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Making Senses of the Past

Toward a Sensory Archaeology

*Edited by
Jo Day*

*Center for Archaeological Investigations
Southern Illinois University Carbondale
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1. | Introduction: Making Senses of the Past

Jo Day

Correspondances

La Nature est un temple où de vivants piliers
Laissent parfois sortir de confuses paroles;
L'homme y passe à travers des forêts de symboles
Qui l'observent avec des regards familiers.

Comme de longs échos qui de loin se confondent
Dans une ténébreuse et profonde unité,
Vaste comme la nuit et comme la clarté,
Les parfums, les couleurs et les sons se répondent.

Il est des parfums frais comme des chairs d'enfants,
Doux comme les hautbois, verts comme les prairies,
—Et d'autres, corrompus, riches et triomphants,

Ayant l'expansion des choses infinies,
Comme l'ambre, le musc, le benjoin et l'encens,
Qui chantent les transports de l'esprit et des sens.
—Baudelaire (1972:10)

A euphonic song of ecstasy of body and soul, Charles Baudelaire's paean to a multisensory world evokes colors, sounds, and a rich array of scents. Perfumes as cool as infant skin, as soft as oboes, or as green as meadows perfectly capture the multisensory aspects of living and being. Indeed, such was the sensual nature of some of the poems in this collection of 1857, *Les fleurs du* *Making Senses of the Past: Toward a Sensory Archaeology*, edited by Jo Day. Center for Archaeological Investigations, Occasional Paper No. 40. © 2013 by the Board of Trustees, Southern Illinois University. All rights reserved. ISBN 978-0-8093-3287-8.

mal, that both the publisher and the poet were prosecuted for offending public morality.¹ Baudelaire, of course, was not alone in understanding that the senses are the mediums through which humans experience their world, but while artists (in the broadest sense of the word) have generally been indulged with a certain amount of freedom for sensory explorations, such themes have only recently become accepted as legitimate subjects of academic investigations outside their more traditional home in the science laboratory. The proliferation in the last decade or so of journal articles and books concentrating on varying aspects of sensory studies in the humanities (e.g., Berg's *Sensory Formations and Society*), as well as the emergence of a new journal dedicated to this topic (*The Senses*), testifies to an interdisciplinary interest in the actual bodily experience of being human, of tasting, touching, smelling, hearing, and seeing. Much of the initial impetus for this came from the Concordia Sensoria Research Team (CONSERT), based at Concordia University, Montreal. CONSERT members David Howes and Constance Classen have consistently produced work that both shapes and redefines sensory studies (Classen 1990, 1993, 1997, 2005; Howes 1991, 2003, 2005, 2009), and their influence, as well as that of Paul Stoller (1984, 1989, 1997), is evident across an array of disciplines including history, sociology, ethnography, sociocultural anthropology, food studies, human geography, art and cinema, and archaeology.

It was the last of these, archaeology, and the senses that was the theme of the 27th Annual Visiting Scholar Conference at the Center for Archaeological Investigations, Southern Illinois University Carbondale, held in March 2010. The papers presented, many of them published in this volume, demonstrated the multiplicity of ways archaeologists are engaging with sensory studies.² This is not the first book to take sensory archaeology as its subject; previous publications have focused on exploring specific aspects of the sensorium: for example, acoustics (Scarre and Lawson 2006) or color (Jones and MacGregor 2002). In contrast, this volume covers a broad spectrum of sensory modalities, highlighting their interconnections, as well as their distinct roles in past societies. Neither does it claim to be a how-to manual for "doing" sensory archaeology, a historiography of the subject, nor a detailed discussion of the theoretical foundations of a sensory approach to archaeology.³ It should be added that, in general, this volume does not venture into the realms of "science" (although see Chapter 12 for a summary of the workings of the human olfactory system). This is deliberate, and while archaeologists are indebted to the physiological and neurological discoveries that allow us to better understand the human sensory apparatus, this book is not the place for a detailed discussion of such things.⁴ No apology should be necessary for the broad range of material and sites included here, from the Aegean Bronze Age to the American Southwest; rather, this diversity should be embraced as stimulating and challenging and as evidence that a more embodied approach to the past is possible regardless of archaeological specialization. In fact, this endeavor gives lie to the assertion that "archaeology of the senses" remains focused upon a narrow range of prehistoric topics" (Borić and Robb 2008:1), and it is hoped that this volume will open minds to future multisensory investigations of the past.

It is important to mention that beyond academia there is a palpable interest in all things sensory, spurred in part by ever-changing technology. For example, the emergence of electronic books (e-books) and their accompanying readers, such as Amazon's Kindle, has led to debates about the experience of reading on-screen versus on a page. At the center of many of these discussions lies a heartfelt plea that such technology disposes of sensory interaction involving the feel of the pages, the sound of turning them, even the smell of new purchases or of old and familiar books (and bookshops). However, new sensory experiences are being formed simultaneously: for example, when using the touch-screen technology of an iPad or iPhone. Research into virtual reality and the computer-game industry, too, are pushing virtual sensory experiences into ever-closer approximations of real life. While the mid-twentieth-century movie experiments using Smell-O-Vision and AromaRama were not enduring commercial successes, products that promise to transmit aromas via the Internet and computer still seem to fascinate (e.g., DigiScents Scent Dome, Scratch-N-Sniff Pro, AromaJet IPsmell). A recent attempt to make practical use of the close link between smell and memory involved aiding student recall with "memory oils."⁵ Food lovers, too, have been on the receiving end of a sensory revolution. Eating is always a deeply multisensory act, yet advocates of the style of cooking often termed "molecular gastronomy" have been striving to enhance consumption through creating richly layered sensory experiences. Heston Blumenthal, chef and owner of the Fat Duck restaurant in Bray, in the United Kingdom, has developed a dish called "Sound of the Sea" that explores sound's influence on the perception of flavor (see also Zampini and Spence 2010). It is eaten while listening to wave noises on an iPod, thus enhancing the experience of flavor of the seafood.⁶ The Slow Food movement and the rising interest in *terroir*, or the taste of place (e.g., Trubek 2008), have also contributed to a broader awareness of both taste and overall sensory experiences.

Sensory Revolutions

The Senses and Society

One of the essential tenets of contemporary sensory research is that the senses, five of which are mentioned above, are as much culturally constituted as physically given. The contemporary Western sensorium happens to name and recognize five (taste, touch, olfaction, hearing, and vision), but this is neither the sole way nor the "right" way to order perception. Ethnographic studies have been invaluable in opening our eyes (to use a visual metaphor!) to other possibilities, where more or fewer than five senses are apparently conceptualized and accorded varying social importance (e.g., Classen 1990, 1993). Alongside this differential saliency, the senses are laden with symbolic meaning: Seeger's (1975) discussion of the Suya shows how they socially define themselves through hearing and speaking, while vision is associated with witches and smell with animals. Moreover, the significance in some cultures of interoceptive sensations—those that are

perceived within the body rather than with external organs like the nose, skin, or ear—is only beginning to be recognized (Geurts 2002, 2003; Stroeken 2008). Irrespective of how the senses are culturally organized, the layers of meaning will permeate all aspects of society, from the language used to moral values to emic ideas of personhood (Geurts 2002:227). This variety of sensory experience suggests that projects such as the all-embracing “natural history of the senses” (Ackerman 1990) are well-nigh impossible.

As culture-specific sensory orders were noted, the accompanying realization of an apparent hegemony of vision pervading all aspects of modern Western life also emerged. Seeing has become synonymous with rationality and reason, with phrases such as “Do you see?” (as opposed to, say, “Do you smell?”) equated with “Do you understand?” Explanations of this phenomenon have been detailed elsewhere (Classen 1997; Howes 2003; Smith 2007; Synnott 1991a), so a succinct summary follows below. Several intertwining threads have combined to produce this ocularcentrism attributed to the Euro-American world, one of which presents Aristotle as its originator. Writing in the fourth century B.C.E., he offered an analysis of the human sensory apparatus that defined the five canonical senses, among them privileging vision (e.g., *De Sensu* and *De Anima* II) (Jütte 2005:31–46, 54–71). Others have preferred to take the philosophy of Descartes as the starting point for a general downgrading of all things corporeal in contrast to the primacy of the mind (the famous Cartesian dualism), which he felt distinguished humans from animals. Descartes believed that the fallibility of the senses meant that only the mind could be trusted to reveal the truth (Synnott 1991a:70). However, it is important to remember that not all philosophers agreed with this position, and, for example, both David Hume and John Locke stressed the link between sensory perception and knowledge (Jütte 2005:127–128).

Nevertheless, an increasing intellectualization of vision did occur in the early modern era and was aided by the invention of various instruments that enhanced viewing, such as telescopes, microscopes, and cameras. With such instruments allowing glimpses of realms far away or tinier than could be seen with the naked eye, sight became a gateway to new worlds and associated with science, knowledge, measuring, and proof. Such supposedly inverse connections between intellect and the nonvisual senses were supported by the voyages of exploration that brought Europeans into contact with “primitive” peoples who were expected to show a natural predilection for the “lower” senses of taste, touch, and smell (Howes 2003:5). The most infamous example of such thinking is the hierarchical classification devised by natural historian Lorenz Oken combining sensory orders with racial types: The rational European eye-man was placed at the top; the Asian ear-man was just below and followed by the Native American nose-man and then the Australian tongue-man; until, on the lowest rung of the scale, was the tactile African skin-man (Classen 1997:405). Nineteenth-century scholarship became more interested in the measurement and comparison of human sensation, rather than in philosophical debate (Geurts 2002:8). Indeed, the association of sensory investigations with inherent racism probably contributed to academia’s rejection of such studies in the first half of the twentieth century (Howes 2003:6). More recently, Marshall McLuhan and Walter Ong contributed to the

marginalization of other sensory ways of knowing when they proposed a divide between visual and oral-aural societies based on technologies of communication (Smith 2007:8–13). Reading and writing were intimately linked to seeing, while tribal societies were thought to emphasize speaking and hearing. However, ethnographic work has now shown that there are no universalist sensory models of cultures such as those proposed by McLuhan and Ong, but rather a wide range of culture-specific sensory orders (Classen 1997:404; also see Goody [1987] on the concepts of written and oral cultures).

