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FRAGMENTATION IN ARCHAEOLOGICAL CONTEXT – STUDYING THE INCOMPLETE

*Anna Sörman, Astrid A. Noterman and
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Archaeological perspectives on fragmentation

From source-critical problem to interpretative potential

In early antiquarian practice, fragmented remains were often viewed as a problem – the result of unfortunate damage, hindering archaeological reconstruction of the original whole. Fragmented remains recovered from excavations were commonly understood as rubbish; burials featuring post-depositional extraction of artefacts and skeletal parts were disappointedly described as ‘disturbed’, and broken objects were generally reconstructed before being put up for exhibition in museums. The complete was considered better than the broken. However, it has successively become clear to archaeologists that broken objects and bodies carry important information. The act of fragmentation, as ‘a breaking or separation into fragments’, was sometimes accidental, sometimes deliberate and sometimes strategic. Whatever the causes of the breakup of the whole, the broken pieces often live on with new meanings. Various forms of breakage and reuse of fragments have been attested from all periods of the past, from Neolithic figurines and relics in the Catholic church to modern souvenirs featuring pieces of the Berlin Wall.

Within archaeology, fragmentation became an eye-opener at the turn of the millennium through John Chapman’s pioneering work on the deliberate use of broken objects in prehistoric societies of Eastern Europe (Chapman 2000). Chapman showed that fragments were not just discarded scrap but were sometimes distributed among people and deposited in the landscape in order to manifest social relationships – to create enchainments. Chapman’s ‘fragmentation theory’ was stimulated by curious patterns in deposited

material, notably ceramic fragments from pots, seals and anthropomorphic figurines in different Neolithic and Chalcolithic communities in the Balkans (Chapman 2000; Chapman & Gaydarska 2007). The theory was also formulated as a critique (Chapman 2000:4) against some of the most functionalistic thinking in processual site formation studies, often assuming straightforward relationships between an ancient activity and its ‘waste’, deposited in archaeological formations (e.g. Binford 1962; Schiffer 1972; 1987; also see critique in Richards & Thomas 1984). This should also be seen in the context of anthropological insights into categorisation of ‘dirt’ and ‘waste’ as culturally relative (e.g. Douglas 1966; Moore 1981). Chapman highlighted how fragments played a part in creating people, places and objects. He also demonstrated how fragmented material culture could create references across time and place as one way of transmitting relationships and memories into new contexts (Chapman 2000).

It has now been over 20 years since the publication of Chapman’s work on fragmentation. Over the last decades, numerous case studies, debates and conceptual developments have taken archaeological insights on fragmentation practices and the use of fragmented materials in new directions (e.g. Knüsel & Outram 2004; Jones 2005; Brück 2006, 2016, 2017; Chapman & Gaydarska 2009; Brittain & Harris 2010; Rebay-Salisbury et al. 2010; Friesman 2012; Burström 2013; Lund 2013; Hansen 2016; van der Vaart-Ver-schoof 2017; Morton et al. 2019; Valera 2019; Chittock 2020; Guernsey 2020; Knight 2020; Nieuwhof 2020; Louwen 2021; Ahola et al. 2022; Chapman 2022). Archaeological thinking has moved a long way from automatically understanding fragments as ‘scrap’ or ‘waste’, and from the historical preference for highlighting only complete or heavily reconstructed specimens in exhibitions and publications. There are now numerous perspectives, studies and examples that acknowledge how fragments can tell stories and testify to historical processes. Fragmentation, whether deliberate or not, is the basic condition for most remains that we handle in archaeology. Not only do these perspectives contain fascinating examples of human strategic and deliberate use and reuse of fragments, but they always have stories to tell where breakage or decomposition is one part of the process of ever-changing materials and assemblages.

The aim of the following collection of texts is twofold: to show the breadth of fragmentation and fragment use in prehistory and history, and to provide an up-to-date insight into the current archaeological thinking around the topic. The volume is divided into three thematic parts: fragmentation and funerary practices; fragmentation and archaeological methods; and fragmentation and the manipulation of objects. These sections are preceded by this introduction, followed by a concluding essay by John Chapman. The examples and case studies in this book concern the chronological period between the Neolithic and the modern period and are almost exclusively European in

scope. They embrace the theme through a variety of approaches and methods that highlight the relevance of the fragmentation discussion in any context.

Fragmentation – definitions of an expanding concept

Actions and reactions in relation to broken materials encompass many interesting avenues for thought. In order to understand the width of this topic, we will start by defining two of the main concepts: fragmentation and fragment. Following the definition of each concept, we provide an overview, broad but not exhaustive, of different archaeological perspectives on fragments and fragmentation in archaeology.

