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***Non Arte, Sed Naturae?* Remarks on Roman Cameos and their Visual Effects**

Abstract: In the aesthetic evaluation of objects, a regular conflict (one that dates back to antiquity) has been constructed between material as the passive object of human craftsmanship and the primacy of the material itself. In this conflict, primacy must be held by either the craftsmanship or the material's own qualities. Precious stones, however, represent a vivid example of the vagueness in this supposedly sharply defined opposition. Following the idea that is transmitted in the textual sources – namely, that both material and design have a share in the perception of jewels and contribute to their value – the following discussion will attempt to trace the optical effect of precious stones in the context of Roman society. The first step is to the relationship between materiality and optical appearance on a physical-phenomenological level (1), in the second step, the handling of the material will be focused upon (2). On the premise that natural materials do not have a solely ontological meaning (that is, a meaning limited to the statements they make), and that their perception does not always necessitate someone 'understanding them as' something, both of these perspectives will finally be brought together (3). In doing so, the relationship between natural-material disposition, artificial modification, perception and cultural significance will be taken into account.

Prologue

In the aesthetic evaluation of objects, a regular conflict (one that dates back to antiquity) has been constructed between material as the passive object of human craftsmanship and the primacy of the material itself. In this conflict, primacy must be held by either the craftsmanship or the material's own qualities. At the beginning of the 20th century, the architect and designer Henry Clement van de Velde (1863–1957) concluded that a material could not be beautiful in and of itself. Beauty was much more the result of the craftsman's work¹. According to van de Velde, a material's properties are only historically classified as 'beautiful' via alteration and cultural attribution. The connection between perception and a particular cultural environment is obvious here². Nevertheless, this approach neglects the fact that certain materials are considered to have comparable value in different cultural contexts, and its conclusions also lack historical depth: from Classical antiquity onward, there is

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1 van de Velde 1910, 13: 'An sich ist kein Material schön, und es wären leicht Beweise hierfür aufzubringen. Holz, Metall, Steine und Edelsteine verdanken ihre eigenartige Schönheit dem Leben, das die Bearbeitung, die Werkzeugspuren, die verschiedenen Arten, in welchen die begeisterte Leidenschaft oder die Sensibilität desjenigen, der sie bearbeitet, äußert, ihnen aufprägt. [...] Die Grenzen des ästhetischen Genießens, das der Stoff durch seine Belebung ermöglicht, sind zu dehnbar, um genau bezeichnet werden zu können; sie verändern sich von Individuum zu Individuum, von Periode zu Periode'. For subject matter, see Mareis 2015.

2 Bender – Hanus 2016, 51–58. The correlation between the anthropological constant of cognitive perception and historico-cultural impressions has not been convincingly demonstrated in detail. Wertsch (1985) postulates a clearly recognisable dependence of perception upon cultural conditions. However, there remain significant faults in this argument: see Damerow – Lefèvre 1998, 77–113. This is grounded in the fact that we must constantly weigh up to what extent differences lie in perceptive processes themselves, or even in differing communicative processes concerning perception: see Bender – Beller 2016, 509.

evidence of the appreciation of the beauty of objects as regards both their natural appearance *and* their craftsmanship³.

Precious stones provide a vivid example amongst the materials introduced by van de Velde. They are the embodiment of objects whose high value is borne in their very name⁴. In his influential work on precious stones, Anselmus de Boodt (1550–1632) assigned to gems the quality of beauty, crediting nature as the originator of this property⁵. This assessment, which prioritises of the *natural* beauty of precious stones, may also be found in virtually any source we care to examine⁶. The idea that a material cannot be beautiful in and of itself, as illustrated by the modern example of van de Velde, can therefore be placed in opposition to the idea that precious stones are naturally beautiful, as illustrated by the early modern example of de Boodt. The intentional sharpening of the opposition constructed here between the primacy of natural materials (*natura*) and art (*ars*), defines at first glance the outer limits of a space within which the optical effect of objects, as well as their perception, can in principle ‘move’ or play out. Precious stones, however, represent a vivid example of the vagueness of this supposedly sharply defined opposition.

Antique descriptions of precious stones in particular allow us to understand how intensely natural appearance and artificial alteration were interlocked with one another. The Hellenistic poet Posidippus described the entire production path of a jewel in one of his epigrams. He begins with the stone’s natural origin, then portrays the process of transformation under the hands of the engraver Kronios, and continues on until the stone is a pendant set in gold on the necklace of a lady named Nikonoe, describing its optical impact in that context⁷. No carved imagery is discussed in this case, rather the luxuriousness of the material is given priority, as is its chromatic effect in interaction with the physical appearance of the wearer. On Nikonoe’s breast the gem reveals a honey-like shine and creates an enticing contrast with her white skin. Simultaneously, stone and skin begin to blend artfully through the combination of honey’s culinary sweetness and the alluringly ‘sweet’ skin of Nikonoe⁸. The epigram itself can be seen as a literary transformation of the material world. However, it testifies to markedly different levels of perception. The natural appearance of the gem draws the eye of the beholder, initiating the association with honey and its conceptual attribution of ‘sweetness’. The stone therefore exhibits natural qualities that initiate an impulse for the process of its reception. Objects generally provide us with prompts based on their functionality, so based on this I will refer to this impulse as an ‘aesthetically-generated prompt’. Following the (functionally constructed) affordance of objects, this impulse will be described as an ‘aesthetically generated prompt to perception’ in the following discussion⁹.

³ For example, Xen. Mem. IV 6, 8–10.

⁴ In German, the term ‘Edelstein’ is derived from the root ‘edel’ (‘precious’ or ‘noble’), which in turn is descended from the Old High German word ‘adel’ (‘nobility’ or ‘aristocracy’). ‘Edel’ or ‘adel’ refers to something that is considered particularly valuable due to its specific native properties: see DWDS 2020.

⁵ de Boodt 1647, 13: *Pulcher (scil. lapis) gemme [sic] nomen meretur. Erit itaque gemma lapis parvus, rarus, durus, & pulcher a natura procreatur* (‘A beautiful [scil. stone] earns itself the designation “gem”. Hence a gem will be a small stone, rare, hard and brought forth in beauty by nature’). I would like to thank M. Deufert (Leipzig) for his help in translating this passage from Latin into German.

⁶ See Bauer 1932, 206 f.

⁷ Posidip. (Austin – Bastianini 2002, 29): ‘Rolling yellow [the rubble] from the Arabian [mountains], / the winter-flowing [river] quickly [carried] to the sea / the honey-coloured gem engraved (*eglyphe/ἔγλυψε*) by the hand of Cronius. / Mounted in gold [it lights up sweet] Nikonoe’s / inlaid necklace, as on her breast / the hue of honey glows with the whiteness of her skin’. See also Kuttner 2005, 141–161; Stročka 2007; Seidensticker et al. 2015, 50 no. 7.

