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Manufacturing and secondary treatment of gold foil figures

ALEXANDRA PESCH

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Gold foil figures form a fairly standardised class of archaeological finds in the Vendel or Merovingian Periods. Their overall production process appears to be fundamentally simple. Nevertheless, there still are many unanswered questions regarding the technique and the timing of the various work steps. This article sheds light on the options during and manipulations after fabrication, focussing on discernable alterations to already finished gold foil figures, such as the attachment of additional gold strips that apparently were intended to represent neck rings. Actions like this either belong to the usual and proper usage of gold foil figures in the context of the related cult, or they are evidence of later adaptations of individual gold foil figures, possibly for other religious or even secular practices. Other pieces show various signs of damage, such as scratches or puncture marks, some of which appear to have been inflicted deliberately. However, as this kind of manipulation cannot clearly be assigned to a specific time, considerations about their purpose remain problematic.

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Introduction

The charming golden foils with embossed human figures are a truly fascinating class of finds from the first millennium AD. They were called *guldgubbar* by Swedish fishermen, who noticed them in the 18th century (Lamm 2004, 60). Since then, similar finds have come to light at many Scandinavian sites – and in today's Scandinavia only. The old term *guldgubbar* (cf. Dan./Norw. *gubber*), meaning "golden old men", is still in use today; but the English wording "gold foil figures" seems more appropriate, as a large part of them are depictions of women, while others feature a couple of woman and man. Frequently, however, the gender is not clearly recognisable. In rare cases, so far only from Bornholm, animal figures are depicted.

Much ink has been spilled on these tiny objects. Numerous publications by renowned scholars (especially Watt 1992, 2004, 2007, 2019; Lamm 2004; see also Hauck 1998; Pesch and Helmbrecht 2019; Rundkvist 2023) have addressed various facets of the topic, such as the pictorial representations, the places where they were found, or the general significance of the objects. Without delving deeper into the problems of the concrete semantic, religious, and social meanings of the gold foil figures, it can be argued that they basically served to visualise and circulate specific ideas, traditions, and philosophies: they were means to conduct cultural and religious rituals and to communicate with the gods or other supernatural beings (Helmbrecht 2011, 270–72, 2013, 12; Pesch and Helmbrecht 2019, 440–41; Sundqvist 2019; Watt 1992, 224).

Among other things, issues relating to the production technologies of the tiny foils were addressed in scholarly writing, but there still are unanswered questions. In this article, I will shortly summarise the current state of research concerning the manufacturing of gold foil figures and present some thoughts on secondary treatments: what actually belongs to the primary production sequence of gold foil figures, and which later manipulations can we find?

The making of gold foil figures

It is striking that gold foil figures rarely occur as single finds in the archaeological record. At sites where their

exact find locations are known, they always seem to occur in larger, sometimes even huge quantities. This leads to the conclusion that gold foil figures usually were produced and used in large numbers. For central places like Sorte Muld, where to date more than 2600 gold foil figures have been found, it is reasonable to assume a kind of mass production (cf. Pesch and Helmbrecht 2019, 430–31). And despite the variety of postures and gestures (Watt 2004, 204–9, 2007, 2019, 44–47), costumes (Mannering 2017; Mannering and Strand 2008), and attributes (Watt 1992, 208, 2004, 209–14) that are depicted, the gold foil figures remain a relatively standardised group. Basically, there are only three motifs: 1. a single female, male, or sexually indeterminable figure, 2. an anthropomorphic couple, or 3. a zoomorphic figure. Other motifs, such as buildings, ships, plants, or landscapes will be searched in vain. In shape, the majority of the figures are rectangular – they are never, for example, triangular or roundish.

But there are different manufacturing types of gold foil figures (for the definition, see Watt 2019, 36–37). The "classic" types, to which belong the majority of finds, were made from wafer-thin gold foil that was stamped with dies, i.e. patrices with positive relief. Additionally, there are examples where the outlines of the figures were cut out directly of gold foil. Sometimes even plastic figurines are referred to as gold foil figures, due to their miniature size and their spatial association with gold foil figures. Thus, "gold foil figures" were not all produced in the same manner.