Fragmentation encompasses all sorts of breakage, not only fragmentation that is intentional. This volume takes a broad interest in the broken and the incomplete – deliberate or unintentional. A lexical definition of fragmentation is “the action or process of breaking something into small parts” (*Cambridge Dictionary online*). This basic and instrumental definition can be complemented with definitions of the *consequences* or *implications* of such a process. In his concluding essay to this volume, John Chapman brings in Julia Guernsey’s (2020:112) observations from studies of Preclassic Mesoamerican human figurines and statues, where “(...) breakage was both a transformative, generative and a communicative act (...)”. In particular, the first two adjectives describe the incontestable consequences of fragmentation: it is transformative (it changes, often irreversibly, the material it breaks) and generative (it creates new entities in the form of pieces). As Chapman observes (p. 291 in this volume), this view could be extended to many, if not most, of the case studies presented in this book. In addition, archaeological research provides a multitude of approaches to fragmentation (Table 1.1).

Turning now to the results of the fragmentation – the fragments. The simple, lexical definition is “a small piece or a part, especially when broken from something whole” (*Cambridge Dictionary online*). However, this phenomenon also benefits from more in-depth reflection. First, it is, for example, interesting to reflect upon the difference between a fragment and any part (or ‘multiple actant’) of an assemblage, considering that assemblage theory and new forms of symmetrical and relational ontologies (e.g. Deleuze & Guattari 2004; DeLanda 2006; Harris 2018) have pointed out that the idea of stable wholes and categories is a misconception. If everything consists of shifting, interrelated constellations on various scales, then how can we argue there is a distinctive difference between what is fragmented and what is just in a constant but ever-changing state of becoming? Bisserka Gaydarska considers this question in the present volume and advances the argument that “if an overall commonly accepted design or form is affected, then we can recognise fragmentation. Thus, there will be no cross-culturally valid concepts of wholeness, while fragments can still be identified as such” (p. 104 in this

TABLE 1.1 List of some interpretative approaches to fragmentation within archaeology and references to their appearance within this volume

| <i>Studying fragmentation as:</i> | <i>Meaning/examples:</i> |
|-----------------------------------|--|
| Intentional vs. unintentional | Random and accidental breaking, natural decay, deliberate act... (All chapters concern fragmentation, either in intentional or unintentional form). |
| Practice | Breaking (Louwen; Moilanen; Plutniak et al.; Knight; Sörman; Arnshav), disarticulating (Brück; Noterman; Fjellström; Röst), splitting (Louwen; Fjellström), parting/dividing (Norstein), crushing, chopping, cutting (Moilanen), reconfiguring (Röst; Chittock; Ojala & Sörman; Arnshav), upcycling (Ojala & Sörman; Arnshav), dismantling (Röst; Chittock; Ojala & Sörman), separating (Hull), accumulating (Jones). |
| Technology | Skilled – unskilled (Röst; Chittock; Knight), reductive – additive (Gaydarska; Chittock; Chapman), complex – multi-stage (Brück; Hull; Fjellström; Knight; Arnshav), demanding of special techniques or tools (Brück; Noterman; Chittock; Ojala & Sörman; Knight; Arnshav). |
| Sensory experience | Discrete, memorable (Knight), violent, noisy, smelly (Noterman), visual (Chittock). |
| Communicative act | Participatory, performative, in front of an audience, as a specific event, in ritual or ceremony, involving specific actors/parties (Moilanen; Gaydarska). |
| Meaningful/Strategic act | Reuse/creating pieces for secondary use (Brück; Röst; Chittock; Ojala & Sörman; Knight; Sörman; Arnshav), enforcing social relations/creating enchainments (Brück; Louwen; Moilanen; Noterman; Norstein; Chittock; Sörman; Arnshav; Chapman), reinforcing group identity and sense of belonging (Moilanen), propaganda/underlining (prestigious) historical links (Brück; Röst; Sörman; Arnshav), economic gain/commodification (Sörman; Arnshav). |
| Disruptive act | Iconoclastic, defunctionalisation, disrespectful, fragmenting in order to symbolically ‘kill’, or fragmenting in order to break alliances or kinship ties (Brück; Moilanen; Noterman). |
| Constructive act | Constructing/configuring personhood (Brück; Louwen; Hull), life stories/materialising narratives (Norstein; Hull; Röst; Chittock; Sörman; Arnshav), maintaining kinship ties (Moilanen), creating notions of identity and place (Noterman; Röst; Chapman). |
| Accumulative process | Assemblages (Gaydarska; Chittock), creating multiple objects (Jones), creating enchainments in the form of ancestral links/histories/connections (Brück; Louwen; Moilanen; Noterman; Norstein; Jones; Chittock; Sörman; Chapman). |
| Taphonomic indicator | Re-fitting studies (Gaydarska; Plutniak et al.), post-burial interventions (Noterman), secondary deposition (Brück; Louwen; Noterman). |

volume). Second, the concept of fragments versus a whole can also be used in a transferred sense for conceptualising the relation between body part versus body, and part versus ‘set’ (Chapman 2000:7, 46–47, fig. 1.4). Furthermore, archaeological research provides a multitude of overlapping perspectives when approaching fragments (Table 1.2).

