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Research Article

Chaîne opératoire in a relational consideration of epistemology, body knowledge, and embodied cognition

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Abstract

Understanding historical bodies in ancient Egypt requires us to be aware of how we might misinterpret our sources based on how we, embedded in our present-day society, think about the body. By considering the relations between epistemology, body knowledge, and embodied cognition we can trace our own preconceptions when we seek to understand the ancient understanding of the body. Epistemology, the way we gain knowledge about the world and consider some types of knowledge valid, while others are classified as beliefs or opinions, influences how we assess knowing. Body knowledge is the capability of making complicated and deeply rooted movements, as mastered by, among others, makers, dancers, musicians, caretakers, cooks, and athletes. In present day society, body knowledge is often undervalued, or not even considered 'knowledge'. The root of valuing the mind over the body may be the split between body and mind (generally known as 'Cartesian dualism'). The third element in this relationship, embodied cognition, foregrounds the interaction with the environment and the importance of the senses in how we know and understand the world. The full-body sensation of touch, knowing which movements to make, how much strength to use, how to shift weight and point of gravity, is essential to all our movements and learning to be in the world. Studying the ancient body from archaeological remains requires an approach that allows us to reconstruct the interactions of material, environment and bodies. In the discussion, I explore the value and limitations of a *chaîne opératoire* approach to consider the ancient body from an embodied epistemology by emphasizing the person who did, rather than the process or the result of doing.

Keywords: ontology, epistemology, tactile, body knowledge, *chaîne opératoire*

منهجية السلسلة التشغيلية في سياق نظرية المعرفة، معرفة الجسد، والإدراك المتجسد

الملخص

لفهم الأجساد التاريخية في مصر القديمة، من الضروري إدراك كيفية تأثير تصوراتنا المعاصرة للجسد على تفسيرنا للمصادر القديمة. نظرتنا المتأثرة بمجتمع اليوم قد تؤدي إلى إساءة تفسير الفهم القديم للجسد. من خلال دراسة العلاقة بين علم المعرفة، معرفة الجسد، والإدراك المتجسد، يمكننا تتبع تصوراتنا المسبقة والكشف عنها أثناء محاولتنا لفهم منظور المصريين القدماء. تشير نظرية المعرفة إلى الطريقة التي نكتسب بها فهمًا للعالم، وكيفية تصنيف بعض أنواع المعرفة على أنها موثوقة، بينما تُعتبر أخرى مجرد آراء أو معتقدات. هذه العملية تؤثر بشكل كبير على كيفية تقييمنا لما يُعد معرفة حقيقية. أما معرفة الجسد، فهي القدرة على أداء حركات معقدة ومتأصلة بعمق، كما هو الحال لدى الحرفيين، والراقصين، والموسيقيين، ومقدمي الرعاية، والطهاة، والرياضيين. ورغم أهميتها، إلا أن هذه المعرفة غالبًا ما تُهمل في المجتمع الحديث، أو لا تُعتبر "معرفة" في الأساس. ربما يرتبط هذا التهميش بالجذور الفكرية لتفضيل العقل على الجسد، كما يتجلى في الثنائية الديكارتية بين الجسد والعقل. الإدراك المجسد، وهو العنصر الثالث في هذه العلاقة، يُبرز أهمية التفاعل مع البيئة ودور الحواس في اكتسابنا للمعرفة وفهمنا للعالم. الإحساس الجسدي الكامل—بما في ذلك الإحساس باللمس، ومعرفة الحركات اللازمة، وتحديد مقدار القوة المطلوبة، وكيفية تعديل الوزن ونقاط التوازن—هو أساس كل حركاتنا وتعلمنا كيفية التفاعل مع العالم المحيط. دراسة الأجساد القديمة من خلال البقايا الأثرية تتطلب منهجية تعيد

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بناء التفاعلات بين المواد، والبيئة، والأجساد. لذلك، يناقش هذا البحث أهمية استخدام منهجية "السلسلة التشغيلية" في دراسة الأجساد من منظور معرفي مجسد، مع التأكيد على دور الشخص الفاعل بدلًا من التركيز فقط على العملية أو النتيجة النهائية.

الكلمات الدالة علم الوجود، نظرية المعرفة، ملموس، معرفة الجسم، منهجية "السلسلة التشغيلي"

