



# Taste, Gastronomic Expertise, and Objectivity

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*The pleasures of the table are for every man, of every land, and no matter of what place in history or society; that can be a part of all his other pleasures, and they last the longest, to console him when he has outlived the rest.*

Jean-Anthelme Brillat-Savarin,  
The Physiology of Taste, 1825

## The Riddle of Taste

There is a long historical tradition of gastronomy that dates back at least to early antiquity and in accordance with this fact it has often been thought that there are those among us with the special distinction of being *bona fide* gastronomes. Gastronomes are thought to possess some ability that others lack with respect to taste in much the same way that experts of all stripes possess special abilities. In virtue of this special ability we often appear to unhesitatingly accept that gastronomes are expert authorities when it comes to certain matters of taste. If, for example, an alleged gastronomic expert claims that morel mushrooms taste of loam or that Kumamoto oysters taste fruity, then if we take him or her to be a real expert we must apparently accept that such pronouncements are true, even when we are perceptually incapable of noticing such things ourselves.

However, as famously defended by David Hume, there is also a general and widely recognized understanding that matters of taste

are wholly subjective. In "Of the Standard of Taste" Hume notoriously tells us that,

a thousand different sentiments, excited by the same object, are all right: Because no sentiment represents what is really in the object, it only marks a certain conformity or relation between the object and the organs or faculties of the mind; and if that conformity did not really exist, the sentiment could never possibly have being. Beauty is no quality in things themselves; It exists merely in the mind which contemplates them; and each mind perceives a different beauty. One person may even perceive deformity, where another is sensible of beauty; and every individual ought to acquiesce in his own sentiment, without pretending to regulate those of others. To seek real beauty, or real deformity, is as fruitless an enquiry, as to pretend to ascertain the real sweet or real bitter. According to the disposition of the organs, the same object may be both sweet and bitter; and the proverb has justly determined it to be fruitless to dispute concerning tastes.<sup>1</sup>

According to this widely held view, disputes about taste can no more be settled objectively than can disputes about our judgments of beauty or personal preference. There simply is, according to the Humean view, no objective component in taste experience on the basis of which such a dispute could be settled. Given these two views it should be apparent that our attitudes about taste and gastronomic expertise are curious to say the least, if not simply inconsistent. It would appear that something has to give if we are to maintain a coherent stance on this matter.

In light of this situation one might be tempted to think that philosophers would have expended considerable intellectual effort in examination of the nature of the faculty of taste and its relation to expertise about taste, especially in its most basic manifestation – the literal sensory capacity of tasting. At least to date, however, the sense of taste has never enjoyed the spotlight in philosophical discussions. This includes general philosophical discussions of the nature of perception, specific discussion of perceptual objectivity in the theory of knowledge and even in the gastronomic corner of aesthetics. Historically, Jean-Anthelme Brillat-Savarin's *The Physiology of Taste* and Hume's "Of the Standard of Taste" are perhaps the only really significant exceptions to this rule. In retrospect Brillat-Savarin's work is particularly exceptional in that it treats taste at length and

from the philosophical, aesthetic, and scientific perspectives, although not of course in light of our contemporary physiological understanding of perception. In any case, Carolyn Korsmeyer's *Making Sense of Taste* is similarly the only extended contemporary investigation into the philosophical nature of taste perception and so there is little or no intellectual tradition to draw on here to help resolve the incoherence in our attitudes towards gastronomic experts and the nature of taste.

That taste has been so consistently ignored is an interesting historical and conceptual lacuna because taste is one of the most primitive and direct senses. As such, the philosophical analysis of taste is uncluttered by some of the complexities that have made, for example, discussion of vision exceptionally difficult. What will be addressed and discussed here are two issues that will hopefully help to resolve this matter. First, we will examine the conditions that must be satisfied in order for an attribution of a taste property to be regarded as objective given our modern scientific understanding of how taste perception works.<sup>2</sup> Addressing this issue will require introducing some of the details of our current understanding of the physiology of taste perception and some thorny issues in the philosophy of perception. Second, we will investigate the nature of gastronomic expertise given this scientific account of taste perception. The perhaps surprising conclusion that will be defended here is that, at least as things stand in our understanding of taste perception, there is very little reason to believe that gastronomic expertise is anything more than an ability to more eloquently describe fundamental taste experiences. So, in effect, there is nothing especially deep and more accurate about most of the pronouncements of gastronomic experts.

