CHAPTER 4

Why Do Flowers Smell Good but Taste Bad? Theophrastus' Reply

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1 Introduction

In his psychological treatises *De anima* and *De sensu* Aristotle talks about the senses of taste and smell in close sequence. In *De anima* II 9 and II 10 he gives an account first of how smell and then of how taste perceive their respective objects, namely odours and flavours, while in *De sensu* 4 and 5 he treats these sense objects in reverse order, first flavours and then odours. Although the sense of smell is, according to Aristotle (*DA* II 9, 421a7–16), less accurate than taste—in fact, smell is regarded by him as the worst sense human beings have both in comparison to the other four senses and in comparison to the sense of smell other animals have—, flavours and odours are said to exhibit a close affinity to the extent that they are considered as "almost the same affection" (*Sens.* 4, 440b30: σχεδὸν … τὸ αὐτὸ πάθος).[1] For Aristotle conceives of flavour as the affection produced by something dry being immersed in what is moist (*Sens.* 4, 441b22–23), and he conceives of odour as the affection produced by the already flavoured moisture in air and water alike (*Sens.* 5, 442b30–31).[2] Moreover, Aristotle (*Sens.* 5, 443a9–22) corroborates the close connection between taste and smell by invoking our everyday experience that flavourless things—for instance, stones and gold—are also odourless. And it would have been strange if the ancients did not notice that, when we have a bad cold and we lose our sense of smell, our food tastes bland.

1 The Aristotelian commentators follow Aristotle in pointing out that the sense of smell is the worst sense human beings have (Alexander, *DA* 51.8–10; 51.25–52.11; Themistius, *In DA* 67.26–68.4; Philoponus, *In DA* 386.4–12; 'Simplicius', *In DA* 150.35–152.26), and all of them discuss, too, the close affinity between flavours and odours (Alexander, *DA* 51.13–25; Themistius, *in DA* 68.4–9; Philoponus, *In DA* 389.23–390.2; 'Simplicius', *In DA* 153.10–18).

2 On Aristotle's accounts of flavour and odour, see Johansen (1997), 230–237; Johnstone (2012), 164–170; Ierodiakonou (Forthcoming (b)).

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The close affinity between flavours and odours is further stressed by Aristotle when, in *De sensu* 5, he introduces the analogy between the different kinds of flavour and the different kinds of odour:[3]

> T1: Aristotle *De sensu* 5, 443b3–16
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> It is not unclear, therefore, that the moist which is in either breath or water can draw upon flavoured dryness and be affected by it; for air, too, has a moist nature. Further, if dry stuff which is, as it were, washed out acts in a similar way within liquids and air, it is evident that odours must be analogous to flavours (δεῖ ἀνάλογον εἶναι τὰς ὀσμὰς τοῖς χυμοῖς). And this, in fact, happens in some cases (ἐπ᾽ ἐνίων συμβέβηκεν). For odours are pungent (δριμεῖαι), sweet (γλυκεῖαι), tangy (αὐστηραί), sour (στρυφναί), and fatty (λιπαραί), and one might say rotten things (σαπράς) are analogous to bitter ones (πικροῖς).[4] That is why, just as bitter things are hard to drink, rotten things are hard to breathe in. It is clear, therefore, that odour in air and water is the very thing which flavour is in water. And for this reason cold and freezing dull flavours and make odours disappear; for cooling and freezing make the heat, which is the moving and creative force, disappear.

However, what particularly surprises us, in this passage, is Aristotle's statement that the correspondence between flavours and odours holds "in some cases"; and we find a similar parenthetical remark in *De anima* II 9:

> T2: Aristotle, *De anima* II 9, 421a26–b3
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> Just as some flavours are sweet and some are bitter, so it is with odours. (But some things possess an analogous odour and flavour—I mean, for example, a sweet odour and a sweet flavour—while others possess a contrary one (τὰ δὲ τοὐναντίον).) Similarly an odour may be pungent, tangy, acidic (ὀξεῖα), or fatty. But because, as we said [i.e. 421a7–16], odours can-

3 All translations from Aristotle's psychological treatises are based on Miller (2018), with some changes.

4 Needless to say, most Greek terms denoting different kinds of flavour or odour are difficult to translate, since we do not know with certainty to what exactly they principally refer. For instance, the term "στρυφνός", which is used both for characterising apples (Athenaeus, *Deipn.* II 56.33) as well as wine (Galen, *De vict. att.* 100.4), is translated here as "sour", but it is also sometimes translated as "astringent"; "αὐστηρός", which is used for water (Plato, *Phlb.* 61c7) and for wine (Aristotle, *Top.* III 3, 111a5), is translated as "tangy" but also as "tart" or "grating"; "δριμύς", which is used for thyme (Aristotle, *DA* II 9, 421b2) and for oregano (Athenaeus, *Deipn.* II 77.31), is translated as "pungent" but also as "harsh".

> not be sharply distinguished the way flavours can, they have acquired names from these objects in virtue of their similarity: the sweet odour of saffron or honey and the pungent odour of thyme and similar objects, and the same for other odours.

So, although the close affinity between flavours and odours is presented, here, as the reason why we use the same terms both for the different kinds of flavour and for the different kinds of odour, Aristotle also implies that the analogy between flavours and odours sometimes breaks down. Which are, then, these cases that Aristotle has in mind?

