## Prologue: Sensory Openings

How many senses are there, really? Is it the eyes that see, or the mind? Do the senses have a history? What makes smell 'the affective sense' par excellence? Are the senses so many independent channels, or do they interact and modulate each other? And, if so, how might we cultivate the capacity to smell colours or see feelingly?

These are among the questions to be addressed in this Element. It pries the senses and perception loose from the psychology laboratory (where their study has come to be confined in modernity) to focus on how they have been constructed and lived differently in different historical periods and across cultures. Many of its findings are surprising because they run counter to our common-sense assumptions about the sensorium. They make uncommon sense.

Part I is called 'Explorations'. Section 1 looks into the issue of the enumeration of the senses, or how the sensorium gets divided up. As we shall see, in many traditions there is a link between the anatomy of the senses and the structure of the cosmos – sensory anatomy and sensory cosmology are one. From this holistic perspective, it emerges that the senses are mediators, or dynamic mediums, rather than passive receptors localized in the body. Other shifts follow, such as from physiology to practice or 'technique'. Section 2 delves into the techniques of hearing, Section 3 explores diverse ways of smelling, and Section 4 enucleates - that is, draws out the gist of - the interrelationship between seeing and feeling.

Part II is called '*Études Sensorielles*'. It offers a pair of case studies in the history of the senses. Section 5 has the scientific revolution of the seventeenth century as its backdrop, when the senses were instrumentalized and harnessed to reveal nature's secrets. The focus in this section is on the natural philosophy and the vast literary output (including poems and plays and the first ever science fiction novel) of Margaret Lucas Cavendish (1623–73), Duchess of Newcastle. The section will show how her sensuous epistemology and vital materialist ontology countered the mechanical materialism of her male peers, who arrogated doing science to their sex alone. Cavendish was sharply critical of gender segregation in science and society alike. Her insistence on emancipation in place of domination warrants serious consideration from the sensory and social studies perspective advocated in this Element.

Section 6 has the artistic ferment of the late nineteenth century as its backdrop. The section offers a sensory biography of the works and life of the expatriate American painter James McNeill Whistler (1834–1903). It will show that the key to his genius lay in the way he crossed geographical, cultural and sensory borders in his artistic practice. The Element concludes with a plea

for 'leading with the senses' (in place of cognition or representation) in the study of mind, society and cosmos, the better to sense – and make sense of – whatever may emerge.

## Part I Explorations

### 1 Making Senses: On How the Sensorium Gets Divided

> Sight, hearing, smell, taste and touch: that the senses should be enumerated in this way is not self-evident. The number and order of the senses are fixed by custom and tradition, not by nature. The regular order being subject to occasional change proves its arbitrariness.
>
> —Louise Vinge

How many senses do we actually possess? I am often asked this question when I give a talk. In *De Anima* (*On the Soul*), the philosopher Aristotle (n.d.) famously proclaimed the senses to be five in number. But even those who have never read Aristotle know about the five-sense model. Perhaps they were exposed to one of the many children's books on 'the five senses'. Most of these books are picture books;[1] some are multimodal (e.g., they have fluffy, smooth or other textured patches that you can feel). Some have amusing titles, like *You Can't Taste a Pickle With Your Ear!* (Ziefert 2014). They are all meant to be educational, and so, for those raised in this tradition, the notion of there being five senses comes to seem like common sense.

The more scientifically informed members of an audience will, however, observe that there are more than five senses, that Aristotle left out proprioception (the awareness of one's own body in space) and kinaesthesia (muscle sense), for example. These senses were not definitively identified until the nineteenth century. As Zeynep Çelik notes:

> Kinaesthesia, the sense of bodily movement, had been studied before the nineteenth century under a variety of other names, including 'inner sense' and 'organic' or 'visceral' sensibility – all referring to those unclassifiable sensations that could not be traced accurately to one of the five known sense organs, but seemed to originate from the undifferentiated mass of the viscera. It was not until the early nineteenth century, however, that 'muscle sense' was officially declared a 'sixth sense' in its own right. (Çelik 2006: 159)

[1] By way of example, consider *Super Senses* (1996), a SNAPSHOT™ Book: 'Young readers choose a tab, pick a page, and discover what's behind the symbols.' The five tabs each feature a picture of a different sense organ. Open the tab for the ear and there are pictures of a duck (with the words 'quack quack'), a clock ('tick tock'), a fire engine ('oooo oooo'), an old-fashioned rotary dial telephone ('ring ring') and so on. The display for touch is not so soundful: it features pictures of sticky honey (dripping from a spoon), soft feathers, hard pebbles, a spiky cactus and an ice popsicle.

