fabiano *et al.* 2004). The origin of the carnelian raw material remains an open question (Purschwitz 2017b). A comprehensive comparison of ornaments is still pending, but a preliminary overview shows that there were striking similarities with the site of Basta, as well as sites west of the Jordan River.

Regarding the development over time, the only clear long-term sequence of burial events was observed in the collective Burial CG11. In this burial, most of the beads were concentrated in the lower levels, while in the most recent burial event, not a single shell bead but only two mother-of-pearl buttons and one chrysocolla (?) bead were uncovered. The infant burial DG2 also suggests a more recent occupation phase, not only due to its stratigraphic position but also by the very bleached turquoise button found in it. A similar bleached turquoise button (F.no. 100809) was discovered in the upper layers in Area D. Strong bleaching is considered a typical trait of turquoise from Serabît el-Khadim (Hauptmann 2004) and was observed only on these later ornament items (see Gerlitzki and Martin this volume). Adornments with only a few or single beads may also point to later developments: for example, two infant burials, each with a single turquoise bead, were uncovered at the late Neolithic site of Shir in Syria (Resch and Gresky 2018: Tables 7 and 9). However, also at the Middle PPNB site of Skhārat Msaied, a single, large "greenstone" bead (F.no. 81311) possibly made of chrysoprase or chalcedony, was found in an almost emptied stone cist (Loc. 80214, Thuesen and Kinzel 2018: 4).

Other Things Associated with Burials (Table 2)

Other objects that were found inside the graves or embedded in the graves' cover include stone vessel fragments (CG1, CG6, CG9, CG10, CG11), grinding stones (CG1, CG2, CG6, CG7, CG10, CG11, CG12?; see Gebel forthcoming b), maceheads (CG1, DG1, Benz *et al.* 2019), flint objects (projectile points: CG1, CG4, CG10, CG11, CG12, DG1, DG2?, TU7G1? see Štefanisko forthcoming, and daggers: CG1, CG10, DG1 and Tuwailan knives: CG11). Gebel (a this volume) and Gebel *et al*. provide detailed evaluations of the daggers (2022a). The daggers were considered prestigious items, with significance from their procurement to their use (or explicit non-use) during life and in burial rituals, as well as their ex-commodification in a few selected burials. Arrowheads, with one exception (CG4), have not been found in subadult burials but mostly with adults or in collective burials where adults and subadults were mixed. This suggests an age-specific choice of grave 'goods', which is also observed in the selection of mother-of-pearl pendants and the number of beads and pendants. So far, at Ba`ja, maceheads have been discovered exclusively in burials (DG1 and CG10; Benz *et al.* 2019). Both exemplars were found inside the burial but not in the grave cover, indicating a close association with the buried person or serving a specific role in burial practices.

[11] It should be noted that no traces of Neolithic mining have been identified at Timna so far (publ. comm. D. Bar-Yosef Mayer, 1.12.21).

[12] According to mineral analyses, for most of the turquoise beads Serabît el-Khadim seems unlikely as a source (see Gerlitzki and Martin this volume).

Fig. 13 A semi-translucent white quartz pebble (blue arrow) was put in the red sand of the burial filling in Burial CG9. Additionally, two large lumps of yellow ochre (yellow arrows) were uncovered right and left of the skull of the firstly buried child. (Photo: M. Benz, Ba`ja N.P.)

Table 2 Distribution of objects inside and embedded in the grave cover. Flint debris and blades were not considered. Upper row per category=objects in the grave cover or immediately above the grave; lower row per category=embedded in the grave filling. *The category of "others" include: small quarzitic pebbles, larger lumps of pigments, and celts (see Benz *et al*. this volume).

	CG1	CG2	CG4	CG5	CG6	CG7	CG9	CG10	CG11	CG12	DG1	DG2	TU7G1
Grinding stones		1			4	5		2		2?			
	1							1	3				
Stone vessel fragments	1				2		2	1	2				
									1				
Macehead													
								1			1		
Pestle								1					
Dagger/knife								1	1				
	1										1		
Projectile points								2		1?			
	4		1						6	12	9	1?	1?
Bone objects								1					
	1		1?	2?					1			1?	1?
Others*					1								
	1			1		1	3	1	7			1	
Sandstone ring fragments													
	1		1						3	1	2	1?	1-2?

Flint blades and blade fragments were also found in some burials, but they are not discussed here (see Purschwitz forthcoming). Similar to bone beads and bone rings, bone objects were rarely found inside burials, including one *spatula* in each Burial CG1 and CG10, and possibly one in the filling of TU7G1(?), as well as bone points in the grave filling or slightly above CG5 and DG2 (Benz *et al.* 2019; Abuhelaleh forthcoming). A very thin toothpick-like object was uncovered immediately above Burial CG5, but its association with the burial remains uncertain (Gebel *et al*. 2020). In two cases (CG1, CG9 [F.no. 117856]), it appears that small, white, polished quarzitic pebbles were deliberately placed inside the burial close to the southwestern border of the burial. Whether this similarity is by chance or is significant can only be determined by further excavations. Interestingly, a similar pebble (F.no. 111804) was found in the small pit next to Burial CG4/ CG6. Additionally, there was one rather small flat quartz pebble with a perpendicular perforation, turning it into a large bead (F.no. 20813), and a quartz button with two perforations (F.no. 20408), which were found outside burials. These artefacts may indicate that a special value had been attributed to white pebbles (see also the burial descriptions for CG1 and CG9).

As stated in the introduction, the sample at Ba`ja is biased towards subadults and male adults, with only a limited number of female adult individuals. Due to this skewed representation, it is not possible to draw any conclusions or make inferences concerning gender-specific objects or burial practices at the site.

Destruction and Fragmentation

Most items, except for ornaments and bone objects, were deliberately destroyed shortly before or during the burial ritual. The destroyed macehead in Burial CG10 is probably the clearest example of this practice (Benz *et al.* 2019). It was split into two halves and small pieces with a hard pointed stroke inside the burial, with broken pieces still resting *in situ*. Similarly, a miniature limestone bowl was broken in two halves, and both parts were placed immediately above the grave cover of Burial CG9. The dagger found in the collective Burial DG1 was also destroyed in four pieces and scattered in the grave (Gebel *et al.* 2022a). For some of these objects, destruction was minimal, such as the dagger and arrowheads of the Burial CG10. The dagger had only a small burination on the tip, but as observations by Denis Štefanisko have shown, the arrowheads were snapped apart deliberately. They could not be used anymore unless they were reshaped (Benz *et al.* 2019). Other artefacts were smashed into pieces, and as it seems, further destroyed, and only fragments were put in the grave cover (*e.g.*, CG1, CG2, CG6, CG7, CG10, CG11).

Fragments of stone vessels and grinding stones were regularly placed on top of the burials (CG1, CG2, CG6, CG7, CG10, CG11), but rarely inside (CG10). As mentioned above, the deliberate destruction of objects not only concerned artefacts but also elements of the grave cover in some children's burials (CG2, CG7, CG9). The meaning of this practice can be manifold, but it inevitably de-/ex-commodified artefacts that may have been prestigious. The destruction of these objects may have transferred the prestige inscribed in them to the person who could afford to destroy such valued items. Moreover, the destruction of stone objects required some physical power, possibly accompanied by noise. The emotional impact on those who destroyed and on those who assisted the destruction was – at least – not a daily practice, and possibly impressive, despite being common during burial rituals. Another reason for their destruction might be that they were inalienable personal possessions, meant only for the deceased, or these objects played specific roles in the burial ritual, making it inappropriate to continue their use. The latter idea likely applies to the grinding tools and slabs showing intensive traces of red pigments (CG7, CG10, CG11), and possibly to the stone bowls, although no use-wear and proteomic analyses have been conducted to determine possible residues of pigments, fat, or proteins so far. They may have been used to grind red pigments for colouring the deceased or burial cloths/ mats during rituals. Additionally, the daggers might have been "objects of destination" for burial rituals (see Gebel *et al.* 2022a; Gebel a this volume). As for the destruction of the white sandstone slabs, other reasons might have existed. Further investigations, particularly focusing on use-wear traces and residue analyses, are necessary to obtain more systematic information on this topic. For instance, some arrowheads from CG1, CG12 and DG1 seem to be broken, but they have not been studied microscopely yet. Although the dagger from the collective Burial CG1 and the macehead uncovered in DG1 seem complete, microscopic analyses were not possible in the frame of the *Household and Death Project*. Remarkably, the purple miniature flint

arrowhead uncovered in the child Burial CG4 was perfectly preserved.

John Chapman suggested for the Balkan Neolithic that fragmentation of figurines served to keep pieces of them as a kind of memory token to enchain people to late members of the community (Chapman 2000). A similar practice has been surmised for destroyed chlorite vessels from Körtik Tepe (Benz *et al.* 2018). Such a practice has not been recorded conclusively at Ba`ja. There were no missing pieces from either the destroyed macehead (F.no. 91811/91812) of Burial CG10, nor from the miniature stone vessel on top of Burial CG9 which was broken in two halves (F.no. 111825). For the fragments of larger stone vessels from Burials CG1, CG6, CG 10, and CG11, it cannot be excluded that the missing parts were kept somewhere else.

The fragmentation of stone objects, namely stone vessels, to cover the dead was observed as early as in the 10th millennium, at the site of Körtik Tepe (Özkaya and Coşkun 2011), and it was still practiced during the Pottery Neolithic at Tell el Kerkh (Jammo 2022). Perhaps the covering of the dead with fragmented white sandstone slabs or vessel fragments at Ba`ja points to rather ubiquitous concepts: that deceased members must be covered, protected, and, despite spatial closeness within buildings, securely segregated from the living.

Segregation

Interestingly, in several burials, different categories of objects were segregated (see the upper and lower rows per category in Table 2). Whereas grinding tools, stone vessel fragments, and grinding slabs were very rarely buried inside a burial close to a corpse but rather in the grave cover, ornaments have never been found on the top or embedded in the grave cover. This segregation may suggest that some objects, such as ornaments, but also the macehead, were considered closely related to the buried person. In contrast, grinding tools, pestles and stone vessel fragments were perhaps not directly linked to the buried individual but to the burying community which used them during the ritual. This suggestion is corroborated by the observation that the association with these groundstone artefacts is irrespective of the age of the buried person.

The differentiation of two sets of grave 'goods', deposited in two different events – inside the grave pit and in the grave cover – has been suggested so far only for the above-mentioned infant burial at Ghwayr I, where most of the objects were deposited above the grave cover (Simmons and Najjar 2006: 90), and at Kfar HaHoresh (Goring-Morris 2005). However, these observations should alert future excavations to be sensitive to the possibility of such a differentiation in assemblages of eco- or artefacts in relation to burials.

Animal Bones Associated with Burials

The relationship of humans to animals possibly changed during the early Neolithic with increasing control and deliberate segregation of wild and domestic (*e.g.*, Hodder 1990; Helmer *et al*. 2004; Theweleit 2013; *cf.* Boyd 2017). In animistic and totemistic communities, animals are often considered alter ego animals, and killing animals causes severe moral problems (Duerr 2010, with a comprehensive compilation of ethnographic examples; Descola 2022). Many rituals, therefore, aim to re-establish a close relationship with animals to compensate for killing them. It has been argued, that with domestication, the relationship to animals became one of dominance by humans (Cauvin 2000; Helmer *et al*. 2004). However, whether this was the case already for the early Neolithic should be carefully reconsidered, as domestication brought humans into much closer physical encounters with animals than ever before. As one of the rare but invaluable ethnological studies on the taming of animals suggests, domestication may have started with raising puppies (Volkhausen 1984). For the Neolithic community of Ba`ja, two studies (von den Driesch *et al*. 2004, and Prust and Pöllath forthcoming), consistently prove that herding animals comprised almost exclusively goat and sheep at Ba`ja. The new study by Prust and Pöllath has brought up some evidence that newborns were even kept inside the settlement. This may suggest a very close relationship to these animals, while only a few animals, such as gazelles, fur-bearing mammals, and some birds, were still hunted. Domestication should, therefore, rather be considered as a form of triage between wild and domestic animals, where the close relationship to domestic animals is possibly laden with highly ambiguous feelings of caring on the one hand and, on the other hand, slaughter, not so much different from the ambiguity of the hunter who "excuses" his killing with psychological or other amends (Willerslev 2007; Duerr 2010).

Since rituals are generally considered conservative elements of a community (notwithstanding that changes may emerge due to rituals or through them, see Benz and Gramsch 2006), we checked whether such a supposed segregation of wild and domestic was mirrored in the burial practices or whether certain species were especially selected for the burial rituals. Neither seems to have been the case at Ba`ja (see Prust this volume). The selection of animal species and parts of animals found inside burials reflects more or less the composition of household contexts. The only possible, but statistically not significant, observation is that some of the animal bones found in burials belonged to rather young animals.

Generally, the number of animal remains in burials is rather low, except for in the collective burials. Feasting remains, as observed at other sites, were not identified (*cf.* Goring-Morris 2000; Twiss 2008). Neither a special selection of animals, such as *e.g.*, in the so-called shaman burial (Grosman *et al.* 2008), was observed, nor the association of complete or significant parts of animals with humans, as *e.g.*, seen in Epipalaeolithic burials from 'Um Mallaha, Hayonim Terrace, Mallaha, where a fox and dogs were buried respectively (Perrot and Ladiray 1988: 35; Tchernov and Valla 1997; Maher *et al*. 2011), or as at the early PPNA site of Hatoula, where a bovid skull was buried with an adult woman (Le Mort 1984: 45), and the PPNB sites of Kfar Hahoresh or Motza, where parts of foxes were buried with the dead (Reshef *et al.* 2019). The only exception at Ba`ja is perhaps an astragalus of a goat found behind the child's back in Burial CG4. However, it remains unknown whether this should symbolise a special relationship to this animal, or whether this bone had been assigned a completely different function (as a toy or an amulet). To our knowledge, similar associations have not been reported from other Late PPNB sites.

