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INTRODUCTION

Taste and the history of science: introduction

Marieke M.A. Hendriksen[1] and Alexander Wragge-Morley (guest editors)[2]

[1]NL Lab, Humanities Cluster of the Royal Netherlands Academy of Arts and Sciences (HuC KNAW), Amsterdam, the Netherlands and [2]Department of History, Lancaster University, UK
*Corresponding author: Marieke M.A. Hendriksen, Email: marieke.hendriksen@huc.knaw.nl

Abstract

In this introduction, we argue that the time is right to explore the role that taste has played in the history of science. For a long time, scientists, philosophers and historians regarded taste as incompatible with the production of knowledge, contrasting the apparent subjectivity of taste with the objectivity supposedly required by the sciences. In recent years, however, the intellectual foundations of this presumed incompatibility have broken down, presenting us with new opportunities to reassess how people use the sensory and mental operations of taste to obtain scientific knowledge. This introduction therefore begins by surveying the intellectual and scholarly landscape, seeking to explain the relative lack of attention to taste in the history of science, arguing that this inattention is misplaced. In turn, it continues by discussing the work that has led growing numbers of historians of science to take taste more seriously – most notably historical accounts revealing that the exclusion of taste from the domain of knowledge was the product of contingent circumstances that did not apply in early centuries, and may not apply today. Finally, by way of introducing the contributions to this issue, the introduction discusses the methodological innovations deployed by historians of science to better reckon not only with taste, but also with the forms of knowledge to which taste might lead.

Taste matters. Scientists have long used taste both to obtain knowledge about the objects around them and to obtain consensus amongst each other about the meanings of those objects. Like any other kind of judgement, however, judgements about taste depend on culture. Interrogating the historical roots of ideas about taste across times and places is thus fundamental to understanding the history of scientific knowledge. In this *Themes* volume, therefore, we would like to show that historians of science need to reckon with taste.

When people talk about taste, they usually mean one of two things. On the one hand, they might be talking about what we will here call sensory taste. This is taste in its literal sense, understood as the form of sensory experience we obtain through the organs concerned with gustation – above all, the tongue. But sensory taste is not just a form of experience. It also involves the exercise of judgements that, by their rapidity, are hard to analyse in the terms usually brought to bear on the production of knowledge. It may be difficult to specify precisely why we find one food delicious and another disgusting. But such judgements can nevertheless become forms of knowledge if, as is frequently the case, they come to be shared by many members of a community. Sensory taste and the judgements resulting from it thus constitute an embodied form of knowledge

production. Indeed, sensory taste depends not only on the body's encounters with external things, but on ingesting and destroying those things in order to learn about them.[1] Moreover, taste is a deeply interconnected sense – it cannot be isolated from touch and smell. In addition, thermoreception, vision and hearing can all strongly influence the perception of taste.[2]

It is therefore not surprising that it is the mysterious, immediate gustatory taste judgement that serves as the master metaphor for the second sense in which people usually talk about taste. We will refer to it as aesthetic taste, understanding it as a form of judgement concerning the beauty or value of objects and materials in the widest possible sense, from written or spoken words to the visual or plastic arts, and from the concrete to the abstract – think about the beauty of mathematical formulas.[3] Although aesthetic taste deals with different objects, and many philosophers have argued that it trades in a different category of experience, it has at least one thing in common with sensory taste. It seems to involve kinds of judgement and forms of consensus that resist explanation in scientific terms. While scientific arguments purport to depend on forms of reasoning that command assent through their claims to objectivity, claims about taste are frequently thought to depend upon individual, subjective forms of experience about which rational argument is essentially fruitless. *De gustibus non est disputandum* – there's no arguing about taste.

Taken together, these senses of taste account for a wide range of the means by which people try to learn about the world around them, ranging from their sensory encounters with external things to the judgements that they make on the basis of those encounters. In recent decades, moreover, historians have increasingly recognized that such apparently subjective practices have been far more important to the production of scientific knowledge than was once recognized. One of the main drivers of this change has been the growing involvement of art history with the history of science. A large and still-growing body of scholarship that owes much to Svetlana Alpers's now classic *The Art of Describing* (1985) has shown that scientific practitioners drew extensively on artistic practices – and vice versa – when seeking to produce truthful representations of the world around them.[4] More recently, scholars including Pamela O. Long, Ursula Klein, Emma Spary, Alexander Marr, Richard Oosterhoff, José Ramon Marcaida and Pamela Smith have shown how early modern artists, artisans and scientists mobilized skill in the manipulation of materials alongside the kinds of perceptual expertise characteristic of artists and artisans to understand the objects that they observed, made and depicted.[5] Scholarship of this

1 See e.g. Rosália Cavalieri, 'La cognizione del gusto', *Conjectura: Filos. Educ., Caxias do Sul* (2014) 19(2), pp. 27–39; Massimo Montanari, 'Sapore e sapere: il senso del gusto come strumento di conoscenza', in Francesco Ghelli (ed.), *I Cinque Sensi (per tacer del sesto)*, Milan: Montadori Education, 2007, pp. 71–8.

