

HANDBOOK
of
MATERIAL CULTURE

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10

SCENT, SOUND AND SYNAESTHESIA

Intersensoriality and Material Culture Theory

David Howes

The importance of attending to the multiple sensory dimensions of objects, architectures and landscapes is quickly becoming a central tenet of material culture theory. This sensual turn – or better, ‘revolution’ (Howes 2004) – is evident in the various references to the sensuous made by the contributors to *The Material Culture Reader* (Buchli 2002). In ‘Contested landscapes’, Barbara Bender writes: ‘landscapes are not just “views” but intimate encounters. They are not just about seeing, but about experiencing with all the senses’ (2002: 136). In his chapter on ‘Trench art’, Nicholas Saunders discusses the heightened sensory experience of warfare,¹ and the ability of material objects (e.g. recycled munition shells) to ‘act as a bridge between mental and physical worlds’ (2002: 181). In ‘Visual culture’, Chris Pinney argues that the field of visual culture (as currently understood) ‘needs to be superseded by an engagement with embodied culture ... that recognizes the unified nature of the human sensorium’ (2002: 84–5).

Christopher Tilley devotes a chapter to an analysis of the sensory and social symbolism of Wala canoes. The Wala, a people of Vanuatu, traditionally attributed various sensory powers to their canoes and embodied this understanding by carving ears, mouths and ‘moustaches’ as well as male and female sexual organs on the prow and stern. According to Tilley: ‘The power of [this] imagery resides in its condensation of reference linked with the sensual and tactile qualities of its material form and reference to the human body’ (2002: 25).

The implication to be drawn from these highly stimulating references to the sensuous is that material culture, in addition to materializing social relations and symbolizing the cosmos, gives expression to a particular set of *sensual relations*. Thus, Wala canoes may be said to condense the sensory – as well as social and symbolic – orders of Wala culture. They are attributed sentience in the same way that they render sensible the cardinal ideas of Wala society. Otherwise put, Wala canoes, and their uses, embody Wala ‘ways of sensing’ (Howes 2003).

My aim in this chapter is to discuss the significance of scent, sound and synaesthesia for material culture studies. My account opens with a consideration of the model of ‘synaesthesia’ (literally, ‘joining of the senses’) advanced by Lawrence Sullivan, a scholar of comparative religion, in a seminal article entitled ‘Sound and senses’ (1986). It goes on to provide a synopsis of the burgeoning literature in the history and anthropology of the senses, pioneered by Constance Classen (1993a, 1998) and Alain Corbin (1986, 1994), among others, which highlights the multisensoriality embedded in the materiality of human existence.

The increasingly sensual orientation of material culture studies and the emergent focus on objects and environments within ‘sensual culture studies’ (a shorthand for the history and anthropology of the senses) represent a happy confluence.² Both developments may be linked to the interdisciplinary counter-tradition that

has crystallized in recent years partly in reaction to the excesses of 'textualism' and 'ocular-centrism' in conventional social scientific accounts of meaning. Sullivan's 'Sound and senses' was, in fact, published the same year as *Writing Culture* (Clifford and Marcus 1986) – that is to say, at the height of the textual revolution (also known as 'the literary turn') in anthropological understanding. The latter revolution began in the 1970s, when Clifford Geertz (1973) introduced the suggestion that cultures be treated 'as texts'. The idea of 'reading cultures' proved tremendously productive throughout the 1970s and early 1980s, but then the idea of 'textualization' (ethnography 'as writing') took command. This had the untoward consequence of deflecting attention on to styles of text construction, and away from the sensuous realities those texts sought to convey. Indeed, in his contribution to *Writing Culture*, Stephen Tyler (1986: 137) went so far as to proclaim that: 'perception has nothing to do with it' (the 'it' being ethnography).³ While it may be etymologically correct to hold that ethnography is tied to writing, it is not epistemologically sound to reduce the anthropological endeavour to an exercise in 'text construction'.

Sullivan intended his model of 'sensing' – as opposed to 'reading' (or 'writing') – culture to serve as a multisensory alternative to 'the model of the text' (Ricoeur 1970, cited in Geertz 1973). That his article has languished in such obscurity is testimony to the extraordinary power of logocentric models in the humanities and social sciences, whether inspired by the Saussurean dream of a 'science of signs' (modelled on linguistics) or Wittgensteinian 'language games' or Foucauldian 'discourse analysis'. But 'the model of the text' no longer enjoys the same grip over the anthropological (or historical) imagination it once did. For example, while it was fashionable for a spell to consider consumer culture as 'structured like a language' following Baudrillard's lead in *The Consumer Society: Myths and Structures* (1970/1998) and *The System of Objects* (1968/1996), many voices now caution against such a 'simplistic equation between language and materiality, mainly due to the unordered and seemingly unstructured nature of consumption' (Blum 2002: 234, citing Miller 1998).

It will no doubt come as a surprise to some that: 'The limits of my language are not the limits of my world' – or in other words, that the evidence of our senses is equally worthy of attention. However, this observation would appear to be a point of increasingly widespread consensus among scholars of material culture: 'a design is not a word and a house is not a text:

words and things, discourses and material practices are fundamentally different', writes Tilley (2002: 23–4; see further Pinney 2002: 82; Tacchi 1998; Stahl 2002). It is also fundamental to sensual culture studies, which has long warned against the visual and verbal biases intrinsic to the dominant social scientific accounts of 'meaning' (Classen 1990; Howes 1991: 3). Setting aside linguistic models and attending to the multiple respects in which culture mediates sensation and sensation mediates culture can be a source of many insights into the 'interconnectedness' of human communication (Finnegan 2002). 'Society', in so far as it is grounded in 'consensus' – meaning 'with the senses' – is a sensory fact, just as the sensorium is a social fact.

THE MODEL OF SYNAESTHESIA

In 'Sound and senses', Sullivan presents a review of recent developments in performance theory, hermeneutics and information theory. His account culminates in the suggestion that: 'The symbolic experience of the unity of the senses enables a culture to entertain itself with the idea of the unity of meaning' (1986: 6). He goes on to apply his model of 'the unity of the senses' – or 'synaesthesia' – to the interpretation of the myths and rituals of diverse South American Indian societies.

Medically speaking, synaesthesia is a very rare condition in which the stimulation of one sensory modality is accompanied by a perception in one or more other modalities. Thus, synaesthetes report hearing colours, seeing sounds, and feeling tastes (see Marks 1982).⁴ Such inter-modal associations and transpositions are also commonly reported by persons under the influence of hallucinogens. Sullivan's account is, in fact, centred on a variety of South American Indian societies which make ritual use of the hallucinogenic *Banisteriopsis Caapi* plant. However, he also extends the term 'synaesthesia' to refer to the ritual process of bringing many or all of the senses into play simultaneously. This makes his theory of 'cultural synaesthesia', as it could be called, potentially applicable to the interpretation of ritual and cosmological systems the world over.

The strength of Sullivan's model lies in the way it recognizes 'the unified nature of the human sensorium', as Pinney (2002) would say; but, from the perspective of the anthropology of the senses this is also one of its weaknesses. The weakness stems from Sullivan's

presupposition of 'the oneness of meaning'. The latter presumption derives from the information theory approach to the study of ritual communication, which holds that 'although the receiver of a ritual message is picking up information through a variety of different sensory channels simultaneously, all these different sensations add up to just one message' (Leach 1976: 41). Such an approach imposes a spurious unity on ritual communication because of the way it treats 'meaning' as primary and the senses as so many arbitrary and basically interchangeable channels for the delivery of some hypostasized 'message'. It would be more consonant with what we now know about the materiality of communication to regard sensing (seeing, hearing, touching, etc.) as primary and meaning as mediated. The information theory approach also tends to deflect attention from the subject of the socialization of the senses through ritual, whereas it is precisely this sensual socialization that ought to occupy the analyst. These points of critique may be illustrated by analysing Sullivan's interpretation of the Tukano-speaking Desana myth of the 'origin of communication' through the lens of Classen's (1990) independent account of the Desana sensory order.

As Sullivan relates:

For Tukano speakers of the Northwest Amazon the crying sounds of a mythic baby called Cajpi are also the tastes and visual images of the hallucinogenic drink made from his body (the magical plant, *Banisteriopsis Caapi*) 'for as soon as the little child cried aloud, all the people ... became intoxicated and saw all kinds of colours.' The divinity named Yepa Huaké commanded that the child be dismembered. A piece of his body was given to each social group. This distribution established not only the ranked hierarchy of groups in society today but also the different qualities of vision and modulations of sound that constitute each group's cultural existence as art, musical performance, and speech.

(1986: 26)

Sullivan goes on to bring the Desana 'interpretation' of ritual and mythic communication into alignment with information theory:

The significance of the ritual beverage and the visions induced by ritual acts arises originally from the crying sounds of the sacred child. That sound in the environment of the unspoiled mythic world is an image similar to the perfect noise-free channel that Corcoran, the communication theorist, described as lying beyond this imperfect world of noise and redundancy. It is a unique

message, a unique signal, which bears meaning for all the senses ... [The] Tukano-speakers would agree that that kind of clarity and wholeness of meaning no longer exists. The dismembered state of meaning in this world requires and causes the redundant messages sent through different senses and media.

(1986: 26–7)

What Sullivan accomplishes by means of the above passage, which stages a conversation between Corcoran and an imaginary Tukano-speaker, is a translation of one cosmology into the terms of another (scientific Western) one. But this conversation is forced, and overrides the question of whether the Desana shaman would be willing (or able) to state his 'message' without recourse to the medium that models it – that is, without insisting that Corcoran ingest *yagé* (the Tukano name for the magical *Banisteriopsis Caapi* plant) first. Let us turn the conversation around, following Classen's analysis of the Desana sensory order in 'Sweet colors, fragrant songs' (1990).