Archaeology and the Senses

Where does all of this leave archaeology, a discipline completely ignored in a recent review of sensory research (Porcello et al. 2010)? During the first half of the twentieth century, as the influence of different theoretical approaches ebbed and flowed within the discipline, emphasis tended to be placed, at one end of the scale, on typologies and material classification, and at the other end, on large-scale processes such as social organization and state formation. Later, processual methodologies adhered to the “archaeology as science” mantra and focused on measurable results and testable hypotheses. The emergence of post-processualism in the 1980s as a response to New Archaeology encouraged archaeologists to jump off Hawkes’s “Ladder of Inference” (1954), an influential model that reified an approach in which understanding ideology and symbolism was believed beyond the capabilities of archaeology. All of these approaches form part of archaeology’s own disciplinary biography and are certainly not being dismissed here. Yet, even as agency and the individual were stressed by postprocessualists, material culture was read as a text, and so the physicality of objects and corporeal human experiences were still missing from interpretation. Indeed, Howes (2005:1–4) sees the current sensory revolution as at least partly a reaction to this paradigm of discourse that was prevalent in much of social science and humanities research during the late twentieth century. Certainly by the 1990s, a realization that the past as re-created by archaeology was peopled by “faceless blobs” (a phrase first used by Ruth Tringham [1991:94]) became a call to arms. Influenced by research in the newly invigorated sensory studies and encouraged by a current scholarly climate that fostered debate, reflexivity, and multivocality, an archaeology that considers a more sensory, sensual, emotional, and experiential past began to emerge. Seminal works—such as those by Hosler (1994), Houston and Taube (2000), Tarlow (2000), and Hamilakis, Pluciennik, and Tarlow (2002)—laid the groundwork for later research in this field.

Concurrent with archaeology’s discovery of sensory studies, modern philosophy offered new approaches to explorations of past humanity. Both Heidegger and Merleau-Ponty developed phenomenological approaches whereby the world becomes meaningful through human interaction with things. Merleau-Ponty (2002) proposed the sensing/perceiving human body as the primary avenue for creating meaning and understanding the human experience. His work has had a significant impact on landscape archaeology in particular, as further discussed below. Michel Serres (2008), through his reaction against the dominance

of language and vision and his celebration of multisensory existence, has also inspired new lines of archaeological inquiry. Crucially, these involve reexamining many of the concepts that archaeologists had assumed immutable, such as color, time, or nature (Insoll 2007). Nevertheless, amid such sensory adventures, archaeology remains a very visual discipline, and no one would doubt the benefits or, indeed, the necessity of using maps, plans, section drawings, photographs, Munsell color charts, sketches, and reconstructions. Similarly, while archaeological fieldwork is a very physical activity and the process of survey or excavation is a multisensory one (as noted by both Tringham and Weismantel in this volume), no one would suggest dispensing with vision as a valued tool. A more sensory approach to archaeology and the past, therefore, does not call for the abandonment of visual analyses, or the privileging of any other sensory order, but is aware of maintaining a balance between contemporary best practice, the use of archaeologically grounded data, and the re-embodiment of the human pasts that we reconstruct.

Bridging the gap between past and present experiences has been a major challenge for archaeologists, and, famously, Binford's development of middle-range theory was seen as one way to surmount the problem. Acknowledgment of our shared human corporeality can be seen as another, and so the body becomes the starting point for sensory archaeology. This body is the physical, perceiving body, the body equipped with the sensory organs found in a fully functioning human being: nose, mouth, eyes, ears, skin, brain and nerves, as well limbs to allow movement. This body is common to humans across the world today and is shared with humans in the past from the moment anatomically modern *Homo sapiens* first emerged as a distinct species. This physical body or the body as a cultural artifact is itself a topic of increasing interest to archaeologists (e.g., Borić and Robb, eds. 2008; Joyce 2005). Numerous theoretical and methodological debates have surrounded "writing the body in archaeology," to borrow the title of Lynn Meskell's (2000) précis of the subject, but sensory archaeology aims to do more than read or write bodies, to go beyond the body's surface toward its multiple somatic experiences. It is crucial, of course, to recognize that all individuals exist in distinct historical and cultural contexts, the confines of which cannot be conveniently overlooked to reembody the past. However, through combining archaeologically informed contextual information with the opportunities provided by a shared sensing body, it is possible to formulate new ideas about past experiences of material culture and place. Or, as summed up by Christopher Tilley, sensory archaeology could be said to enable a focus on "culturally constructed individuals whose personhoods differ while possessing a universal body" (2010:487).

Sensing Landscapes, Sensing Buildings, Sensing Power(s)

Tilley, of course, is one of the archaeologists who brought the issue of the sensing body to the foreground in archaeological work, commencing with his 1994 publication of *A Phenomenology of Landscape*. In particular, it was British

prehistorians who adopted this so-called phenomenological approach, which draws on the philosophical works of Heidegger and Merleau-Ponty and emphasizes an "embodied engagement with the material world" (Brück 2005:46), without getting too involved in the ontological nuances that underpin the original philosophy. Landscape archaeology became the main forum for proponents of this methodology; the archaeologist "enters into the landscape and allows it to have its own effect on his or her perceptive understandings" (Tilley 2010:26). An awareness of the physicality of the landscape and monuments therein, as well as the interrelationship of these features, and a recognition of the agency they possess as more than just backdrops for human activity heralded new ways of thinking (and writing) about the past, all based on experiences in the present (e.g., Bender 1998; Cummings and Whittle 2004; Edmonds 1999; Scarre 2002). Such an approach is not without its critics (e.g., Barrett and Ko 2009; Fleming 2006), and the flaws in a phenomenological approach to landscape archaeology, at least in the earlier stages of its development, are evident. Most apposite for this volume is its reliance on vision, where what can or cannot be seen was granted primary importance (perhaps to be associated with the increased prominence of geographic information systems [GIS] in archaeology), while other sensory impressions were less emphasized or even ignored completely. Another criticism of the phenomenological approach is that it highlights the experience of the individual—frequently a white, Western academic, often male—and therefore omits many other potential interactions with the landscape, such as those of children, women, or groups. Closely connected to this is the question of the degree of familiarity of the researcher with the area. Long-term dwelling and regular habituation to place will produce experiences and memories that contrast with those of an infrequently visiting archaeologist. Many of the studies also tend to focus on ritual monuments in the landscape, at the expense of mundane experiences (Hamilton et al. 2006:33, 35). A final complaint has been the untestable nature of such research: How can a "subjective epistemology" (Barrett and Ko 2009:279) ever be replicated or verified? It should be noted, however, that Tilley himself has recently taken a more multisensory approach to his research and has responded in print to his critics (2010:471–481).

One of the ways archaeologists have been able to gain a culturally situated and sensorially aware understanding of past landscapes has been to cooperate with indigenous peoples where possible (Fowles 2010).⁷ The work of William A. Allen and Perry Fletcher with their indigenous partners Gerard O'Regan and Roger Noganosh, which combines First Nations and Maori understandings of the landscape with more traditional archaeological techniques, is very much in this tradition. In Chapter 2, they explore a potential link between the locations of rock paintings and the ephemeral phenomenon of "shimmer," the visual effect noted when sunlight reflects off the surface of water and brings the painted rock face to life. The transience of such occurrences precludes a regular archaeological study; indeed, shimmer may not even be noticed unless the archaeologist is already attuned to looking beyond the image itself. However, an awareness of the indigenous beliefs relating to the surrounding landscape, where spirits and ancestors are understood to reside, means that interpretations of such numinous

phenomena can move away from metaphor and toward recognition of actual powers in the land itself. The flickering light and dancing painting animate the rock as a nonhuman person, or a coactor, in rituals performed there. It should not be a surprise to find that something as apparently inanimate as rock can be perceived as alive, potent, and even a gateway to another world; indeed, other works have highlighted this issue in different cultures (e.g., Herva 2006; Lewis-Williams and Dowson 1990). Seeing beyond the static image is only one aspect of experiencing these rock-art sites, and sound, too, can play a key role (see also Boivin et al. 2007; Goldhahn 2002; Waller 2006). Spirituality of place may be further emphasized by the kinesthetic experiences required to create or interact with these Maori and First Nation sites: They are accessible only by water during favorable conditions, and thus the journey to the site also becomes incorporated into its meaning (Tilley 2008).

Karen Holmberg (Chapter 3) too stresses the link between a living landscape and its inhabitants, in this case, the supersensory experience of volcanic eruption. She uses analogies from her own life in New York City to draw attention to the mutability of landscapes, moving from benign to dangerous and back again to benign, replete with new (bodily) memories. Reconstructions of past perceptions must always be carried out in the distant present, but the experience of an erupting volcano is perhaps one of the few events during which it may be possible to at least approach past corporeal effects, whatever about their associated cultural meanings. Based on fieldwork in Panama, Holmberg demonstrates how these active landscapes make their way into myths and folktales, which through their retelling across generations help make sense of the violence of nature. In a similar fashion, the curation of material remnants of eruptions may also guide social memory and even offer a sense of regaining control over an unstable world. Her discussion of art exhibitions based on volcanic themes highlights that, while archaeology remains essentially text-bound, artists can produce the type of multisensory presentation that best encompasses something as intense as a volcano. This debate about presenting a sensory past in the present is returned to in greater detail later in the volume in Chapters 18 and 19.

Corin C. O. Pursell's work (Chapter 4) moves from thinking about the landscape to considering both the interaction between a settlement and its setting and the interaction of specific monuments within the settlement, in this instance Shiloh Mounds in Tennessee. Focusing on ritual action in public monumental settings, he explores control of space and the perception of mounds using a methodology that combines angles of visual perception with the actual form of public space. In discussing the different functions and audience experiences of Mound A and Mound C, he concludes that not only did each mound support varying social agendas within the community but that Mound A also functioned as a statement to the outside world. Furthermore, Pursell's research ties in to the important archaeological work on the symbolic roles of color (e.g., Cleland and Stears 2004; Hosler 1994; Houston et al. 2009; Jones and McGregor 2002), and his careful contextual examination of the use of red and white sediments in Mounds A and C suggests shifting control of symbolic media and potentially fluid meanings that changed over time.