These perspectives on fragmentation and fragments demonstrate the variation in how these phenomena can be studied archaeologically. As highlighted by Gaydarska (this volume), fragments can continue to live on and be strategically used, no matter whether they are created through intentional or random breakage. This stands as an important and nuanced insight in relation to the ‘fragmentation premise’ developed by Chapman and Gaydarska (2007, 2009), where much emphasis was placed on the intentional breakage in the process of strategic fragment use. As indicated by the approaches listed above, meaning can be created at various points during the handling of fragmented matter: in the event of breakage, in the process of fragmentation, in the practice surrounding the fragmented parts directly after the break, or through non-associated practices following the rediscovery of these pieces at a later point in time. This highlights an important point about temporality: fragmentation can have importance as an act or event for the fragments that were created, but fragments can also be used in practices totally unrelated to the original breakage. In this sense, our terminology around fragmentation could be further developed to capture differences in the processes of fragmentation and the itineraries of the resulting fragments.

The ontological and existential qualities of fragments

Among the perspectives listed above, we can see that some themes touch upon the more existential values of fragments, with particular relevance in relation to the archaeological pursuit. First, in an ontological and philosophical sense, the world contains residues and incomplete pieces of past realities. This affects us and stimulates reactions and thoughts. Pastness through fragments and ruins arouses curiosity about what was once there and evokes ideas of there being something more to reality than what we can perceive in the present (Olivier 2011; Burström 2013; Schnapp 2020; Demoule et al. 2021). In our time and culture, these reactions are tightly tied to and answered by the disciplines of archaeology and history. At the same time, there is also a growing awareness of how ideas of our own modern culture have presented the complete and spotless, while often discarding broken and used materials as weak or waste (e.g. Chapman & Gaydarska 2007; Brück 2017:144; Chittock 2020).

Living in this bricolage of fragments from different pasts has inspired various kinds of approaches and underlined experiences, as illustrated by the fruitful archaeological studies of ‘the past in the past’ and the role of material

TABLE 1.2 A list of some of the most common interpretative approaches (of which many overlap) to fragments that can be found within the archaeological literature

| <i>Fragments as:</i> | <i>Meaning/examples:</i> |
|--|---|
| Referencing their original whole | Memory is related to origin (transmitted, invented and mythical), with the original whole being identifiable from the fragment. Examples of ‘wholes’: a body, an object, a set of objects, a construction, a monument, a place/raw material outcrop/landscape feature. |
| Unrelated to/going beyond their original whole | Used for new purposes and no importance placed on origin or perceived origin/the original whole is unidentifiable from the fragment. |
| Reinforcer of social relations | Creating or embodying enchainments, tokens of hospitality, tokens of friendship, kinship, alliances or deals. |
| Constructive | Constructing personhood, life stories, notions of identity and place. |
| Material memories | Real, fake, manipulated, enhanced; relating to personal, institutional, communal, living or mythical memory. |
| Present vs. absent | Archaeologically present (orphan) versus absent (missing) fragments, meaning that fragments from the same whole had different itineraries after the break. |
| Dispersed/distributed/circulated | Fragments found in multiple locations were identified as belonging together, meaning that fragments from the same whole had different itineraries and uses after the break. Fragments circulating as currency. |
| Recycled/reused material | Raw materials or modules to be integrated into new forms. |
| Variably fragmentable | Composite objects that can be easily parted or disassembled versus materials breaking into more random pieces; fragile materials versus massive materials breaking with more difficulty; the partibility of bodies subjected to different post-mortal treatments (e.g. cremation) or in different stages of decomposition. |
| As pieces of different types of wholes | As fragments of a material mass or natural (such as flakes of a rock), as pieces of a broken object (such as half a sword, a foot of glass or a shard of a pot), as parts of a composite object, as elements of a large construction, as pieces of a body, as pieces from a scattered ‘set’ of associated objects or features or as pieces of material extracted from the same landscape feature. |
| ‘Multiple objects’ | In constant forms of becoming, stages in a process (see Jones this volume). |

culture in memory processes (e.g. Bradley & Williams 1998; Bradley 2002; Jones 2007, this volume; Chittock this volume) (see also Lowenthal 1989). Similarly, fragments as material memories are related to questions about the archaeological project itself. Archaeology is just yet another way to handle fragmented materials from the past in the present. In modern culture and scientific discourse, historical disciplines are approaching fragments of the past by ordering, classifying and trying to explain past societies, and by protecting and exhibiting such remains through politically sanctioned heritage discourses. This focus and the tendency to think of time as linear and separated episodes (e.g. Lucas 2005; Olivier 2014) are probably one of the reasons why other stories possible to tell through fragments, those of secondary uses, natural decay, dispersal or later interventions, etc., are less exploited than the narratives relating to the original wholes.

