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Im/materialities: Things and Signs

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Abstract: There has been a sustained and forceful call in recent anthropological accounts to engage more critically with the tangible materiality of the world, and especially a demand to take into account the ability of things to resist or exceed the discursive frameworks within which humans situate them. In this shift away from questions of subjectivity and interpretation, there is often an attendant downplaying of the semiotic. We resist this dualistic framing of semiotics in opposition to material things, and suggest that we should think more carefully about the assumption that subjectivity, interpretation and semiotics should be pushed aside in order to explore the nonhuman. Here we construe semiotics more broadly, recognizing a more encompassing field that engages explicitly with the non-representational, drawing upon a Peircean heritage. Rather than putting questions of representation to one side in order to focus on the peculiar characteristics of things, in this issue we situate representation within a wide-ranging field of sign-making and sign-perception, in which the concrete characteristics and qualities of sign relations are fully recognized. This is to put representation in its place as one of many forms of sign-relation, and similarly to situate human ways of knowing within a world of knowing actors, humans and nonhumans alike.

Keywords: semiosis; representation; Peirce; materiality; immateriality; ontology; forensic entomology; fingerprints; Black Sea; ceramics

In the first pages of her thought-provoking 2010 book *Vibrant Matter*, Jane Bennett positions objects as things "never entirely exhausted by their semiotics" (2010:5), something we would surely agree upon. It is clear that the being of any element of the world is not reducible to how it is represented or understood. As Graham Harman has explored in detail, drawing on Heidegger (Harman 2002, 2005), there is more to things than is given to us in perception or can be understood through language. This insight is a common theme in much current writing. Over recent decades sustained criticism has been directed at the central role of the human in the analyses of the social sciences and humanities. Despite differences in approach, this critique is unified by a suspicion of the "unmasking" of meaning that has been central to much social analysis, and an assertion that this effectively reduces any understanding of the nonhuman to its role within human worlds of signification (Barad 2003; Bennett 2009:xiv). This criticism has been articulated largely in terms of the longstanding suspicion of the binary dualisms that haunt Euro-American traditions, namely those of object and subject, nature and culture. A central strand has been the call to deconstruct these calcified boundaries by taking better account of the tangible, non-discursive elements of the world, particularly those material properties that seem to resist or exceed the discursive frameworks within which humans situate them.

This may be seen in the exploration of the distributed and dispersed nature of agency across the "collective" of humans and nonhumans within science studies (Latour 1993, 1999; Pickering 1995) or in the concern with the problem of "presence" (Nancy 1994; Gumbrecht 2004; Runia 2006). Similarly, "post-representational" or "anti-representational" approaches in human geography and other disciplines (Ramsey 2007; Thrift 2007; Castree 2014) argue for a move away from the semiotic, as do many strands of the literature on "materiality" and questions of material agency in art, anthropology and archaeology (Gell 1998; Miller 2005; Olsen 2010). Another distinct and influential area of critique growing in part from Harman's work has delineated an 'Object Oriented Ontology' (sometimes also called speculative realism). This term draws together a number of perspectives, which grow from conversation with older philosophical traditions in order to explore that which is "indifferent to its own givenness … existing in itself regardless of whether we are thinking of it or not" (Meillassoux 2009:7; cf. Morton 2013). Finally, Jane Bennett and Karen Barad's work may be situated within yet another loose constellation of thinkers, commonly grouped under the heading of 'New Materialisms' (Coole and Frost 2010), along with authors such as Sarah Ahmed (e.g., 2006) and Rosi Braidotti (2013). New Materialist writers emphasize process and becoming, as a means to conceptualize matter as something animate and emergent, that is continuous with the human, rather than set apart from it.