The theme of elite-controlled experience of place as an expression of power is a concept Ryan Mongelluzzo also explores in Chapter 5 on Maya Classic palaces. Comparing Holmul and Tikal, Mongelluzzo discusses the interplay between architectural design and bodily effects. Unlike the situation with many other prehistoric societies, detailed iconographic and epigraphic evidence allows some insight into the Maya sensorium, and Mongelluzzo draws on these culture-specific understandings of seeing and hearing for his chapter. Indeed, when possible, sensory archaeologies should make use of contemporary texts to complement the physical remains, albeit with due caution. Movement within the Maya palace, as well as from inside to outside spaces and from public to private spaces, was accompanied by constantly changing sensory effects; smells, temperatures, light, colors, viewsheds, and sound filters all combined to reproduce and reinforce the social hierarchy in a spatial dimension. Mongelluzzo's chapter analyzes how this intricate palace design therefore affected and even controlled sensory perception. This work pushes a phenomenological approach toward new directions, focusing on a complex built environment rather than on the more usual landscape setting.

In a similar vein, Mary Weismantel presents a study of the sensory interfaces at the well-known site of Chavín de Huantar in Peru (Chapter 6). She notes that current archaeological interpretations of both the carved stone monuments and the site layout are heavily dependent on contemporary techniques of seeing, which use line drawings to offer instant totalizing narratives. However, when confronted with the physical reality of the monuments and architecture, a completely different way of viewing is required, necessitating bodily interaction and providing a far more fragmentary understanding of the whole. Whereas Mongelluzzo's chapter focuses on one entity—the palace—Weismantel considers the site as a whole to be moved through in processional fashion, with the elements of unpredictability and wonder essential to the experience of Chavín as a pilgrimage site. She also draws attention to the divergent experiences of place, based on the different social roles of the subject(s), reminding us that there is no one true past experience but rather a multiplicity of valid experiences.

Embodied Rituals

The merging of more than one sense is a feature of many of the chapters in this volume, corresponding to the normal multisensory human experience. Although research has suggested culturally specific hierarchies of senses, whereby one particular mode of sensory perception becomes the dominant paradigm, it is accepted that all humans rely on the full sensorium in their daily lives. Chapters 7 through 9 emphasize this aspect of sensory archaeology, focusing on the interplay among the senses at specific ritual events or places. In Chapter 7, Candace Weddle explores the experience of sacrifice in Roman imperial cult through analogy with contemporary Islamic animal sacrifice in Turkey. Animal sacrifice was an important element in many of the rituals of ancient Rome and has long been the focus of academic inquiry. Perhaps unsurprisingly, study of the phenomenon has relied

primarily on literary sources and iconographic evidence, leading to what Weddle terms "senseless" examinations of the ritual. In the tradition of autoethnographic research, she investigates the impact of large-scale animal sacrifice on both the worshipper and the location itself, although she is careful not to claim that her experiences replicate a precise historical moment. To see this chapter as merely aiming to shock via graphic descriptions and images of animal sacrifice is to miss one of the author's main points: Experiencing the full multisensory sacrificial process led her to formulate new research questions pertaining to activities before and after the fatal moments frozen in iconography or texts.

Ritual is also the focus of Heather Hunter-Crawley's research, but her Chapter 8 concentrates on a later period: the world of sixth-century Christianity. Complementing Weddle's emphasis on the bodily experience of being a worshipper, Hunter-Crawley considers the sensory affordances of the material culture used in Eucharistic ritual. Taking the Riha Hoard as her case study, she discusses the multisensory experiences associated with the chalice, paten, and fan, as well as related ecclesiastical objects such as censers and lamps, the use of which allowed worshippers to physically encounter the divine. Like Mongelluzzo, Hunter-Crawley is able to draw on texts describing early Christian attitudes toward the senses, such as the idea of the "tactile eye," itself derived from earlier Classical concepts of extramission. These support her suggestion of a more nuanced and interrelated notion of body and soul, in contrast to the Cartesian mind-body duality often imposed on the same material. To merely "read" artifacts is, as Hunter-Crawley states, to deny them their own materiality and presents an intellectual challenge to archaeologists grappling with the concept of material culture (e.g., Boivin 2008; Gosden 2005; Hurcombe 2007; Knappett 2005; Meskell 2005). Certainly objects become interesting as they reveal the "social and individual self-creation" associated with them (Olsen 2003:91; see Miller 2008 for a recent anthropological study of people and their things). However, objects are also interesting because of their "thingness," or materiality, which actively affects their creation and uses and which is perceived by humans through our senses. An approach to material culture informed by sensory archaeology, therefore, considers not just the associated symbolism and potential social meanings of things, but it also pays close attention to the bodily effects of things on people within a culturally specific context. This theme is returned to later in this volume in chapters by Day and Dakouri-Hild.

In contrast to the specific religious rituals discussed by Weddle and Hunter-Crawley, Ruth Tringham (Chapter 9) focuses on the rituals of daily life in a study of the senses of touch in the past and the present at Çatalhöyük. Previous archaeological studies on touch have concentrated on what Rodaway (1994:50) termed "reach touch," that is, active tactile encounters, usually with the hands. MacGregor's (1999) work on carved stone balls is the genesis of this genre and other researchers have followed in his footsteps, adding a haptic dimension to studies of stone (Tilley 2004), rock art (Ouzman 2001) and monuments (Cummings 2002). Ingold (2004) has also drawn attention to "pedestrian touch," focusing on feet instead of hands, which should certainly not be overlooked in studies of the past. In contrast to these studies, "global touch" (Rodaway 1994:48–50) lies at the

heart of Tringham's chapter. Using Ingold's concept of the taskscape, Tringham explores the "full-body haptic-tactile-kinesthetic sensual experience," reminding us that since movements construct places, an awareness of our experiences in the here and now can be a guide to experiences of past peoples. Crucially, she grounds her theories in archaeological evidence from the site; hence, osteological results suggest habituation to squatting, and architectural remains demand certain movements—crouching, climbing, perhaps even falling. This exploration of the rhythms of activity that effectively help "places make sense" as "senses make place" (Feld 1996:91) demonstrates that a sensory archaeology is not restricted to elite or elaborate events and places but can also elucidate everyday experience (as demonstrated by King and Sánchez Santiago 2011).

Exploring Sensory Modalities in the Past

Although Tringham's contribution is mainly about touch, it is clear that such a separation of the senses is an artificial one created to enable an academic presentation of a particular facet of human experience. The following chapters focus on other individual senses (hearing, taste, and smell) but by no means suggest that these senses are prioritized within the societies under discussion. Rather they are explorations of aspects of an interconnected human sensorium, separated here to allow an archaeological investigation of previously overlooked aspects of the material. In a similar way, the surge of publications focusing on individual senses sought to redress the apparent ocularcentrism of academia but were not intended to herald a new sensory hierarchy; select examples include acoustics (Bull and Back 2003), taste (Korsmeyer 2005), touch (Classen 2005), and smell (Classen, Howes and Synnott 1994; Drobnick 2006). It is also important to ensure that, when other senses are emphasized in academic studies or fieldwork, research with a visual basis is not forgotten or even denigrated, as one visual anthropologist has warned against (Grimshaw 2001:6; see also Edwards and Bhaumik 2008). To that end, Pursell (Chapter 4) shows how to take visual research in new directions.

Archaeoacoustics

The archaeology of sound is perhaps the most well developed of sensory studies that focus on the past, and research falls roughly into two categories. First, there is the study of ancient sound-making devices, often including experiments on how to play them or otherwise establish the range of notes that could be produced, although actual melodies and rhythms cannot generally be apprehended. Such work is often grouped under the heading "archaeomusicology," and includes such examples as Tutankhamun's trumpets (Kirby 1947) and Irish bronze horns (Coles 1967). Investigations into the earliest production of music by humans are related to this category (e.g., Dams 1985; Zhang, Xiao, and Lee 2004), but this topic spreads far beyond archaeology into evolutionary and neurobiological studies (Mithen 2006; Wallin, Merker, and Brown 2000).

The second category is a study of the behavior of sound—not just music—at archaeological sites; these can be either natural places featuring evidence of human activity and even modification, such as caves and rock-art locales (e.g., Boivin 2004; Goldhahn 2002; Loose 2008; Ouzman 2001; Reznikoff and Dauvois 1988), or man-made monuments, such as passage graves and stone circles (Devereux and Jahn 1996; Watson 2001; Watson and Keating 1999). All such studies emphasize that considering soundscapes is as important as considering visual effects and that a more integrated multisensory investigation may help in understanding the functions of the sites in question. In their earlier manifestations, these archaeoacoustical studies focused on measuring resonance and sound frequencies at the sites, thus providing quantifiable scientific data (e.g., Jahn, Devereux, and Ibison 1996). Indeed, the physiological and psychological results of certain sonic effects have been noted (Cook, Pajot, and Leuchter 2008; Watson and Keating 1999), fueling speculation about a link between monument design and the use of sound in ancient rituals, whether to attain an altered state of consciousness or to induce feelings of awe, fear, inclusion, or exclusion (see Needham [1967] and Tuzin [1984] for seminal articles on the power of sound).

As the archaeology of sound has become more established and has been influenced by wider sensory studies, measuring sound waves, while still providing intriguing food for thought (see the recent work on the prehistoric structures of Malta, for example, presented by Linda Eneix at this conference), is being complemented by a deeper engagement with the social meanings of the construction and use of sound and soundscapes (Boivin et al. 2007; King and Sánchez Santiago 2011). Feld's (1996) concept of "acoustemology" is useful here, drawing attention to acoustic knowing and sound's role in making sense of place. Ethnographic case studies provide opportunities to broaden our understanding of the myriad ways humans perceive and make sense of sound (e.g., Feld 1990; Porath 2008; Stoller 1984). The challenge for archaeologists, in acknowledging this diversity, is to tease out the deeper meanings of sounds and sound-making devices for past societies.

Chapter 10 by Joe Williams is a welcome addition to the archaeological corpus on sound and is unusual for focusing, not on prehistory, but on medieval England. Using the concepts of access analysis and copresence zones, he analyzes the musical space and the quiet space within two monastic structures, with the second of these categories perhaps inverting what is normally considered within the remit of archaeoacoustics. But quiet, silence, and the absence of noise can be culturally meaningful, too, yet are often overlooked in the clamor to focus on sound. At his chosen sites, aural experiences were structured by the architecture as well as by the different rules followed at each location according to the monastic order of the participants. Drawing on excavation reports, Williams is able to comment on the various types of noises that permeated the monastic walls—the human and background noises—as well as the temporal quality of the sounds. Moreover, as Weismantel also points out, there were many possible experiences of a (monastic) soundscape, varying according to the identity of the hearer—whether monk, visitor, tradesman, or even dog!