1 Introduction to the problem: what the body knows

The purpose of the 2022 workshop *Egyptology in dialogue: Historical bodies in relations of comparisons and negotiations* in Atlanta was to investigate the perception and conceptualization of the body and bodily difference in ancient Egypt and how, mostly anthropological, theories of relations, comparisons, and negotiations could be useful in the Egyptological understanding of the body. Theory has not been a mainstay of Egyptological interpretation, which traditionally heavily depends on texts and imagery (HOWLEY & NYORD, 2018). The wealth of information provided by well-preserved material remains, including texts ranging from formal inscriptions to daily notes, have long been considered to 'speak for themselves'. Speaking, language, the meaning of words is fundamental to our understanding of the world and how we are part of it, but always requires translation. Language is central to ontology as well as to epistemology: how we define and can know the relations between environment, materiality, human and other animal bodies. Letting the ancient texts 'speak for themselves' means understanding them from a very specific way of thinking about the world, either today's or that of the many pasts that we study. There are clear examples on how unrecognized preconceptions in scholarship are the basis of tacit theories that have far reaching influence on the Egyptological interpretation of its subject (NYORD, 2018). Sometimes these are not all that silent, as in the explicit naming of domestic spaces in Amarna as 'master's bedroom', 'servants' quarters', and 'porter's lodge' (FRANKFORT & PENDLEBURY, 1933). Not acknowledging or explicating one's preconceptions is in fact a theoretical approach: 'our' reality is 'the' reality. Such an approach uses theory, albeit tacitly, unrecognised and therefore difficult to account for and to critique.

Understanding ancient Egyptian culture requires, then, researching our own ontology and epistemology: how does our worldview influence what we consider ways of knowing and valid knowledge? Studying the body in ancient Egypt compels us to consider our own attitudes towards the body, and to trace how the body was deemed to be in different regions and social contexts over time. In Christian and Islamic thought it was clear that both humans and animals have bodies, but humans were considered distinct from and superior to other animals, based on the difference between creatures with and without a soul (BUSHNELL, 2021; HARRISON, 1992; TLILI, 2014). It allows human superiority over the natural world, which is understood to be created for human use. This is just one of the consequences of what is usually called the Cartesian split, although the distinction between a metaphysical and a physical realm predates Descartes. In his vision it is the mind, sentience, spirit or soul that separates humans from animals. The mind, despite its different nature, is intimately connected to all of the human body, rather than any particular part of it. Descartes' interest in anatomy led him to consider the function of various body parts, including the brain, and he tentatively suggested that the pineal gland, a small organ of unclear function, might be the point of connection between body and soul (LOKHORST, 2021).

The notion of a body and soul as separate entities obviously predates Descartes, and was put forward by, among others, early Christian authors, as can be seen in the writings of Augustine, Clement of Alexandria, and the later work of Thomas Aquinas, based on his knowledge of Aristotelian texts (TKACZ, 2012). Their understanding of the relationship of body and soul during life as well as after death resulted in disdain for the body, evident in the Christian emphasis on ascetism and martyrdom. The bodily suffering of martyrs as imitation of the suffering of Christ glorified the immaterial soul as merely contained in a physical body (TILLEY, 1991). With the establishment of Christianity as an official religion, other aspects of bodily weakness, such as the physical decay of the body in old age, let alone after death, created theological conundrums

to ensure the community of an—often believed to be imminent—healthy and youthful bodily resurrection. The body-soul or body-mind split remains deeply engrained in Western society, even if increasingly philosophers, anthropologists, ecologists and psychologists have pointed out the problematic consequences of this dualism, and emphasize the importance of understanding the human experience as embodied (RYLE, 1949; BATESON, 1979; INGOLD, 1988; INGOLD, 2000; LAKOFF & JOHNSON, 1999; GIBBS JR., 2005; GALLAGHER, 2006; PFEIFER & BONGARD, 2007; VARELA et al., 2017).

The philosophy of mind has effectively criticized Cartesian dualism (RYLE, 1949; BATESON, 1979; INGOLD, 1988) but the understanding of mind and body as separate entities has persisted, for instance in cognitive science. Computational cognitive science considers external stimuli as input that is being processed and results in an output. Embodied cognition on the other hand 'variously rejects or reformulates the computational commitments of cognitive science, emphasizing the significance of an agent's physical body in cognitive abilities' (SHAPIRO & SPAULDING, 2021: 1).

Embodied cognition maintains that we humans are in constant interaction with our environment, even when at times we are day-dreaming, thinking, or analyzing situations or memories. Memory, as argued by GLENBERG (1997: 1) is not for memorizing, but for 'the encoding of patterns of possible physical interaction with a three-dimensional world'. Interacting in that world is done through speech and gestures, but embodied cognition proponents state that gestures are not just meant for communication, but are an aid in recalling memories or helping the thought process (M. WILSON, 2002: 629). Bodily perception constitutes a relation to the world around us and a seamless combination of the visual, aural, spatial, tactile, olfactory, and gustative, as well as the emotive elements related to these. Examples of the latter are memories of well-being, fear, or unrest. Movement is a foundation of human cognition and arguably its only 'output' (BARNARD, 2022: 321–325; GALLAGHER, 2006: 9; PFEIFER & BONGARD, 2007: 25; SHEETS-JOHNSTONE, 2011: 117–118; F. R. WILSON, 1999: 10; WOLPERT et al., 2001). Margaret Wilson argues that even mental concepts that are highly abstract can be considered to stem from sensory and motoric knowledge (M. WILSON, 2002: 634). Her emphasis on the origin of mental properties leads her to suppositions about the development of human kind and is focused on how human intelligence arrived where it is. For our purpose, this is not the most important contribution of embodied cognition, but rather its consequences for epistemology is.

