

# Gotland's Picture Stones

Bearers of an Enigmatic Legacy

**G**OTLAND'S PICTURE STONES have long evoked people's fascination, whether this has been prompted by an interest in life in Scandinavia in the first millennium or an appreciation of the beauty of the stones. The Gotlandic picture stones offer glimpses into an enigmatic world, plentifully endowed with imagery, but they also arouse our curiosity. What was the purpose and significance of the picture stones in the world of their creators, and what underlying messages nestle beneath their imagery and broader context? As a step towards elucidating some of the points at issue and gaining an insight into current research, the Runic Research Group at the Swedish National Heritage Board, in cooperation with Gotland Museum, arranged an international interdisciplinary symposium in 2011, the first symposium ever to focus exclusively on Gotland's picture stones. The articles presented in this publication are based on the lectures delivered at that symposium.

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 Gotlands  
Museum



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## Picture Stone Workshops and Handicraft Traditions

AN OLD QUESTION within picture stone research is whether the production of picture stones was carried out within different associations of carvers, linked to different schools and workshops.<sup>1</sup> I imagine a workshop as being a style-wise closely connected, social and economic unity with a master surrounded by apprentices. The workshop may have some kind of fixed home base, but would also be itinerant, occasionally even changing the location of its home base. When I say 'school', I mean a fraternity or circle of merely loosely associated carvers, who share the same stylistic features and/or motifs. The master of the workshop may adopt styles which will generate a model, which will eventually lead to a new school, where his apprentices in their turn will establish workshops and pass on the craftsmanship and wealth of treasure, etc. Thus, a school may comprise several workshops.<sup>2</sup> As regards other forms of artistic expression, apart from picture stones, there is within archaeology an extensive discussion concerning Viking Period handicraft and workshops: were the artisans itinerant or settled, what was their status, did trading and craft guilds exist, etc.<sup>3</sup> Would it be feasible to draw parallels between the production of picture stones and other contemporaneous craftwork?

In a research project conducted between 2006-2008, the carved image surfaces of 68 Gotlandic picture stones, as well as picture stone fragments, with an even distribution from Lindqvist's Groups A-E, were scanned with a portable optical 3D scanner.<sup>4</sup> The result of the 3D-scanning was a three-dimensional digital model of an image surface with high resolution, in this case 0.27 mm, which reproduced the structure of the surface with its dressing and cutting lines (fig. 1). Documentation using



Detail of the ARDRE CIST (G 114). Optical 3D-scanning with an 0.27 mm resolution between the measuring points. 3D-model by the author.

3D-scanning is gradually becoming widespread within archaeology. It takes analysis one step further, making use of the technique to analyse cutting techniques and use of templates as a means of distinguishing between handicraft groups and handicraft traditions. In this article, I will give examples of how 3D-scanning can help us to identify carver groups and picture stone workshops.

### Documentation Using Optical 3D-Scanning

The attributes, i.e. objects and accessories in the motif, play a vital role in the interpretation of the picture stones. They provide the key to the pictures on the stones, and show how these can be linked to myths and legends in the



Optical 3D-scanning of the picture stone  
BROSTENEN in Gotland museum's storeroom.  
3D-model by the author.