Despite growing from a similar set of concerns, many aspects of these diverse approaches are in tension with one another, particularly in their different commitments to the real, and to questions of agency. What they share however, is a shift in focus away from questions of subjectivity and interpretation, and, to different degrees, an attendant downplaying of the semiotic. This may be seen in how related themes have been taken up in archaeology. Here the call to engage more fully with the qualities and self-realizing nature of material things (Olsen et al. 2012) builds upon a more general complaint against the interpretive and hermeneutic archaeologies of the 1980s and 1990s. A reiterated theme in recent accounts is the need to better understand the recalcitrance and resistance of material things to meaning. Bjørner Olsen suggests that these now-unfashionable views of material culture as text failed to acknowledge "materiality as providing a distinct sphere of experience – sometimes closely related to language, other times very remote from it." He emphasizes that things are "not experienced solely as linguistic signs or signifiers", and quoting Graham Harman (2002:17) asserts that it is time to "return to the drama of things themselves" (2010: 59). Along similar lines Christopher Witmore calls for archaeologists "to grapple with the reality of soil-encrusted relics, detritus and ruins without recourse to a theoretical apparatus that passes over actual objects for the supposedly greener pastures of language, interpretation or meaning…" (Witmore 2014:204). Passing over the tacit suggestion that only things are real, what's of interest to us here is the somewhat oppositional framing of semiotics and material things. Why should subjectivity, interpretation and semiotics be pushed aside in order to explore the nonhuman? Does this not imply that some kind of purification is still at work? We suggest that it points to the still vibrating resonances of older distinctions between nature and culture, objects and subjects even within approaches that explicitly repudiate them. Similarly, ethnographic questioning of the ontological assumptions that underpin the distinction between nature and culture, things and their representation, has led to a refusal of epistemology and its privileged relationship to a foundational natural world within European tradition (Henare, Holbraad, and Wastell 2007). Instead ontology is offered as unifying theme through which alterity may be explored. The concern with knowledge has come under suspicion because of its association with the 'culture' side of the nature-culture divide (Holbraad 2009). But we would argue against the conflation of knowledge, semiosis and culture along these lines, suggesting that the repudiation of epistemology does the same kind of work as the rejection of semiotics, sloughing off part of the world in an attempt to better understand it.

This implied view of semiotics in many of these texts is one embedded in a narrow lineage that can be traced back to Saussure's linguistic semiology. Semiotics in this view is about representation, discourse and symbolism. The limitations of this perspective for ethnographic and archaeological analysis have been extensively detailed (e.g. Silverstein 1976, Singer 1978, Preucel and Bauer 2001, Preucel 2006). Here we'd like to think more

carefully about semiotics broadly construed, recognizing a more encompassing field, that for many years now has been engaging explicitly with the non-representational (Jakobson 1971[1957]; Friedrich 1979; Sebeok 2001), and which draws upon a Peircean heritage to do this. As Jakobsen observed in 1977 "…in Peirce's view it was wrong both to confine semiotic work to language and, on the other hand, to exclude language from this work." (1977:1029). Rather than putting questions of representation to one side in order to focus on the peculiar characteristics of things, we contend that representation should be situated within a wide-ranging field of sign-making and sign-perception, in which the concrete characteristics and qualities of sign relations are fully recognized. This is to put representation in its place as one of many forms of sign-relation, and similarly to situate human ways of knowing within a world of knowing actors, humans and nonhumans alike. This perspective has much to contribute to the views developed in the work of authors such as Ahmed, Braidotti and Barad, both in a view of semiosis that stretches across boundaries of mind and matter, and in an understanding that is processual and dynamic, rather than rooted in the structure of language.

Charles Sanders Peirce's semiotic allows two important moves to be made, that situate semiosis as an unfolding process within the world, regardless of the status of the actors involved. On the one hand it makes the claim that the recognition of any element of the world is a semiotic act, in which the senses perceive the signs of another presence. Peirce argued strongly that perception emerges through semiosis. Indeed, the signs through which the world is recognized, acknowledged, and understood need not be discursively articulated. Touch, for example, may be understood as a semiosic process, one that relies upon the material signs of texture and surface felt under the fingertips. Similarly, taste is a semiosic experience in which flavors are recognized and made sense of through the mouth. As Webb Keane has remarked, semiosis includes "such things as the sounds of words, the constraints of speech genres, the perishability of books, the replicable shapes of money, the meatiness of animals, the feel of cloth, the shape of houses, musical tones, the fleshiness of human bodies, and the habits of physical gestures" (2007:5-6). As Rosemary Joyce has noted, this allows us to hold in view both the material trace that interests us, and its contextually defined relationships (2015:185). Indeed, thinking about semiosis in this way, broadly construed, allows a way to conceptualize the difference between various forms of agency and animacy, and between living and inert matter. Peirce himself suggested that a semiotic perspective could provide insights into the problem of how life itself emerged (CP 6.322 [1909]), a challenge that is currently being explored by a number of scholars (e.g., Hoffmeyer 2009; Deacon 2011; Barrett 2014).

This brings us to the second important contribution of Peirce, which is the insight that significance or meaning is not the exclusive province of humans. This was explored long ago by Jacob von Uexküll in the early 20th century: we all live in our own umwelten, which

intersect with those of others to different degrees (Von Uexküll 2010). Moving away from human signs makes the semiosic unfolding of the world and its scale dependency clearer. Drawing on Peirce, Eduardo Kohn (2007:3) suggests that we should work with "an embodied and emergentist understanding of semiosis—one that treats sign processes as inherent to life and not just restricted to humans". Following Deacon (2003), Kohn notes that intention and purpose can be understood as semiosic processes that are implicated in the emergence and reproduction of life (cf. Kohn 2013; Sebeok 1972). In this view the living world is not only "perfused with signs" but is fundamentally constituted through forms of semiosis.