## Direct and Reflective Tasting

Before proceeding any further into the complex and somewhat messy philosophical and physiological details, we must distinguish between the direct and the reflective senses of taste.<sup>3</sup> This distinction can be illustrated more clearly through the consideration of an example. In *The Cheese Companion* Judy Ridgway offers the following description of the taste of Ossau-Iraty-Brebis Pyrénées:

It has a distinctive, sour, wine-like aroma with a touch of the farmyard and a really tangy, spicy taste. Lemons and leaf mold remain in the lingering flavor which is sweet, salty and mellow.<sup>4</sup>

The concept of a direct taste experience is then to be understood as the experience of a taste property at the most basic level, where it has yet to be interpreted in terms of our more elaborate system of taste concepts.<sup>5</sup> So, if we examine Judy Ridgway's report concerning the taste of Ossau-Iraty-Brebis Pyrénées we might note that she reports that the cheese elicits certain objective taste experiences in us and which are not described in terms of our more conceptualized or metaphorical language. In this case we might see that sweetness, sourness, and saltiness are properties being ascribed to the cheese in this way and they are ascribed in virtue of the nature of the cheese and the nature of our sensory apparatus. But note that this is done independent of our more reflective interpretations of these qualities.

Reflective taste experiences are then direct taste experiences that have been interpreted in terms of some concepts via processing in the parts of the brain that allow for higher level cognitive functioning and thus allow for more sophisticated description. In our example concerning Ossau-Iraty-Brebis Pyrénées, the attributions of lemon and leaf mold flavors appear to be good examples of these sorts of reflective taste attributions. They do not refer directly to basic objective qualities that our sensory apparatus are tuned to detect and they are far more metaphorical and descriptive. Presumably, then, the concepts that we use to interpret perceptual inputs like taste experiences are imposed on direct experiences at some higher level of cognitive functioning, so that we can reflectively think about such experiences in a richer manner that allows such experiences to be integrated into our broader perspective on the world. This is crucial because even casual familiarity with the pronouncements of gastronomic experts suggests that the bulk of gastronomic pronouncements seem to concern reflective tasting. This may well be because it is typically quite uninteresting to simply describe complex tastes in terms of simple attributions of the basic qualities that our taste faculties are tuned to detect: sweetness, sourness, saltiness, bitterness, and savoriness. So, it is the more florid and rich kinds of description of tastes that appear to be the real meat and potatoes of supposed gastronomic expertise.

The main thesis of this essay will be based on the observation that since there is little reason to believe that so-called gastronomic experts possess different physiological, non-cognitive, taste faculties, there are no good reasons to believe that such expertise involves non-reflective differences in tasting. To be sure, we are aware of physiological variations in the population that do account for variation in some types of direct taste experiences and we will look at a particular case of this sort a bit later, but there is no general reason to believe that there is such physical variation between gastronomic experts and non-experts or among various gastronomic experts. As a result, if there are disputes about taste properties in these cases, they can only really be disagreements about how the direct taste experience is to be conceptually interpreted or described and not about the objective experience itself. This has the interesting consequence that there are no good reasons to accept much of the testimony of such gastronomic experts as being true.

### Disagreements About Properties in Tasting and the Science of Taste Perception

In considering gastronomic expertise as a special sensory acuity or ability a particular and difficult problem arises, especially where there is significant perceptual variation between individuals. The seemingly obvious suggestion is that in such cases appealing to intersubjective community agreement could circumvent these sorts of difficulties. We could simply say that when such disagreement occurs we should accept the judgment of the majority. Of course, this unfairly biases the issue in favor of such a majority and ignores the possibility that the common perceptions of the majority of perceivers are those that are inaccurate.

In any case, given a scientific take on the issue of taste and even passing familiarity with the science of gastronomy, we have good reason to believe that if we work to develop it we are capable of possessing a reliable, and rather ordinary, way of coming to know about how things really taste, even when those taste properties are complex and subtle. The substantive point is that if there were an adequate explanatory theory of the perceptual mechanism sensitive

to such properties, then we could ignore the issue of depending on intersubjective agreement when dealing with appeals to special perceptual faculties. In the case of gastronomic expertise, this sort of explanation would have to account for the reliability of that faculty and thus for the acquisition of taste information. It would also have to permit us to distinguish the perception of "expert" perceptions from the perceptions of non-experts. In effect, we would not have to worry about, for example, how many people agree that Crostin de Chavignol (a famous French cheese from the Loire valley) tastes flinty or not if we could settle the matter by finding out whether or not those who say it is flinty actually possess some physiological ability to detect flinty tastes.