⁸ See Seidensticker et al. 2015, 53. A similar effect can be found in a further example from this series of epigrams: see Seidensticker et al. 2015, 46 n. 6.

⁹ On the concept of ‘affordance’, see Gibson 1977. On functional affordance in objects from an archaeological perspective, see Fox et al. 2015.

Pliny the Elder's observations suggest that this was a quite widely disseminated idea. For Pliny, precious stones allowed for a perfect aesthetic experience of the natural world in all its facets¹⁰. He notes that 'nature's grandeur' reaches such a height in precious stones that some people regard it a sin to tamper with certain kinds by engraving them as signets, although this is the prime reason for their use¹¹. This conflict, in which van de Velde came down on the side of design, is not solved here, but rather presented in its disunity. Thus, Pliny acknowledges that the violation of natural splendour via human intervention can be seen as a sin against the natural order of things (*nefas*)¹². At the same time, he emphasises the functional necessity of committing this sin in order to bring the natural form to its actual purpose or destiny. Here it is clear that precious stones are valuable in and of their nature, but are also a material destined to be altered by human intervention.

Following the idea that is transmitted in the textual sources – that both material and design have a share in the perception of jewels, and both contribute to their value – the following discussion will attempt to trace the optical effect of precious stones in the context of Roman society¹³ in an illustrative way. Special attention will be paid to the entangling of natural appearance with artificial design throughout. Recognising the basic lack of empiricism in the quantification of observable appearances, two questions comprise the main thrust of this paper: to what extent can we reconstruct the perceivable effects of these stones as the result of natural appearance and intentional design? And to what degree can we connect the stones' significance to natural, material qualities, as well as to the design process?

The first step, then, is to explore the relationship between materiality and optical appearance on a physical-phenomenological level (1). Using surviving literary sources as our foundation, we need to demonstrate first and foremost which material aspects and optical qualities of precious stones were perceived in antiquity, which part of the appearance of cut stones was considered natural, and how the latter was represented in texts. Thus, we will pay less attention the material's performance in terms of concrete agency¹⁴. In the second step, the handling of the material will be the focus. Using case studies, we will outline how changes in material properties could increase the natural performance of materials and for what purpose such changes were made (2). Cameos¹⁵ offer a highly appropriate type of object for examination here, because they were used only as jewellery and their relief engraving (Fig. 1) had a decorative function¹⁶. A central consideration here is the possibility of categorisation, following regularly used procedures. On the premise that natural materials do not have a solely ontological meaning (that is, a meaning limited to the statements they make), and that their perception does not always occur in the sense of someone 'understanding them as' something¹⁷, both of these perspectives will finally be brought together. In doing so, the relationships between natural-material disposition, artificial modification, perception and

10 Plin. HN 37, 1: 'Hence very many people find that a single gemstone alone is enough to provide them with a supreme and perfect aesthetic experience of the wonders of nature' (*ut plerisque ad summam absolutamque naturae rerum contemplationem satis sit una aliqua gemma*).

11 Plin. HN 37, 1: *violare etiam signis, quae causa gemmarum est, quasdam nefas ducentes*.

12 On the meaning of this word, see Cipriano 1978.

13 It will be taken for granted in the following discussion that this political entity can in no way be understood as a singular socio-cultural unit; see, among others, Alföldy 2011, 60.

14 On the powers of various precious stones, see, among others, Orph. *lithika* or Damig. *lithika* (both dating to the 2nd century A.D.); see also Quack 2001.

15 The term is of medieval, rather than ancient origin: see Zwierlein-Diehl 2008, 14. It is retained here as the established term in scholarship.

16 For intaglios this cannot be posited so easily, since various functional aspects overlap and are difficult to separate from one another: see Zwierlein-Diehl 2007, 6–20; Lang 2012, 98–107; 2020.

17 See Gadamer 2010, 97. This is different to Cassirer ([1929] 2002, 124). For Cassirer objects always have an expressive character (*Ausdrucksform*). This expressive character precedes the perception of meaning and is not replaced by meaning – it remains unchanged or is intensified. According to Cassirer ([1929] 2002, 114) only the triad of expression, representation and meaning facilitates a perception-based understanding of reality. To the best of my knowledge, only Schweitzer, in his 1941 analysis, the 'Grand Camée de France', has given consideration to these aspects of cameos.

Fig. 1: How a cameo is made. Carving by Gerhard Schmidt, Idar-Oberstein.

cultural significance will be taken into account (3). Since the issues outlined here are only relevant where the objects were used or observed, in this context we must also look for concrete, active situations in which the objects were embedded.

The Effect and Meaning of Natural Forms: Fluorite and Agate

Approaching historical processes of perception is a methodological challenge¹⁸. The density of the data available is nevertheless sufficient, at least in terms of Roman society, to reconstruct the material aspects and optical qualities that were perceived in precious stones, and how these were represented in texts.

In 'On Stones', which dates to the late 4th century B.C. and is thus one of the earliest complete surviving treatises, the author Theophrastus of Eresos pursues the source and geographical origin of precious stones¹⁹. While he lists over 40 different types of stone, the *Naturalis historia* of Pliny the Elder, which dates to the Imperial period, lists over 300. Like Theophrastus, Pliny initially classified the stones according to how they were formed, and then used a combination of each stone's durability and optical characteristics (such as colour, transparency and gloss) in order to differentiate them²⁰. These classifying properties describe the particular optical qualities of precious stones. The spectrum is quite wide, and the minerals and properties named in the sources often cannot be matched definitively to the established modern designations of precious stones. Because of this, the following discussion will concentrate on just two examples that are described well enough in ancient sources to permit their identification: fluorite and agate. This means, in turn, that the descriptions and actual optical appearances of the materials can be considered in relation to one another.

Pliny describes in detail the optical qualities of vessels referred to as *murrhina vasa* (murrhine ware), which was considered in antiquity to be amongst the most sumptuous objects in the world²¹.

¹⁸ See the attempt by Porter 2010, in which there is no mention of precious stones, however.

¹⁹ Theophr.

²⁰ Bradley (2011, 101–106) spends much of the text referencing one of the precious stones treated by Pliny, the *smaragdus*.