Eating, Tasting, Remembering

Moving from ears to mouths, Marie Hopwood's contribution (Chapter 11) turns to the sensuous world of food: of cooking, eating, and tasting as evidenced in archaeological material. Somewhat surprisingly, taste was the least well represented of the traditional five senses at the Carbondale conference. Within archaeology, focus on food has shifted over the last century from ignoring, or at best merely recording faunal and paleobotanical material, via a subsistence-driven outlook typical of processual approaches, toward studying the social meanings of eating and, in particular, feasting (Dietler and Hayden 2001; Wiessner and Schiefelhövel 1996). Until recently, therefore, the dominant approach within archaeology "focused mainly on procurement-production, rather than consumption" (Hamilakis 2000:56). The concept of feasting is one that archaeologists have embraced wholeheartedly, although attending to the sensory act of eating has been overwhelmed by using the feast to frame social and political issues, such as status negotiation, resource control, and the roles of commensality. There are signs though, at least in some branches of archaeology—for example, the Aegean Bronze Age—that the multisensory feast is gaining prominence (e.g., Day this volume; Fox 2008; Hamilakis 2008).

Despite this increasing interest in the archaeology of food, little has been done on actual taste. The term *taste* is, of course, an ambiguous one, entailing moral or ideological judgment ("to have good taste"), but here it is used to imply flavor preferences. Taste is one of the most intimate of the senses, as tasting only occurs once something has been incorporated into the body, via the mouth. As with exploring other senses from the past, a skeptical response is that it is impossible to say anything meaningful about something as personal and ephemeral as taste. After all, food preferences vary among people who share a culture, as well as within individuals as they move through different life stages (Macbeth and Lawry 2006:3). However, taste is also a cultural phenomenon, and even allowing for economic and ecological variables, it is closely linked to beliefs about what is "good to eat," often reinforced through taboo, dietary restrictions, or social hierarchies. This concept of social taste in turn is tied in to the material used in storing, preparing, and serving these substances. This, then, is how archaeology can approach taste: not on the individual level, but on that of the society and is the approach taken by Hopwood.⁸ Through a study of the ceramic use alteration at the site of Fıstıklı Höyük in Turkey, diachronic changes in the shape and size of vessels point to fluctuations in cooking and storage needs within the community. Like Tringham, Hopwood's chapter considers quotidian performances (of food preparation here) rather than extraordinary events. By focusing on vessel changes as related to the foodstuffs within, rather than as isolated technological changes, she builds up a picture of a past cuisine that encompasses tastes and activities together (cf. Isaakidou 2007; Joyce and Henderson 2007). It is to be hoped that a future exploration of ancient tastes might combine Hopwood's ceramic-based approach with Isaakidou's focus on faunal remains and Valamoti's (2009) discussion of plant foods, approaching ever closer to the "gustemology" (Sutton 2010:215) of past societies.

Eating, tasting, and food are intimately tied in to memory, a theme that pervades many of the chapters in this volume. While Hopwood does not explicitly discuss this in relation to food at Fıstıklı Höyük, the powerful bodily memories created by the consumption of food and drink have been of considerable interest to anthropologists (Holtzman 2006; Seremetakis 1994; Sutton 2001). More broadly, Paul Connerton's (1989) work has been influential in archaeologies of memory, with his concept of "incorporating practice" in particular becoming pivotal for sensory studies. For it is not just tastes or recollections of food that are evocative, but smells, sounds, sights, and kinesthetic memories also recall similar moments in the past, what he calls "mnemonics of the body" (Connerton 1989:74). However, Connerton's traceless incorporating practices do not take into account the material culture—the cups, the food, the incense—that enables bodily memories to be created. As a result, Hamilakis has recently suggested abandoning the opposing categories of incorporating and inscribing mnemonic practices and instead focusing on the "shared mnemonic power of all material sensorial interaction" (2010:192).

Archaeological studies of memory also draw on Pierre Bourdieu's concept of *habitus*, where bodily practices both reflect and reproduce elements of society, as well as the idea that material culture can be seen as a means for "storing memory in extrabodily form" (Jones 2007:1). It is this characteristic of archaeological finds that facilitates the use of archaeology in nationalist agendas and imaginations. Material remains can be seen as providing emotional and tangible links to the past, in embodied support of present ideologies (e.g., Hamilakis 2007). It is obvious that memory is currently riding a wave of popularity within archaeology: The work of Van Dyke and Alcock (2003) was an early foray, while more recently, Mills and Walker (2008), Borić (2009), Georgiadis and Gallou (2009), and Lillios and Tsamis (2010) have all explored different aspects of the theme. Perhaps this is not surprising; after all, it can be said that "all archaeology is about memory" (Hamilakis 2010:188). As with all subjective experiences, however, there is never one true memory to be investigated but rather a concept operating on multiple levels simultaneously, whether individual, social, or even invented (Holtzman 2006:363). Archaeologists, while exploring the role of the senses in remembering the past in the past, must remain aware of whose memory they are presenting in the present.

Smelling the Past

Smell is especially noted for its mnemonic powers, and the fame of the Proustian moment, combining smell, taste, and memory, is far-reaching. While the following three chapters (12, 13, and 14) on olfaction in the past do not take memory as their specific concern, the close link between remembering and scent is an integral element in each work. Archaeologies of smell are not common, although Insoll (2007:49–53) briefly discussed a material-based methodology for such explorations. Considering that an aroma cannot be excavated, this careful reliance on the archaeological material is essential and is a shared feature of these

chapters. Joanne M. Murphy's contribution (Chapter 12) provides a summary of the physiology behind the human sense of smell, highlighting the particularly close connection between the olfactory system and the brain. While she stresses that all senses are used by humans in evaluating the world around them, scientific studies suggest that smell has a very immediate effect on the brain and, hence, on our emotions and memories. Murphy explores this idea through the lens of perfume manufacture and use at the Late Bronze Age palace of Pylos, in Greece. The decipherment of Linear B texts revealed a world of palatial administration, where perfumed oil was one of a number of goods closely controlled by the elite. While perfume manufacture contributed to the Pylian smellscape at large, the restricted use of the finished commodity helped create and maintain social hierarchies. As Synnott remarked, odor "is above all a statement of who one is" (1991b:438), and the links between smell and identity are strong. Furthermore, by thinking about the corporeal effects of the Pylian perfume industry, Murphy takes studies of Mycenaean wealth finance and elite gift exchange in new directions: A gift of perfume carries a reminder of social obligations with every inhalation, a truly embodied memory.

The scent of perfume wafts through Emerson Avery's Chapter 13 too, but here it mingles with the smells of death and decay. Focusing on the experience of visitors to Roman and Byzantine era tombs in the cemetery of Beth She'an-Scythopolis, Avery reminds us that not all smells are pleasant. In the close, lamp-lit environment of the chamber tomb, the proximate senses come to the fore, and the pungent mixture of perfumed oils, foodstuffs, and human remains would have created in the visitor a very specific bodily memory, made all the stronger by the use of many familiar items in this unfamiliar context (see also Hamilakis 1998). Unpleasant sensory experiences have been less well explored in archaeology and anthropology, with a few notable exceptions (Bartosiewicz 2003; Bubandt 1998; Corbin 1986; Holtzman 2010; Stoller and Olkes 1986; see also Miller 1997). Crucially, Avery emphasizes that olfactory likes and dislikes are culturally conditioned; indeed, olfaction has been described as "a moral construction of reality" (Synnott 1991b:438), enabling an "othering" of those who smell differently, in every meaning of the phrase (e.g., Almagor 1987). Thus, learning to smell correctly is an essential element in socialization, and laboratory tests have demonstrated the experience-dependent nature of odor perception (Ayabe-Kanamura et al. 1998). On a broader scale, this also reminds us that it is essential not to impose a contemporary Euro-American or Western construction of sensuousness onto other societies (Holtzman 2009:57–61) and, of particular importance for archaeology, onto those of the past.

Chapter 14, by Jo Day, returns to Bronze Age Greece, this time to the island of Crete and the Minoan civilization. The concept of synesthetic material culture is used here to investigate new ways of understanding stone and ceramic vessels with relief floral decoration. True synesthesia, where the subject automatically experiences cross-modal perception, such as attributing smells to colors or shapes to tastes (e.g., Cytowic and Eagleman 2009), is not the focus of this study. Rather, it discusses how the deliberate stimulation of one sensory modality can

trigger other sensory responses. As with Hunter-Crawley's (Chapter 8) work, the emphasis is on the user's bodily interaction with the chosen objects, but links to olfaction in particular are explored, with the vessels' decoration suggesting a deliberate attempt to stimulate the sense of smell at communal events. On a larger scale, it is also suggested that in the light of a range of other archaeological evidence, olfactory stimuli were regularly manipulated in Minoan society to create emotional and mnemonic bonds and may have had ritual significance. This chapter also engages with the challenge of how to depict something as ephemeral as a smell or a sound, demonstrating that in fact this apparent difficulty resides within contemporary Western epistemology and need not be problematic in other societies.

Sensory Production

There are many different archaeological approaches to understanding ancient technology and production, usefully summarized in Dobres (2010). The next three chapters in this volume (Chapters 15, 16, and 17) shift emphasis from consumption onto matters of production, in particular the idea of interplay between object and craftsperson. That objects or materials have "social lives" is not a new concept (Appadurai 1986), but it is the sensory aspects of this interdependence (e.g., Saunders 2001) that are brought to the fore here. Anastasia Dakouri-Hild considers the multiple material lives of agate objects in Late Bronze Age Thebes through the unusual approach of focusing on "unfinished, failed, and partially recycled" artifacts (Chapter 15). A key difference between her study and the more traditional *chaîne opératoire* approach to object biographies is that she allows for a dynamic relationship between the craftsperson and the material itself. Thus, the very materiality of agate may help direct the craftsperson's work—its stripes and bands suggesting forms to the experienced eye, its weight and cool smoothness perhaps pleasing in the hand—and failed artifacts offer opportunities for "sensory play." Relating these discarded objects to Theban society more broadly, Dakouri-Hild wonders whether a form of "sensory pruning" was carried out by the elite, where "workmanship of risk" (Pye 1995) was not appreciated and adherence to a certain aesthetic was preferred by those in authority.