In the beginning there was sound (the baby's cry), not a 'word' or 'score' (another favourite metaphor of information theory). This sound embodied smells and temperatures, as well as colours and tastes. These sensations are meaningful to different senses now, but were indistinguishable from each other in the mythic world. Thus, the sound of the baby's cry is viewed as having contained the Tukano 'sense ratio' (to borrow McLuhan's 1962 terminology) in embryo.

The division and distribution of the parts of the child's body modulated the original sound, just as it modulated society, partitioning the latter into ranked groups, each with its own style of singing, speaking and use of colours as well as other sensory media (odours, tastes). The division of sound, the division of the senses and the division of society, therefore, all arose together. Thus, the Tukano social and moral universe is structured in accordance with a model derived from the interrelation of the senses under the influence of *yagé*.

Social norms are sensory norms. This fundamental tenet of the Tukano sensory-social order finds expression in the way the different flavours with which each of the social groups were imbued at the moment of partition are to this day used to regulate marriage: 'Compatible marriage partners are those with opposite flavours' (Classen 1991: 249). It is also embedded in the contemporary ritual use of *yagé*: 'Through the use of hallucinogens, and a controlled sensory environment, shamans attempt

to "make one see, and act accordingly," "to make one hear, and act accordingly," "to make one smell, and act accordingly," and "to make one dream, and act accordingly" (Classen 1990: 728). The need for the shaman to control the sensory environment follows from the fact that each social group embodies a different modulation of the senses. A shaman would not want his patients to see red where they ought to be seeing yellow, or smell a pungent odour when they ought to smell a sweet one, for it is believed that were the senses to be crossed in this way people would commit incest and other contraventions of the Tukano moral order.

Sullivan suggests that Tukano-speakers would agree with information theorists that the 'wholeness of meaning' is gone. He also claims that: 'Wholeness is seen in retrospect and in mourning' (Sullivan 1986: 27). This is far from clear. If there were only one sense and one meaning – that is, if the Desana sensory ratio had remained in the embryonic form it had in the mythic world, and never unfolded – then the sound of, say, a flute would convey a wealth of meaning, but not be able to evoke images in other modalities the way it does today. The Desana appear to delight in the cross-sensory associations which the unfolding of the sound of the baby's cry into the other senses has made possible. When a boy plays a flute, for example: 'The odor of the tune is said to be male, the color is red, and the temperature is hot; the tune evokes youthful happiness and the taste of a fleshy fruit of a certain tree. The vibrations carry an erotic message to a particular girl' (Reichel-Dolmatoff 1981: 91). The multiple associations adduced here serve to multiply the perceived meaning (or connotation) of the tune. Alas, the only thing the information theorist can see in this concatenation of sensations is redundancy; that is, all the *resonances* of the Desana way of sensing would be lost on one such as Corcoran.

Hence, while the theory of cultural synaesthesia has the potential to illuminate many aspects of cultural performance, space must be made within this theory to allow for a more relational, less unified conception of the human sensorium. Specifically, while the notion of 'the unity of the senses' is a helpful point of departure, and certainly more culturally sensitive than 'the model of the text' or 'score', more attention needs to be paid to such issues as: (1) the weight or value attached to each of the modalities, instead of assuming equality and interchangeability; (2) the sequencing of perceptions, instead of assuming simultaneity; and (3) the way the use of different senses

may give rise to different meanings, instead of assuming redundancy. Each of these assumptions (which Sullivan imports into his interpretation of the Desana myth owing to his uncritical reliance on information theory) limits what we sense, whereas the Tukano material challenges us to *expand* our senses, to recognize their interplay, and thus discover more meaning instead of less.

THE MODEL OF INTERSENSORITY

A consideration of Dorinne Kondo's sensuous symbolic analysis of the Japanese tea ceremony will help concretize what is meant by the model of intersensory (in place of synaesthesia) advanced here. Kondo notes the emphasis on non-verbal symbolism in Japanese culture. The tea ceremony itself entails a cleansing and heightening of perception conducive to a state of silent contemplation. In the ceremony meanings are conveyed through sensory shifts, from garden to tea room, from sound to silence, from the odour of incense to the taste of tea. Kondo describes the aesthetic order of the tea ceremony as an 'unfolding, a sequence of movement with tensions, climaxes and directionality' (1983/2004: 197).

As is well illustrated by the sensory sequencing of the tea ceremony, intersensory need not mean a synaesthetic mingling of sensation. The strands of perception may be connected in many different ways. Sometimes the senses may seem to all be working together in harmony. Other times, sensations will be conflicted or confused. Either state may be employed as a social or aesthetic ideology.

Just as the model of intersensory does not necessarily imply a state of harmony, nor does it imply a state of equality, whether sensory or social. Indeed, the senses are typically ordered in hierarchies. In one society or social context sight will head the list of the senses, in another it may be hearing or touch. Such sensory rankings are always allied with social rankings and employed to order society. The dominant group in society will be linked to esteemed senses and sensations while subordinate groups will be associated with less valued or denigrated senses. In the West the dominant group – whether it be conceptualized in terms of gender, class or race – has conventionally been associated with the supposedly 'higher' senses of sight and hearing, while subordinate groups (women, workers, non-Westerners) have been associated with the so-called 'lower'

senses of smell, taste and touch (Classen 1998: 154–6).

Within each sensory field, as well, sensations deemed relatively unpleasant or dangerous will be linked to 'unpleasant', 'dangerous' social groups. Within the field of smell, for example, the upper classes were customarily considered to be fragrant or inodorous, while the lower classes were held to be malodorous. George Orwell described this olfactory division of society forcefully when he wrote that 'the real secret of class distinctions in the West' can be summed up in 'four frightful words ... *The lower classes smell*' (quoted in Classen et al. 1994: 166). This perception of malodour had less to do with practices of cleanliness than it had to do with social status: according to the sensory classification of society a low social status translated into a bad smell. Thus Orwell stated that a nasty smell seemed to emanate from 'even "lower class" people whom you knew to be quite clean – servants, for instance' (Classen et al. 1994: 167). Here we can see how sensations of disgust are a matter not just of personal distaste but of social ordering (Miller 1997). The transformation of class distinctions into physiological sensations is a powerful enforcer of social hierarchies (see Corbin 1986; Classen 2001).

An instructive comparative example is provided by Anthony Seeger's analysis of the sensory order of the Suyà Indians of the Mato Grosso region of Brazil in 'The meaning of body ornaments' (1975). Suyà men pride themselves on their ear discs and lip discs. These ornaments are understood to make one 'fully human' (*me*). The faculties of speech and hearing are, in fact, 'highly elaborated and positively valued in Suyà society' (Seeger 1975: 215). For example, the Suyà word for hearing, *ku-mba*, means not only 'to hear (a sound)' but also 'to know' and 'to understand'. Thus, when 'the Suyà have learned something – even something visual such as a weaving pattern – they say, "It is in my ear"' (1975: 214). The ear is the primary organ through which the world is cognized. It is also the organ through which the human subject is socialized: both boys and girls are fitted with ear discs at puberty. A person who is fully social – that is, one who conforms fully to the norms of the group – 'hears, understands and knows clearly' (1975: 214). Only senior men and chiefs are permitted to wear lip discs, and (by virtue of this oral modification) engage in 'plaza speech' or 'everybody listen talk' as well as perform the songs which are so central to the Suyà symbolic order and sense of cultural identity.

Significantly, 'the eyes are not ornamented, tattooed or specially painted', nor is the nose (1975: 216). This diminution of the eyes and nose (in contrast to the extension of the lips and ears) is linked to the fact that only certain highly dangerous and elusive game animals are credited with a keen sense of smell, as well as 'strong eyes'. Related to this is the fact that adult men are presumed to be 'bland smelling' while adult women, who are deemed to participate more in nature than society, are said to be 'strong smelling' (Seeger 1981: 111). Witches are also credited with 'strong eyes', and their transgressive position within the moral (which is to say, aural) bounds of society is further underscored by the fact that they are poor of hearing and engage in 'bad' or garbled speech.

It is of historical interest to note that Seeger's analysis in the 'Body ornaments' piece was inspired in part by McLuhan's notion of media as 'extensions of the senses'. Whereas McLuhan's point in *The Gutenberg Galaxy* (1962) was that our media become us, Seeger's point is that body decorations do much the same. The ear-minded sensory order of the Suyà is precisely what one would expect of an 'oral-aural' (as opposed to chirographic, typographic or electronic) society, in McLuhan's terms. However, Seeger also complicates McLuhan's typology by attending to the different meanings and values of the different faculties in the Suyà sensory order, and in those of other Gê-speaking peoples of the Mato Grosso. For example, the neighbouring Kayapo mark the attainment of puberty by fitting boys with penis sheaths, and do not wear ear discs (only strings of beads). Adult Kayapo men do wear lip discs, but they are not very ornate. This makes them less than human by Suyà standards, and this ranking is, of course, mutual. The Suyà economy of the senses thus differs from that of the Kayapo, as regards the salience and direct/indirect regulation of aurality and tactility (or sexuality) respectively. This suggests that, contrary to McLuhan's theory, not all 'oral societies' are of one mind with respect to the ranking and uses of hearing relative to the other senses – a point which has been confirmed by numerous subsequent studies (Classen 1993a, 1997; Geurts 2002; Howes 2003).