2 For a discussion of the perception of taste see e.g. Gordon MZ Sheperd, *Neurogastronomy: How the Brain Creates Flavor and Why It Matters*, New York: Columbia University Press, 2012.

3 On the social construction of aesthetic judgement see e.g. Norbert Elias, *Über den Prozeß der Zivilisation*, Basel: Haus Zum Falken, 1939; and Pierre Bourdieu, *La distinction: Critique sociale du jugement*, Paris: Les Editions de minuit, 1979. On what we now consider aesthetic judgement in science see e.g. David Orrell, *Truth or Beauty: Science and the Quest for Order*, New Haven, CT: Yale University Press, 2012; Sabine Hossenfelder, *Lost in Math: How Beauty Leads Physics Astray*, New York: Basic Books, 2018.

4 Svetlana Alpers, *The Art of Describing: Dutch Art in the Seventeenth Century*, Chicago: The University of Chicago Press, 1983.

5 Pamela O. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance*, Baltimore: Johns Hopkins University Press, 2001; Pamela O. Long, *Artisan/Practitioners and the Rise of New Sciences, 1400–1600*, Corvallis, OR: Oregon State University Press, 2011; Ursula Klein and Emma C. Spary, eds., *Materials and Expertise in Early Modern Europe: Between Market and Laboratory*, Chicago and London: The University of Chicago Press, 2010; Richard Oosterhoff, José Ramón Marcaida and Alexander Marr (eds.), *Ingenuity in the Making: Matter and Technique in Early Modern Art and Science*, Pittsburgh: Pittsburgh University Press, 2021; Pamela

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kind has done much to blur the once sharply drawn lines between objectivity and subjectivity, making it clear that scientists and their publics use techniques and practices once dismissed as irreducibly subjective to produce purportedly objective, truthful representations of nature.[6]

Equally important is scholarship exploring the myth that people can produce knowledge through their minds alone, somehow ignoring or transcending the bodies upon which those minds depend. The idea that tacit or embodied knowledge plays an important role too was first developed in philosophy and science studies, and adopted widely by historians of science.[7] In her influential 2004 work *The Body of the Artisan*, for example, Pamela H. Smith demonstrated that European artisans of the sixteenth and seventeenth centuries came to understand natural phenomena through their bodily engagement with matter, especially their efforts to manipulate and shape it. For Smith, this artisanal knowledge amounted to a 'vernacular science of matter', and it depended not – as later generations of scientists attempted – on effacing the body from the scientific enterprise, but instead on using the body as an instrument through which knowledge could be obtained.[8] Meanwhile, scholars have applied similar insights to the work of scientific observation. Thus Lorraine Daston, Peter Galison, Elizabeth Lunbeck and others have drawn our attention to the emotional motivations for, and tacit skills involved in, the work of scientific observation. Daston has shown, for instance, that successful observation often depends on the cultivation of perceptual habits. But it is difficult to account for habit formation in terms – such as an enumeration of skills acquired or techniques learned – that would satisfy the requirements usually expected of an objective, scientific explanation. She therefore shows that embodied knowledge was by no means the preserve of artisans and artists. Rather, people whom we would still recognize today as scientists also depended on bodily habits and dispositions acquired in ways that seem more characteristic of the arts than of the sciences.[9]

It is our contention that the discourses and practices associated with taste can help us to make sense of the wide variety of subjective practices out of which we now understand knowledge to be constituted. While taking inspiration from scholarship on the practices of embodied knowledge and the role of the arts in scientific practices, our position is more directly informed both by those historians who have explicitly addressed the interconnections between science and aesthetics, and by the increasing number of scholars working on the history of food and the food sciences – fields in which gustatory taste is obviously important.[10] Scholars including Robert Brain, Deborah R. Coen and M. Norton Wise have

H. Smith and Benjamin Schmidt, *Making Knowledge in Early Modern Europe: Practices, Objects, and Texts, 1400–1800*, Chicago: The University of Chicago Press, 2007; Pamela H. Smith, Amy R.W. Meyers and Harold Cook (eds.), *Ways of Making and Knowing: The Material Culture of Empirical Knowledge*, Ann Arbor: University of Michigan Press, 2014; Pamela H. Smith, *From Lived Experience to the Written Word: Reconstructing Practical Knowledge in the Early Modern World*, Chicago: The University of Chicago Press, 2022.

6 For shifting understandings of objectivity see Lorain Daston and Peter Galison's seminal *Objectivity*, New York: Zone Books, 2007.

7 See, for example, Michael Polanyi, *The Tacit Dimension*, London: Routledge & Kegan Paul, 1966; Harry Collins, *Tacit and Explicit Knowledge*, Chicago: The University of Chicago Press, 2010.

8 Pamela H. Smith, *The Body of the Artisan: Art and Experience in the Scientific Revolution*, Chicago: The University of Chicago Press, 2004. See also Christopher Lawrence and Steven Shapin (eds.), *Science Incarnate: Historical Embodiments of Natural Knowledge*, Chicago: The University of Chicago Press, 1998. These scholars were by no means the first to investigate tacit knowledge. See, for instance, Polanyi's *Tacit Dimension*, op. cit. (7) (1966). However, it is fair to say that most current work on tacit and embodied knowledge responds to the more recent interventions by Smith, Lawrence, Shapin and others.

