

## Acknowledging Substances: Looking at the Hidden Side of the Material World

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**Abstract** Material culture, strictly speaking, is substance culture. Nevertheless, studies on material culture are almost exclusively concerned with things. The specificities in the perception of substances and the related everyday practices are rarely taken into consideration. Although this can be explained by the history of anthropology, the bias towards associating material culture with “formed matter” is a foundational shortcoming. In consequence, particular perspectives on the material remain understudied, and the cultural relevance of substances as such is rarely taken into consideration. Taking a perspective grounded in anthropology and phenomenology, this article intends to provide new approaches to substances that elucidate the particular modes of their perception, reveal their characteristics and reflect on particular notions implicit to substances. The final section of this contribution discusses two exemplary studies on substances and proposes transformation and incorporation as new fields of research that would contribute to a more explicit engagement with substances in material culture studies.

**Keywords** Methods in material culture studies · Substances · Things · Phenomenology · Perception · Materiality

### 1 Introduction: Substances, Things and Their Perception

Substances only play a minor role in material culture studies. The research of the last 20 years privileges objects, understood in this context as “matter plus form”, while neglecting research on substances and their societal roles. Although some recent publications address the issue of “materiality” (Miller 2005; Ingold 2007), the question of what is specific about substances (as opposed to things) remains largely

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understudied. Reasons for this neglect may have to do with the difficulties of defining the term “substances” and developing a methodological approach that takes into account the specificity of substances.

According to Webster's Dictionary (RHUD 1999), the term “substance” has more than a dozen different meanings. However, in this contribution, our starting point (not the result) will be the first definition provided by the dictionary: “that of which a thing consists; physical matter or material: *form and substance*”. Substance is matter in its physical sense; it is, according to this definition, matter without form. This article intends to contribute to a more specific approach to substances based on the particular modes of their perception in contrast to the more established “studies on things”.

Thus, we will ask why substances attract so much less scholarly interest, although we are confronted with both, “matter plus form” and “matter without form” in everyday contexts. We suggest the difference in the academic attention paid to things versus substances is merely a consequence of the particular perspective on the material that has been made relevant to material culture studies. To make the particularity of the material culture studies view on substances more clear, we will juxtapose it to the views taken by phenomenology, chemistry and history, and other disciplines which, to some degree, have their own approaches to the study of substances.

### 2 Ambivalences of Every Perception of Substances

In day-to-day life, our perception is focussed both on things as well as substances. In some contexts, we tend to deal more with stuffs as such, especially in the context of substances of the body. As Janet Carsten (2004) makes clear, in many societies, concepts of kinship are linked to substances of the body, such as blood and milk. Blood, for example, is a metaphor for unity and sameness. However, the significance of blood in this context has little to do with the concrete perception of the substance in question. As the phenomenology of blood as substance is less relevant than the metaphorical dimension, this example focuses more on blood as it is embedded in the realm of the meanings. Therefore, it does not contribute much to capturing specific ways in which substances are perceived in their very materiality.

Because our mouths are more attuned to substances than to things, drinking and eating are good candidates in our search for the sensual dimension of substances. Therefore, if we understand meals as composed of substances, the perception of meals becomes relevant for an approach to substances as such. Thus, the anthropology of food might reveal something about the taste of a meal or the substances contained in it. But, as Judith Farquhar (2002: 288) complains, the anthropology of food deals with meanings of food rather than with its taste. Once again, the meanings of the substances are privileged over their perception. Farquhar's own study is an important exception of this, as she makes clear that the medicinal meals she is dealing with are considered to have healing powers not only because of the substances included but also because of their taste. This example shows the specificity of the western concept of medicinal substances: Although most medicines

are substances, its taste and other sensual qualities have little relevance in everyday perception.

The works of Candau (2002, 2005: 162–165), Howes (1988, 2003) and Stoller (1989) on oral and olfactory senses are important steps in the direction intended here. However, as Stoller (1989: 25) mindfully states, most anthropologists have unconsciously followed Hegel and chosen not to base their arguments on the sensible, which is in this context the taste. Stoller and Howes correctly point to this problem in anthropology, and they contribute to the anthropology of the senses (and, in particular, of taste and smell). But they do not deal with the question of to which extent some senses have a particular capacity to perceive substances.