This is not to deny the observations of Bennett, Harman and others about the ability of things to withhold something from how we understand them. Rather, it is to make the claim that humans and other inhabitants of the world can only experience others through signs that they are able to recognize, regardless of whether those others are human or non-human, animate or inanimate, particulars or generals. It is not only things that withhold themselves – this may be extended to the phenomena of the world in general. Peirce offers a pragmatic approach to this, not concerning himself with access to any posited thing-in-itself, but rather with how phenomena reveal themselves through interactions with others. "The question is what the phenomenon is. We make no vain pretense of going beneath phenomena. We merely ask, what is the content of the Percept?" (Peirce CP 5.53 1903). Although framed here in terms of perception this should not be understood in terms of representationalist meaning, but rather as an attempt to think through the engagement of all life with the world as inhabited and experienced.

In this open collection of papers we invite different authors to explore how the semiotic of C.S. Peirce might provide another route to engage with the problem of materiality without setting semiosis aside. For those readers who are not familiar with Peirce's work, below we briefly recap his semiotic and the categories that inform it, in so far as it informs our discussions of materiality. We also recommend introductory texts by Cornelis de Waal (2013) and Albert Atkin (2015). The following three paragraphs can be safely skipped over by those who are familiar with Peirce's semiotic.

Peirce's Semiotic: The Briefest of Outlines

Semiotic for Peirce was grounded in his three categories or modalities of being, which he suggested, could be used to characterize everything in experience. These abstract categories grew from his study and critique of Kant and as they inform his semiotic we'd like to briefly consider their relevance. His first category was that of potential, as "the world was to Adam on the day he opened his eyes to it, before he had drawn any distinctions, or had become conscious of his own existence — that is first, present, immediate, fresh, new, initiative, original, spontaneous, free, vivid, conscious, and

evanescent" (Peirce, in Houser and Kloesel 1992:248). Typically for Peirce, who made few compromises when seeking out precise terms that can be somewhat opaque for the uninitiated, this category he named Firstness. It describes anything ineffable or unconsidered, before judgments are made. As such it is more or less impossible to pin down exactly in words, as Peirce noted: "Only, remember that every description of it must be false to it" (ibid.).

Peirce's Secondness is the category of relation, of brute force, of the particularities of experience in time and space. It is where the potential of the world (as first) is brought into relation with actuality, affecting and constraining experience. Secondness can be seen in the stone that trips you, or the whistle that startles as Paul Manning explores in his paper in this volume. It may also be used to characterize mechanical interactions, where the action of one element upon another is determined by physical forces without the possibility for alternate forms of response to emerge. Finally, the third category was one that Peirce developed in order to respond to his observation of the tendency of the world to form habits which can themselves grow and change. Thirdness is therefore a category of habit and mediation. Within human worlds it encompasses conventions, customs, representation and meaning, but it also has wider application. Most notably it characterizes self-organizing processes, and may be used to think about the emergence of life and of other new and emergent patterns in the natural world (cf. Deacon 2011; Hoffmeyer 2009).

In the discussions around materiality, so far Secondness has played the most prominent role, in terms of acknowledging the capacity of the material world to intervene into human representational and discursive worlds. This can be seen in terms of Peirce's sign relation, which itself was grounded in and refracted his categories. Peirce organized semiosis around the indivisibly triadic inter-relation of the sign (a first) to a semiotic object for which it stands in some respect (where this relation may be thought of as a second) through a mediating interpretant or more developed sign that emerges from or motivates this relation (a third). This interpreting sign can then turn around and become the basis for a new sign-relation. These elements themselves are broken down into triads. Starting with the sign itself, it may be understood in terms of its being as potential (first), as actual existent (second), or as regularly occurring type (third). The relationship between sign and semiotic object can be variously iconic (that is a relation of similaraity, such as a portrait's relation to its subject), indexical (demonstrating an actual existing relationship or cause, such as a bullet hole's relation to the bullet) or symbolic (a conventionalized relationship, such as a flag standing for a nation). Finally, the interpretant may also be broken down into one or more triads, as we sketch out below.