²¹ Plin. HN 37, 21 f.: 'The substance is thought to be a liquid which is solidified underground by heat. In size the pieces are never larger than a small display stand, while in bulk they rarely equal the drinking vessels that we have discussed. They shine, but without intensity; indeed, it would be truer to say that they glisten rather than shine. Their value lies in their varied colours: the veins, as they revolve, repeatedly vary from purple to white or a mixture of the two, the purple

Fig. 2: Barber Cup, fluorite, 1st century A.D.; London, British Museum, inv. 2003,1202.1.

The precision of Pliny's observation allows us to identify the material as fluorite (calcium fluoride, CaF_2), a mineral belonging to the halide class²². With a degree of hardness of four on the Mohs scale, this mineral is comparatively easy to work with. The 1st century A.D. 'Barber Cup' (Fig. 2), a vessel decorated with vine branches, is held in the British Museum in London and is one of the few surviving ancient objects made from this material²³. The small number and high quality of the surviving pieces in fluorite emphasise, from the perspective of the *material* legacy, that they were almost certainly considered sumptuous luxury objects²⁴. By applying a direct source of light to the stone, it is possible to observe how crimson and white blend together and refraction of the light produces a rainbow effect. This effect is particularly noticeable when the vessel is rotated, an optical effect also recognised by Pliny, who described this movement using the verb *circumagere*²⁵. This passage demonstrates that the vessel was actively used, as only then could the effect be observed²⁶.

Agate (*achates*) belongs to the mineral class quartz (Silicon dioxide, SiO_2), and in antiquity was mainly sourced from India or the Rhodope Mountains in southern Bulgaria. It also represented a particularly characteristic material for the carving of cameos. The banded or layered agate²⁷ was named after the Achates River (now known as the Dirillo or Acate River) in Sicily by Theophrastus of Eresos, student of Aristotle, and a great number of varieties of this stone were known in antiquity²⁸. This example allows us to observe that precious stones could be graced with a naturally occurring

becoming fiery or the milk-white becoming red as though the new colour were passing through the vein. Some people particularly appreciate the edges of a piece, where colours may be reflected such as we observe in the inner part of a rainbow'. For the existing comprehensive discussion of the ancient sources, see Christ 1743; Thiersch 1833, 443–509.

²² See Thiersch (1833, 492f.) for discussion of the state of research from the Renaissance on. For extensive discussion on the history of research, see also Del Bufalo 2009, who nonetheless does not speak convincingly of agate as the material employed in *murrina vasa*. For a summary, see Harden 1954; Tressaud – Vickers 2007, 143–152; Del Bufalo 2016; Thoresen 2017, 176. 180–182.

²³ On the vessel, see Lapatin 2015, 258 f. Pls. 133 f.; Butini 2019, 53 Fig. 7.

²⁴ The other known objects are the Crawford Cup (London, British Museum, inv. 1971,0419.1), which is thought to have come from the same burial site as the Barber Cup (see Lapatin 2015, 258), and a small statuette of Asclepius (see Henig 1990, 109 n. 181 Pls. 40 f.).

²⁵ Plin. HN 38, 2, 8.

²⁶ See the convincing discussion in Thiersch 1833, 476.

²⁷ Theophr. 5, 31.

²⁸ Thoresen 2017, 155–217, esp. 168.

Fig. 3: 'Landscape agate' from Blue Hole near Montrose; Edinburgh, National Museum of Scotland, inv. heddle-g-210–453.

figurative quality. In the context of his natural history, Pliny provides a long list of agates that appear to exhibit landscape-like elements, as well as trees, groves, animals and rivers²⁹. In agates typically described as sardonyxes in glyptics³⁰, the remarkable structures of the mineral make Pliny's associative interpretation understandable. Generally such agates have a layered structure, and the individual layers mostly display a colour spectrum of grey, red, brown or yellow. There are also largely colourless examples and some that are even translucent³¹. Even today some agates are described as 'landscape' or 'dendritic' agates, because their layers exhibit outlines that remind us of landscapes or vegetation (Fig. 3). These peculiarities, already noted by Pliny, are actually crystalline structures the take the shape of trees or shrubs³². In this case, then, there is an existing natural form that gives the impression of being something else³³. This appearance in fact is nothing more than a chance occurrence, but is perceived as a pictorial-artificial element.

This conclusion becomes clear, in a much-enhanced form, in a further passage from Pliny's *Naturalis historia*. During a discussion of famous rings, Pliny comes to an agate in the possession of King Pyrrhus that, without any proof of human intervention, appears to exhibit an image of Apollo and the nine Muses³⁴.

Here, then, the characteristic banding of the material undergoes a content-based or textual interpretation. The natural form is perceived as an image, ascribed to it by the figurative imagination

²⁹ Plin. HN 37, 139–142. 193; see recently Micheli 2020.

³⁰ On the synonymous usage of onyx, sardonyx and agate, see Thoresen 2017, 179.

³¹ For a comprehensive discussion on the ancient designations, see Zwierlein-Diehl 2008, 16 f.; on layered stones, see Platz-Horster 2012, 29–32.

³² There are numerous invented names for the extremely varied manifestations of agate transmitted in the ancient sources: see Okrusch – Matthes 2014, 186.

³³ On this property of the objects, see Sommer 1999, 80 f.

³⁴ Plin. HN 37, 5 f.: 'After this ring, the most renowned gemstone is that of another king, the famous Pyrrhus who fought a war against Rome. He is said to have possessed an agate on which could be seen the Nine Muses with Apollo holding his lyre (*in qua novem Musae et Apollo citharam tenens spectarentur*). This was due not to any artistic intention, but to nature unaided (*non arte, sed naturae sponte*); and the markings spread in such a way that even the individual Muses had their appropriate emblems allotted to them (*ita discurrentibus maculis, ut Musis quoque singulis sua redderentur insignia*'). On the opposition between nature and art in the work of Pliny, see Platt 2018, though exclusively in reference to the famous Zeuxis episode.

of the author and the reader of his text³⁵. The particular material quality manifests above all in the fact that nature is credited with the ability to create its own inherent imagery³⁶. It shapes semantic effects in the sense of stimulating pictorial perception, wherein the pictorial plane is superimposed on the natural appearance of the agate. In one moment, the observer's gaze represents an instance of 'seeing as', whereby the natural properties of the materials are initially suppressed. However, the evidence of the material's 'markings' makes it plain to see that the natural form is constantly present³⁷.

Pliny's perception would only have been possible in the context of a relevant socialisation with images. Nature does not, therefore, display her artistic potential universally, but rather in culturally specific contexts and situations where her forms may be comprehended as pictorial impulses. If fluorite gains attention via the optical qualities exhibited as the result of a play of light and colour, then our perception of agate concentrates on the figurative aspects of the stone. The latter make it clear that perception itself ultimately co-determines the shape of the observed object and ascribes meaning to it³⁸.