### The Strange Case of the Phenol Tasters and the Physiology of Tasting

In order to illustrate this important line of thought consider the analogous case of taste sensitivity with respect to the substance phenol and other related substances. The general population happens, as a matter of fact, to be partitioned into two groups with regard to tasting phenol. One group, the minority, reports that phenol tastes bitter. The other group, the majority, reports that it is tasteless. The natural question to ask is then whether or not phenol is really bitter. Can we simply assume in this case that the majority is correct, and that phenol is not bitter? Surely we cannot respond in this naïve manner. We do not, and should not, automatically impugn the claims of those who appear to be sensitive to phenol simply because the majority of us are not sensitive to this apparent property. Problems can and often do arise, however, both when we try to account for such differences in perceptual abilities and when we attempt to ascertain the significance of such perceptual states. Most crucially, it is remarkably difficult in such circumstances to determine whether phenol really is bitter or not. But before we address this crucial issue we first need to look carefully at what science tells us about the faculty of taste.

According to our best physiological theories of taste we, and other mammals, can experience five basic tastes or taste qualities. These taste qualities are sweetness, saltiness, sourness, bitterness, and

umami, or savoriness. The ability to experience these tastes is due to the presence of receptors on the tongue and in the mouth and throat, where they can then interact with substances we ingest. Tasting occurs because we have such taste receptor cells that are found on a certain kind of epithelial cell in the mouth. These specialized cells act like neurons and exhibit many of the functions that neural cells exhibit. Taste buds are collections of these taste cells and are located on papillae found in various parts of the mouth, throat, and tongue. Taste buds themselves come in three varieties: fungiform, foliate, and circumvallate, depending on their shape. Nerves then connect the receptors to the brain. In the case of the tongue, the chordia tympani carries messages from the outer third of the tongue. The glossopharyngeal nerve carries messages from the outer third of the tongue and a nerve in the superficial petrosal branch carries messages from receptors located in the larynx and epiglottis. These nerve fibers actually respond to more than one taste, but each one responds most strongly to just one direct taste quality. So what are known, for example, as "sourbest" nerve fibers are those that respond most strongly to sourness.

The nucleus of the solitary tract, the parabrachial nucleus, and the thalamic gustatory areas are where these signals are processed in the lower brain and presumably are where reflective tasting begins to occur. However, there are in fact two current paradigms concerning how taste information is processed in the brain. The labeled-line theory suggests that signals from taste receptor cells are carried to the brain without being modified, so the signal is directly recognized as being of one of the particular taste qualities. The pattern hypothesis, on the other hand, suggests that the brain also takes into account the particular details of the pattern of neural firing. Whichever happens to be correct, it is clear that tasting is localized both on the tongue, etc. and in the brain. Moreover, whichever theory is correct it is clear both that tasting capacities vary significantly from person to person and that prior experiences and beliefs influence taste perception. The point concerning variation in taste sensitivity is especially important here. People differ both in terms of the number of receptors that they have and in terms of the sensitivity of taste receptors. To a great extent this is explained as being the result both of broadly environmental factors like smoking, age, etc. and of genetic factors.<sup>6</sup>

So in the phenol example we might reasonably believe that phenol is bitter because phenol activates bitter receptors and that there is some physiological difference in the sensory apparatus of the phenol tasters and the phenol non-tasters. As it turns out, despite the fact that the majority may not possess the ability to detect such properties, there are many cases of minorities that possess special sensory acuities that we take to be accurate precisely because we have detailed understanding of the physiological basis of those special sensitivities. So, while it may or may not be the case that the individuals in the different groups actually have different perceptions because they have different sensory abilities, one lesson is clear: the size of the group claiming to have a particular taste experience tells us nothing about which group is having sensations that are objectively correct.

The real worries that might arise in the case of the phenol tasters are twofold. First, there may be no objective property being identified in this case. In other words, perhaps the bitter taste experience is just a subjective quirk of these peculiar tasters that does not correspond to any capacity of the substance to produce bitter taste experiences. Second, the taste experience that is reported by this group may not be the objective property of tasting bitter that is being detected by the phenol tasters. In other words, perhaps they are misidentifying some other taste property, saltiness or sweetness for example, as being bitter. So absent sufficient independent reasons to believe that the phenol tasters are really accurately detecting some objective feature of how phenol interacts with our sensory apparatus, it is surely possible that this is just the result of some subjective quirk in the phenol tasters' physiology, that they are merely detecting some pedestrian property of phenol and not its actual bitterness, or that they are merely interpreting the taste of those substances as being bitter even though they are not so.