The Aristotelian commentators of the *De anima* notice Aristotle's reluctance to generalise in an absolute way this analogy, and they consider it helpful to add examples in order to justify his reserved claim. For instance, Themistius (*in DA* 68.18–25) refers to the case of honey in which the sweet flavour coincides (συντρέχει) with the sweet odour, just like Aristotle does, and he also mentions that in the case of most perfumes their odour is sweet while their flavour is bitter.[5] John Philoponus (*In DA* 389.28–33) adds garlic and leek to the examples given by Aristotle of things that have an odour consonant (σύμφωνον) with their flavour—that is, sweet in the cases of saffron and honey, and pungent in the cases of thyme, garlic, and leek—, and he further gives two examples of things whose bitter flavour is not consonant (ἀσύμφωνον) with their sweet odour, namely aloe and storax.[6] Finally, Priscian ('Simplicius', *In DA* 153.35–154.1)[7] repeats Aristotle's example that the flavour of honey coincides (συντρεχούσης) with its odour, but he does not agree that saffron has a sweet flavour and thus presents it as an example of something whose flavour is in discord (διαφωνεῖ) with its sweet odour.[8]

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5 πλὴν ὅπερ εἶπον, οὐκ εὐποροῦντες τῶν οἰκείων ὀνομάτων ἐπὶ τῆς ὀσμῆς ἀπὸ τῆς γεύσεως αὐτὰ μεταφέρομεν, καὶ ὥσπερ τῶν χυμῶν τοὺς μὲν γλυκεῖς, τοὺς δὲ πικροὺς ὀνομάζομεν, οὕτω καὶ τῶν ὀσμῶν τὰς μὲν γλυκείας, τὰς δὲ πικράς. ἐνίοτε μὲν οὖν ἐπὶ τῶν αἰσθήσεων ἀμφοτέρων συντρέχει καὶ τὰ ὀνόματα καὶ τὰ πράγματα, καὶ ὁ γλυκὺς τῇ γεύσει χυμὸς καὶ τῇ ὀσμῇ γλυκύς, ὥσπερ τοῦ μέλιτος· πολλὰ δὲ ἡδέα μὲν τῇ ὀσμῇ, πικρὰ δὲ τῇ γεύσει, ὥσπερ τὰ πολλὰ τῶν μύρων.

6 τῶν δὲ γευστῶν φησιν ἅμα καὶ ὀσφραντῶν τὰ μὲν σύμφωνον ἔχειν τὸν χυμὸν τῇ ὀσμῇ, οἷον κρόκος τε καὶ μέλι (γλυκεῖα γὰρ ἐπ᾽ ἀμφοτέρων λέγεται ἡ ὀσμή, ὥσπερ καὶ ὁ χυμός· ὁμοίως τὸ θύμον, σκόροδον, πράσον δριμὺ καὶ τῇ ὀσφρήσει καὶ τῇ γεύσει), τὰ δὲ ἀσύμφωνον, οἷον ὁ ἀλόας τὴν μὲν γεῦσιν πικρὰν ἔχει, γλυκεῖαν δὲ τὴν ὀσμήν, ὁμοίως δὲ καὶ ὁ στύραξ.

7 On the identity of the author of this commentary, see the introduction in Steel (1997) and Hadot (2002).

8 ⟨ἡ μὲν γλυκεῖα κρόκου καὶ μέλιτος⟩, ἐπὶ μὲν τοῦ μέλιτος συντρεχούσης τῇ γλυκείᾳ ὀσμῇ τῆς γεύσεως, οὐχὶ δὲ καὶ ἐπὶ τοῦ κρόκου, ἀλλὰ διαφωνεῖ πρὸς τὴν ὀσμὴν γλυκεῖαν οὖσαν οὐ τοιαύτη ὑπάρχουσα ἡ γεῦσις.

Hence, Aristotle and his commentators seem to have been well aware of the fact that sometimes the objects of taste and smell are not analogous but contrary. How did they try to account for such a phenomenon? My aim, here, is to look into Aristotle's suggested explanations of the possible discrepancy between flavours and odours, in order to compare them with Theophrastus' views on this issue and to figure out how they both influenced later authors.

2 Aristotle's Reply

Let me begin with Aristotle's position. In *De sensu* 5, right after his claim that there is an analogy between the different kinds of flavour and the different kinds of odour, Aristotle makes a distinction between two kinds of odour: the first kind includes subkinds that are analogous to the different kinds of flavour, while the second kind includes subkinds that are independent of the different kinds of flavour:[9]

> T3: Aristotle, *De sensu* 5, 443b16–444a8
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> There are two kinds (εἴδη) of odour. For it is not the case, as some say, that there are no kinds of odour, because there are. But it is necessary to distinguish in what way there are and in what way there are not. One kind of odour is classified in line with flavours, as we have said [i.e. 443b7–8], and is coincidentally pleasant or unpleasant. For because flavours are properties of what nourishes, odours are pleasant to animals which experience appetite but not pleasant when they are full and not in need of anything; nor are they pleasant to those animals which do not find the food that has the odours pleasant. So, these odours, as we have said, involve pleasure and pain coincidentally, and hence they are also common (κοιναί τῶν ζῴων) to all animals.
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> But odours of the other kind are pleasant in virtue of themselves, for example, those of flowers. For they do not provide any inducement, great or small, toward food, nor do they contribute anything to appetite, but instead the contrary; for what Strattis said when mocking Euripides is true: "When you cook lentils don't pour on perfume!" Those who in fact mix such potent ingredients into drinks compel our pleasures by habituation, until a pleasure arises from two senses as it might from one. This

9 Aristotle, unfortunately, uses the term "εἴδη" both when he talks about the two kinds of odour and when he talks about the different subkinds belonging to the two kinds of odour, and this practice sometimes results in making the relevant passages somewhat difficult to follow.

> second kind of odour is peculiar to human beings (ἴδιον ἀνθρώπου), while the first, which is classified in line with flavours, belongs also to the other animals, as we said before; and the first kind, because it involves pleasure coincidentally, is divided into subkinds (εἴδη) corresponding to the flavours, whereas the second kind is not, because it has a pleasant or unpleasant nature in virtue of itself.

