Blattes de Byzance *in India: Mollusk Opercula and the History of Perfumery*[1]

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Aromatics derived from animals have played a very important role in the history of perfumery. The most well-known of these materials are musk from the preputial glands of the musk deer,[2] ambergris produced in the stomach of the sperm whale, and civet from the anal glands of the civet cat. Two other notable materials are castoreum from the beaver, and hyraceum from the solidified urine of the African hyrax. The material that I will call 'sweet hoof' in this article, also called *blattes de Byzance*[3] and *unguis odoratus,* is another fragrant material derived from an animal, consisting of the opercula of certain marine snails. With its marine origins 'sweet hoof' is intrinsically linked to the ocean and to trade, and it has also long been of importance all the way from the Mediterranean to China and Japan.[4] Indeed, it is probably the most ancient animal derived aromatic to have an extensive global use, being mentioned in ancient Babylonian incense recipes.[5] Yet, quite probably owing to its very low profile in more commonly studied genres of Sanskrit texts, the South Asian chapter of the history of 'sweet hoof' has yet to be written.

[1]I would like to thank a number of people who have been of great help in producing this article. First Dinah Jung at the University of Heidelberg organised a wonderful workshop on "Perfumery and Ritual – The Use of Aromatics in Asia", and it is in that context that I produced this article. At Harvard, Kenneth Boss discussed mollusk opercula with me. Also, the scholar Thomas Zumbroich kindly shared an article he found on this topic. In India many perfumers, incense makers and herbalists have discussed mollusk opercula with me over the years, most notably J. N. Kapoor at R. P. Fragrances in Kanauj, and many people at both Vasu and Cyclebrand Agarbatti in Mysore. Perfumer Christophe Laudamiel has also discussed his perceptions of this material with me on several occasions. The Office of the Provost and the Grant Program for Advancing Scholarship in the Humanities and Social Sciences at the University of Southern California provided generous support for travel and research in India in summer 2010, during which time I was able to collect more sources for this article.

[2]For a very recent comprehensive history of musk see King, Anya, "The Musk Trade and the Near East in the Early Medieval Period." Ph.D. dissertation, Indiana University 2007.

[3]Literally "Byzantine cockroaches" in French, this striking term has been the subject of some discussion. Some authorities suggest that this term is a corruption of the Greek *blattos* meaning purple: "Rondelet affirms that it was the production of the shellfish *murex* or *purpura*; and that the name *Blatta* is derived from the Greek βλαττος, 'purple'." R. Dunglison, *Medical Lexicon, A Dictionary of Medical Science* (Philadelphia, 1854), p.136. Rumphius, a scholar who I discuss below, also refers to the term and suggests it derives from *Blattion Byzantium*. He translates this as "a leaf from *Byza*" which he suggests is the former name of a city in Africa. Georg Eberhard Rumpf, *The Ambonese Curiosity Cabinet*, (translated) and (ed.) E. M. Beekman (New Haven, 1999), p. 125.

[4]On this material in Chinese incense, see Edward H. Schafer, *The Golden Peaches of Samarkand: A Study of Tang Exotics* (Berkeley,1963), p. 175. On Japanese incense see Kiyoko Morita, *The Book of Incense: Enjoying the Traditional Art of Japanese Scents* (Tokyo, 1992).

[5]See the excellent article by Michael Jursa, "Die Kralle des Meeres and andere Aromata," in *Philologisches and Historisches zwischen Anatolien und Sokotra: Analecta Semitica In Memoriam Alexander Sima*, (ed.) W. Arnold, M. Jursa, W. W. Müller, S. Procházka (Wiesbaden, 2009), pp. 147–180.

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In this article I will present for the first time a detailed history of this strange aromatic material in pre-modern South Asia, mainly by examining a variety of Sanskrit sources. Exploring the history of *unguis odoratus* in India is revealing on several counts.

First, using this example I will reflect on how we ought to translate and identify early words for aromatic substances, and the potential utility of doing so. Second, I will consider why certain materials of perfumery become highly celebrated whereas others do not. Comparing the status of *unguis odoratus* in India with the history of musk, camphor and ambergris in this region, I will argue that the fame and prestige of an aromatic is both a function of its natural availability, as well as being related to inclusion in what we might think of as classical canons of great aromatics. Related to the above two points concerning translation and prestige, I will also consider the types of sources one should use when studying historical aromatics, and how we ought to go about reading these various sources, for it would appear that literary texts paint a very different picture of perfumery to that presented in more practical sources such as lexica of materia medica.

Although in discussing this matter I shall keep the histories and representations of some other major aromatics in mind, there is another reason why the history of 'sweet hoof' in South Asia makes a good case to help us tackle the above questions. For, unlike an aromatic such as musk or sandalwood, it is possible to give a very comprehensive account of this material in Sanskrit texts in the space of one article, as the sources on this topic are relatively few in number. Finally, given the unusually detailed contents of one particular source in Sanskrit that deals with this material, our investigation of 'sweet hoof' will provide a unique glimpse of the workings of a lost world in which South Asian scholars had access to multiple perfumery texts, all of which have disappeared today.

The Identity and Nature of 'Sweet Hoof'

What exactly is 'sweet hoof'? As noted above, this aromatic consists of the opercula of certain sea snails, that is to say it is the chitinous lids these animals use to close their shell-openings. It is still used in Indian perfumery today, and I have been informed on several occasions by incense makers that this ingredient is fried in clarified butter to remove any bad smell, and then ground and used in incense. A liquid preparation is also made from 'sweet hoof' in contemporary India that is used in making some blended *itr*s, such as the quite common *itr* called *hīna*. In my experience both the burnt shell and the liquid preparation smell rather unpleasant, or at least very harsh, somewhat like the odour of overheated electrical equipment with some marine notes, but apparently they act somewhat like a 'fixative' in scents, allowing the smells to linger in the air for longer.[6] Perfumer Christophe Laudamiel has commented to me that this material smells somewhat like certain pyrazines: molecules that are also found in coffee for example.[7] I might note in passing that, given the probable role of the squid (beak) in producing ambergris, and the ancient and widespread use of 'sweet

[6]I am grateful to everyone I met at Cyclebrand Agarbatti and Vasu Agarbatti in Mysore India for sharing their knowledge of this material with me in summer 2006. Quite how an airborne fixative might work is unclear to me. Possibly such a substance might work by acting like a regular fixative in liquid perfumes, once the smoke of an incense permeates and settles into various porous materials such as fabrics and hair.