This brings us to the second point of *how* archaeology and the heritage sector handle fragments of past objects and bodies, which in themselves have stories to tell. This meta-perspective – turning questions of fragmentation towards our practice as archaeologists – can reveal interesting phenomena and processes. Fragments that were broken or divided among contestants in colonial heritage ventures are now distributed among museum institutions in several modern nations (e.g. Shefton 1985). In a similar way, entire monuments, assemblages or pieces of objects were divided and shared between geopolitical stakeholders (e.g. Hicks 2020). Displayed in the main collections during the 19th and 20th centuries, they were both trophies of glory and tokens of scientific advances. Moreover, they were hints of geopolitical dominance and a way to inscribe one's own nation's history into the framework of the Great Civilisations (Bourguet et al. 1998; Díaz-Andreu 2007; Gran-Aymerich 2007), and hence a tool for the ideology of imperialism (Hicks 2020). This dispersed heritage is in itself an example of a more recent practice of fragmentation (see also Arnshav this volume). Most objects have remained separated, but sometimes they have been joined in new exhibitions or after repatriation to states in the original find-regions (e.g. Shefton 1985; Rondot 2022:144). The potential of fragmented materials to tell the meta-story of archaeology and colonialism is an important issue to develop.

Another example of fragmentation within the heritage sector is the separation between skeletal remains and bone artefacts in museum storage. Generally, pieces of human and animal bodies are stored separately and separated from other items in the same context depending on whether they have been reworked into objects or not (Karlsson 2016:9). Animal and human remains from the same set of finds are usually studied independently of each other, in every sense of the word. Expected to require different professional skills, they are analysed in different rooms, even sometimes in different buildings; they are examined at different times of the post-excavation process, presented in a

different way in the final report, and discussed separately in conferences. This fragmentation in the study of bone assemblages is barely questioned today, nor are issues concerning large fragmented animal bone material (however, see Hull this volume). Even though separated categories of finds might be reassembled again before exhibition, the fact that we keep supporting these fragmentation practices when handling archaeological source material reveals our own systems of thought.

Broken bodies – funerary practices, personhood and secondary use of human body parts

Human bodies have a certain degree of individual variety and uniqueness when it comes to details. However, the overall form of the human body can be universally recognised.¹ Also, human body parts – primarily in the form of disarticulated dead bodies – have been fragmented, manipulated and circulated in a variety of forms throughout prehistory, history and the present. Even if the industrialised nations within monotheistic religious traditions mostly live in the paradigm of the sacred and unpartable body, there are different traditions in cultures with other outlooks as well as new trends in cremation practices in the Western world where bodies are more subjected to manipulation after death than is often believed or acknowledged (e.g. Williams 2011; Anthony 2016).

Jennifer Kerner's research on post-mortem body manipulations has shown that the partibility of the deceased is in fact a longstanding story (Kerner 2018). Fragmentation is an integral part of the funeral ritual in some modern communities, with dead individuals positioned in a certain way in the tombs to facilitate the recovery of body parts, while the graves themselves are adapted for post-mortem handling (e.g. Dumas-Champion 1995). Archaeological contexts often provide dry skeletal remains, free of organic material such as soft tissues and organs, limiting the discussion on the fragmentation of the organic part of human bodies. Yet, the separation of the body from its entrails is attested in written and ethnographic sources, not necessarily in connection with the simple desire to annihilate the putrefaction of the body (Kerner 2018:178–188). For the 12th–14th centuries, the mortuary traditions have even been referred to as a 'culture of fragmentation' (Westerhof 2004).

A further example is the forceful repressive function of the 'incomplete' body in life (e.g. colonial forces cutting off hands in the Belgian Congo; hand-cutting as a punishment for theft) and to live on with this visible incompleteness in a culture where the missing of that particular piece stands so clearly for repression, guilt and oppression. On the other end of the spectrum, these hands, like other body parts in collections (anatomical, ethnographic, medical, curiosity cabinets, etc.) were displayed in Western contexts to underline

domination, racial world order and sometimes to boost personal or scientific pride. In antiquity, cutting off hands was not only used as a punitive measure but also used as a visual marker for grave robbers (Noterman 2016:192–193). In his thought-provoking publication on the notion of *corpse*, Louis-Vincent Thomas points out all the ambiguity of body mutilations, involve contempt and disrespect but may also be ritual in many societies. In biblical narratives, there are several examples of this; after being butchered and pulled apart by dogs, Jezebel is denied her individuality in death (Jégou 2015). There are also iconic examples in European history, such as the corpse of the pope Formosus, which was exhumed, brought to trial and condemned and had several fingers amputated in a symbolic gesture to deny him his ritual rights (Thomas 1980:109–110).