The sensory experiences involved in manufacturing are also to the fore in Jonathan T. Thomas's contribution (Chapter 16), where he recounts experiments in crafting Late Neolithic Iberian slate plaques. Thomas writes of the specific sounds made when carving patterns into the stone, of the acrid smell and taste that accompanied the activity, and of the pain carvers experienced as their hands became raw. These are truly the embodied experiences of craftsmanship, and like Avery's (Chapter 13) aromas of decay, these unpleasant effects are as important as the pleasing tactile interaction with the smooth finished artifacts. Thomas reminds us, however, as Tringham (Chapter 9) and Murphy (Chapter 12) also note, that habituation changes the nature of the sensory experience. He proposes, therefore, that if those who made the plaques in Neolithic times were more experienced than his novice students, the acuteness of the perceived sound, smell,

and pain would have lessened over time, perhaps to be replaced by other dominant reactions and mnemonics or perhaps even to be enjoyed rather than disliked (remembering that sensory likes and dislikes are culturally conditioned).

It is interesting, too, to situate Thomas's work within experimental archaeology more generally. Despite its aim of testing hypotheses about past practice using an experience-based approach, many archaeologists manage to ignore the actual experience in their results. As Thomas himself notes, publications focus on how many kilocalories it takes to chop down a tree with a stone ax or what precise temperature is needed to cook meat in a skin (Coles 1973:51). On the other hand, Mathieu (2002:4–5) has recently identified the emergence of a form of behavioral replication he calls "phenomenological," noting that if better controls were in place human perception could indeed be approached through experimental archaeology (for an example of this approach, see Molloy 2008). It is surely to be expected that future experimental archaeology will follow in this direction.

Krysta Ryzewski (Chapter 17) switches from an emphasis on the body of the craftsperson to the body of the actual artifact and examines the sensory experiences that lie embedded within metal at a microscopic level. Using the material from three family-run iron production sites in colonial period Rhode Island, she investigates the sensory cues that facilitated successful smelting and ironworking, as well as the transfer of this specialist knowledge. As Thomas wonders who the audience for plaque making was, in the preceding chapter, so Ryzewski also considers craft production as performance. Public display of the production process showcased the skills of the ironworkers while simultaneously creating a distinction between their specialized knowledge and the uninitiated audience (see also Carter 2007). This same audience, of course, were the ones who complained about what were, to them, the unpleasant smells and sounds that accompanied the process, yet again reminding us of the diverse sensory perceptions of the same activities.

Telling a Multisensory Story

The final two chapters in the volume revolve around how to present the past and how best to communicate the results of sensory research. Catherine P. Foster (Chapter 18) discusses the dissemination of sensuous pasts and presents at the Badè Museum of Biblical Archaeology and Doug Adams Gallery. Her curation of an exhibition *Lived Experience in Ancient Judah* allowed Foster to create thematic multisensory experiences for the visitors, where contrary to the norm in most contemporary museums, they were encouraged to "Please Touch Gently." Interacting with the exhibits in such a tactile way harks back to practice in the earliest museums, where touching the artifacts was deemed an essential and expected part of the visit (Classen 2007). Only later in the nineteenth century did the past become secured in glass cases, to be appreciated solely with an educated eye.

Foster, like Tringham in Chapter 9, alludes to the developments in technology, in particular haptics and virtual touch, that allow ever more realistic encounters

with artifacts without actually touching the real thing. This "digital touch" has been discussed in detail elsewhere (Paterson 2007) and was the subject of a paper by Linda Hurcombe at the Carbondale conference. Yet digital touch removes the opportunity to interact with the authentic and eliminates the personal engagement with the past engendered by handling objects from the lives of others or feeling "what others have felt" (Classen and Howes 2006:202). Such reproductions and non-artifacts (antifacts?) may therefore deliver a less satisfactory experience, an intangible sense of diluted "aura," to borrow Walter Benjamin's (1992) term. It should be asked whether the opportunity for experiences of the authentic will continue to be restricted to museum staff, archaeologists, and other such trained professionals, in the name of preserving and protecting artifacts. This was one of the issues that sparked debate at the conference, and although perhaps heretical, the idea of designating certain items as "sacrificial objects" to be handled, played with, and even broken by museum visitors should perhaps be considered. After all, why should we expect the public to be content with replicas and digital copies, while maintaining our own privilege of touching the genuine past?

The second exhibition that Foster discusses was a contemporary artist's exploration of "an archaeology of the senses." Whereas Foster strived to create holistic sensory experiences in her exhibition curation, Pamela Blotner focused on individual senses in each of her archaeologically inspired works to build up a layered effect of a full sensorium. Foster's comment that contemporary art can make archaeologists conceptualize material culture in new ways accords with Holmberg's (Chapter 3) comments on art's potential to convey experience. It is undeniable that archaeologists cannot avoid text and images as the current standard means to communicate research. But perhaps further cooperation with artists would allow more imaginative and emotional responses to the past to be explored beyond the self-imposed limits of a reproving academia.

To accompany her multisensory museum visit, Foster developed what she terms a *micro-narrative*, where the material was enhanced by textual explanations written from the point of view of a young girl in the ancient community, albeit mediated by the curatorial voice behind it. Ruth M. Van Dyke further develops this theme in Chapter 19, the book's final chapter, in which she tackles the potentially contentious issue of writing a more sensuous archaeology. While sociocultural anthropologists have been relatively proactive in considering the subjective nature of their writing (e.g., Clifford and Marcus 1986; Geertz 1988; Waterston and Vesperi 2009), archaeological writing generally has strived to maintain a patina of scientific objectivity, despite now recognizing the interpretive nature of even the most basic report (see Joyce 2002 for discussion on archaeological writing). So-called thick description, a descriptive and contextual style of ethnographic writing celebrated by Clifford Geertz (1973), is perhaps most closely approximated in archaeology by the writings of Tilley and other "landscape phenomenologists." Their accounts are bound by the researcher's first-person field observations (thus providing ammunition for those who critique the highly personal and subjective nature of such writing), a point Tilley sidesteps through exaggeration, stressing that he does not wish "to go around pretending to understand something from the point of view of a female Neolithic weaver with twins" (Tilley 2010:474). This

protest against past voices masks lost opportunities, as Van Dyke explains, because imagined narratives offer the chance to present a multivocal past. The two accounts she presents here of a visit to Chaco Canyon, by a teenage girl and by the girl's grandmother, allow a freer exploration of different experiences of the same place and different understandings of the same material culture. Thus, side by side, they combine to present a fluid, dynamic, and more human interpretation of a past culture. Although the voices are fictions, all that her protagonists say and do is rooted in Van Dyke's own knowledge of the archaeology of Chaco and her own multisensory experience of the place.

Of course, Van Dyke is not the first to employ imagined narratives in archaeological writing. An issue of *Historical Archaeology* (32.1, 1998) was devoted to archaeological story-telling, and Mark Edmonds, for example, felt encouraged to experiment with intermingling story, material, and theory because "[t]he past constructed on the page was peopled either by dull archetypes who spent their lives chasing and producing food, or automata, blindly reproducing abstracted and simplistic symbolic codes" (Edmonds 1999:x). In contrast to Van Dyke's individual voices, Edmonds adopted the omniscient narrator perspective, a tactic that subtly underlines the sense of distance between past and present. Certainly, if we are to follow Stoller's exhortation to replace "bloodless language" with "sensuous scholarship" (1997:xv), a new way of writing the past must be utilized, at least in tandem with traditional scholarship.

It is often assumed that the target audience of these works must be the rather daunting "interested but nonspecialist member of the general public." With their vernacular language and lack of academic baggage (e.g., references, footnotes, and tentative framing of hypotheses), such works are undoubtedly more accessible to all, but that should not preclude these narratives from making other archaeologists rethink what they know and how they know it. Imaginative explorations of the past are carried out as much for the writer as for the reader (Gibb 2000:5) and can be valuable guides to future research, as Van Dyke herself points out. Her list of decision points encountered during the crafting of her Chacoan narrative provides an insight into her creative process. However, this "interpretive narrative archaeology" (McCarthy 2003) is not without its critics (e.g., Fleming 2006:275–276; Hummler 2008), and archaeologists must bear in mind the responsibility inherent in creating imagined or fictional pasts that may be understood elsewhere as definitive presentations. In the context of this volume, it is prudent to remember, too, that we must tread carefully to avoid projecting our own sensory values into these narratives, even if we can perceive sensory experiences in a similar fashion.

Sensing the Past in the Future

The irony of presenting multisensory archaeological research in a standard edited volume is not lost on the contributors and editor. Papers at the conference were accompanied not just by the now-standard PowerPoint presentations, but also by videos, sound recordings, and replica artifacts for handling. To

some degree, therefore, a written version can be seen as an "anticlimax" (Howes 2003:57). Indeed, during the social events that followed the day's papers, ideas were (only half-jokingly) bounced around about whether this book could have a tactile cover or scratch-and-sniff pages or colored and textured paper or pop-out images and sound effects. A supporting Web site to host the various multimedia materials was also investigated as a more feasible option (e.g., see King and Sánchez Santiago 2011 for online supporting aural material), but issues of intellectual property rights prevented its inception. But would such features have added anything to the scholarly value of the end product or just been attention-grabbing tricks? The answer depends on how such elements are used, much like sensory archaeology itself. Whether an approach to the past informed by sensory theories represents a paradigm shift, as debated more than once at the conference, or is just the latest sparkly new trick in the archaeologist's toolbox depends on what happens next. It is no longer enough for us to shout that the "faceless blobs" need to be given bodies and emotions. In line with Herzfeld's (2001:240–253) comments on an anthropology of the senses, an archaeology of the senses must avoid becoming a catalog of case studies and a marginalized branch of archaeology; rather, it needs to be seamlessly adopted into future interpretations of past cultures.

A number of themes emerge from this book that are pertinent for this incorporation of a sensory approach into mainstream archaeology. Many of the authors here are concerned with techniques of the body, unsurprising considering that the senses are ultimately corporeal in origin. Habituation, daily lived experience, movement through landscapes and around sites and buildings, apprenticeship, and performance are elements common to many of the chapters. While none of these themes are the prerogative of a sensory approach, the addition of sensory information enriches them further. The active manipulation of the senses is a second theme, whether that manipulation is by elites, authorities, craftspeople, or cooks and effected through landscapes, buildings, or material culture. We are also asked on more than one occasion to reflect on unpleasant sensory experiences—such as smelling foul odors (bearing in mind their cultural specificity), falling, or getting lost—as well as on the material results of sensory experiences—such as imperfectly crafted artifacts—all of which remind us that the past was far from a perfect world. Interestingly, only two chapters refer to altered states of consciousness (Weismantel; Day), although if the full gamut of past sensory experiences are to be recognized, these other ways of knowing and perceiving must be taken into account too (see Price 2001 and Hume 2007 for such an approach). It could even be suggested that the desire and capacity to experience other worlds or the feelings of awe when faced with natural phenomena such as sunlight shimmer or volcanic eruptions are candidates for recognition as other human senses. A caveat: The potential richness of sensory approaches must not lure archaeologists into "peopling the past with people like us," as discussant Robin Beck cautioned at the conference.