Given the preference of the oral sense for substances, it is not surprising that individual objects in the mouth are felt to be an irritation. The perception we have of any object in the mouth is usually very imprecise. We have to fish the thing out of our mouth so that we can *see* it. Only then is it possible to determine what it is. The sensual capacities of the mouth help little to identify things, while they are extremely precise and seemingly unlimited in their ability to perceive and identify sorts of substances. Our oral perception clearly privileges substances. Even in everyday life, we use our mouth or our nose to identify substances. Thus, we can smell if a given white powder is sugar or salt; we may distinguish vinegar from wine or soda-water from lemonade. We even may identify components of cosmetic products via tasting. Creams often contain soaps as emulgators: this cannot be seen but it can be tasted. It is for this reason that to this day, the two basic classifications in chemistry are what they are; the distinction between acids and bases perhaps would never have arisen if earlier chemists had not had the habit of tasting the substances with which they worked. Similarly, physicians in those times not only examined the patient but also smelled them and tasted specific body fluids, above all urine. Thus, the British physician Thomas Willis (1621–1675), one of the most important men in seventeenth century medicine, who also treated members of the royal family, recalls the “often wonderfully sweet taste, as if filled with honey or sugar, of some urines” (cited in Lippmann 1929: 687). Today, neither physicians nor chemists still use their oral senses to any significant degree. The stunning ability of our mouth to identify substances is no longer used in our modern life—except, of course, in the context of cooking, eating and drinking. Nevertheless, the examples show that the sense of taste is a powerful tool in the differentiation of substances.

In contrast to our oral sensual capacities, our visual perception is oriented mainly toward things; it is, however, always possible, without further ado, to pay attention to substances. Such a shift in perspective is routine in specific contexts. In many substance-oriented professions (stonemasonry, woodworking, restoration, baking, etc.), it is even professionalised. If we want to look at the substance out of which a thing is made, we reduce the distance from which we observe it, if possible, from arms length to a few hand widths, and we look obliquely at the surface. Thus, we can better recognise the microstructure which is characteristic for many substances. Often indirect lighting is better suited than direct light, which is optimal for the perception of things. Thus, we may, for example, distinguish true leather from imitation leather or true wood from plastic, etc.

Bill Brown (2004) uses the metaphor of the window in order to explain how specific perspectives are adopted in scientific discourses that privilege one particular

aspect of a phenomenon over other aspects. Usually, objects are reduced to “windows”; they are transparent; they refer to something else that is recognisable behind the objects themselves. Although we are close to the material world, it is not necessary to take notice of things and their substances. We just use them, like glass in a windowpane. With this metaphor, Brown takes a critical approach to current material culture studies, and he questions whether the material qualities of things have not been neglected in reflections about objects. The direct awareness of material objects is no longer relevant. People almost completely rely on what is conveyed when speaking about things and substances. Thus, things become “windows” because people look through them and only recognise signs and symbols. Brown urges the students of material culture to pay more attention to “materiality as such”, that is, to look at the window frame and at the almost invisible glass it surrounds. This call is very much in line with our reflections on the shortcomings in the perception of substances. If studies on substances are limited to the meaning of substances, we have little opportunity to understand their specificity.

### 3 Some Problematic Traditions in Material Culture Studies

Before entering into a discussion about the specificities of substances, it should be made clear that the difficulties in addressing substances are also a result of the research tradition in anthropology, where the strong bias in favour of objects is obvious. A paradigmatic example for this one-sidedness is the social sciences' concern with an especially highly valued and emotionally charged object, the automobile. Since the now classic description of the *Citroen DS* by Roland Barthes in his volume “Mythologies” (1957), countless studies on auto brand names, automobile lifestyles and on the social significance of this key object of material culture have appeared. As a result, the possession and use of cars as well as the meanings of specific models have been of central concern as strategies of social differentiation and cohesion.<sup>1</sup> Yet, which of these authors ever took into consideration the role of gasoline in lifestyles? As Tim Dant (2004) remarks, gasoline, as an important substance essential to the use of any car, is economically at least as relevant if one considers the accumulated costs over the lifetime of the car. In sharp contrast to the interest in cars, their brands and forms, the social relevance of the substance “gasoline” and its perceived material properties are neglected.<sup>2</sup>