Interestingly, the bone beads that have been analysed so far (Nielsen 2009) were exclusively made of bones from wild animals.

Treatment of the Corpses

The idealised eventology of the burial ritual for single, double, or multiple interments can be reconstructed according to the two most elaborate burials, CG7 and CG10. All other burials show parts of these practices or slight variations. As for the collective burials, they indicate some similar traits, even though the reconstruction of the sequence of burial events is evidently more complex. The collective Burial CG1 is the only collective burial so far for which the identification of individuals allowed the reconstruction of the sequence of interments.[13] For all other collective burials, detailed analyses are pending; either the bones were not accessible, or they had just been excavated in the final excavation seasons of 2019 and 2021. Integrative analyses of archaeological and anthropological data are still ongoing. The interments started with preparing the corpse or corpses (ornamentation, clothing?) and the burial pit. In some pits, burnt objects were deposited (CG5?, CG6, CG11), or objects were burnt inside the pit (CG4), but none of the human bones shows evidence of burning, *i.e.*, the corpses were deposited in the pit after things had been burnt.

Second, the corpse was placed in the pit, with grave 'goods' and pigments added, either in a liquid or compact form. The colouration of some bones (see below, Burial CG7, and a finger bone in Burial CG11) was so strong that either the skin was deliberately coloured, or the deceased wore dyed dresses or were wrapped in dyed cloths (Reifarth *et al.* this volume). Histological studies of some individuals (Haddow this volume) suggest that the normal decaying process was hampered in one way or another, as most of the bones do not show bacterial destruction, *i.e.*, the corpses were "mummified" or desiccated intensively, either naturally by hot and dry conditions or artificially through heat. Evidence of fire next to burials was recorded in many cases (see below). After a certain time, the pit was filled with rather sterile sand or sediment and then firmly covered with unworked stones, large stone slabs, and/ or broken stone slabs. The addition of grave 'goods' was described above in detail.

In general, compared to other sites in Southwestern Asia (Ackerfeld and Gopher 2022), the handling of human bones at Ba`ja seems to be rather rare as indicated by the low number of uncovered loose, isolated human bones. However, evidence from histotaphonomic studies (Haddow this volume) and stratigraphic observations lead us to surmise that, beside the collective burials, some burials (CG5[?], CG6,

[13] Morphological analyses and matching of bones were done by Susan Klingner, Zentrum für Anatomie of the University of Göttingen, in the frame of the *Household and Death Project* (BO 1599/16-1).

CG9) were reopened, and either individuals were secondarily added into the grave or other skeletal remains were removed. Interacting with human bones was thus probably more intensive than previously thought (Benz *et al.* 2019; *cf.* Moore and Molleson 2000: 293; Hermansen 2017), confirming that burial rituals included a longer process of liminal stage, as suggested by Hertz in 1907 and later generalised by van Gannep in his three-stage model of rituals (see above).

Position and Orientation

Most of the individuals were buried in a hocker or hocker-like position, with some leaning their backs against the burial pit's wall similar to a sitting position as recorded at the Pre-Pottery Neolithic A (PPNA) site of el Hemmeh (Makarewicz and Rose 2011), the Late PPNB site of Halula (Guerrero *et al*. 2009) and in a few cases at Abu Hureyra (Moore and Molleson 2000: 286) and the Neolithic site of Shir (Resch and Gresky 2018). This was possibly the case for Individual V in Burial CG1, the young adult man in Burial CG10, and perhaps also for the child (Loc. CR6:23a) of the double Burial CG5. The latter child may have collapsed on his legs, resulting in the position in which it was found with the pelvis in the NE and the feet and head in the SW. A subadult individual was also leaning with his/ her back against the pit's wall in Loc. *CR17:117*, but the cranium was missing. Unfortunately, the progress of the excavation did not allow us to reconstruct whether this was due to ancient disturbances, animal activities, or modern destruction. In the double Burial CG8, both subadults were rather squeezed in the pit, perhaps originally also imitating a sitting position. Many individuals in the double and collective burials may represent secondary burials of isolated or reassembled bones.

Wherever it was possible to record the orientation of the corpses, it was along a N-S/S-N, NE-SW/SW-NE or E-W axis, most often paralleling the walls, close to which the individuals were buried (Fig. 14). Heads were placed most often in the N/NE/E, but some also had their head in the S/SW. So far, no individual who was oriented NW-SE or W-E has been found. The reasons for this preference remain unknown, but it seems that the location parallel to a wall, and possibly also along the main axis of the room, played an important role. As mentioned for the location of burials, most of them were beneath a window-like opening.

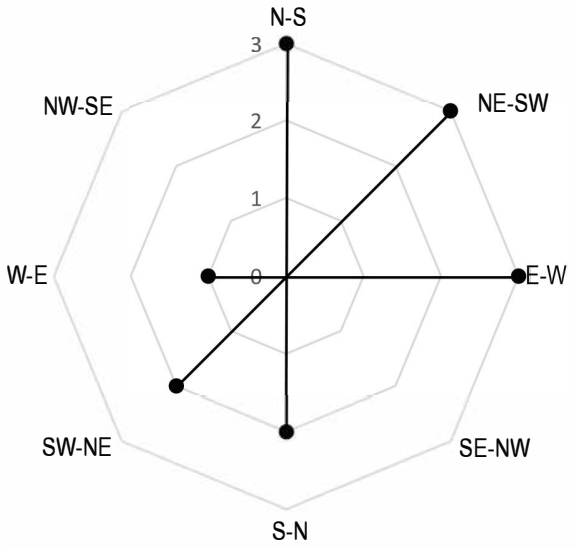

Fig. 14 Orientation of the corpses in burials. Individuals from the collective Burials CG11, CG12, and DG2 could not be considered as investigations are ongoing. (Graph: M. Benz, Ba`ja N.P.)

Use of Fire

The use of fire in, on top of, or next to, the burial pits has been observed in nine, possibly twelve of 15 burials (CG1?, CG2, CG4, CG5/6, CG7?, CG8, CG9, CG10, CG11, CG12?, DG1). A patch of charcoal, indicating that something burnt was put in the grave pit, was recorded in Burial CG6, whereas in Burial CG4, the rubification of stones and a patch of ash and charcoal attest to the burning of something inside the burial pit. This must have happened before the interment of the corpse, as no traces of heat affection have been observed on the bones. For the burial sequences CG5/6, as well as for the collective Burials DG1, CG12, and CG11, patches of ashes and the high amount of charcoal in the burial filling attest to the use of fire nearby. For the sequence of collective interments in Burial CG11, the analyses are ongoing, but the high amount of charcoal and ashy sediment unambiguously indicate the intensive use of fire from the lowest to the most recent interment. For all other burials, ashy sediments, pieces of charcoals, and rubification of stones were observed only close to the grave borders or on top of the grave cover (CG10), but not in the grave pits themselves.

The use of fire close to graves or in relation to interments can be considered an ancient tradition in the Levant, possibly starting during the Epipalaeolithic and becoming more common in the course of the Neolithic (for detailed

references, see Bocquentin *et al*. 2020). However, at Ba`ja, evidence for cremation, *i.e*., intentional fire-induced modification, is missing. There is no evidence for primary (*i.e*., burning of corpses) nor for secondary cremation (*i.e.*, burning dry human remains) so far, as it has been recorded at the Late PPNB sites of Beisamoun and Kharaysin (Bocquentin *et al.* 2020; Iriarte *et al*. 2020), or as it became a more common practice during the Pottery Neolithic (Jammo 2022).

Use of Pigments and Colours

Before we come to the evaluation and interpretation, it should be mentioned that some of the human remains contained traces of red pigments. This is most evident in the case of "Jamila" (CG7). Only the outer surface of her bones was stained completely red (Gebel *et al.* 2019; Benz *et al.* 2020; Gresky this volume; Reifarth *et al.* this volume), indicating that the pigmentation happened before the bones disintegrated. Interestingly, the sand in which the child was embedded, was not redder than usual, except for the surroundings of a lump of red ochre that was placed immediately in front of the legs of the individual (Benz *et al.* this volume: Fig. 41, Loc. C10:52). Red staining was observed on both individuals of Burial CG5 as well (Reifarth *et al.* this volume). However, no traces of intentional defleshing have been observed so far (*cf*. Erdal 2015), which might indicate that the bones were not painted directly.

A coating of the sand grains by hematite was also identified for the burial filling of Burial CG6 through geochemical analyses (pers. comm. M. Gerlitzki), and red pigments were visible on the Nerita bead of this burial. Evidence for the use of red pigment – possibly ground and liquified (Gebel *et al.* 2006) – has been suggested for the collective Burials DG1, CG1, and CG11, and possibly CG12. Traces of red ochre on grinding slabs or manos were observed for CG1 and CG7. Systematic XRF analyses of the bones and artefacts nearby or in graves may identify more cases, especially of yellow ochre, which may have bleached considerably and thus may no longer be visible to the naked eye. Lumps of yellow ochre were found in the Burials CG6 and DG2 and in the multiple/ collective Burial CG9 (Fig. 13). Interestingly, both Burials CG6 and DG2 were burials of infants. For Burial CG9, the association with one or the other child is unclear, but none was older than four years. This might be another hint at the significance of age groups for the burial ritual.

The meaning of these colours remains enigmatic and can be polysemic. The use of red ochre in burials is a very ancient tradition in the Near East, recurrently reported from Epipalaeolithic and Neolithic sites (Maher *et al.* 2011; Richter *et al.* 2019; Schotsmans *et al.* 2021). Yellow and red were also used for painting the plastered skulls at the Middle PPNB site of Aswad in Syria. Skulls were either painted with red or yellow ochre. It has been suggested that the choice might have been related to gender, with red symbolising male and yellow female (Khawam 2014: 407). The few cases from Ba`ja do not allow a significant conclusion. Due to the low number of female adults at Ba`ja and the low number of valid aDNA analyses (n=3) for the identification of the sex of children (see Skourtanioti and Feldman this volume), for the time being, it is impossible to attest any correlation of age/ sex and colours. Moreover, at least in the collective burials, it seems that the red pigment was sprinkled over the corpses, but it is impossible to know whether this was renewed during each burial event for a specific individual or whether it was applied all over as a sign of burial termination. For a more in-depth interpretation of the meaning of the colour red at Ba`ja see Gebel (b this volume) and also Reifarth *et al.* (this volume). Recently, Christopher Knüsel summarised the different possibilities of the function and meaning of red ochre so comprehensively that we cite this paragraph without further comments:

"Although ochre has often been considered to have been a symbolic attribute (Bar-Yosef, 2002), its attested medicinal properties – due to the iron salts it contains – suggests that it may have served as an astringent and antiseptic in remedial treatments such as a treatment for burns, as well as a deodorant, as among Australian Aboriginals (Velo, 1984; Wreschner, 1981). That ochre is often found throughout the grave suggests its use as a preparation applied to the feature. The simplest interpretation is that it represents an apotropaic symbolic practice, perhaps based on color, but it also, may be seen as a potential remedial treatment as well as body preparation to make the dead 'safe' in a symbolic but also functional sense as a form of protection for the living." (Knüsel 2021: 214)

For the use of green and blue pigments in burials, Schotsmans *et al.* (2021: 280) observed for Çatalhöyük that these two hues were associated only with subadults and women but not – with one possible exception – with male adults.

Similarly, at Aşıklı, single "greenstone" beads were only worn by women and subadults (Yelözer and Özbaşaran 2022: 309). At the PPNA site of Wadi Faynan 16, single "greenstone" beads were also excavated in burials of subadults and adults, but the anthropological identification of sexes has not yet been done (Mithen *et al*. 2018: Table 44.1). As shown above, at Ba`ja, beads of various "greenstones" were associated with subadults, including one possible female individual (CG7), and with the young man of Burial CG10. However, none of the burials at Ba`ja contained pigments of blue or green hue, although various "greenstone" minerals were found unworked in other contexts. The only exception might have been the collective Burial CG1 (Gebel *et al*. 2006: Table 1), where the excavators observed "green sediment" and "greenish pigment", but to our knowledge, it has not been analysed and might be the result of natural geochemical processes (Velde 2003: 10-11).

The composition of ornamental elements underlines that the choice of colours was not an arbitrary act. As recorded above, every ornament had a very individualistic, deliberately chosen composition of colour patterns from a common repertoire, whereby neither hues of green-blue nor red-orange or white-yellow were dominant among all ornaments. The ornaments that could be reconstructed had different main colours, intersected by clearly contrasting hues. This deliberate selection of a few hues corroborates ethnographic records that suggest that the importance was not merely the colour itself but rather the pattern (Finlay 2007: 55). The multicoloured decoration of the lab area of the two children in CG9 is so far exceptional.[14] Taken together, the visual attraction of the adorned children must have been very strong, not only because of the sheer number of – partly exotic – beads but also by the intense use and specific choice of colours.

This brief, preliminary overview of pigments and colours cannot replace comprehensive investigations on the use of pigments and colours in burials, including systematic microscopic (SEM) and XRF analyses to identify possible residues of pigments invisible to the naked eye. Determining their composition, provenience, use, and context is a desideratum for future work. It thus seems premature to surmise an interpretation of the meaning of the various colours in burials at Ba`ja.

Noise and Sounds

The importance of communally enacted songs, melodies, or rhythms, for the intensification and activation of collective memories and feelings has been underlined by many authors (*e.g.*, Winkelman 2002). A few lines of a collectively known song may be enough to manipulate the mood of thousands of people. People only need their voices and bodies to interpret tunes and give them a rhythmic background. The almost hypnotic effects of masses clapping their hands or stamping their feet is undeniable. However, none of these activities leaves any archaeological traces. Rattling instruments of wood, seeds, or shells also disappear without clearly interpretable traces. So, were there sounds or silence? Hardly anything is known about the acoustic effects during burials rituals at Ba`ja. The sound of the breaking of things and destroying of stone slabs may have caused negative emotional reactions while also attracting attention. This noise combined with the visual effect of witnessing forceful (aggressive?) action, of anger, and fear may have been a way to channel and release negative energies.