SENSORY WORLDS

The field of material culture studies stands to be significantly enriched through attending to the multiple sensory dimensions of 'material

worlds' (Miller 1998). As Daniel Miller observes in 'Why some things matter': 'through dwelling on the more mundane sensual and material qualities of the object, we are able to unpick the more subtle connections with cultural lives and values that are objectified through these forms, in part because of the qualities they possess' (1998: 9). My focus in this section shall be on artefacts as extensions of the senses and the emergent notion of emplacement, or the sensuous reaction of people to place.

Artefacts

Every artefact embodies a particular sensory mix. It does so in terms of its production (i.e. the sensory skills and values that go into its making), in the sensory qualities it presents, and in its consumption (i.e. the meanings and uses people discover in or ascribe to it in accordance with the sensory order of their culture or subculture).

The shell valuables (armshells and necklaces) which circulate in countervailing directions around the vast inter-island system of ceremonial exchange known as the 'kula ring' in the Massim region of Papua New Guinea provide a good example of artefacts as extensions of the senses. The sonic, kinetic and visual as well as olfactory characteristics of these objects (together with their attachments) are keyed to the Massim hierarchy of sensing and scale of self-constitution. The shell valuables provide a standard in terms of which the social status and persuasive powers of their (always temporary) possessors can be judged and communicated. In the Massim world, every man of the kula wants to progress from being a face with no name (i.e. admired for his visual and olfactory appearance when he goes on a kula expedition to visit his partner on a neighbouring island) to being a name with no face (i.e. have his name circulate quite apart from his body in concert with the named shells of note that have passed through his possession).

According to Annette Weiner's revisionist analysis of kula exchange, the kula is not about 'the love of give-and-take for its own sake', as Malinowski suggested, 'but creating one's own individual fame through the circulation of objects that accumulate the histories of their travels and the names of those who have possessed them' (quoted in Howes 2003: 67). The cardinal value of Massim civilization is, in fact, *butu*, which means both 'noise' and 'fame'. This value is condensed in the sensual qualities of the attachments which serve as an index of a

kula valuable's status or rank. The attachments consist of trade beads, seeds, other types of shells, and bits of plastic or tin, which are tied either to the valuable itself or to a frame. Basically, the attachments serve to augment the space of the valuable by extending its boundaries, by suggesting motility and by making a chiming or tinkling noise. It is fitting that the attachments enlarge the body of the shell, extending it outward in space, given the connection between beautification and exteriorization that is so fundamental to Massim aesthetics (Munn 1986; Howes 2003: 72-3). It is also fitting that they impart motion (specifically, a trembling motion) to the shell, since the essence of a valuable lies in its mobility – its being for transmission. The main function of the attachments, however, is to signify success in kula exchange through sound, hence the significance of the chiming or tinkling sound they make. (In many parts, kula transactions are in fact concluded at night, so that it is the sound of a kula valuable being carried off to the beach that signals success on the exchange.) As Nancy Munn observes, 'the mobile decor makes a sound that ramifies the space [of the shell] – as if putting it into motion – so that what may be out of sight may nevertheless be heard' (quoted in Howes 2003: 82).

The sensory meaning of an object or artefact may change over time. Consider the case of the rose. The transformation of the rose from a pre-modern symbol of olfactory and gustatory perfection to a modern symbol of formal visual perfection indexes the shifting balance of the senses in Western history – specifically, the visual eclipse of smell. While in pre-modern times 'A rose by any other name would smell as sweet' and rose petals were frequently used in cooking, in modern times, many varieties of roses look quite splendid but have, in fact, lost their scent owing to selective breeding. This shift did not go uncontested. William Morris, for example, railed against 'the triumph of surface over essence, of quantity over quality', represented by the way in which showy gardens had come to replace scented gardens in Victorian England (Classen 1993a: 31).

The sensory meanings of objects also vary across cultures. Analysing commodities as bundles of sensual relations, susceptible to multiple appropriations (or appraisals), can help elucidate the sensory as well as social biographies of things in the course of their domestication (see Dant 1999: 110-29). It can also help to explain the often innovative meanings and uses ascribed to foreign products in contexts of 'cross-cultural consumption' (Howes 1996).⁵

For example, the Algonquin Indians traded furs for glass beads of various hues with the French in seventeenth-century Québec, and there was also a significant traffic in prayer beads. But the Algonquians did not admire the beads simply for their 'brilliance', they also occasionally ground them up and smoked them because 'the respiratory route' was the standard sensory channel for the ingestion of power-laden substances (von Gernet 1996: 170-6). To take a contemporary example, Johnson & Johnson's baby powder is a popular trade item in Papua New Guinea. Rather than being applied to babies, however, it is used for purifying corpses and mourners, asperging the heads of ritual performers, and for body decor.⁶ This decorative use of baby powder (as a substitute for crushed shell) has the effect of intensifying the visual and olfactory presence of the person in ways that accord with the emphasis on exteriorization in the Massim aesthetic order, as discussed elsewhere (see Howes 2003: 217-18).

It is not only in contexts of cross-cultural consumption that commodities acquire new uses and meanings on account of local appraisals of their sensual qualities. Take the case of Kool-Aid – that icon of American middle-class family life – which is used as a (cheap yet colourful) hair dye by numbers of rebellious North American 'tweens' (i.e. those aged 10 to 13). Here tween subculture is the determining factor in 'making sense' of what Kool-Aid is good for, converting a taste into a sight.

Emplacement

The sensuous reaction of people to place has received increased attention of late thanks to the pioneering work of Yi-Fu Tuan (1974, 1995) and Steve Feld (1996), among others. Their example has led geographers and anthropologists alike to foreground the notion of sense-scapes in place of the conventional notion of landscape, with its primarily visual connotations (see Porteous 1990), and to pay heightened attention to processes of 'emplacement' (Rodman 1992; Fletcher 2004) as distinct from (but inclusive of) processes of 'embodiment' (Csordas 1990).

In his contribution to *Senses of Place*, Feld probes the seemingly transparent meaning of the word 'sense' in the expression 'sense of place' by asking: 'How is place actually sensed?' He goes on to argue that 'as place is sensed, senses are placed; as places make sense, senses make place' (1996: 91). Feld's point is nicely exemplified by numerous subsequent studies

of the sonic dimensions of social life (or sonorization of the material world), such as those collected in *Music, Sensation, and Sensuality* (Austern 2002), *The Auditory Culture Reader* (Bull and Back 2003) and *Hearing Cultures* (Erlmann 2004).

The odorization of the material world, both historically and across cultures, has also come under increased investigation (Corbin 1986; Classen et al. 1994; Rasmussen 1999; Drobnick forthcoming). Vishvajit Pandya's ethnography of Ongee 'osmology' (or science of scent) presents a particularly illuminating case study of the socialization of olfaction. Among the Ongee, a hunting and gathering people of Little Andaman Island in the Bay of Bengal, smell is the primary sensory medium through which the categories of time, space and the person are conceptualized. Odour, according to the Ongee, is the vital force which animates all living, organic beings, and life, for the Ongee, is a constant game of olfactory hide-and-seek. They seek out animals in order to kill them by releasing their odours, and at the same time try to hide their own odours both from the animals they hunt and from the spirits who hunt them.

Space is conceived of by the Ongee not as a static area within which things happen but as a dynamic environmental flow. The olfactory space of an Ongee village fluctuates: it can be more expansive or less, depending on the presence of strong-smelling substances (e.g. pig meat), the strength of the wind, and other factors. The Ongee smellscape, then, is not a fixed structure but a fluid pattern that can shift according to differing atmospheric conditions. The Ongee convey the fluid nature of odour by employing the same word, *kwayaye*, for both the emission of odours and the ebb and flow of tides (Pandya 1993; Classen et al. 1994: 97-9).

When Pandya observed that his official map of the island did not correspond with his experience of it among the Ongee, an Ongee informant replied:

Why do you hope to see the same space while moving? One only hopes to reach the place in the end. All the places in space are constantly changing. The creek is never the same; it grows larger and smaller because the mangrove forest keeps growing and changing the creek. The rise and fall of the tidewater changes the coast and the creeks. ... You cannot remember a place by what it looks like. Your map tells lies. Places change. Does your map say that? Does your map say when the stream is dry and gone or when it comes and overflows? We remember how to come and go

back, not the places which are on the way of going and coming.

(Pandya 1991: 792–3)

Among the Ongee, space is as fluid as the odours which animate the world. How would a Western cartographer begin to map the complexities of the Ongee's fundamentally non-visual sense of place?⁶

A culture's sensory order is also projected in its architecture. A good comparative example would be the nineteenth-century European fashion for balconies versus the windowless walled domestic compounds found in many parts of Africa. The architectural form of the balcony allowed the bourgeois subject to gaze but not be touched while the walled compound inhibits sight and fosters tactile engagement. The latter arrangement is important to a people such as the Wolof of Senegal, for whom touch is the social sense and vision the sense of aggression and transgression (Howes 1991: 182–5). Another interesting comparative example is the Inuit snowhouse or 'igloo' versus the modern bourgeois home. According to Edmund Carpenter, 'visually and acoustically the igloo is "open," a labyrinth alive with the movements of crowded people' (1973: 25). By contrast, the proliferation of rooms within the bourgeois dwelling has had the effect of privatizing what were once more social functions (the preparation and consumption of food, the elimination of bodily wastes, sleeping) by confining each to a separate compartment. The fragmented understanding of the sensorium with which most modern Western subjects operate is at least partly attributable to this great nineteenth-century repartition of space and bodily functions.