This one-sidedness is rooted in older anthropological traditions. Particularly in the nineteenth century, during the discipline's constituting phase, material culture played a fundamental role, but its object of study was limited to “formed matter”. At that time, forms of things were regarded as indicators marking the historical evolution of cultures, but substances were never in the focus of interest.<sup>3</sup> The uniqueness of a given form and its complexity were the exclusive objects of investigation, much as

<sup>1</sup> For lifestyle, or milieu and the role of objects, see Bourdieu (1979).

<sup>2</sup> An exception are the lucid remarks of the historian Christoph Maria Merki on the European history of gasoline, cf. Merki (2008: 391–402).

<sup>3</sup> The so-called “criterion of the form” that dominated German-speaking ethnology's engagement with material culture included the possible transmission of formal elements from one substance to another, whereby historical continuity was tied to the abstract form as such (Zwernemann 1983).

was the case in comparative art history.<sup>4</sup> Thus, the neglect of substances originates from the early stages of anthropology and culminates in the paradigm of current material culture studies that has a preference for studies of the relation between forms and meanings.<sup>5</sup>

This lamentable deficit should be placed in the larger framework of an intellectual dilemma that seems to be inseparably connected to the rise of modern scientific thought. The structure of this dilemma can best be clarified by the Cartesian system that divided the world centuries ago in *res cogitans* and *res extensa*. While the first is the realm of thoughts and represents the part of the world which is dedicated to mankind, the second is not recognised as a part of humanity, but instead regarded to be wholly separate from it. This division of the world is mirrored by the division of the scientific world into humanities and natural sciences. Natural sciences are non-reflexive because their objects of enquiry are firmly embedded in the immutable world of the *res extensa*. The *res cogitans*, on the other hand, is the scientific domain of the humanities. Although this division has been more and more challenged, recently, for example by those neurobiologists who study the biology of consciousness, the substances, from which any kind of artefact is made, seem to be of little relevance. In this highly questionable line of thought, an object is just a “materialisation” (Johansen 1992), an expression that emphasises the substance's merely intermediary role.

The conception of the modern individual who is actively involved in attributing meanings to things accentuates this dichotomy. To the extent that modernist thought uses the agency of the individual as an indicator of whether or not specific objects have significance, meaningfulness is no longer an attribute of a thing or a substance as such, but rather becomes a consequence of the abilities of the acting individual (Thomas 2005). When the attributes of an object, i.e. its potential to have meaning, are subordinate to the individuals' agency, substances are bracketed from the picture. Agency is equated with modifying or creating forms; substances play no role. In short, there seems to be a tendency to subordinate substances to forms. Substances are reduced to “bothersome” incidentals of formed things (Appadurai 2006).

In order not to misrepresent the current state of the debates in material culture studies, it should be noted that Barthes' approach to interpretation has recently been subjected to criticism. The aforementioned works of Brown and Dant, among others, ask new questions concerning the perception of materials. In this vein, Tim Ingold (2006) is concerned with why the air surrounding us has never been considered a part of the material environment, and Daniel Miller (2005) examines the materiality in current social science research practices.<sup>6</sup> In line with such a critical revision of perspectives on “stuff”, this article intends to go a step further and to inquire into the approaches to and perceptions of substances. The aforementioned metaphor of

“things as a window” suggests how we might deal with these questions. To follow the terms of the metaphor, the investigation of the glass as a substance constitutive of the window has never received sufficient attention. Detailed investigations of substances, of their perception and the associated specific handling methods can bring to light a new, heretofore overlooked dimension of material culture.