Peirce's Sign Relation and Material Things

In terms of Peirce's sign relation it is the relation of Secondness that most often informs discussions of materiality. Particularly important is the relation of sign to object and the role of the index in this relation. The index has been particularly important in foregrounding semiotic relations that might somehow stand for something without representing it as a conventionalized symbol (cf. Bloch 1995; Gell 1998). It offers a way to acknowledge the ability of material signs to force a recalibration of representations around them. Indexical forensic traces are a good example of this, in that they make assertions about the past (that finger made this print, that weapon made this injury), but these claims do not ascribe symbolic meaning to the traces. In emphasizing the ways in which things can "act" or shape human action without "meaning" in the conventionalized or discursive sense, discussions of materiality draw an implicit contrast between iconic-indexical meaning and symbolic meaning (albeit not in these terms). Yet to privilege indexical relations as forms of action is to reinscribe the dualism of mind and matter, to emphasize the bringing of things into relation with discourse in a tacit contrast between two domains. Peirce's concept of the symbol, as a kind of conventional sign most closely allied to Saussure's signifier offers some scope for sidestepping the dualist trap. However, a more powerful ally in this task is the third term in Peirce's sign relation, the interpretant. This offers the potential to destabilize the dualisms that seem to be resincribed by many of the currently popular themes in the literature around materiality, material agency and ontology.

The interpretant is the third, mediating element of Peirce's sign relation, growing out of the relation between sign and object. Like the other elements it can be decomposed into three parts. In one exploration of the interpretant, Peirce delineated the three interpretive modes, as follows: first, the "emotional" interpretant which can be understood as a feeling of potential – perhaps a sense of recognition; second, the "energetic" interpretant – a reaction or change in state – such as a jump in response to a fright, or the urge to let go of a hot plate; and third as a "logical" interpretant, which we can gloss as an intellectual concept, a habitual response, or a change in established practice. This then shifts the locus of interpretation, away from a question of mind-based cognition, and into the world more widely, including into bodies and things. For it is not only through the body that we interpret, but also through material culture. A vessel built to hold warm liquid is an interpretant of the liquid's capacity to be held, and its ability to be kept warm. A tomb built to hold the dead is an interpretant that anticipates future mourners and future commemoration of the dead. Here Peirce's work shares some commonality with Gibson's discussions of affordances (Gibson 1979; Knappett 2004). This then expands 'interpretation' out from the terrain of the subject, and into the world of things and practices, human and non-human alike. Semiosis in this Peircean imagining may have structure, but is not reducible to a structural relation, given that it is understood as something dynamic that unfolds over time.

If Peirce's interpretant crosscuts the world of subjects and objects as they are normally delineated, equally so do the other elements of his sign relation. This can be seen in how Peirce's semiotic does not restrict secondness to the material world. Rather, it allows for the imaginary, for habits, for qualities and ideas to have an impact on thought and representation. The object or referent of the sign for example, need not be a physical thing. Belying its name which seems to speak of the tangible and objectified, the object can be an idea, a practice, a hope, an expectation. The sign itself may be a present thing, but also it can be a potential, something barely graspable, and it can be a convention, a recognized type. This then opens up possibilities for rethinking materiality, that go beyond the usual claims for its potential to make visible the dialectical mediation between the world of things and people. Peirce's mediation is imagined very differently; it's a mediation that makes no claims about the ontological status of the elements that are being brought into relation. Things can be placed anywhere within this triad; so too can qualities and habitual practices.

The sidelining of semiosis in much of today's writing has a number of unfortunate effects. One becomes apparent in the usual struggle against the inherited conceptual categories that organize how we describe the world. This means that despite their best efforts otherwise, many accounts of materials, material agency or ontology seem to resolve into tacit divisions between objects and subjects, as for example with the call for material things to be given recognition of their own special domain and characteristics. Latour attempts to get around this by a kind of slice-and-dice of dualist categories in which he transfers capacities from one domain to another. So to conceptualize agency in his book *The Politics of Nature* (Latour 2004) he redistributed translation from the domain of society and language across the collective of humans and nonhumans. Yet this provides little insight into how exactly these translations take place, or as to the relationship between the discursive and the non-discursive. What Peirce offers us instead are three categories of analysis that crosscut the boundaries of material and discursive – categories of potential; of the intrusive bringing into relation; and of habit and habit making. These may be material or immaterial; there is no prejudgment made as to the nature of the world in relation to the human. Peirce allows us to reframe the question of how the world intrudes into and is made part of thought, so that it is no longer a question of material resistance, but rather one of potential, of resistance, and of mediation -- whether of things, processes, or ideas material and immaterial.