Examples of divided, manipulated bodies and the circulation of body parts are numerous in European modern and pre-modern history. Reasons varied and included, for example, the protection that a piece of a body could offer by wearing a dead man's bone as an amulet to fight fever or bring luck (Jacob 1859:96–97). Other examples involved cures through the ingestion of specific parts, as in 17th and 18th century *pharmacopoeia* manuals that recommended using fragments of the skull of a man who died from a violent death (execution) to cure epilepsy (Lémery 1697). Going further back in time, the examples multiply, spanning from the deliberate fracturing of body parts into relics as remnants of specific cults within the Catholic church (e.g. Kjellström 2017:171) to arrangements of dismembered, incomplete remains in collective assemblages of megalithic tombs (e.g. Tornberg 2022) and the intricate handling of cremated and curated human remains in Bronze Age mortuary traditions (e.g. Brück 2006, 2017, this volume; Ojala & Röst 2021; Louwen this volume), to mention only some.

Breaking bodies and using the parts might be ways to link ancestors with specific places, persons or phenomena in the present. They can serve to activate, manipulate, or eradicate memory; to relate and make claims on ancestry, history or terrain; to be extracted for reuse – magically, religiously, medically, scientifically or for propagandistic purposes, for example (see Brück this volume; Moilanen this volume; Noterman this volume; Hull this volume). Parts of bodies can also serve to link the dead with the living, keeping a connection between two worlds or recreating a connection that death had momentarily broken.

Fragments – their properties and how to study them

The properties of various materials and bodies have a major impact on how they lend themselves to fragmentation and how they behave as fragments (Chapman 2000:23, 71; Gaydarska this volume). Significant visual qualities that are sometimes harnessed in fragmentation and fragment use are,

for example, peculiar/exotic forms and decorations (Chapman 2000:65) and age/patina (Chittock 2020). Properties such as durability, density, shape, proneness to decay, hardness, etc. will impact the likelihood of breakage of things and bodies, the means needed to fragment them, and the characteristics of the fragments produced. The importance of these qualities is a growing insight in archaeological studies of fragmentation and is also visible in the studies presented in this volume. This is presumably partly influenced by new strands of thought, such as new materialism and posthumanism, which urge us to reflect on material properties, and co-dependences between material and form, and the effects and affects of things.

The range of material properties and conditions given by the material form is one of the points that emerge from various examples and materials discussed in this volume. The breakability of objects varies between, for example, ceramic pots (Gaydarska this volume; Plutniak et al. this volume), animal bodies (Fjellström this volume; Hull this volume), massive bronzes (Knight this volume; Sörman this volume) or composite metalwork objects (Chittock this volume; Ojala & Sörman this volume). A cremated human body (Brück this volume; Louwen this volume) does not present the same qualities for fragmentation as a decomposing human or skeletal human body in an inhumation grave (Brück this volume; Moilanen this volume; Noterman this volume) and differs yet again from large architectonic elements salvaged from old houses or shipwrecks (Röst this volume; Arnshav this volume). All these materials indicate different strategies and technologies for fragmentation in the past.

Fragments of different materials also require different types of methodological considerations from archaeologists studying them in the present. Typically, easily breakable and frequent (mass)materials such as faunal skeletal remains, ceramics and lithic debris are more often subjected to re-fitting studies, stratigraphic analyses and quantitative reconstruction efforts (e.g. Gaydarska this volume; Plutniak et al. this volume; Hull this volume; Fjellström this volume). Here, the possibility to scientifically trace common origins (through similarities in microstructure, chemical composition, isotopic signatures, aDNA, etc.) also creates varying conditions for various materials. However, it should be noted that provenance from the same original whole might have been perceived differently in the past, as suggested by examples where 'fake' fragments are, knowingly or unknowingly, given the same value as 'authentic' pieces (e.g. Hunter & Biekert 2014; Thunø 2018:163; see also Röst this volume).

Material properties also have implications for the technology of breaking, and the scale and skill involved (Gaydarska this volume). Ceramics can be broken without special skill, while massive metalwork is harder to break and breaks differently depending on the technique applied (Knight 2019, 2020, this volume), whereas composite metalwork designs might instead enhance

the breakability and inspire fragmentation (Chittock 2021, this volume; Ojala & Sörman this volume). Bodies that have been burned (cremated), skeletonised, processed in some way or have reached an advanced stage of decay are more easily fragmented (reconfigured) than the newly deceased (Brück this volume; Noterman this volume). This has consequences for thinking about skill, the fragmentation as an event, and the sensual experiences surrounding the break, but also for the end result (Knight 2022; Gaydarska this volume). How many fragments are created, what are the properties of these parts, and are the qualities and characteristics of the parts the same or different?

In previous works, objects such as figurines have been emphasised as possible to break into pieces of very different shapes and visual properties, opening for complex forms of association (e.g. Chapman 2000; Chapman & Gaydarska 2007:69–70). The character of fragments influences their potential use and sets certain limits for interaction with them. For example, different treatments of Neolithic figurine parts in material from the Balkans have been linked to configurations of gender identities (Chapman 2000:68–79; Chapman & Gaydarska 2007: Chapter 3). Other examples are the special handling of hands and heads in the Late Bronze Age cremation graves in central Sweden (Röst 2016), which is a pattern not yet fully understood, and the special attention to heads in some reopening practices in early medieval row-grave fields (Noterman this volume). Furthermore, in several cultural contexts, fragmentation of objects with a particular symbolism, such as stamps, seals or friendship tokens, has been identified as meaningful in confirming alliances or joint agreements (e.g. Chapman 2000; rituals involving early medieval belts, see Noterman this volume).