Sensory scientists will object that the list does not stop at six, that thanks to advances in neurobiology we now know that there are at least ten senses, but more likely twenty-one, and radical estimates put the number as high as thirty-three (Durie 2005). These enumerations are arrived at when all of the 'interoceptive' senses (keyed to discriminable receptors) and 'exteroceptive' senses (more fragmented than is commonly thought) are counted together (see Howes 2022a: 82–3; DeSalle 2018).

Moving beyond Western traditions, how many senses have other cultures counted? This is a fascinating topic with surprising variations. Before broadening our scope, however, let us undertake an 'archaeological' excursion into the history of ideas about the senses in the West.

## *Archaeology of the Sensorium*

Starting with Aristotle, we find that the senses were not simply anatomical, they were cosmological. According to the Aristotelian worldview, the universe was composed of four elements: Earth, Air, Fire and Water. Each element was distinguished by a different combination of qualities: the wet, dry, hot and cold. Thus, Earth was classified as cold and dry, Water as cold and wet, Fire as hot and dry, and Air as hot and wet.

The senses were further understood to be distinguishable by reference to the four elements. According to Aristotle, Water was the element of sight (because the eye contains water); Air was the element of hearing; Fire, the element of smell; and Earth, the element both of touch and of taste, due to the latter being classified as 'a mode of touch' (Connor 2015: 241). This cosmic understanding contrasts with the modern understanding of the senses as localized in their corresponding bodily organ (eye, ear, nose, etc.).

Each sense was supposed to have its 'proper sensible', such as colour in the case of sight, sound in the case of hearing and odour in the case of smell. The provincialism of this categorization posed certain difficulties, though. For example, what of those objects that are perceived by more than one sense, such as figure or number, which are discernible by sight and by touch? (Aristotle called these qualities the 'common sensibles'.) What of complex sensations, such as the experience of eating an apple, which is both red and sweet? Furthermore, given that a sense cannot perceive itself, how is it that we perceive *that* we see and hear?

In answering these questions, Aristotle reasoned that there must be a further sense, a shared sense, responsible for distinguishing, coordinating and unifying the five senses and their deliverances. This power he called 'the common sense' (*koinē aisthēsis*, or *sensus communis* in Latin translation). This sense sounds

suspiciously like a sixth sense. Was Aristotle contradicting himself? No, for as Daniel Heller-Roazen explains in *The Inner Touch: Archaeology of a Sensation*:

> Strictly speaking, the common sense [on account of its commonality and irreducibility] is . . . not a sixth sense, . . . it is nothing other than the sense of the difference and unity of the five senses, as a whole: the perception of the simultaneous conjunction and disjunction of sensations in the common sensible, the complex sensation, and finally, the self-reflexive perception [or sense of oneself sensing]. (Heller-Roazen 2007: 35)

In the third century, the theologian Origen introduced the idea of 'spiritual senses' corresponding to the physical ones. 'According to Origen these senses enabled one to perceive transcendental phenomena, such as the "sweetness" of the word of God' (Classen [1993a] 2023: 3) or having a 'vision' (Gavrilyuk and Coakley 2011; Canévet et al. 1993). The doctrine of the spiritual senses was complemented by the elaboration of a model of the 'inner senses', which included memory, imagination, cogitation and the common sense of Aristotle. It bears underlining that all of these powers were conceptualized as sensory faculties, not cognitive capacities.[2] They were continuous with the world rather than independent of it, much less opposed to it, as in the way imagination, in particular, is understood today (Kearney 1988).

Moving into the modern age, the eighteenth century was a particularly fertile period for the identification of novel sensory faculties. This period is commonly referred to as the Enlightenment (*siècle des lumières* in French), the Age of Reason or (somewhat surprisingly in view of the close association between luminescence or lucidity and rationality) the Age of Sensibility. The last term, 'sensibility', has a subjective, emotional and somewhat murky tinge that conflicts with the ostensible objectivity and universality of reason. It has more to do with feeling than with thinking. However, Enlightenment thinkers, especially those of the Scottish Enlightenment (Hutcheson, Hume, Smith, Sir William Hamilton), thought a lot about feeling and, in particular, social feelings. They coined a number of senses that were classified as 'inward' but also eminently social. For example, the political philosopher James Moore observes that Frances Hutcheson, in *An Inquiry into the Original of Our Ideas of Beauty and Virtue* (1725), posited a sixth, moral sense which, Hutcheson claimed,

> brings to mind an idea of virtue whenever one perceives a character or an action prompted by benevolence, kind affection or public spirit. He considered the moral sense analogous to the sense of beauty, a seventh sense,

[2] This is because memory, imagination and so on belonged to the sensitive soul in humans, as distinct from the rational soul (our cognition) and the nutritive soul, responsible for the vitality of humans (and animals and plants).