The Effect of Cameos as the Result of Artistic Design: Case Studies

Although the naturalness of precious stones' optical impact is constantly brought to the fore, the fact remains that the visual effects exhibited by ancient cameos are in no way the result of natural processes. Rather, there were many different processes used to enhance the optical characteristics of cameos. Without being able to reconstruct how these characteristics were perceived by viewers, the regularity of the manifestations considered below suggests that we recognise in them less coincidence than intention. To begin with, the figurative shaping of the raw material will be outlined. Then we will look at the production of the finished object, which could include colouring, gilding and/or the decoration of the cut gem with additional jewels, before turning to the final setting of the stone in precious metal.

In the simplest manner, the natural form was typically enhanced by active, figurative representation, and thus there are a series of ancient cameos that were cut from natural, mostly translucent minerals. These cameos often display frontal busts of gods or humans, such as the example depicting a bust of Athena wearing the aegis held in the J. Paul Getty Museum (Fig. 4)³⁹. In this instance, the uniformity of the monochrome green chalcedony is broken here and there with characteristic black flecks. The overall effect of the piece can still be experienced, thanks to the survival of the original ring setting (dating to the 1st century A.D.)⁴⁰. In such works, the engraver based his

³⁵ Depictions of the nine Muses are relatively rare in glyptics, but there is some evidence for them. They were certainly known to ancient observers: see Sena Chiesa 2002, 202f. n. 37; Scarisbrick et. al. 2017, 14 f. n. 28.

³⁶ On nature as 'maker of things', see Gombrich 1982, 17 f.; Platt 2018, 221. 228. G. Julius Solinus' transmission of the idea of naturally occurring images, and the capacity of nature to create such images in precious stones, was used in the medieval *lapidaria* and was thus disseminated far beyond antiquity: see Zwierlein-Diehl 1998, 69.

³⁷ From a physiological perspective, the recognition of textures (the grain of the agate) and forms (in this case the nine Muses) are not competing, but rather complementary processes: see Nänni 2009, 15.

³⁸ See Cassirer [1929] 2002, 126 f. 134.

³⁹ See, e.g., Pannuti 1983, 128 no. 213 (cornelian, female bust, Claudian period); Platz-Horster 2012, 53f. Pls. 1.4 (cornelian, portrait of Livia); Tondo – Vanni 1990, 59 no. 17 (topaz, female portrait, Antonine period); Spier 2010, 70 f. no. 49 (amethyst, female portrait, Antonine period); Vollenweider – Avisseau-Broustet 2003, 69 f. no. 74 col. Pl. 10 (cornelian, portrait of young man, Julio-Claudian period). The regular use of a frontal pose was grounded in the fact that monochrome material did not allow sufficient contrast for a profile and obscured the necessary differentiation between the figure and background: see Nänni 2009, 32.

⁴⁰ Los Angeles, J. P. Getty Museum, inv. 88.AN.13; Spier 1992, 158 no. 435; Platz-Horster 2010, 195 no. 89.

Fig. 4: Chromian chalcedony cameo with Minerva set into a hollow ring, 1.8 × 1.1 × 1.3 cm, 1st century A.D.; Los Angeles, The J. Paul Getty Museum, inv. 88.AN.13.

work entirely upon the natural colour of the material, which showed off different aspects of its colouring according to the way the light fell upon it. Nature did not create the form, since the figurative composition was definitely the result of human intervention, but this intervention relied heavily on the natural properties of the material.

In contrast, within the agate group there is a significant departure from the natural appearance of the stone. The characteristic contrast between darker and lighter layers we know today is not naturally so intense, but is rather the result of a colouring process. While the blue and white layers of agate are marked by great density and are therefore difficult to affect, the more porous red, brown, grey and black layers can easily be recoloured. To achieve this, the mineral is placed in a sugar solution derived from honey. A solution of this kind absorbs unevenly into the agate, because of the varying density and porosity of its layers. Finally, the stone was treated with sulphuric acid, which penetrates predominantly in the direction of the stone's growth and burns out the absorbed sugar up to a maximum of 15 mm into the surface. In antiquity, this process was described by Pliny using the expression 'boiled in honey'⁴¹. The process produced a stark contrast between the agate's layers and could be repeated multiple times during the engraving⁴². Thus, only in the finished piece would the naturally beige or brown layers emerge as a bright red-brown or deep brown. These layers create the contrast between light and dark that is characteristic of agate cameos. How this could be used to accentuate the cameo figures is illustrated using several case studies.

The contrast achieved by colouring the agate is of central significance. It often meant the background layer had a very dark tone, which accentuated the actual pictorial motif worked into the lighter layer of stone. The Claudian cameo portrait of Augustus can provide an example here (Fig. 5). The cameo is held in the Metropolitan Museum of Art in New York and depicts a naked bust of Augustus in three-quarter rear view, wearing the aegis⁴³. The bust and attributes stand out in

⁴¹ Plin. HN 37, 193–195: *quas melle excoqui tradunt septenis diebus noctibusque sine intermissione*.

⁴² Helm 1978, 77–80; Giuliani – Schmidt 2010, 86–89; Platz-Horster 2012, 30; Thoresen 2017, 194; Schmidt 2019.

⁴³ On sardonyx, see Zwierlein-Diehl 2007, 436 Fig. 622, with further bibliography; Boardman et al. 2009, 54 no. 52; Cadario 2014, 116 no. 79.

Fig. 5: Sardonyx cameo portrait of Augustus ('Cameo Marlborough'), 1st century A.D.; New York, Metropolitan Museum of Art, inv. 42.11.30.

Fig. 6: Cameo with bust of Julio-Claudian woman (possibly Livilla), 1st century A.D.; Berlin, Antikensammlung, inv. FG 11096.

uniform white relief against the dark brown background. This figural representation is not brought to the fore by the carved sculptural form alone. The colouring has also altered the material to maximise the contrast. This was a useful device for engravers when they depicted lighter figures on a darker background, or when (no less often) they created darker motifs on a lighter background⁴⁴. As a design option, the two-layer cameo model was disseminated across the whole of the Roman Empire.

Multi-layer agate could also be used to produce other visual effects. For example, the surface of the pictorial or figurative motif might be enlivened with colour, using the individual layers⁴⁵.