In the domain of art history, Monika Wagner (2001) has done pioneering work in her study on “Materials of the Fine Arts”. As she shows, the canon of forms of earlier epochs of art history has been challenged. With this new freedom and the increasingly experimental character of artistic expression, a new uncertainty emerged with respect to the authenticity of works of art.<sup>7</sup> Facing this problematic situation, artists now allow substances to become integral parts of their works because this enables them to make the claim of authenticity explicit. As Wagner shows, substances are rarely integrated into art objects in line with their function, but rather are to be found in consciously estranged forms. An everyday object, like Marcel Duchamps' urinal, becomes a sculpture, colours become a pasty mass and pieces of cloth become coloured surfaces. Wagner's interpretations make clear that the focus of artistic endeavours to move beyond canonised aesthetic forms centres on one specific feature, namely, the texture of the substances used. Other characteristics of the material (e.g. the smell), on the other hand, rarely receive attention from the artists.

The same applies to the everyday handling of substances. Perceptions and uses are always highly selective. Man's life-world is full of substances with unrecognised or unused properties. Many properties of substances are considered to be little more than undesired side effects.<sup>8</sup> We have allergic reactions to many substances (all too often without being aware of this); other substances are difficult to store or are flammable, and still others are poisonous. In spite of the unlimited divisibility and “absence of form”, substances are complex material structures to which many properties can be attributed. Their characteristics are associated with specific values that give substances social definitions. It is precisely through the often implicit embedding of a substance into social and cultural contexts that it differs from any general physical description of the same substance.

Valuations of substances often remain below the threshold of the conscious in everyday life, although, on a more general level, specific properties of the very same substances are subject to intense debates. Good examples for this are sugar, salt and water, which are key issues in highly faceted and contradictory debates concerning

<sup>4</sup> More recent ethnographic studies on the structure of the everyday world incorporate substances implicitly in that they assign them a place in higher-level symbolic systems. This is the case, for example, with the raw materials used by craftspeople, such as iron or clay. For the symbolism of pottery clay in Algeria, see cf. Bourdieu (1972) or by the Dwayoo in Cameroon cf. Barley (1983).

<sup>5</sup> This “obsession with the form” explains why substances disappear from sight. Thus, Alfred Gell (1998) drew parallels between Duchamps' object art and forms of Melanesian handcrafts. Following Larson (2007), Gell's “Anatomy of Object Forms” did not allow any place for substances.

<sup>6</sup> The rise of the idea of “clean air” (which is odourless) has been examined by Corbin (1982).

<sup>7</sup> It appears as if anthropological research regarding substances is at a stage analogous to that of art history in the 1990s, a period described by Monika Wagner as one of a “marginalisation of materials”: Key methods of research, such as iconology, were developed on the basis of photographs of the art objects. Perceptions of materials were thus mediated and did not play a significant role. Using photographs may be an advantage when consulting worldwide image databases, but photography destroys the original materiality of a work and thereby reduces the art object to its form. Without data on the substances of which a work is made, it is impossible to determine from a photo if a given statue is made out of Parisian marble, plaster, cement or Styrofoam.

<sup>8</sup> A popular criticism of consumer culture focuses on the lack of appreciation for substances and materials. It seems as if a trust in brand names has come to replace specific knowledge of the qualities and characteristics of substances. This increasing “superficiality” of perception further reduces the perspective to a matter of forms and colours (Asendorf 1984). The aesthetics of consumption thus leads to the “atrophy” of perceptive capabilities (Haug 1971).

their actual characteristics, not only with respect to the correct or healthy dosage. One of the few works taking into account the history and significance of one of these substances is Sidney Mintz's (1985) study of sugar in the Atlantic trade. Sugar in early modern times was considered a luxury item, available only to the wealthy. The material worth of sugar at that time motivated an increase in production in the Caribbean, whereby African slaves were used for plantations labour. In exchange, slave traders on the West African coast received manufactured goods from England. Sugar was imported to England in great quantities and, within a short time, this substance came to be regarded as an everyday necessity essential to the maintenance of the productivity of industrial workers. Mintz's study shows that it is worth studying the history or particular substances and, in particular, how their perception and valuation changes over time. Sugar goes from being considered medicine to becoming an everyday necessity, which in turn leads to the development of new modes of production and trading.

In the following, we will ask about the methodological tools appropriate to understanding the actual perception of substances. We will discuss the special attributes of substances which would not be considered in investigations focussing only on objects. Finally, we will sketch some strategies how the social embedding of substances can best be approached.