Perhaps most provocatively, the issue of presenting a multisensory past arises. Some museums are moving toward including greater interactivity with artifacts and/or replicas, and the developments in digital technologies will

undoubtedly lead to ever more "real" virtual experiences. Whether these are as satisfying, both emotionally and intellectually, as touching the actual objects or visiting the sites remains to be seen (see Chatterjee 2008 for debate). Writing archaeology in a way that allows for greater scope to experiment with interpretation and multivocality (another theme common to several chapters) may well become a regular accompaniment to traditional texts. As Praetzelis (1998:1) noted, "The site contains many potential stories, but every one is a product of the archaeological imagination that pulls together historical and archaeological facts into an interpretation that is more than the sum of the parts of which it is made and more than its excavator can document in the usual way." We are all storytellers, and the reader of this volume may note the relatively high degree of subjectivity with which many of the authors write, unabashed in their use of *I* and the validity of drawing on their own embodied experiences to inform their archaeological interpretations. Simultaneously though, and of equal importance, some of them also voice their doubts and methodological concerns, reflecting the exploratory nature of their research and of the sensory field in general. Certainly, not every archaeologist will feel the need to write "imagined narratives," nor should they; scientific results need appropriate scientific presentation, and there is room for a whole spectrum of writing styles and techniques within the discipline. To paraphrase Frank (2000:482), it is important to ask, What can an archaeologist accomplish by using fiction and what is given up in the process?

It should also be asked to what extent sensory archaeology might affect archaeological practice, beyond the current phenomenological surveys. Research by Sarah Pink (2009) has focused on this very issue in ethnographic fieldwork. Excavation is a multisensory experience, and perhaps unconsciously, archaeologists already rely on touch and hearing (and smell to a lesser degree) as well as vision to guide their actions and interpretations. Is it possible to conceive of a future in which site-recording forms have spaces not just for soil color and texture, for example, but also for soil smell or sound? And what impact would this have on the resulting site interpretations, which are always guided by the questions one thinks to ask? However, it is not just field archaeology that may have to deal with "new" senses: The future promises developments in investigating the broader human sensorium. It is well known that training can enhance extant sensory perceptions (e.g., wine tasting), but research in neuroscience suggests that, with practice, it may be possible to acquire new senses such as magnetoreception (Nagel et al. 2005), and the ongoing fascination with sending aromas via computer may finally produce viable results. Moreover, who is to say whether Aldous Huxley's futuristic "feelies" will not become the norm for moviegoers everywhere? It is possible, of course, that among some circles this book may be seen as heretical as Baudelaire's sensual poems once did, but hopefully this will not lead to the prosecution of either the publisher or the editor and authors for crimes against archaeological morality. Rather, we should be confident that in this era of reflexivity and innovative thinking, it will be recognized that a sensory archaeology allows us to carefully explore previously inconceivable issues related to the very experience of being human in the past.

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Notes

1. *Les fleurs du mal* can be read online at <http://fleursdumal.org>, in the original French and in various translations.
2. Papers by Kim Porter, Stacie King, Linda Eneix, Vasilis Tsamis, and Linda Hurcombe were not submitted for publication in this volume.
3. The forthcoming Cambridge University Press monograph *Archaeology of the Senses* (2013), by Yannis Hamilakis, will provide a more detailed examination of sensory archaeology. See also Skeates (2010) for an outlined methodology and archaeological application.
4. Those who wish to learn more about this aspect of sensory studies are directed to core texts such as Calvert, Spence, and Stein (2004) and the work of bodies such as the Crossmodal Research Laboratory at Oxford and the Multisensory Cognition Group at Trinity College Dublin.
5. Thanks to Joe Williams for passing on the link to the relevant Times Educational Supplement feature, available at www.tes.co.uk/article.aspx?storycode=6060248, accessed October 8, 2010.
6. See the restaurant's Web site (www.thefatduck.co.uk) for a more detailed exploration of Blumenthal's philosophy on food and sensory perception.
7. See also the forum on "Indigenous Archaeology" in *American Antiquity* (75:211–243).
8. In the case of societies with literary remains, it may be possible to reconstruct taste based on texts, albeit a taste filtered through the authors' own judgments. See, for example, Feldman (2005) on Roman taste.

References

- Ackerman, Diane
1990 *A Natural History of the Senses*. Random House, New York.
- Almagor, Uri
1987 The Cycle and Stagnation of Smells: Pastoralists-Fisherman Relationships in an East African Society. *Res: Anthropology and Aesthetics* 13:106–121.
- Appadurai, Arjun (editor)
1986 *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge University Press, Cambridge.
- Ayabe-Kanamura, Saho, Ina Schicker, Matthias Laska, Robyn Hudson, Hans Distel, Tatsu Kobayakawa, and Sachiko Saito
1998 Differences in Perception of Everyday Odors: A Japanese-German Cross-Cultural Study. *Chemical Senses* 23:31–38.

- Barrett, John C., and Ilhong Ko
2009 A Phenomenology of Landscape: A Crisis in British Landscape Archaeology? *Journal of Social Archaeology* 9:275–294.
- Bartosiewicz, László
2003 "There's Something Rotten in the State . . .": Bad Smells in Antiquity. *European Journal of Archaeology* 6:175–195.
- Baudelaire, Charles
1972 [1857] *Les fleurs du mal*. Le Livre de Poche, Paris.
- Bender, Barbara
1998 *Stonehenge: Making Space*. Berg, Oxford.
- Benjamin, Walter
1992 [1936] The Work of Art in the Age of Mechanical Reproduction. In *Illuminations*, translated by Harry Zohn. Fontana, London.
- Boivin, Nicole
2004 Rock Art and Rock Music: Petroglyphs of the South Indian Neolithic. *Antiquity* 78:38–53.
- 2008 *Material Cultures, Material Minds: The Impact of Things on Human Thought*. Cambridge University Press, Cambridge.
- Boivin, Nicole, Adam Brumm, Helen Lewis, Dave Robinson, and Ravi Korisettar
2007 Sensual, Material and Technological Understanding: Exploring Prehistoric Soundscapes in South India. *Journal of the Royal Anthropological Institute* 13:267–294.
- Borić, Dušan (editor)
2009 *Archaeology and Memory*. Oxbow, Oxford.
- Borić, Dušan, and John Robb
2008 Body Theory in Archaeology. In *Past Bodies: Body-Centered Research in Archaeology*, edited by Dušan Borić and John Robb, pp. 1–7. Oxbow, Oxford.
- Borić, Dušan, and John Robb (editors)
2008 *Past Bodies: Body-Centered Research in Archaeology*. Oxbow, Oxford.
- Brück, Joanna
2005 Experiencing the Past? The Development of a Phenomenological Archaeology in British Prehistory. *Archaeological Dialogues* 12:45–72.
- Bubandt, Nils
1998 The Odour of Things: Smell and the Cultural Elaboration of Disgust in Eastern Indonesia. *Ethnos* 63:48–80.
- Bull, Michael, and Les Back (editors)
2003 *The Auditory Culture Reader*. Berg, Oxford.
- Calvert, Gemma A., Charles Spence, and Barry E. Stein (editors)
2004 *The Handbook of Multisensory Processes*. MIT Press, Cambridge, Massachusetts.
- Carter, Tristan
2007 The Theatrics of Technology: Consuming Obsidian in the Early Cycladic Burial Arena. *Archaeological Papers of the American Anthropological Association* 17:88–107.
- Chatterjee, Helen J. (editor)
2008 *Touch in Museums: Policy and Practice in Object Handling*. Berg, London.
- Classen, Constance
1990 Sweet Colors, Fragrant Songs: Sensory Models of the Andes and the Amazon. *American Ethnologist* 17:722–735.
- 1993 *Worlds of Sense: Exploring the Senses in History and across Cultures*. Routledge, London.
- 1997 Foundations for an Anthropology of the Senses. *International Social Science Journal* 153:401–412.

- 2007 Museum Manners: The Sensory Life of the Early Museum. *Journal of Social History* 40:895-914.
- Classen, Constance (editor)
2005 *The Book of Touch*. Berg, Oxford.
- Classen, Constance, and David Howes
2006 The Museum as Sensescape: Western Sensibilities and Indigenous Artifacts. In *Sensible Objects: Colonialism, Museums and Material Culture*, edited by Elizabeth Edwards, Chris Gosden, and Ruth B. Phillips, pp. 199-222. Berg, Oxford.
- Classen, Constance, David Howes, and Anthony Synnott
1994 *Aroma: The Cultural History of Smell*. Routledge, London.
- Cleland, Liza, and Karen Stears (editors)
2004 *Colour in the Ancient Mediterranean World*. BAR International Series 1267. Archaeopress, Oxford.
- Clifford, James, and George E. Marcus (editors)
1986 *Writing Culture: The Poetics and Politics of Ethnography*. University of California Press, Berkeley.
- Coles, John M.
1967 Some Irish Horns of the Late Bronze Age. *Journal of the Royal Society of Antiquaries of Ireland* 97:113-117.
- 1973 *Archaeology by Experiment*. Hutchinson, London.
- Connerton, Paul
1989 *How Societies Remember*. Cambridge University Press, Cambridge.
- Cook, Ian A., Sarah K. Pajot, and Andrew F. Leuchter
2008 Ancient Architectural Acoustic Resonance Patterns and Regional Brain Activity. *Time and Mind* 1:95-104.
- Corbin, Alain
1986 *The Foul and the Fragrant: Odor and the French Social Imagination*. Harvard University Press, Cambridge, Massachusetts.
- Cummings, Vicki
2002 Experiencing Texture and Transformation in the British Neolithic. *Oxford Journal of Archaeology* 21:249-261.
- Cummings, Vicki, and Alasdair W. R. Whittle
2004 *Places of Special Virtue: Megaliths in the Neolithic Landscapes of Wales*. Oxbow, Oxford.
- Cytowic, Richard E., and David M. Eagleman
2009 *Wednesday Is Indigo Blue: Discovering the Brain of Synesthesia*. MIT Press, Cambridge, Massachusetts.
- Dams, Lya
1985 Palaeolithic Lithophones: Descriptions and Comparisons. *Oxford Journal of Archaeology* 4:31-46.
- Devereux, Paul, and Robert G. Jahn
1996 Preliminary Investigations and Cognitive Considerations of the Acoustical Resonances of Selected Archaeological Sites. *Antiquity* 70:665-666.
- Dietler, Michael, and Brian Hayden (editors)
2001 *Feasts. Archaeological and Ethnographic Perspectives on Food, Politics, and Power*. Smithsonian Institution Press, Washington, D.C.
- Dobres, Marcia-Anne
2010 Archaeologies of Technology. *Cambridge Journal of Economics* 34:103-114.
- Drobnick, Jim (editor)
2006 *The Smell Culture Reader*. Berg, Oxford.