Evidence of ornaments that may have been worn to make sounds when moving, as suggested by Daniella Bar-Yosef Mayer recently (publ. comm. 1st, December 21), is lacking from Ba`ja so far. For now, it seems that the ornaments were primarily visually striking. One exception may have been the decoration of the hips of the two children of CG9, but the fragility of some raw materials (marl, limestone, very thin mother-of-pearl) makes it unlikely that they were intended for intense shaking and producing noise. Use-wear traces of these ornaments are outstanding but will possibly reveal whether they were sewn onto some kind of cloth or left free hanging.

Efforts and Time Investments

As outlined in the former paragraphs on grave constructions and artefacts associated with the burials, it has become evident that despite basic similarities in burial rituals, there are significant differences in the time and efforts investigated for both the grave constructions and the artefacts in the grave. To compare both aspects systematically, we applied a standardised evaluation. It is important to note that the available data on

[14] The adolescent burial in CG11 discovered in 2021 also had a very colourful assemblage of beads. Since the analyses need new financial support to be analysed, it was not possible to represent the beads in this volume.

time investments are evidently insufficient, but we assessed all burials using the same evaluation criteria. Therefore, if there were any misconceptions, they would apply to all burials in a relatively equal manner. The credit system we employed is additive, meaning that the more effort required, the more credits a burial receives. However, we were not able not consider the rarity of certain items or the difficulties in their procurement and production, mainly due to the lack of relevant knowledge and experimental data. It should be emphasised that this evaluation does not provide an absolute measure of actual time or effort involved in these burial rituals. We acknowledge that our assessment may underestimate the efforts considerably, particularly for complex ornaments like the necklace of "Jamila" (see Alarashi b and Costes and Fischer this volume) or the decorated clothes of the two children buried in the multiple Burial CG9. The limited data and the absence of ethnographic or experimental information, apart from the production of carnelian beads and a dagger (see Kenoyer *et al.* 1991; Gebel *et al.* 2022a), make it challenging to fully grasp the intricacies and complexities of the cultural practices and artisanship involved. Despite the potential for underestimation, it is important to recognise that our results still demonstrate notable differences between the burials in terms of effort and time investments.

Moreover, we should not neglect the bias of decayed organic artefacts associated with the dead, the production or procurement of which may have been very time-consuming. For instance, Nerissa Russell's study of bird bones from Çatalhöyük (2019) suggested that feathers may have been important items, particularly in infant burials. There is increasing evidence for the use of matting or basketry for wrapping or as containers for the dead at many other earlier, contemporary, and later Neolithic sites. Some examples include Wadi Faynan 16 (Mithen *et al*. 2018: 683-684), Aswad (Stordeur *et al*. 2006), Halula (Guerrero *et al.* 2009: 385-386), Abu Hureyra (Moore and Molleson 2000: 280), Aşıklı (Yelözer and Özbaşaran 2022: 305-306), Çatalhöyük (Schotsmans *et al.* 2021), and Shir (Resch and Gresky 2018). This suggests that we may miss evidence at Ba`ja due to poor preservation (see Öğüt forthcoming). Currently, there is only scant evidence that basketry and matting played some role (see Reifarth *et al*. this volume). Unless mats or baskets were preserved as imprints on plaster, we would miss these artefacts. Systematic chemical analyses on the composition of minerals, including pigments, are necessary for a comprehensive overview of procurement efforts (see below). For example, it cannot be excluded that some of the red pigments were cinnabar as it has been shown for Abu Hureyra, Kfar Hahoresh, and Çatalhöyük (Molleson 2000; Goring-Morris 2005; Schotsmans *et al.* 2021: 286-287), although the red encountered at Ba`ja is not as bright as it should be if it were cinnabar. Therefore, the estimations given below should only be considered an approximation, allowing us to compare the different burials on the basis of similar criteria and providing a rough idea of similarities and differences.

Assessments of the Grave Constructions and Artefacts Associated with Burials

A rough, relative assessment of time and effort for the grave constructions is given in Tables 4 and 6, while Tables 5 and 7 present the estimations for the artefacts associated with the burials. The mean of estimations for both categories is represented in Fig. 16. When estimations were not clearly possible, the range is given by the error bars. Due to too many uncertain upper borders of burial pits, reopening of pits, and secondary/ collective burials, it made no sense to use the burial size for the workload assessment, although this is generally an important aspect. However, it was considered whether a pit was dug into the paleosol or the hard terrazzo-like floors, a task that is time-consuming compared to burials deposited in room fill or just on the floor. The results (Fig. 15) indicate that the efforts for the grave constructions (represented by blue symbols) roughly align with the efforts for the ex-commodified artefacts (represented by orange symbols), regardless of the age of the buried person. However, it is important not to overestimate the differences in the increase rate, as detailed time-investment calculations for bead making and raw material procurement are lacking, as mentioned above. The efforts for the burial construction of CG7 ("Jamila") and CG10 ("Usaid") are above the mean increase, underlining their extraordinary nature. The efforts for "Jamila"'s necklace and the ornaments of CG9 are most likely underestimated and should be significantly higher than the mean increase rate for lavishly decorated burials. At the lower edge, there is the double subadult (infant and child) Burial CG8 with no grave 'goods' and CG5 with minimal elaboration of the burial construction. The minimal investment in the burial construction of CG5 is unexpected compared to the elaborate decoration with a bracelet of various types

Table 3 Eventology and credit assessment according to workload per grave construction. *Numbers given in the first row, refer to the idealised sequence of burial events; Uncertain entries with question marks were not considered for the statistics. Regarding the workload for constructional elements, it makes no difference whether the sandstone slabs were aligned or used to build a stone cist (see Appendix 1).

Event	Evaluation	Credits	Burial ID
1. Size of the burial*	Not considered for the statistics		
2.3. Preparing the burial ground	0=without pit,	0	CG12, DG1(?), CG11(late)
	1=digging a pit	1	CG1, CG2, CG3, CG4, CG5, CG6, CG7, CG8, CG9, CG10, CG11(early), DG2, TU7G1
2.3.1. Digging through	0=sediment,	0	DG2, CG5, TU7G1
	1=(plaster) floor into paleosol	1	CG1, CG2, CG3(?), CG4, CG6, CG7, CG8, CG9, CG10, CG11
2.3.2. Undercutting a wall	0=no,	0	DG1, DG2, TU7G1, CG1(?), CG2, CG3, CG4, CG5, CG8, CG9, CG11(?), CG12(?)
	0.5=yes	0.5	CG6, CG7, CG10
3. Constructional elements in/next to the pit	0=absent, if present see 3.1-2	0	DG2, CG1, CG2, CG3, CG4, CG6, CG8, CG9, CG11, CG12, TU7G1
3.1. Separating the pit from the room by stones, small wall	1=present	1	CG5 (?), CG7, CG10, DG1
3.2. Fixing of grave pit's walls	1=building wall/s	1	CG7, DG1
	1=with separated stone slabs/building a cist	1	CG7, CG10, DG1
6. Burial and grave cover	0=with sediment,	0	DG1, DG2, CG1, CG2, CG3, CG4, CG5, CG6, CG8, CG 11, CG12,
	1= sterile sediment	1	CG1, CG6, CG7, CG9, CG10
	2=with large stone slabs	2	CG1, CG2, CG4, CG6, CG7, CG8, CG9(?), CG10, DG1(?)
	2= with destroyed stone slabs	2	CG2, CG7, CG9,
	1= with unworked stones	1	DG1, CG2(?), CG3, CG6, CG7, CG8, CG9, CG10, CG11, CG12, TU7G1
	1=with small (recycled?) floor gravels	1	CG6, CG7, CG10, CG11(?), DG1(?)
	1=with white plaster	1	CG7, CG10, CG11 (?)

of "greenstones" and a finely crafted plastered object made of basketry. This observation may suggest that some constructional elements beneath this burial might actually belong to Burial CG5 and not to the grave cover of CG6 (see Benz *et al.* this volume). Given that the collective burials comprise six or more individuals (MNI), the number of ornaments and objects found in these burials must be considered very low compared to most of the single burials.

The cumulative graph (Fig. 16) reveals that there are no distinct groups of very elaborate burials with numerous grave 'goods', but rather a gradual and continuous increase in efforts observed across all burials. However, it is possible that the Burials CG7 and CG9 are underestimated regarding their artefacts. When considering the spatial distribution within Area C, there is no clustering of lavishly decorated or poorly equipped graves. Instead, all types of burials are found very close to each other. For instance, Burials CG10 (the most lavishly decorated adult individual) and CG8 (the subadults without grave 'goods') are both located in Room CR35, and the elaborate Burial of CG6 is immediately adjacent to the rather modest Burials CG3 and CG4 (taking into consideration that both Rooms CR5 and CR6 belonged to one larger room during the time of the burials).

Table 4 Eventology and assessment according to workload per grave 'goods' and ritual. The use of fire was not evaluated, because for many cases, it is not clear to which burial the ash remains belong exactly. For similar reasons, possible grave markers were not considered either. When it was possible to attribute objects in multiple/ collective burials to a specific individual, these burials may be mentioned in two categories. Traces of burnt stone and charcoal were observed inside Burial DG1, but it is unclear whether burnt material was brought into the pit or whether, indeed, a fire was lit inside the burial (see Benz *et al*. this volume). Clear evidence for CG4's grave cover above the stone slab is missing due to a test pit dug in 2018. However, nothing unusual was recorded in the sediment above the stone slab. Therefore, it does not seem probable that there were stones, grit, or any other 'grave good' above the large covering slab. Grey characters indicate limited evidence.

Event	Evaluation	Credits	Burial ID
2.1. Grinding colour/ dressing the corpse with red coloured clothes	0=no	0	CG4, CG8, CG9, CG10, DG2(?), TU7G1(?)
	1=yes	1	CG1, CG2, CG3, CG5, CG6, CG7, CG11, CG12, DG1
2.2. Adding ornaments to the corpse(s)	0=non	0	TU7G1, CG2, CG4, CG5, CG8, CG12(?)
	0.5=n<10	0.5	DG2, CG3, CG6
	1=n<100	1	DG1, CG1, CG5, CG6, CG11, CG10,
	1.5=n<1000	1.5	CG9
	2=>1000	2	CG7
4.5.2. Association with animal bones	0=no	0	CG1, CG3, CG7, CG8, CG9, DG2,
	0.5=isolated bones	0.5	CG2, CG4, CG5, CG6, CG10, CG11, TU7G1, DG1
	1=parts of animals	1	CG12
	2=complete animals		Not recorded
5. Depositing grave 'goods' into the pit (jewellery excluded)	0=none	0	CG2, CG3, CG6, CG8,
	0.5=n<5	0.5	CG4, CG5, CG7,CG9, CG10, DG2(?), TU7G1(?)
	1=n≥5	1	CG1, CG11, CG12, DG1
5.3. Lighting a fire close to / in the burial pit	Not assessed here but suggested for the burials mentioned in the right column	No evidence	TU7G1, DG1, DG2, CG3(?), CG9, CG5(?)
		Present	CG1, CG2, CG4, CG6, CG7, CG8, CG11, CG10
6.7. Adding grave 'goods' in the grave cover	0=none	0	CG4(?), CG8, TU7G1
	0.5=n<5	0.5	CG1, CG2, CG9, CG11, CG12(?)
	1=n≥5	1	CG6, CG7, CG10
7. Marking the grave	Not assessed here but suggested for the burials mentioned in the right column		CG5/6, CG7, CG10, DG1?

Social Affiliations and Mobility

Before we close the summary of the empirical data on burials and start with the interpretation of the records, it is essential to briefly note the results of aDNA analysis (Skourtanioti and Feldman this volume) and mobility studies using stable strontium isotope analyses (Knipper *et al.* this volume) in order to understand reactions to death according to social relationships. Unfortunately, due to poor collagen preservation, it was impossible to achieve valid results for C/N isotope analyses, which would have been useful for investigating paleodiets and distinguishing households (Benz *et al*. this volume: Appendix 4 by Lösch and Arenz).

The ancient DNA of three individuals (two infants and one adult) was successfully sequenced, despite the poor preservation of

Table 5 Estimation of time and effort for the burial constructions. Note that for Burial CG8 due to the small size of the slab, only one credit was given for the grave cover.

Room	CR 5			CR 6						CR 36.1	CR 35			DR 19	TU7	DR26.2	CR28.2				CR34	CR35	CR17
Burial	CG2		CG3	CG4	CG5		CG6			CG7	CG8		CG10	DG2	TU7G1	DG1	CG9				CG12	CG1	CG11
Loc.	53	54	49A	48	23a	23b	40	41a	41b	46	405 Ind I	405 Ind II	408.8	110	6	MNI=12	122a	122b	123a	123b	MNI=6	MNI=6	MNI=14
Age (given in years, m=month, inf.=infant, y=young a=adult, c=child)	3-4	1-2	1.5-2	7±2	3±1	1.5-2	0±2m	a	c	8±2	6-9m	3-4	25-35	0±2m			3-4	3-4	0±2m	0±2m	n.d.	2 ya 1 a 3 inf. I	n.d.
Sex (f=female, 99=indet.)	99	99	99	99	99	99	99	99	99	f?	f	99	m	99	f	n.d.	99	99	99	99	n.d.	3x m(?) 3x99	n.d.
2. Preparing the burial ground																							
2.3. preparing the ground digging a pit	1		1	1	1		1			1	1		1	1	1	0 2?	1				0	1	0 1
2.3.1 through sediment or floor	1		1?	1	0		1			1	1		1	0	0	0	1				0	1	0 1
2.3.2 undercutting a wall	0		0	0	0		0.5			0.5	0		0.5	0	0	0	0				0	0	0 ?
3. Burial construction																							
3.1. separating the pit from the room by stones/ slabs/ small wall	0		0	0	1?		0			1	0		1	0	0	1	0				0	0	0
3.2. fixing of grave pit with stone slabs/ walls	0		0	0	0		0			2	0		1	0	0	2	0				0	0	0
6. Covering the corpse and grave																							
6.1. with sterile sand							1			1			1				1						
6.2. with sediment	0		0	0	0		0				0			0	0	0					0	0	0
6.4. with large slab(s)	2		0	2	0		2			2	1		2	0	0	2?	2?				0	2	0
6.5. with deliberately broken stone slabs	2		0	0	0		0			2	0		0	0	0	0	2				0	0	0
6.6. with unworked stones	1?		1	0	0		1			1	1		1	0	1	1	1				1	0	1
6.8. with (re-used) flint-/ limestones grit	0		0	0	0		1			1	0		1	0	0	0	0				0	0	1?
6.9. painting the grave cover white	0		0	0	0		1			1	0		1	0	0	0	0				0	0	0
Total (range)	**6-7**		**2-3**	**4**	**1-2**		**8.5**			**13.5**	**4**		**10.5**	**1**	**2**	**4-8**	**6-8**				**1**	**4**	**2-4**

Table 6 Estimation of time and effort for burial rituals and grave ‘goods’. *For all abbreviation see Table 5.