#### 4 Characteristics of Substances

Of course, things and substances have many characteristics in common: all things are material, which means that all things consist of substances. Therefore, all things can be transformed into substances, whereas it is not possible to transform all substances into things. In general, there is no neat dividing line between an imagined realm of things and a realm of substances, rather each fades into the other with a certain amount of overlap.

In phenomenology, the most notable differentiation between things and substances is that a thing has sides that hide each other, whereas a substance has as such only a surface or perhaps not even that but only a blurred margin. Getting acquainted with a thing means to look at all sides of this thing: the front side, the back side, upside, downside and maybe inside. Getting acquainted with a substance generally means to smell or taste it, to feel it, to work with it, to know about its behaviour, for example, when exposed to fire or water or to other substances.

Another observation is at first glance, it is merely linguistic: The grammar of substance names shows a different structure than the grammar of object designations. One speaks differently about things than one does about substances. One can count things directly, but it is not possible to say this is "one water". For the sentence to make sense, the term for a unit of measure must be included: this is a glass of water (or a millilitre, a gramme, etc.). Granted, it is possible to speak of waters in the plural, but then one is referring not to a concrete substance portion but the type, just as one can also speak of species of elephants or oak trees. In linguistics, these differences are thus summarised: substance names, as "mass nouns" are considered uncountable, in contrast to the thing names, which are countable.

Thus, we can further elucidate the term "substance". In the following is a short summary of a description that one of the authors developed along phenomenological lines (Soentgen 1997, 2008), which is useful in our attempt to understand the specificity of substances.<sup>9</sup> The description selects specific characteristics and presents their possible relevance to material culture studies.

The most important phenomenological characteristic of substances is the fact that they can be divided without losing their identity. With things, this is possible only to a very limited degree. Some things can be dismembered or in some cases even be cut without losing their identity. (This feature gives rise to the old paradox of the "Ship of Theseus", first mentioned by Plutarch.) Certain (normally not all) parts of a certain thing can get lost or be changed; it nevertheless is still this same thing. This is something different. The result of this line of thought is that the distinction between things and substances is not completely neat.

With substances, the situation is different: They can be cut into any directions, and the result is still this same stuff. After being divided, every part will have the same principal characteristics as the whole had before. Separate a pound of salt in two parts, and the two parts are again designated salt. Only the quantity has changed, not the name. But there is also a caveat: there are not many substances that we can dissect in this way ad infinitum. Gold and water (if we do not consider atoms and molecules) are appropriate examples. But if we look at foam or at granite, we find that the dissectability only reaches a certain degree. Nevertheless, a first key property of substances is that they can be divided into portions. The portions themselves are determined by standards that are subject to repeated revision: measures, weights, measurement techniques, controls and norms are found everywhere where substances are dealt with. Measures undoubtedly play an important role in the social embedding of substances. As a result, the study of measures of volume and their history has been the subject of research in cultural history time and again (e.g. cf. Trapp 2001, Breuß 1999 or with respect to salt: Hocquet 1985).

Because substances can be divided into portions, it logically follows that one and the same substance can occur in several places simultaneously. This does not hold for things in the same measure. There are some specific things, for example, works of art that exist in only one place. This may at first seem like a purely formal characteristic, but the occurrence of certain substances is, for the handling of them and what is stated about this handling, of major importance. There are only a few substances that occur more or less equally everywhere (like the air): more common is natural or man-made asymmetry in occurrence that has motivated numerous efforts for more equal distribution. Thus, trade more or less arose from the unequal distribution of material resources, originally, above all, of salt.

Furthermore, substances display characteristic structures (micro-forms). Such structures are, for example, crystalline lattice of salt or casting traces in metals. But not only natural substances show such structures but also every substance does. Sometimes, it may be hard to identify them, as they are very tiny, but if examined in

<sup>9</sup> The definition is worked out in a much more technical vein in Soentgen (2008).

the appropriate light, they always appear. From such traces, the expert can glean important information about the substance and its origins. At the same time, these structures are often an important aspect of their aesthetic valuation. Jean Baudrillard (1968) implicitly refers to such traces in his “systems of objects”. He distinguishes, on one hand, objects with homogenised substances that are strictly functional; on the other hand, he describes legendary objects, the material of which shows clear growth marks.