[7]Personal communication.

hoof', we can certainly say that mollusks have played a rather significant, and overlooked, role in the history of perfumery.[8] Although ambergris and 'sweet hoof' are both found on the shores of parts of the Indian Ocean, the two products could not have more different histories and statuses as aromatics, and the reasons for these differences are something else that I shall discuss below.

'Sweet hoof' is most commonly called *nakhī* (and *nakha*) in Sanskrit, and it was a significant ingredient in many aromatic preparations described in Sanskrit from an early date. For example, it appears in several of the perfume formulae given by Varāhamihira writing in the sixth century CE.[9] In India today, 'sweet hoof' is still relatively easily available, and I have seen a variety of shapes and sizes for sale. I have investigated the possible identity of the shell from which these opercula came – the dealers who sold them to me were only able to tell me they come from South India and Sri Lanka. Professor Kenneth Boss of Harvard University has confirmed they are from an order of carnivorous marine snails called neogastropods, though it is not generally possible to identify the species from the operculum alone.[10] In an article on the chank shell industry in modern India David Heppell, the late mollusk expert from the National Museum of Scotland in Edinburgh noted that the operculum of the sacred chank/sacred conch is used in preparing incense.[11] Writing in 1922, G. Petit sheds light on the trade and use of this material in Madagascar, noting "the opercula of certain marine gastropods . . . were sold by the Vezo fishermen to Hindus based in the Toliara region. Every year these Hindus export from two to three-hundred kilos of these opercula to Zanzibar and Bombay . . . which they use in the preparation of a perfumed essence that the Hindus call "Antar" [*sic*], and for the little sticks that give off a very fragrant smoke when burned".[12]

The scholar who has perhaps written the most about this substance is George Everhardus Rumphius, an important seventeenth-century botanist employed by the Dutch East India Company, who discussed 'sweet hoof' in *The Ambonese Curiosity Cabinet* (*D'Amboinsche Rariteitkamer*) of 1705.[13] Here, he describes the many varieties used in perfumery in Southeast Asia. With regard to their smell his description matches what I have found to be the case today: "if censed by itself it is not very pleasant, but when mixed with other incense, the same gives, so to speak, a manly power, and durability; for since most incenses consist of woods, resins, and saps, that have a sweet, flowery or cloying odor, one should mix the Sea Nail among them, in order to make them strong and durable. One can therefore compare

[8]On ambergris see Karl H. Dannenfeldt, "Ambergris: The Search for Its Origin," *Isis* 73.3 (1982), pp. 382–397. Dannenfeldt makes the point that ambergris, of unknown origin, lacked a classical textual account as to the nature of those origins. The same cannot be said for 'sweet hoof', at least within Sanskrit textual traditions, where its origins were quite well understood. As I note below, one South Asian Persian source is a little more speculative concerning the origins of 'sweet hoof'.

[9]For example see Varāhamihira, *The Bṛhat Saṃhitā by Varāhamihira: with the commentary of Bhaṭṭotpala*. (ed.) Sudhakara Dvivedi. E. J. Lazarus, Benares 1895–97, p. 947.

[10]Personal communication to the author, 15 June 2006.

[11]David Heppell, "The chank shell industry in modern India," Princely States Report 2.2, April 2001 [journal on-line]; available from http://www.princelystates.com/ArchivedFeatures/fa-03-03a.shtml; Internet; accessed 1 June 2006.

[12]G. Petit, "A propos de l'utilisation en parfumerie hindoue d'opercules de gastéropodes marins. Leur emploi dans la sorcellerie et la pharmacopée malgache," *Bulletins et Mémoires de la Société d'anthropologie de Paris*, VII° Série, tome 3 (1922): pp. 58–61.

[13]Georg Eberhard Rumpf, *The Ambonese Curiosity Cabinet*, (trans., ed.) E. M. Beekman (New Haven, Connecticut, c. 1999), pp. 124–127.

this *Unguis* to a basse [sic] in Musick which, when heard alone has no comeliness, but which when mixed with other voices, makes for a sweet accord . . . ".[14] I might also point out that Rumphius' comment here is a particularly early example of the musical metaphor as applied to the odour of blended perfumes.[15]

Translating and Identifying the Sanskrit Term "*Nakhī*"

Before I discuss the history of 'sweet hoof' in pre-modern South Asia I want to pause and ask one very basic, yet important, question that I have taken for granted so far: how do we know that the thing(s) called by the term *nakhī* (and by several other terms) in Sanskrit is what I have described as "sweet hoof" above? How do we translate the word *nakhī*, and how do we translate terms for aromatic substances in general? How can we know what substances these words refer to and why should we care? This matter might seem rather obvious to some, and irresponsibly and naively positivistic to others, but it is important to reflect on whether we can translate these terms, and if so, how we do so. We must also theorise on both the nature and purposes of this process.

In the case of *nakhī*, in order to give us something to work with I will first give a brief and vague sketch of how I arrived at my translation. Let us start with a Sanskrit source, the commentary of Bhaṭṭotpala, composed in the tenth century CE, on a famous prognostication text called the *Bṛhatsaṃhitā* of Varāhamihira, which is an early South Asian perfumery text that, as I have already noted, mentions an ingredient called *nakha*.[16] In his commentary Bhaṭṭotpala explains the term *nakha* as a "skin/hide produced from a conch" (*nakhaṃ śaṅkhodbhavaṃ carma*).[17] Turning to the present day, an aromatic shell operculum is still available in India under the name *nakhī*/*nakha*,[18] and moreover this material resembles those varieties of *unguis odoratus* described by Rumphius both in terms of its properties and animal origin. Thus it might seem reasonable to understand *nakha* as something on the lines the fragrant operculum of a shell, which we might also translate as *unguis odoratus* or 'sweet hoof'.

At this point, in reflecting on what I am doing with words and things here, it might help to adopt some terminology from the philosopher Gottlob Frege who famously made the useful distinction between the *sense* of a word and the *referent* (or denotation) of a term. Frege's most famous example is Phosphorus, "the morning star", and Hesperus, "the evening star", which are both words/terms for the planet Venus—these terms *denote* or *refer to* the same thing (Venus), but they have different *senses*. Now, this theory has been the subject of debate for over a century, and I do not wish to present it here as a philosophical theory, but rather as a useful terminology for making distinctions when reflecting on methods for studying pre-modern material culture as-described-in-texts.