Embodied cognition maintains that knowing and learning is only possible through integrated bodily, sensorial experience. There are, however, many definitions and variations in understanding what this entails and what the consequences are of embodiment (MALAFOURIS, 2016). My work on learning and maintaining knowledge of and through bodily activity in the past and the present has led me to consider how epistemology suffused in our Western academic approach is biased, especially towards what I have called elsewhere *body knowledge* (WENDRICH, 2012). What the Western world considers acceptable ways of knowing is shaped by a very specific value proposition, a tacit ranking of different kinds of knowledge. Western epistemology considers 'theoretical knowledge' as intrinsically of higher value than 'practical knowledge', an attitude that has led to an emphasis on thinking at the expense of doing. This also underlies current societal problems, such as economic, social, and racial inequality in which manual skills are rated low and blue-collar workers are paid a fraction of the income of CEOs in the same industry (BIVENS & KANDRA, 2022). The classification of some types of work as 'mindless' seemingly considers the body as a separate entity, a machine or automaton. Expressions such as 'working like a dog, pig, or donkey' likens manual labour to the efforts of similarly 'mindless' animals.

It is from this epistemology that we tend to evaluate ancient cultures as well. The result of such a hierarchy of knowledge is that Egyptology makes distinctions that do not exist in the ancient sources. For instance, in the Egyptological interpretation of ancient Egyptian texts that deal with sickness and health, some ancient approaches are considered science, or medicine, while others are classified as 'magic' (ERMAN, 1901). Similarly, 'religious texts' are divided into 'theology', 'ritual', and 'magic' (BAUMANN & KOCKELMANN, 2017). The papyri describe, however, integrated body techniques, which combine speaking ('reciting a spell') with other actions (e.g. tying a knot). This choice of translation renders bodily activities related to making, worshipping

and healing as unsophisticated or 'primitive', i.e. not (yet) reaching our standards. The distinction between ancient Egyptian medicine, magic and religion are, perhaps subconsciously, the result of our assessment of what is a rational approach, an effort of the mind, rather than the body.

In the anthropological literature the terms epistemology and ontology are not always sharply distinguished and sometimes used almost interchangeably. In this chapter I use ontology as defined by HARRIS and ROBB (2012: 668), as a fundamental set of understandings about how the world is. Epistemology is the way in which we gain knowledge about the world, and defines what is considered valid knowledge, in contrast to what is, for instance, a belief, an opinion, or superstition. Epistemology and ontology are closely linked, especially when discussing different worldviews, something that is the bailiwick of anthropologists and should be that of archaeologists as well (CARRITHERS et al., 2010; CRELLIN et al., 2021). Especially if we try to interpret ontologies that differ from our own, we might be severely hampered in understanding these because we classify spiritual knowledge as 'merely beliefs' or 'superstitions'. Such disconnects in fundamental understanding not only are at play across centuries, countries or continents, but also between groups within the same geographical region, as illustrated by the sharply increased polarisation in the United States, and elsewhere, in the 21st century.

The problematic shorthand for ontological and epistemological differences is 'culture', or 'sub-culture', and the degree of variation, as well as the interpretation of the underlying reasons for its occurrence is a matter of scale (STRATHERN, 2004: xvii). In the Western epistemological tradition, variation is subsequently interpreted as branches of culture, based for instance on geographical distance or genetic bifurcations, that are understood as developments similar to the evolutionary explanatory system. The self-reflexive approach of Marilyn Strathern, which at times reads as a *monologue intérieur*, is a wonderful example of constantly second-guessing ones own preconceptions, analyzing ones own biases, and bringing up alternative interpretations, while she states that 'interpretation must be a matter of refusing many meanings in order to focus on any' (STRATHERN, 2004: xxi).

Strathern thus complicates comparison, by stressing the seemingly endless variation in both the phenomena we might choose to study, as well as our way of thinking and understanding these. 'Cultures', a term she critiques as a particular way of objectifying the world, where 'we' are the norm and alterity is defined by 'our' relation to 'them' (see also FRIEDMAN, 1989) exist by our definition. A better approach might be to consider varying worldviews not as more or less fixed entities, but focus instead on relations. Comparisons require a definition of the entities that are to be compared. Relationships similarly need to be characterised, and in the process invite a self-reflexive approach. The two- or multi-way traffic of relationships includes an identification of the entities that are related, but also the analysis of the relationship itself. In contrast, comparisons might evoke the use of an authoritative voice: one entity is held up and compared to a standard or better known example, that then functions as benchmark (CANDEA, 2018; CANDEA, 2019).