Substances further bear an inner complexity of hidden properties. This inner sensual richness is important for the discourse on the “materiality” of substances. Moreover, substances that are well known and familiar in certain situations reveal completely new and astonishing properties when suddenly put in a different situation. To illustrate with a simple example, the glue with which self-sealing envelopes are coated appears to be a banal substance: it feels moist, appears to be transparent and is odourless. But this apparently banal substance appears much less, so when one tears open a letter sealed with such glue in a dark room: the moment the envelope is torn open, the substance lights up. Another unexpected property is the potential of asbestos to cause silicosis. In this sense, every substance, even those which have been studied for centuries (as is the case with asbestos), still offer infinite hidden properties, hidden not only to the layman but also to scientists. Every substance is in this sense a world of “infinite richness”. This “infinite richness” is also why we are convinced that some substance names refer to natural kinds: Two samples of a natural kind share an infinite number of common properties, while two samples of a nominal (artificial) kind only show a finite number of common properties. In this sense, water, copper, salt, etc. are natural kinds (kinds, which have an existence in nature), while substance names like dyestuff or filler material refer to nominal (artificial) kinds (kinds owing their existence to a convention). There are of course also borderline cases, but there are also clear-cut examples, and these are important for our understanding of “substance”. If we are asked “What do you mean by ‘substance’? Show me an example!”, we would rather point out a natural (e.g. salt and water) than a nominal kind (e.g. filler material).

One final characteristic of substances merits to be highlighted, which is to have tendencies. Substances are not only useful for specific purposes; beyond this, they develop something of a life of their own that we can harness only for a short time before they finally break free. The expression of a tendency goes back to the philosopher Gottfried W. Leibniz, who distinguished two sorts of possibilities: active possibilities, whose origins lie in the thing itself, and passive possibilities that are only realised by an external cause. For the purpose of the description of substances, these terms can easily be translated into “tendencies” (active possibilities) and “suitabilities” (passive possibilities). The basis of the distinction is the causal attribution, in so far it resembles the difference between *tendance* and *fait*, as Leroi-Gourhan (1943) in *L'homme et la matière* proposes. Here are some examples of such tendencies (active possibilities): water evaporates, salt scatters over the floor when the salt shaker falls, glass breaks and a jumper loses lint constantly. To summarise this characteristic in a play on words, it can be said: the jumper sheds lint, but the lint never “jumpers”. The lint that disperses in space is created by itself. But out of

the lint, never again is a pullover created spontaneously, even when the slowly turning ball of lint behind the door seems to suggest that the lint is of its own accord attempting to spin anew a thread from which cloth can be spun or knit again.

A closer look at substances means, for a large part, to know their tendencies and either to use them to our advantage or to keep them in check.<sup>10</sup> Naturally, what one calls the “resistance” of things is based mostly on the tendencies of the substances of which they are made. To a minor degree, this “obstinacy” also comprises structural properties. If one wants to summarise the description presented here, a phenomenological definition of the term substance would encompass the following points:

- Substances can be divided into portions
- Substances occur at the same time in different places
- Substances always display characteristic structures (micro-forms)
- Substances are material
- Some substances are natural kinds
- Substances have tendencies

These points are both necessary and sufficient to explicate the notion of substance (in the sense of this stuff or another). It is of course not immune to criticism, but hopefully it captures at least the most important characteristics of substances. The definition converges very well with an independently published definition that has been developed in the tradition of analytic philosophy (Hacker 2004). Nevertheless, it should be kept in mind that it only accounts for our western ontological categories.

## 5 The Cultural Significance of Substances

Substances stand in the centre of an infinite number of use contexts and routines. In every society, substances are attributed specific properties, yet other properties are not perceived or are irrelevant. In particular, because many substances are distributed worldwide, it is worth taking a closer look at how specific properties are assigned. Which characteristics of a given substance are made explicit and why? How is a given substance valued? These questions are decisive for understanding a substance's role and the related usages.