Most studies of emplacement have tended to focus on the ordering or integration of the senses. However, it is important to consider the underside of emplacement as well – namely, the sense of displacement typically experienced by marginal groups within society. For example, Chris Fletcher (2004) has coined the term 'dystoposthesia' to describe 'the incompatibility of bodies to the space they inhabit' experienced by those who suffer from 'environmental sensitivities' (ES). For sufferers of ES, the visual world is dangerously deceptive. Through the eye-catching facades of modern life – furniture, paint, rugs, cosmetics – seep invisible toxic fumes, turning the dream worlds of consumer capitalism into corporeal nightmares. ES sufferers have no evident reason for their deranged sensations, for the world they perceive as threatening is judged by others to be safe. Indeed, ES is medically unrecognized and often

dismissed as a 'garden variety mental disorder'. In order to retain a sense of sanity, ES sufferers must 'work out a bodily logic of what remains illogical' (Fletcher 2004: 384).

The term dystoposthesia might also be applied to the life world of the homeless persons in Boston studied by Robert Desjarlais in 'Movement, stillness' (2004). Whether on the street or in a shelter the homeless are incompatible with their sensory environment. Both sites offer a continual series of sensory assaults; brutal in the case of the street, distracting in the case of the shelter, with its constant hum of activity. Desjarlais describes how the homeless develop various sensory techniques to cope with their situation. When a 'quiet place' cannot be found, the body itself becomes 'silent', numb to the world outside and the feelings inside: the homeless 'play dead', even though this strategy exposes them to additional risks.

SENSORIAL INVESTIGATIONS

Victor Buchli has drawn attention to the curious neglect of materiality in material culture studies. He observes that 'material culture' transforms 'a mostly inarticulate realm of sensual experience into the two dimensions of a scholarly text or the "nature-morte" of the museum display' (2002: 13). He wonders whether there is any alternative to this seemingly inexorable 'decrease in physicality' (or movement towards 'the dimensionless and ephemeral') when objects are reduced to writing or subject to classification and exhibition in glass cases.

I am in sympathy with Buchli's critique of the neglect of materiality in material culture studies, though I would be more inclined to speak of the sensuality of material culture. I am also in agreement with his attack on the ideology of 'conservation'. (Conservation, according to Buchli, conserves nowhere near as much as it 'produces' a particular order of things.) However, I also believe that a number of questionable assumptions remain embedded in Buchli's state-of-the-art critique, and that these have the effect of limiting what he is able to conceive of by way of alternative modes of presentation. Why suppose that artefacts are not for handling? Why prioritize the visual appearance of an object? This last question is prompted by Buchli's observation that:

Most of our publications deny us any visual representation of the very physical objects we explore. This was never the case in the beautifully illustrated

discussions of material culture in the past and their exquisite display when the affects of these objects were at their most problematic ... [from a contemporary postcolonial perspective]. Their visibility and form was the primary vehicle of authority and information, the text was merely supplementary and discursive.

(2002: 14)

To truly access the materiality of an object, I maintain, it is precisely those qualities which cannot be reproduced in photographs – the feel, the weight, the smell, the sound – which are essential to consider. As the previous sections of this chapter have indicated, these non-visual qualities are also often of key importance within an artefact's culture of origin. Appreciating the visual design of a Tukano basket would tell one nothing of the range of sensory characteristics which are meaningful to the Tukano, right down to the odour of the vines from which a basket is made. To access such non-visual qualities, however, often involves breaking one of the most sacred museological taboos and actually *handling* a collectible. This fear of touch is not intrinsic to the museum. Early museums often gave visitors tactile access to their collections, of which visitors took full advantage. Thus seventeenth and eighteenth-century diarists record lifting, feeling and smelling artefacts in the collections they visited (Classen and Howes forthcoming). It is certainly the case that most early curators did not share the modern preoccupation with conservation. However, it is even more true that the sensory values of the time gave an importance to tactile knowledge which has since been discounted. Even though it might endanger the collection, visitors were still allowed to touch because of the belief that touch was essential for appreciation. The current sensory order of the museum resulted from the confluence of a widespread hypervaluation of vision in modernity and a new emphasis on the preservation of the material past (Classen 2005).⁸

Owing to its association with museum studies and to its development within a particular culture of vision, material culture studies has tended to overlook the multisensory properties of materiality. While this is now changing, as we have seen, old habits die hard. Examining the sensuous worlds of non-Western peoples such as the Tukano and the Ongee brings out the importance of exploring all the sensory dimensions of material life, even the olfactory – the most denigrated sensory domain of modernity. The model of intersensoriality, in turn, compels us to interrelate

sensory media, to contextualize them within a total sensory and social environment. While all media may not be conveying the same message, or given the same attention, they are nonetheless all playing on each other. The study of material culture, from this perspective, becomes the exploration of sensory relationships and embodied experience within particular regimes or systems of cultural values. It is only through such multisensory investigations that material culture studies can become a full-bodied discipline. After all, a material culture that consisted solely of images would be immaterial.

NOTES

- 1 Saunders's point is that the Great War of 1914–18 was a crisis of synaesthetic proportions, and not simply a 'crisis of vision', as others maintain (e.g. Jay 1993: 211–15).
- 2 The sensual revolution in material culture studies is not confined to the work of the University College London Material Culture Group, as the examples cited thus far might suggest. For example, Nadia Seremetakis makes an eloquent case for treating 'perception as material culture in modernity' in *The Senses Still* (1994), and David Sutton (2001), building on the work of James Fernandez (1986), has highlighted the sensory dimensions of memory and food. There is a whole sub-field of archaeology now dedicated to the 'archaeology of perception' (Houston and Taube 2000; Ouzman 2001). Other leading proponents of the sensory analysis of artefacts include Richard Carp (1997) and Jules Prown (1996).
- 3 In drawing out this logical implication of the 'writing culture' position, Tyler is, of course, exposing the limits of representation, unlike the other contributors to the Clifford and Marcus volume (1986), who would appear to condone and even celebrate them (see Howes 2003: 22–3).
- 4 There is a quality to synaesthetic expressions, such as 'crumbly yellow voice', which some perceive to be akin to metaphor. Similarly, one finds the term 'synaesthesia' being used interchangeably with 'metaphor' in the works of anthropologists such as Isbell (1985). This is untoward, for synaesthesia is a sensory process, not a linguistic one like metaphor, and its value as a theoretical concept may consist precisely in the way it enables us to analyse rituals from a perspective that is beyond metaphor – that

is, from a perspective which treats rituals as 'ways of sensing' the world (Howes 2003). Such an approach builds on the manifold senses of the word 'sense' – 'sense' as 'sensation' and 'signification', to which one might add 'direction' (as given in the French word *sens*).

- 5 Also of note in this connection are those studies which highlight the struggle for dominance of conflicting constructions of the sensorium in situations of culture contact (see Classen 1993b; Hoffer 2003).
- 6 Ongee cosmology, in addition to defying cartography, poses a significant challenge to phenomenological approaches to the study of human-environment relations. To take a paradigm case, in *The Perception of the Environment* (2000) Tim Ingold dwells extensively on sight and sound and 'motion' (or action) but his text is virtually devoid of references to smell or taste or touch. The Ongee would thus find little or nothing to perceive in Ingold's phenomenologically reduced 'surroundings' – but then, this should not be so surprising, given that phenomenology comes from the Greek *phainō*, which means 'to appear'. Ingold's work, in addition to being open to critique for (uncritically) reflecting certain conventional Western perceptual biases in its account of 'the environment', must be challenged for the Eurocentrism with which it champions the theories of perception advanced by philosopher Maurice Merleau-Ponty and psychologist J.J. Gibson as if the universal validity of those theories were a given, instead of remaining to be seen (see Ingold 2000: Chapter 14; Howes 2003: 239–40 n. 8).
- 7 To these questions one might add: why assume that writing must be a two-dimensional medium? There exist counter-examples, such as the Inca *quipu*, which consists of a series of knotted strings, and is best characterized as a multidimensional and multisensorial form of writing (Classen and Howes forthcoming; see further Küchler 2002 and Connor 2003: 40–1 on the multisensory symbolic significance of knots and knotting). Given the unlikelihood of Inca writing ever being revived, much less becoming the lingua franca of the academy, it might be objected that our writing about material culture means continuing to frame it within a two-dimensional medium. To this objection I would respond that it is nevertheless possible to hone our powers of (verbal) description to the point that our words mingle

with their referents, thereby sensualizing language instead of merely verbalizing things. This path is suggested by the work of historian Alain Corbin who, by recuperating past phrases, such as *aura seminalis*, *miasma*, etc., has succeeded at rendering history sensible (see Corbin 2000: 62). It is also exemplified by certain contemporary writers, such as Seamus Heaney (1991) and Susan Stewart (2002), who exploit the materiality (or better sensuality) of language in untold ways. So too can what Buchli (2002) calls the dimensionless "*nature morte*" of museum displays be complicated sensorially by curating exhibitions for all the senses, as exemplified by the work of Displaycult (Drobnick and Fisher 2002).

- 8 For an account of the florescence of the 'exhibitionary complex', or visual eclipse of touch, in the mid-nineteenth century see *The Birth of the Museum* (Bennett 1995), and for an analysis of the prehistory and fall-out of this transformation in perception see Classen (2005) and Candlin (2004).