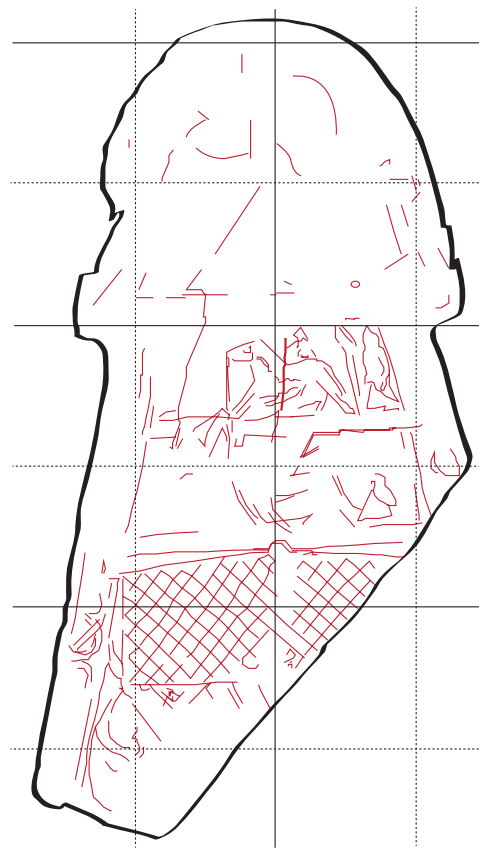
Norse pictorial world, as we know it, mainly from the Icelandic sagas and from motifs on metal objects, textiles, etc. Unfortunately, these picture stones are often in poor condition, the carved relief and incised lines are ill-defined and the motif may be scuffed or damaged. New analyses generally lead to new or reinterpretations of motifs which are of significance for iconographic studies.<sup>5</sup> It can be seen from literary sources on picture stones that interpretations vary considerably, depending on which details the interpreter has seen and attached importance to.<sup>6</sup>

Traditional methods used by picture stone scholars to highlight the motifs on the often decomposed or damaged image surfaces have included side lighting and two dimensional photographic methods. Making casts using latex<sup>7</sup> and frottage (rubbing)<sup>8</sup> have also been used as aids. In enigmatic cases, new details tend to emerge following virtually every new thorough examination, depending on method and lighting.

In Sune Lindqvist's classical *Gotlands Bildsteine* from 1941-42, the motifs on many of the picture stones have been highlighted with paint. Lindqvist explained that he had tried to avoid chalk or paint, but found it difficult to achieve distinct photographs, so he used the same method as had been used on runestones, namely

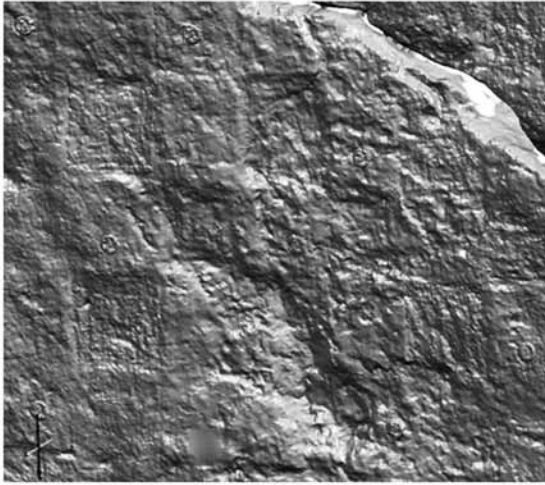
to paint contours and surfaces with water-soluble coloured pigment.<sup>9</sup> It should be emphasized that Lindqvist was also very much aware of the fact that highlighting motifs on enigmatic stones with paint meant that he had actually produced a form of reconstruction.<sup>10</sup> Therefore, he often also took photographs of the stones with a side light, prior to painting, whereby many details in the carving were projected. This technique may have been inspired by Erik Moltke, who had developed methods for recording runestones, using photography, in the 1930s. Lindqvist might also have used the same coloured pigment – carbon black (which is based on soot). Moltke meant that there were advantages to be gained from photographing the runestones both before and after painting – the former to highlight details, the latter to gain an overall view.<sup>11</sup> The photographs of the painted stones can thus be seen as useful for assessment and orientation.

Awareness of the significance of details, and of the fact that painting might conceal details that could block interpretations, has altered the modern view of how to treat picture stones. Whenever a limestone monument is painted, the coloured pigment actually soaks into the material. This is an irreversible action, which eliminates the possibility of analysis of any possible prehistoric traces of colour, as well as obstructing alternative deciphering and pictorial interpretations. Painting limestone monuments is definitely not recommended these days, it can actually be considered presumptuous that one single scholar's interpretation could influence a later observer's perceptions of a picture stone. A far superior alternative is for newly-discovered carved surfaces to be recorded using an optical 3D scanner, the interpretations being presented for example in a picture or copy or by a light show projecting images on the picture-stone photocomposition.<sup>12</sup> Only a few laboratory analyses have been made on Gotlandic picture stones, meaning that the greatest care should be taken in the event of new discoveries, where chances are greatest of finding and analyzing traces of original colour.