In other cases, the layers were employed to create distinctions with respect to content. This can be seen in depictions of heads, in which hair and beard were regularly sculpted from different surfaces⁴⁶. This approach is particularly evident in a group of portraits produced in three-layer sardonyx thought to depict Livilla, the sister of Claudius. Here we shall focus on the example held in the Antikensammlung of the Staatliche Museen Berlin. (Fig. 6)⁴⁷, in which the mostly white bust stands out against a dark background. The significant iconographic elements, including the wreath made from ears of grain and poppy, earrings and heart-shaped pendant, are all created from the

⁴⁴ One of the best-known representatives of this type is the large Eagle Cameo held in the Kunsthistorisches Museum in Vienna: see Walters 1926, 346 no. 3674; Pannuti 1994, 200 f. no. 168; Zwierlein-Diehl 1998, 158 Fig. 28; 2008, 84–91 no. 4; Sena Chiesa 2002, 218 no. 61; Boardman et al. 2009, 149 no. 323; Wagner – Boardman 2018, 229 no. 214.

⁴⁵ Megow 1987, Pl. 44, 1; Giuliano 1989, 152 no. 26. See also a cameo with the head of a young athlete held in the Hermitage Museum in St. Petersburg (inv. GP-12485). Here part of the hair (for example on the brow and back of the head) is worked in the white layer of agate, while another section is brown or dark brown. As much as this can be attributed to the irregular fall of the hair, it also ensures that the figure's bandage/hair-binding is accentuated.

⁴⁶ Pannuti 1983, 6–8 nos. 5, 6; 127 no. 212; Megow 1987, Pls. 18, 2, 3, 6, 7; Zwierlein-Diehl 1991, 217 no. 2469 Pl. 152; Henig – Molesworth 2018, 41 f. nos. 32, 33. Harpocrates' characteristic lock of hair, which is iconographically significant, is also emphasised: see Pannuti 1983, 71 no. 108; Kagan – Neverov 2000, 1377 no. 159/66.

⁴⁷ Berlin, Staatliche Museen, inv. FG 11096. See Platz-Horster 2012, 78 f. no. 55 Pl. 11 with further bibliography. On the group, see Megow 1987, 294–298 no. D21–27 Pl. 12.

Fig. 7: Sardonyx cameo with mythological scene, 1st century B.C.; Naples, Museo Archeologico Nazionale, inv. 25834/2.

topmost layer of agate, ochre in colour. The same layer is used sculpt the mantle that lies over the figure's left shoulder, the end of which is held in the right hand. Another important iconographic element, the depiction of two children amidst the mantle's billowing folds, also stands out in brown against the white background. Because of these contrasts, the eye is drawn immediately to the most important attributes: the wreath, which signifies fertility, the jewellery, which indicates wealth, and the two children, who are recognisable as twins, and thus assist with the identification of Livilla⁴⁸.

There is also evidence of comparable engravings outside the realm of portraiture. In depictions of multiple figures, for example, clothing is often differentiated from the uncovered parts of the body – bare skin was mostly cut from the white layer, while garments were produced from the darker layers above⁴⁹. An impressive example of this technique can be observed in a cameo from the Medici collection of the Museo Archeologico Nazionale in Naples (Fig. 7)⁵⁰. The two young men on the left, who are identified as hunters due to the presence of the dog and spear, appear entirely in white, as do the tree and the pillar. The pair of women on the right, however, were sculpted from the dark brown upper layers. Various parts of their clothing are created from different layers of agate, with the result that the elderly woman at the far right appears to wear a light brown robe beneath a dark brown mantle.

A similar handling of the different agate layers can be observed in other motifs, as well. In renderings of warriors, shields were typically created from a contrasting layer (either light or dark brown). Engravers thus sought to emphasise the shield both optically and in an attempt to indicate its material within the image itself⁵¹. In some cases, vague colour associations even made content-based references to the depicted subject possible. Thus, in cameos depicting Heracles and Omphale, the lion's pelt worn atop the former's head is typically depicted in light brown, the natural colour of the element being represented⁵².

⁴⁸ As a contrasting example, see a sardonyx in Paris that depicts the same person, in which the twins do not appear in brown on a white background but are rather worked into the brown layer of stone: see Megow 1987, 296 f. no. D21 Pl. 12, 6; Vollenweider – Avisseau-Broustet 2003, 89 f. no. 95 Pl. 70. For discussion concerning the portrait of Livilla, see Boschung 1993, 63 f. Figs. 45 f.

⁴⁹ See Megow 1987, 298 f. no. D29 Pl. 12, 1; Giuliano 1989, 156 f. no. 31; 278 f. no. 240; Vollenweider – Avisseau-Broustet 2003, 78–80 no. 84 col. Pl. 11.

⁵⁰ Naples, Museo Archeologico Nazionale, inv. 25834/2. See Pannuti 1994, 220 f. no. 187. The meaning of the scene is contested, but it can probably be placed in the genre of Greek mythology. See most recently Toso 2007, 101 Pl. XII Fig. 41 (interpreted as Hippolyte and Phaedra). Similar effects can be found in Scarisbrick et al. 2017, 21 no. 16. 33 no. 27.

⁵¹ See Giuliano 1989, 286 f. no. 259; Pannuti 1994, 227 f. no. 192; Boardman – Aschengreen-Piacenti 2008, 39 no. 13. This interpretation is also supported by the fact that the approach/technique was employed in glass cameos (e.g., Pannuti 1983, 109 no. 162) and intagli (Henig – McGregor 2004, 79 no. 7.28), although these materials would have permitted other colour combinations.

⁵² St. Petersburg, Hermitage, inv. ГР-12719; see Walters 1926, 335 no. 3563; Pannuti 1983, 99 no. 146; D'Ambrosio – de Carolis 1997, 48 no. 113 Pl. X.

Fig. 8: Cameo with head of Julio-Claudian woman (possibly Livilla), 1st century A.D.; Florence, Museo Archeologico, inv. 14553.

In rare cases the appearance of a cameo was modified so that the optical effect was elevated not just by the material and the engraving, but also through the addition of secondary elements. This is demonstrated by an example that depicts a female member of the Julio-Claudian house (Fig. 8)⁵³, in which the figure stands out in milky white against the dark background. Her *stephane* is reworked as a crown⁵⁴ and appears on a layer of light brown, as do the teardrop-shaped earrings and the mantle worn over her right shoulder. These additions are probably modern in origin, although the necklace from which the pendant hangs must have been inserted in antiquity. A limited breach in the surface for a post-antique addition is highly unlikely, given the near-perfect condition of the piece. In any case, these additions remain exceptional in the inventory of Roman cameos⁵⁵.