- Edmonds, Mark
1999 *Ancestral Geographies of the Neolithic*. Routledge, London.
- Edwards, Elizabeth, and Kaushik Bhaumik (editors)
2008 *Visual Sense: A Cultural Reader*. Berg, Oxford.
- Feld, Steven
1990 *Sound and Sentiment: Birds, Weeping, Poetics and Song in Kaluli Expression*. 2nd ed. University of Pennsylvania Press, Philadelphia.
- 1996 Waterfalls of Song: An Acoustemology of Place Resounding in Bosavi, Papua New Guinea. In *Senses of Place*, edited by Steven Feld and Keith H. Basso, pp. 91-135. School of American Research, Santa Fe, New Mexico.
- Feldman, Charles
2005 Roman Taste. *Food, Culture and Society* 8:7-30.
- Fleming, Andrew
2006 Post-Processual Landscape Archaeology: A Critique. *Cambridge Archaeological Journal* 16:267-280.
- Fowles, Severin
2010 The Southwest School of Landscape Archaeology. *Annual Review of Anthropology* 39:453-468.
- Fox, Rachel
2008 Tastes, Smells and Spaces: Sensory Perceptions and Mycenaean Palatial Feasting. In *DAIS. The Aegean Feast*, edited by Louise A. Hitchcock, Robert Laffineur, and Janice Crowley, pp. 133-141. *Aegaeum* 29. Université de Liège, Liège.
- Frank, Katherine
2000 "The Management of Hunger": Using Fiction in Writing Anthropology. *Qualitative Inquiry* 6:474-488.
- Geertz, Clifford
1973 Thick Description: Toward an Interpretive Theory of Culture. In *The Interpretation of Cultures: Selected Essays*, pp. 3-30. Basic Books, New York.
- 1988 *Works and Lives: The Anthropologist as Author*. Stanford University Press, Stanford.
- Georgiadis, Mercourios, and Chrysanthi Gallou (editors)
2009 *Past in the Past: The Significance of Memory and Tradition in the Transmission of Culture*. BAR International Series 1925. Archaeopress, Oxford.
- Geurts, Kathryn Linn
2002 *Culture and the Senses: Embodiment, Identity, and Well-Being in an African Community*. University of California Press, Berkeley.
- 2003 On Rocks, Walks, and Talks in West Africa: Cultural Categories and an Anthropology of the Senses. *Ethos* 30:178-198.
- Gibb, James G.
2000 Imaginary, But by No Means Unimaginable: Storytelling, Science, and Historical Archaeology. *Historical Archaeology* 34(2):1-6.
- Goldhahn, Joakim
2002 Roaring Rocks: An Audio-Visual Perspective on Hunter-Gatherer Engravings in Northern Sweden and Scandinavia. *Norwegian Archaeological Review* 35:29-61.
- Goody, Jack
1987 *The Interface Between the Written and the Oral*. Cambridge University Press, Cambridge.
- Gosden, Chris
2005 What Do Objects Want? *Journal of Archaeological Method and Theory* 12:193-211.

- Grimshaw, Anna
2001 *The Ethnographer's Eye: Ways of Seeing in Anthropology*. Cambridge University Press, Cambridge.
- Hamilakis, Yannis
1998 Eating the Dead: Mortuary Feasting and the Politics of Memory in the Aegean Bronze Age. In *Cemetery and Society in the Aegean Bronze Age*, edited by Keith Branigan, pp. 15–132. Sheffield Academic Press, Sheffield.
- 2000 The Anthropology of Food and Drink Consumption and Aegean Archaeology. In *Palaeodiet in the Aegean*, edited by Sarah J. Vaughan and William D. E. Coulson, pp. 55–63. Wiener Laboratory Monograph 1. Oxbow, Oxford.
- 2007 *The Nation and Its Ruins: Antiquity, Archaeology and the National Imagination*. Oxford University Press, Oxford.
- 2008 Time, Performance, and the Production of a Mnemonic Record: From Feasting to an Archaeology of Eating and Drinking. In *DAIS. The Aegean Feast*, edited by Louise A. Hitchcock, Robert Laffineur, and Janice Crowley, pp. 3–19. Aegaeum 29. Université de Liège, Liège.
- 2010 Re-collecting the Fragments: Archaeology as Mnemonic Practice. In *Material Mnemonics: Everyday Memory in Prehistoric Europe*, edited by Katina T. Lillios and Vasileios Tsamis, pp. 188–199. Oxbow, Oxford.
- 2013 *Archaeology of the Senses*. Cambridge University Press, Cambridge, in press.
- Hamilakis, Yannis, Mark Pluciennik, and Sarah Tarlow (editors)
2002 *Thinking through the Body: Archaeologies of Corporeality*. Kluwer Academic/Plenum Publishers, London.
- Hamilton, Sue, and Ruth Whitehouse, with Keri Brown, Pamela Combes, Edward Herring, and Mike Seager Thomas
2006 Phenomenology in Practice: Towards a Methodology for a 'Subjective' Approach. *European Journal of Archaeology* 9:31–71.
- Hawkes, Christopher F.
1954 Archaeological Theory and Method: Some Suggestions from the Old World. *American Anthropologist* 56:155–168.
- Herva, Vesa-Pekka
2006 Flower Lovers, After All? Rethinking Religion and Human-Environment Relationships in Minoan Crete. *World Archaeology* 38:586–598.
- Herzfeld, Michael
2001 *Anthropology: Theoretical Practice in Culture and Society*. Blackwell, Oxford.
- Holtzman, Jon D.
2006 Food and Memory. *Annual Review of Anthropology* 35:361–378.
2009 *Uncertain Tastes: Memory, Ambivalence, and the Politics of Eating in Samburu, Northern Kenya*. University of California Press, Berkeley.
2010 Remembering Bad Cooks: Sensuality, Memory, Personhood. *Senses and Society* 5:235–243.
- Hosler, Dorothy
1994 *The Sounds and Colors of Power: The Sacred Metallurgical Technology of Ancient West Mexico*. MIT Press, Cambridge, Massachusetts.
- Houston, Stephen D., Claudia Brittenham, Cassandra Mesick, Alexandre Tokovinine, and Christina Warinner
2009 *Veiled Brightness: A History of Ancient Maya Color*. University of Texas Press, Austin.

- Houston, Stephen D., and Karl A. Taube
2000 An Archaeology of the Senses: Perception and Cultural Expression in Ancient Mesoamerica. *Cambridge Archaeological Journal* 10:261–294.
- Howes, David
2003 *Sensual Relations: Engaging the Senses in Culture and Social Theory*. University of Michigan Press, Ann Arbor.
- Howes, David (editor)
1991 *The Varieties of Sensory Experience*. University of Toronto Press, Toronto.
2005 *Empire of the Senses: The Sensual Culture Reader*. Berg, Oxford.
2009 *The Sixth Sense Reader*. Berg, Oxford.
- Hume, Lynne
2007 *Portals: Opening Doorways to Other Realities Through the Senses*. Berg, Oxford.
- Hummeler, Madeleine
2008 Review of Stone Worlds: Narrative and Reflexivity in Landscape Archaeology. *Antiquity* 82:1156–1157.
- Hurcombe, Linda
2007 A Sense of Materials and Sensory Perception in Concepts of Materiality. *World Archaeology* 39:532–545.
- Ingold, Tim
2004 Culture on the Ground: The World Perceived Through the Feet. *Journal of Material Culture* 9:315–340.
- Insoll, Timothy
2007 *Archaeology: The Conceptual Challenge*. Duckworth, London.
- Isaakidou, Valasia
2007 Cooking in the Labyrinth: Exploring 'Cuisine' at Bronze Age Knossos. In *Cooking Up the Past: Food and Culinary Practices in the Neolithic and Bronze Age Aegean*, edited by Christopher Mee and Josette Renard, pp. 5–24. Oxbow, Oxford.
- Jahn, Robert G., Paul Devereux, and Michael Ibison
1996 Acoustical Resonances of Assorted Ancient Structures. *Journal of the Acoustical Society of America* 99:649–658.
- Jones, Andrew
2007 *Memory and Material Culture*. Cambridge University Press, Cambridge.
- Jones, Andrew, and Gavin MacGregor (editors)
2002 *Colouring the Past: The Significance of Colour in Archaeological Research*. Berg, Oxford.
- Joyce, Rosemary A.
2005 Archaeology of the Body. *Annual Review of Anthropology* 34:139–158.
- Joyce, Rosemary A., with Robert W. Preucel
2002 *The Languages of Archaeology: Dialogue, Narrative and Writing*. Blackwell, Oxford.
- Joyce, Rosemary A., and John S. Henderson
2007 From Feasting to Cuisine: Implications of Archaeological Research in an Early Honduran Village. *American Anthropologist* 109:642–653.
- Jütte, Robert
2005 *A History of the Senses: From Antiquity to Cyberspace*. Translated by James Lynn. Polity Press, Cambridge.
- King, Stacie M., and Gonzalo Sánchez Santiago
2011 Soundscapes of the Everyday in Ancient Oaxaca, Mexico. *Archaeologies: Journal of the World Archaeological Congress* 7:387–422.