Aristotle begins, in this passage, by airing his objection to the view that there are different kinds of flavour but no kinds of odour, a view that was indeed put forward by his predecessors, namely by Democritus and Plato. For, if we are to trust Theophrastus' report (*Od.* 64; *Sens.* 82), Democritus introduced seven different kinds of flavour, but he neglected the sense of smell and failed to distinguish kinds of odour. And Plato, in the *Timaeus* (66d1–67a6; see also, Theophrastus, *Sens.* 84–85), defended the view that we cannot classify different kinds of odour; we can only adopt, he said, a rough scale between the extremes of the pleasant (ἡδύ) and the unpleasant (λυπηρόν) odour. Aristotle, on the other hand, makes the distinction between odours that are said to be pleasant or unpleasant coincidentally (κατὰ συμβεβηκός)—that is, insofar as they are related to things that have a pleasant or an unpleasant flavour—and odours that are said to be pleasant or unpleasant in virtue of themselves (καθ' αὑτάς).[10]

Aristotle explains that all animals experience the odour of something that tastes good as pleasant, whereas they experience the odour of something that tastes bad as unpleasant. He also maintains that the same thing that tastes and smells good when animals are hungry, no longer tastes and smells good when they are full. In Aristotle's view, therefore, human and non-human animals experience odours as pleasant or unpleasant depending on the nutritive value of the corresponding flavours; and these are the coincidentally pleasant or unpleasant odours. Moreover, Aristotle adds, human beings may judge odours as pleasant or unpleasant in virtue of themselves, and thus independently of flavours. In other words, human beings find enjoyable or repelling odours that have nothing to do with food; for example, they enjoy the odours of flowers and are repelled by the odours of filth or staleness. In fact, it is this Aristotelian distinction between two kinds of odour—the odours that are pleasant or unpleasant coincidentally and those that are pleasant or unpleasant in vir-

10 It is worth noting that Aristotle, in this passage, does not take into consideration that animals use their sense of smell in order to find mates, a fact which he observes in his zoological treatises; for instance, in *HA* VI 18, 572b9–13, he says explicitly that each stallion recognises the mares that form his company by their odour (I owe this reference to Sophia Connell).

tue of themselves—that explains, I think, the occasional discord between flavours and odours, to which Aristotle alludes in the *De sensu* (T1) as well as in the *De anima* (T2). Since human beings are able to disassociate the odours of perceptible objects from their corresponding flavours, it is reasonable to expect that sometimes they may experience the odour of something as pleasant while they experience its flavour as unpleasant; for instance, to use the commentators' examples already mentioned, it should not be surprising that perfumes, aloe, and storax taste bad but smell good.

Most importantly, Aristotle does not only claim that human beings experience two kinds of odour; he also tries to understand why human beings are unique among animals in this respect, and he offers in *De sensu* 5 two types of explanation. First, he gives a physiological explanation: the human brain, he states, in comparison with that of other animals, is disproportionately large, moist, and cold; having such a brain does not make our sense of smell more accurate but at least contributes to making it more refined, in the sense that we are thereby able to appreciate odours completely unrelated to food. Second, Aristotle presents a teleological explanation: human beings are meant to appreciate certain odours completely unrelated to food, because such odours have been generated in order to restore the equilibrium between heat and coldness in the region around the human brain, and this proves beneficial to our health:[11]

> T4: Aristotle, *De sensu* 5, 444a8–b2
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> The reason why the second kind of odour is peculiar to human beings involves the condition of the region around the brain. For the brain is cold by nature, and the blood in the vessels around it is thin and pure and easily cooled (which is also why the exhalation rising from nutriment is cooled by this region and produces sickly discharges). Hence, this kind of odour has been generated for human beings to support their health (τοῖς ἀνθρώποις πρὸς βοήθειαν ὑγιείας γέγονε); indeed it has no function (ἔργον) other than this. And it obviously performs it; for food, though pleasurable, whether it is dry or moist, is often noxious, while the fragrance result-

11 Aristotle seems to follow, in this regard, a Platonic tradition: In the *Timaeus* (67a1–6), Plato claimed that pleasant odours bring the body back to its natural state. Moreover, in the ninth book of the *Republic* (584b4–7), he referred to odours as examples of pure pleasure, and in the *Philebus* (51b3–7; 51e1–5) pure odours are treated as less divine than other sense objects but are also said to be pleasant in virtue of themselves (I owe these references to Xanthippe Bourlogianni and Claire Louguet). For Plato's account of the sense of smell, see Ierodiakonou (Forthcoming (a)).

ing from the odour which is pleasant in itself is almost always beneficial (ὠφέλιμος) to them whatever condition they are in. And for this reason smelling takes place through breathing—not in all animals but in human beings and some animals with blood such as those with four legs and those which partake to a greater extent in the nature of air. For when the odours are carried upward to the brain due to the lightness of the hot stuff in them, this region of the body is in a healthier condition; for the power of odour is by nature hot …

The second kind of odour is peculiar to human beings because they possess the largest and moistest brains relative to their size; for this is also why human beings are almost (ὡς εἰπεῖν) the only animals that perceive and enjoy the odours of flowers and similar things. For the heat and change produced by these things is commensurate (σύμμετρος) to the excess (ὑπερβολὴν) of moistness and coldness in this region of the body.

I have not been able to trace any early medical sources on which Aristotle may have depended for these claims about the condition of our brain and the effect of pleasant odours on the human health. Still, it is worth quoting a passage from Galen's treatise *De instrumento odoratus*, which comes quite close to what Aristotle says:[12]

T5: Galen, *De instrumento odoratus* 62.1–12 Kollesch (= II 884.1–16 Kühn); transl. B.S. Eastwood, with changes

That intense odours at once cause pains in the head, make it stuffy and heavy, sometimes even bringing on delirium, is also a sign that some of the material itself reaches the brain. For the brain could not be affected to so violent and acute a degree just on the basis of a similar quality [i.e. cool and wet]. Similarly it is now to be expected, when the brain suffers as a result of heatstroke, that the odour of roses is healthful. Whereas nothing less than roses, and also inhaled cold air, helps, so on the other hand very warm air rather clearly is deleterious. And when in fact the whole respiration is carried on by the brain in order to preserve the correct amount