Here, we also note the importance of the shape of the original whole, as certain wholes, such as more uniform and massive objects, might be less partible and therefore more remarkable when actually fragmented. Rings are often involved in enchainment practices, with and without the involvement of fragmentation, and examples are found cross-culturally (e.g. Swift 2012; Ahola et al. 2022; Chapman this volume; Sörman this volume). One might ask if certain shapes, such as rings, would be more readily subjected to these kinds of practices. Would the properties of round, solid or symmetrical shapes evoke other notions when forming wholes vis-a-vis parts, and is this quality and potential symbolism harnessed? Here we might also think of human bodies and non-human animal bodies, which might be seen as presenting quite distinct and historically continuous ‘wholes’. Another strong potential for symbolism can be found in breaking the coupling of a pair, consisting of two symmetrical pieces; this seems to have occurred in some cases of Scandinavian Viking oval brooch sets (Norstein this volume) and discs on some Nordic Late Bronze Age ‘spectacle fibulas’ (Ojala & Sörman this volume). The properties of wholes and parts and the incentives for choosing

to use certain wholes for fragmentation practices certainly differ in cultural contexts and situations and are thereby key to archaeological analysis.

Affordances of patina and visual signs of age also play a major role in many of the examples where fragments come into secondary use. This underlines the often intimate and intricate link between fragmented matter and memories of the past. Examples from this volume include decayed objects from sets of grave goods in a reopened grave, which might have special significance for their obvious origins (Noterman this volume); the fragments of old architectural parts strategically reused at the Årsta mansion, partly appreciated for their ‘old’ style (Röst this volume); and Late Bronze Age metal objects accumulated in some of the so-called ‘scrap hoards’, which were recognisable and probably tied to ancestral memories (Brück this volume; Sörman this volume). Further, oak salvaged from sunken battleships became souvenirs, often in masculine spheres evoking naval life and military pride, and were exploited for the very reason of the colour and patina of the ‘black oak’, timber that had once sunk to the seafloor and was later recovered (Arnshav this volume). Age and patina are significant sometimes, but might not always be sought after or exploited in fragmentation.

Another factor is ‘otherness’ or ‘specificness’ involved in the itinerary of the object or the form, as for example in fragments of obvious non-local objects and imports, or special patterns or shapes that are perhaps sometimes more potent for use in strategic links through fragmentation (Chapman 2000: 64–65). One example here is the sets of Viking oval brooches used in Scandinavian female costume, where single parts or fragments could sometimes be used in West Atlantic colonies to evoke memories of the journey and origins of women from previous generations (Norstein this volume). The special character of valued fragments can also be enhanced by adding to or configuring their appearance, such as by assembling them into composite objects that tell visual stories (Chittock 2020, this volume). Other examples involve placing them on a special base or pedestal, such as souvenirs of the Berlin Wall mounted on small plaques and provided with a label, or setting them in special fittings, capsules or feretories, such as relics in the Catholic cult. Such additions underline the exclusiveness and the special trajectories of the fragments, and their ‘specialness’ is enhanced by reconfiguring the object itself.

A last point considered here is a reflection on what is lost and what is gained after fragmentation. What aspects and qualities of the original whole are still perceivable in the piece (its colours, its identity, its shape, its function or its origin)? A broken pot can no longer serve as a container but can be carried and stored in small places (Brück 2016, 2017; Louwen this volume; Gaydarska this volume). A fragment with a handle, a hole or a loop could be suspended from a hook or on a string. A shipwreck can no longer sail but can fit in a home as a piece of furniture (Arnshav this volume). A bronze vessel

fragment can no longer be used for banquets, but can be shaped into a new, smaller object (Thrane 2013; Ojala & Sörman this volume). A fragmented body can no longer act as a living individual in relation to others but can be intermingled and physically mixed with the body of another individual (Brück this volume; Louwen this volume). Many important observations can be made by posing the question, what can fragments *do*? (c.f. Chittock 2021). Their capacity to be multiplied, portable, combinable, etc. demonstrates the qualities and possibilities that fragmentation brings about and that we must try to evaluate. Changing from whole to fragment means losing some characteristics but gaining others. As emphasised throughout this volume, the result of fragmentation and breaking is transformation rather than loss.