In fact, the actual production of a large part of the gold foil figures essentially can be reconstructed quite well. Researchers have dealt with this before, most notably Margrethe Watt, who has followed each and every track in the world of gold foil figures (e.g. Watt 1999), and Jan Peder Lamm (2004, 109–12). All that is needed is a piece of gold sheet and a die; then the sheet is pressed on the die or vice versa. After that, the embossed part is cut out of the sheet, and the gold foil figure is complete.

This may sound very straightforward, but right from the beginning, there are a lot of difficulties and possible alternatives in the processing (cf. Figure 1). To start with, the manufacturing of sheet metal is not easy at all. In the Vendel Period, no devices were known to roll out gold into thin sheets; instead, gold had to be hammered out in order to create wafer-thin foils (see Armbruster 2012). This is a time-consuming and exhausting process that also requires the material to be heated frequently, or it becomes brittle and cracks (Gullman in Lamm 2004, 113); this task needs a lot of experience and skill (Armbruster 2012; Pesch 2015, 515–19). And, first of all, the

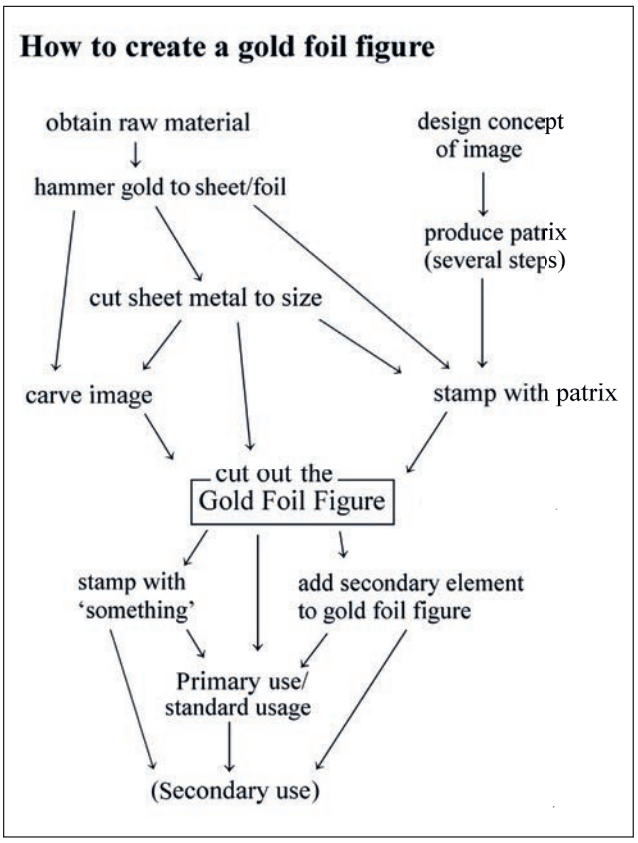

Figure 1. The steps and options of making a gold foil figure. Diagram: Alexandra Pesch.

raw material is needed. In the Vendel Period, gold was relatively rare – in contrast to the earlier Migration Period, the "golden age", where Roman *solidi* coins were available in abundance and served as source for gold. The shortage that began in the middle of the 6th century could be a consequence of the "Late Antique Little Ice Age" (Büntgen et al. 2016), the climatic catastrophe that began in AD 536 and covered the Northern hemisphere with a long-lasting veil of dust. This destroyed the harvests and led to hunger, armed conflicts, and major changes in the way of life in the North (Axboe 2001; Gräslund and Price 2012; Høilund Nielsen 2015), which also cut off the inflow of Roman goods. People began looking for new ways to communicate with the gods, and so, probably at the end of the 6th century, the gold foil figures were invented (Pesch and Helmbrecht 2019, 443–45, 2024). Thanks to the extreme thinness of the foils, the gold could be used sparingly for their production (Watt 2004, 216). In purely mathematical terms, around 100 gold foil figures could be produced from a humble gold ring (wedding ring) (Gullman in Lamm 2004, 113) – or put another way, from one roman *solidus* with an average weight of 4.5g dozens of specimens could be fabricated.