12 In addition, it is worth quoting a passage in Plutarch's *De Iside et Osiride* (383D), in which we find a reference to Aristotle's view about the beneficial effect of pleasant odours to the human health, in the context of a discussion about related practices performed by the Egyptians (I owe this reference to Sean Coughlin): Ἀριστοτέλης δέ φησι καὶ μύρων καὶ ἀνθέων καὶ λειμώνων εὐώδεις ἀποπνοίας οὐκ ἔλαττον ἔχειν τοῦ πρὸς ἡδονὴν τὸ πρὸς ὑγίειαν, ψυχρὸν ὄντα φύσει καὶ παγετώδη τὸν ἐγκέφαλον ἠρέμα τῇ θερμότητι καὶ λειότητι διαχεούσας. εἰ δὲ καὶ τὴν σμύρναν παρ' Αἰγυπτίοις σὰλ καλοῦσιν, ἐξερμηνευθὲν δὲ τοῦτο μάλιστα φράζει τῆς ληρήσεως ἐκσκορπισμόν, ἔστιν ἣν καὶ τοῦτο μαρτυρίαν τῷ λόγῳ τῆς αἰτίας δίδωσιν.

> of heat in the heart, it is quite reasonable for the brain to provide this equilibrium (τὴν συμμετρίαν) first for itself, since by nature it is most susceptible of being injured through excessive (ἀμετρότερον) heating up or cooling down.

So, for Galen, too, some odours are beneficial to the health of human beings. Contrary to Aristotle, however, Galen claims that the sweet odour of roses helps those suffering from a heatstroke, because it cools the human brain and hence restores the equilibrium of its heat and coldness.[13] But leaving aside Galen's dissent from the Aristotelian doctrine as well as his own general theory of smell,[14] let us next investigate the way Aristotle's followers and commentators account for the exceptions of the correspondence between the senses of taste and smell.

3 Theophrastus' Reply

The Aristotelian who showed special interest in theories of perception and, in particular, in the senses of taste and smell is, undoubtedly, Theophrastus. Among his surviving writings, we find the short treatise *De sensibus*, in which he presents and criticises the views of Aristotle's predecessors on the function and objects of taste and smell, but we also find many interesting passages about flavours and odours both in the sixth book of his botanical work *De causis plantarum* and in his small treatise on odours, the *De odoribus*.[15] Indeed, when reading Theophrastus' works, one often gets the impression that his treatment of issues such as the production of flavours and odours as well as the classification of their different kinds is much more thorough than the relevant passages in Aristotle's psychological treatises. It is indicative that, when Galen discusses

13 On the beneficial effect of the sweet odour of roses, see also Galen, *De instr. odor*. 40.6–8 Kollesch (= II 862.12–16 Kühn); 48.1–4 Kollesch (= II 870.3–6 Kühn). Furthermore, according to Galen (*SMT* XI 537.5–539.8; 557.10–564.9 Kühn), rose juices blended with olive oil have a moderately cooling capacity (I owe this reference to John Wilkins); for the use of roses as ingredients in the production of medical drugs, see Squillace (2020), 181–183.

14 For Galen's views on the senses of taste and smell, see Siegel (1970), 140–173; for his dependence on Plato's and Aristotle's theories of smell, see Eastwood (1981); and for his anatomical description of the olfactory apparatus, see Smith (1971), 81–84.

15 Diogenes Laertius (V 44) includes in his list of Theophrastus' treatises the *De odoribus* in one book but also lists *De causis plantarum* in eight books, although we have it in six books. It has been argued that some version of the *De odoribus* was originally part of the eighth book of *De causis plantarum*; see Thompson (1941), 10–20; Wörle (1988); Sharples (1995), 133; Reger (2005), 257.

Plato's treatment of the senses of taste and smell in the *Timaeus*, he compares them to Theophrastus' rather than to Aristotle's account of these senses. In particular, in his work *De simplicium medicamentorum temperamentis ac facultatibus* (XI 450.16–452.2 Kühn), Galen presents the Platonic list of seven kinds of flavour and then attributes to Theophrastus the addition of a further kind, namely the fatty flavour, even though Aristotle, too, talks about this kind of flavour in the *De sensu* (4, 442a12–25).

Theophrastus actually seems to have been engaged in a more systematic study of the senses of smell and taste, as well as of their respective objects, than his illustrious teacher and collaborator did; for instance, concerning the generation of the different kinds of flavour, Theophrastus clearly has a more precise idea with regard to the role played by the different degrees of dryness and moisture. Although Aristotle (*DA* II 10, 422b10–14; *Sens.* 4, 442a12–25) lists between the sweet and the bitter flavour five, or sometimes six, other kinds of flavour—fatty, pungent, tangy, sour, acidic, and salty—, without specifying the criteria for the order of this list, Theophrastus claims that what is dry has a flavour closer to the sweet flavour—for instance, the pungent flavour—, whereas what is moist has a flavour closer to the bitter flavour—for instance, the acidic flavour:[16]

> T6: Theophrastus, *De causis plantarum* VI 11.1
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> Another point that we must endeavour to settle as relevant to flavours is this: Which, what is dry or what is moist, prevails more in each of the kinds of flavour? Thus the acidic is believed to belong more to what is moist, and so the tangy; whereas the pungent is believed to belong more to what is dry, and so the sweet (at all events what is moist gets sweeter as it thickens).

Moreover, Theophrastus supports this view by many concrete examples; not only something gets sweeter as it thickens, i.e. as it loses its moisture, he is also reported to have argued that unripe fruits, which are sour, become less sour and more acidic when ripe, due to the increase of their moisture (Galen, *SMT* XI 660.5–10;[17] see also, *SMT* XI 636.16–638.9 Kühn).

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16 All translations from Theophrastus' *De causis plantarum* are based on Einarson and Link (1990) and those from the *De odoribus* on Hort (1916), with changes.

17 ὡς γὰρ καὶ πρόσθεν εἴρηται, σχεδὸν ἅπαντες οἱ τῶν δένδρων καρποὶ κατὰ τὴν πρώτην γένεσιν, ὡς καὶ Θεόφραστος ἔλεγε, στρυφνοὶ γευομένοις εἰσὶν, εἶτ' ἐπειδὰν ὑγρότητος πληρῶνται, προσλαμβάνουσι μὲν ὀξύτητος, ἀφαιροῦσι δὲ τῆς στρυφνότητος.