Room	CR 5			CR 6						CR 36.1	CR 35			DR 19	TU7	DR26.2	CR28.2				CR34	CR35	CR17
Burial	CG2		CG3	CG4	CG5		CG6			CG7	CG8		CG10	DG2	TU7G1	DG1	CG9				CG12	CG1	CG11
Loc.	53	54	49A	48	23a	23b	40	41a	41b	46	405 Ind I	405 Ind II	408.8	110	6	MNI=12	122a	122b	123a	123b	MNI=6	MNI=6	MNI=14
Age (given in years, m=month, inf.=infant, y=young a=adult, c=child)	3-4	1-2	1.5-2	7±2	3±1	1.5-2	0±2m	a	c	8±2	6-9m	3-4	25-35	0±2m			3-4	3-4	0±2m	0±2m	n.d.	2 ya 1 a 3 inf. I	n.d.
Sex (f=female, 99=indet.)	99	99	99	99	99	99	99	99	99	f?	f	99	m	99	f	n.d.	99	99	99	99	n.d.	3x m(?) 3x99	n.d.
2.1. grinding colour/ dressing with coloured clothes	1		1	0	1		1	?		1	0		0	0	0	1	0				1?	1	1
2.2. adding ornaments	0	0	0.5	0	1	0	0.5	1	0.5?	2	0	0	1	0.5	0	1	1.5	1.5	1	0	0	0.5	1
4.5.2. with animals	0	0.5	0	0.5	0.5		0.5			0	0		0.5	?	0.5?	0.5	0				1	0	0.5
5. depositing grave ‘goods’ in the grave pit	0		0	0.5	0.5		0			0.5	0		0.5	0.5	0.5	1	0.5				1	1	1
6.5. adding objects in the grave cover	0.5		?	0?	?		1			1	0		1	?	0	?	0.5				0.5?	0.5	0.5
Total (range)	**1.5-2**		**1.5**	**1**	**2-3**		**2.5-3.5**			**4.5**	**0**		**3**	**1**	**0.5-1**	**3.5**	**1-2.5**				**2-3.5**	**3**	**4**

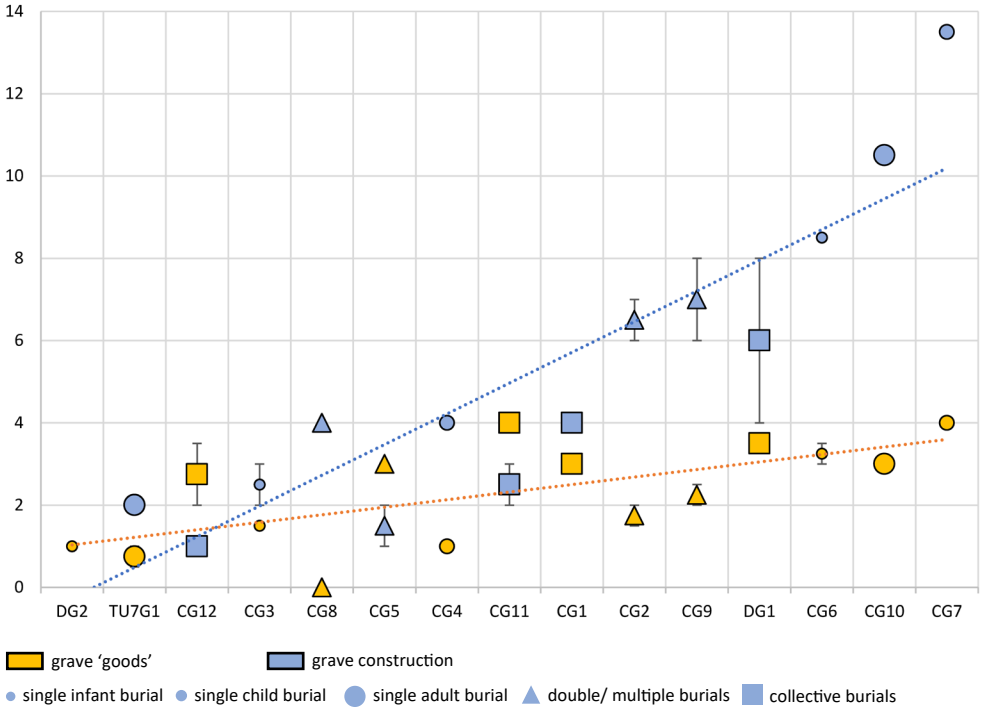

Fig. 15 Estimation of time and effort investment for each burial regarding grave 'goods' and grave constructions. The collective burials cannot be compared with the other burials directly, since it is assumed that the grave was constructed for several people, and for the ornamentation and grave 'goods' attributions to a single individual were hardly possible with few exceptions. (Graph: M. Benz, Ba`ja N.P.)

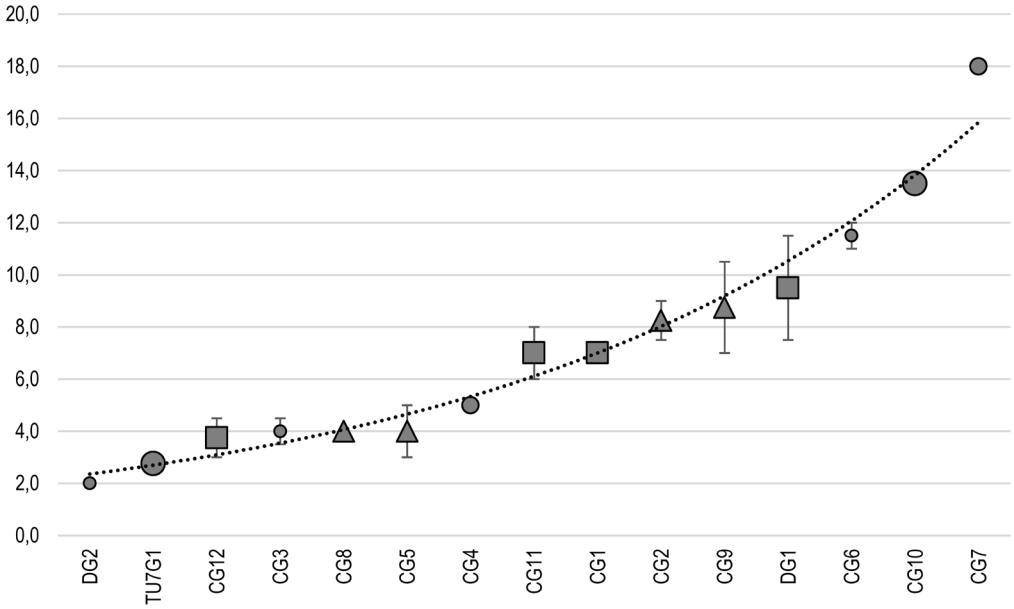

Fig. 16 Estimation of time and effort considering all categories for each burial. The error bars indicate the range of scoring, when unambiguous assessment was not possible. For the legend see Fig. 15. (Graph: M. Benz, Ba`ja N.P.)

protein. The well-preserved individuals yielded valid results allowing for the detection of some evidence of genetic relations through the analysis of Runs of Homozygosity (ROH). Short ROH accumulation in the infant of the double Burial CG8 (Loc. CR35:405, Ind. I) indicates smaller population sizes. On the other hand, the male adult buried in the collective Burial CG11 had rather long ROH, suggesting that his parents were possibly closely related second to fourth

degree. However, all three successfully sequenced individuals, despite two of them being buried in the collective Burial CG11, were not closely related to each other.

On a population level, the male adult belonged to the same Y-chromosome haplotype (E1b1b1b2a1) as individuals from 'Ain Ghazal. The sequenced aDNA of all three individuals shows similarities to the Natufian individuals (Lazaridis *et al.* 2016) of the southern Levant, but also exhibit some admixture with more northern Neolithic genes (Feldman *et al.* 2019, see also Wang *et al.* 2023), supporting the archaeological evidence of supra-regional exchange networks (Carter *et al.* 2013; Purschwitz 2017a; Alarashi *et al.* 2018; Goring-Morris and Belfer-Cohen 2020).

Despite facing significant challenges of homogenising and biasing effects in arid limestone environments, it was possible to identify the local signal of the Ba`ja Area, thanks to the use of local contemporary (!) wild animal samples as a reference. The close and uninterrupted range of strontium (Sr) signals from the 18 investigated individuals suggests a relatively local population with resource procurements areas only slightly different from the local wild animal population (Knipper *et al.* this volume). The Sr signals of the infants and young children closely matched the wild animal range, supporting the idea of a year-round settlement occupation. However, it cannot be ruled out that some mobility occurred from regions with similar or overlapping isotope signals, such as the Jordanian Central Highlands and southeastern limestone regions. Additionally, considering the observed similarities in haplotypes and gene exchange, there might have been some immigration from the north (Gebel *et al*. 2004). These interpretations are preliminary and should not be generalised, given that the database of geological and archaeozoological reference samples is still too limited to make any definite conclusion about movement of people (Knipper *et al*. this volume: Appendix 1)

The combined results of the a-DNA and Sr analyses support the idea of relatively local and genetically closely related communities, similar to what had been suggested for individuals from Basta (Alt *et al.* 2013). However, these communities also had some contact with other Neolithic populations. It is essential to acknowledge that the lack of comparative samples from other region of the eastern and western southern Levant limits the ability to determine the direction of genetic flow or origins. The available a-DNA samples are primarily from Motza, from a few Natufian, and Middle/ Late PPNB sites of the central Levant and central Jordanian Highlands, and south-east Anatolia (Wang *et al.* 2023).

The limited number of sequenced individuals as well as the lack and inaccessibility of burials from other areas of the settlement make it impossible to draw any definitive conclusions about the composition of households or the criteria for being buried in the rooms of Area C. The predominance of young individuals among the buried individuals does not support the idea of ancestral veneration, as it has been suggested for the Late PPNB/ early Pottery Neolithic site of Çatalhöyük (Düring 2008). However, without additional data and a more extensive sample, it is challenging to fully understand the social dynamics at Ba`ja. Further research and excavations in the area may provide more insights into these aspects.

Thanatoarchaeological Theses and Interpretations

In the previous chapters, we have summarised the main observations and results of the *Household and Death Project* to provide essential knowledge for understanding the relationship between the inhabitants of Ba`ja and death, as well as their treatment of deceased members. The aim of this final part of the synthesis is to evaluate the empirical evidence of ritual activities within the framework of theoretical considerations and information about the living communities 9000 years ago.

Our interpretations will follow the structure given by the thanatoarchaeological research group of the *Household and Death Project* (Gebel *et al.* 2022b).[15] In this workgroup, we identified three fields of parameters that influence human decisions and behaviours towards death and the dead: 1) social neuroscience, 2) ethological dispositions and 3) ontological/ environmental influences (Gebel *et al.* 2022b). All three fields interact constantly and are interconnected so strongly that a forth field of etho-ontological theses was integrated.

[15] This workgroup included Hans Georg K. Gebel, Joachim Bauer, Christoph Purschwitz, and Marion Benz.

The interacting nature of all four fields causes strongly overlapping empirical datasets and some repetitions. It might also be possible to shift datasets from one thesis set to the other. Some theses were treated together here to avoid too many repetitions of empirical evidence. All the theses, including the first set on epistemology (Theses Set 1), were published by Gebel *et al*. (2022b) and will be published in full length in the third volume of the *Household and Death Project* (Gebel and Benz b forthcoming). Therefore, it is sufficient to summarise the various parameters here that were identified for the four interacting fields, and to add the empirical data observed at Ba`ja. Here, we aim to evaluate the empirical data for each of the thanatological theses to provide data for the conclusion on a meta-level in Volume 3. Moreover, we will provide insights into the long-term processes of thanatological traditions by evaluating the data from Ba`ja within its early Neolithic environments. Short explanations for a better understanding of the metatheses were added (Gebel *et al.* 2022b). As Theses Set 1 concerns primarily epistemology and will be addressed in Volume 3, we start with Data Set 2.

Data Set 2 on Social Neurosciences

Thesis 2.1 (*Bio-Anthropological Constants/ Basics*): Activation of Pain System, Anxiety/ Stress System, Mirror Neuron System, Self Networks, Reward System

There is no direct empirical evidence from the archaeological data. However, the care and efforts expended on the burial rites of certain deceased individuals indirectly suggest a significant activation of the pain system (see also the onthological section).

Thesis 2.2 (*Role of Epigenetics*): supposes the modulation of brain structures due to enculturation into a sedentary, early productive community, including remaining Epipalaeolithic concepts.