> which brings before the mind an idea of beauty when it perceives uniformity in variety in compositions, landscapes, works of art and the order of the world. . . . In another work, . . . [Hutcheson] added an eighth sense, a public sense or a determination to be pleased with the happiness of others and uneasy at their misery. (James Moore, personal communication)[3]

The list continues with such other senses as the sense of honour (a ninth sense) and common sense (the way we moderns understand this notion, not Aristotle),[4] which makes ten. It will be observed that all of these senses (without organs) were basically social constructions.

During the nineteenth century, numerous interoceptive senses came to be identified, such as proprioception and kinaesthesia, as discussed earlier. The *milieu intérieur* expanded exponentially, thanks to advances in physiology (Paterson 2021). The sensorium also underwent a second spiritual revolution (redoubling Origen's intervention). The Spiritualists (Madame Blavatsky, Charles Webster Leadbeater) posited various occult powers, such as telepathy and communicating with the souls of the departed. Diverse learned societies were formed to investigate these powers, notably the British Society for Psychical Research (founded in 1882). They sought to 'scientize' the occult powers of the Spiritualists, and reclassified these powers as 'psychic' (Thurschwell 2001).

The drive to scientize or 'psychologize' the Spiritualist sensorium culminated in the invention of the notion of 'extrasensory perception', or ESP, as proposed by the Duke University psychologist J. B. Rhine (1934). The field of 'parapsychology' was thus born. The science of statistics was pressed into service and numerous ingenious experiments, such as Zener cards,[5] were developed to sift psychic fact from fiction, or chicanery. A new, more psychological-sounding language was invented to describe these proclivities: premonitions were reclassified as 'precognition', clairvoyance as 'remote-viewing' and levitation as 'psychokinesis'.

Thus, the notion of 'the five senses' has by no means been the only way of dividing up the sensorium in Western history (*pace* Aristotle). In addition to the canonical five senses, there are the inner, the spiritual, the inward or social, the

[3] James Moore is a political philosopher at Concordia University (now retired). I am indebted to him for having enlightened me regarding the social senses of the Scottish Enlightenment over the course of numerous memorable conversations.

[4] For an account of common sense as a 'cultural system', see Geertz 1983. For an account of how common sense diverged from the common sense of Aristotle, see Heller-Roazen 2008.

[5] In a pack of Zener cards, each of the cards displays one of five symbols. Subjects are asked to predict the order of all twenty-five cards when spread before them on a desk. If a subject defies the law of averages by consistently guessing more than five cards correctly, this is taken as evidence of 'psychic ability'.

interoceptive, the spiritual (again) and the psychic senses. Even the neurobiological model of the ten or twenty-one or thirty-three senses must be seen as contingent on the notions of the day. But there is more. In the preceding account, our focus has been on the sensorium as a whole. An equally interesting history could be told of numerous other piecemeal transgressions to the five-sense model, such as the contested notion of speech as a sense (Classen [1993a] 2023: 2; Mazzia 2005); or Jacobson's organ (Watson 1999), which is allegedly responsible for detecting pheromones (sub-olfactory chemical signals); or the genitals as sense organs (Ehm et al. 1999; see further Eschenbaum 2020: 124–6 on titillation).

All of the above-mentioned (and other) candidates for the status of a sixth sense, seventh sense, eighth sense and so on suggest that 'the bounds of sense', such as the philosopher Immanuel Kant understood there to be, are far more variable than he ever imagined. Kant ([1781] 1998) proposed that 'the mind makes the object', and that it does so within the framework of the a priori categories of time and space. We would turn his philosophy on its head. The senses make the object – and the mind, for that matter.

## *Cultural Variations*

When we look across cultures we find that the five-sense model appears to enjoy a certain currency, at least on first impression. For example, in the philosophical texts of the China of the Warring States period (475–221 BCE), the standard model of the sensorium depicted the five senses as five 'officials' with the 'heartmind' (*xin*) as their ruler:

> 'Ear, eye, nose, mouth, and form, each has its own contacts [literally, "receptions" or "meetings"] and does not do things for the others. Now, these are called the heavenly officials. The heartmind dwells in the central cavity and governs the five officials. Now this is called the heavenly ruler' (*Xunzi* quoted in Geaney 2002: 19; see further Blake 2019).

There is a parallel between this notion of the 'heartmind' and 'the common sense' of Aristotle. Incidentally, Aristotle also located the mind (or, rather, the soul) in the heart, rather than the brain.

Probing further, we find that, much as in classical Greece, the ancient Chinese cosmos was a 'sensory cosmology' (Classen [1993a] 2023, 1998). The universe was understood to be composed of five elements (Metal, Wood, Water, Fire and Earth), the human body of five major organs (heart, liver, spleen, kidneys, lungs), the year of five seasons and space of five directions. To these divisions there corresponded five musical tones, five flavours, five colours and so forth. Thus, the element of Fire was associated with a smoky scent, a bitter taste, a red

colour, the musical tone *chih*, the season of summer and the direction of South. The element of Water was associated with a rotten smell, a salt taste, the colour black, the musical tone *yu*, the winter season and the direction North (Meade and Emch 2010: 436; Jütte 2005: 25–31).