The possibilities available to skilled craftsmen (without the use of such additions) are demonstrated by the vessels produced in precious stone. One artisan working in the 1st century A.D. achieved a unique form of representation with a small vessel held in the Kunsthistorisches Museum in Vienna (Fig. 9). The surface of a six-tiered agate is cut so that the stone's numerous 'eyes' remain raised. Their surfaces bear figural depictions, including a double portrait of Venus and Mars, Eros and a *ketos*. Particularly in the examples that use different coloured layers of the agate to form the motif, this gives the impression of natural cameo inlays⁵⁶. This perception is strengthened by the fact that the appearance of double or triple portraits (*capita iugata*) on cameos would have been known to ancient observers since Hellenistic times⁵⁷.

⁵³ See Megow 1987, 290 no. D9 Pl. 18, 8; Tondo – Vanni 1990, 41. 84 no. 107 (with a less convincing post-antique dating); Zwierlein-Diehl 2007b, 38 Pl. 4, 2; Gennaioli 2010, 113 no. 26.

⁵⁴ See Megow 1987, 290 f.

⁵⁵ The only example currently known to the author is a portrait of Alexander Severus from the collection of Catherine the Great: see Neverov – Kagan 2000, 104 no. 85/35. The diadem on the Strozzi-Blacas cameo is a modern addition: see Megow 1987, 166 no. A18.

⁵⁶ See Bühler 1975, col. Pl. II; Zwierlein-Diehl 2008, 208 f. no. 24.

⁵⁷ See the example given by Zwierlein-Diehl 2007, Figs. 219. 221. 624.

Fig. 9: Cameo vessel with various cameo-like medallions, 1st century A.D.; Vienna, Kunsthistorisches Museum, inv. IX 22.

Fig. 10: Cameo vessel with mythological (?) scene, 30 B.C. – A.D. 25 (with mounting dating to the 5th or 6th centuries A.D.); Saint Maurice, Trésor de l'Abbaye de Saint-Maurice.

The special structure of the agate was also used in another way (and far too consistently to have been pure chance) to produce an onyx jug held in the Abbey of Saint-Maurice d'Agaune (Fig. 10)⁵⁸. This vessel was created during the Early Imperial period (between c. 30/20 B.C. and the first quarter of the 1st century A.D), and the interpretation of the five figures that adorn it is controversial, due in part to the uniqueness of the composition. There is only agreement on the general interpretation

⁵⁸ See Zwierlein-Diehl 1999, 26 Fig. 31 with further bibliography; 2007, 174–177. 441 f. Fig. 644a. b. On the later cloisonné setting, see Adams 2008, 405–427. This link provides a 360-degree view of the jug: <<https://www.youtube.com/watch?v=yjIUjqmyBIE&feature=youtu.be>> (07.05.2020).

Fig. 11a–b: Glass cameo with head of Drusus in modern gold mount, 1st century A.D.; Vienna, Kunsthistorisches Museum, inv. IX 22; a: overall view; b: detail of the gilded surface.

of this as a scene of mourning located near a grave⁵⁹. Here however, we will look only at how the properties of the agate have been employed to create this image. The figures have been arranged so that their faces and the bare parts of the body are generally formed from the white bands of the agate. At the same time, these bands also establish the floor, upon which the scene is set. The iconographic particularities and figurative composition are thus also based upon the properties of the agate itself. This example spurs us to contemplate how, regardless of any additional overworking, the natural material prefigured the final appearance of the piece and in some cases even possessed its own independent iconography.

Finally, gilding can be mentioned as a form of visual enhancement, as it is often observed as a regular feature on glass cameos. There is evidence of gilding in numerous places on the Hierophilos cameo in Vienna, for example⁶⁰ (Fig. 11a–b). Glass cameos like this one could be produced in series by taking moulds from an original worked in stone⁶¹. Here we also find multiple material transformations. First, a cameo in precious stone was translated into a form made from a less valuable material. But then, as a kind of countermeasure, the core of this new object was increased in value by covering it in gold⁶². Gilded cameos have not yet been systematically examined in scholarship, and thus there is in general a lack of material for research on these objects. One could, for example, determine whether there are also examples of partial gilding that aimed to create a contrasting colour effect, in addition to the full gilding of less valuable materials like glass. Such a conclusion could be reached if the remains of gold were found on banded agate. Here it would not make sense to assume that the piece was completely gilded, as this would hide the effect generated by the stone's natural layers. The fact that most cameos were finely engraved and show evidence of surface polishing also seems to contradict the idea that they were made with a view towards gilding from the beginning of the production process⁶³. Rather, we can assume that partial gilding, which fundamentally enhanced the piece's visual impact, was likely in most cases. This hypothesis would have to be proven in a systematic way, however, with the help of modern imaging processes and methods of analysis.

⁵⁹ See the tabulated overview in Zwierlein-Diehl 2007, 175.

⁶⁰ See Zwierlein-Diehl 2008, 134–141 no. 9. This was a regular occurrence. Traces of gold were found on 27 cameos in the Kunsthistorisches Museum. See Zwierlein-Diehl 2008, 24, 140 Fig. 92 for an example of nearly intact gilding. A compilation of the material has not been made, however, and the most significant task would be recording gold traces on cameos from ancient contexts.

⁶¹ On production, see Zwierlein-Diehl 2007, 326–329, 504 f. Figs. 984–990. In a rare case, there is evidence that glass cameos were made from a mould that was taken from a cameo now preserved in the Kunsthistorisches Museum in Vienna; copies are held in Florence and Klagenfurt: see Zwierlein-Diehl 2008, 182–185 no. 18 Figs. 138, 140 f. 328–330.

⁶² On the value of gold, see Lapatin 2015, 19–34. On the process (and semantics) of gilding, see Anguissola, this volume.

⁶³ See Zwierlein-Diehl 2008, 24.

Fig. 12: Cameo with *capita opposita* in ancient medallion, 3rd century A.D.; Vienna, Kunsthistorisches Museum, inv. IX 1976.

The materiality of these cameos, which appears so natural in perception and is so heavily emphasised in the sources, cannot be seen as the sole result of nature. In ancient cameo engraving, it was far more common to intentionally manipulate and exploit the optical appearance of the material by means of artificial processes, so that the aesthetic qualities and meaning of a piece could not always be separated. This relationship only gained cultural significance through the act of perception. In antiquity cameos were typically encountered in rings (Fig. 4), or, from the 2nd and 3rd century B.C. on, in earrings or pendants (Fig. 12)⁶⁴. The setting gave the jewel a frame, within which its materiality and crafted image were displayed. The finished objects were thus no longer limited to their native and unchanging materiality, but rather attained a new dimension, gaining sensual material properties through the modification of their natural disposition. This disposition was ‘tamed’ and intentionally modified in order to produce images using the material’s properties. It was no longer the materiality of the gemstones that appeared in its pictorial form; rather, pictoriality emerged through the production of form, and contrast created imagery on the basis of the artificial alteration of nature. Human intervention does not usually mask natural properties, but rather enhances them in an effort to focus perception. These two perspectives (creating image-like qualities, or ‘Bildlichkeit’, by modifying nature and emphasizing natural qualities of materials) can finally be observed against the background of real situations, in which the perception of precious stones outlined here can be demonstrated time and again.