There is no bio-anthropological evidence, but emerging tensions may be supposed between assimilation to corporate identities – represented by the choreographed burial rituals and some standardised artefacts, such as bead types and daggers – and the differentiation of certain individuals as well as individualistic traits observed in ornaments and burial constructions (Benz *et al.* 2019, 2020). The differentiation of some individuals may hint at the changing ethics and the struggle the early Neolithic sedentary communities faced. Similar observations were made when evaluating the long-term development of isolated skull depositions: during the Late PPNB, skulls of adult/ mature male individuals were increasingly segregated from group caches of secondary burials of skulls (Benz 2010), in contrast to earlier caches (PPNA/ Middle PPNB) where the emphasis was on the association of several skulls.

The use of red ochre in burials, as well as the ornamentation of a few selected individuals, was a recurrent practice in Epipalaeolithic communities (Belfer-Cohen 1991; Belfer-Cohen and Goring-Morris 2017; Richter *et al.* 2019). Sepulchral traditions from the Natufian cultures were transformed especially during the Middle PPNB (*e.g.* Goring-Morris 2000; Rollefson 2000). They modified very old traditions (as mentioned above) by intensifying diacritical means, such as the plastering of some skulls (Kuijt 1996; Benz 2010), whereas ornamental decorations became rare, only re-emerging during the Late PPNB (*e.g.*, Grindell 1998; Molist *et al.* 2013; Alarashi 2014).

In Protoneolithic[16] communities deliberate associations of humans with complete or important parts of animals in burials have been found (Le Mort 1984; Perrot and Ladiray 1988; Tchernov and Valla 1997). No such associations have been uncovered in Ba`ja so far. However, adults have been found adorned with bone beads made of wild animals' bones, while the bones of domesticated animals have not been used for the production of beads. Instead, white translucent mineral pendants were made to imitate wild animal teeth, specifically canines. Bone beads discovered in non-burial contexts (F.nos. 24068.1, 24070.1, 64500) were made from long bones of wild animals like hare, and two were made from bones of small animals, possibly foxes (Nielsen

[16] Following the socio-economic terminology suggested by Uerpmann and Schyle, we use the term Protoneolithic (Benz 2000, with references therein) to refer to incipient sedentary communities with some cultivation and herding but without fully agricultural systems. Based on the current state of archaeobiological data, these communities include Natufian, Pre-Pottery Neolithic A, and Early Pre-Pottery B communities. It is important to note that these socio-economic structures are more or less independent from the chronological periods introduced according to technological traits, meaning that not all Natufian or Pre-Pottery Neolithic A communities were necessarily sedentary, and not all Late PPNB communities were full farming agriculturalists.

2009: 36-38). Bone rings were also made from long bones of medium-sized ruminants, but it remains unclear whether these were from wild or domestic animals (Nielsen 2009: 39). Interestingly, none of these rings were found in a grave, although observations from Çatalhöyük suggest that they were worn on the fingers (Vasić 2020).

Thesis 2.3 (*Death Traumata*): activation of neuronal networks depends on environmental conditions, particularly on socialisation

Special care, decoration, and efforts for certain burials (CG6, CG7, CG9-10; see Tables 5 and 7), as well as the association of children with infants, indicate that the death of children and selected young adults were accompanied by strong attachment and empathy, thus making a strong activation of neuronal networks plausible. However, this anticipated care might have also relieved stress for those who were dying (see Thesis 2.4; Schiefenhövel 2007).

Thesis 2.4 (*One's Own Death*): helplessness and fear because of the uncontrollable death

Thesis 2.5 (*Death of a Peer*): fear, helplessness, and social stress due to extended and relational self concepts

Differentiating between Theses 2.4 and 2.5 is a heuristic means, but considering the overlapping neuronal representations of self and important others (Mitchell *et al.* 2006; Jenkins *et al.* 2008, Krienen *et al.* 2010; Ma *et al.* 2014), especially within the context of a Neolithic relational "*habitus"* community (Gebel 2017), it is meaningful to treat them together. Clear empiric evidence for fear, helplessness, and social stress syndromes is missing in the archaeological records, but they are probable in the context of an early agricultural community where survival depended on cooperation and successful mitigation. Cultural efforts to reduce psychological stress caused by death, such as deliberate destruction (see above), may indirectly indicate these neurobiological reactions (see Theses 5.2, 5.4-5.5).

Thesis 2.6 (*Kinds of Deaths/ Dying*): activation of neuronal systems according to the degree of affiliation to the dead and kind of death

Ancient DNA and Sr isotope analyses' results tentatively indicate a rather small, local, sedentary community with some evidence of close familial relations. However, in contrast, raw material procurement indicates an extensive exchange network, suggesting that possible social confinement was a deliberate choice and not solely due to the secluded environmental setting of Ba`ja. If this preliminary interpretation were validated, the death of a community member would have meant a significant loss, potentially causing tensions and instability within the community.

Concerning the kind of death, anthropological data have not yet revealed any correlation between burial rituals and pathological data. Many illnesses cannot be identified on the bones, especially when death occurred quickly without affecting the bones. Analyses of pathogens are pending and may provide new insights. An early and single case of tuberculosis of an adolescent individual from Aswad (Baker *et al.* 2017) might hint at special adornments in case of unfamiliar deaths. This individual was adorned with a necklace of 45 beads, which is the highest number of beads recorded at Aswad (Alarashi 2014; Khawam 2014).

Thesis 2.7/ 2.8 (*Extended Self and Charging Things/ Resonance*): Through the capacity of humans for loading others and things with meaning ("Theory of Mind"), things and/ or others can represent and become parts of one's own identity. This capacity is based on resonance (Bauer 2019), which involves mirroring others, embodying perceptions, and personally responding to them.

Associating the dead with highly valued and prestigious artefacts, such as the necklace or daggers, possibly evoked highly emotional moments, as these artefacts were taken from the living community. The long 'biographies' or intensive use of some of these artefacts, like the recycled turquoise and hematite beads and the buckle, suggest that they were treated carefully for an extended period and probably held a certain value, even if only to the person(s) who wore them before (Alarashi b this volume). It is possible that some ornament elements that one person wore for a long time became part of their identity. However, such an emotional attachment to things might be a modern idea, and in an early Neolithic community, the circulation of objects could have been very common without any possessive concepts.

On the other hand, it is also possible that some ornaments were specifically made for the burial ritual, combining old and new elements. The Ba`ja daggers were likely ritual objects,

as they have been found exclusively in association with burials and show minimal use-wear traces, except for a slight polish, possibly from some soft protection. Their non-local raw material, sophisticated production by experienced knappers, rarity, and strong standardisation, all suggest that their procurement, use, and ex-commodification were likely prestigious activities (Gebel *et al*. 2022a; a this volume). The 'biographies' and stories related to these artefacts, even if they were buried and taken out of sight, probably made them become integral parts of the identity of those who were assigned to use, wear, or bury them (Knappett 2005). By burying these artefacts, it can be assumed that a strong mental relation was created with the dead, with the burial event, and with the community who assisted the ex-commodification. The potential that these acts had an impact on personal and communal identities and memories is high. The burial place was thus imbued with communal memories of collective efforts and the (collectively overcome of) feelings of deprivation when giving away valued things or destroying them. It can be supposed that the collective efforts (see Table 5 and 6) served to reintegrate grieving individuals into the community. However, this remains speculative, as we do not know about taboos concerning persons in grief.

The destruction of some valued artefacts represents acts of physical force, perhaps helping to discharge negative feelings due to deprivation caused by death. However, it is also possible that these artefacts – except for the covering slabs – represented personal, inalienable goods that were so strongly related to the deceased person that it was unthinkable to continue their use. The burying of complete households as suggested by Gebel (Gebel *et al*. 2019; 2020) underscores the transfer of identities onto things.

Thesis 2.9 (*Need of Order and Understanding*): humans need to make sense of the (im-)material worlds. Death causes disorder and remains inexplicable and thus may incite a search for explanations and meaningfulness in the metaphysical/ spiritual realm

Giving death a place by establishing an intramural burial ground reintegrates late members into a certain (social) order; the liminal stage of perimortem situations was overcome by choreographed rituals, activating procedural memories without the need to reflect on the extraordinary situation of death. The idea of controlling death through the prolongation of social death (delayed burying) and controlling the dead by placing them beneath house floors can be considered one of the hypertrophic moments of self-overestimation by early Neolithic communities, believing they were able to exert control in all fields (Hodder 1990: 33).

Searching for evidence on metaphysical concepts in the realm of burial rituals depends on the interpretation of symbols: every amulet or stone, such as the white pebbles deliberately deposited in at least two burials (CG1, CG10), the chalky white stones placed above the feet of "Jamila" (CG7), or the symbols of colour might hint at such metaphysical concepts. Apart from some evidence of magic power that does not seem to have been related to death (Gebel 2002a), the above-described pit (Loc. CR6:25), close to Burials CG4 and CG6, might attest to an apotropaic function. The celt found associated with some stones in this pit may have represented the power to cut or clear fields from wood, or simply the strength and skills needed to produce and use this tool. This pit was covered with the same clay layer as the burial pit of CG6 and was thus probably filled contemporaneously. Although its meaning remains ambiguous, it could be interpreted as a sign of transferring power from a meta-physical or spiritual agency or simply meant to bury power (see also Thesis 2.7; Benz *et al.* 2019).

Data Set 3 on Human Ethology

Thesis 3.1 (*Uncertainty Dispositions*): = (Theses 2.4-5)

See data on Theses 2.4-2.5.

Thesis 3.2 (*Physical Segregation Disposition*): surmises that humans have an inert tendency to segregate the dead from the living

Segregating the dead spatially in the basements, confining them to a certain place, and segregating the burials with small walls, covering them firmly, sometimes with several layers of stone slabs and gravel plaster, all respond to the ethological disposition of physical segregations but also to the wish to prolong the physical presence of the dead within the community (*cf.* Thesis 3.5). Furthermore, micromorphological studies suggest the covering and/ or wrapping of the dead in mats (Reifarth *et al*. this volume).

Thesis 3.3 (*Entrapment Disposition*): burials as territorial and cognitive orientation for a peer group

The recurrent pattern of burying late members beneath floors of the basements inside houses that were – at least partly – still used, confirms this thesis for the community at Ba`ja. Moreover, the location of the burials close to window-like wall openings suggests that burials were accessible. It remains a matter of debate whether they were regularly visited or not, but for some burials, reopening (CG1, CG6, CG9[?]) or continuous interments (CG11, CG12, DG1) were attested. However, evidence for rituals that included the offering of animals, as it has been recorded for other sites (Goring-Morris 2000; Twiss 2008; Munro and Grosman 2010), has not been identified at Ba`ja yet. Some of the elaborate burial constructions may have become monuments of commemoration, such as the Burials CG2, CG5/6, CG7 ("Jamila"), CG10 ("Usaid"), DG1, which were visible constructions inside the rooms with some of them possibly being marked. Similarly, Room CR17 was used as a burial place for a very long time, possibly for several generations, with at least three or possibly four major phases of interment. Due to the uneven state of excavation in different areas, it is not yet possible to decide whether the "intramural cemetery" in Area C (Gebel *et al*. 2020, 2022b) was a special place for the dead only, as for example, the "Maison des Morts" at Dja'dé (Coqueugniot 2000), the so-called "memory house" (Unit F) at Middle PPNB Skhārat Msaied (Hermansen 2017; Kinzel *et al*. 2017), the "charnel place" at Bestansur (Riel-Salvatore *et al*. 2021: 27), or House F at the Late Neolithic site of Shir (Resch and Gresky 2018: 629). The two Burials DG1 and DG2 indicate that more burials may also be expected in other areas. Nonetheless, it is undeniable that corpses were continuously (re-) deposited in some rooms like CR17 and CR34.

Thesis 3.4 (*Aggregation Disposition*): surmises that people tend to aggregate during/ after dying/ death of a member of the community

Death induces fear and questions the familiar reality. Additionally,[17] psychological observations suggest that dying members may mentally detach themselves from the social and material environments even before their physical death. This mental segregation is likely perceived by others, triggering relational support and resistance. It can lead to confusion, premonitions, and possibly anxiety related to impending death. Therefore, Thesis 3.4. assumes that people come together around the time of/ after death to a) avoid the upcoming death, b) mutually reassure themselves of reality (including the otherworldly reality?), and c) to jointly confront the unsettling situation of the mental fading of a dying peer. Given the relational character of early Neolithic groups, it is likely that the emerging death of a group member was a strong incentive to aggregate and share the mental challenges for the living.

There is no clear evidence for the size and location of aggregations during burial rituals, except for the communal efforts that were probably necessary to construct the elaborate burials with thin, yet large stone covering slabs requiring two persons to carry them to avoid breakage. Furthermore, the complexity of the burial rituals suggests the involvement of various participants: constructors, bead and ornament makers, flint knappers, colour grinders, and lime plaster producers, not to mention those who provided food and beverages. As certain activities like lime burning or bead making needed light and space, it was impossible to perform them inside. These activities likely did not go unnoticed by other inhabitants and might have attracted spectators if only children. Additionally, the procurement and masonry work of the stone slabs may have garnered attention due to the resulting noise. The inclusion of coloured slabs and grinding stones with intensive traces of red pigments in the covering of specific burials (CG1, CG7) lends support to the notion that pigment grinding took place in the close proximity to the burial, possibly shortly before or during the burial ritual.

If there were aggregations, they had to take place outside the houses, because the space in the basements, next to the burials, was very limited. It remains hypothetical whether such aggregations were organised or not, and, if so, whether the whole community or only parts of it were involved.

Thesis 3.5 (*Familiarity Disposition*): says that despite the disposition towards physical segregation (Thesis 3.2), there was a tendency to extend the physical presence and/ or connection with the deceased

[17] The following paragraph adds new observations and interpretations to the recently published theses (Gebel *et. al*. 2022b).