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11

THE COLOURS OF THINGS

Diana Young

This chapter addresses the materiality of colours. In using the term *materiality* to designate colour I refer to the material stuff of colour, coloured cloth, coloured paper, coloured paints, coloured food etc. I will argue that colour is a crucial but little analysed part of understanding how material things can constitute social relations. Here, in emphasising their materiality I will consider what it is that colours can do, something which has been neglected even in material culture theory, as it has been in every other branch of anthropology. It is as much for what they do, as well as for what they can mean, that colours are so useful and worth attending to both in images and in things. Colours may be harnessed to accomplish work that no other quality of things can, especially in the hands of knowledgeable practitioners. Colours may be combined to interact with one another producing an effect of vivacity and movement. Colours animate things in a variety of ways, evoking space, emitting brilliance, endowing things with an aura of energy or light. Conversely colours are also able to camouflage things amidst their context. Colours constitute badges of identity and connect otherwise disparate categories of things – red buses, red birds, red fruit, say – in expanding analogical networks. Colours can transform things and sequences of colour transformations employed to represent temporality. Colours are also linked with emotional expression. Lastly, in the phenomenon known as synaesthesia coloured mental imagery is linked with other senses, not just the visual – commonly sound, odour and tactility.

Colour figures across a vast array of contested theories in philosophy, psychology, art and brain science. (e.g. Davidoff 1992; Gage 1993; Goethe 1987; Hardin and Maffi 1997;

Lamb and Bourriau 1995; Wittgenstein 1977). In all of these, bar Western art history, colour has been consistently dematerialized; it has been argued that the very entity 'colour' is itself a product of science.¹ In post-Enlightenment philosophy and science, colour has been considered as *qualia*, a qualitative, not quantitative, aspect of things that resists mathematical measurements, making it problematic as a subject of scientific investigation (Hardin 1988). But since colours are also self-evidently *there*, philosophers have seen them, from Locke onwards, as paradigmatic of empirical knowledge (Hardin 1988; Saunders 2002). Colour has thus earned the status of a 'given', an innate concept common to all human beings, but it is also considered as merely a 'sensation' (Rye, quoted in Saunders 2002). These sensations are held to require processing by some higher area of the brain. The search for *where* in the brain such processing might take place and what kind of links there may be between 'higher' and 'lower' processes have occupied psychologists and neurologists. As I will explore below, most often the higher processing has been assumed as linked with language. A further consequence of this idea of sensation has been that colours are considered as spontaneous and a 'froth' of consciousness. The difficulty arises as to how it is possible to represent such sensations as measured (cf. Saunders 2002). This has resulted in a wavelength of light becoming the standard measure of colours in colour science. All this may seem tangential to discussions of colour as materiality. Yet the way colour is discussed across all disciplines is heavily influenced by colour science and it is a necessity to be critical of this, not least because most of the things circulating in the world today are

coloured using formulas produced by colour science (Saunders 1998).

There is then a tension in this construct called colour. Colour is quantified and calibrated in some arenas, and extravagantly expressive and intuitive elsewhere. Colour is on the one hand considered merely 'decorative', trivial, feminine, and on the other taken as the foundation of epistemology since Descartes. Anthropology has, for the most part, taken colour as a serious subject in two ways: as a matter of classification linked with language and as symbolism.

For studies in material culture colour presents a thicket of difficulties. First there is a long history of the dematerialization of colours in Western science. Anthropology has followed the dematerializing approach with its interest in colour as symbolic, and standing only for a meaning that lies elsewhere, beyond the colours of things. Then there is the 'problem', dependant on the idea that colour is a given, that colour perception is somehow related to language and the understanding of colour as pure 'sensation' which only needs processing by higher mental levels to become relevant and meaningful. The disembodiment of the experience of colour occurs when colour is understood as only connected with processes that take place in the head as mediated through the eyes and brain/mind.

The reductionism of colours in science eschews the emotion and desire, the sensuality and danger and hence the expressive potential that colours possess. These last may lack evidence in scientific terms but are extensively harnessed by makers and artists across cultures in their work. Colours seem to be too many things at once. Perhaps that is why universal or at least generalizing frameworks are constantly created for colour. It has been suggested that there are different grammars of colour: Euclidian, pixellated and vernacular.²

If all human beings have the capacity to discriminate colours then the universality of the human cognitive apparatus is often cited as a reason to believe that perception is similarly universal or that colours are cognitively salient (Dedrick 2002; Sperber 1975). I follow here the argument that cognition is always mediated by other people and altered by social experience (Toren 1993). 'We are not constrained by the nature of our perceptual experience but ... [are] users' (Dedrick 2002: 63).

Here I want to move away from linguistic models of colour. I argue that the colours of things are both able to structure knowledge as well as affect ways of being. The idea that the experience of colours is an aspect of being in

the world has meant that phenomenology is often invoked to illuminate social colour practice, since it considers colour as embodied, eschewing the mind/body split of colour science (e.g. Jones and MacGregor 2001). Merleau-Ponty wrote:

We must stop ... wondering how and why red signifies effort or violence, green, restfulness and peace; we must rediscover how to live these colours as our body does, that is, as peace or violence in its concrete form ... a sensation of redness and its motor reactions [are not two distinct facts] ... we must be understood as meaning that red, by its texture as followed and adhered to by our gaze, is already the amplification of our being.

(Merleau Ponty 1962: 211)

Red as the amplification of being is a beguiling concept. At the same time, the emphasis on the individual's sensations offers little to an understanding of colours as social practice and relegates colours yet again to qualia that cannot structure things, that cannot be knowingly and strategically employed. On the other hand *being* colour, literally, wearing colour or consuming it, may be an immediate and emotional response to a particular social situation, something I will explore further below.

The experience that is called colour is a highly encultured construct. The 'period eye' and the 'cultural eye' are always at play in judgements of colour and colour combinations (Gombrich 1960; Coote 1992). Questions about aesthetics as a cross-cultural category are often raised with respect to colour: is a colour or combination of colours sought after because it is 'aesthetically pleasing', or grounded in a biographical and socially relational milieu from which it derives significance (Gell 1998; Ingold 1996)? A conventional Western sense of colour is highly biased and based on ideas of aesthetics. As Malraux observes, 'Athens was never white but her statues, bereft of colour, have conditioned the artistic sensibilities of Europe ... the whole past has reached us colourless' (Malraux 1956: 47-9).

Time-worn patina is what is generally valued in European art, an aesthetic exported into ethnographic collections. Authenticity resides in the faded surface and rarely, for example, in a coating of fluorescent acrylic paints. This presents a dilemma for conservationists. Should an object that was once highly coloured be restored to that state, producing the effect it was originally intended to have by those who made it, or should it be left 'as found' for museum or gallery display?

In Western art history, colours have often been a mere superficial adjunct to the more

substantial form or, in drawing and painting, *line*, or *disegno et colore* (cf. Gage 1993). Line is more telling, more sophisticated and *more like writing* and reinforces the logocentrism of anthropological enquiries. This opposition between line and colour has heavily influenced analyses of non-Western art (e.g. Munn 1973; Dussart 1999). A linearity of thought pervades many important studies of art in anthropology, where colours are often rendered as redundant, cluttering the elicitation of meaning through graphics or form. A privileging of colour, rather than a reference in passing, needs to be continually justified. Commentators are allowed some latitude in judgements about the colour use of the 'Other', seen conventionally as tending to combine colours 'garishly' or to limiting themselves wisely to what are held to be 'traditional' earth colours, thereby ensuring the desirability of their work for the colonizer's art markets (e.g. Michaels 1994).

I propose an anthropocentric view of colour that can engage not only the question 'Why does the object have the colours it does?' but also, importantly, 'What do those colours do for the object?' or, in other words, 'What kind of effect do they have?' I turn first to a consideration of some of the existing frameworks that have been constructed to 'contain' and dematerialize colour, before suggesting how material culture theory may offer fresh insights.

COLOUR AS A SCIENCE

Colour science has constructed particular versions of what colour is. Colour, it seems, is a highly problematic concept, one that philosopher J.J. Gibson refers to as 'one of the worst muddles in the history of science, the meaning of the term "colour"' (Gibson, in Malcolm 1999: 723). The received view is that colours are not a fundamental property of things at all (Thompson 1995). Following this orthodoxy, colour can only be a secondary quality of objects in contrast to form. Thus, modern popular accounts of colour and its pragmatic applications, in landscape and building, for example, seem to need to begin with an account of the perceptual apparatus that are deemed to conjure it, the eye and the brain, something which is not apparently necessary for an account of form.

This enduring orthodoxy, the understanding of colour as a secondary quality, dates from Newton and Locke (Thompson 1995). Newton's experiments refracted sunlight through two prisms, producing the spectrum which he

famously named as 'seven hues', a propitious number derived from Descartes's musical scales and a number that Newton took some years to decide upon (Gage 1993: 232-3). These colours are, Newton theorized, produced by the wavelength of light refracted. In this way, colour became a mathematically precise principle that took precedence over the painter's and dyer's knowledge of colour, practised during the preceding centuries; 'the seventeenth century was, for the student of optics, the century when colour had finally been relegated to a derivative, subordinate position ...' (Gage 1993: 191, 155). Colour had been dematerialized into light. In the Newtonian paradigm a surface appears red because it reflects more red light than any other: 'every body reflects the Rays of its own Colour more copiously than the rest, and from their excess and predominance in the reflected Light has its Color' (Newton 1730, in Hardin 1988: 187). Modern colour science, with its Newtonian legacy, dematerializes colour into wavelengths of light, which is both geometrically precise and empirically quantifiable.

Colours have been measured by a system, metaphorically called the colour 'space' because it has been given three dimensions. The most common of these systems is known as the Munsell. The three dimensions of the colour space are hue, or the identification of *what* colour; tone, or the measurement of how much grey the colour contains, and saturation, or how pure a hue is or, in other words, how intense it is.³ Van Brakel (2002) provides a good overview of the gradual accretion over time of this model to its status as an objective fact. It is such systematized colour that moves from laboratory testing out into the fields of anthropology and anthropological linguistics as chips or swatches, thereby inhibiting the study of the colours of things themselves within their different social contexts. Van Brakel challenges the 'methodological fetishism' of linguistic anthropology regarding, which 'it is often suggested that only data collected with elaborately standardised methodology can be taken seriously' (2002: 148). This is a pertinent point, as anthropological studies that do not employ Munsell chips or something similar are, of course, of no interest whatever to colour scientists.