This elaborate system of correspondences or 'crossmodal connections' (Howes 2023: 188) provided the underpinning for numerous domains of life, from medicine (see Farquhar 2002, 2020) to the ceremonial life of the Emperor and his court. For example, one manual of court etiquette prescribed that, in the first month of spring, 'The Son of Heaven shall live in the apartment to the left of the Green Bright Hall. He shall ride in a belled chariot driven by dark green dragons [horses] and bearing green flags. He shall wear green clothes with green jade. He shall eat wheat and mutton' (cited by Henderson 1984: 53). It bears underlining that, due to the presumed interdependence of all these macrocosmic and microcosmic divisions (they were actually regarded as 'phases' and perhaps 'forces' would be the most apt term to describe them), action in one domain could affect the balance in all the others, setting off a concatenation of changes, but always tending (ideally) to the recovery of equilibrium.

A fivefold schema also informed traditional Indian cosmology:

> The five elements are associated with the five senses, and act as the gross medium for the experience of sensations. The basest element, earth, created using all the other elements, can be perceived by all five senses – (i) hearing, (ii) touch, (iii) sight, (iv) taste, and (v) smell. The next higher element, water, has no odor but can be heard, felt, seen and tasted. Next comes fire, which can be heard, felt and seen. Air can be heard and felt. 'Akasha' (aether) is beyond the senses of smell, taste, sight and touch; it being accessible to the sense of hearing alone.[6]

What is interesting about these alternative models is that they all attest to the link between sensory anatomy and cosmology, and that they all point to the five senses plus one. In other Asian traditions, such as Buddhism, for example, the mind is regarded as a sixth sense. 'In this conception, the mind as a sense organ has as its objects the appearance of any phenomena that do not have material contact as a condition of their immediate possibility: in other words, inner picturing, monologue, intentions, thoughts' (Klima 2002: 201). On this account, the mind is not positioned on a superior plane to the body and the senses, as in the West; rather, it is on a par with them, a sense like any other.

Further explorations reveal ever more variation to the enumeration of the senses across cultures. For example, the Hausa of Nigeria entertain a two-sense

[6] This account of Indian sensology and cosmology, which comes from Wikipedia (https://en.wikipedia.org/wiki/Classical_element), finds support in Sarukkai (2014) but requires further substantiation.

model: they have one word for sight (*gani*) and another for hearing, smelling, tasting and touching, understanding, and emotional feeling (*ji*), 'as if all these functions formed part of a single whole' (Ritchie 1991: 194). The Cashinahua of Peru have a six-sense model: they regard the skin, hands, genitals, liver, eyes and ears as 'percipient centres', each with its own kind of knowledge. When asked by an ethnographer 'Does the brain have knowledge?', they responded: '*Hamaki* (it doesn't), . . . the whole body knows' (Howes 2018: 229–30 and n. 6).

How are we to make sense of this astounding multiplicity of models? I suggest that, rather than simply 'counting', we focus on sensory practices or 'techniques' (including technology) instead. This whole Element is, in fact, about techniques or 'ways of sensing' and the 'worlds of sense' (Classen [1993a] 2023) which they support.

By way of introduction to the notion of 'technique', take the example of the capacity of some blind people to navigate a street or room strewn with obstacles. In the *Blindenpsychologie* of the nineteenth century, this capacity was explained by reference to 'facial vision', a capacity so mysterious that it was dubbed a 'sixth sense'. As Robert Stock (2023) reports, this apparent mystery was pierced as a result of a series of experiments conducted in the psychology laboratory at Cornell University during the 1940s. These experiments involving researchers with visual disabilities (who brought their personal experience to bear on the research question) led to the reconceptualization of 'the sixth sense of the blind' as a matter of technique – the 'audile technique' of perceiving reflected sound, or 'spatial hearing' (also known as echolocation). What is more, the Cornell researchers found that sighted people could learn this technique just as well, if they only tried – that is, if they put their ears to it.

### *Derivation of 'Sensorium'*

We have been using the term 'sensorium' throughout the previous account. A few words are in order about its derivation because its recuperation has played such a vital role in sparking the 'sensorial revolution' in the humanities and social sciences (Howes 2022a). In the early modern period, it referred to 'the seat of sensation in the brain', and it still carries this sense today. However, it also extended to include the circumference of perception. This is apparent in one usage reported in the *Oxford English Dictionary* from 1714: 'The noblest and most exalted Way of considering this infinite Space [referring to "the Universe"] is that of Sir Isaac Newton, who calls it the *Sensorium* of the Godhead'; and in another from 1861: 'Rome became the common sensorium