Fragments and their relations – assemblages, new materials and post-human perspectives

Climate change and the environmental changes that we are facing today have opened up archaeology to a new field studying the effects of the Anthropocene and its materiality. With finds made through glacial archaeological surveys (Callanan 2012, 2016), new categories of fragmented objects and animal remains are emerging from the melting ice and snow, formed in special conditions. The findings of whole organic artefacts, ecofacts and fauna historic finds provide new understanding of fragmented objects, whether they were unintentionally or deliberately broken, intentionally deposited or accidentally misplaced. Modern fragments also give us an unfortunate insight into the consequences of worldwide consumerism, with fragmented plastic objects and (macro- and micro-) plastic fragments floating ashore, also far away from areas where these plastics were used, such as the Arctic (Pétursdóttir 2019). The archaeology of plastics is a currently developing field that studies how plastics can be used as a stratigraphic indicator of the Anthropocene (Zalasiewicz et al. 2016). According to Jan Zalasiewicz et al. (2016:8), plastics seem to be gaining terrain in the archaeological field, and plastic fragments are increasingly used as stratigraphic markers in recently disturbed or modern deposits. Recently, analyses of fragmented plastic debris in terrestrial deposits have illuminated the contemporary use and pollution of heritage sites (Mytum & Meek 2021:208–209).

There is currently a growing body of theory that calls attention to the intermingled character of all agents (human and non-human animals, ‘nature’, things) in the creation of reality. These developments in science and philosophy can partly be understood as responses to and insights following the accelerating climate crisis on Earth. More than before, the changing climate highlights the embedded human position in ecological systems, inter-species dependencies and the impact of natural processes and material resistance on

human lives. Among these perspectives, we find actor-network theory, relational, flat and object-oriented ontologies, symmetrical perspectives, posthumanism, new materialism or the ‘material turn’. In one way or another, these are approaches that appeal to a higher sensitivity to the symmetry between humans and other kinds of physical entities in our efforts to describe and understand the world (e.g. Latour 1987, 2005; Deleuze & Guattari 2003; DeLanda 2006, 2016; Ingold 2008; Haraway 2015, 2016; Harman 2018). These perspectives have also taken inspiration from indigenous worldviews and ontologies, an intellectual inspiration that has rarely been acknowledged in the Western academic community (Marín-Aguilera 2021). These strands of thought have been fundamental in deconstructing traditional dichotomies, which have been argued to be misleading, such as human versus thing, human versus machine, human versus animal and culture versus nature. Furthermore, posthumanism and animal studies have begun to demonstrate the fallacies and inconsistencies in anthropocentric explanations for current and past processes (e.g. Weil 2012; Braidotti 2013; Fredengren 2015; Haraway 2016). How do fragmentation studies relate to these recent theoretical currents of relational archaeology?

Post-human perspectives criticise the tendency to place human agency and experience at the centre of attention, explanation and description (e.g. Fredengren 2015:125–126). In a straightforward sense, this might call into question some of the terminology and metaphors used when speaking of fragmentation in archaeology. Expressions such as ‘orphan’ shards to denote single fragments where the rest of the object is missing are one of them. Others are ‘parent’ and ‘child’ relationships for the whole and the part ‘descending’ from that whole. Although these might refer to kinship relations among animals or ‘beings’ in general, we have to raise the question about what associations these terms bring with them (intimacy, strong emotional bond, similarity). Could the fact that we are drawing from the human experience, instead of trying to describe what we see with more adapted terms, limit our view? On the other hand, in advocating more inclusive views on ‘kinship’, there are also scholars who argue for the necessity of regarding relations to landscapes, matter, objects and non-human animals as extended kinship (Johnston 2020; Brück 2021). Another relevant reflection pointed out by Emily H. Hull in her contribution to this book is the anonymising terminology and methods used to process fragmented skeletal remains from non-human animals.

A fundamental question when considering fragmentation in reference to symmetrical or relational perspectives was already touched upon in an earlier section (see *Fragmentation – definitions of an expanding concept*). How can we consider parts and wholes while also relating to reality in terms of assemblages? Seeing the world through assemblage theory stipulates that everything, all entities and even their components, are clusters forming different assemblages, more or less stable or elusive through time (e.g. DeLanda 2006,

2016; Harris 2017). Assemblages are thus, as Helen Chittock has aptly formulated by drawing on Manuel DeLanda (2006, 2016), Yannis Hamilakis and Andrew Jones (2017), “heterogeneous collections of co-functioning elements that are related but independent” (Chittock 2021:68). Moreover, as expressed by Oliver J.T. Harris (2018:89), this is “a way of thinking about the world that turns our gaze from the appearance of final, fixed forms to the multiplicity of elements that come together and sustain all the different things in the world”. As Bisserka Gaydarska (p. 104 in this volume) notes, assemblage theory thereby tells us that everything is always part of a bigger whole. Nevertheless, following Gaydarska, considering that there are designs or forms that are accepted and recognised (by humans, by animals and sometimes by other biological or physical forces in the world), these can be identified as incomplete.