Concerning now the relation between the senses of taste and smell, Theophrastus (*CP* VI 5.3; 17.10; *Od.* 4), just like Aristotle, points out that, although human smell is less accurate than taste, there is a close correspondence between them; and this, he also adds, we observe both in the fact that flavourless things are also odourless (*Od.* 67) as well as in the analogy between the seven kinds of flavour and the seven kinds of odour (*CP* VI 4.1–2). But although Aristotle does not doubt the applicability of the terms used for the different kinds of flavour to those of odour, Theophrastus expresses the worry that, since odours are more difficult to distinguish than flavours, there are occasions on which the terms used for flavours may not be appropriate for odours:

> T7: Theophrastus, *De odoribus* 1–2
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> Of odours some are, as it were, indistinct and insipid, as is the case with flavours, while some have a distinct character. And these characters appear to correspond to those of flavours, yet they have not in all cases the same names—as we said in a former treatise—nor, on the whole, are they marked off from one another by such specific differences as are flavours; rather, one may say that, in generic character, some things have a good and some a bad odour (τὰ μὲν εὔοσμα τὰ δὲ κάκοσμα). But the various kinds of good or bad odour, although they exhibit considerable differences, have not received further distinguishing names, marking off one particular kind of sweetness or of bitterness from another; we speak of an odour as pungent, powerful (ἰσχυρά), mild (μαλακή), sweet, or heavy (βαρεῖα), though some of these descriptions apply to bad-smelling things as well as to those with a good odour.

Most importantly for our purposes, Theophrastus states that the cases in which the analogy between flavours and odours breaks down are many, thus stressing more sharply than Aristotle the possibility of a discrepancy between the senses of taste and smell; for example, wines with a rich and powerful odour sometimes do not have a pleasant flavour, and the same applies in the cases of perfumes, incense, coronary plants, and other aromatic substances—as he himself remarks:

> T8: Theophrastus, *De causis plantarum* VI 16.6–7
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> Again, wines with a rich (πολύοσμοι) and powerful odour are not mild when tasted, which shows that good flavour (εὐστομίας) does not coexist with rich and powerful odour. This holds also of perfumes, incense, coronary plants, and other aromatic substances: all such things are bitter and of poor flavour (δύσχυλα), as are the almonds too. Again mountain wines

> have in some cases a fragrance, but they are harsh (σκληροί) and not good in flavour (οὐκ εὔχυλοι).

Also, the reverse is said to be the case; in particular, Theophrastus gives the example of the carob and the Phoenician cedar, which both have a sweet flavour but produce an unpleasant odour:

> T9: Theophrastus, *De odoribus* 5
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> And, as was said above [i.e. *De odor.* 1], things which have a good odour are generally of poor, sour, or somewhat bitter (ὑπόπικρα) flavour. Again some things which have a good flavour have also a bad odour (κακώδη), such as the carob, which is sweet (this is true of some regions, if not of all). Also, the Phoenician cedar, though it is sweet, when chewed produces a sort of bad odour but makes the urine fragrant (εὐώδες).

There are even some passages about plants in which Theophrastus makes the sweeping remark that all fragrant things have a bad flavour; he even goes as far as to say that the bitter flavour is "the origin" (ἀρχήν) of fragrance:

> T10: Theophrastus, *De causis plantarum* VI 9.4
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> It seems that of the two opposites, namely the sweet and the bitter, the sweet is the origin (as it were) of good flavour, whereas the bitter is the origin of good odour; and in a way the bitter is to a greater extent the origin of good odour, since it is hard to find anything fragrant that is not bitter, but many non-sweet things have good flavour (these being more or less the things that are also fragrant when tasted and eaten). Sweetness on the other hand has rarely any odour at all, least of all a good one. All this suggests that the sweet and the fragrant do not mix; and yet both are products of concoction. But of this problem later [i.e. *CP* VI 16.1–8].

To account for such discrepancies, it is not surprising that Theophrastus follows Aristotle and makes a distinction between coincidental odours and odours in themselves:

> T11: Theophrastus, *De odoribus* 5
>
> Now the odour of some things which have a good odour resides in things which are used for food—for instance, that of stone-fruits, pears, and apples—, the odour of which is sweet even if one does not eat them; indeed it may be said to be sweeter in that case. However, to make a general distinction, some odours are in themselves (καθ' αὑτάς), while others

> are coincidental (κατὰ συμβεβηκός); those of juices and things used for food are coincidental, those of flowers are in themselves.

And similarly to Aristotle, Theophrastus (*Od.* 4) also states that the different kinds of odour that are unrelated to food are experienced by human beings, whereas other animals do not seem to appreciate a pleasant odour in virtue of itself; he even adds that there are some animals—for instance, vultures and beetles—which seem to be annoyed by pleasant odours. But Theophrastus, who had a particular interest in doing research on non-human animals, is more careful than Aristotle in this respect and makes sure to also point out that the temperament of animals in question should always be taken into consideration as well as their capacity of smell. There is actually evidence that he considers it rather questionable whether non-human animals, in general, do not enjoy pleasant odours for their own sake (see also, *CP* VI 5.5):

> T12: Theophrastus, *De causis plantarum* VI 5.1–2
>
> In fact, among animals other than human beings there are either none at all or very few indeed that seek out good odour for its own sake (τὴν εὐωδίαν διῶκον αὐτῆς χάριν); if animals do seek it out, they do so only coincidentally, when their food has that odour, for their desire is relative to food and it is the food that they want. In the second place, if there is in fact such an animal, the matter is not evident (οὐ σαφές), at least to us. So the panther is reported to have a pleasant odour for other animals in its own right (this being why it hunts them by lying down, luring them by this odour); but it has no noticeable fragrance to us.[18]