9 Daston and Galison, op. cit. (6); Lorraine Daston and Elizabeth Lunbeck (eds.), *Histories of Scientific Observation*, Chicago and London: The University of Chicago Press, 2011, 81–113.

10 S. Margot Finn, *Discriminating Taste: How Class Anxiety Created the American Food Revolution*, New Brunswick, NJ: Rutgers University Press, 2017.

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in different ways shown that past scientific practitioners have mobilized aesthetic judgement in pursuit of scientific knowledge, or that artists and philosophers mobilized the sciences when seeking out the principles of aesthetic experience.[11] More recently, scholars have begun to link the conceptual terrain of aesthetic judgement to the until recently overlooked field of the food sciences. Steven Shapin has shown how oenological scientists at work in California from the 1950s to the 1980s used devices such as the wine aroma wheel to turn the apparently subjective taste and smell of wine into something objective. Rather than aligning flavours and aromas with the likes and dislikes of those tasting the wine, California scientists sought to make those flavours into indicators of something objectively knowable about that wine – that is, a chemical property identifiable through the flavour or aroma that the wine provoked in the palate of the taster.[12] Meanwhile, scholars including Ken Albala, Anita Guerrini, Elaine Leong, Susan Pinkard, Emma Spary, Viktoria von Hoffmann, Anya Zilberstein and Wendy Wall have demonstrated that debates about dietetics and food were important arenas for the production of knowledge, especially concerning medicine and public health.[13] They have shown that hitherto overlooked spaces such as the kitchen and household were centres of knowledge production, especially where personal and family health were concerned. It must be said, however, that most of this work – with the exception of that by Shapin – is not explicitly concerned with taste.

The lack of direct attention to taste may perhaps be explained by referring to the problem with which we opened this introduction – the paradoxical status of taste in the European philosophical tradition.[14] For the most part, historians of science still tend to regard taste as something either separate from or opposed to the kinds of knowledge associated with science.[15] This tendency can perhaps be explained by the continuing influence of a model of aesthetic judgement rooted in Immanuel Kant's work – even if Kant did not intend it as such. As we have both demonstrated elsewhere, European thinkers before and including Kant, most notably Alexander Gottlieb Baumgarten (1714–62), understood aesthetic judgement in different terms.[16] To Baumgarten, there were two

11 Robert Brain, *The Pulse of Modernism: Physiological Aesthetics in Fin-de-Siècle Europe*, Seattle: University of Washington Press, 2016; Deborah R. Coen, *Vienna in the Age of Uncertainty: Science, Liberalism, and Private Life*, Chicago: The University of Chicago Press, 2007; M. Norton Wise, *Aesthetics, Industry, and Science: Hermann von Helmholtz and the Berlin Physical Society*, Chicago: The University of Chicago Press, 2018.

12 Steven Shapin, 'The tastes of wine: towards a cultural history', *Rivista di Estetica* (2012) 51, pp. 49–94.

13 Ken Albala, 'The use and abuse of chocolate in 17th-century medical theory', *Food and Foodways* (6 June 2007) 15(1–2), 53–74; Anita Guerrini, 'A natural history of the kitchen', *Osiris* (2020) 35, 20–41; Elaine Leong, *Recipes and Everyday Knowledge*, Chicago: The University of Chicago Press, 2018; Susan Pinkard, *A Revolution in Taste: The Rise of French Cuisine*, Cambridge: Cambridge University Press, 2009; Emma C. Spary, *Eating the Enlightenment: Food and the Sciences in Paris, 1670–1760*, Chicago: The University of Chicago Press, 2012; Spary, *Feeding France: New Sciences of Food, 1760–1815*, Cambridge: Cambridge University Press, 2014; Viktoria von Hoffmann, *From Gluttony to Enlightenment: The World of Taste in Early Modern Europe*, Urbana: University of Illinois Press, 2017; Emma C. Spary and Anya Zilberstein (eds.), *Food Matters: Critical Histories of Food and the Sciences*, *Osiris* (2020) 35; Wendy Wall, *Recipes for Thought: Knowledge and Taste in the Early Modern English Kitchen*, Philadelphia: University of Pennsylvania Press, 2016.

14 For a detailed discussion see Carolyn Korsmeyer, *Making Sense of Taste: Food and Philosophy*, Ithaca, NY: Cornell University Press, 1999.

15 Recent examples of studies of taste as a way of knowing come from other fields, such as education, philosophy and anthropology. See Erik Fooladi, 'Taste as science, aesthetic experience and inquiry', in Pamela Burnard and Laura Colucci-Gray (eds.), *Why Science and Art Creativities Matter: (Re-)Configuring STEAM for Future-Making Education*, Leiden and Boston: Brill, 2019, 358–80; Nicola Perullo, *Taste as Experience: The Philosophy and Aestehtics of Food*, New York: Columbia University Press, 2016; Luca Veronelli, *The Invention of Taste: A Cultural Account of Desire, Delight and Disgust in Fashion, Food, and Art* (London: Bloomsbury, 2017).