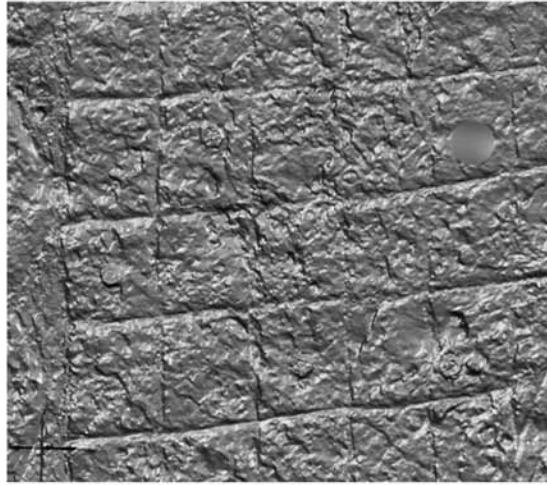


Interpretation of the picture stone BROSTENEN (Gotland Museum Inv.no. C21905 discovered in connection with cable trench digging) after 3D-scanning.

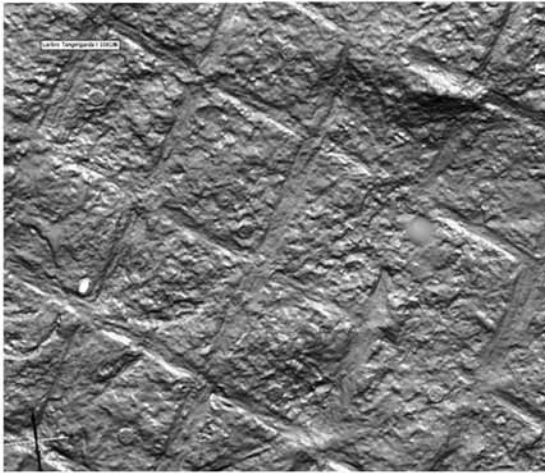
One example of 3D-scanning, which has produced good results, is the picture stone BROSTENEN, discovered in connection with cable trench digging in 2001. The first record was based on side light examination.<sup>13</sup> In 2007, the stone was subjected to 3D-scanning which resulted in the discovery of several other motifs on the carved image surface, including a formerly overlooked horserider. We can now draw the conclusion that the BROSTENEN stone is of the same type as the picture stone LÄRBRO STORA HAMMARS I (se bild s. 19).