The interesting question, of course, is how Theophrastus explains the phenomenon of the discord between flavours and odours. Does he follow Aristotle in giving two types of explanation, namely a physiological and a teleological? It is telling, I think, that he does not give a teleological explanation. That is to say, he does not claim that only human beings have the capacity to experience odours of the second kind, i.e. odours in virtue of themselves, because their function is simply to restore human health; on the contrary, he seems to doubt such an explanation:

18 On the panther's odour, see also Aristotle, *HA* IX 6, 612a12–15; [Aristotle], *Probl.* XIII 4, 907b35–37.

T13: Theophrastus, *De causis plantarum* VI 5.5

> This occurs also in human beings, for the same odours are not agreeable (προσφιλεῖς) to all of us. Uniformity occurs rather in bad and heavy odours, some of which affect all alike, as the odours exhaling from chasms and caves that are lethal to all who draw near. Even if these odours affect only the animals that breathe, yet this point is clear, as it was with flavours, that with odours too there are some that are appropriate to different kinds of animal, and that fragrance not associated with food is agreeable to few or none. Whether it is also beneficial (συμφέρον) to some animal is still more uncertain (ἀδηλότερον).

Is this, then, another occasion on which Theophrastus diverts from Aristotle's teleology?

The subject of Theophrastus' take on Aristotle's teleology has often been raised in contemporary scholarship.[19] It has been remarked that, in the ninth chapter of his *Metaphysics*, Theophrastus discusses passages from the Aristotelian treatises in which the Stagirite seems to have struggled to explain certain phenomena in terms of his teleological principle, when it may have been better for him to admit that such explanations are simply inappropriate. For instance, Theophrastus (*Metaph.* 9, 10a22–11a5) claims that natural phenomena such as extremely dry and moist seasons, the breasts in males, the large size of the deer's horns, and the insects that only live for a day seem to violate Aristotle's doctrine that all things in nature are for the sake of something (τοῦ πάνθ' ἕνεκά του). He thus proposes that such instances should urge us instead not to posit teleological reasons in all cases without qualification, and to acknowledge that there may be limits to the determination of causes. Nevertheless, scholars have also stressed that such statements by Theophrastus do not imply that he completely fails to recognise the role of necessity in nature nor that he rejects all teleological explanations, even though it is true that in his surviving works there are few such examples. Therefore, his stance in this issue has been interpreted, rightly I think, as showing nothing but caution towards an indiscriminate application of the principle that nature does nothing in vain. It is most likely, then, that his uncommitted position regarding the teleological explanation of the beneficial role of pleasant odours should be understood as another case of such a cautious stance.

19 See e.g. Lennox (1985); Repici (1990) and (2013), 226–229; Van Raalte (1993), 491–492; Gourinat (2015).

As to the physiological explanation Theophrastus offers for the sweet odours that are produced by bitter flavours, or for the reverse case, it does not resemble the Aristotelian account which is found in the *De sensu* and involves the condition of the human brain and the region around it. To explain, for instance, why a fruit tastes sweeter the less fragrant it is, Theophrastus says the following (see also, *CP* VI 16.1–3):

> T14: Theophrastus, *De causis plantarum* VI 14.5
>
> But no sweet fruit (one may say) is fragrant, or it is so only slightly. Thus the sweet apple is of all apples the least fragrant, and the sweeter it is, the less its fragrance. (Yet at the same time the sweet apple too has a certain vinous character in its flavour.)
>
> The reason for the absence of odour is that the sweet flavour is thicker and too earthy (παχύτερος καὶ γεωδέστερος) (especially when mingled with the pericarpion), whereas odour belongs to a finer and drier flavour (λεπτοτέρου καὶ ξηροτέρου) and to things that evaporate more readily. These matters will be treated in greater detail later.

And this is, in fact, what he says later about the reverse cases, that is, when unpleasant flavours produce pleasant odours:

> T15: Theophrastus, *De causis plantarum* VI 16.8
>
> It appears that the other answer is yielded as well: fragrance lies rather (as it were) in the unperfected (ἀτελέσιν) and privative (στερητικοῖς) flavours, inasmuch as fragrant things are some of them bitter, some pungent, some faint (ἀσθενῆ), some sour, some with another unpleasant flavour. This is not perhaps unreasonable, since there is more exhalation of a sort (ἀποπνοή τις) from these unperfected flavours. Hence if the exhalation carries off particles that are well-tempered (εὔκρατα),[20] the odour is commensurate (σύμμετρον) to the sense of smell; whereas if it takes particles that run to excess (ὑπερβάλλοντα), the odour becomes disagreeable (δυσχερῆ) and heavy. And it would not appear that odours of this type are a mere matter of privation (ἐν στερήσει), but possess a nature of their own, inasmuch as the effects are in some cases extreme.[21]

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20 For Theophrastus' use of the adjective εὔκρατος in a similar context, in which though it primarily denotes quality than quantity, see *HP* I 4.1: Πλείω μὲν γὰρ δοκεῖ τὰ ἄγρια φέρειν, ὥσπερ ἀχρὰς κότινος, καλλίω δὲ τὰ ἥμερα, καὶ τοὺς χυλοὺς δὲ αὐτοὺς γλυκυτέρους καὶ ἡδίους καὶ τὸ ὅλον ὡς εἰπεῖν εὐκράτους μᾶλλον.

21 Theophrastus questions, here, Aristotle's view that bitter odours should be considered

> Fragrance, then, for this reason lies more in non-sweet and poor-flavoured things (so to speak).

Hence, according to Theophrastus, it is the way odours are produced from the flavoured moisture in air or in water that seems to be mainly responsible for the discord between the taste of bitter apples, for instance, and their fragrance: if the particles emitted by the bitter apple are well-tempered, i.e. not in excess, and thus commensurate to the sense of smell, the odour is pleasant.