In point of fact, in the case of phenol and some other compounds, 6-n-propylthiouracil, phenylthiocarbamide, etc., the difference in the ability to taste the bitterness of such chemicals is genetically determined.<sup>7</sup> So persons in one genetic group are tasters and those in the other are non-tasters due to a known genetic variation that affects our ability to detect bitter tastes. In fact, due to this genetic difference phenol tasters have larger numbers of papillae that hold our taste buds and determine taste sensitivity to bitterness in the manner described above. Interestingly, there is also a subgroup of tasters who

are what are known as supertasters of these substances, those who report not only that they taste bitter but also that they are overwhelmingly bitter. Predictably, supertasters have the largest number of papillae.<sup>8</sup> As a result of our knowing how and why differences arise in the perceived taste of phenol, those of us who are non-tasters (whether we constitute a majority or not) and those of us who are tasters and supertasters are all justified in believing that the tasters and supertasters of these substances have objective experiences of those substances in question. The justification, however, is provided only in virtue of our possessing an adequate scientific explanation of the variation in perceptual apparatus between phenol tasters and phenol non-tasters that accounts for the special acuity attributed to tasters and supertasters.

Consequently, those who want to hold that gastronomic expertise is a reliable sensory capacity must, given our scientific theories of taste perception, specify some neuropsychological difference between such experts and non-experts. This difference must supply reason to believe that our perceptual organs are detectors of the kinds of properties involved in such alleged expertise, and be sufficient to distinguish such special perceptual states from ordinary perceptual states using those same detectors. Absent any differences of this sort, we would have no good reason to believe the claim that there is some objective taste and that it is being detected by those with such a special sensory acuity merely based on their testimony. The same point would arise even if the partition sizes were reversed. The lesson is that if we are to scientifically ground belief in the existence of objective properties of some type on the basis of this special sort of perception, there must be a fully adequate physiological account of the difference between those who perceive that property and those who do not. The reason why we must have such an account is that we must be able to distinguish such perceptual states. That this is required of us is especially important in cases where there is perceived to be significant variation in perceptual ability and, for example, where there is serious disagreement about the properties perceived. In the case of the kind of gastronomic experience attributed to gastronomic experts it seems reasonable to hold that these conditions are met, and so those who defend the objectivity and authority of gastronomic experience are obligated to provide an adequate account of the special sensory acuity that is the basis of that alleged expertise.

## Skepticism and the Nature of Disputes About Tastes

Let us look at the kinds of disagreements in taste property ascription that have been alluded to above, and let us consider a particular case in which we have disagreement about taste properties involving gastronomic experts. To begin, let us consider a typical review offered by a putative expert, in this case by again referring to *The Cheese Companion*. The book offers not only a stimulating history of cheese and some insight into some of the technical details of cheese making, but as we have seen it also includes some fairly detailed descriptions of the taste properties of various famous cheeses. For example, Judy Ridgway offers the following account of the taste of Langres, a cheese from the Champagne region of France:

The rind is the typically bright orange color of washed rind cheese and this gives it its pungent farmyard-like aroma.

The paste is very creamy with a pretty pale yellow color and a sweet aroma of lemons and a touch of bacon. The flavor is strong but creamy. There is a definite suggestion of old socks but this balanced by a lovely lemon tang.<sup>9</sup>

What are we to make of such descriptions? Notice first that there is no reference to direct taste qualities here and that the taste property ascriptions being made are of the reflective sort.

Clearly, a number of very specific taste properties are being attributed to this particular cheese, specifically lemon and old sock flavors, as well as some other properties that are not clearly taste properties: bacon and farmyard odors and creaminess. Presumably the author believes that Langres has these taste properties, and this is suggested insofar as nowhere does the author contend that these are merely personal, subjective, reactions to Langres. Her claims are presented as *bona fide* claims about the taste of Langres. Suppose however that a different (purely hypothetical) expert, Skip Tickle, disputed Ridgway's particular property ascriptions to Langres and gave the following alternative account of the experience:

The rind is the typically bright orange color of washed rind cheese and this gives it its pungent farmyard-like aroma.

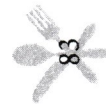
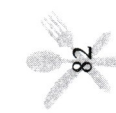
The paste is very creamy with a pretty pale yellow color and a sweet aroma of oats and a touch of crayon. The flavor is strong but creamy. There is a definite suggestion of bicycle tire but this is balanced by a lovely monkey flavor.