Both modern and ancient philosophical debates about colour have debated colour's relative subjectivity and objectivity. Is colour out there in the world, as it were, or merely produced in our brains as sensations, such that things only *appear* to have colours? The most radical position in the latter conceptualization

theorizes colour as an exclusively brain-based experience (e.g. Hardin 1988). Dispensing with this subjectivist approach, that colour is merely a quality extruded by the brain, or the objectivist approach that finds colour as a physical quality of objects, the new orthodoxy in colour science, following Thompson's influential work, considers colours as mutually constituted by things and persons, following (selectively) the ecological psychology of Gibson (Thompson 1995). Thompson's work intends to dissolve the mind/body split (Saunders 1998). This is a more helpful construct for material culture studies. If things themselves may embody social processes, so too may colours. The mutual construction of colour and person resonates with recent critiques of the assumed divide between persons and things as a myth of modernity, from the assumption that certain things possess person-like qualities (Latour 1993; Gell 1998). The 'stickiness' of highly saturated colours, as Gell describes the adherence of things to persons through the quality of pattern, can also render things and persons interchangeable. Pattern, after all, can exist only through colour, since without contrast there is no pattern. Paul Cézanne put it more precisely: 'colour is the place where our brains and the universe meet' (Merleau-Ponty 1964/2004: 180).

Although neurology is not interested in embodied and socially situated experience, because it considers colour as a given, it is worth noting some recent influential neurological findings that claim to have identified a colour centre in the brain in the area called the 'visual cortex'. This is in contrast to the refusal to countenance the presence of such an area in the preceding century (Zeki 1993). According to Zeki, the brain experiences the world in a state of constant flux. The brain must assemble or collate information from large parts of the visual field, compare different features and extract constants rather than break information down into its components.⁴ It is an active process rather than the old idea of an image impressed on the passive brain (1993). Colour is seen before form, which is seen before motion (Zeki 1998: 75). How the brain decides *what* colour it is seeing must always be, Zeki argues, as a result of comparison with surrounding colour. On some occasions the brain decides that a colour is a constant despite the comparative information. This is known as 'colour constancy'.

The neglected problem of colour constancy has recently become the central problem within the study of colour vision (de Weert 2002; Zeki 1993). How is it that a leaf looks green to us whatever the weather conditions

may be? That is, contrary to Newtonian theory, it is thought now that no precise relation exists between the wavelength of the light reaching the eye from every point on a surface and the colour we see at that point. Colour constancy is invoked as crucial because without it there would be no biological signalling mechanism, that is, there would be supposedly no method for an ape or a human to distinguish a ripe fruit from a leaf (Mollon 1999).

COLOUR AND COGNITION; LANGUAGE AND PERCEPTION

What is the relationship between colour perception and language? Is colour cognition independent of language? Is there a direct link at all between what we know and what we can articulate about colour? (Hardin and Maffi 1997: 355). To write about 'colour' at all may seem presumptuous, given that there is no universal linguistic term for what we understand by colour. That position depends on assuming that the discrimination of hues is somehow linked with the existence of colour terms. These are questions that have dominated colour debates and influenced anthropology during the last half-century. There is an enduring assumption that to communicate with colours is to talk about them – in short, that language is culture (e.g. Kuschel and Monberg 1974). Such research also hinges on the received view that 'colour' is a given cognitive category, that is, somehow innately present in the brain. The problem is to find out how colour is divided up. Are there universal categories or are such divisions culturally relative or, according to the language as culture paradigm, relative to linguistic differences (Saunders 2002)?

Gladstone wrote a famous paper on the apparent lack of interest in colour shown by the ancient Greeks, citing the paucity of colour words in Homer (Gladstone 1858). In the 1880s Magnus noted that many primitive peoples have a well developed colour perception, and a comparatively limited colour vocabulary (cited in Gardner 1985). Van Wijk hypothesized that societies near the equator focus more on brightness in their lexicon, whereas those from higher latitudes he claimed, are more interested in hue (Van Wijk 1959, cited in Gardner 1985). The Sapir-Whorf hypothesis, 'a radical doctrine of linguistic relativity', assumed that colour perception is created by language (Kay and Willett 1984; Whorf 1956). Thus if a language contains no term for 'blue', say, then

allegedly its speakers do not discriminate blue as a category. Berlin and Kay claimed to overturn this hypothesis in their much criticized but highly influential theory of Basic Colour Terms (BCTs). They claimed that their research with people from ninety-eight language groups, all living in the Los Angeles area, showed that all languages follow a universal evolutionary pattern of colour naming. There could be no culture that would only have a single colour term. If a language has only two colour terms, these are always black and white, and this was dubbed Stage 1. In Stage 2, where there are three terms, the third is always red. The fourth and fifth terms are always either yellow or green and comprise Stage 3, and the sixth and seventh terms are either blue or brown, which is Stage 4. Purple, pink, orange and lastly grey amounted to a total of eleven terms, a sophistication achieved only by Indo-European cultures (Berlin and Kay 1969). A basic colour term is one that does not refer to something but rather is an abstraction.

There have been numerous criticisms of Berlin and Kay, including, for example, that all their informants lived in the Los Angeles area; that they took their eleven colour terms derived from the American English lexicon as a universal evolutionary standard to which everyone, given time, would evolve; that they made words conform to English colour words – light and dark, for example, were translated as white and black. Moreover, what the precise meaning of a BCT might be has never been adequately explained (Saunders and van Brakel 1997: 168).

Nonetheless, Berlin and Kay are ubiquitously quoted across many disciplines as fact, by, for example, neurologists, psychologists and art historians, and their work has spawned a host of ethnographic comparative studies. The early part of the developmental sequence proposed by Berlin and Kay, the so-called Stage 2, caused excitement in anthropology because it concurs with much evidence from ethnographic research, where there is a well documented common ritual triad of the colours black, white and red, to which I return below (e.g. Turner 1967; Tambiah 1968).

Berlin and Kay's basic colour terms were, they claimed, invariably clustered around 'focal' colours, that is, colours chosen as the brightest and best example of a hue, and a further dimension of their original project involved other participants representing twenty more genetically diverse languages. These participants apparently selected the same group of hues as brightest, whatever their lexicon. That is, according to Berlin and Kay, these bright

colours are universally recognized or salient, regardless of a person's language. Berlin and Kay regarded their work as counter-evidence to Whorf's theory, which was that language determines perception.

Berlin and Kay's findings seemed to be endorsed by the research of Rosch Heider. Rosch Heider's research started from the premise that focal colours were 'natural prototypes', perceptually more attention-grabbing and therefore more easily remembered. Her work with the Dani of the Indonesian part of New Guinea showed, she claimed, that people's recognition of focal colours was unmediated by language (Rosch Heider 1972, Rosch 1978). She concluded from her work with the Dani that the ease with which colours were remembered correlated with the BCT series of Berlin and Kay. Her methods and results have also been challenged (e.g. see Saunders and van Brakel 1997).⁵ Lucy, an enduring critic of the universal colour theory, and Shweder claimed that their experiments reinstated the Whorfian basis of earlier studies (Lucy and Shweder 1979). There has recently been an attempt to replicate Rosch Heider's research with a neighbouring group, Berinmo-speakers, and this proposes the opposite of Rosch Heider's findings (Roberson et al. 2002).

According to this study, the Berinmo have a term, *nol*, which encompasses green, blue and blue-purple on the Munsell chart; a term, *wap*, that refers to almost all light colours; *kel*, which applies to most dark colours; and so on for five categories. These categories are not centred on focal colours as Rosch Heider had proposed as universal and the new researchers claim 'an extensive influence of language on colour categorisation' among the Berinmo (Roberson et al. 2002: 35).⁶

Others have suggested broadening the category of colour, proposing that a fixation with brightness, rather than hue, precedes Berlin and Kay's Stage 1, while a linguist claims that there is a universal term 'to see' rather than a universal of colour (MacLaury 1992; Wierzbicka 1999). Fundamental criticisms of Berlin and Kay, in particular, and colour science, more generally, have been made by Saunders and van Brakel. These authors argue that the whole theoretical structure of Berlin and Kay in particular, and colour science in general, is tautological in its assumption of colour categories as given *a priori* rather than acquired socially in practice (Saunders 2000; Saunders and van Brakel 1997). Why, they ask, should colour form a closed and static system and why should it be a universal (Saunders and van Brakel 1999)? This is the

assumption of such tests, which are doomed to find only the parameters that they construct. Berlin and Kay's argument that proposed a universal linguistic evolution to the standard of complexity represented by the Indo-European eleven hues is without foundation. 'Colour' is produced by the experimental framework of the contextless 'colour space' and the dematerialized patches of light that are presented as 'stimuli' both in and out of laboratory settings (Saunders 1998). In short, 'Colour science explores the (changing) definition of colour science itself' (Saunders 1998: 702).