[14] *Ibid.* p. 125.

[15] Made most famous by the perfumer Piesse who created a "gamut" of odours, found in: G. W. Piesse, *Art of Perfumery*, second American from the third London edition (Philadelphia, 1867), pp. 41–44.

[16] Varāhamihira. *The Bṛhat Saṃhitā by Varāhamihira,* (ed.) Sudhakara Dvivedi. For the date of Bhaṭṭotpala see David Pingree, *Census of the Exact Sciences in Sanskrit* (1970, Series A, vol. 4, p. 270).

[17] For one example see his commentary on *Bṛhatsaṃhitā* 76. 9 as numbered in Dvivedi's edition. Varāhamihira. *The Bṛhat Saṃhitā by Varāhamihira: with the commentary of Bhaṭṭotpala.* (ed.) Sudhakara Dvivedi. E. J. Lazarus, Benares 1895–97, p. 947.

[18] Platts' *A Dictionary of Urdu, Classical Hindi and English* gives three terms, *nakha*, *nakhī*, and *nakhail.*

In the case of *nakhī*, the precise referent, the object denoted by the word, and the exact species of mollusk from which the operculum was derived, no doubt varies, as it no doubt did in pre-modern South Asia. The other associations of the term—the sense—what else the term *nakhī* and its several synonyms implied in Sanskrit in various times and places—are of course not something we can necessarily translate from Sanskrit to other languages with just one word, but for this we need a lengthier, culturally 'thick' account. As we shall see below, however, in the case of *nakhī* we do not in fact lose all that much in translation, and *nakhī* and its synonyms remained relatively 'thin' terms in South Asia, less loaded with complexities of 'sense' than a term such as *candana* (sandalwood), which was associated with all sorts of people, places, practices and texts, not to mention many poetic and (polysemous) synonyms. Indeed it is precisely the nature and origins of the cultural 'thinness' of this aromatic that interest us here.

The problems encountered in translating the names of aromatics are not the same in every case, and it is important to note that the culturally 'thinner' the *sense* of a name for a material, the fewer the potential problems of translation. Translation of historical terms for aromatics is additionally greatly eased if the material in question is well described in our sources, and especially if the material was widely traded for a long time (as with musk), such that there are major and well-established interregional and temporal *overlaps in discourses* concerning the material, and also in usages of the material. For example, in this case I arrived at the translation by observing many overlaps of discourse.[19]

To elucidate this method and to be clearer about what I mean by 'overlaps' of discourse, let us retrace more explicitly the steps by which we arrived at a translation of *nakhī*.

First, Rumphius uses both the terms "*unguis odoratus*" as well as "*Murex ramosus*" in his discussion of a certain aromatic, and this latter term overlaps with the name of a type of shell in contemporary scientific discourses. The uses of this material that Rumphius describes in Southeast Asia accord with what we see in pre-modern Indic texts. In pre-modern Indic texts we also see overlaps between Persian sources and Sanskrit ones, not to mention western classical ones, as I shall discuss below, allowing us ultimately to connect Persian aromatic terminology to Hindi. As already noted, one important pre-modern Sanskrit text calls this material "the skin of a conch", which we might well understand in the circumstances to mean an operculum. Finally, a material sold to me a few years ago in India under the name *nakhalā* was called a "neogastropod operculum" in the terminology of an expert on mollusks at Harvard University. With so many overlaps, carefully considered, it seems reasonable to translate the term *nakhī* as 'neogastropod operculum' or 'sweet hoof' even when there is no single referent (i.e we cannot narrow down to the operculum from one specific species of mollusk).

In doing this sort of work, I am not privileging scientific discourses as providing some sort of God's eye view of reality, nor am I asserting that European languages are superior.

[19]In my analysis here I am inspired by the work of Bruno Latour on the way in which a greater number of connections can produce knowledge in science, though of course the theory and context here are quite different as is my usage of some of these terms. Some readers might be alarmed by my simultaneous usage of Frege and Latour given their apparently rather different theories of language and epistemologies, but I should emphasise that I am not using these terms in a systematic philosophical sense, but rather as useful terminologies to highlight certain aspects of a given situation. See Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA, 1999).

Instead, bringing these scientific discourses and more recent European discourses into play in addition to the older Indic ones merely increases the connections we can make, helping us align older terms with more contemporary ones. Identifying *nakhī*, discovering the material thing(s) that the word would denote in our language with (relative) precision, is useful as it permits us to say more complex things about *nakhī*, where it came from, how common or rare it tends to be, how much this material was used in other neighbouring cultures and times, if this material is found in archaeological digs, amongst other things.

We now see that what appeared to be a separate endeavour—identification—is actually only translation, in this case translation of a Sanskrit term to one in another ancient language that is used to classify objects: scientific Latin. The whole process is admittedly open ended and complex, but I would argue that in some cases, at a certain point skepticism becomes unreasonable and thus in the present case it seems sensible to admit that *nakhī* was a fragrant mollusk operculum, also known as 'sweet hoof'.

The possibilities for this sort of translation vary from case to case. To give two examples, words for a material that was not traded widely nor used for any length of time, but that had very rich local cultural connotations would be very hard to translate, especially if we have no archaeological evidence for the material referred to. Here finding any referent eludes us. On the other hand, sometimes a term for an aromatic is so enormously well-connected to many discourses and substances in multiple places over such a long period—so massively rich in sense and also in reference—that to try and find overlaps with single terms in contemporary sources is not wise. An example of this situation is the term 'balsam' which, as words go, is about as thick and complex as 'wine'.[20] In such cases we have a very rich body of pre-modern discourse but this cannot be usefully related to any *single* terms in contemporary discourses with a more restricted meaning, such as a scientific name.[21] Here the reference eludes us as there seem to be so many possible candidates. Perhaps the best thing to do here is possibly to compare the term to a similarly rich and complex term (such as 'wine') that we use, in order to get a sense of how this word was understood. Arguably, combinations of these sorts of problems are exactly what hinder attempts to identify the elusive *soma* of the Vedas—a plant/drug/god/concept that no doubt has as many, if not more, senses and referents as 'balsam'. Nevertheless, the existence of these sorts of fascinatingly messy cases should not put us off translating simpler cases such as *nakhī*, and also some more complex ones (e.g. camphor), so long as we add all the necessary qualifications and accept the often provisional and incomplete nature of our results. The point is that not all ancient words for plants and perfumes present equal difficulties in translation.