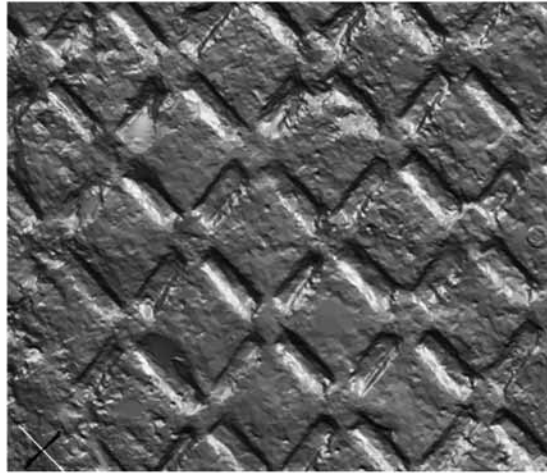
GARDE BOTA



NÄR SMISS I



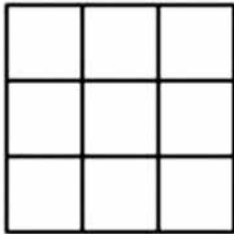
LÄRBRO TÄNGELGÅRDA I



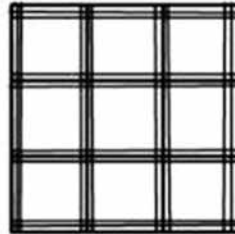
ALSKOG TJÄNGVIDE I



1



2



3



4

## Cutting Techniques in Picture Stone Ships

One subject of extensive discussion has been whether the picture stones illustrate real-life motifs, which can be used to understand facts about the material culture, or if the motifs are to be largely understood as mythological. The ship is widely known as the most common and most dominating motif on the Gotlandic picture stones, and has above all been the all-important subject of research within maritime culture. Some mean that they are mythological ships, while others claim that they are real-life depictions.<sup>14</sup> The sail of the picture stone ship, for example, bears a regular checked pattern, which has led to a tentative suggestion that the sail has been made of plaited lengths of woven fabric.<sup>15</sup> Some depictions seem to be more schematic than others, such as the uniform lozenges of the *ARDRE KYRKA VIII* and *ALSKOG TJÄNGVIDE I* stones, compared to the more billowing and slightly rounded carvings on the *KLINTE HUNNINGE I* stone. The debate of whether the ships are mythological or realistic will be left here, with the comment that even a realistic depiction can be of a mythological ship, and that the motif has been produced in a number of different ways.

I have studied the cutting technique in the sail on 13 picture stones.<sup>16</sup> At first glance there would seem to be as many variations as number of picture stone ships, but if we disregard the size and shape of the sail, we can see that the carver has chosen between different methods for highlighting the lozenges. The lozenges may be outlined with shallow cutting lines or with emphatic carvings; the sense of reality varies, depending on the different techniques employed.

Cutting techniques in picture stone sails. Example (above) and schematic pictures of different variants in craftsmanship (below). Photo and illustrations by the author.

The methods for highlighting the lozenges fall into four main variants (see facing page):