Nonetheless, the work of Berlin and Kay and Rosch spawned many engaging cross cultural studies in anthropology and archaeology, locating colour terms and aiming to compare them with the evolutionary colour stages. These comparative studies reveal no universal pattern, only an increasing tendency for all languages to align themselves with American English as the current global standard (van Brakel 2002: 150).⁷ Still, it is repeatedly assumed in much of the colour literature, or the premise is re-examined again and again, that colour language constitutes colour knowledge and, by extension, the failure to categorize or name a hue constitutes, at one and the same time, also a failure to discriminate *between* hues (e.g. Gellatly 2002). Elsewhere the divergence between what people say and what they know has been presented as a central flaw in research that uses verbal reports (Lakoff and Johnston 1981: 125). The complaint is also heard that all non-Western languages are now in a transitive state and will soon all use English colour terms – leaving no intact 'other' for colour science to research (Levinson 2000). Adopting Anglo-American colour terms, however, does not necessarily mean adopting Anglo-American colour *practices*.

While colour is popularly linked with emotional expression, there is also laboratory testing of the link between colour and emotion. As should be clear by now, such testing is conceived along the same lines as colour science, employing decontextualized chips in these studies while colour is similarly regarded as necessarily mediated by language. For example, D'Angrace and Egan used Munsell cards and words referring to emotions in laboratory research with Tzeltal and English-speakers. Both groups produced similar results for the following associations: 'happiness' elicited the most saturated colours, 'sadness' the most unsaturated, 'strong' the most saturated, 'weak' the most unsaturated and 'anger' and 'fear' produced the widest spread between the two groups (D'Angrace and Egan 1975).

The problem of language is, then, one that scholars of material colour must constantly confront. The study of material colours may yield further insights into the relationship between words and things (Keane 1997). But colours themselves are an expressive communication as potent as music, and this expressive potential lies in colour being other than verbal expression, in its being an-other medium. Colours can be agentive and thus capable of effecting events and transformations. It is surely these qualities that make colours so amenable to symbolism. It is to the prevalent notion in anthropology of colour as symbolic meaning that I now turn.

COLOURS AS MEANINGS

In symbolic anthropology the existence of 'colour' was not a philosophical problem. But here, too, the impetus has been to find some universal rules as meanings for individual hues, notably for the triad of red, white and black familiar from ritual settings (Barth 1975; Sahlin 1977; Turner 1967; Tambiah 1968).

In symbolic theory colours are transcendent, they stand for something else beyond and in this sense are representational. Symbolism in anthropological analysis works iconographically, that is, by similitude: 'if we want to know what black means we need to know what black is the colour of' (Bousfield 1979: 213). In the struggle to systematize unruly colour there are echoes of colour science. Colour cannot have influence in itself but must always be subordinated to form and substance, and meaning is learnt through this route.

Victor Turner's essay on red, white and black as 'epitomising universal human organic experience' has been highly influential (Turner 1967). Extrapolating from his work on the Ndembu, Turner proposed that semen and milk are symbolized by white, blood is symbolized by red, faeces and dirt are symbolized by black. All these are invoked as not merely perceptual differences but 'condensations of whole realms of psycho-biological experience, involving reason, all the senses and concerned with primary group relationships' (1967: 91).

Turner has been criticized in many quarters for being totalizing in his approach to symbolism in general (e.g. Sperber 1975) and colour symbolism in particular (Tambiah 1968) but his bodily fluids theory has been embedded within anthropological and archaeological discussions of colour. As with Berlin and Kay's work, the

evidence from cross-cultural comparisons does not support Turner's universalist theory. As Urry remarked of Turner – but the criticism applies equally to Berlin and Kay – such models have severely limited the attention given to colour in anthropology and archaeology, where it remains sufficient to compare one's data with these parameters, thus covering the topic of colour, and consider it closed (Urry 1971).

Barth's analysis of ritual and knowledge among the Baktamen of New Guinea is a good example of a Turner-esque symbolic approach, or at least a reply to it (Barth 1975). Barth's ethnography follows the example of Turner in that the dominant ritual colours of red, white and black are treated singly and are ascribed basic referents from which meaning is derived. The particular referents, though, differ from Turner's universals, except for the correlation between the colour red and blood (1975: 177). Barth writes that he cannot show that meanings derive from the inherent properties of the colours. In later work comparing the different cosmologies of Mountain Ok societies, Barth notes the use of a recipe containing red ochre, red pandanus fruit, red bark juice and pig fat as an 'emphatically male' substance among the Baktamen, who consider menstrual blood as black. The neighbouring Teleformin, however, consider red ochre as menstrual blood. Barth concludes that there is an opposition in the Teleformin ancestor cult between 'tarokind' in that gardening and pigs are codified by white and 'arrowkind', where war and hunting are codified by red. Barth concludes that 'powerful transformative processes are represented in myth and in ritual as transformations between red and white' (1987: 51). For Barth the coloured symbols achieve meaning through 'the design and activities of persons rather than by virtue of their natural qualities' (1975: 173). He sees colours as one aspect of a closed system of representation that is understandable only to those enculturated in its codified meanings (cf. Forge 1970). As well as the power of colour to express a social dynamic in the red-to-white transformation of ritual, Barth's analysis also shows the linkage between everyday and ritual that colours make possible, habitually and instantaneously.

The association of red with blood has been much discussed in the literature of symbolic anthropology. There are different kinds of blood; menstrual blood, for example, is frequently symbolized, as in the example above, by black (Urry 1971). Red ochres sprinkled around Neanderthal graves and with more frequency in later burial sites of *homo sapiens*

have been used to argue that red ochre was associated with life/blood (Wreshner 1980). This approach to colours has been criticized as too particular, one that would invalidate its polysemic symbolism (Jacobsen-Widdings 1980). Rather red might be associated with ambiguity, as it is in Central Africa, where it is neither one thing nor the other and thus stands for things that defy classification. Red is therefore endowed with dynamic properties and with magical powers (*ibid.*).

I suggest that while colours do have meanings which may *represent* knowledge (Munn 1973) or *communicate* it (Morphy 1991), these are not the only things that colours do. These approaches may also lead to foregrounding only certain arenas of analysis where conscious and highly constructed appearances such as ritual or art prevail, thereby neglecting the flux of colour in the more mundane areas of the everyday – cloth, cars and food, for example – and the ebb and flow of colours that compose daily existence. Having explored the two most influential approaches to colour in the social sciences, colour language and symbolic colour, I now turn to the colours of things. In doing so I wish to place less emphasis on the singularity of hues that is central to colour science and also marks out the linguistic and symbolic approaches to colour in anthropology. Rather, colours in a coloured context, that is, in the habitus of everyday life, might be considered as relational effects. The effect of colours taken together may be manipulated to produce a specific impact; for instance, in the use of four earth pigments to produce 'brilliance' by Yolgnu people in Arnhem Land, North Australia (Morphy 1989). Material colours may tell us about the relationship between things and people, whether certain objects are, for example, regarded as possessing an animation or agency, and what kind of spatial effect they are intended to produce, while other things are construed as passive. By using such an object-centred approach to colours, and by carrying out ethnography on the colours of things, we could learn about all sorts of levels of which meaning is only one dimension.

MATERIAL COLOUR

So far I have discussed the various dematerializations of colour, namely the reduction of colour to a measurable 'stimulus' in colour science and the dematerialization of colour as language and colour as symbolic meaning in anthropology. I have discussed how the

very notion of 'colour' has been considered problematic, since the apparatus of colour science that is used to conjure it already presupposes its existence. Yet the world is now full of circulating coloured things produced industrially such as cars, cloth and clothing, cosmetics and paints. All such industrial goods are coloured, usually purposely coloured with particular markets in mind, by employing pigment formulas with international standard numbers, pigments that are manufactured by a few multinational companies. Even the landscape is subject to colour interventions with, for example, the introduction of oil seed rape in the United Kingdom whose brilliant yellow flowers have transformed the washed-out hues that were once emblematic of the landscape.

I have suggested that material colour in the social world might be better considered as a relational quality, and below I will consider in more detail just what those relations might consist of. Rather than asking what people *perceive* in response to a given stimulus, such as an asocial, decontextualized piece of coloured card (a Munsell chip, say), or privileging what people say, we might consider what they *do* with coloured material things within the dynamics of social practice. By focusing on changes in colour practices during periods of social upheaval, for example, the articulation of the role of things might be revealed.⁸ Such situations might include the impact of colonization or post-socialism in the former Soviet bloc, for example, the question 'In what ways are colour relationships used to animate things?' could then be tested by examining the qualities of colour mixtures chosen before and after social upheaval.

For, alongside the intuitive idea of colour in phenomenology, I suggest that colours can be a compelling, exact and calculated medium for producing and reproducing power and for transmitting knowledge and an essential facet of knowledge systems. Further, colours have agency and can communicate and also effect complicated ideas and relationships instantaneously, following Wagner's writing on the power of images (Wagner 1987). But colours are also able to convey and embody a sense of becoming, and of being. Within these two generalized senses of colour, as knowledge, and as being, are further particularities. I will suggest some aspects of colour that might constitute new parameters for investigation. They are by no means offered as universals, rather they require careful comparative ethnographic fieldwork to show how colours embody social transactions. By researching exactly how people communicate with coloured things and imagery, networks

of connections may be revealed. These types of colour practices are not mutually exclusive. Colours can be distinguishing and emotive, they can structure space and create topographies of things.

First, then, since it seems colour's most simple application, there is *distinguishing* colour or the difference in hue used to differentiate things from one another—ginger cats from tabby ones, red lorries from green, territories on a map (itself a famous mathematical problem: what is the fewest number of colours needed to colour a map?) In evolutionary biology the necessity of distinguishing fruit from leaves is said to account for the co-evolution of trees and colour vision among primates (Lumsden and Wilson 1981; Mollon 1999). Distinguishing colour is the singular hue of colour science in that colour is the property which is used to discriminate this from that and, as I discussed above, is now linked with new ideas about colour constancy. It is colour categorized, codified, functional and reductive, yet also potentially of great social import. Distinguishing colour, often as sets of colours, signals social identity such as football or basketball strips and national flags and as such can be the focus of intense emotional expression, socially directed (Lutz and White 1986).