It is also worth noting that, in this context, Theophrastus presupposes a theory of effluences that postulates particles being emitted by perceptible objects and reaching the perceiver's organ of smell; and interestingly enough, we find him subscribing to the same effluence theory in *De odoribus* 3 and in more passages from the *De causis plantarum* (e.g. VI 9.3; 14.11; 17.1). In the *De sensibus* (20–22; see also, Priscian, *Metaphr.* 13.16–27; 14.10–15), on the other hand, Theophrastus seems to argue against the general theory of effluences that Empedocles and Plato put forward and defended. Does this mean that he is inconsistent in this respect? Or, does he perhaps recognise that there is something particular in the case of the sense of smell, in contrast to the other senses, that requires the assumption of effluences? It may not be accidental, after all, that the same ambivalence seems to characterise Aristotle's views in the *De sensu*; for he clearly rejects the effluence theory of his predecessors (5, 443a2–8; a21–b2), whereas he appears to make use of such a theory especially when it comes to the sense of smell (5, 444a21–24; 445a25–27).[22]

4 Theophrastus' Legacy

But whether or not Aristotle's and Theophrastus' theories of sense perception are inconsistent, at least Theophrastus offered a more worked out physiological explanation, than the one suggested by Aristotle, of the reason why the analogy between flavours and odours does not hold in certain cases. Furthermore, it seems that Theophrastus' reasoning as well as his general treatment of the

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as privative, just as he questions earlier on that bitter flavours are privative (*CP* VI 4.2); for Theophrastus' dissent from Aristotle's account of different kinds of flavour, see Ierodiakonou (Forthcoming (b)).

22 On whether or not Theophrastus' account of perception is inconsistent, see Sharples (1985), 193–197; Sedley (1985), 205–206; Eigler and Wörle (1993), 16–18; Baltussen (2015a), 43; Schorlemmer (2022), 71–82; Roreitner's contribution to this volume.

objects of taste and smell had an influence on later ancient authors, who also tried to give plausible descriptions of the function of these senses.

For instance, in his rather long comment on the coincidental odours and those unrelated to food, Alexander of Aphrodisias subscribes to Aristotle's teleological explanation and elaborates on it (*In Sens*. 99.9–15),[23] but he also adopts Theophrastus' criteria of what makes an odour sweet or bitter. For Alexander remarks that the odours of the second kind, which are not related to flavours, are more pleasant the hotter they are and more unpleasant the more moist they are; he even illustrates this with the example of lands and things that are more fragrant in hot and dry areas than in cold and moist ones:

> T16: Alexander, *In Sens*. 98.23–99.9; transl. A. Towey, with changes
>
> For there is no function (ἔργον) for odour of this sort other than to heat and be dispersed through the places around the brain which are too cold and to bring them to what is commensurate (εἰς τὸ σύμμετρον ἄγειν). For odours of this kind are by their own nature fragrant and pleasant. For they are dry and distinguished by the hot which is mild and pleasant, and the more they have been overpowered by the hot the more fragrant they are. For generally there is fragrance in them because of the ripening of the moist in them by the hot. It is at any rate for this reason that things in hot and dry places are more fragrant, and land which is hot and dry is fragrant when it first admits rain because of the heat which is present in it. For at that time the flavours from it are fine and dry. Odours which are unpleasant and troublesome (ἀηδεῖς καὶ μοχθηραί) are generated because of the cold and unripeness of the moist which is present in that from which they are generated.

Galen, too, is influenced by the Theophrastean views on taste and smell, especially in his previously mentioned work, *De simplicium medicamentorum temperamentis ac facultatibus*, in which he talks about the odours unrelated to food and, without even mentioning Aristotle, explicitly refers to Theophrastus as someone who studiously examined the phenomenon of the roses that smell good and taste bad (*SMT* XI 697.16–698.4 Kühn).[24] However, Galen's own

23 Alexander also gives, in this passage, an example of the fact that odours can be beneficial to human beings, when he claims that pleasant odours soothe the pain caused by pestilential diseases (ἐν ταῖς λοιμώδεσιν).

24 ἐπὶ μέντοι τῶν ἡδίστων, οἷά περ καὶ τὰ ῥόδα, διαφέρουσί τε καὶ πάμπολυ διεστήκασιν. οὐ μόνον γὰρ οὐχ ἡδέα γευομένοις ἐστὶν, ἀλλὰ καὶ πικρότητος οὐκ ὀλίγον ἐμφαίνει. καίτοι τόγε πικρὸν οὐδέποτ᾽ ἦν εὐῶδες οὐδ᾽ ὡς φάρμακον, οὐδ᾽ ὡς τροφὴ ἡμῖν ἡδύ. τίς οὖν ἡ τῆς διαφωνίας ταύτης αἰτία, διὸ καὶ Θεόφραστος μὲν ἐζήτησεν, ἄμεινον δ᾽ ἴσως καὶ ἡμᾶς ὅσα γιγνώσκομεν ὑπὲρ αὐτῆς εἰπεῖν.

account somewhat differs from Theophrastus', since Galen introduces the role of the *pneuma* in the brain ventricles with which the odours should be compatible in order for them to be experienced as pleasant (*SMT* XI 698.15–699.5 Kühn).[25] In spite of this, I think that Galen's explanation of the discord between flavours and odours is along the same lines as Theophrastus' doctrine; it is not a teleological explanation and it also depends on how the different qualities of the elemental particles—hot and cold, dry and wet—affect our senses of taste and smell. For Galen (*SMT* XI 701.14–702.11 Kühn)[26] explicitly states that, from the three constituent elements of roses, namely earth, air, and water, it is the coldness of the water alone that produces their sweet smell, whereas all other three elements are responsible for its bitter flavour.[27] This is, I think, an elaboration of the type of explanation given by Theophrastus. That is to say, Theophrastus implies that apples have a bitter or a sweet odour depending on the quantity of particles emitted by them, while Galen clearly suggests that the rose's flavour is due to the admixture of constituent elements that are other than the ones responsible for its odour.[28]

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25 οὐ μὴν εὐθὺς καὶ πᾶν ὀσμῶδες ἡδύ, διότι μηδ' οἰκεῖόν ἐστιν ἅπαν τοῦ κατὰ τὰς κοιλίας τοῦ ἐγκεφάλου πνεύματος. ὥσπερ γὰρ τῶν προσπιπτόντων τῇ γλώττῃ χυμῶν οἱ μὲν οἰκειότατοι γλυκεῖς ἦσαν, οἱ δ' οὐκ οἰκεῖοι πολλὰς ἐκέκτηντο διαφοράς, οὕτω καὶ τῶν ἀτμῶν οἱ μὲν οἰκεῖοι τῷ κατὰ τὸν ἐγκέφαλον πνεύματι φίλιοί τ' εἰσὶ καὶ ἡδεῖς, οἱ δ' οὐκ οἰκεῖοι διαφέρουσι μὲν ἀλλήλων οὐκ ὀλίγαις διαφοραῖς.