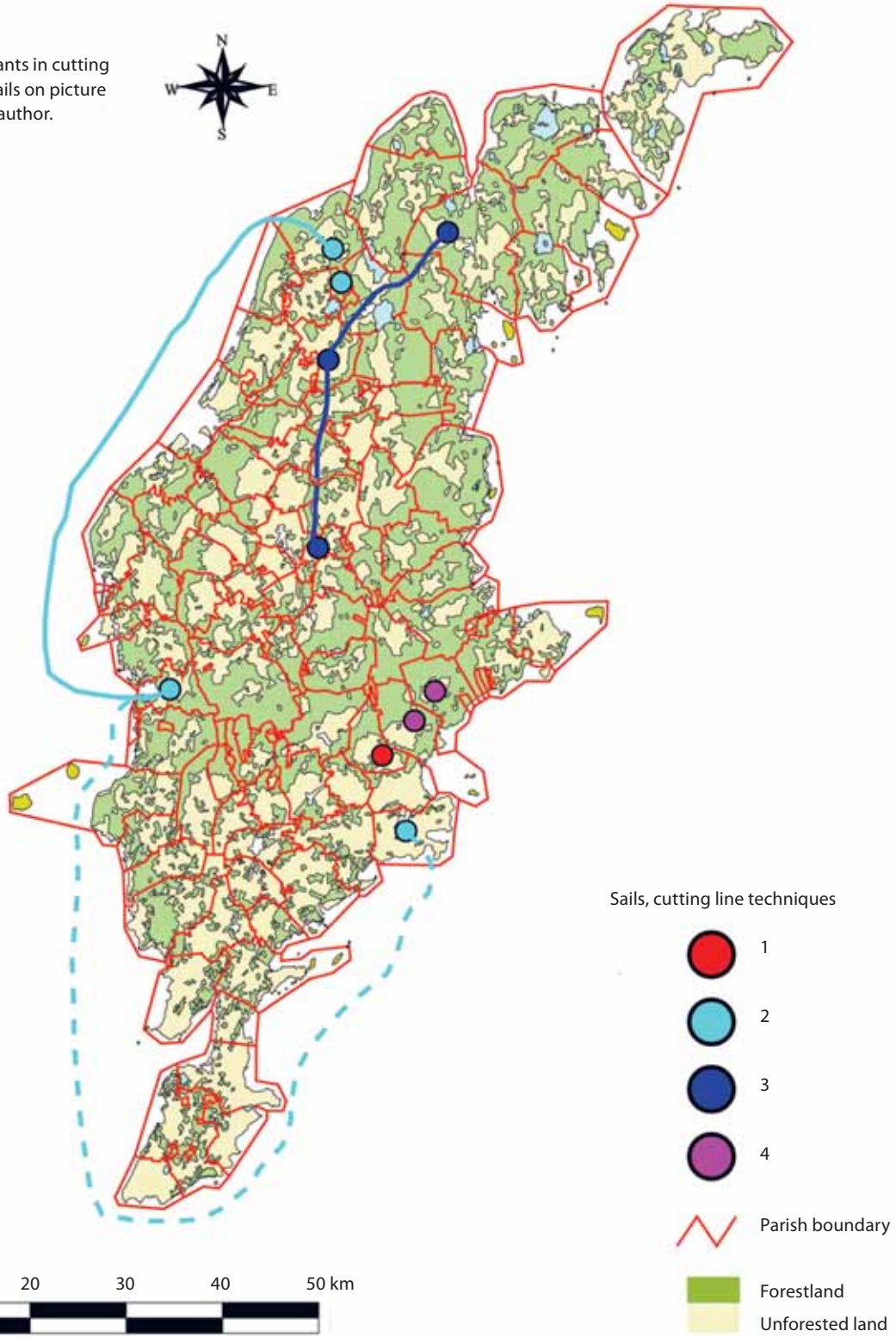
1. Shading, i.e. striation in every alternate lozenge. No lines. E.g. *GARDE BOTA*.
2. Shallow incisions, no more than a marked groove base. E.g. *KLINTE HUNNINGE I*, *STENKYRKA LILLBJÄRS III*. POSS. *STENKYRKA LILLBJÄRS XVII*, *STENKYRKA SMISS I*, *NÄR SMISS I*, *SHM Inv.no. 45110:I* (location unknown).
3. Broad carvings, parallel cutting lines appear in the groove base. E.g. *HALLA BROA IV*, *LÄRBRO TÄNGELGÅRDA I*, *LÄRBRO TÄNGELGÅRDA III*, *LOKRUME II*.
4. Deeply-cut lines accentuate rectangular panels. E.g. *ALSKOG TJÄNGVIDE I*, *ARDRE KYRKA VIII*.

Strictly speaking, this classification is not an analysis which directly singles out individuals or cutting techniques tied to any one workshop, but the discussion should rather focus on to what extent different carver groups have expressed different preferences and to what degree they have adhered to them. More evidence is needed, to be in a position to determine which cutting techniques belong to which individual workshop or carver.

When plotted on a map (fig. 5) we note that the examples of the relatively advanced techniques (1) and (4) are situated in close proximity on the east coast of Gotland. The simpler workmanship (2) can be found in two parishes on the west coast. Method (3) occurs in two parishes lacking direct contact with the sea, as well as one parish by a sea bay. One possible interpretation would be that this indicates interrelationships between the stone carvers along each coast respectively, while method (3) indicates connections between inland parishes. During the Viking Period, however, even the innermost parts of Gotland were accessible and navigable by boat via a series of waterways that were drained off later on in history. As indicated on the map, analysis of material in the parishes in between is lacking. Interpretations must thus be highly hypothetical and can



Map indicating variants in cutting line techniques in sails on picture stones. Map by the author.



only be regarded as submitted suggestions, with a high risk of over-interpretation. The selection made for analysis was based on the hypothesis that differences would emerge between the north and south of Gotland, but in a comparison of cutting techniques it might have been more fruitful to compare the west coast with the inland. If we compare this result with Lindqvist's hypothesis regarding a northern and southern school<sup>17</sup>, we can conclude that the evidence of craftsmanship tends to point towards a distinction between coastland and inland, or rather eastern and western Gotland. I must once again emphasize that this hypothesis needs to be supported by additional material. Meanwhile, this may be regarded as a possible means of systematizing our observations, enabling us to discern more extensive networks on an artisanal level. If we study the cutting techniques we can look beyond the mere fact that a carver can create picture stone ships of different types and sizes, according to the customer's liking and tastes.