Why do we want to do this sort of work? As noted, in these cases, translation is not merely a naïve, positivist exercise in obsessively trying to anchor the terminology of ancient texts to a privileged "scientific reality" just for the sake of it. Through this sort of translation into contemporary terms we are sometimes able tentatively to say that a certain aromatic material, broadly speaking, comes only from a certain part of the world (e.g. camphor in Sumatra

[20] On balsam see Elly R. Truitt, "The Virtues of Balm in Late Medieval Literature", *Early Science and Medicine* 14.6 (2009), pp. 711–736.

[21] Unless one takes a subset of the usage of the term 'balsam', such as in examining the application by Europeans of this term to materials found in the New World such as 'balsam of Peru'. In such a case contemporary materials might usefully be brought into conversation with older ones.

and Borneo). Such observations might be strengthened and refined if our translation to a scientific name (or a modern term such as 'camphor') permits an overlap with the information presented in contemporary or recent maps of species distributions. If we find references to this material that were written in another part of the world, for example nutmegs in early medieval Kashmir, we might carefully infer the existence of certain trade networks. An understanding of trade networks might complicate our understanding of political history, and that in turn might change the way we read a text, such as a sumptuary manual that refers to a perfume made with the aromatic in question—we might be able to say with greater confidence that the material in question was not only represented as exotic, but that it actually *was* exotic and most likely also expensive and prestigious. The process of translating aromatics that I have outlined above might involve a complex process of deferment, but that does not mean that it is empty, arbitrary or useless. And far from obscuring the politics of naming and classifying the materials in the world, whether this be in medieval South Asia or in a modern laboratory, exploring these discursive overlaps also constitutes a process of *comparison* that allows us to see clearly historical differences in the way materials are named and categorised.

'Sweet Hoof' in Pre-modern South Asian Sources

I now turn to accounts of this material in South Asian sources, mainly medieval Sanskrit texts. By looking at what people did with this aromatic, and what they said about it, we will be in a stronger position to discover why, despite its evident importance in perfumery, 'sweet hoof' did not become one of the aromatics to be celebrated in poetry. We will also learn quite a lot about the complex and technical world of perfumery texts in medieval South Asia.

The sources that provide the most information on this material are medical, pharmacological and perfumery texts. 'Sweet hoof' seems to have been used from an early date, being mentioned in the medical text called the *Carakasaṃhitā*, which, in its present form, contains materials that are possibly dated from the third or second centuries BCE to the fourth or fifth centuries CE.[22] The uncertain dating of this text, however, means we might do well to accept the earliest attestations to the material in perfumery as those references found in the sixth-century CE *Bṛhatsaṃhitā* of Varāhamihira, discussed above. For a very detailed account of the nature of *nakhī* and what people did with it, we need to turn to a later source, a text by Niścalakara called the *Ratnaprabhā*. This is a commentary on an important medical text called the *Cikitsāsaṃgraha* or *Cakradatta* by Cakrapāṇidatta. Niścalakara's commentary dates from the early second millennium CE and was probably composed in the Bengal region.[23] Not only does this text tell us a lot about the varieties and purification of *nakhī*,

[22]On the date of this text, see Dominik Wujastyk, *The Roots of Ayurveda*, Rev. (ed.) (London, 2003), 4. On attestations of this material see Priya Vrat Sharma, *Āyurveda kā Vaijñānika Itihāsa* (Varanasi, 1975), p. 369.

[23]Meulenbeld places Niścalakara in Bengal in the second half of the twelfth century CE, and Priya Vrat Sharma suggests a date later than 1250 CE. See Meulenbeld, *A History of Indian Medical Literature*, vol. II A (Groningen: E. Forsten, 1999–2002) p. 105. P. V. Sharma, "Some New Information about Niścala's commentary on the Cakradatta." in *Medical Literature from India, Sri Lanka and Tibet*, (ed.) G. Jan Meulenbeld, *Panels of the VIIth World Sanskrit Conference*, vol. VIII, general editor J. Bronkhorst (Leiden, 1991), pp. 107–112. For the first description of this text, see also D. C. Bhattacharyya's important article "New Light on Vaidyaka Literature (*From Niścalakara's Ratnaprabhā*)," *Indian Historical Quarterly* 23.2 (1947), pp. 123–155.

but in discussing this substance Niścalakara quotes a number of perfumery texts that are lost today, thus offering what is, as far as I know, a unique insight into how many such perfumery texts might have been available to a scholar in Bengal in the early second millennium CE, and of the sorts of materials they contained.

In commenting on a passage in the *Cakradatta* which describes a certain medicinal oil (*mahārājaprasāriṇītaila*), Niścalakara explains what is meant by the prescription of "the three *nakhī*s" (*nakhītrayam*), a term that causes considerable confusion and discussion, since it appears that typically five types of *nakhī* are described in texts. In order to resolve this discrepancy Niścalakara therefore turns to several authorities on the matter:

> [With regard to the term:] "the three types of sweet hoof," there are five types of sweet hoof, as is stated in the perfumery manual of Bhavadeva: "sweet hoof for perfumes should be known as having five varieties by those who attend closely to perfume. Some has the appearance of a *badara* (jujube) flower and [some] is thought of as a lotus petal. Some has the shape of a horse's hoof, and also it is the same as an elephant ear and with the appearance of a boar's ear, [and thus it is] proclaimed as fivefold". The three sweet hoofs are to be taken from amongst the first four here. The one with the shape of a boar's ear is altogether unacceptable. As is stated elsewhere in a perfumery manual from the Bengal region, "*karaṇḍa*[24] is to be employed that is horse-hoof, elephant-ear, *badara* [flower], lotus petal. Two by two in perfume formulae and in incense formulae [respectively], and boar-ear is to be rejected". Also, Pṛthvīsiṃha states "One should employ elephant-ear and horse-hoof [varieties of] sweet-hoof in perfume blends, *badara* and lotus petal in incenses, and boar-ear in neither".[25]

Thus Niścalakara resolves this problem by showing that several authoritative texts on perfumery differentiate between the five types of 'sweet hoof': one variety is never to be used for perfume or incense[26] and amongst the others some are better for perfumes (i.e. perfumed pastes and oils that are not burned), and some are good for incense. The three 'sweet hoofs' are to be chosen from amongst the four that are suitable for aromatic preparations. We also see that 'sweet hoof' is classified here in terms of its resemblance in shape to other familiar objects, not according to its geographical origin or odour. The passage, like the other parts of this commentary, also shows us just how many sources Niścalakara had at his disposal. Here, for example, we see that he could refer to three authorities on perfumery in discussing 'sweet hoof': two of these texts have named authors and one is characterised as being "from the Bengal region".[27] None of these texts on perfumery have survived—indeed

[24] Sanskrit "basket" or "box", possibly a regional or vernacular term for *nakhī*?