Returning to the problems of manufacturing, the process of stamping is not easy either. First and foremost,

a die is required. Using dies makes it possible to produce whole series of figures featuring exactly the same motifs. Several series of such die-identical specimens are known, either from the same site or from different places (see e.g. Eketorp hoard: Lamm 2004, 65–66; Pesch and Helmbrecht 2019, 24–25; Uppåkra series: Watt 2004, 179). In most cases, the dies are lost, but they can be reconstructed based on the gold foil figures that were made with them. In 2019, Margrethe Watt identified a total number of 725 different dies (Watt 2019, 39); and in recent years a growing quantity of genuine dies for gold foil figures have come to light, often discovered by metal detectorists, but also found in regular excavations (Watt 1999, 2019, 39–40, 47–48). They are made from copper alloys and come in different shapes. Usually, they are metal blocks that show the motif on the top, always in positive relief (= patrices). Due to their small size, they are difficult to handle, but it is possible that originally, they were set in a holder or some sort of lining; in any way, thin pads of leather or fabric were required while stamping to prevent damage to the gold foil. The dies from Järrestad in Scania, Sweden and Vester Egersborg in Sjælland, Denmark feature long handles on the face bearing their images (Lamm 2004, 105; Watt 2019, 58). Strangely enough, some of the known "dies" are actually too large to be used as stamps for tiny gold foil figures (see e.g. Watt 2019, 57, fig. F); whether these are objects of a different purpose, despite their clearly gold foil figure-like images, is a matter of debate.

Up to this point in the proceedings, the production of classic gold foil figures with dies may sound like a more or less formalised and standardised procedure. But this is not really the case, because every piece was processed manually. The figures were cut out individually, usually in simple square shapes. Figures from the same die can be cut in different ways, however (cf. Watt 2004, 179, fig. 11). Often the cut followed a framing that was already laid out in the die (concerning framing, see Behr 2019). Many figures were even completely freed from the background sheet and cut out, following all body contours; many examples for the latter come from Sorte Muld, Bornholm, for example, but also from several other places (see e.g. Lamm 2004, 100–1; Watt 2004, 180–84, 2008, 51).

Additionally, there are figures that were not die-stamped, but simply cut out of the gold foil in outline. Less frequently, figures occur that have been scratched into rectangular gold foils, while others have been both scratched and cut out. And, as a final variant, there are figures that were cut out first and then stamped – not with the usual dies, but using unusual means, including apparently the face of a Roman figurine (see Watt 2019, 55, fig. 1A, 65, fig. 20). It is impossible to tell whether the stamping was performed before or after the cutting, as both ways are feasible. Partly, the procedure depends on the shape of the die: if it is a small block die, the handling seems to be easier if the die is repeatedly pressed on a large gold sheet rather than on a tiny rectangle of foil; but if the die has a handle, it appears more likely that it was the foil that was pressed on the die – and in this case, small pieces would work better. But this is merely hypothetical.

All in all, production techniques were diverse (see Figure 1). Still, as various types of gold foil figure production (such as stamped, scratched, or cut) occur in the same places, they do not come from different production sites and do not represent local styles or traditions.

Some gold foil figures are so unique or so simple that they may have been made by untrained persons. But the majority, especially the stamped ones, were obviously produced by specialised craftsmen on a large scale. Although it is unclear whether the actual manufacturers of the figures cut them out in their entirety or whether the users (e.g. priests or cult specialists, customers, or worshippers) removed, for example, the rims of the foils, a huge amount of objects was fabricated. But it was not a mass production in a modern sense: it can be concluded that all gold foil figures were processed individually during their primary manufacturing.