Moreover, suppose that there is no significant difference in the expert reputation possessed by Judy and Skip, that neither of them is physiologically unusual in any respect and that we cannot directly taste the cheese ourselves at this time.

In this hypothetical case we are faced with two equally good appeals to expert authority and so the issue of what to believe in such a case cannot be settled by appeal to differences in reputation, but neither can it be settled by appeal to the general population, or, in this case, by appeal to direct tasting. The only thing that would reasonably suffice to settle the dispute would thus be to establish that there is some physiological difference between Judy's and Skip's reliability, as in the case of phenol tasting. However, this does not seem to be plausible, as Judy and Skip might well still differ on the taste ascriptions even though there is no relevant physiological difference between them. Moreover, presumably Judy Ridgway is really not physiologically different than you or I in terms of her taste apparatus, or at least we have no good reason to suppose that she is unusual in this respect.

In effect what we are really then left with are two competing explanations of such disagreements. The first explanation regards the two competing accounts of the taste of Langres as objective and posits some unknown physiological difference between Skip and Judy that would account for their differing property ascriptions. Provided they are not both deceived, one of them is then correct. The second explanation is simply that such taste ascriptions are not direct, but rather are reflective, and that this accounts for their differing descriptions of the taste of Langres. They simply use different concepts or terms to describe one and the same taste experience and so the reports are subjective in nature. However, they are then both right.

When we then turn our attention to answering the obvious question about which of these explanations is better, certain difficult problems arise. If, on the one hand, we opt for accepting the first "explanation" as best, then we are saddled with making sense of an



explanation that appears to be utterly *ad hoc*, at least as things stand. Without data that verify relevant physiological differences between Judy and Skip, this simply is not an explanation at all. It would be no more than a possible account of why there *might* be a difference in the taste descriptions. Also, there do not appear to be any good reasons to believe in general that there really are significant physiological differences between various experts. *Ipso facto* this approach cannot then be the best explanation of the situation, and so we have no rational reason to accept either Judy's or Skip's descriptions as correct. If, on the other hand, we accept the second explanation as best, then we must concede that the experts are not reporting *bona fide* taste properties of the cheese in the direct sense. The best we could say is that what expertise they have consists in selecting certain concepts or terminology to apply to the direct experiences that they share in reflective taste. But this is to render their expertise totally impotent, as it provides for no connection between their reports and the objective taste properties of the cheese.

The problem is more radical still. Suppose that we subsequently find out that Skip is no expert at all, but that, nevertheless, Skip is still not significantly different from Judy in terms of the relevant physiological features. Notice that this changes almost nothing. There is still no reason to accept that Judy's description of the cheese is any more accurate in the direct sense than that of Skip unless we have some way to account physiologically for the "unknown" differences in the sensory abilities of Skip and Judy. In this case, given an explanation like the second one offered above, all we could say is that based on reputation Judy's reflective taste reports about the cheese are preferable. But in what way are they preferable? It certainly cannot be a compelling reason on any scientific theory of perception, and so the best one could say is that Judy's reflective descriptions are to be preferred because, in some non-rational sense, we like the concepts she selects to describe taste properties. That Judy has more past experience in applying concepts to describe tastes makes no rational difference, as it merely underwrites the claim that Judy is perhaps more eloquent than Skip. But on this reading it has nothing to do with Judy's being more reliable in identifying objective taste properties in the direct sense.

## Conclusion: Taste Skepticism and Everyman's Gastronomic Authority

So the qualified conclusion established here is that if we accept our best scientific theory of taste perception and want to say that gastronomic expertise is genuine, then we must be able to specify the nature of that ability. However, disputes about taste ascriptions cannot be settled by appeal to numbers, and we do not have a theory of taste that meets the physiological conditions above as it applies to grounding typical cases of gastronomic testimony. As such, gastronomic expertise is not a sort of rational expertise because it involves nothing more than the perceived ability to apply concepts to direct tastes reflectively, and thus is essentially subjective in nature. Note however, that our current physiological understanding of taste perception indicates that there is some objective component to taste experience, so we need not concede that Hume is entirely right about the subjectivity of taste. Specifically, we have very good scientific reasons to believe that any properly functioning human can detect real, objective, tastes such as saltiness, sourness, bitterness, and so on. However, there are no good reasons to suppose that there are real differences in capacities when it comes to reflective taste, and such are the meat and potatoes of gastronomic expertise. So Brillat-Savarin, a paradigmatic gastronomic expert, was ironically correct in making his aphoristic claim that "[t]he pleasures of the table are for every man, of every land, and no matter of what place in history or society."<sup>10</sup> That such pleasures are truly for every man is simply a consequence of the fact that the alleged gastronomic experts do not generally possess any special sensory abilities absent in most any Tom, Dick, or Harry.