2 Discussion

2.1 Relationships

What happens if we define the ancient body within a set of relationships? Even though archaeology does not have the living body to relate to, it has the certainty that human bodies existed and that these had relationships with the things that we find today: landscapes, sites, objects, residues. Archaeological interpretation is built on relationships, often literally as in the description of stratigraphy through the relations of walls, deposits, and things found within these. Defining relationships brings into focus that, throughout the history of archaeology, research interests determined which relations were considered valid, interesting, or relevant. We can actually sketch out the history of the study of archaeology as sets of relationships between objects and scholars: emotional, objectifying, symbolic, positivist, or subjective.

In what perhaps can be considered very early forms of archaeology object relations were mostly based on

the senses, emotions, and wonder. Stones that were unusually smooth or shaped with curious angles urged people to pick them up from the ground and keep them. The relation of the antiquarian to objects from the past was one of intrigue and wonder, of admiration of beauty, with the emotional involvement of the collector at its center (ANDERSON, 2012; BARNARD, 2023a; CARBONELL, 2012; GENOWAYS & ANDREI, 2016; HODDER, 2012; IMPEY & MACGREGOR, 2018; MACGREGOR, 2008; SCHNAPP, 1996). The *Wunderkammer* contained objects of which it was often unclear whether they were 'natural' or 'cultural'. Axe and arrowhead shaped stones were thought to have been shaped by thunder, because they were often found where lightning had struck. This most likely was due to search bias, because curiosity to see the results of the immense power of lightning meant that these areas were checked carefully and possibly dug over. The rational explanation that these were not faerie stones or created by thunder was mostly based on comparison with native American artifacts, as well as biblical references to stone knives. The suggestion that these objects were made by humans was given by several different antiquarians and gradually accepted (GOODRUM, 2008).

Objectifying relations are the basis for early 'scientific' archaeology with its penchant for classifying, organising, and maintaining an objective stance towards the material world. Relationships between objects were created based on similarities of place, material and appearance in order to form 'archaeological cultures' connected to distinct periods in the past. Rarely recognized, however, is the fact that early Egyptologists were also seeking a relation between archaeological material and 'cultures' of the present, with good intentions, but for all the wrong reasons: a fascination of comparing Nilotic 'primitive' cultures with the 'primitive' phases of Egyptian Neolithic and Predynastic periods (SELIGMAN & MURRAY, 1911; SELIGMAN, 1913; MURRAY, 1956). The relations with anthropological sub-Saharan Africa that Murray and Seligmann emphasized were subsequently explained away as foundations of Egyptian culture and overshadowed by theories of a 'dynastic race' that had the higher mental capacity to build pyramids (DERRY, 1956; EMERY, 1961; PETRIE, 1920).

Considerations of object symbolism, and analyses of functional and isochrestic styles mostly in the 1970s were similarly object focused (SACKETT, 1990; WIESSNER, 1985). The positivist effort to define archaeology as a science, using measurable, verifiable and reproduceable information looked at how one (set of) objects could be related to another, through precise measurements and statistical analyses. The objective was to consider the intentionality of persons, either those producing, obtaining, displaying or using objects. In terms of relationships, ethno-archaeology played an important role, but was limited to object-object relations, in which human behaviour was inferred based on analogical reasoning. Most attempts to involve the body in these relationships are linked to ethnoarchaeology or other forms of anthropology, usually based on comparisons, analogies, correspondences or discrepancies broadly discussed in the literature (BINFORD, 1979; BINFORD, 1980; WYLIE, 1985; DAVID & KRAMER, 2001; GOSSELAIN, 2016).

In the last decades, attention in archaeology has shifted from the products and mode of production to the two-way relationship of object agency and the human factor in the form of the producer and user of objects (WENDRICH, 1999; BARNARD, 2023b). In this context Marcia Dobres refers to two types of ontology, firstly 'practical reason epistemology' that highlights approaches that are often positivist efforts to study tangible remains, as well as testable claims and, secondly, 'cultural reason epistemology' that is interested in finding indications of, for instance, gender, between the lines of the obvious (DOBRES, 2010: 105–107). In this context she brings up the concept of *tekhne* in its original Greek meaning, a term that has its own history of thought in the philosophical traditions of phenomenology into postmodernism in Germany and France (e.g. DERRIDA, 1976; FOUCAULT, 2005; HEIDEGGER, 1993; HUSSERL, 1970; LYOTARD, 1984). In several of his books, Tim Ingold highlights *tekhne* as the term that encompasses art, skill, craft, methods, knowledge, understanding, and awareness (INGOLD, 1988; INGOLD, 1990; INGOLD, 2000). These are among the many aspects of body knowledge (WENDRICH, 2012) and can be rephrased as relationships between object and maker, user, buyer, consumer, receiver, researcher, or reader. The understanding of what something should look or feel like is only partly inherent in the object, its material, or its maker, but also in others (objects and people) who interact with the thing. This complicates the concept of agency as being neither of the 'thing', nor of its maker. Agency thus defined is relational, situated somewhere in between, as belonging to the many different relationships

that can be explored with the object as its starting point.