16 Marieke M.A. Hendriksen, *Elegant Anatomy: The Eighteenth-Century Leiden Anatomical Collections*, Leiden and Boston: Brill, 2015, pp. 17, 22–3, 117–18; Alexander Wragge-Morley, *Aesthetic Science: Representing Nature in the Royal Society of London, 1650–1720*, Chicago: The University of Chicago Press, 2020, pp. 153–8.

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levels of cognition: logic, which produces knowledge on the basis of rational thought, and aesthetics, which produces knowledge from perception.[17] Kant too initially opposed the use of the term 'aesthetics' to designate the critique of taste, and advocated its use only in the classical sense of *aistheta*, things known through perception, as opposed to things known through reason.[18] In his later philosophy, however, he distinguished between transcendental aesthetics – the aforementioned knowing through perception in the first *Critique* – and aesthetic judgement – disinterested judgements of taste and beauty as formulated in the third *Critique*.[19] But this subtle distinction was lost on most of those who subsequently read Kant's work. As a result, Kant's association of aesthetic judgement with disinterested judgements of taste and beauty became dominant in both philosophy and popular culture, while the classical understanding of aesthetics as knowledge produced from sensory perception soon became obsolete. In other words, the result of Kant's intervention was the sundering of aesthetic experience from the kinds of sensory experience that might lead to scientific knowledge. Although Kant argued that aesthetic judgements had some claim to universality, this universality was emphatically not derived from any kind of mental process resembling the ones at stake in scientific reasoning.[20]

Although there have been many challenges to Kant's model of aesthetic judgement, the tendency to regard taste, whether aesthetic or gustatory, as subjective may help to explain the relative lack of attention paid to taste by historians of science. Indeed, there remains a strong suspicion that such judgements do not lead to reliable insights – that they reveal as much about the taste of the person making the judgement as they do about the object itself. Thus the idea that aesthetic judgement can be reduced to a science, readily found in the works of early modern art theorists such as Charles Le Brun (1619–90) and Jonathan Richardson (1667–1745), has frequently encountered resistance. For its opponents, including those writing during the seventeenth and eighteenth centuries, the very act of turning aesthetic judgement into a calculation was a negation of the kind of experience upon which beauty or sublimity depended.[21] As Steven Shapin has shown, something conceptually similar has happened to sensory taste. Even though sensory evaluation remains crucial to assessing the authenticity and value of products like wine and coffee, the period from the eighteenth century onward has witnessed a decisive shift in the way most people understand the insights that practices such as tasting can give us. Thinkers such as the Scottish philosopher Thomas Reid (1710–96) could argue that sensory experience provided reliable insights about the external world because it was ordained as such by God. But these days, few would take such cosmological claims seriously. As a result, the senses may seem less instructive today than they did for many, though by no means all, early modern thinkers. Instead, thinkers have tended to emphasize the apparent subjectivity of sensory

17 Hendriksen, op. cit. (16), p. 17–23.

18 Immanuel Kant, *Kritik der reinen Vernunft, Kritik der praktischen Vernunft, Kritik der Urteilskraft*, Wiesbaden: Fourier, 2003, 62 n. 9.

19 The foundation for Kant's later understanding of aesthetic judgements was laid in Immanuel Kant, *Beobachtungen über das Gefühl des Schönen und Erhabenen*, Leipzig: Insel-Verlag, 1913, 5–6; first published 1764.

20 Marieke M.A. Hendriksen, '"Art and technique always balance the scale": German philosophies of sensory perception, taste, and art criticism, and the rise of the term Technik, ca. 1735–ca. 1835', *History of Humanities* (2017) 2(1), pp. 201–19.

21 On Richardson see Carol Gibson-Wood, *Jonathan Richardson: Art Theorist of the Enlightenment*, New Haven, CT: Yale University Press, 2000; on Le Brun see Stephanie Ross, 'Painting the passions: Charles Le Brun's *Conférence sur L'Expression*', *Journal of the History of Ideas* (1984) 45(1), 25–47. On the eighteenth-century project for a science of art connoisseurship see Kristel Smentek, *Mariette and the Science of the Connoisseur in Eighteenth-Century Europe*, Farnham: Ashgate, 2014. On the fraught history of 'physiological aesthetics' in the nineteenth and twentieth centuries see Brain, op. cit. (11).

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experience, dwelling on what those experiences reveal about the people who report on them rather than hoping to see them as authoritative statements about the external world.[22]

In recent decades, however, the assumptions underlying both the apparent subjectivity of taste and the Kantian distinction between sensory taste and aesthetic taste have come under sustained pressure. Much of the scholarship discussed above has contributed to this change. Work on the role of embodied habits and practices in both the arts and the sciences poses an obvious challenge to the notion that either aesthetic experience or scientific insights are somehow disembodied experiences, giving rise to their respective forms of knowledge in spite of – rather than because of – the body's involvement. In recent years, for example, scholars including Rebecca Anne Barr, Anne C. Vila, Sylvie Kleinman-Lafon, Aris Sarafianos and Sophie Vasset have all shown that the thought and culture of eighteenth-century Europe were far more preoccupied by the body's gustatory and digestive operations than sobriquets such as 'the Enlightenment' or 'the Age of Reason' would suggest.[23] In social histories of exotic tastes in early modernity, such as Sidney Mintz's *Sweetness and Power* and Wolfgang Schivelbusch's *Tastes of Paradise*, important questions were raised about embodied cultures in early modern capitalist consumption.[24] In addition, several scholars have addressed taste more directly, with the literary historian Mary Caruthers, for instance, pointing out the intimate connection between tasking and knowing implicit in the Latin verb *sapere* – a connection that Bernard of Clairvaux (1090–1153) had pointed out in the twelfth century.[25] Similarly, Denise Gigante has shown that sensory and aesthetic taste were very closely linked in the anglophone literatures of the seventeenth and eighteenth centuries.[26]