Summary: Enhancement of Form and Significance

The first aim of the paper was to examine the physical dimension of materiality and its perception, which has been transformed by literary sources. The second step was to contrast this with artificial modifications made through craft and the optical effects achieved. We cannot reach any final, unified conclusion simply by merging these two perspectives (natural physical characteristics and artificial modifications, along with the latter’s results) via our own perception of the object: the material resists such a simplistic approach. The following outlines some starting points for further discussion.

⁶⁴ Rings: Pirzio Biroli Stefanelli 1992, 129 f. Figs. 108 f.; Platz-Horster 2012, Pl. 1; pendants: Deppert-Lippitz 1985, 12 f. no. 11 Pl. 6, 1; Zwierlein-Diehl 2007, Pl. 146 Fig. 652; necklace: Platz-Horster 2012, 85 no. 62 Pl. 14; brooch: Marshall 1911, 339 f. no. 2867 Pl. LXVI; Deppert-Lippitz 1985, 16 no. 26 Pl. 11; Pirzio Biroli Stefanelli 1992, 201 Fig. 244. Gold settings are the most common. In one instance, a female portrait was set into a recess in the plaster near a *loculus* in the Catacomb of Priscilla: see Bisconti 2019.

First, any analysis of these visual effects in a historical setting proves methodologically complex. This is because any approach must not only take the anthropological prerequisites of this perception⁶⁵, but also the cultural dependency of the processes mentioned at the beginning of this paper into account. Two starting points are available to us: potential contexts in which the visual effects outlined here were actually engendered, and literary descriptions that provide evidence of the perception of material qualities. With regards to cameos and cameo vessels, the context of the effect can be determined relatively reliably.

Because they were so beautifully carved and engraved, glass or stone cameos were mostly used as the main element in jewellery⁶⁶. They were typically set in rings and worn on the finger (Fig. 4). More rarely, they served as medallions (Fig. 12) or were set into diadems. From the late 2nd and 3rd century A.D. they also formed an integral part of earrings and necklaces. During perception, the objects remained constantly close to their wearer and were thus simultaneously bound up with his or her personal interactions. In contrast to seals, cameos remained connected to the person wearing them rather than simply being put aside after use⁶⁷. This means that the context of perception did not only affect the cameo itself, but rather that the cameo represented one element in a person's ensemble of 'signifiers'⁶⁸. The small format designs were worn to be viewed up close and were therefore particularly effective in contexts of close social interaction. When possible, they needed to be taken in hand in order to reveal the engraved image.

The need for tactile interaction can also be postulated for the cameo vessels. According to historical accounts, vessels made from fluorite were viewed as luxurious tableware for *convivia*, and the jug in St. Maurice (Fig. 10) also belonged functionally to this domain, which counted as one of the central social events of everyday Roman life⁶⁹.

If we now turn to the perception of the object itself, we must first state that what is perceived – that is, the material described – is clearly identifiable. With respect to the minerals agate and fluoride, which have been discussed here, the common reference point for the appearance must be clarified. In this context we have to take into account that this appearance is described by ancient authors and formed through the medium of text⁷⁰. Only on this basis can we grasp the connection between the optical perception of materiality and an alteration of this perception in different contexts (assuming that a materiality is constant). Since no such description of finely carved precious stones has survived, the following discussion will make use of a source that discusses an engraved gemstone, examining the conflict between natural materiality and intentional design in a particularly vivid manner.

In the 3rd century A.D., Heliodorus of Emesa recounted the love story of the Thessalian nobleman Theagenes and the Ethiopian princess Charikleia in the ten books of his *Aithiopika*⁷¹. In the fifth book Heliodorus describes a ring set with an Ethiopian amethyst in great detail, including the bucolic scene engraved upon it:

'They [scil. amethysts] are like rosebuds just breaking into flower and bushing pink for the first time in the sunlight, but from the heart of an Ethiopian amethyst blazes a pure radiance, fresh as springtime [...]. Every amethyst from India or Ethiopia is as I have described, but the stone that

⁶⁵ See Yantis 2001; Nänni 2009. Starting with the Pre-Socratics on, the eyes were given priority over the other senses: see Grassi 1962, 48.

⁶⁶ Platz-Horster 2012, 29–32.

⁶⁷ See Platt 2006; Lang 2012, 98–106; Grüner 2014. Seals made with cameos are extremely rare (see Boussac 1988, 326 f. Fig. 40).

⁶⁸ See Schenke 2003.

⁶⁹ If ointments were an important part of the *convivium*, as postulated by Elke Stein-Hölkeskamp (2005, 18 f.), then it may be assumed that stone vessels, which were used as *balsamaria* to store precious oils, were often employed there.

⁷⁰ This cannot however be said of all precious stones in antiquity. On the attempt to match ancient terminology with modern designations, see Thoresen 2017, 175–179 with a tabulated overview. See Thoresen 2017, 198 f. for the explanation of the problem of inconsistent terminology between modern gemmology and mineralogy.

⁷¹ Morgan 1982, 221–265; 1996, 417–456; Winkler 1982, 93–158.

Kalasiris was now presenting to Nausikles was far superior to all others, for it had been incised and deeply carved to present living creatures. The scene depicted was as follows: a young boy was shepherding his sheep, standing on the vantage point of a low rock, using a transverse flute to direct his flock as it grazed, while the sheep seemed to pasture obediently and contentedly in time to the pipe's melody. One might have said that their backs hung heavy with golden fleeces; this was no beauty of art's devising, for art had merely highlighted on their backs the natural blush of the amethyst. Also depicted were lambs, gambling in innocent joy, a whole troop of them scampering up the rock, while others cavorted and frolicked in ring around their shepherd, so that the rock where he sat seemed like a kind of bucolic theatre; others again, revelling in the sunshine of the amethyst's brilliance, jumped and skipped, scarcely touching the surface of the rock. The oldest and boldest of them presented the illusion of wanting to leap out through the setting of the stone but of being prevented from doing so by the jeweller's art, which had set the collet of the ring like a fence of gold to enclose both them and the rock. The rock was a real rock, no illusion, for the artist had left one corner of the stone unworked, using reality to produce the effect he wanted: he could see no point in using the subtlety of this art to represent a stone on a stone! Such was the ring⁷².