The study of agency is particularly interesting when focusing on standardized objects, such as a water jar that is quite famous in present day Egypt. The Ballas jar is made of marl clay in one area of Middle Egypt. Depending on the placement in the kiln and the firing temperature these jars can have a beige, pinkish or greenish tint. The Ballas producers have no direct influence on the color, but they market clusters of similarly-tinged pots to particular regional communities. Each of these has a strong preference for jars with one of these three colors, which is somehow considered to be of higher quality than the others, while they are for all practical purposes all the same (NICHOLSON & PATTERSON, 1985).

2.2 Relationships of the body

Early in the development of archaeological reasoning the consideration of the relationship between human bodies and matter existed, but was seen in the light of human evolution, where the use of tools and the complexity of manipulating matter was part of the definition of the progress of humanity (THOMSEN, 1836; HEIZER, 1962). Ancient technology was closely related to progress of human capability that developed from tool use to science, and was part of humanity's influence on and mastery over nature. These studies often focused on the mechanisms of materiality, the properties that dictate technological solutions and the inventiveness of humanity through time (SINGER et al., 1954; FORBES, 1955). The emphasis on making, rather than the experience of owning or using is partly explained by a western focus on productivity and industry and the fact that making objects can be studied either from the product itself, or from production localities and debris (COSTIN, 1991). The ontology of the Western world determined much of the interest in and conclusions about ancient technology. For instance, linking ancient technology to social organization by marking craft specialization as an important indicator of social complexity was based on tacit considerations born from a capitalist understanding of economic systems, in which economic systems, moreover, were considered the determining factor in social organization (WEBER, 1958).

Bodily interaction as well as emotional reactions are relationships that are felt corporeally. It is in this realm that a life history of a group of objects, or a biography of one particular object, provides a series of relationships that go beyond the physical and beyond the instrumentalization of the concept of use-wear. It includes ownership, inheritance, value, meaning, discard and destruction (GOSDEN & MARSHALL, 1999). Beyond the visual relation of seeing an object, touching, smelling or tasting something that is part of another realm, whether determined by distance in history, social stratification or space, can provide an experience that transcends the mere sensory encounter. Whenever people ask me what my most special archaeological find was I often tell them about a palm leaf brush that was excavated in Amarna, dating to approximately 1350 BCE. The brush is made of long grass and heavily worn down, originally it would have been over a meter in length, but now only 35 cm is left of it. This consists of a stump of the brush part, but is mostly formed by the handle, which is a folded bundle of the grass sturdily wound with string. Holding the handle and putting my fingers in the position where the brush was held over 3350 years ago is like touching the past: archaeological cooties. The relationship of a touch through time is a very special, powerful and in this case positive thing. The bodily experience of the past, which seems utterly out of reach and impossible, was present in this case, and in many others, as long as you allow yourself to look for them.

Our study material, archaeological remains, is surrounded by potential relationships, which form an in-between-space. Depending on our interest, we focus on specific relations and the possibilities and limitations of grasping them. Here Strathern's work provides a vital contribution, when she discusses the end of the all-encompassing ethnographer and the consumption of experience (STRATHERN, 2004). Rather than academia claiming sole authority, indigenous archaeology provides subaltern voices and different ways of being and knowing. These contributions are slowly being accepted as providing valid information. Yet this does not mean that present day indigenous epistemology and ontology are in any way identical to the ancient ones, nor can we state that in a 'society' there was only one way of being or knowing. Nevertheless, with the

emphasis on indigenous and community archaeology the leading voice should not be that of the Western researcher and the leading paradigm cannot only be based on a Western ontology and epistemology. The fundamental problem is that this paradigm has for centuries been so overwhelmingly expanding that the work from colleagues from the southern or eastern hemisphere is only accepted if they fully subscribe to and have internalized Western epistemology. Moreover, they are frowned upon when they are considered to not keep up with the latest disciplinary developments and might subscribe to 20th century Western methods and theories.