At the same time, philosophers and sociologists of science have explicitly addressed the role that aesthetic judgement may play in the sciences. The philosophers Milena Ivanova and Gregory J. Morgan have shown that scientists frequently mobilize aesthetic ideals when deciding between competing hypotheses, for instance by holding that an apparently beautiful theory is more likely to be true than one deemed less attractive.[27] Along with other scholars, Ivanova has also shown that aesthetic ideals are important not only to the theory, but also to the practices, of science. She thus demonstrates that scientists frequently identify beauty as an important feature of experimentation, whether identifying experiments as beautiful because their design makes them particularly generative of sought-for insights, or because their outcomes seem to make a given idea or principle easy to comprehend.[28] Among philosophers of science, therefore, there is increasing recognition that aesthetic taste may inform both scientific theory and scientific practice, contributing to the production of knowledge in ways that scholars have until recently been slow to recognize. Meanwhile, the sociologists Michael Lynch and

22 Steven Shapin, *Changing Tastes: How Things Tasted in the Early Modern Period and How They Taste Now*, the Hans Rausing Lecture, Salvia Småskrifter No. 14, Uppsala: Tryck Wikströms for the University of Uppsala, 2011, esp. pp. 23–4, 45–7.

23 Rebecca Anne Barr, Sylvie Kleiman-Lafon and Sophie Vasset, 'Introduction: entrails and digestion in the eighteenth century', in Barr, Kleiman-Lafon and Vasset (eds.), *Bellies, Bowels and Entrails in the Eighteenth Century*, Manchester: Manchester University Press, 2018, pp. 1–23.

24 Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History*, New York: Penguin Books, 1985; Wolfgang Schivelbusch, *Tastes of Paradise: A Social History of Spices, Stimulants, and Intoxicants*, New York: Vintage Books, 1992.

25 Mary Carruthers, 'Sweetness', *Speculum* (2006) 81(4), pp. 999–1013, 1000.

26 Denise Gigante, *Taste: A Literary History*, New Haven, CT: Yale University Press, 2006.

27 Milena Ivanova, 'Aesthetic values in science', *Philosophy Compass* (2017) 12(10), pp. 1–9, 5; Gregory J. Morgan, 'The value of beauty in theory pursuit: Kuhn, Duhem, and decision theory', *Open Journal of Philosophy* (2013) 3(1), pp. 9–14, 9–11.

28 Milena Ivanova, 'The aesthetics of scientific experiments', *Philosophy Compass* (2021) 16(3), pp. 1–9, 5–7.

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Samuel Y. Edgerton Jr made a similar case in the 1980s. Basing their conclusions on ethnographic fieldwork, they revealed that astronomers mobilized aesthetic preferences when producing purportedly objective depictions of astronomical phenomena with the then quite new technologies of digital image processing.[29]

Across a wide range of disciplines, therefore, scholars have increasingly sought to find connections between the forms of cognition at stake in the formation of taste judgements and the production of scientific knowledge. Many of those scholars, moreover, have broken down distinctions once taken for granted between the embodied cognition implicit in gustatory taste and the supposedly disembodied forms of cognition implicit in both aesthetic taste and scientific reasoning. Although the signs of direct influence are few, it is worth remarking that this shift parallels recent developments in the neurosciences and philosophy of mind. Philosophers and scientists of the mind take an increasingly holistic view of cognition, regarding thought not as a computational operation that takes place in the mind or brain, but instead as a distributed process taking place not only in the rest of the body, but also in the environments in which the body is situated and which affect the body in various ways. Thus the philosopher Alva Noë has written a slew of works arguing that thought does not arise from disembodied computational operations but instead emerges from interactions between the body and the environment, especially from its allostatic operations and through the gradual formation of habits.[30] Annemarie Mol has also disavowed the supposedly Cartesian vision of the disembodied mind. But Mol takes eating as her model, showing that the consumption of food disturbs the subject–object distinction so important to mainstream accounts of knowledge. Processes such as chewing, digestion and excretion involve the incorporation of the environment into the body, as well as disincorporation back into the environment. If we take seriously the body's interconnections with the environment, the standard model of knowledge premised on the separateness of the knower from the object known looks not only untenable, but also perhaps even bizarrely implausible.[31]

The time is therefore right to pay closer attention to the place of taste in the history of science. Some scholars have already begun this reconsideration. Elizabeth L. Swann, for instance, has recently shown in her *Taste and Knowledge in Early Modern England* that gustatory taste was far more important to the work of early modern English philosophers and scientists than anybody has hitherto realized.[32] As we have already indicated, and as Swann has also shown, such a reconsideration must involve posing two kinds of question. On the one hand, we must ask whether or to what extent the post-Kantian distinction between aesthetic taste and scientific reasoning actually holds true. While we would not seek to suggest that this distinction is without foundation, or that it has never been important to the history of science, we want to know whether scientists in other times and places identified different relations between the experience of beauty and the discovery of the truth. We would also like to know whether the widespread insistence on that distinction has perhaps occluded practices that related taste to knowledge in different ways. On the other hand, we need to ask whether sensory taste has played a more important role in the production of knowledge than conventional histories of science usually allow.