26 ἐν δὲ τῇ τοῦ ῥόδου φύσει τὸ μέν ἐστι στρυφνὸν γευομένοις, ὅπερ ἀναγκαῖον εἶναι γεώδες τε καὶ παχυμερὲς καὶ ψυχρόν, ἕτερον δὲ πικρόν, ὃ δὴ λεπτομερές τ' ἐστὶ καὶ θερμόν, καὶ τρίτον ἐπὶ τούτοις τὸ ὑδατῶδες, ψυχρὸν μὲν ἐξ ἀνάγκης, ἀλλ' ἐν τῇ κατὰ τὸ λεπτομερές τε καὶ παχυμερὲς ἀντιθέσει μέσον πως ὑπάρχον τῶν ἄκρων, οὗ τῇ μίξει καὶ τὸ στρυφνὸν καὶ τὸ πικρὸν οὐκ ἔστιν ἄκρως τοιοῦτον ἑκάτερον οἷόν περ λέγεται· πάσας γὰρ ἐκλύει τὰς ποιότητας ἡ τοῦ ὑδατώδους ἐπιμιξία. τοῦτ' οὖν αὐτὸ τὸ ὑδατῶδες ἔοικέ πως ἤδη τε καὶ κατειργάσθαι καὶ λελεπτύνθαι καὶ τεθερμάνθαι, καὶ διὰ τοῦτο ῥᾳδίως εἰς ἀτμοὺς ἄγεσθαι καὶ ταύτῃ τὸ ῥόδον ὀσμῶδές τε εἶναι καὶ ξηραίνεσθαι τάχιστα. καὶ ταῦθ' ὑπὲρ αὐτοῦ πάντα διὰ μὲν τῆς γεύσεως ἔνεστι τεκμήρασθαι, διὰ δὲ τῆς ὀσμῆς οὐχ οἷόν τε τῷ μήθ' ὁμοίως ἀτμίζειν ἅπαντ' αὐτοῦ τὰ μόρια μήθ' ὁμοίως κινεῖν τὴν αἴσθησιν.

27 On Galen's explanation of why things that smell sweet often taste bad, see also Sharples (1985), 196–197.

28 Theophrastus, in fact, analysed the ingredients of the rose perfume (ῥόδινον): it is obtained from the flowers of the rose (*Od.* 27) together with certain spices—for instance, gingergrass and sweet-flag—and a considerable amount of salt (*Od.* 25) as well as with some plant-based colouring substances (*Od.* 31, 33). He also claimed that it is due to the salt that rose perfume is used in medicine for curing earaches and strangury (*Od.* 35) and for alleviating headaches caused by other fragrances (*Od.* 50). So, although Theophrastus did not explain the sweet odour of roses and their bitter flavour in terms of their different elemental particles, he did realise that the different constituents of an admixture produce different effects.

Therefore, according to my suggestion, it is the same principle that lies behind the physiological explanation, proposed both by Theophrastus and Galen, of the observed discrepancies between flavours and odours. To put it briefly, the elemental particles that are emitted by the perceptible object and produce its odour differ in some respect from those that produce its flavour. And this is actually the principle behind Priscian's explanation, at least as much as it is possible to assess from his extremely concise remark in his commentary on Aristotle's *De anima*. For Priscian, too, does not talk of a teleological explanation; rather, he claims that the discord we experience between flavours and odours is caused by the fact that, during the process of the production of an odour, i.e. when the flavoured moisture affects the air or the water, the odour generated sometimes may be similar to the flavour but sometimes may change to its contrary:

> T17: 'Simplicius', *In DA* 153.27–34; transl. C. Steel, with changes
>
> The names "sweet", "bitter" and the like have been transferred from flavours to odours. But not idly—for why not from objects of touch or sounds? Rather it is because, as was said, there is an affinity (συγγένεια) of odours to flavours also with relation to their bearers, because of the solution of the flavoured in the compounded moisture of air and water. Why then does a sweet odour not always follow (ἀκολουθεῖ) on a sweet flavour? It is because sometimes the flavoured matter, as it dissolves, changes its character (παρατρέπεται), and the change of character (παρατροπή) turns it into something of the same kind or into just the privation of the bearer.

In other words, the elemental particles responsible for the flavour of something tasteable are not always the same as those responsible for its odour; the production of the odour may require processes that result in significant changes of the constituents involved in the production of the corresponding flavour.

5 Conclusion

To conclude: Aristotle constructed a general theory of perception and tried to apply it in the case of the five specific senses, marking their differences as well as their affinities. But he also observed cases in which his blanket doctrine did not conform with his everyday experience. If the senses of taste and smell are closely related, as he thought, how could one explain the fact that flowers have a sweet odour but a bitter flavour? Aristotle's treatment of such phenomena did not seem adequate to his followers. Among them, Theophrastus was the

one who undertook to closely study the relevant experiential evidence and to suggest a more detailed explanation, which in certain respects even doubted some of the Aristotelian principles. Those who later engaged themselves in settling the same issue acknowledged the Theophrastean contribution, although they had to adapt it to their own doctrinal predilections. Hence, there was nothing remarkable for the ancients regarding the fact that roses smell good but taste bad; it was just a spinoff phenomenon accounted for in various ways by ancient theories of perception introduced and defended by different philosophers, with the result that it remained a point of contention for a long period of time in antiquity.[29]

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