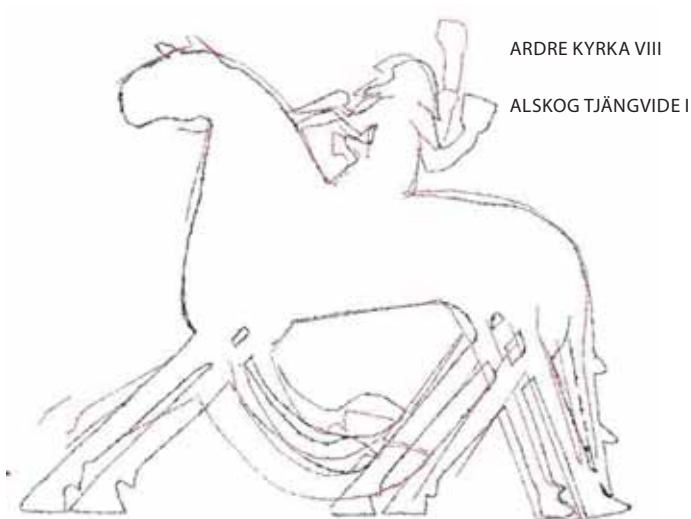
### The Use of Templates on Picture Stones

Another approach to studying the occurrence of picture stone workshops is to analyze if and in what way the stone carver has used templates or patterns. If the same template has been used on several picture stones, it is quite likely that it is either the same stone carver who has used them, or that a group of carvers have shared a common set of tools. Template studies have already been carried out on stone sculptures in Great Britain, e.g. on Anglo Saxon stone crosses, with interesting results.<sup>18</sup> Templates have been used for figures and parts of figures, in order to produce mirror images or adapt their size. They have also been divisible into sections. When the same template has been used in different locations, this has been interpreted as a sign of a central workshop, or an itinerant stone carver; in each case the stone sculptures may be contemporaneous within the time span of one generation.<sup>19</sup>

18 picture stones from Lindqvist's Groups C and D, dating from appr. 750 to 1 000 A.D.<sup>20</sup> and distributed across the entire island, have been examined. Templates seem to have been used on all of them. Whether the occurrence of the same template on different picture stones should be interpreted as an indicator of a group of stone carvers or of a workshop would depend on how the templates would seem to have been used.

The motifs have been filled in and isolated in the digital 3D models, after which concordance has been checked by superimposition. The question remains, how can we determine if these figures have been filled in according to templates and not just happened to be similar despite the fact that they were free-hand sketches? The criteria for template use in this study was that when the figures were superimposed, the outer contours would coincide, as would the fixed points for the extremities. I did, however, make certain allowances for differences in details within the outer contours. We must bear in mind that the templates were transferred to bulging stone surfaces, and that a template may have slipped when the contours were being filled in. Moreover, weathering and abrasion have added to the difficulties that even present day 3D models may encounter when filling in and isolating the motifs. Despite all this, they often display a surprisingly close match when superimposed. The templates have sometimes been transferred to the picture stone, despite lack of sufficient space, and figures seem to have been squeezed into cramped spaces, instead of being redrawn on a smaller scale.<sup>21</sup>

We shall now take a closer look at a Gotlandic example of template use. The ALSKOG TJÄNGVIDE I and ARDRE KYRKA VIII stones are so similar in composition that they have already been presumed to have been produced by the same stone carver, or emanate from the same workshop.<sup>22</sup> If we begin by scrutinizing the horse on both picture stones, we note that the outer contours are congruent. Note especially the neck, the placing of the head, the hind-quarters, abdomen and breast. At first glance,



Superimposition of the horses on the ALSKOG TJÄNGVIDE I and ARDRE KYRKA VIII picture stones.