29 Michael Lynch and Samuel Y. Edgerton Jr, 'Aesthetics and digital image processing: representational craft in contemporary astronomy', *Sociological Review* (1987) 35, pp. 184–220.

30 For a recent and accessible example see Alva Noë, *Out of Our Heads: Why You Are Not Your Brain, and Other Lessons from the Biology of Consciousness*, New York: Hill and Wang, 2009.

31 Annemarie Mol, *Eating in Theory*, Durham, NC: Duke University Press, 2021.

32 Elizabeth L. Swann, *Taste and Knowledge in Early Modern England*, Cambridge: Cambridge University Press, 2020.

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Both sets of questions have the potential for far-reaching methodological and theoretical implications. Recognizing the role of taste in the production of knowledge may involve recognizing ways of knowing that do not line up with classical accounts that isolate the knower from that which is known. Histories of taste and knowledge may instead show, as Mol's work exemplifies, that the knower and the known are dynamically and mutually constitutive, raising difficult questions about the nature of the cognitive operations at stake, and the communicability of their results.

Taken together, the essays making up this volume seek out preliminary answers to these questions. In addition, they aim to show that integrating the histories of sensory and aesthetic taste makes it possible to recover epistemic strategies that have been overlooked or excluded because they do not conform to hegemonic accounts of knowledge production. We therefore define taste broadly, whether as a metaphor for bodily or intellectual forms of judgement, or more literally as the operation performed by the tongue when it comes into contact with external things. On the one hand, we find the term useful as a metaphor for the processes through which groups of people attempt to produce intersubjective consensus – especially where sensory experience is concerned. On the other, we regard taste both as a term and as a sensory and evaluative practice that captures the embodied operations that people across times and cultures have employed to categorize, understand and use all kinds of things. These are processes that cannot be confined strictly to the realm of science, but belong to knowledge production broadly conceived. We have therefore asked a diverse group of authors to contribute to this volume, including not only historians of science but also a sociologist, an interdisciplinary team headed by an archaeologist and a historian–pharmacist team. Together, these contributions demonstrate that interdisciplinary scholarship provides us with a richer and more interconnected understanding of the changing meanings of taste in the history of knowledge and science.

As well as arguing for the importance of taste to the history of science, this *Themes* volume seeks to equip scholars with conceptual tools and methodological strategies for talking about taste in their own work. As a result, several of our contributors deploy new methodological strategies for analysing the history of taste, while others seek to elucidate the conceptual frameworks necessary for talking about taste. Inanna Hamati-Ataya therefore opens the volume by offering a long-term, global perspective on the visions of the social order that have motivated judgements on taste, and which those judgements have in turn served both to naturalize and to conceal. She makes her case using a series of four vignettes from a wide range of times and places, beginning with the devaluation of taste by the Socratic philosophers of ancient Greece and ending with the claims of superior gustatory expertise made by today's professional wine tasters. Through these and many other case studies, Hamati-Ataya invites us to consider the damaging consequences of either overlooking taste, or assuming that its subjectivity makes it impossible to analyse. We remain unable to see how philosophers and scientists have used taste, whether consciously or not, to serve and reproduce 'the same social distinctions and erasures that sustain social hierarchies'. To ignore the sense of taste, in other words, is to ignore one of the most important ways in which the sciences have expressed the social relations upon which they are founded.[33]

The following two articles, with their use of performative methods, contribute to current debates in the field of sensory history by demonstrating what methodology from other fields can do to make history a less 'senseless' discipline.[34] Nils-Otto Ahnfelt,

33 Inanna Hamati-Ataya, 'Epistemic demarcations as social erasures: taste and the politics of distinction from the "revolutions of wisdom" to the "Green Revolution"', this volume.

34 The history of science has a relatively long tradition of including performative methods, although this remains a relatively small subfield. For a brief historiography see M.M.A. Hendriksen, 'Rethinking performative

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Hjalmar Fors and Karin Wendin thus take a methodologically innovative approach to investigating the sensory dimension of historic pharmaceuticals by using techniques from the food sciences to assess the taste, flavour and odour of the famous panacea theriac andromachalis, widely used in the ancient, medieval and early modern periods. In so doing, they address a difficulty that has long dogged histories of sensory experience, especially the senses of taste, touch and smell. It is very hard to record sensory information in textual form, and as a result we know very little about those medicines in the past that were known primarily through their taste or smell. In response to the absence of such experiences from the archival record, Ahnfelt, Fors and Wendin made theriac andromachalis for themselves, assessing its taste, flavour and odour using sensory analysis and a trained panel of sensory assessors.