In a recent analysis of the development of assemblage theory in archaeology, Yannis Hamilakis and Andrew M. Jones identify Chapman’s fragmentation theory as one of the first initiatives to have realised the significance of assemblages (Hamilakis & Jones 2017:81; see also Jones this volume; Chapman this volume). They highlight the fact that Chapman’s work not only demonstrated practices of fragmentation but also was concerned with how materials are used for creating relations, for example by discussing fragmentation and accumulation as two ways to link people through enchainment relations. Hamilakis and Jones point out the relational character of assemblages or accumulations and how these links between people, places and objects co-create relations and, essentially, reality. Relational perspectives on symmetrical relations and interdependence among all scales of assemblages are therefore in agreement with ideas concerning the ways fragments (similarly to other materials) facilitate enchainments between people, places and objects, as proposed by Chapman (2000) and developed by Chapman and Gaydarska (2007).

In his concluding essay to this volume, John Chapman points out the early contribution of fragmentation theory in shifting our thinking towards more relational perspectives on humans and their interactions/co-dependency with places and non-human animals. While still arguing for the validity of human-centred questions at the heart of the archaeological pursuit, Chapman clarifies and develops his reasoning concerning links between insights formulated in fragmentation theory and the relational perspectives that were later adopted in archaeology. Notably, he emphasises the various strategies by which people link with places and communities and how they relate to senses of belonging (where fragmentation is only one of the possible ways to do so). He shows how these insights and perspectives can be seen as an early expression of this wider orientation towards understanding not only human actors on their ‘scene’ with animal and material ‘prop’, but engaging with the network of actors and agents linking us all together.

Like fragmentation theory, assemblage theory also challenges the concept of ‘waste’ when nothing ever comes to a final form; objects, parts and atoms are part of eternal, shifting itineraries rather than linear and ending lives (Chapman & Gaydarska 2007; Harris 2018; for discussion on the problems with the concept of ‘object biography’, see, for instance, Joyce & Gillespie 2015; Jones this volume). Even if something was (subjectively/culturally) considered waste at some point, its potential for reuse and continued presence in the world as fragments makes it continue to participate in new assemblages – and perhaps eventually, in thousands of years, as microscopic fragmented grains that have joined new geological formations. This, more than before, opens up the perspective of the transformation of fragments into endless related and unrelated chains of assemblages (see Jones this volume). We believe that perceiving reality along these ontological lines does not and should not exclude an analysis of power inequalities,² injustices or potentially harmful consequences for nature or living beings resulting from the assemblages and configurations we identify. It might be true that nothing can really, ontologically or conceptually, be considered a finite ‘waste’ or an unchanging remnant of the ‘original’. Nevertheless, as scholars and citizens, we must still strive to contextualise, explain and (re)act on our observations of phenomena such as pollution or the abuse of fragments of ancient times in historical revisionism or propaganda.

Final reflections

A central idea within studies of fragmentation is that fragments, rather than being waste or useless scrap, have special potential *precisely* because of their broken and transformed format. Through observing fragmented parts in the past and present, we reach the complex, interrelated, ever-changing assemblages that constitute our reality. In view of the stimulating observations of fragmented materials in archaeology, we see that human responses to the incomplete have often been responses of creativity, opening up new associations and allowing us to perceive other realities beyond our own. This provides insight into how fragments can be used for new purposes and processes. By asking what fragments *do*, the potential of broken material becomes more apparent and acknowledges that breaking is fundamental transformation rather than destruction or loss.

Following the itineraries of fragments included as parts of various assemblages shifting over time and scale – as part of objects, as part of bodies, as part of enchainments, as part of stratigraphic layers, as part of historical narratives, as part of museum collections, as part of clay deposits. This highlights the constant cycle of changes – the constant forming and reforming of assemblages of which our physical bodies and surroundings are part. Seeing fragmentation in this perspective also raises the question of what

fragments and assemblages we are co-creating on this planet, in the form of non-degradable chemical compounds and pieces of durable materials such as steel and plastic (e.g. Zalasiewicz et al. 2016; Pétursdóttir 2019; Kuijpers 2020). At a more fundamental level, fragmentation challenges assumptions about human independence in our era and even the fetishisation of this, and it forms part of theories that acknowledge our interdependence with ecosystems and other beings (Chapman this volume). Archaeological approaches to fragmented materials place our own practices of fragmentation and reuse in a deeper historical perspective.

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Notes

- 1 However, this does not mean that social personhood has always been perceived as unified; see Chapman (2000:27): “There is a common sense assumption, widespread in archaeology and anthropology, that the physically discrete nature of the body is evidence for the unity of the person. But a central paradox of the human life cycle is the contrast between the physical identity and social changes which occur and the ‘fact’ that they occur to/in the “same” person”. Here, we will not go further into the complex question of the culturally variable relationship between perception of body and the perception of personhood; but it is a topic that has been linked to the issue of fragmentation and enchainment since the first work of J. Chapman (2000; see also further discussion in Fowler 2004; Jones 2005; Brück 2006, 2017; Chapman & Gaydarska 2006; Brittain & Harris 2010).
- 2 For critique on the lack of power analysis in works of relational or symmetrical ontologies see, for instance, Harris & Cippolla 2017:148 with references.

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