As we saw, the traditional Western ontology is biased against the body and even the term 'embodiment' reflects this split, as if something exists outside the body that needs to be brought within, or sustained by feeding the body as its carrier. Yet during intense physical activity, such as complicated physical or emotional tasks, the entirety of us is involved. The unity of body and mind, action and thought, are most readily experience during, for instance, focused work, dance, trance, or sex. The Western ontology, with its Cartesian split of body-mind, tends to distinguish a person from a body, while the body is the most intimate part of a person. This is evidenced by the social limitations to touching, the familiarity needed to allow skin to skin contact, let alone sharing bodily fluids. STRATHERN (2020: 137) describes the relations of persons that are unknown to each other until the moment that part of one body is implanted in another. She narrates that this creates a strong sense of kinship between families of the deceased donor and the recipient living with the bestowed body part. The physical—and literal—incorporation of part of a living or deceased person in another is perceived as 'living on' in the body of another. Perhaps the strongest argument in opposition to the Cartesian split would be that there is no such thing as a mind that exists independent of the body, but anyone who has lost a loved one might have experienced that the deceased is no longer the beloved person. The Western ontology can pull apart body and personhood, at death and in exceptional cases during life when regular relations are upended. The expression that someone 'is not themselves', or 'is not the same person' is used for living people, who are still the same body, but have shown a profound change of character, for instance due to illness or traumatic events. In spite of being the same body, they are no longer recognized, as if a change in personality means they left the body. The 'inner person' is reflected in the body, which thus is essential and at the same time suspect. What is perceived by society as attractive needs to be young, strong, healthy, beautified, and enhanced. What is considered unattractive has been attested to work against the old, the disabled, or the ugly and is increasingly called out as ageism, ablism, and lookism (MINERAVA, 2017). This conflict and ambiguity in what we tend to consider a rational well-ordered epistemology comes to the fore most clearly if we focus on subalterity.

2.3 Relationships of matter and the *chaîne opératoire*

As archaeologists we deal with material and we can express object agency as relationships of matter, by considering the influence of objects in the tension field of human-object relations (GELL, 1998; JONES & BOIVIN, 2010; STRATHERN, 1988). Analysing these relationships requires a methodological approach that allows us to take the object as starting point. DOBRES (2010) proposes an agnostic use of the *chaîne opératoire* independent of whether the objective or focus of research is the material or the person. Her interest in the study of agency or intentionality in object creation takes as its point of departure the ideas of the maker or producer. She considers this explicit or implicit design as a mental image, as something separate from their bodies. *Chaîne opératoire*, developed by LEROI-GOURHAN (1965) to consider objects as the result of a process, rather than an *objet d'art*, is most often used to understand the agency of a maker in a production process. It is a method that orders and simplifies imagined production processes and the unintended effect is that it disembodies the process, as if things happen without the physical involvement of the maker. This certainly was not the purpose of Leroi-Gourhan, who emphasized gestures and movement, including the body position of the maker during the process. The concept of body knowledge, in contrast, integrates the physical-mental continuum and relates actions to the body in time and space: movements, strength, subtlety, power, design, and moments of contemplation in which the entire mindbody is involved.

Using a *chaîne opératoire* approach we can reconstruct relations of the body with matter based on the different production sequences and specifically how materials are grasped by the producer. The grasp is reaching out both by hand and thought, linking the material remains to physical, bodily actions of the producer. A fine-grained description of the production sequence allows us to understand the positions, attitudes, affordances, and limitations of the body and the materials within the process of making. Grass simply is. It only becomes a 'material' in relation to the hands of a farmer who cuts it for his wife. It becomes a 'raw material' in her hands when she uses it in the production of a basket. Standardised objects from a workshop have the same *chaîne opératoire*, but display slight differences, that are engrained in the body knowledge of the potters, akin to trademarks or finger prints. Potters can readily recognize the work of others, usually by microvariations in rims or handles (GUPTA-AGARWAL, 2015). In the words of the potters: 'Pots are like people, each alike yet different from others' (NICHOLSON & PATTERSON, 1985: 234). The *chaîne opératoire* of Egyptian sewn plaits baskets, shows that standardized sizes are based on the span of two outstretched arms, the *ba'a*, the exact size of which depends on how large the basket maker is. A small basket, the *gauta*, is sewn from a plait that is three arm-spans long (approximately 4.50 m), a medium sized basket, the *alaga* is 7 arm-spans and the large *maqtaf* is sized as 10 *ba'at* (150 m). The size is, therefore, not determined by a particular diameter, height or content of the end product, but is embodied by the basket maker (WENDRICH, 1999: 397).

In an archaeological object such elements of production are perhaps more readily discernable, than the relation between a thing and its user. This in spite of the fact that the relationships between us and objects is one of intense connection, repeated use and multiple senses. We see, hear, smell, taste, and most of all touch objects. Use wear, especially on clothing, blankets, furniture, tools etc, is the rubbing of the body and the material world. It is touch embedded in material and gives the clearest indication of repeated movements, habits and habitus. In how far this can be observed depends on the type of object and the intensity, length and intimacy of use.

As archaeologists, we consider objects because that is what we have to work with. We know, but do not truly account for the fact that we are left with only a fraction of what once existed, and it is not the subtle part, but the hard, sturdy stuff such as flint and potsherds, to a lesser extent bones, hardly ever flesh. But bones and even flesh are still not bodies. If we construct a *chaîne opératoire* to understand only the process, rather than the many relations of the archaeological object, then it does not get us to the quintessence of experience.