From a number of studies in literature linking substances, their perceived properties and their cultural significance, we choose two examples in order to illustrate this process. The first is shea butter; the second is water. Shea butter is a vegetable fat, produced in the West African Savannah. While the valuable fat of the Shea Tree (*Parkia biglobosa*) serves as a foodstuff in the region of its origin, in global trade it is considered to be a substance that serves as a basic ingredient in cosmetics. This leads to completely different ideas about how this substance should be dealt with. While in the region of its production there is a long tradition of household production for personal consumption, the world market demands large quantities that are produced under controlled, hygienic conditions. No consumer in

<sup>10</sup> It is not only in daily life that the tendencies of substances seem to be an obvious property; these tendencies are also named by science, such as the chemical potential of substances “ $\mu$ ”, measuring the transformation tendencies of specific substances.

the West has ever considered the taste of this substance to be an important property. Instead, the most important characteristics pertain to its use as a base ingredient in cosmetics, its neutral colour, its creamy consistency at room temperature and the fact that it does not irritate sensitive skins. Although western perceptions of this substance predominate, having caused dramatic changes in production techniques and methods of handling during production, the different ways of perceiving and conceptualising this substance do not lead to conflicts (Chalfin 2003, 2004).

While this example draws an image of differing, but generally complementary properties, valuations of other substances are less compatible, if not antagonistic. A comparison of different views of such substances leads to paradoxes that are of political and societal relevance. A good example is drinking water. As Richard Wilk (2006) explains, there is a western ideology of water that declares this substance as “pure food”. The purity of water thus becomes a key property, and it is constitutive for the boom in bottled water. In times of increasing global sensibility with regard to the harmful effects of environmental pollution, “pure water” from selected sources seems to protect the consumer. Although due to political debates on development the general public is well aware of the lack of access to *clean* water in many parts of the world, consumers still prioritise their preoccupation with *pure* water. Much like the example of gasoline, mentioned earlier, water is apparently a substance that is contextualised in two different and quite separate logics: on one hand, a small percentage of the world population is paying ever higher prices for the ideal of getting a “pure substance”; on the other hand, there is a stoic acceptance of the fact that ever more people get sick or die due to the lack of water-quality standards. The increasing consumption of bottled water shows all too clearly the degree to which consumer attitudes are culturally specific and highly selective.

There is one further aspect becoming clear through the example of “bottled water”. This is the implicit association of things and substances which frequently happens within the process of appropriation. As the perception of water is limited, i.e. the taste might be more important than the visual aspect, the visual shape of the bottle as a “thing” takes significations that form or transform the social meaning of the substance. Thus, it often gives rise to a typical conflict between the consumer and the producer, as the designation of the package may differ from the sensual properties of the packed substance. On the other hand, the bottle of water becomes an example of a very general problem of the design of new products: New products are just evaluated as new objects, whereas the fact that these products have become possible only by the use of new substances or materials eclipses from the awareness of the consumer (Küchler 2008).

This example illustrates the relevance of the cultural appropriation of substances, based on the discussed particularities in the perception of substances. Depending on how substances are perceived, they may have quite different roles and usages. This explains why the term of cultural appropriation is a valuable tool to explain the creation and setting of specific characteristics of substances in a given cultural context.<sup>11</sup>

<sup>11</sup> This is very close to the findings of Hermann Bausinger (1961, 1981), who emphasises that appropriation always means a radical limitation of perception and a renunciation of many alternative methodologies. Going beyond the findings of Bausinger, the example of water shows that the process of cultural appropriation also implies the emergence of new properties like “purity”. Appropriation is thus not only selection but also the creation of new properties previously hidden, irrelevant or even unknown.

Appropriation is, however, not only a term that emphasises the significance of specific ways of dealing with substances. Cultural appropriation as a conceptual framework also opens up several empirical fields (Hahn 2004), of which we suggest two that are particularly appropriate to highlighting the perception of substances and their subsequent transformations.