Evidence for this disposition is observed through: 1) dead members that were preserved or stored temporarily, as indicated by the combination of primary and secondary interments in the double and multiple Burials CG2, CG5, CG8, and CG9 (and possibly CG1) as well as by histotaphonomy (see Haddow this volume); 2) burials that were reopened, the dislocation of skeletons as in the collective burials (CG1, CG11, CG12, DG1), or skeletons that were removed (*e.g.*, CG6?). The delayed and recurrent handling of human remains can be viewed as "a discursive act, communicating cultural information through actions" (Osterholtz 2020: 3), thereby establishing or affirming connections between the living and the deceased.

Nonetheless, it is important to keep in mind that the sub-floor burials might only represent a fraction of the deceased members of the community. We lack information about burial rituals that left no or hardly any traces. Occasionally encountered isolated human bones within the buildings may imply bone discarding or scattering after a certain period (Hermansen 2017), potentially signifying intentional actions to conclude life cycles or facilitate forgetting (Kuijt 2008).

Thesis 3.6 (*Local Fixation Dispositions*): suggests that places for remembering the dead are indispensable for coping with grief, control of the dead, self-determination, and legitimation.

Clear evidence for practices of commemoration is missing at Ba`ja. However, the location of almost all burials close to wall openings (except for CG2 and DG2) suggests that it was intended that burials were accessible. Patches of charcoal and ash attest to lighting fires during the burial ritual itself (CG4, CG6, CG8, CG9, CG10). At least in one case (CG10), the lighting of an intense fire must have been shortly before the covering of the grave construction. The layer of ash that was uncovered beneath the plaster cover disappeared shortly after the excavation, *i.e.*, if the fire had been lit long before the burial, the ash would not have been preserved so well.

The determination of a special place for remembering the dead may be a concept that only emerged with the first burial grounds during the Middle PPNB, *e.g.*, at Aswad (Khawam 2014). Proving remembrance activities remains difficult as long as no material goods were involved.

Thesis 3.7 *(Otherworldly Dispositions)*: includes the transfer of agency onto imagined powers

see dataset on Thesis 2.9

Data Set 4 on the Etho-Ontological Intersection

Thesis 4.1 *(Behaviour Enabling a Social and Cognitive "Bidirectionality" of Death*):

The placement of the dead inside the houses, the handling of corpses, the extended "preservation" of certain individuals, and the care given to the corpses (see Thesis 2.3) collectively indicate the important role that the deceased played within the living community. Dying and the dead were not excluded from life but constituted an integral and essential part of it. The deliberate association or orientation observed among certain interments in relation to others (such as in Burials CG6 and CG5), as well as the observation that subsequent burials did not cut through any prior ones, either suggests the remembrance of the emplacement or the marking of the burial position above ground (CG6, CG10). It is also possible that the grave construction itself, characterised by its above-ground constructional elements, became an intrinsic part of the room (*e.g.*, CG7, CG10), which was likely traversed, with individuals possibly even using the enclosing walls of the grave as a pathway between two window-like wall openings. In instances where burials intruded upon others or were layered atop each other, it seems that this was a deliberate decision (*e.g.*, CG1, CG5/6, CG11).

Thesis 4.2 (*Behaviour Enabling Collective Arousal and Relief*):

Through activating procedural memories, choreographed rituals addressed the need to alleviate stress and bring order to the disordered without requiring deliberate decisions or conscious actions. Intense moments that engaged all the senses were observed across different stages of the burial process (as discussed in the empirical section; Benz *et al.* this volume): sight (via contrasting and glittering colours, the inclusion of exotic and valued items that were either destroyed or buried, and the presence of fire), auditorily (through the preparation and breaking of the stone slabs and other artefacts), tactically (involving the laborious extraction and arrangement of stone slabs, *etc.*), and olfactorily (the

scent of fire and the smell of corpses). We lack information regarding whether specific food or beverages were linked to burial events. While activities to ward off malevolent entities were not directly observed, the use of fire might suggest such a function (even though this might also have practical implications like purification or odour reduction).

Thesis 4.3 (*Behaviour Enabling Collectively Steered Cognition*): surmises that specific activities promoted collective cognition

Recurring patterns in burial rituals and standardised artefacts may have encouraged collectively guided cognition, but many individualistic traits of burials and ornaments also indicate possible tensions.

Thesis 4.4 (*Behaviours Establishing Social Cohesion and Routine*)/ Thesis 4.5 (*Behaviour Establishing Inheritance Standards*): Theses 4.4 and 4.5 are so closely related from an empiric point of view that data is given for both together

Re-establishing social order and cohesion despite the disruption of death is best observed in the burial of the young male adult ("Usaid") in the primary Burial CG10. The segregation of artefacts that were embedded into the burial cover – those set apart from personal items –, and artefacts like the ornaments and the macehead, which were buried and destroyed close to the dead man and placed within the grave pit, highlight the struggle between presenting an extraordinary status for this person and simultaneously restoring the situation before these artefacts were present (and conveyed prestige/ status) through deliberate destruction (macehead, daggers, and arrowheads). This ambivalence in burial rituals within the Ba`ja community is also mirrored by the elaborate and lavishly decorated Burials CG7 and CG9. Their ornamentations transcend the norm, connecting the burying community to the dead by potent "objectified" relationships. Although accumulating and storing resources in an agricultural community has become crucial to ensure sustenance, hoarding things does not seem to be an appropriate practice. On the contrary, even highly valued objects, which had circulated for extended duration, evident from their pronounced use-wear traces, or of which the procurement was probably loaded with prestige, were ex-commodified in these graves.

Although these practices of material ex-commodification may have terminated power by destroying symbolically charged artefacts like the macehead, the dagger, and the projectile points (Benz *et al.* 2019), they concurrently conveyed the power – in an intangible manner – to those who interred the deceased. Ultimately, what may have been aimed to equalise or terminate power actually confirmed basic social order and differentiation. Consequently, burials evolved – intentionally or inadvertently – into a means for stabilising social constructions or even naturalising them by embodying symbolic meanings through repetition in choreographed rituals.

Data Set 5 on Human Ontology

Thesis 5.1 (*Behavioural Sepulchral Diversity*):

The integrative studies on burial taphonomy suggest multi-staged long processes of burying, involving the storage of certain individuals or their desiccation within the burial pits (= "primary burials" in the sense of Gebel *et al.* 2022b, *i.e.*, burials that seem to be primary depositions but were kept elsewhere for a period), along with combinations of primary and secondary burials in double and multiple burials, as well as collective burials. Further investigations are necessary to clarify whether the multiple or collective burials indeed indicate a more significant effort to demarcate territories or conceal inequalities compared to individual primary sub-floor burials, as has been suggested for the Late Natufian (Belfer-Cohen and Goring-Morris 2000: 27), or whether the different forms of interment imply varying methods of commemoration or are rather age- and sex-specific.

Despite this apparent diversity, recurrent patterns emerge at Ba`ja that enable us to propose an idealised sequence of ritual activities (as mentioned above). Similar to the ornaments, where beads and pendants were individually recombined from a shared repertoire, the burials, in most instances, do not represent all events (CG6, CG7, CG9, CG10); however, specific elements are consistently combined in nearly all burials (except for DG2 and TU7G1). Compared to other burials of the Late PPNB, such as at Basta (Gebel *et al.* 2022b) or Shkārat Msaied (Hermansen 2017), the reopening of graves and isolated human bones in domestic contexts have been observed relatively rarely, except for the collective burials. The collective Burials CG11, CG12, and DG1 seem to use the same space continuously over a longer period of time. The earliest phase

of burials in CG11 consists of single interments upon which sequences of interments follow, interspaced by recurrent layers of gravel and/ or sediment. Both Burials CG12 and DG1 need further analyses to say anything certain about the burial rituals. In contrast, the individualised analyses of the skeletons from CG1 point to only one or two re-openings, similarly to the multiple Burial CG9, thereby combining secondarily buried individuals with supposed "primary" burials. Histotaphonomic analyses for all the collective and multiple burials are pending. Correlating these different forms of interment – single and collective/ multiple – with individual and collective forms of commemoration disregards the temporal aspects of different phases of interment and ignores that remembrance cannot be prescribed (*cf*. Ostenholtz 2020: 5-6). However, if it turned out that certain areas were related to specific households or parental groups, burials might indeed confirm social alignments and foster household or even collective identities beyond the household level (Molleson 2000: 302; Moore and Molleson 2000: 283; Düring 2008; Hodder 2016; Pilloud 2020).

On a more general level, sub-floor burials were a widespread practice of early sedentary communities in southwest Asia since the Natufian (Ackerfeld and Gopher 2022). Interestingly, at Ba`ja, special skull treatments have not been observed so far (see for further references Khawam 2014; Bocquentin *et al.* 2016; Gresky *et al.* 2017; Haddow this volume). Whether the two individuals who were missing their skull or cranium, respectively (Individual IV in CG1 and one adolescent in CG11), represent individuals whose cranium/ or skulls were deliberately removed, cannot be clarified anymore, because detailed taphonomic studies during the excavation were not possible.

During the end of the Late PPNB, this practice also vanished on other sites of the Levant[18], and the strong similarities of sites with plastered skulls during the Middle PPNB dissolved into more individualistic practices per site during the Late PPNB (Grindell 1998; de Contenson 2000; Berner and Schultz 2004; Benz 2010). The dating of the Ba`ja burials to the end of the Late PPNB would thus be in accordance with this development.

[18] This is in contrast to Central Anatolia, where isolated skulls were still buried either associated with primary burials as at Çatalhöyük (Haddow this volume) or isolated or in groups as at Köşk Höyük (Öztan 2012).

Thesis 5.2 (*Behavioural Inclusion of/ Confined Reciprocity with the Dead*): suggests that the dead remained an integral part of the living community.

There is ample evidence mentioned above confirming strong bonding with the dead. We will list it in an abbreviated form referring to the empirical data of the other theses:
- sub-floor burials (Thesis 5.1.),
- ornamental common repertoire,
- choreographed burial rituals,
- prolonged physical presence and care (Theses 3.5 and 5.1.).

Thesis 5.3 (*Behavioural Consequences of Death*):

See all the burial events listed above, plus the possible termination of households (Gebel *et al*. 2020) and the deliberate breakage of things.

Thesis 5.4 (*Behavioural Perception of Death*): sustains that the *noemic* [what people think about] systems of Late PPNB communities on death were steered rather by meronomic than taxonomic ordering of things (Gebel *et al.* 2022b; Thorton 2020).

As suggested in Thesis 2.1. death activates neuronal networks related to pain, fear, and stress, however the neocortical control of these emotions is considerably influenced by cultural conditions (Schiefenhövel 2007) and these in turn depend, of course, on the way people think and order their world. There is no direct evidence how death was perceived by the Late PPNB communities at Ba`ja.

One of the co-authors of this synthesis (H.G.K.G.) considers meronomic thinking (first addressed in Gebel 2017 and Gebel *et al.* 2022b) to be an essential ingredient of behaviour in Ba`ja, especially expressing with rituals and symbolism. The enduring legacy of the hunter/ gatherer mind and the nascent taxonomies of productive commodification regimes should still have preserved high levels of meronomic thinking in early Neolithic communities. Basically, all findings with seemingly non-rational object-context relations need to be examined for them using understanding or knowledge that works with "merons" (Gebel *et al*. 2022b), escaping our taxonomically dominated understanding of the world and the social using their discrete hierarchies and categories. To discuss the supposed meronomic part of the Neolithic mind is crucial for an emic understanding of the

Late PPNB ethos and will therefore be taken up by H.G.K. Gebel (in Gebel and Benz forthcoming b). There is no question that identifying shares of causal taxonomic and causal meronomic thinking in Early Neolithic findings is accompanied by exceptionally high speculative levels. Additionally, conceptional categorisations are generally highly situative, multifold, and not fix: for example, the white semi-translucent pebbles that were found in the settlement but also in two Burials CG1 and CG9 were probably collected by Neolithic people for aesthetic reasons and their rarity. As archaeologists, we ignore their meaning. We can only observe that – despite a rather sterile filling of the grave with sand – at least in two of the graves a single white pebble was uncovered (possibly more ecofacts remained unrecognised as deliberate associations). Their difference to the surrounding sediment proves that they were put in the grave deliberately, *i.e.*, they could not be part of the grave filling by chance. After their use during the burial ritual, their meaning was transformed into a purely symbolic meaning, relating dead and living people. At least the person who had put the pebble in the grave would remember that act more intensively as if he/ she had only watched the burial ritual. It remains speculative whether the stones had a symbolic meaning beyond their aesthetic attraction. It seems erroneous to conclude because some things were put into the grave – possibly by various actors and for various reasons –, that they were also related in daily life, thus representing the way how people categorised their world. In daily life, this pebble may have had a purely aesthetic function; perhaps it was kept for being perforated and used as some kind of adornment as it has been done with another quarzitic pebble (F.no. 20813). It was thus related to all other "exotic" minerals used for adornments. However, through employment in the burial ritual, its meaning changed, and it became part of an assemblage that did not have a taxonomic relation.

Apart from these difficulties, the social, medical, and economic conditions these people lived in, may give some ideas of how they may have perceived death. Social relations in such small communities were probably more intense, and people depended on each other. Pathological data do not show enhanced evidence of trauma, as it was, for instance, the case for Basta (Schultz *et al.* 2007), nor do we have any indication that some groups/ households within the community distanced themselves from others (Alarashi and Benz this volume). Evidence from the ornaments points to a rather communal organisation with open access to raw materials (though slight differences in flint procurement seem to exist, Purschwitz forthcoming). Mitigation and cooperation seem to have been quite successful. Keeping in mind the neurobiological basics of resonance and mirror neurons, it can be supposed that the death of a member was probably a big loss. Relational identities, as suggested by ethnographic case studies of small-scale hunter-gatherer-fisher or small groups of horticulturalists (Descola 2022[4]), would have increased feelings of deprivation, irritation and, in the worst case – loss of identity.