2.4 Body knowledge

A relational approach provides a means to map out experience, and the transfer of experience as knowledge. Body knowledge is a way to express the experience of movement, the doing, making and ingrained 'knowing how' that often is only gained by years of practice and gradual improvement, building skill, dexterity, and endurance. Elsewhere, I have defined dexterity as the physical ability to perform an action, while skill involves the right conduct of movement, timing, and organization. Endurance is the stamina built to continue a process for the required length of time (WENDRICH, 2012: 3). Ingold emphasizes that skill is not a property of the human body but of the total field of relations 'constituted by the presence of the organism-person, indissolubly body and mind, in a richly structured environment' (INGOLD, 2000: 353). That *culturalnatural* environment is the determinant in informal learning as well as formal apprenticeship. Training to do complicated tasks involves a long continuous process of observing, listening, but most of all feeling through repetition that lies at the basis of apprenticeship. The *chaîne opératoire* helps us to organize the different activities and relations with teachers, co-workers, materials, and the environment, but it is a stylized and polished rendering of a process that is in fact unorganized and messy. Actions are not done in a certain order and are constantly interrupted by other, more urgent tasks that may have nothing to do with the production or procurement or whatever undertaking is supposed to be the 'main' pursuit. The traditional way of using a *chaîne opératoire* approach not only simplifies, but also creates a linear representation of processes that are only linear in hindsight. Constructing what actions are needed to create the end-result, the only aspect that an archaeologist has in

hand, is artificial, and does not consider agency of the participants and the many relationships represented by the object. First of all, there are the relations with people, foremost children, who in many societies are present in the place of work and participate, interfere, or need to be taken care of. Then there are the relations to the materials, architecture, community and the environment. Moreover, apprenticeship is not just about learning to do something, but perhaps most importantly to be or become someone, to grow into a member of a community of practice. Instilled in the body are not just the movements, but also the values and ethics.

In the last few decades critique of traditional Western epistemology as the standard way of accepted knowing has opened the way for the recognition of other types of knowledge. A re-evaluation of body knowledge is one of these developments (BENDER JØRGENSEN, 2003). This is not about melancholic longing for the high-quality craftsmanship of the past, when people still had time on their hands to create beautiful things, but about the fundamental reconsideration of what comprises intelligence, knowledge, and expertise. It enables a re-evaluation of indigenous knowledge, which similarly does not fit the Western epistemic model. Ingold's example of the reindeer or caribou who offers their life to the hunter is a case in point (INGOLD, 2000: 13). During the hunt, when a reindeer becomes aware of the hunter, they stop and look the hunter in the face. The 'rational' explanation by biologists is that this is an apt reaction when reindeer are pursued by wolves: it allows both prey and predator to catch their breath for a final dash. This behaviour makes the animal easy to kill by humans with weapons, but rather than thinking the animal heedless, the Cree consider it a voluntary gesture towards the hunter, who receives the substance of the caribou in gratitude. This is an example of how indigenous ontologies can provide explanations that are based on a deeply felt relationship. Gratitude for a gift of life is a very different proposition than extractive behaviour, based on maximising yield.

The authoritative foregrounding of traditional Western epistemology and ontology has come under critique, not just because of ingrained and easy to defend social and racial inequality, but because of the disastrous ecological effects and the instrumentalisation and commodification of earth resources. The politicisation of ontology is used as a weapon in an effort to counter the effects of the Anthropocene (TOLA, 2018; LATOUR, 2017; POHL, 2020). Considering not just the human body as important, but embodying the world, makes the understanding of damage done visceral and immediate.

2.5 Body relations in ancient Egypt

Visceral reactions are immediate, gut-felt, and stand in contrast to reasoned, mind-based reactions. This is just one example of how English idiom tacitly includes the body-mind divide. In *Breathing Flesh*, Rune Nyord considers the ancient Egyptian terminology for body parts and the relations between them in the theoretical frame of metaphor (NYORD, 2009; see also NYORD, 2017). Perhaps from the standpoint of embodied cognition, we can go further and state that these metaphors reflect a deep felt ontological 'truth', which may not need to be taken literal in order yet to be 'true'. Nyord hints at this when he discusses the literature on the two terms that are used in ancient Egypt for the heart: *ỉb* and *ḥꜣty*. They seem to refer to the same anatomical entity, are sometimes used interchangeably, but have a clear semantic difference. The translation *ḥꜣty* as heart and *ỉb* as mind, seems to make perfect sense:

(Eb. 855 k) 'As to the mind [*ỉb*] kneeling (breaking down): this means that the mind [*ỉb*] is constricted and the heart [*ḥꜣty*] becomes small. It is that the heart [*ḥꜣty*] is hot and weary and eats little.

This is explained in a rubric (an explanatory line, in red ink):

(Eb. 855 l) 'As to drying up of the mind [*ỉb*], it is that probably the blood coagulates in the heart [*ḥꜣty*].'

Another example is Papyrus Ebers 277, where a medicinal intervention is said:

(Eb. 277) 'To expel a poison from the heart [*ḥꜣty*], expel fleeting forgetfulness and injury of the mind [*ỉb*]' (Translations: BRYAN & SMITH, 1930).