[25] Niścala Kara, *Cakradatta-Ratnaprabhā: the Cakradatta (Cikitsā-Saṅgraha) of Cakrapāṇidatta with the commentary Ratnaprabhā by Mahāmahopadhyāya Śrī Niścala Kara*, (ed.) Priya Vrat Sharma (Jaipur, 1993), p. 390.

nakhītrayam iti pañca nakhyo bhavanti yad uktam bhavadevīyagandhaśāstre
"nakhī paṇcavidhā jñeyā gandhārthā gandhatatparaiḥ |
kācid badarapuṣpābhā tathotpaladalā matā ||
kācid aśvakhurākārā gajakarṇasamā tathā |
varāhakarṇasaṃkāśā pañcadhā parikīrtitā ||" iti.

atrādyāsu caturṣu madhye nakhītrayaṃ grāhyam. varāhakarṇākārā tu sarvathā na grāhyā yaduktam anyatra vaṇgadeśīyagandhaśāstre "hayakhurakarikarṇabadarakuvalayapatram upayujyate karaṇḍam. gandhavidhau dhūpavidhau dve dve ca varāhakarṇikā heyā." iti. pṛthvīsiṃhenāpy uktam "karikarṇaturagakhuranakhaṃ prayuñjīta gandhayogeṣu. dhūpeṣu badarotpalapatraṃ na varāhakarṇam ubhaye 'pi. iti.

[26] One wonders what it is good for. Medicine?

[27] I am tempted to speculate whether the proximity of the ocean to this region produced a greater awareness of the nature of 'sweet hoof'.

we now only possess three Sanskrit texts entirely concerned with perfumery (in just two manuscripts).[28] This passage gives us a glimpse of what we might be missing, and thus we can try to imagine the background in which the surviving perfumery texts were produced and circulated. As we see here, these texts varied in style, some being terser in style than others, and they also varied in terms of the opinions they presented on the exact nature and uses of aromatics.

Later in the commentary on this same passage Niścalakara turns to the question of the purification of this material. As I noted above, in more recent periods, 'sweet hoof' in India is heated in clarified butter (or sometimes in hot sand) prior to being used in order to remove the fishy smell. It appears that the purification of 'sweet hoof' was likewise essential in pre-modern South Asia. First, Niścalakara explains the general purpose of purifying aromatics, referring again to one of the authorities on perfumery we saw above:

> The purification of perfumery substances certainly has to be performed, otherwise there will be aversion [for the perfume], as Pṛthvīsiṃha states "Without purification a substance becomes so as to produce aversion".[29]

Then Niścalakara gives several accounts of the purification of 'sweet hoof' of which the most extensive is the following from Bhavadeva,[30] who we saw above as the author of a "perfumery manual" (*gandhaśāstra*):

> . . . but Bhavadeva says otherwise: "sweet hoof, sweated with cow urine for three days on the ground, [when] removed from the ground, afterwards one should boil it with sour rice water. Having removed the skin, afterwards one should crush it with *dhātrī* (emblic?) and costus root. Then, when heated by the rays of the sun, it is crushed with *devī*[31], saffron and sandalwood, [and] afterwards a man who knows how to "cook" [i.e. who knows how to make preparations called *pāka*s] should cook it with honey. Then [there is] crushing with the five perfumes, and also enfleurage[32] with flowers. Sweet hoof is very much purified by this action".[33]

The resulting preparation would have already been quite perfumed, having undergone several treatments with precious aromatics as well as with flowers. Given the extent of the accounts of 'sweet hoof' in the perfumery texts and the lengths one had to go to in order to

[28]On all these texts, lost and extant, see the appendix in James McHugh, *Sandalwood and Carrion: Smell in Indian Religion and Culture* (New York, 2012).

[29]Niścala Kara, *Cakradatta-Ratnaprabhā*, p. 391.
śuddhiś ca gandhadravyāṇām avaśyaṃ kartavyā anyathā vairāgyam eva syāt yadāha pṛthvīsiṃaḥ "śodhanena vinā vastu virāgāyopapadyate." iti.

[30]On the possible identity of this Bhavadeva, see McHugh, *Sandalwood and Carrion*, pp. 114–115.

[31]This could refer to several plants.

[32]The French term "enfleurage" is the best translation of the perfumery process called *vāsanam*, which involves placing flowers next to a substrate (often oily) to be perfumed, and replacing the spent flowers with fresh ones for several days until they have imparted their fragrant quality to the substrate.

[33]Niścala Kara, *Cakradatta-Ratnaprabhā*, pp. 391–392.
bhavadevas tv anyathā āha
"nakhīṃ gomūtrasaṃsvinnāṃ tridinaṃ bhūtale gatām |
bhūtalād uddhṛtāṃ paścāt kvāthayet kāñjikena ca ||
apanīya tvacaṃ pascād dhātrīkuṣṭhena mardayet |
tataḥ sūryāṃśusantaptāṃ devīkuṅkumacandanaiḥ ||
mardayitvā pacet paścān madhunā pākavin naraḥ |
tataḥ pañcasugandhena mardanaṃ vāsanaṃ tathā ||
kusumaiḥ karmaṇā 'nena śudhyate sutarāṃ nakhī |

purify it, it seems that 'sweet hoof' was an important and valued perfumery ingredient. In elucidating a reference to 'sweet hoof' in a medical text, Niścalakara had recourse to several texts on perfumery – evidently these were in his opinion the best authorities on this topic.