Given the meticulous efforts for the burial constructions and the sophisticated work for the ornaments, we may conclude that dying within the community was relieved by social assistance and care. However, burials like TU7G1 show that there were also other cases when people were deposited into a midden area – as it seems – rather carelessly.

Thesis 5.5 (*Behavioural Collective Confinement of the Dead/ Death*): highlights the importance of death rituals to support group solidarity and communal commemoration

Compared to other sites, death rituals at Ba`ja – despite their above-mentioned variability – seem to follow a specific choreography. There is some evidence that age at death and identities the burying people assigned to the dead, as evidenced by the highly individual compositions of ornaments, played an important role for the burial rituals. Irrespective of these individualistic traits, communal procedural memories were enhanced through the repetition of choreographed practices, reflected by recurring events during burial rituals, *e.g.*, the destruction of stone slabs, lighting fires, destruction of artefacts, grinding of pigments *etc.*; cultural means were thus embodied and naturalised. The repeated interment of people in the same place (in double, multiple and collective burials) offered further incentives to re-activate memories – for those who buried the person if they had assisted a burial in the same place before – on formerly interred members by spatial association.

Thesis 5.6 (*Behavioural Interventions Commodifying Death/ the Dead*):

The areas of possible commodification of the dead and death are represented in the empiric data on several levels:

1. Burying provided or confirmed status or prestige for those who were able to afford a lavish burial ritual (*e.g.*, CG7, CG9, and CG10); however, it is questionable whether prestige may have been achieved by a lavish burial, even if it did not align with concepts of power held by the majority of people who participated in the burial. Would the burial then become a distorted representation and transform the intended goal of respect and admiration into its opposite? What if lavish burials were not valued by the majority of an egalitarian community at all, and contradicted what was considered appropriate? These intriguing questions can only be assessed through extensive social investigations, observing if certain social changes, such as the institutionalisation of social differences, were ultimately successfully established. Given the social evolution in early Neolithic communities across Southwest Asia, divergent models have emerged, ranging from "fiercely egalitarian" (Hodder 2006) to "flat-" and "cone-shaped chiefdoms" (Gebel 2002b), as well as corporately segregated groups with *primi inter pares* as temporary forms of leadership (Benz *et al*. 2017, 2019). Simultaneously, these investigations underscore that social hierarchies had not yet fully formed but were in the process of emergence. Definitive answers are likely to be refined through forthcoming studies in prehistoric social contexts. The status and prestige ascribed to the deceased by the burying community were reflected in those who interred the individual or who were (at least said to be or claimed to be) connected to them. In the collective perception, the image of the deceased is projected onto the burying community or people, unless there was a deliberate distancing from the deceased. The (collective) commemoration and the physical presence of the grave within the houses reinforced personal bonding by aligning social relationships to a territorially fixed location. This emotional bonding to a place is closely related to Point 2. In the case of the female burial TU7G1, the act of placing and covering the deceased with stones might have been perceived as an assertion of power of the burying community, demonstrating the ability to deny the individual a conventional burial.

2. The strong spatial association of collective memories with the dead and death at Ba`ja enhanced identification with the territory. The connection to a particular individual or group was embodied in the specific location of the grave. This distinct place thereby symbolised the personal relationship and could, to a certain extent, function as a substitute for household relationships. It might have functioned as a catalyst for evoking emotions and social relations on an abstract level. Additionally, on a larger scale, it merges personal relations (with deceased members of the community) with the abstract relation to a natural landscape, and thus personifies the landscape and promotes empathy with the land, *i.e.*, the land becomes a synonym for the people, segregating one's own group from other groups. Possibly not in the sense of possessing land (see the open access to resources mentioned for Thesis 5.4), but by emotional bonding. In animistic communities this personification only intensified concepts that existed before. In contrast, the intensified bond with a specific place through the intangible relationship with "ancestors" amplified the effects of sedentism, gradually transforming the landscape into a more pronounced anthroscape.

3. On a spiritual level, re-establishing connections with the deceased and asserting authority over "death" through its assimilation into cultural norms bestows power upon those who lay claim to this control over the envisioned destiny of the departed. Proof of this reclaimed authority is evident in the spatial assimilation of the deceased and the "objectification" of memories and relationships through the de-/ commodification of valued artefacts. Whether these claims were of temporary nature or whether this authoritative power was reclaimed/ attributed based on status remains an unresolved query.

Relating Death and Life: Concluding Remarks

In the final chapter of the synthesis we evaluate the impact of funerary ritual practices on daily life. This represents the third level of interpretation. In Part 2 of this volume, the specialists described the empirical "raw" data of which we presented a short summary and interpretation in the second part of this synthesis. Following this initial presentation, we assessed the empirical data in light of our archaeothanatological theory. In our *Concluding Remarks*, we aim to discuss

the mutual interplay of thanatological concepts and practices with daily practices (Fig. 17).

Establishing Territorial and Emotional Bonds Beyond Death: Embodied Memories and Territories of Death

As we have shown in the previous chapters, death constituted an integral facet of life within the Ba`ja community. The prolonged physical and emotional presence of the deceased was apparent across multiple dimensions. Personal relations to the deceased were 'objectified' through giving away prestigious and valued items, communal endeavours, and the meticulous execution of burial rituals. Consequently, relationships with the deceased were both intensified through burial rituals, and, simultaneously, served to maintain social cohesion within the living community. Various stages of the burial rituals were charged with highly arousing activities designed to engage each of the senses: sight, sound, smell, touch. This heightened the potential for collective remembrance, akin to the concept of the "memory house" at Shkārat Msaied (Hermansen 2017: 193) or "history houses" at Çatalhöyük (Düring 2008; Hodder and Pels 2010; Hodder 2016), thereby providing strong mechanisms for stabilising the social fabric of the community.

The choreographed nature of the burial rituals at Ba`ja likely engaged procedural memory and facilitated the embodiment of symbolic behaviour, naturalising cultural constructions (Benz and Bauer 2021). Burying the deceased beneath house floors intensified their integration with the settlement and with the land. Additionally, the human capacity to invest agency in things allowed for personal relationships with deceased members to be projected onto the land. Given humans' heightened emotional and cognitive empathy, a strong emotional connection to the burial site is implied. Knowledge of grave locations and the individuals buried within probably persisted for at least two or three generations (see Purschwitz *et al.* forthcoming). However, circumstances shifted after an earthquake (Gebel *et al*. 2020; for dating details, see Purschwitz and Benz forthcoming). Earlier

Fig. 17 Interacting areas and interdependence of factors influencing the thanatological behaviour and practices. (Graph: H.G.K. Gebel, Ba`ja N.P.)

networks for acquiring flint raw materials and semi-finished products were altered, and ornaments seem to have changed as well (see Alarashi and Benz this volume). Burial rituals also seem to have changed, as no burials – with perhaps one or two exceptions (TU7G1/ DG2) – have been uncovered from the later occupation.

This close relationship between the living and the dead at Ba`ja, at least during the Phase II occupation (Gebel *et al.* 2022b; Purschwitz *et al*. forthcoming) to which most of the burials belonged, mirrors observations made in the earliest sedentary communities of the southern Levant and northern Mesopotamia (*e.g.*, Perrot *et al.* 1988; Valla 1991: 114; Bocquentin 2003; Benz *et al.* 2015). "Living and dead participated together in the structuring of the inhabited space and in the continuity of occupation" (Bocquentin 2021: 7). The dead were intended "to draw tighter the symbolic bonds between the community of the dead and that of the living". However, it is important to note that only a specific subset of the community was buried beneath house floors or within the settlement (Molleson 2000; Rollefson 2000; Bienert *et al.* 2004a; Khawam 2014; Gebel *et al*. 2022b).

Transcending Linear Time Concepts of Death

Given the prolonged presence of the dead and their intensive commemoration within the settlement, it can be suggested that the passage between life and death was suffused with cultural concepts for the inhabitants of Ba`ja. The social death of a group member was not a brief event but rather an extended process, potentially spanning many years or even generations (Hofmann 2008; Kuijt 2008; Hermansen 2017). This transitional or "liminal" stage, as conceptualised by Hertz (1907) and van Gennep (1909), likely encompassed multiple phases. This notion is aligned with Cornelius Holtorf's argument that a burial, as we uncover it, might blend various temporal perspectives into a single moment. For example, how can we ascertain that the firmly sealed Burials CG10 and CG7 were not meant to be reopened, as collective Burial CG1 was, despite the considerable efforts involved? Could they have been intentionally constructed as a challenge? What criteria signified the passing of a person? Did the cessation of vital signs (*e.g*., breathing, heart rate) mark their death? The extended exposure of the deceased and their burial beneath house floors is just one realm in which humans believed that they were able to control natural processes. Death and the deceased were, quite literally, "domesticated" (Hodder 1990) – even if this remains just one of humanity's self-deceptive illusions. Similar trends of increased handling of human bones were observed at other early Neolithic sites, such as Basta (Nissen *et al.* 2004), Motza (Vardi *et al*. 2020), Jericho (Kurth and Röhrer-Ertl 1981), Ramad (de Contenson 2000), ´Ain Ghazal (Rollefson 2000), Abu Hureyra (Moore *et al.* 2000), Halula (Molist *et al.* 2013) and Çatalhöyük (Haddow *et al*. 2021).

Defining the Group

At a time when settlement and regional population densities in the southern Levant were on the increase, the manner in which communal or group identities were defined and maintained is a pressing area of study (Benz 2010; Alt *et al*. 2013; Benz *et al*. 2017). From the limited sample at Ba`ja, it seems that neither age nor sex played a role in determining who was interred inside the house. Collective, multiple, and single burials encompassed subadults across all age categories as well as adults. There is no distinct differentiation observed for very young infants. This implies that they were likely integrated into the community from the beginning (*cf.* Moore and Molleson 2000: 291), although the presence of infants in double/ multiple burials (CG2, CG5, G8, and CG9), as well as the scattered and complete infant skeletons in collective burials (CG1) and the rarity of ornaments for babies, might suggest some age-specific practices. As discussed earlier, certain adornments (mother-of-pearl rings and bone beads), artefacts (dagger and macehead) and perhaps colours (yellow ochre?) might also be associated with certain age groups. Distinctive attributes that could have served as distinguishing factors for households have not been identified, suggesting that the selection of individuals for interment was not influenced by specific households. The grouping of burials in Area C does not imply any distinct status associated with this location; instead, it is more likely a preliminary impression due to the progression of excavations at the site.

Between Assimilation and Differentiation

The heightened potential for identification, achieved by bridging the gap between the past and present, humans and their environment, contrasted with the social and territorial flexibility of mobile hunter-gatherer groups. Strong traditional *habitus* (*sensu* Gebel 2017) curtailed individualistic behaviour, rendering actions deviating from traditional

norms either unacceptable or challenging.[19] As we posited earlier, the burial assemblages in Ba`ja indirectly hint at these tensions: while we observed elements of choreographed rituals, variations in these rituals and differences in ornamentation are suggestive of individualistic or idiosyncratic practices. Some deceased were buried lavishly in elaborate burial structures, while others received few or no grave 'goods' or were not buried beneath house floors. It might also be possible that additional types of burials existed that remain invisible to us (Gebel *et al.* 2022b). Perhaps, burial rituals even served as a release valve, allowing for the display of personal identities otherwise masked by strong *habitus* in daily life.

The sophistication of the artefacts used in the burial rituals (and the energy expended in making them), including flint, ground stone, and bone artefacts, ornaments, and basketry, as well as the grave constructions themselves, demanded planning and high technological skills, perhaps even communal coordination. As we have shown in the empirical section, ornaments were used to mark social affiliations through a common repertoire of raw materials and ornamental types. In other cases, the same materials were reconfigured idiosyncratically, perhaps to reflect personal choices. This dual role for ornaments may have stimulated their development and usage in light of growing communities and increasing population densities. The increasingly sophisticated elaboration and variety of artificial ornamental elements mirrors this demand for an increased range of items for distinguishing increasingly diverse aspects of group and individual identities. This is in contrast to naturally formed types (*i.e.*, marine shells) characteristic of the Epipalaeolithic cultures of the Levant (Belfer-Cohen 1991; Belfer-Cohen and Goring-Morris 2000: Fig. 2). On the other hand, assimilation processes in peer-groups, *e.g.*, the desire to be "like you" (Meltzoff 2007; Lakin *et al*. 2008), may have fostered the increasingly wide distribution of certain types as attested, for example, by the ubiquitous use and even imitations of exotic semi-precious "greenstones" in many Late PPNB sites (*e.g.*, Goring-Morris and Gopher 1983; Bar-Yosef Mayer and Porat 2008; Maier 2008; Bains *et al*. 2013; Bar-Yosef Mayer 2013; Bursali *et al*. 2017), as well as their longevity and particular way of being worn (Alarashi b this volume; Yelözer and Özbaşaran 2022: 309). The increasingly elaborate and varied types of butterfly beads (Alarashi 2016) reflect this tension between communal assimilation and individual differentiation (Benz *et al*. 2020).

In this context, it is worth recalling the two instances of imitative production from the adolescent burial in collective Burial CG11, which warrant further investigation (Fig. 11). Both cases may simply be interpreted as experiments in the display of newly acquired skills in ornament production (Alarashi 2016). However, indirectly, these two types of imitations may also reflect distinct demands. The "canine" imitation may suggest a desire to showcase ancient traditions of adornment with animal teeth. Perforated fox teeth and a pendant made from a hyena tooth were uncovered at the Early Natufian sites of El Wad and Hayonim Cave (Belfer-Cohen 1991: 570-572; Belfer-Cohen and Goring-Morris 2017) as well as the late Natufian level (Niv. I) of Mallaha (Maréchal 1991: 594). As mentioned earlier, a close association with foxes has been documented in human burials from the Epipalaeolithic onwards (Maher *et al.* 2011; Reshef *et al*. 2019), as well as in the PPNA imagery of Jerf el Ahmar (Stordeur 2015) and Göbekli Tepe (Peters and Schmidt 2004). It is possible that obtaining teeth of wild Canidae near the densely populated Late PPNB site of Ba`ja had become difficult. However, archaeozoological analyses demonstrate that these animals still inhabited the region, with their bones found in the settlement (von den Driesch 2004; Prust and Pöllath forthcoming). The use of a mineral substitute was likely not due to the lack of the original material, but rather a deliberate choice. The mineral's shining and semi-translucent qualities may have been the deciding factors for its use.