It is well known that, in the past, apothecaries relied on their embodied experience of taste and smell when making medicines. They used taste, flavour and odour when trying to understand whether the ingredients they had at their disposal would have the desired pharmacological effect, and in assessing the quality of the medicines they had made. Such evaluative methods were also of importance to the people who purchased medicinal substances, whether sufferers or medical practitioners. The team do not claim that they can use modern methods of sensory assessment to recover the lived experiences of historical actors. We can never know what premodern people experienced when they made and sampled medicinal substances. But these researchers nevertheless use scientific methods to ask whether theriac was capable of producing some of the powerful sensory experiences by which that substance was made and judged. They use their conclusions to call into question some of the commonplace assumptions of ethnopharmacology about the role of the senses. Rather than focusing on the role of the senses in the identification and assessment of the efficacy of ingredients, they argue that the key to understanding the role of the senses in early modern pharmacy is to study the sensory effects of a pharmaceutical preparation on the body of its maker and on the senses of its consumer. This interdisciplinary team therefore not only seek to learn about the role of taste in the history of medicine, but also, perhaps more importantly, use taste as an instrument of historical research. They enrich the history of medicine by using their own and others' gustatory organs to address the gaps in the gustatory archive.

Experimental reworking also plays an important role in the work of Grace Tsai and her team. They investigate the use of sea or bay salt in seventeenth-century marine food preservation. Tsai and her collaborators point out that early modern actors had a refined understanding of salts, their taste and their applications, and that sea salt – as opposed to other kinds of salt – appears to have had a specific status as a means for food preservation. Their study is one outcome of the Ship Biscuit and Salted Beef Research Project, run by the Institute of Nautical Archaeology. This project seeks to understand how the maritime diet affected the health of those who travelled the oceans during the seventeenth century. One strand of the project uses the scientific analysis of experimental reconstructions to find out whether there was a biological or chemical basis to the claim, often made in the seventeenth century, that bay salt was better for the preservation of food than others forms of salt. Their findings suggest that taste may have played an important role in the way mariners assessed food preservation, with laboratory studies

methods in the history of science', *Berichte zur Wissenschaftsgeschichte* (2020) 43(3), pp. 313–22. In social history, attention has been paid to the senses of taste and smell from the 1980s onwards, most notably by Alain Corbin and Jean-Louis Flandrin, yet these are the exceptions rather than the rule. The argument that history is mostly a 'senseless' discipline was first made by George H. Roeder Jr, 'Coming to our senses', *Journal of American History* (1994) 81(3), pp. 1112–22. For a detailed recent discussion of the state of the field of sensory history see Mark M. Smith, *A Sensory History Manifesto*, University Park, PA: Pennsylvania State University Press, 2021; and William Tullett, 'State of the field: sensory history', *History* (2021) 106(373), pp. 804–20.

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revealing that the microbial contents of bay salt give beef a more pleasant taste than do other kinds of salt. Tsai and her team therefore show that experimental archaeology can powerfully supplement the textual record, revealing that taste may have played a more important role in the 'food science' of the seventeenth century than has so far been understood.

Andrés Velez Posada and Gregorio Saldariagga take us to the other side of the globe, to examine how taste has been used as tool for the production of knowledge. Their focus is on the intertwined relationship between taste and mining culture in the Spanish-ruled territories of Peru and the New Kingdom of Granada in the period from 1550 to 1640. Using a range of documents related not only to the practices of mining, but also to the classification and appreciation of precious metals, Velez Posada and Saldariagga reveal the hitherto overlooked instances when taste was used to distinguish one substance from another. They show that taste played an important role not only in the act of knowing minerals and metals, but also in situating those substances in relation to the social and cosmological order as the Spanish colonizers then understood them. They reveal, in other words, that the embodied act of tasting had significant implications for the Spanish colonial enterprise and Spanish efforts to understand and control the natural resources under their power.

Such considerations are also important to Bharat Venkat's paper on thermal sensation in nineteenth-century India. It addresses a similar set of issues, showing that bodies and their capacities for sensory experience were implicit in British attempts to understand and master the Indian climate. In Venkat's paper, however, we move from taste itself to one of the broader issues that discussions of sensory taste tend to raise – namely the way in which different bodies seem to experience the world in different ways, with some apparently developing much more refined insights than others. For the British scientists and medics of nineteenth-century India, such questions came to the fore in discussions about the apparently varying effects of tropical heat on racialized colonizing and colonized bodies. On the one hand, Venkat shows that British scientists came to see the white, European body as a technology for registering the heat that it experienced. But figuring the body as such a technology was by no means straightforward, raising difficult questions not only about the physiological mechanisms at stake in the experience of heat, but also about the kinds of judgement and expertise required to correctly interpret that experience. Eventually concluding that light was the cause of the effects in question, colonial scientists came to regard skin colour as a crucial outward sign of experiential difference. As they saw it, the difference in skin colour between white Europeans and non-white Indians explained why people from these two racialized groups experienced the effects of light – felt as heat – so differently. It was race, in other words, that explained why different communities of people had such different forms of sensory experience – a distinction that mirrors the eighteenth-century claim that the thin, pale skin of the white European elites gave them the capacity for more refined forms of aesthetic experience than either working people or people from other parts of the world.[35]