In this description the artificial character of the ring is pushed increasingly into the background. It is the material properties of the amethyst in particular that allow the pelt of the sheep to appear a luminous gold. On the one hand, the setting permits the stone to be worn, and on the other it is understood as an element of the design, since it functions as a golden enclosure for the herd⁷³. Through this interplay, the relationship between motif and material becomes so intense that, by the end of the description, the line between art and reality fades.

The process that Heliodorus describes can also be used for understanding the finely worked jewels examined here. Natural characteristics and technical modifications were not seen as conflicting ideas, but rather as mutually enhancing. They did not compete with one another, but rather aimed to achieve an optical effect or impact that only competed with – and was ultimately surpassed by – the literary reshaping of the experience. Thus, the passage by Heliodorus offers ideas that we can glean much from.

The natural beauty of the cameos emphasised in the sources was, as the examples above have demonstrated, usually modified. In contrast to the view of van de Velde cited in the introduction, here the natural characteristics of the material were emphasised despite the practices of modification evidenced and already well-known in antiquity. It is therefore evident that cameos are hybrid objects in which art and nature flow together through human intervention. This alone produces unique optical effects. If we are trying to gain an enhanced perspective on carved and engraved stones in antiquity, as well as their contribution to overarching questions concerning aesthetic, function and semantics, there is little value in setting these two aspects against one another. These stones also contradict the notion that all art is an imitation of nature, an idea widely attested in the literature⁷⁴. Cameos were not created from abstract ideas, and imagined forms were not simply imposed upon the material (as proposed, for example, in the design theory of the Stoics)⁷⁵. Precious stones offered gem cutters numerous concrete starting points from which to work, so that pictorial ideas could arise under the power of that materiality⁷⁶. The resulting forms were the outcome of transforming natural material to create meaning or significance. The material was not just the substance from which a pictorial design was made, but rather a feature of the motif itself. In response to the question posed by Pliny referenced in the title of this paper, one might say 'art, because

⁷² Heliodor. 5, 14, 2–4. See also Menze 2017, 266 f. I would like to thank Markus Deufert und Andreas Hainichen (Leipzig) for their discussion of this passage in the context of a shared seminar.

⁷³ For a parallel, see Anth. Gr. 9, 747; Zwierlein-Diehl 2007, 2.

⁷⁴ Sen. Ep. 65, 3.

⁷⁵ See Grassi 1962, 152–157.

⁷⁶ This goes much further than the considerations offered by Platt (2018, 231), who argues that the connection between nature and art in sculptural works and painting could inspire reflection upon nature.

this is also nature'. Even if form is only revealed by engraving, this form was still based directly upon the natural materiality and the possibilities that stemmed from it⁷⁷. The artistic representation shifted the focus of the perception to the meaning or significance of forms. Yet the colour, form and brilliance of the precious stone could prefigure the following pictorial-symbolic process, meaning that the natural material dimension of the object retained its agency even when engraved, and was therefore not limited to being the passive product of the craftsman's intervention⁷⁸.

Finally, in the case of cameo vessels we must take into account the visual effects that would have made an impact during use at the *convivium*. Statius, for example, emphasises how vessels made of rock crystal and fluorite increase the charm of wine⁷⁹. Translucent rock crystal and fluorite cannot be directly compared in terms of their visual effects, though the passage proves without doubt that attention was paid to them. It also demonstrates that the objects were valued for more than their practical use or their figurative/pictorial qualities⁸⁰. In the case of the *murrina vasa* it was precisely the combination of their varied natural colouring with the crimson-coloured wine that produced perceivable effects when the vessel was actively used. The inviting character of such vessels was not solely a consequence of their practical use (and thus cannot be thought of as purely functional), but rather was simultaneously inspired by the viewer's experience of the vessels' optical effects. An enhanced form of the same dynamic can be postulated for cameos. Their small-format representations were designed for close-up viewing and therefore worked primarily in contexts of close social interaction. If necessary, they could be held to fully 'open up' the image. The optical impact of cameos and cameo vessels therefore possesses a dual character. They provide access to the object, but only reveal themselves fully in active use.

Alongside the concrete powers credited to precious stones (which have not been discussed here), one of their fundamental properties is their constant oscillation between material and image⁸¹. We can read them simultaneously as a sensual manifestation of our experience of the world's natural beauty, as well as a pictorial view of that same world. The process of crafting the precious stone grants it a natural effect that remains present in every context in which it is perceived. In this way, the artistic (and thus artificial) techniques employed to enhance the material's natural effects therefore always leads us to the origin of its materiality and its sensual appearance⁸².

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⁷⁷ Such an approach would most likely find its equivalent in the Neoplatonic model of refinement: see Plot. 5, 8, 1; Halfwassen 2007, 43–58. But see also Cassirer's ([1942] 1994, 43) remarks on the dimensions of materiality and meaning.

⁷⁸ They retain parts of their expression in the sense of Cassirer, even when their representation has been transferred to a linguistic, and therefore different, level of perception through classification of the image: see Cassirer [1929] 2002, 134–137.

⁷⁹ Stat. Silv. 3, 56–59: '[...] he bears first cups to the great leader, weighty murrhine and crystal, with a hand more fair. New grace enhances the wine' (*hic pocula magno prima duci murrasque graves crystallaque portat candidiore manu; crescit nova gratia Baccho*). I thank Anna Anguissola pointing this passage out to me.

⁸⁰ Here we must consider whether such descriptions should be understood as references to the expression of objects and thus to an element that precedes meaning, following Cassirer ([1929] 2002, 134 f.).

⁸¹ Sensual expression (such as colour effects) and significance (such as pictorial representations) cannot be clearly separated. To explore these levels further, see Cassirer [1929] 2002, 124.

⁸² For a comprehensive discussion, see Cassirer [1929] 2002, 119, who differentiates the experience of expression (a lower form) from what he calls thing-perception (*Dingwahrnehmung*) (a higher form). The constant mention of the natural properties of precious stones in the sources demonstrates that such fundamental experiences always had to be taken into account for such stones, even when they had been formed by human intervention.

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Fig. 8: Su concessione del Museo Archeologico Nazionale di Firenze (Direzione regionale Musei della Toscana).

Fig. 9: Vienna, KHM-Museumsverband.

Fig. 10: Saint Maurice, Trésor de l'Abbaye de Saint-Maurice (Jean-Yves Glassey and Michel Martinez).

Fig. 11: Vienna, KHM-Museumsverband.

Fig. 12: Vienna, KHM-Museumsverband.

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