Secondary features

After primary production, further activities with gold foil figures can be identified. There are indications for secondary reworking and manipulations of the tiny images as additional aspects of the manufacturing process. Furthermore, there have been deliberate destructions of gold foil figures.

A surprising feature that has been noticed before in scholarly writing are secondary neck rings: a good example is a gold foil figure from Uppåkra (Figure 2) in southern Sweden (Watt 2004, 182; cf. Back Danielsson 2013, 13). It is die-identical to other foil figures from that famous central place, but the only one in the series that is equipped with an extra gold strip. This strip is placed around its neck – obviously a secondary element in the creation of the foil figure and its imagery.

This would hardly be remarkable if it was an isolated case, but some more specimens with such secondary neck rings have been published; seven of them come from Sorte Muld (Figure 3). The secondary neck rings occur on very different types of gold foil figures, including stamped and roughly cut-out pieces, that are neither motif-like foils, in terms of elements such as gestures or clothing,

nor particularly fine-looking or otherwise outstanding specimens. Most of them have no gender-specific characteristics, but there is no clearly recognisable female figure among them. This is strange, because different types of *primary* neck rings occur on stamped gold foil figures on both men and women (cf. Pesch 2015, 523–25; Watt 2008, 48). These rings already were created in the die and are an important part of the overall imagery.

The phenomenon of secondary neck rings is also known from another group of finds: Scandinavian figurines, some of which are almost as small as gold foil figures (Helmbrecht 2011, 366–70; Zachrisson 2019). A little figurine from Gullhullet, Bornholm (Figure 4a), features a neck ring of twisted wire, wrapped twice around the neck, and seems to be something between a gold foil figure and a figurine. Further examples are the statuettes from Slipshavn, Denmark, and Kymbo, Sweden (Figure 4b; Zachrisson 2003, 2019, 107–9). The latter actually has a primary neck ring, too, which closely resembles that of a figurine that was found in Gudme, Funen (Figure 4c); but here, there is no secondary neck ring. It is possible, though, that this primary ring was meant to be some sort of basis for attaching a secondary ring. Like the majority of the gold foil figures with secondary neck rings, the figurines are naked, wearing *only* a neck ring, thus underlining the overall importance of this feature.

In real life, golden neck rings were markers of dignity and power (Capelle 1999; Lamm 1994; Watt 1999, 211–13), especially in northern Europe and long before crowns came into fashion. Thus, a practice of applying them to humanoid figures appears to have been widespread, and it seems to have been a relatively common way to treat little figures in the Migration and Vendel Periods – even despite the fact that many secondary gold rings may have been lost in the ground. But for what specific purpose were the figures equipped with neck rings? Were those rings meant to concretise the motif (in the sense of an attribute), or should they add yet another layer of meaning? Were they intended to reinforce the image's message and power? Or should they simply increase the value of the figure with their additional gold? Ornamenting the extremely tiny, fragile foils with extra strips without damaging them surely was not at all easy. Therefore, there must have been a good reason.

Figure 2. Die-identical gold foil figures from Uppåkra, Scania, Sweden, height 1.3cm. The left one is equipped with a gold strip, folded around its neck. Photo: Bengt Almgren (Lund University Historical Museum).

The performance of a secondary action involves a second time horizon – which, however, cannot be defined. Manipulations like the addition of a neck ring could have been made during the primary production process. In this case, these operations would belong to the actual manufacturing of the gold foil figures, performed by the craftspeople themselves, and related to the proper primary function of the foils, their "standard usage" – about which we, regrettably enough, do not know anything more specific. Another possibility is that they happened shortly after the production. Then, the people who obtained, maybe purchased, and used the tiny foils added the rings, as individual acts – but still within the frame of the traditions concerning the standard usage. This might have to do with the performance of special rituals in which individual gold foil figures were used, such as in an act of initialising their expected agency. As a third option, the rings could have been added later, perhaps *much* later, and then, for example, in the context of a completely different action than the standard usage. In this case, this action could be evidence of a re-use of gold foil figures.