The emphasis on the ability of material things to demand attention has been a common theme through all the formulations of the challenge of materiality: the stone that trips you, the door that bars entrance, the traces of past human action that last and endure into the present. This amounts to an acknowledgement of the capacity of the material to intervene into human representational and discursive worlds, of the ability of the material world to

shape and form representations, a form of “Secondness” in Peirce’s terms. However, the material obduracy of things is just one dimension of Peirce’s second category, and Peirce provides ways to open up and refigure the way in which this material resistance is conceptualized. Peirce’s delineation of haecceity, of the individual specificity and “thisness” of Secondness is obviously helpful here, not least because it allows us to separate out the particular and specific presence of things from their quiddity, or the qualities which make them identifiable as belonging to a particular class of things – the stoniness of stones, the softness of wool, the claggyness of mud. This distinction is little-explored in the literature as presently constituted, which seems for the most part to conflate these two dimensions. This can be seen in the way that a stone is recurrently used as a classic example of materiality, because of its particular material presence which cannot be easily effaced or denied (as noted by Fowles 2016:20–21). In contrast, cotton wool or steam (see Manning, this issue), plants or water, material things with a soft or changeable nature are less often used as a means to demonstrate the importance of taking account of the material. Stone encourages attention to the stable qualities of things, to its particularly enduring and apparently changeless quiddity, which can be pulled together with its thisness or haecceity to illustrate how some things demand a response. As important in this example as the thisness of the recalcitrant stone, are its stony qualia, which are experienced differently by different actors at different times in the life cycle of the stone.

So to draw on what Peirce would term “Secondness” alone only serves to reinscribe the dualism of mind and matter, to continue to divide the world into things and signs, and to orient discussion around the bringing of things into relation with concepts. This is to leave untheorized a vast swathe of human-material experience; to fail to consider the other possibilities for relationships between people and things; and to obscure how patterns of practice and thought emerge and are changed through these very relationships. Peirce’s categories of First, Second and Third ignore the conventional boundaries between mind and matter, instead creating a different, decentered way to view the world that provides alternatives to the old binaries of mind and matter, semiotics and things, epistemology and ontology. As Vincent Colapietro has noted, Peirce’s formal definition of semeiosis allows the exploration of its unfolding “without specifying the nature of the participants in that process” (Colapietro 1989:6).

Self and Other

If perception itself is semeiotic in orientation this has implications for how we think about the self and its relation to others. In his book *Man’s Glassy Essence* (1984), Milton Singer explored Peirce’s conception of self. He observed that in this semeiotic framework, the locus of the self was to be found not within an individual, but rather “in the sign processes themselves; it was an ‘outreaching identity’ which connected the feelings, thoughts, and

actions of one individual with those of others" (1984:56-57). This perspective resonates with ethnographic insights drawn from work with communities where personhood is understood to be distributed, "dividual," or partible in nature. Here, research in South Asia (Marriott 1976; Daniel 1984; Busby 1997) and the South Pacific (Strathern 1988; Wagner 1991; Mosko 1992; Bird-David 1999) has been particularly influential in reorienting how anthropologists and others conceptualize the relations between self and other. Building upon these insights, Viveiros de Castro, Martin Holbraad, Morten Pederson and others have argued that another step needs to be taken. As noted above, these and other authors have suggested that it is not enough to view these different configurations as so much ethnographic variation upon a more fundamental natural order that is aligned with Euro-American expectations. Instead, these forms of alterity should be more radically challenging, understood not as different ways of interpreting the world, but rather as different ways of being. This 'ontological' project presents another means to criticize the Kantian realm of the real thing-in-itself that is presumed to lie behind or beyond the world of perception (cf. Holbraad 2010:181). (This speaks to one of the tensions with the object-oriented ontologists - see Wolfendale's (2014) critique of Harman's work). Although we are critical of the positioning of epistemology as in opposition to ontology, we also see that a Peircean perspective can offer a great deal here. For one, Holbraad, Pedersen and Viveiros de Castro speak of the "anthropological concept of ontology as the multiplicity of forms of existence enacted in concrete practices" (2014). As Singer observed, for Peirce the "signs of the self, its manifestations, *are* the real self, which emerges along with the external world by a process of fallible inference from 'the parish of percepts'." (1984:69). Forms of existence are thus known and understood through an uneven and changing material-semeiotic engagement, which plays out in different ways in relation to different circumstances. This ontological existence is also of course applicable to objects themselves, so that objects too have a "glassy essence" (Bauer 2013), manifest through their semiotic interaction with both human and non-human participants. Closer attention to the processual ontology of signs, as much as to the ontology of people, animals, things and their worlds provides a means to explore self-other relationships in a way that does not recreate the entrenched subject-object divide.

To illustrate how a Peircean approach can productively intervene in contemporary discussions about materiality and ontology, we would like to discuss case studies taken from our own research. First we turn to forensic investigation to think through the role of indexicality and of animal signs within human semiosis, and then we turn to the archaeology of the Black Sea in order to explore the constitution of self and other during the Bronze Age.