The case of the red-painted beads may reveal a different reason. Carnelian was available in the settlement, but perhaps it was not considered appropriate for the burial of this person? Or was there not enough time to procure or work this hard material into seven beads until the burial? As discussed above, only some of the beads of

[19] One of the co-authors (H.G.K.G.) sees a particular social phenotype emerging with the Late PPNB *habitus* society of south Jordan: that of the Late PPNB dividual (Gebel 2017). It was formed by accelerating and agglutinating conditions in all spheres of the mega-site lifestyle, demanding from group members the utmost devotion to the group's tangible and intangible territories within the overall framework of the regional *habitus*. It is expected that this was not much eased by the emerging mobile pastoralism in the extensive eastern steppes, where other territorial constraints ruled the new pastoral and pasto-venatorial lifestyles (*cf.* Gebel a this volume: Fig. 8). The dividual concept will be elaborated in the discussion of the Ba`ja ethos (Gebel and Benz forthcoming b).

the ornament were red. It is therefore less likely that the intense colouration resulted from other staining processes during the ritual, but that it was an intentional choice that only some beads should be coloured red. Similarly, imitation of "greenstone" beads by artificial pigment application and/ or heating processes of wood or bone beads are known from Nahal Hemar Cave (Bar-Yosef and Alon 1988: 5), and from the Pottery Neolithic layers of Tell el-Kerkh, Syria (Taniguchi *et al.* 2002) and Barcın Höyük in Central Anatolia (Bursali *et al*. 2017: 503). Imitation of the carnelian bead of the young adult male individual of Burial CG10 – and the desire of the burying community to assimilate the dead adolescent with this man without having the means for procuring the exotic raw materials – seems possible. Garfinkel and Dag (2006: 157) speculate whether clay beads from the Pre-Pottery Neolithic A site of Gesher were used to replace mineral or shell beads, "because the inhabitants of the site did not have access to exotic mineral?". For the moment such questions remain intriguing, but cannot be clarified without further investigations.

This emerging differentiation in burial practices and objects may have spread into the community through the human inclination to project experiences onto other areas of life. Despite the deliberate ex-commodification or destruction of valued artefacts to terminate power (Benz *et al.* 2019), the concept of displaying or reinforcing personal or group identities through material symbols was fostered by these processes of enhanced differentiation and the need for identification in ever larger and more anonymous communities (Benz and Bauer 2013; Dunbar 2013).

One of the most obvious means of distinguishing individuals in Middle to Late PPNB burials was the removal and plastering of isolated skulls (for references see Haddow this volume). This particular treatment of skulls has not yet been documented at Ba`ja. One probable reason could be the chronological dating of the burials to the latest 8th and early 7th millennium (Benz *et al.* 2019). During the 7th millennium and Pottery Neolithic, "skull" burials became increasingly rare in the Levant (Resch and Gresky 2018), and it was only later observed, albeit in a different form, in Central Anatolia at sites like Çatalhöyük (Haddow and Knüsel 2017), Köşk Höyük (Öztan 2012), and Tepeçik Çiftlık (Büyükkarakaya *et al*. forthcoming).

Similarly, while figurines associated with burials have been found at other sites (Jericho, Ramad and es Sifiye; Kenyon and Holland 1983; de Contenson 2000; Mahazneh 2001), they were not observed at Ba`ja. However, a clay figurine of the es Sifiye type was discovered directly atop a window-like wall opening that connected the burial location of Burials CG1/ CG10 in Room R35 with the collective Burial CG12 in Room CR34 (Gebel *et al.* 2006). This figurine seems to belong to a later closing phase of the wall opening. Likewise, the hoard discovered atop Burial CG2 (Gebel *et al.* 2020), which includes a decorated clay token and a broken human (?) figurine, is stratigraphically more recent.

The Impact of Burial Practices on Craft and Exchange Networks

As emphasised in the chapters on ornaments (Alarashi a and b this volume; Gerlitzki and Martin this volume) and daggers (Gebel *et al*. 2022a; Gebel a this volume), the inhabitants of Ba`ja actively engaged in an extensive exchange network involving both raw materials and possibly finished prestige or symbolic artefacts. The demand for valuable items in burial rituals likely drove the need for production and exchange of the requisite raw materials and finished products (Alarashi 2016: 507, also referenced in Bains *et al.* 2013). Conversely, the expansion of wide-ranging exchange networks, evident from obsidian and flint procurement (Carter *et al*. 2013; Purschwitz 2017a), may have spurred an interest in acquiring exotic raw materials, motivating their incorporation into ornaments.

The distribution and utilisation of shells from the Red Sea to the Late PPNB site of Halula indicate that trade was not dictated by ease of access, considering that shells from the Mediterranean might have been more geographically accessible. It appears that cultural preferences and robust, far-reaching exchange networks, possibly facilitated through down-the-line exchange systems, established connections between communities in the northern and southern Levant (Molist *et al.* 2013; Alarashi *et al.* 2018; Schechter and Bar-Yosef 2020).

While sharing a common local repertoire with the contemporary site of Basta, some ornamental elements found at Ba`ja are unique. Consequently, both in terms of burial rituals and ornamental components, burial practice at

the site fostered group differentiation, while at the same time promoting integration into supra-regional networks. Ba`ja's secluded location, as well as the strontium isotope and genetic data from the human skeletal assemblage, collectively affirm a trend towards increasing isolation between communities (see Gebel 2017). These trends, originating with the early sedentary communities of the late Epipalaeolithic period, marked by an increasingly "intensive artistic activity" (Belfer-Cohen and Goring Morris 2000: 25, Belfer-Cohen and Goring Morris 2017), evolved into a notably elevated level of intricacy, epitomised by "costly"[20] artefacts such as daggers or the necklace of "Jamila", along with their deliberate ex-commodification within burial contexts.[21] While these sophisticated artefacts may have been "regarded as a means for alleviating scalar stress caused by intensive social interactions" (Belfer-Cohen and Goring-Morris 2000: 25) during the Epipalaeolithic, in the long term, within larger mega-site communities, the influences of assimilation, imitation, and heightened intragroup territoriality potentially led to an increased likelihood of some groups or individuals experiencing social and/or material deprivation.

Burial Rituals as Catalysts for Social Differentiation

In general, burial rituals have the potential to promote group cohesion and mitigate conflict by collectively overcoming the seemingly insurmountable or by (re-)establishing order in the face of bewildering loss (Thesis 5.5). Nonetheless, within the diacritical framework of burials, the Ba`ja communities inadvertently sowed the seeds for escalating social differentiation. Participation in elaborately adorned burials and "costly" burial ceremonies, or even being obliged to assist in them, might have engendered feelings of social and material inadequacy among those whose own group could not afford such efforts. This phenomenon exists regardless of the role raw materials and artefacts played within the community. Even if the concept of ownership was absent and a perpetual flux and circulation of objects prevailed, the aspiration to mimic or align with influential members of the community is a goal that resonates with many humans (Lakin *et al.* 2008; Haun *et al.* 2014; Hirst *et al*. 2018).

As others have argued previously (Belfer-Cohen 1995; Kuijt 1996), it would be premature to interpret these variations in terms of social hierarchies or status. While we have been able to identify age as a potential factor for certain distinct traits (such as the use of mother-of-pearl rings and yellow ochre for subadults, and the presence of bone beads and a higher prevalence of collective burials for adults), it is important to note that the diversity of burial and adornment practices were not solely determined by age. In the context of Ba`ja, we observe a growing distinction in the burial of infants, with a notable number of infants being re-interred alongside 3-5 year-old children. However, a more consistent age-based differentiation is primarily seen in the burial practices of later Neolithic communities. Regarding sex our current biased dataset indicates that it was not a decisive factor.[22] Pathological conditions, such as neurological or other physical disorders, inexplicable deaths (*e.g*., food poisoning), specific skills or even charisma may also have played a role in how specific burials were carried out. It remains unclear whether social affiliations (such as familial ties, household memberships, or group associations) influenced burial practices; this determination is hindered by the skewed spatial distribution of graves and the limited genetic data available to us. Numerous other factors may have played a role, beyond our current understanding (*e.g*., Shay 1985; Murphy and Le Roy 2023).

As mentioned in previous chapters, the association of the deceased with the living space likely fostered a sense of identification with co-residential individuals, thus promoting group identities, even during the Natufian period (Belfer-Cohen and Goring-Morris 2017: 83; Bocquentin 2021). At the same time, this could also have contributed to increased segregation between communities in the region.

[20] "Costly" in the sense of demanding specialised knowledge about raw materials and technological skills for procurement and production.

[21] For a rather similar development at the Late PPNB site of Aşıklı see Yelözer and Özbaşaran (2022: 306).

[22] Although the concept of gender was probably more important, the only criteria we can deduce from a bio-anthropological point of view, is biologically determined sex. If archaeological records would contradict the determinations by the anthropologist, it would be possible in a further step to start investigations on gender. However, since we lack clear sex-associated objects at Ba`ja – due to the biased anthropological data – questions about gender must be postponed for the time being.

Interestingly, during the most recent settlement phase, the acquisition of the so-called Basta blades declined, while the use of other exotic raw materials persisted (Purschwitz forthcoming). Could this reduction be linked to an increasing trend towards segregation? To gain clarity on this matter, further investigations into the final occupation phases at Ba`ja and other sites within the region are warranted.

Epilogue and Outlook

The interconnected processes of rising population densities, growth of permanent villages, social differentiation, specialisation, and the objectification of identities created escalating demands for raw materials and exerted pressure on exchange networks. These dynamics, in particular, appear to have instigated internal tensions between relational identities and the increasing differentiation and segregation of specific groups or individuals. The process of "objectifying" identities, coupled with the inherent human inclination to imitate, reflect, and assimilate with peers to forge a sense of belonging, might have contributed to the increase of material wealth displays within burial rituals.

The inhabitants of Ba`ja, whether consciously or intuitively, countered this trend by deliberately destroying and ex-commodifying valued items. In doing so, they prevented the inheritance and accumulation of goods within one family or subgroup. However, narratives and memories associated with opulent burials and the cessation of households (Gebel *et al*. 2020) likely lingered for a certain period, regardless of being perceived as negative or positive. Despite the increasing differentiation in burial practices, notable household-based discrepancies – such as those observed in the Late PPNB sites of Halula and Abu Hureyra in the Euphrates region (Molleson 2000: 307; Guerrero *et al*. 2009; Kuijt *et al*. 2011; Tornero *et al*. 2013) and at Aşıklı in Central Anatolia (Itahashi *et al*. 2021) – have not yet been identified in relation to access to raw materials or ornamental elements (Purschwitz forthcoming; Alarashi and Benz this volume), nor in terms of architectural features (Kinzel 2013; Purschwitz *et al.* forthcoming). Nevertheless, over time, material entanglements and the representation of social roles through various means continued unabated (Hodder 2005: 183).

The integrative role of rituals and the practice of burying the deceased beneath house floors may have been effective methods for affirming group identities, mitigating emerging conflicts and maintaining a relatively egalitarian social order for a certain period (Kuijt 1996; Reddish *et al.* 2016; Pilloud *et al*. 2020: 157). However, these practices also had the unintended consequence of fostering territorially localised communities and naturalising social differentiation, as well as the literal objectification of social roles. Through delayed burial customs, the incorporation of graves into architectural structures, and burial rituals engaging multiple senses – including profound material aspects, such as the destruction or ex-commodification of valued artefacts – the past was interwoven with the present. This engendered new perceptions of spatial and temporal concepts, potentially introducing cyclical notions of time (Benz 2020). Emotionally charged burial rituals for selected individuals, as well as the manner in which the deceased were conceptualised, likely had a significant impact on enculturation, collective identities, and social memory.

Despite its limited duration, the *Household and Death Project* has revealed the immense potential of Ba`ja to provide profound insights into the thanatological behaviour of an early Neolithic community and the dialectical relationship and strong interdependence between deceased and living group members. Thanks to the new excavations, we were able to systematically identify the physical and symbolic characteristics of graves at the site. Our observations shed light on the complex interplay between burial rituals, social dynamics, and identity formation in the Late PPNB community of Ba`ja, while also comparing it to contemporary sites in the Levant. Due to the poor preservation of human bones, definitive conclusions regarding the composition of social core groups, such as genetically related clusters or larger social entities like households or kin groups, remain elusive. Our understanding of the makeup of the collective burials, many of which fell outside the scope of the *Household and Death Project*'s analysis, is still incomplete. The burial with the most extended period of use, CG11, may potentially provide insights into chronological shifts over its prolonged usage, and we await the results of ongoing analyses before finalising our interpretations.

Similarly, the biased picture regarding the concentration of burials in Area C, as well as the underrepresentation of adults, particularly females, can only be rectified through future

excavations in other areas of the site. Systematic analyses of raw materials from beads might help to identify more sources and contribute to a more profound understanding of local, regional, and supra-regional networks.

A comprehensive comparison of subadult burials is pending, but our preliminary overview (Benz *et al.* 2020, 2023) indicates that they played a distinctive role in early Neolithic communities from a certain age onward. Notably, selected children were placed in elaborate interments beneath the floors of basements. The high occurrence of infant and children's burials recovered during the *Household and Death Project*, including those from collective burials, provides a valuable repository for forthcoming investigations into the evolving role of infants, children, and adolescents within ever-expanding sedentary farming communities.

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see the general acknowledgements to this volume (p. xxiii-xxiv).

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