An extension or the inverse of distinguishing colour is colour as *analogy* in which the colours of things connect whole panoplies of otherwise disparate cultural categories, thereby constituting a network of resemblances (cf. Stafford 1999). It is one way of creating categories of things that are otherwise dissimilar, for example things and persons or green birds and green clothing and green cars. There may flow from this an expectation that things that are similarly coloured will produce the same effect on the grounds that if things have similar attributes then they will have other similarities (van Brackel 2002).

The colours of things may change (something that is generally neglected in the constructs of colour discussed above, where singularity and stasis of colour are mostly assumed), rendering such networks both unstable and dynamic. Land is apt to pass through changes in colour with seasonal variation, as do some animals and birds, producing and concealing analogies as they transform (Boric 2002; Young n.d.). In representations, things and persons can be shown as dynamic by a succession of differently coloured outlines around the original figure.

A colour change might also be thought of as the transformation itself not just as symbolic.

For example, Bailey has written of colour in the Hindu tradition as not 'merely an accident of matter' but an independent manifestation of the spirit that is part of the make-up of red cloth. 'Thus the spirit of red cloth, or redness, can combine with the moral substance of a particular person and transform it'. A man dressed in red was something more than this, he was a red man, a sorcerer. 'His costume did not symbolise a status acquired by other means; it was an essential component of the very transformation itself' (Seal, in Bayly 1986: 287). In south Indian ritual, coloured food is used to control the state of heat or coolness in the body. White is auspicious for stability, whilst red supercedes the ordinary and is necessary for innovation. But the instability of redness makes a further change to white desirable for well-being. The person undergoing purification is thus fed balls of coloured rice: the first is white, the second red, a quality achieved by adding lime or tumeric, and the third white (Beck 1969).

Among Pitjantjatjara and Yankunytjatjara people living in the central desert of Australia, greenness is consumed in the form of green tobacco harvested from land following rain. The becoming green of the land is echoed by wearing bright green clothing, thus re-embodiment the attachment of persons to their 'country' and the equation of these as interchangeable (Young n.d.). The becoming green of the body, both inside and out, is a concrete articulation of the ties of people to their land. In the Melanesian *kula*, the white shell valuables become red with age and human handling and it is this transformation that indicates their history and increases their prestige and value (Campbell 1983). The transformative work of colour thus effects and produces a spatial and temporal dimension. Colours are arguably, in these cases, construed as having agency, altering events and/or persons. Among the Abelam of Papua New Guinea, Forge wrote of the yam cult where all magical substances are classed as paint and paint is the ceremonial medium through which initiates are turned into men (Forge 1962). By anointing both yams and boys with colour both grow large and hot.

Colours acting together may be employed to produce captivating effects (e.g. Albers 1963; Cennini 1954; Chevreul 1858). In one of the few systematic attempts during the twentieth century to document the interaction of colours, the artist and teacher Josef Albers wrote, 'colours present themselves in continuous flux, constantly related to changing neighbours ...' (1971: 5). These effects might be said to

produce the quality of animation, a sense of movement through colour juxtapositions, that fetishizes things and brings them alive. The production of brilliance and of space are the two specific effects that I will discuss briefly here. While there is an inclination to oppose form to colour, both in art history and in neuroscience, as discussed above, form can be created through colour relationships. Paul Cézanne, for instance, used colours to create form in painting. 'The outline and the colours are no longer distinct from each other. To the extent that one paints, one outlines: the more the colours harmonise, the more the outline becomes precise'.⁹ Albers's colour experiments also show the particular and strong spatial pull together exerted by the combination of red, white and black, the contractive nature of black, next to expansive white and reds that seem to come forward (Albers 1963). I suggest that the cross-cultural predilection for the ritual combination of these colours has to do with the spatial effect created by their relationship to one another, an effect that is certainly embodied, an 'amplification of being' in Merleau-Ponty's words. With such examples in mind, the replacement of one colour by another when people obtain access to new coloured materials can be seen differently. The use of blue paint instead of black, frequently noted in the anthropological literature, is discussed in relation to Abelam cult houses (Forge 1970). Seeing the use of colour as codified, Forge is puzzled by the lack of distinction made by painters between black and recently obtained blues. It may be that for the Abelam the blues and blacks were similar in their spatial effect, something also implied by the description of initiated men working only on dark backgrounds using white outlines. The space created by the figure/ground relationship of white lines on a black ground is considered by Abelam men as distinct from black lines on white. Abelam children, however, were happier to paint on white paper (1970: 284). A possibility offered by this information is that adult men have acquired a different notion of space from children (cf. Toren 1993).

The structuring possibilities of colour in pattern applied to things and bodies are arresting, altering symmetries and spatial structures. Altering the colours of repetitive patterns also transforms their spatial orientation and adds ambiguity to symmetries, as Boas recorded for Peruvian weavers and embroiderers (Gombrich 1979).

If some assemblages of colours create strong spatial relationships, then others create an

impression of luminosity and dazzle. An analysis of Byzantine mosaics shows them to act as light materialized. It is through the colour combinations and lustre of the mosaic pieces that the huge church murals created and manifested form, with the whole building seeming to produce light as well as capturing daylight through its apertures. The Byzantines are held to have valued saturation rather than hue (James 1996). Among the Yolgnu of northern Australia, 'brilliance' is produced through the particular skilful combinations of earth pigments and expresses the powerful and dangerous presence of ancestors. In his influential paper Morphy declares the transformation from dull to brilliant as a concept underlying all ritual (Morphy 1989). My argument here is that objects can manifest different kinds of effects through the relationship of colours.

The idea of colour as involving only the visual is also a limited and culturally bound conception. In addition to the three 'dimensions' of colour encompassed by colour space models like the Munsell system, that of hue, tone and saturation, colours can also be implicated with senses that in the West are conventionally separated such as odour and tactility (see Howes, chapter 10 in this volume).

Conklin's paper on Hanunoo colour categories formed the basis of Berlin and Kay's research. His analysis of the four 'basic' categories of the Hanunoo correlates white to black as lightness and darkness, and wetness/succulence to desiccation shows a more expansive idea of colour (Conklin 1955: 343). This last pairing of wet to dry was grouped broadly around colours containing green and colours containing red, or rather things that were greenish and things that were reddish. This wider construct of what colour words might encompass resonates with other case studies on ancient Egypt and also contemporary central Australia, where greenness and wetness or fecundity are linked with rain in a way which might be termed cultural synaesthesia (Baines 1985; Young forthcoming).

In many cultures the senses are thought to alter the world in the process of perceiving it, rather than simply registering it (Howes 1992). In classical Mayan culture the eye was held to emit images (Houston and Taube 2000: 281). Recent rereadings of Aristotle, on whose work much subsequent Western philosophy of perception relies, have also argued for a return to the idea of colour as mutually 'out there' and in the mind, as having a powerful presence that changes objects and persons together (Johansen 2002).

CONCLUSION

Whilst anthropology might deplore the framework that has produced the phenomenon of colour, I have argued that as a discipline it cannot afford to ignore the industrial colours in the contemporary social world which are very often the result of that framework or are at least modified by it. Colours have escaped the laboratory where they had been de-materialized and become a part of material social practices.

I have attempted to argue that it is possible to step outside the guiding principles of colour science that have also influenced the social sciences by concentrating not on the discrimination of singular hues but on the effect of colours together. I have suggested that the qualities that Western science has called 'colour' animate things and are therefore crucial in determining the role of things and persons in a social context. It is through a detailed and thorough examination of colour practices, as well as what people say about these, that particular intended animative qualities can be revealed.

If colour continues to elude definition, the evidence of its pragmatic application is nonetheless present without anyone knowing why colour does what it actually does. A treatment for dyslexia has used coloured gel overlays on the standard black text on white page to enable dyslexics to decipher words (Wilkins 2003). It may be the spatial shift that the overlays bring about that introduces the necessary clarity.

Colour, then, is at once knowledge and being. Colours can dispense with the distinction between subject and object and define how things/persons move in the world through their animation and spatial distinctions. Indeed, the mutual constitution of persons and things will soon be literal in new 'smart' buildings where walls react to the occupants' clothing and change colour to match as a person moves across the space. While colour is still considered by anthropologists as a narrow specialist field, or as one which is too superficial, too difficult or as tautological, a whole dimension of the social world has escaped them.

NOTES

- 1 See Saunders (1998).
- 2 Saunders (2001) following Heelan's (1983) theory concerning grammars of perception,

- constructs Euclidian colour as the geometric and standardized colour of colour science; vernacular colour as that of the 'life world', meaning colour as part of the lived world, including socially situated colours, and pixelated colours refers to the growing body of work concerning the role of colour in computer displays.
- 3 Some sources refer to these axes as hue, value and chroma.
 - 4 Zeki, illustrating the incestuous circularity of colour science, quotes from the work of Rosch Heider, see below, to bolster his argument.
 - 5 Saunders and van Brakel, among others, challenge Rosch Heider's notion of focal colours which she herself selected and seem to have some correlation with the most saturated colours.
 - 6 See Henselmans (2002) for a critique of Roberson's Munsell-based methodology.
 - 7 See van Brakel (2002) for an overview of comparative studies.
 - 8 I am indebted to Nicholas Saunders for this insight.
 - 9 Merleau Ponty in 'Cezanne's doubt' (1964), quoting conversations with Emile Bernard.
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