The first of these aspects concerns the local transformations of substances. Such transformation may consist in the simple modification of the substance. It may be cleaned, sieved or distilled. It may, on the other hand, be mixed with other substances. This is what Aristotle, using the word in exactly the opposite way they are used now, called *synthesis*. But a substance may also be transformed into a new substance with new properties: Grape juice becomes wine, milk becomes cheese or latex becomes rubber. Aristotle called such a process by which the substance is transformed *mixis*. This process is much less evident, much more mysterious, even miraculous, than the formation of a thing. Cultural appropriation as “transformation” highlights once again the differences between substances and things. The processes leading to the formation of a thing follow a very straightforward logic. The transformation of one substance into another is something completely different. How or why the transformation takes place is not easily understood, even by the craftspeople executing it frequently.<sup>12</sup>

The second aspect concerns the incorporation of substances. This has already been made clear above with the examples of food and drink. Medicine and the air, being the substance we breathe, are also important cases in point. Substances can be inhaled or imbibed, but most things cannot. Substances can infiltrate the body and become part of it. They may strengthen us, heal us or, contrarily, weaken or even kill us. The physical aspects and the perception of substances are highly relevant to their valuation. This is evident in nutritious substances (sugar and water), but no less true for many other substances, often considered harmful or poisonous (cf. Allesch 1959 on white arsenic). Asbestos can be seen as an outstanding example of how a substance's relation to the body changes over time: In the middle of the twentieth century, the valuation of asbestos changed dramatically from a valued, protective material to a dangerous poison. Similar “careers” can be observed with regard to heroine (de Ridder 2000) or DDT (Simon 1999). At the same time, physical competence in dealing with specific substances is also seen explicitly as a means of training perceptual capacities and bodily control. The handling of certain substances, such as clay or wood, therefore is often regarded as a technique of educational value. At the same time, substances become charged with implicit social meanings.<sup>13</sup>

<sup>12</sup> Hirschberg and Janata (1966) differentiate between the extraction of substances and their processing. Their (outmoded) terminologies limit the meaning of “technology” to substance preparation. Accordingly, the manufacture of things is referred to as “ergology”. Hirschberg and Janata's notion of substances today may be considered as a precursor to the study of substances as part of material culture.

<sup>13</sup> Joachim Radkau has examined such values with respect to wood. He concludes that the substances' valuations are gender-biased: “The present history, sensitised to gender differences, must probably take it more exactly and specify that above all, the typically male access to technology goes via woodworking, while female access developed more through forming, joining and tying activities like the preparation of food, clothing and ceramic wares” (Radkau 2007: 43).

## 6 Conclusion

In the present article, perception, everyday usage and cultural significance of substances were discussed. In particular, we have pointed out the lack of attention paid to the treatment of substances as important elements in their own right in the study of things. Because substances are matter with no evident form, and many of their properties lie beyond the threshold of conscious perception, studies of material culture all too often neglect the relevance of substances and their cultural embedding. Obviously, there are some kinds of perception—like the visual—which contribute to the prioritisation of the things. Other senses like the taste and smell function in favour of substances.

The specificities and modes of paying attention to substances versus things are further contextualised in Section 3 as being a particular problem of method, since an adequate approach to substances requires some preliminary considerations regarding their specific characteristics. In fact, however, the few counter examples given in Section 4 make clear the large extent to which perceptions and meanings of substances depend on historical and cultural contexts.

Finally, by shortly presenting two possible fields of empirical research—the transformation of substances and their incorporation—we have suggested how we might gain a deeper understanding of the culture-specific properties of substances, their meanings and the everyday routines which they provoke or in which they are embedded. The present article therefore directs at a higher-level aim: to have provided arguments for the importance of the cultural dimension of substances.

Finally, we must also mention the problematic or even dangerous aspects of transformation and incorporation, as these become particularly clear when dealing with substances. Substances always have something of a life of their own—according to their tendencies (active possibilities). They melt, they get brittle, they lose their elasticity and so on. Recalcitrance in the eyes of the observer or user may be a surprising experience; it may be an unexpected characteristic, setting limits to the possible modes of handling. Examples for this “stubbornness” (Hahn 2005: 46–49) are that substances oxidise, become non-functional, explode, burn or mould. Currently, people have become more and more concerned with these unexpected or even uncontrollable properties of substances. It seems as if substances sometimes have an afterlife, even when the purposes, they were used for, are gone, or the objects, they have been part of, vanished since long. At least some substances, like carbon dioxide (Soentgen 2009) or lindane, reappear in totally unexpected contexts and constitute a serious problem for the environment. Florian Rötzer (1991) aptly refers to these unintended reactions as the “revenge of the material”.

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