Literature on gold foil figures refers to belts as another secondary element (Back Danielsson 2013, 12), and one of the cut-out foils from Sorte Muld (Figure 3b) indeed not only has been equipped with a neck ring, but also with a belt made of a gold strip. In my research, however, I found this one example only. With figurines, I am not aware of any examples featuring secondary belts. In contrast, belts are very common as primary decorative elements. On gold foil figures, they appear regularly, sometimes in combination with a neck ring, and frequently, they are the only feature of an otherwise nude figure. Like neck rings, belts are considered a sign of dignity, and in mythology and folk belief, they are associated with physical strength and power (Runde in Meineke et al. 1999, 176–77; Watt 1999, 213).

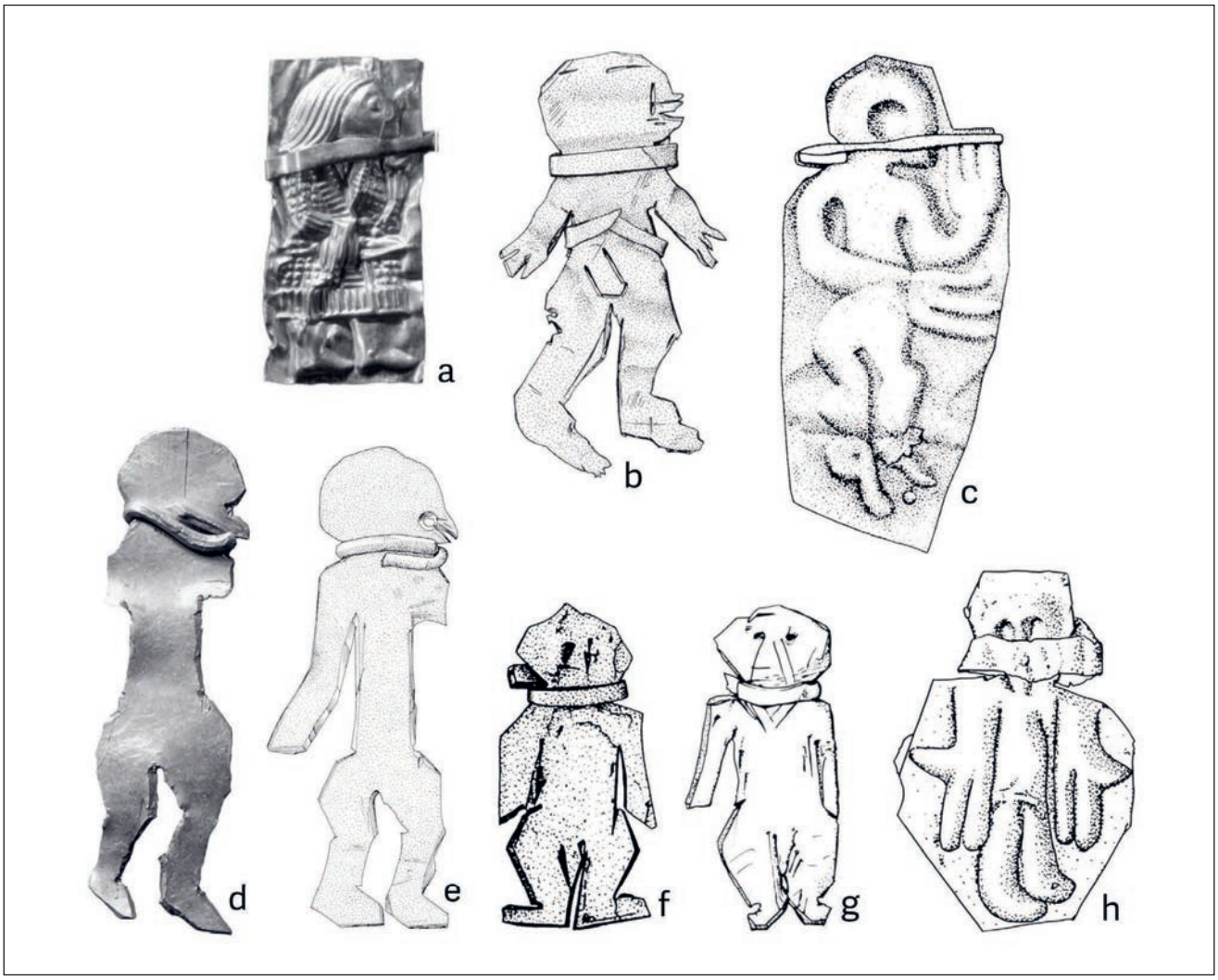

Figure 3. Eight gold foil figures with secondary golden neck rings from Uppåkra (a), Sweden, and Sorte Muld (b–h), Bornholm, Denmark; height of a 2.1cm. a–f: after Watt 1992, 2004, 2019; g and h: drawing Paula Haefs.

A third phenomenon of additions to gold foil figures mentioned in literature is a secondary *phallos*. Evidence for this, however, is even less convincing. There are gold strips from Uppåkra that are crudely shaped into humanoid figures (Watt 2004, 199–200), and one of them has been pierced with a rectangular piece of gold that protrudes on both sides (Figure 5). If this addition really was meant to represent a penis, as was tentatively suggested (Back Danielsson 2007, 121–22; Watt 2004, 199–200), it would be the only example