Alexander Wragge-Morley's work, too, considers taste in a less literal sense, instead picking up on Venkat's interest in questions about the ways in which our supposedly subjective experiences might be shared by members of some social groups, while not being shared by others. He does so by reconsidering the nature of medical expertise in early eighteenth-century Britain, focusing on a case in which both practitioner and patients saw shared suffering as an important qualification for medical expertise – perhaps just as important as formal medical training. In an intellectual and cultural setting that

35 See e.g. Mechthild Fend, *Fleshing Our Surfaces: Skin in French Art and Medicine, 1650–1850* (Manchester: Manchester University Press, 2017), esp. Chapter 5.

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increasingly saw agreement about the meanings of sensory experience as the solution to a wide range of problems, medical practitioners such as the fashionable physician George Cheyne (1671/2–1743) framed the ability to share the experiences of their patients as a core component of their medical expertise. In other words, they saw the formation of intersubjective community between doctors and sufferers as a central part of what it meant to be a competent doctor. In addition, acknowledging this form of expertise enables us to uncover therapeutic activity by people who are not usually recognized as having engaged in medical practice. Drawing on previously overlooked letters from the political organizer Susan Keck (bap. 1706–d. 1755) to Selina Hastings, Countess of Huntingdon (1707–91), Wragge-Morley shows that women used the same model of expertise for their own purposes, seeking advice from the people whose experiences most closely resembled their own – other women. Drawing on resources from the theory and sociology of taste, moreover, he suggests that the resulting form of expertise, based on shared bodily experience, cannot easily be assimilated to the intellectualized, disembodied model of knowledge that most people still tacitly deploy in the history of science. Experiences of pleasure and pain were not objects that could be resolved into the static form of verbal signs, and therefore an intersubjective model of expertise had to be developed.

In the next article, meanwhile, Ardeta Gjikola also seeks to understand the formation of an intersubjective consensus. But she does so on a much larger scale, using strategies derived from the sociology of science to explain the emergence of taste judgements in a community of connoisseurs and the educated public. And rather than addressing sensory taste, she instead explores the difficulty of understanding how supposedly subjective judgements of aesthetic value come to be shared judgements of aesthetic taste. She works by focusing on a remarkable case in which the process of taste formation took place in an unusually explicit manner – the debate about the aesthetic value of the Parthenon marbles provoked by the Earl of Elgin's efforts to sell them to the British state, eventually accomplished in 1816. She asks, in other words, how the painter Benjamin Haydon's judgement that the marbles were 'the finest things on earth' came to be a widely accepted position, rapidly dominating contemporary discourse about their aesthetic value. But Gjikola's main aim is to explain precisely what kind of knowledge Haydon possessed and articulated when he claimed that the marbles were beautiful, and to ask whether the theories of knowledge ordinarily deployed by historians of science are adequate to understanding it. Drawing on the moves Haydon used to make the Parthenon marbles beautiful, including his use of a black model named Wilson as a counterexample, Gjikola encourages us to think carefully about what we mean when we use the word 'knowledge', and about how best to incorporate the forms of consensus associated with taste into our interpretations of the work of knowledge production.

Finally, Marieke Hendriksen explores an even larger taste community: a nation, in this case the seventeenth-century united Dutch provinces. Hendriksen questions how the individual body and the political body were shaped and maintained through medicine, diet and taste in the early modern Low Countries. She shows that historical taste identities were shaped by many different factors, but that the medicinal use of pharmaceutical preparations, foodstuffs, tastes and diets played a key role in the maintenance and restoration of health. Her article analyses the interlinked roles of sensory and cultural taste in early modern medicine in the making of individual and national identities through textual and visual analysis. Hendriksen thus demonstrates that food, medicine and taste were used in publications in the vernacular to shape and maintain the health of both the individual body and the body politic of various social groups in the early modern Low Countries.

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Taken together, these articles aim to vindicate our opening suggestion that taste matters to the history of science. Taste has been used across a wide range of times and places to produce consensus about the meanings of experience, and in many instances has provided the basis for forms of knowledge and experience deployed in what we now understand to be the sciences. Individual and collective assessments of sensory taste have informed practices ranging from food preservation and handling pharmaceuticals to mining and nation building, while aesthetic taste preferences influenced and mediated judgements in domains such as medicine and philosophy. But we hope above all that this *Themes* volume will provide readers with tools for developing yet deeper insights into the intertwined histories of science and taste. If this collection shows anything, it is that methods from other disciplines, such as archaeology, sociology and pharmaceuticals, and new methods such as reconstructions, supply us with potent new strategies for uncovering the once neglected role of taste in the history of science. Indeed, such methods do more than simply add to the stock of knowledge about the history of science. They force us to reckon with the theory of knowledge itself, asking us to fully imagine what knowledge might be like if premised not on the positivist objectivity characteristic of some domains of science in the nineteenth and twentieth centuries, but instead on the apparently subjective judgements that those domains sought to exclude.

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