Accounts of 'sweet hoof' in pharmacological literature, specifically in pharmacological glossaries (*nighaṇṭus*), also survive and it is to these that I will now briefly turn. These texts provide only lists of synonyms of aromatics, along with their pharmacological properties according to the categories of traditional South Asian medicine, *āyurveda*. The famous pharmacological glossary of Dhanvantari lists twelve synonyms for 'sweet hoof' (here under the heading of *nakhaḥ*) many of which mean 'fingernail', and also 'hoof'. The text also gives seashell related synonyms, along with terms meaning 'jaw' and 'snake jaw' and two terms whose relevance in this case are less clear (*śilpī*, *kośī*).[34] As for the qualities of 'sweet hoof', they are said to be as follows in this text:

> Sweet hoof is pungent and warm, destroys poison that has been employed, destroys [certain types of] skin diseases (*kuṣṭhāni*), removes phlegm.[35]

A later pharmacological glossary, the fifteenth or sixteenth century CE *Rājanighaṇṭu*, expands the number of synonyms to make a total of eighteen. Notable additions to the list of synonyms include '*badarī* leaf' (*badarīpatra*), which would seem to correlate to the *badara* flower *shape* seen in the *Ratnaprabhā* commentary of Niścalakara.[36] Another term (*dhūpya*) refers to the use of this material in incense, and finally there is a very interesting term *paṇyavilāsinī* whose primary sense is 'prostitute' (i.e. 'commodity coquette'). I have no idea why this latter term refers to this material, unless there is some association between the 'fingernail' and the erotic culture of scratching in early and medieval South Asia, something we will see below in a certain playful riddle/incense formula involving *nakhī*. However, another famous Sanskrit lexicon (not pharmacological), the *Nāmaliṅgānuśāsana* of Amarasiṃha contains a very similar term for this aromatic material that likewise means 'prostitute' (*haṭṭavilāsinī*) which is explained by the commentator Kṣīrasvāmin as follows "it charms in the marketplace so is a 'marketplace charmer', or it is like a prostitute", though this comment does not really make things all that much clearer.[37]

Finally I will now turn to another source, the longest and most detailed of the three surviving Sanskrit texts on perfumery, the early-mid second millennium CE *Essence of Perfume*,

[34] *Rājanighaṇṭusahito Dhanvantarīyanighaṇṭuḥ*, Ānandāśramasaṃskṛtagranthāvaliḥ 33, 2nd edition (Pune, 1927), p. 107.

nakhaḥ kararuhaḥ śilpī karajo 'tha khuraḥ śaphaḥ |
śuktiḥ saṅkhacalaḥ kośī hanur nāgahanuḥ sahaḥ ||

[35] *Ibid.*

nakhaḥ kaṭukam uṣṇaṃ ca viṣaṃ hanti prayojitam |
kuṣṭhāni sādayaty eva kaphaṃ khaṇḍayati ||

[36] Indeed the jujube tree leaf would appear to be a better candidate for comparison with an operculum than the flower.

[37] *haṭṭe vilasati haṭṭavilāsinī veśyeva vā. The Nāmaliṅgānuśāsana (Amarakosha) of Amarasimha with the Commentary (Amarakoshodghāṭana) of Kshīrasvāmin*, (ed.) K. G. Oka (Poona, 1913), p. 76. Note that another commentator on this text, Bhānuji Dīkṣita takes this term as well as *hanu* as synonyms of the previous item listed in the lexicon. Comparison with the pharmacological glossaries suggests that this is not the case and these terms belong with *nakha*. Though, possibly, those sources could all point to a very old confusion about the grouping of these items in lexical lists. See *Nāmaliṅgānisāsana alias Amarakoṣa with the Commentary Vyākhyāsudhā or Rāmāśramī of Bhānuji Dīkṣita*, (ed.) M. M. Paṇḍit Śivadatta Dādhimatha, revised Pt. Vāsudeva Lakṣmaṇa Paṇaśīkara, 1st edition 1915 (Delhi, 1984), p. 172.

or *Gandhasāra*.[38] This text is divided into three sections, one on perfumery processes, one containing recipes, and a final section that is a glossary of aromatics together with instructions on how to examine them for quality. Here, the extensive perfumery ingredient glossary contains a whole section devoted to animal derived aromatics (*jīvavarga*). This section is interesting as it shows just how many of these were available at that time in South Asia, and also that people (at least specialists) were well aware that they were animal products. These materials are as follows (I have selected the better known Sanskrit terms for them here): musk (*kastūrī*), civet (*pūti*), 'sweet hoof' (*nakhī*), 'tiger claw' (*vyāghranakha*), ghee (*ghṛta*), honey (*madhu*), wax (*siktha*), lac (*lākṣā*), and bamboo silica/tabashir (*vaṃśalocana*).[39]

In the section on 'sweet hoof' in the glossary of the *Essence of Perfume*, we see the usual synonyms for 'shell' and 'hoof' and for 'jaw'. Quite notably there are no synonyms for 'fingernail' apart from the term *nakha* itself. There is also a term that suggests a lotus petal and one that means 'pig's ear', terms that we saw describing varieties of this material in terms of its shape. One other term *sunāda* ('with a good sound') could well imply 'conch' and therefore the term *nāda* ('sound') might also be an abbreviated version of that term.[40] Turning to the examination (*parīkṣā*) of this material, the *Essence of Perfume* notes the following:

> And sweet hoof (*nakhī*) that has the appearance of an elephant ear, or [of] the hoof of a scent elephant, [or] *badara* and lotus petal is to be burned as incense, then crab.[41]

So, in the *Essence of Perfume*, the *Gandhasāra* we see two types of text about 'sweet hoof'. One passage lists the many synonyms for *nakhī* in the same manner as the pharmacological glossaries, *nighaṇṭu*s, something that would be useful in simply understanding perfumery recipes. The other type of text gives a classification of the shapes (or standardised names for shapes) in the manner of the extracts from perfumery texts given in the commentary of Niścalakara, something that would be useful in buying 'sweet hoof', or in choosing which type of 'sweet hoof' to use in a recipe.

From this we can learn two important things. First, those passages we saw above from the lost perfumery texts that described the *shapes* of 'sweet hoof' were probably taken from parts of those texts that dealt with the examination (*parīkṣā*) of aromatics—it would seem that all three of these lost perfumery texts contained such sections. Secondly, we see that the verses on 'sweet hoof' in the extant perfumery text called the *Gandhasāra* somewhat resemble, but

[38]Gaṅgādhara, *Gaṅgādhara's Gandhasāra and an unknown author's Gandhavāda, with Marathi commentary*, (ed.) Ramkrishna Tuljaram Vyas. *Gaekwad's Oriental Series*, no. 173. (Vadodara, India, 1989).