to date; three related figures from the same site are even more doubtful. Besides, primary markers of genitals are very rare (Watt 2019, 43), so I am afraid this is leading nowhere. There is far too little evidence to assume a common or widespread custom.

The destruction of gold foil figures seems to be yet another type of secondary treatment, as many foils show scratches and dents. But were they damaged deliberately? It is extremely difficult to attribute such "injuries" to intentional actions with any certainty. Scratches and dents as well as tears and cracks can easily happen during the centuries the objects spent in the ground, simply by chance and natural courses. A certain number of the finds surely have actively been torn apart by human agency, but again, that this kind of destruction was the result of an *intended* action is hard to prove. In fact, we can only assume deliberate actions if a regularity is recognisable on different foils, a recurring pattern of scratches, perforations, or even breaks (cf. Hydman in Axboe et al. 1999, 235; Back Danielsson 2007, 124–26; see also Back Danielsson 2013). If scratches are concentrated on specific areas of the gold foil figures, such as the head or the genitals, this may serve as an indication for deliberate damage (see Watt 1992, 216, fig. 10a).

Another case that allows to think confidently of deliberate actions is when gold foil figures were rolled up (see e.g. Watt 2019, 65, fig. 18), as this cannot have happened by chance. I assume that a relatively common practice existed that belonged to the standard usage of gold foil