Forensic Evidence

Forensic evidence provides an example of a field in which the ability of material traces to disrupt or prompt new narratives is foregrounded and elaborated. Yet, considering this from a semiotic perspective we can query how far the foregrounding of the role of material things really gets at how representations about the past are constrained or challenged. Instead, forensic research can be seen to identify and privilege particular kinds of indexical sign relation that revolve around and incorporate material traces. These are carefully controlled and circumscribed. Iconicity can also be important in this work, but it is the indexical qualities of forensic evidence that underwrite its validity. A good example of this play of icon and index may be seen in recent debates over fingerprint evidence. For many decades fingerprints were taken as cast-iron proof of identity, each apparently unique and linkable to only one individual. Although the iconicity of fingerprints is perhaps most evident, what gives the evidence its power to convince is the indexical relation with its object – the fact that *this* print was made by *that* finger. Simon Cole notes that despite the great trust placed in fingerprints through the twentieth century, increasingly problems with their reliability as forensic evidence started to emerge at mid-century. A key issue was that most crime scene prints are partial and often single prints, in comparison with the ten full impressions taken from suspects and others by police. A partial print may well resemble a number of other prints, especially as its orientation and the relevant digit from which it came can be difficult or impossible to ascertain. Additionally, latent prints create other interpretive problems. These are prints that are only made visible through the application of dusting powder, as opposed to more obvious fingerprints in blood or paint. Along with latent prints comes other background noise, derived from dirt or dust, and characteristics of the surface on which the prints are found (Cole 2001:171). Both the fragmentary nature of fingerprint evidence, and the collection of latent prints continue to present difficulties in establishing whether a print resembled another by chance or whether it has genuinely come from the same digit. This speaks to a key characteristic of iconic signs: they may resemble their semiotic object (as a portrait resembles its subject), but an iconic sign makes no guarantee that the object exists, or that it is in an actual existing relationship with it. A painting may always be of an imagined person or place, and a partial fingerprint may resemble another without having come from the same thumb or finger. The focus of debate is therefore over how to demonstrate indexicality – how to show that the marks did not resemble each other through chance or even fraudulent means, but rather that crime-scene prints are in an actual existing relationship to the supposed perpetrator. Peirce's distinction between iconic and indexical signs lets us see that this is a dual problem, of complex pattern recognition on the one hand, and of demonstrating a causal relationship on the other. Cole outlines how in the United Kingdom a minimum number of sixteen "points of similarity" were mandated for comparison in 1953, whereas in the United States more reliance was placed on expert judgment and on a comparison which took account of other features such as pores, creases or scars,

depending on context and expert (Cole 2001:260-61). Both systems have been shown to have their problems and failures, but regardless, while iconicity is important in giving a first impression of similarity, the work of demonstrating an indexical link is more complex and it is this vinculum on which the evidence stands or fails. This is to acknowledge the haecceity of indexical signs. It is to privilege the particular, the ungeneralizable "thisness" of forensic evidence, which by its nature must be shown to be pertinent to each individual case.

Forensic entomology provides another example of the use of indexical signs by crime scene investigators. In this case the iconic aspects are less obvious, although still present, while the indexical dimensions are more clearly demonstrable and quantifiable. Forensic entomologists study the succession of necrophagous arthropods that colonize the corpse soon after death (e.g., Anderson and Cervenka 2002; Rodriguez and Bass 1983). To simplify somewhat, the arrival of different insects and the stages of their life cycles represented are used to index the time that has passed since death (Catts and Goff 1992). So, for example, blowflies (Calliphoridae) are usually among the first insects to arrive at a corpse, attracted by the smell of decomposition, and by the congregation of other blowflies at the site of death (Archer and Elgar 2003). Depending on local environmental conditions, these and other necrophagus insects are then followed in predictable succession by their predators and parasites, and later by omnivorous beetles, wasps and ants that feed adventitiously on the corpse and its insects. Finally as time passes the corpse becomes a more integrated part of the local environment and other invertebrates such as centipedes, spiders and woodlice may wander on to it or shelter beneath it (Smith 1986). Forensic entomologists can assess the postmortem interval based on the presence of these different species, but also based on the different life stages represented. In the case of the early-arriving blowflies, females lay eggs which then develop into larvae, which grow through shedding their exoskeleton through two molts, then developing into pupae and finally into adult flies. The entomologist collects a sample of the insect stages present and preserves them as evidence of the time that has passed since death. Larvae are also taken back to the laboratory where they are reared to identify species (Rivers and Dahlem 2013:222–29). The succession of insects and life stages therefore acts as an index of time passing. Because indexicality is tied to the particulars of time and place, the forensic interpretation relies upon a semiotic chain that is demonstrably intact and undisturbed, from the action of autolysis, endogenous and exogenous bacteria, and fungi on the body's tissues, through the insect response to the gases produced by the body and the "thanatomicrobiome", to the work of collecting and recording the insects present. All this must be carefully situated within a careful assessment of local environmental conditions, including those of the corpse itself, in order to be sure that the indexicality of the insect succession is properly understood (Rivers and Dahlem 2013:193–214).