[39]The last part of this passage is confusing. The term *tālakṣīrīpateḥ* would seem to be a corruption of an Indic version of *tabashir*, yet the side-heading suggests this whole line provides synonyms for a distinct product, *karcūrasattva*. Although associated with a plant, bamboo silica was also classified as one of the varieties of pearl in medieval South Asia, which most probably explains its inclusion in the list of animal derived aromatics.

[40]The full passage is as follows, *Gaṅgādhara, Gandhasāra,* p. 48.
śuktiḥ śaphanakhāhvaś ca khuro nāgahanur hanuḥ |
nādo vāri varaḥ karnaśilpī kolotpalacchadaḥ ||
kolakarṇī kambukośī sunādaḥ śilpaśaṅkau | nakhī

[41]Here, in the section on examination, we see a material called 'crab' (karkaṭa). This term is also given as a synonym of an unidentified material called 'tiger claw' (*vyāghranakha*) in the *glossary* section of this same text. Possibly the implication of this line is that this is a lesser material to be used in incense, or maybe this is the start of a lost line (or possibly the next line that does not seem to be connected) on the examination of 'tiger claw'? *Ibid*. p. 51.
nakhī tu gajakarṇābhā gandhahastikhurātha vā |
badarotpalapatrā syād dhūpyo 'tha karkaṭaḥ ||

are not exactly the same as, those in the lost perfumery texts. This points to a textual culture of perfumery in which a body of similar ideas circulated but in which individual authors nevertheless modified and rewrote these materials for new compositions, adding a touch of diversity, and no doubt also allowing for innovation, new products, new materials, as well as regional variety.[42]

Practical Perfumery and Literary Perfumery

A survey of the formulae for perfumes and incenses in a text such as the *Bṛhatsaṃhitā* of Varāhamihira or in the *Essence of Perfume* shows that 'sweet hoof' was a relatively common ingredient in perfumes and especially in incenses. If, on the other hand, we read literary texts from any period, we find that this material is never mentioned and one would never notice that this was an important aromatic in pre-modern India. This is a contrast with sandalwood, agarwood, musk, camphor and saffron—materials that are all very frequently mentioned and described in all manner of literary texts in Sanskrit. Why did certain aromatics become important components of the perfumery culture described in literary texts and others not? Let us first compare 'sweet hoof' with some other aromatics to see what qualities it shares with them as perfumery ingredient and what it lacks. I shall not provide a detailed account of literary sources on perfumery here, as this corpus is far too extensive to cover in this context.[43]

An aromatic in a work of literature, such as camphor in a poem is, to state the obvious, an odorous material named and described in words. Thus in Sanskrit literature the *name* of an aromatic can be of some importance. As with 'sweet hoof', most aromatics had a number of synonyms. Some of these terms for aromatics could evoke other concepts and sensations, evoking and constructing the complexities of the cultural 'sense' of descriptions of the aromatic. Camphor, for example, has a number of synonyms that suggest its whiteness and coolness, and the poet could refer to camphor with words that mean 'moon', and 'snow'.[44] Sanskrit literature quite frequently contains passages that are bi-textual, that is to say the words in a passage can be read in two senses, being a complex pun. If the common name (or even a synonym) of an aromatic has different meanings, i.e. possesses homonyms,

[42] Although I wish to focus on Sanskrit sources, I should note that the *Ain-i Akbari* of Abū al-Faẓl ibn Mubārak a sixteenth-century Persian gazetteer of the kingdom of the emperor Akbar that was composed in India, also discusses 'sweet hoof', which was used in Arab (and no doubt Persian) perfumery. The short account of this material in this text notes that in Hindi the material is called *nakh* and that it is treated by being heated with butter. This Indo-Persian account of the material also incorporates materials that would seem to derive ultimately from the works of Dioscorides, namely that 'sweet hoof' is fragrant because is feeds on *sumbul* (spikenard). This is not surprising given the existence of Arabic translations of Dioscorides — for 'sweet hoof' see M. M. Sadek — *The Arabic Materia Medica of Dioscorides*, (St-Jean-Chrysotome, 1983), p. 82. The *Ain-i Akbari* also gives the price of this material in India at that time, which would seem to be approximately the same price as cheaper 'other kinds' of frankincense. It is particularly interesting to note the way in which the exoticising, western discourse of the *unguis odoratus* shell that feeds on well-known aromatics in India was now being reiterated *within* South Asia itself. Abū al-Faẓl ibn Mubārak, *Ain-i Akbari*, translated by H. Blochmann (Calcutta, 1927), p. 87. For the discussion in Dioscorides see Pedanius Dioscurides of Anazarbus, *De materia medica*, translated Lily Y. Beck (Hildesheim, 2005), p. 96.

[43] For many references to perfumes in Sanskrit literature see McHugh, 2012.

[44] For many examples of such usages see Ludwik Sternbach, 1974. "Camphor in India," in *Vishveshvaranand Indological Journal* vol. 54, *Acharya Dr. Vishva Bandhu Commemoration Volume*, (ed.) B. R. Sharma, pp. 425–467. (Hoshiarpur, 1974).

it can be used in such bi-textual passages. For example, in one medieval text there is a description of the houses of aromatics merchants. In punning prose-style their abundance of aromatics is described. The aromatics here are camphor, sandalwood, agarwood, musk, yellow sandalwood, and nutmegs. Their abundance of musk is described as follows: "like the Ganges' stream they have many paths" (or " . . . they possess much musk") (*gaṅgāpravāhair iva bahumārgaiḥ*).[45] This phrase makes a pun using one (rather obscure) term for musk meaning 'deer-related-thing' (*mārga*), a word that most commonly means 'path' or "way".