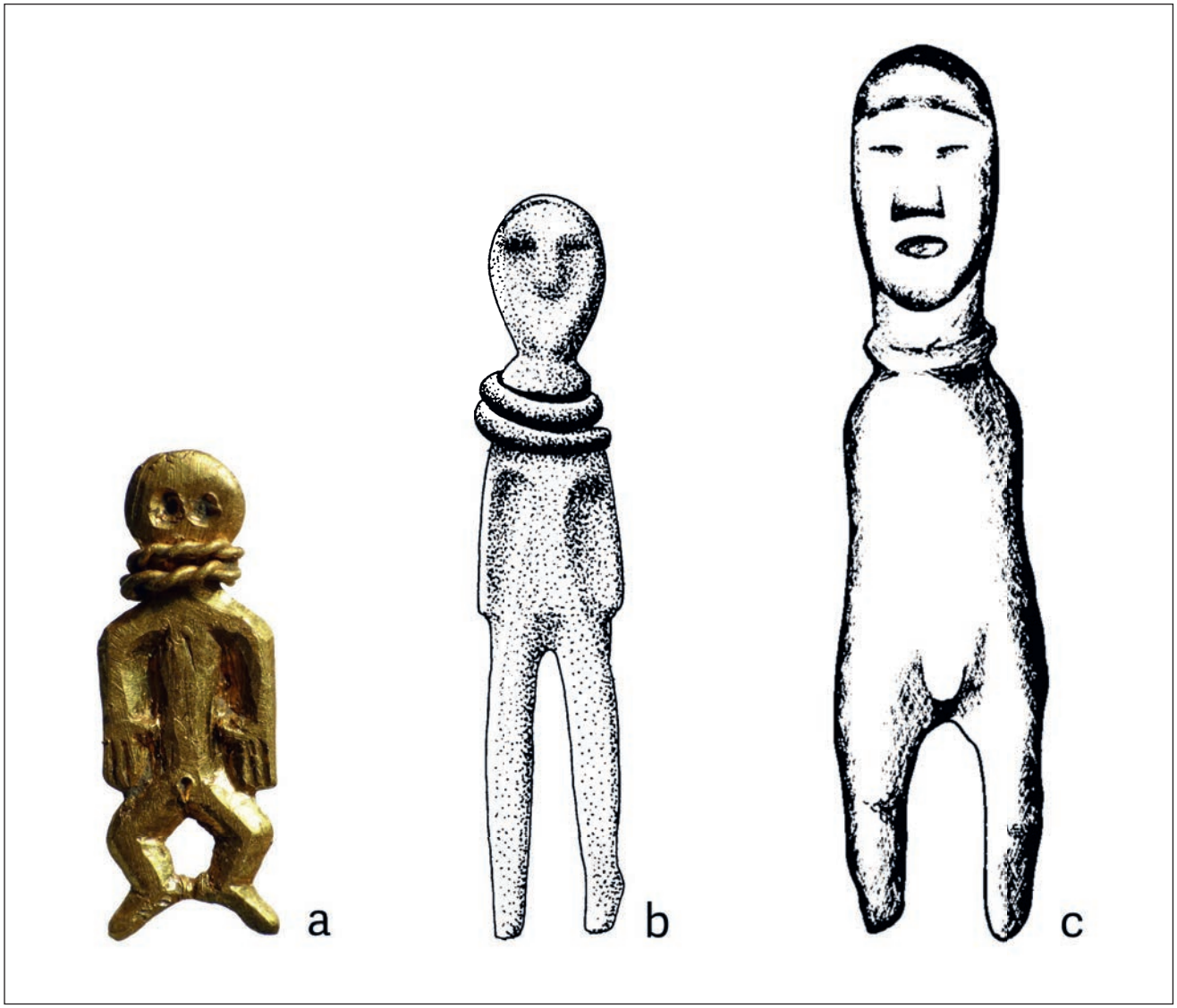

Figure 4. Figures (not to scale) from: Gullhullet, Bornholm (a), height 1.3cm, after Watt 2019, 55, fig. 1B; Kymbo, Västergötland, Sweden (b), height 3.4cm, after Capelle 1999, 459, Gudme, Funen, Denmark (c), height 6.7cm, after Hauck 1992, 555.

figures; the same applies to careful folding, which is a relatively frequent phenomenon (Watt 1992, 224). Parallels for this practice are Antique curse tablets (*tabellae defixionis*), made of lead (Brodersen and Kropp 2004). They were inscribed with curse formulas against a particular victim. The person who commissioned the curse activated its magical power by folding or rolling up the foil. Here, analogies can only be established theoretically, and the act of folding gold foil figures remains uncertain in terms of its significance.

So, what purpose did the destructions have? Did they have a specific meaning; did they carry an additional message? Was folding and rolling intended to enhance the desired effect of the images – as offerings or votives, for example? The damaging could have acted in a capacity similar to today's postmarks, which devalue and deface the beautiful postage stamps, but may also serve the actual purpose of the stamps themselves. Was folding meant to activate the figures – a practice that we know from the Antique lead curse tablets, for example? Then again, it also seems possible that destructive manipulations were directed against the gold foil figures themselves – against the images and against their overall purpose and social background. As images very specifically reflect political, religious, or cultural conditions, a destruction or manipulation can be an act of aggression against these conditions. We would have to assume that destructive actions happened outside the standard usage, probably at a later time.