This example is interesting semiotically not only because of the role of indexicality in the assessment of time since death or disposal, but also because of the way in which insect semiosis underpins the forensic work. To a human a decomposing corpse is a terrible thing to behold. To a mature female blowfly looking for a reproductive site, it is an attractive prospect. The odors of ammonia and sulfide compounds (LeBlanc and Logan 2009) are signs that this is a suitable vehicle to lay eggs. Forensic entomologists implicitly understand Jacob von Uexküll's insight that different animals exist within different but intersecting umwelten. To interpret insect action as an indexical sign of the postmortem interval requires a bracketing for a moment of the world of human meaning-making and a foray into the semiotic worlds of bacteria and insects. This is to work toward an understanding of the signs that an insect is oriented toward. It also recognizes how the insect itself is an embodied and interpreting sign that can be mobilized in a forensic narrative. Equally, this operates at the microbial level, whereby after death the body participates differently in the life-world, as its microbiome changes, endogenous bacteria migrate out of the intestine, and new bacteria arrive and multiply. As gases are released and putrefaction sets in, so the corpse becomes a site of revulsion and shock for humans. In perceiving these irreversible changes humans realize with dismay that the life they recognize has ended, and the corpse is becoming part of lifeworlds which now ignore the boundaries of the body and the scale of the living human.

This then is not a question of the 'real' material corpse lying behind a world of language or of discursive signs, but rather of an entity whose reality is disclosed and acted upon through the signs that different beings perceive inhering in it. To move toward a fuller appreciation of the reality of the dead body one must understand that the corpse is no less real to fly or human, and that whereas to most people it is a site of horror and disgust, to the blowfly it is a rich and attractive place. In attempting to hold in view these widely divergent semiotic processes involving the dead, we come to a more encompassing disclosure of its reality, without ever being able to grasp it completely.

Black Sea Pottery

Ceramic evidence too can be used to illustrate the ways in which taking a Peircean perspective destabilizes assumed categories of "agent" and "structure," "subject" and "object," and allows us to inquire into how people create and understand their worlds by being brought into semiotically mediated relationships with signs-in-the-world, whether these be experienced as physical, emotional, discursive, or conceptual signs. Ceramics, or more precisely, pottery, is among the most ubiquitous material found on archaeological sites of pottery-producing communities because once fired, it does not break down again into its components when buried. In addition, pottery traditions tend to be highly susceptible to change, whether cultural, technological, or environmental (Arnold 1985). As a result, archaeologists often use pottery as a proxy indicator for a wide range of social

and environmental conditions and their changes over time. Within the general framework of pottery studies, a focus on ceramic technology—reconstructing the process of manufacturing a particular pottery type—been shown to provide an important line of evidence independent from and corrective to the stylistic analysis common in culture-history approaches that tend to look at material culture for its more "symbolic" or representational meanings (Rye 1981; Vandiver 1988). Since the process of pottery production, including the clay preparation and tempering, the forming, firing, and finishing of vessels tends to follow learned practices, it can contain features identifiable with specific groups, and thus can be used by archaeologists to examine boundaries and linkages among groups in the past (Reina and Hill 1978; Stark 1998; Gosselain 2008). Similarities and differences within technological practices thus allow archaeologists a way to identify meaningful links among regional traditions that might otherwise be difficult to determine.

Current theories of materiality and agency have focused on the important issue of how things act as a locus of the social reproduction of meaning. This is of central importance to interpreting material patterns such as those observable in the Black Sea case, where the appearance of a new, interregional pottery-making tradition seems to appear at sites along the coast at the outset of the Early Bronze Age (ca. 3500-2400 BCE). But while it is without question that material objects affect and constrain the way people interact with them, and often shape our understandings of the world, such an approach "tends to blind us to that more complicated world of relations" (Fowles 2010:25). For example, by considering the ways in which absent objects have practical effects, such as a set of lost keys, Fowles points out that the effects of things in the world depend on some level at least on their acknowledgment by humans and other subjects, illustrating that the status of things is not ontological but relational, or, more precisely, semiotic.