Now, the various synonyms of 'sweet hoof' would appear to lend themselves quite well to both evocative and punning usages: 'fingernail', 'hoof', 'conch', and even 'prostitute'. Such synonyms for 'sweet hoof' are indeed commonly used in the recipes in the *Essence of Perfume*, lending that text at times a quite suggestive tone. This is especially the case given that scratching with fingernails was an activity associated with sex in texts on erotics. One very curious incense formula even relies on the reader solving riddles that can then be read as puns in order to discover the ingredients required for the incense. This formula is found in both the *Essence of Perfume* and in another text, the *Lore of Perfume* (*Gandhavāda*). An old Marathi commentary in the latter text explains how to solve the riddle. The term in the riddle that can be transformed into "sweet hoof" is "the shame of a respectable woman" (*kulavadhūlajjā*). The fingernail scratches of illicit lovemaking would be shameful to such a woman, and thus her shame is produced by fingernails (*nakha*), which also means 'sweet hoof'.[46]

Despite the striking exploitation of the name of 'sweet hoof' in this text on perfumery, no such references are, to my knowledge, found in literary texts. Thus while the terms for 'sweet hoof' in Sanskrit were eminently suited to a literary context, they were never so used. Evidently a playful and evocative name was not enough to allow an aromatic to be included in the literary canon redolent with musk, camphor, and other major aromatics.

Another factor that seems to have influenced whether an aromatic could be included in literary texts was the date at which it became commonly available in South Asia. All the major aromatics mentioned above, musk etc., were available to perfumers at the latest by the early to mid first millennium CE, a period when many of the conventions of classical Sanskrit poetics were also being formed. In that early period, it seems that a new material such as musk could still be incorporated into the classical perfumery world of literature. A material that appeared much later, such as ambergris, which is first mentioned in texts that date most probably from around the beginning of the second millennium CE, was not able to join the classical canon of literary aromatics. 'Sweet hoof', however, was evidently a feature of South Asian perfumery at an early enough date to have been incorporated into poetic conventions. Age is no problem for 'sweet hoof', and therefore the literary aromatics must possess still other qualities that 'sweet hoof' lacks.

An important aspect of all the major aromatics mentioned in literature is their colour as well as their hotness and coolness according to the conventions of the traditional pharmacological system. Camphor and sandalwood were white or light in colour, musk and agarwood were celebrated for being black, and saffron is red in Sanskrit literature. The two white aromatics

[45]Someśvara, *Vikramāṅkābhyudayam*. (ed.) M. L. Nagar, *Gaekwad's Oriental Series* no. 150 (Baroda, 1966), p. 11.
[46]For a complete discussion of this riddle see McHugh 2012, Chapter Five.

were thought to be cooling, and the black and red aromatics were thought to be warming. We saw above that 'sweet hoof' is classified as warm, but in terms of its visual appearance the colour is not noted so much as the shape, which would be effaced on its being ground up to use. Although to us the colour of a piece of agarwood and that of an operculum might not seem all that different, it was not the colour of 'sweet hoof' that people noted in medieval South Asia. Possibly the dull pigmentation of 'sweet hoof' played a role in its poetic obscurity?

But this seems a bit of a weak argument – there are plenty of strikingly brown and white aromatics that were never mentioned in poetry in Sanskrit despite their colours. One might also argue that the dark colour of agarwood was celebrated on account of the already-established importance of this material. What else can we say about the literary aromatics? Two other aspects of these aromatics stand out, their exotic origins and their high value, factors that I have discussed elsewhere.[47] These qualities are connected of course, since the exotic material is by definition hard to come by, and, being rare, it is costly, assuming there is a demand from consumers. Not only were materials such as musk and camphor actually exotic, being brought from far northern regions and Southeast Asia respectively, but their strange and remote origins were also celebrated in literature. 'Sweet hoof', however, was no doubt available relatively locally in many coastal regions. The conch and other sea snails were not exotic animals, and although we do not know the price of this material apart from in one later context, we can assume its price was not so high as that of a material such as camphor that was brought from so far away.[48] As noted above, in some respects, such as being found on seashores, 'sweet hoof' resembles ambergris, yet the production of 'sweet hoof' was easy and predictable, assuring a regular plentiful supply. Ambergris is washed ashore infrequently and sporadically, and requires many hours of scouring the coast to locate.[49] Thus the supply of ambergris is unpredictable, and the substance itself is very rare and expensive. One might even speculate that it was the extreme spatial and temporal unpredictability of ambergris that slowed its arrival on the scene as a global aromatic. As I have argued elsewhere, it appears that musk paved the way for the later popularity of civet. [50] When ambergris was finally adopted, might 'sweet hoof', with its unusual toasty marine odours, have partly paved the way for its acceptance? Does amber*gris* perhaps simultaneously furnish all the qualities of precious and mysterious *yellow* amber, pungent, fixative 'sweet hoof', and rare, imported animal musk, whilst being conveniently (if somewhat irregularly) found in many places around the Indian Ocean and beyond?

It seems that it was the cheap and less exotic nature of 'sweet hoof' that excluded it (and many other aromatics) from being included in literature. Although this material was called by terms 'ripe for literary exploitation' and although it was an ancient and established aromatic, it was just too commonplace and affordable to include in the idealised luxurious worlds described in literary texts. Thus economic concerns, above all else, dictated what it took to

[47] See McHugh 2012, Chapter Seven.

[48] In the Ain-i Akbari materials such as musk and camphor are significantly more expensive than 'sweet hoof', ambergris being the most expensive aromatic.

[49] For a charming and very reliable recent discussion of the production of ambergris today, see Christopher Kemp, *Floating Gold: A Natural (and Unnatural) History of Ambergris* (Chicago, 2012).

[50] James McHugh, "The Disputed Civets and the Complexion of the God: Secretions and History in India," *Journal of the American Oriental Society* 132:2 (2012), pp. 245–273.

become a famous literary perfume in medieval South Asia, and these were closely tied to the availability of the product and the difficulty of production. On the other hand, the practical world of perfumery was far more inclusive, and perfumery texts present a different picture of what actual perfumes would (or should) have been like. In texts on perfumery 'sweet hoof' is very common and its striking fingernail-related synonyms were deliberately exploited in lending the *Essence of Perfume* a rather interesting, poetic and playful texture. The qualities an aromatic needed to play a role in the poetics of perfumery texts were quite different to the qualities an aromatic required in order to play a role in perfumery as described in courtly literary texts. The ideal perfumes of poetry are costly, rare, and unchanging, but not very complicated affairs. The somewhat pragmatic world of perfumery is far more varied and less conservative. As we have seen, texts on perfumery are by no means devoid of their own 'in-house' poetic touches. Yet, such texts do not play with the names of aromatics in order to mark distinctions in terms of wealth and literary prowess, but rather they play on the name of 'sweet hoof' in order to invite readers to display their command of perfumery expertise.[51]

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[51] Perfumery expertise itself would, however, have been a marker of several types of social distinction, some based on wealth.