## Notes

This essay is dedicated to John and Diane Shaffer. Thanks to both for the introduction to gastronomy. Also, the author would like to thank the St. John restaurant in London for an inspirational meal.

- 1 Hume, David. "On the Standard of Taste." *David Hume: Essays Moral, Political and Literary*. Ed. Eugene Miller. Indianapolis: Liberty Classics, 1985: 230.
- 2 It is important to note that I am not treating tastes here as properties in the objects tasted, but rather as capacities in those objects to cause effects in our sensory apparatus. So the main issue raised here should not be confused with the issue of whether tastes correspond to real properties of food objects. Rather, the main issue is that of the objectivity of those complex interactions between those food objects and our taste apparatus. To be sure, such experiences do carry information about the nature of foodstuffs and, for example, it has long been conjectured that the ability to taste bitter tastes is the result of the intertwined evolutionary need for animals to avoid ingesting alkaloids, many of which are poisonous, and for plants to avoid being eaten (see, for example, Levin, D. A., "Plant Phenolics," *American Naturalist* 105 (1971): 157-81; Whitaker, R. H. and R. G. Feeny, "Allelochemics: Chemical Interaction Between Species," *Science* 171 (1971): 757-70). In this general understanding of the nature of the objectivity of perceptual states I am in broad agreement with Harold Brown and other defenders of versions of the causal theory of perception. See Brown, Harold, *Observation and Objectivity*. New York: Oxford University Press, 1987.
- 3 See Jean-Anthelme Brillat-Savarin, *The Physiology of Taste*. Trans. M. F. K. Fisher. New York: Counterpoint, 1949: 40-1.
- 4 Ridgway, Judy and Sara Hill, *The Cheese Companion*, 2nd edn. Philadelphia: Running Press, 2004: 126.
- 5 For discussion of perceptual modularity, see Fodor, Jerry, *A Theory of Content and Other Essays*. Cambridge, MA: MIT Press, 1990; Fodor, Jerry, *The Modularity of Mind*. Cambridge, MA: MIT Press, 1983; Fodor, Jerry, "Observation Reconsidered," *Philosophy of Science* 51 (1984): 23-43; and Churchland, P. M., *A Neurocomputational Perspective*. Cambridge, MA: MIT Press, 1989.
- 6 The account of the physiology of taste perception offered throughout this essay is based on Reed, D. R., T. Tanaka, and A. H. McDaniel, "Diverse Tastes: Genetics of Sweet and Bitter Perception," *Physiology and Behavior* 88 (2006): 215-26; Bartoshuk, L. M., "Comparing Sensory Experiences Across Individuals: Recent Psychophysical Advances Illuminate Genetic Variation in Taste Perception," *Chemical Senses* 25 (2000): 447-60; Duffy, V. B. and L. M. Bartoshuk, "Food Acceptance and Genetic Variation in Taste," *Journal of the American Dietetic Association* 100 (2000): 647-55; Mojet, J., E. Christ-Hazelhof, and J. Heidema, "Taste Perception with Age: Pleasantness

and Its Relationships with Threshold Sensitivity and Supra-threshold Intensity of Five Taste Qualities," *Food Quality and Preference* 16 (1): 413-23.

- 7 See Bartoshuk, "Comparing Sensory Experiences"; Bartoshuk, L. M., V. B. Duffy, D. Reed, and A. Williams, "Supertasting, Earaches and Head Injury: Genetics and Pathology Alter Our Taste Worlds," *Neuroscience and Behavioral Reviews* 20 (1996): 79-87; and Duffy and Bartoshuk, "Food Acceptance and Genetic Variation in Taste."
- 8 Duffy and Bartoshuk, "Food Acceptance and Genetic Variation in Taste." Interestingly, Brillat-Savarin noted that differences in taste sensitivity correlated with differences in density of papillae: see *The Physiology of Taste*, pp. 35-7.
- 9 Ridgway and Hill, *The Cheese Companion*, p. 113.
- 10 Brillat-Savarin, *The Physiology of Taste*, p. 3.