In his comment Nyord states that it is clear 'why this description seems so initially appealing: it corresponds exactly to a modern dualistic folk model of the relationship between brain and mind' (NYORD, 2009: 65). Egyptian personhood appears to be split into many aspects, of which some are referred to during life, most are important around and after death: the ba, ka, shadow, name, body, image, heart etc. Nyord's careful analysis shows that there is no consistency, even in the same period and genre of texts.

If we subscribe to the notion that body and mind are one, are we not making the same mistake by now forcing another Western ontology onto ancient societies? Lakoff and Johnson ask themselves what difference it makes if we accept that there is no disembodied mind, no split between body and a free-moving soul and that the division in subject and self is metaphorical. For anthropologists this is a real conundrum:

> Requiring the mind and Soul to be embodied is no small matter. It contradicts those parts of religious traditions around the world based on reincarnation and the transmigration of souls, as well as those in which it is believed that the Soul can leave the body in sleep or in trance. It is not consistent with those traditions that teach that one can achieve, and should aspire to achieve, a state of pure consciousness separate from the body (LAKOFF & JOHNSON, 1999).

The problem mostly arises due to the epistemological conviction that truth exists, is unique and absolute. The inconsistent references to all aspects of ancient Egyptian personhood are not subject to ancient 'theological' treatises, but mostly problematized by Egyptologists, based partly on Hellenistic philosophical traditions and early Christian theologians who tried to precisely define how the two elements of a person, body and soul, and their relationship, should be thought of.

Archaeology allows us to foreground the body as a complete entity that is in the world. Through archaeology we can approach ancient ontology in a theoretically and methodologically consistent way, without superimposing our own worldview. Considering material culture, art, architecture, writing, landscape modification, etc. as the result of actions, interactions and relationships we can employ a *chaîne opératoire* to understand material remains as the result of what mindbodies do. It is a suitable method that allows breaking down actions into movements in which all senses are involved, resulting in a fuller understanding of what being-in-the-world in ancient Egypt might have entailed. The main vector of body knowledge is sensory. We cannot easily verbally explain, read or write touch, nor can we readily record touch, smell or taste. An essential aspect of conveying knowledge is to pass on what something should feel like. The experienced farmer, maker, dancer, cook, scribe, might say 'here, let me show you', while what (s)he really means is: 'Let me make you feel', or: 'Let me try to make you experience what it should feel/smell/taste like'.

3 Conclusion

Body knowledge is an aspect of embodied cognition, focused not just on how we learn, but also how we maintain knowledge through ingrained movement memory. In Western society, bodily achievements are generally considered less important than those of the mind, with some striking exceptions, such as the accomplishments of famous concert pianists, dancers or artists. Their 'art' is, however, not considered in the first place a physical achievement, but a soulful or spiritual one. A pianist who plays all the notes speedily, but without feeling, is compared to an automaton, or a robot. Yet expressing feeling can only be done by the body, so playing mechanically, or playing soulfully does not represent a contrast of mind and body, but a differentiation of skill.

Considerations of the body as the lesser part of the self has led to inequalities on many levels, social, economical, ecological. The inequality in social standing and payment of blue versus white collar workers, or the underpayment of those who provide care, mostly women, are examples of this. Perhaps even more fundamental is the different value that is given to animals, as soulless bodies, and nature, as in the service of humankind. My emphasis on the value of body knowledge is in a way a reaction to an epistemology that

is based on a dualism of mind and body and in particular the difference in appreciation for the body as the unique source of our intelligence in the broadest sense of the word, including ideas, social and emotional intelligence, and the capability to move and be moved.

Epistemology allows us to be explicit about what we consider valid ways of knowing and the acceptable expressions of this knowledge. In our world, speaking, writing, and reading are the aural and visual exponents of knowledge transfer. Audio and video are the electronic equivalents that enable hearing and seeing across distance in space and time. They are replacing oral traditions and are grudgingly allowed entry as a way to convey knowledge, rather than mere amusement. Although we claim that a picture says more than a thousand words, images are usually considered more suitable for children, who cannot yet read, or for analphabetic populations. Similarly, virtual reality, which involves completely merging the visual and the aural, is considered amusement, or at best a great way to illustrate things, such as reconstructions of the past, to children or the general audience. Theories of embodied cognition should help us to understand that, on the contrary, virtual reality is a tool to enable an embodied representation that evokes new questions and has the potential to provide a deeper understanding of the world, an understanding that texts will never be able to achieve. Yet even these representations, that are considered 'experiential' are still lacking smell, taste and touch. To represent the cloud of relations of objects that have come to us from the past, requires analysis, but also imagination and a theoretically founded understanding that the mindbody is a sensory creature. A *chaîne opératoire* approach focused on movement and interaction, rather than production sequences, is a suitable method to define smaller analytical units that include relationships and a broad range of sensory experiences.

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