And finally, destruction can also have had the purpose of taking the objects out of circulation by making them unusable for other people. In this case, the destruction

Figure 5. Gold foil figure with additional piece of gold (phallos?) from Uppåkra. Height 2.05cm, after Watt 2004, 200.

was not directed against the images and the beliefs they represent, but simply against unwanted usage by third parties.

Some more interesting cases of secondary treatment should be put on record. Some of the cut-out foils from Sorte Muld show multiple perforations or punch marks, which in one of them (Figure 3g) are concentrated mainly in the genital area. This is worth mentioning, because something similar has been observed in one of the slightly older Migration-period gold bracteates: during its conservation, numerous perforations and scratches were observed on the large B-bracteate from Söderby, Sweden (IK 538) (Axboe et al. 1999; Lamm et al. 2000). The central figure as well as the other figures of the bracteate were maltreated with stabs to the head, heart, and genital areas. The cited experts describe the damaging as a literally aggressive action, in an almost orgiastic manner, and interpret this procedure as a possible desecration ceremony, before the bracteates (and the hoard) were deposited in the earth as a sacrifice. Jan Peder Lamm even considered a ritual reminiscent of black magic (Axboe et al. 1999, 235). There were, in fact, similar practices in Antiquity: Roman magical figurines, for example, crudely made of clay, show multiple holes and other damages, especially in the head, abdomen, and genital areas (Nüsse 2011). They are interpreted in the context of harmful magic; today, the clay figurines would properly be called voodoo dolls (cf. for concepts of magic in general: Birkhan 2010; Daxelmüller 2005; Engemann 1975; Helmbrecht 2011, 41–44; Priesner 2019). So are the gold foil figures' stab wounds indications for black magic? Were they directed against someone or something the figures represent? This also depends on the question of whether the gold foil figures are ultimately images of gods (Hauck 1993; Holmqvist 1960; Lamm 1994, 117–24; Steinsland 1991) or rather representations of humans (Gustafson 1900; Pesch and Helmbrecht 2019, 438–40). In fact, it is difficult to say to what extent religious ideas or generally conducted rituals play a role here. However, the "*phallos*" from Uppåkra (Figure 5) probably should be seen in this context, too: the little figure was pierced and thus perhaps ritually killed.

Intentional destruction does not really occur regularly on a majority of the gold foil figures: manipulation and defacement of various kinds certainly exist, but remain the exception. As standard practice, it is difficult to recognise clear patterns for certain manipulations; but it seems that secondary treatment rather is evidence of individual actions of individual persons, albeit within the framework of generally known options of handling during the standard usage process. Thus, I assume that destructions do not reflect the aggressive rejection of the overall religion associated with the gold foil figures; instead, they may be expressions of special care or perhaps indication of magical beliefs. But still, the majority of the finds does not show deliberate scratches or perforations, they are not folded or torn, and they are not decorated with secondary elements.

Conclusion

In the making of gold foil figures, various levels of manufacturing, shaping, and further processing can be identified. There is evidence of manipulations probably meant to upgrade the foils, but also deliberate destruction to the tiny images. In this, it seems indicated that different time horizons are involved, but primary and secondary treatments cannot be distinguished easily in terms of time.

Perhaps systematic examinations, e.g. with 3D photomicroscopes, could provide further insights into the tools used, the techniques, and perhaps even the chronology of the changes. But for the time being, it remains problematic to try to assign image manipulations to a specific religious or political milieu, as the destruction of images is a widespread phenomenon throughout the ages, caused by many different reasons. Keeping this in mind, no conclusive statements can be made about the concrete religious or political backgrounds of the secondary treatments, and the interpretation of such actions remains hypothetical, too.

The majority of gold foil figures, however, obviously entered the soil intact: the images were used exactly as they were produced. Being as fragile and delicate as gold foil figures are, they certainly were not meant to be used more than once. In the end, they were disposable products, not made for sustained usage.

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