- Kirby, Percival R.
1947 The Trumpets of Tut-Ankh-Amen and Their Successors. *Journal of the Royal Anthropological Institute* 77:33–45.
- Knappett, Carl
2005 *Thinking Through Material Culture: An Interdisciplinary Perspective*. University of Pennsylvania Press, Philadelphia.
- Korsmeyer, Carolyn (editor)
2005 *The Taste Culture Reader: Experiencing Food and Drink*. Berg, Oxford.
- Lewis-Williams, J. David, and Thomas A. Dowson
1990 Through the Veil: San Rock Paintings and the Rock Face. *South African Archaeological Bulletin* 45:5–16.
- Lillios, Katina T., and Vasileios Tsamis (editors)
2010 *Material Mnemonics: Everyday Memory in Prehistoric Europe*. Oxbow, Oxford.
- Loose, Richard W.
2008 Tse'Biinaholts'a Yalti (Curved Rock That Speaks). *Time and Mind* 1:31–50.
- Macbeth, Helen, and Sue Lawry
2006 Food Preferences and Taste: An Introduction. In *Food Preferences and Taste: Continuity and Change*. 2nd ed. Edited by Helen Macbeth, pp. 1–13. Berghahn, Oxford.
- McCarthy, John P.
2003 More than Just "Telling the Story": Interpretive Narrative Archaeology. In *Ancient Muses: Archaeology and the Arts*, edited by John H. Jameson Jr., John E. Ehrenhard, and Christine A. Finn, pp. 15–24. University of Alabama Press, Tuscaloosa.
- MacGregor, Gavin
1999 Making Sense of the Past in the Present: A Sensory Analysis of Carved Stone Balls. *World Archaeology* 31:258–271.
- Mathieu, James R.
2002 Introduction—Experimental Archaeology: Replicating Past Objects, Behaviors, and Processes. In *Experimental Archaeology: Replicating Past Objects, Behaviors, and Processes*, edited by James R. Mathieu, pp. 1–10. BAR International Series 1035. Archaeopress, Oxford.
- Merleau-Ponty, Maurice
2002 [1945] *The Phenomenology of Perception*. Translated by Colin Smith. Routledge Classics, London.
- Meskel, Lynn M.
2000 Writing the Body in Archaeology. In *Reading the Body: Representations and Remains in the Archaeological Record*, edited by Alison E. Rautman, pp. 13–21. University of Pennsylvania Press, Philadelphia.
- Meskel, Lynn M. (editor)
2005 *Archaeologies of Materiality*. Blackwell, Oxford.
- Miller, Daniel
2008 *The Comfort of Things*. Polity Press, Cambridge.
- Miller, William I.
1997 *The Anatomy of Disgust*. Harvard University Press, Cambridge, Massachusetts.
- Mills, Barbara J., and William H. Walker (editors)
2008 *Memory Work: Archaeologies of Material Practices*. School of Advanced Research Press, Santa Fe, New Mexico.
- Mithen, Steven
2006 *The Singing Neanderthals: The Origins of Music, Language, Mind, and Body*. Harvard University Press, Cambridge, Massachusetts.

- Molloy, Barry P. C.
2008 Martial Arts and Materiality: A Combat Archaeology Perspective on Aegean Swords of the Fifteenth and Fourteenth Centuries B.C. *World Archaeology* 40:116–134.
- Nagel, Saskia K., Christine Carl, Tobias Kringe, Robert Martin, and Peter König
2005 Beyond Sensory Substitution—Learning the Sixth Sense. *Journal of Neural Engineering* 2(4):R13–R26.
- Needham, Rodney
1967 Percussion and Transition. *Man*, n.s. 2:606–614.
- Olsen, Bjørnar
2003 Material Culture after Text: Re-Membering Things. *Norwegian Archaeological Review* 36:87–104.
- Ouzman, Sven
2001 Seeing Is Deceiving: Rock Art and the Non-Visual. *World Archaeology* 33: 237–256.
- Paterson, Mark
2007 *The Senses of Touch: Haptics, Affects and Technologies*. Berg, Oxford.
- Pink, Sarah
2009 *Doing Sensory Ethnography*. Sage, London.
- Porath, Nathan
2008 Seeing Sound: Consciousness and Therapeutic Acoustics in the Inter-Sensory Shamanic Epistemology of the Orang Sakai of Riau (Sumatra). *Journal of the Royal Anthropological Institute*, n.s. 14:647–663.
- Porcello, Thomas, Louise Meintjes, Ana Maria Ochoa, and David W. Samuels
2010 The Reorganization of the Sensory World. *Annual Review of Anthropology* 39:51–66.
- Praetzelis, Adrian
1998 Introduction: Why Every Archaeologist Should Tell Stories Once in a While. *Historical Archaeology* 32(1):1–3.
- Price, Neil S.
2001 An Archaeology of Altered States: Shamanism and Material Culture Studies. In *The Archaeology of Shamanism*, edited by Neil S. Price, pp. 3–16. Routledge, London.
- Pye, David
1995 *The Nature and Art of Workmanship*. Herbert Press, London.
- Reznikoff, Iegor, and Michel Dauvois
1988 La dimension sonore des grottes ornées. *Bulletin de la Société Préhistorique Française* 85:238–246.
- Rodaway, Paul
1994 *Sensuous Geographies: Body, Sense and Place*. Routledge, London.
- Saunders, Nicholas J.
2001 A Dark Light: Reflections on Obsidian in Mesoamerica. *World Archaeology* 33:220–236.
- Scarre, Chris (editor)
2002 *Monuments and Landscape in Atlantic Europe*. Routledge, London.
- Scarre, Chris, and Graeme Lawson (editors)
2006 *Archaeoacoustics*. MacDonald Institute for Archaeological Research, Cambridge.
- Seeger, Anthony
1975 The Meaning of Body Ornaments: A Suya Example. *Ethnology* 14:211–224.

- Seremetakis, C. Nadia (editor)
 1994 *The Senses Still: Perception and Memory as Material Culture in Modernity*. Westview, Boulder, Colorado.
- Serres, Michel
 2008 [1985] *The Five Senses: A Philosophy of Mingled Bodies*. Translated by Margaret Sankey and Peter Cowley. Continuum, London.
- Skeates, Robin
 2010 *An Archaeology of the Senses: Prehistoric Malta*. Oxford University Press, Oxford.
- Smith, Mark
 2007 *Sensing the Past: Seeing, Hearing, Smelling, Tasting, and Touching in History*. University of California Press, Berkeley.
- Stoller, Paul
 1984 Sound in Songhay Cultural Experience. *American Ethnologist* 11:559–570.
 1989 *The Taste of Ethnographic Things: The Senses in Anthropology*. University of Pennsylvania Press, Philadelphia.
 1997 *Sensuous Scholarship*. University of Pennsylvania Press, Philadelphia.
- Stoller, Paul, and Cheryl Olkes
 1986 Bad Sauce, Good Ethnography. *Cultural Anthropology* 1:336–352.
- Stroeken, Koen
 2008 Sensory Shifts and 'Synaesthetics' in Sukuma Healing. *Ethnos* 73:466–484.
- Sutton, David E.
 2001 *Remembrance of Repasts: An Anthropology of Food and Memory*. Berg, Oxford.
 2010 Food and the Senses. *Annual Review of Anthropology* 39:209–223.
- Synnott, Anthony
 1991a Puzzling over the Senses: From Plato to Marx. In *The Varieties of Sensory Experience*, edited by David Howes, pp. 61–76. University of Toronto Press, Toronto.
 1991b A Sociology of Smell. *Canadian Review of Sociology and Anthropology* 28:437–459.
- Tarlow, Sarah
 2000 Emotion in Archaeology. *Current Anthropology* 41:713–730.
- Tilley, Christopher Y.
 1994 *Phenomenology of Landscape: Places, Paths and Monuments*. Berg, Oxford.
 2004 *The Materiality of Stone: Explorations in Landscape Phenomenology* 1. Berg, Oxford.
 2008 *Body and Image: Explorations in Landscape Phenomenology* 2. Left Coast Press, Walnut Creek, California.
 2010 *Interpreting Landscapes: Geologies, Topographies, Identities. Explorations in Landscape Phenomenology* 3. Left Coast Press, Walnut Creek, California.
- Tringham, Ruth E.
 1991 Households with Faces: The Challenge of Gender in Prehistoric Architectural Remains. In *Engendering Archaeology: Women and Prehistory*, edited by Joan M. Gero and Margaret W. Conkey, pp. 93–131. Blackwell, Oxford.
- Trubek, Amy B.
 2008 *The Taste of Place: A Cultural Journey into Terroir*. University of California Press, Berkeley.
- Tuzin, Donald
 1984 Miraculous Voices: The Auditory Experience of Numinous Objects. *Current Anthropology* 25:579–596.
- Valamoti, Soultana Maria
 2009 Plant Food Ingredients and 'Recipes' from Prehistoric Greece: The Archaeobotanical Evidence. In *Plants and Culture: Seeds of the Cultural Heritage of Europe*, edited by Jean-Paul Morel and Anna Maria Mercuri, pp. 25–38. Edipuglia, Bari.

- Van Dyke, Ruth M., and Susan E. Alcock (editors)
 2003 *Archaeologies of Memory*. Blackwell, Oxford.
- Waller, Steven J.
 2006 Intentionality of Rock-Art Placement Deduced from Acoustical Measurements and Echo Myths. In *Archaeoacoustics*, edited by Chris Scarre and Graeme Lawson, pp. 31–39. Macdonald Institute for Archaeological Research, Cambridge.
- Wallin, Nils L., Björn Merker, and Steven Brown (editors)
 2000 *The Origins of Music*. MIT Press, Cambridge, Massachusetts.
- Waterston, Alisse, and Maria D. Vesperi (editors)
 2009 *Anthropology Off the Shelf: Anthropologists on Writing*. Wiley-Blackwell, Oxford.
- Watson, Aaron
 2001 The Sounds of Transformation: Acoustics, Monuments and Ritual in the British Neolithic. In *The Archaeology of Shamanism*, edited by Neil Price, pp. 178–192. Routledge, London.
- Watson, Aaron, and David Keating
 1999 Architecture and Sound: An Acoustic Analysis of Megalithic Monuments in Prehistoric Britain. *Antiquity* 73:325–336.
- Wiessner, Polly, and Wulf Schiefelhövel (editors)
 1996 *Food and the Status Quest: An Interdisciplinary Perspective*. Berghahn, London.
- Zampini, Massimiliano, and Charles Spence
 2010 Assessing the Role of Sound in the Perception of Food and Drink. *Chemosensory Perception* 3:57–67.
- Zhang, Juzhong, Xinghua Xiao, and Yun Kuen Lee
 2004 The Early Development of Music: Analysis of the Jiahu Bone Flutes. *Antiquity* 78:769–778.