Efforts to interpret the significance of an emerging pan-Black Sea pottery-making tradition can benefit from a consideration of the capacity of pottery to meditate regional identities. Here it is important to note that this particular case looks at human-pottery relations and is limited to that for the purposes of the present discussion, but there are other types of relations that could be examined. Anthropologists who focus on the role of discourse in establishing and maintaining social relations suggest that all signs, including material objects, mediate and convey meaning between participants in each social encounter, and in this way act as vehicles for the ongoing circulation of culture itself (Urban 1996; Parmentier 1997; Keane 2006; Urban 2010). This is the process that Urban (2010) terms "cultural motion," in which relationships are emergent from social interactions and the bits of culture that are transmitted and replicated through such encounters. The replication of signs within ongoing discourse acts to mediate new social relations and the cultural traditions they enable, which are at once generative and reflective—articulated by

Parmentier (1987) as signs both *in* and *of* history. “Signs of history,” Parmentier (1987:11-12) explains, refers to those expressions which “through their iconic, indexical, and residually symbolic properties, record and classify events as history.” In other words, these are signs that communicate and comment upon history itself, effectively relating information about cultural continuity and change as time unfolds. “Signs in history,” in turn, refers to those signs which, “as objects, linguistic expressions, or patterns of action, themselves become involved in social life as loci of historical intentionality.” As a result, signs have the capacity to communicate both reflectively and productively as they are encountered in the process of semiotic mediation (see also Parmentier 1985), and together they bring new culture into existence.

This emphasis on the mediative relationships at the heart of exchange and the movement of culture itself provides a way to understand the role that material objects play in cultural motion, and a better way to interpret the pottery of the early Black Sea, where a new pan-Black Sea community seemed to be developing out of the practice of interaction itself. Through an analysis of 4th and 3rd millennium pottery from three regions along the Black Sea coast—the Sinop region of Turkey, the Northwest Caucasus near modern-day Sochi in Russia, and the lower Dniester valley around Odessa, Ukraine—, it was possible to identify a shift in pottery-making practices at the outset of the Early Bronze Age—around 3000 BCE—away from a variety of local technologies and strategies, to the emergence of a single, shared practice of pottery-making among the region’s coastal communities (Bauer 2011). Interestingly, this shared practice did not typically extend to the communities’ inland neighbors, even if they were in closer geographic proximity than those across the Black Sea maritime space, thus suggesting that a coherent “Black Sea” identity was emerging at this time, mediated in part through the materialized social practice of pottery-making.

A semiotic approach thus helps us to understand how a Black Sea “self” could emerge at the onset of the Bronze Age, an identity which is both signaled by and reinforced through material practices and objects. The semiotic functioning of such material objects would have been to convey a powerful message of community among those living along the Black Sea’s shores, and a message of distinctiveness from the inland cultural spheres of Europe and the Near East which were beginning to use the Black Sea as a conduit for travel and influence at that time (Sherratt 2003). The coherence in style and material practices across the region at this time was likely due to a sense of community identity emergent from a growing communication network connecting Anatolia with Europe. As the Mediterranean routes became preferred as the Bronze Age wore on, the Black Sea network would have lost that which gave it a single, coherent identity with respect to a larger world, and along with it, the sharing of material practices seems to disappear (Bauer 2011).

Conclusion

An archaeology built around Peirce's ideas has a great deal to offer for a more nuanced approach to meaning that is not characterized by symbolic or discursive presuppositions. Equally, while the claim that material culture is central to how social relations are constituted, is certainly true, problems arise when material culture is assumed to have an active or agentive role in itself. A Peircean view of semiosis as mediated and multi-modal shows us that the centrality of material objects in social reproduction is due not to its agency but to its position in processes of semiosis. Things act, but always within a context, and that context is constantly shifting. In attending to the dynamics of semiosis Peirce offers a method of inquiry that is inclusive and relational and non-foundational. This then is to broaden the scope of Peirce's potential for archaeology, away from offering a critique of writings on materiality, and toward a reimagining of the archaeological project as a semiotic enterprise that foregrounds the multifarious and changing relationships that are always at play (Preucel and Mrozowski 2010, Crossland 2014). In concluding we should note that this issue of Semiotic Review joins the growing literature in anthropology that explores the intersections of materiality and semiosis (Parmentier 1994; Bauer 2002; Keane 2003; Preucel 2006; Hull 2012; Manning 2012; Fehérváry 2013; Kockelman 2013). This interest spans the anthropological discipline, bringing together subfields that are otherwise rarely in conversation. We'd argue that the very fact that biological anthropologists, linguists, archaeologists and sociocultural anthropologists can all find something productive in Peirce's work speaks to its fecundity and, perhaps more importantly, to its potential for remaking the anthropological discipline in terms that are fit for 21st century concerns.

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