The horse on the ARDRE KYRKA VIII stone has been squeezed into too small a space. The hind legs and tail are at odds with the border panel. 3D-model and illustration by the author.

the rider would seem to fall outside the template pattern. The template, however, may have slipped while the stone carver was filling in the outer contours, so that the body of one of the riders ended up at a different angle to the horse. The riders' arms are of differing lengths and are differently angled. A partial explanation might be that they had become too thin and limp on the template, and thus needed to be sketched by free hand. On the ARDRE KYRKA VIII stone, the template for the horse has been squeezed into a space that is too small, and the hind legs are at odds with the interlaced border panel and the hooves seem to merge into the border pattern. It would seem that the horses on the two monuments were both transferred from the same template, although the placing seems to be perfunctory and the craftsmanship less skilled on the ARDRE KYRKA VIII stone. The transference of the template to ARDRE KYRKA VIII seems to indicate a slightly more indifferent attitude towards the motif. Had the horse been drawn by free hand, it would have been better adapted to the inadequate space.

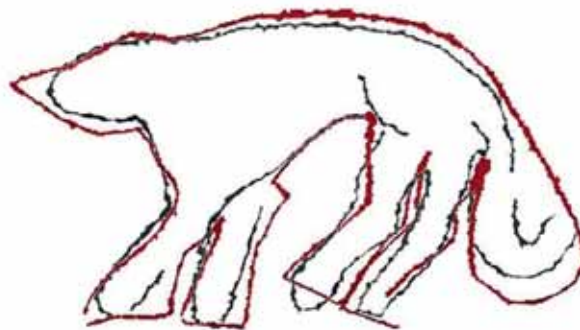
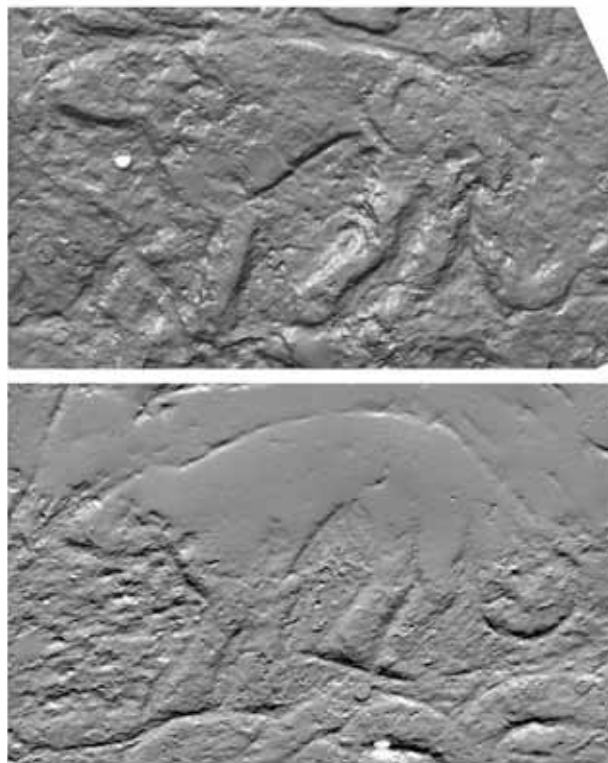
The canine-like animal should not be overlooked in this connection, since there are some interesting anomalies in the details, while the proportions of the body are concordant (fig. 8). The motif would seem to have been somewhat misunderstood on the ARDRE KYRKA VIII stone, in that the contours of the template have been followed, while the figure has not been corrected to tally with the carving of the details necessary to define the tail. It thus differs from the canine-like animal on the ALSKOG TJÄNGVIDE I stone, despite the fact that the same template was used for their outer contours. This is an example of use of the same template, coupled with a distinctive design.

Regarding the interlaced border panels, there are several different variations, and even here the same templates have been used on the ALSKOG TJÄNGVIDE I and the ARDRE KYRKA VIII stones. The overall picture is that the ALSKOG TJÄNGVIDE I and ARDRE KYRKA VIII picture stones have had a complete set of templates at their dispo-

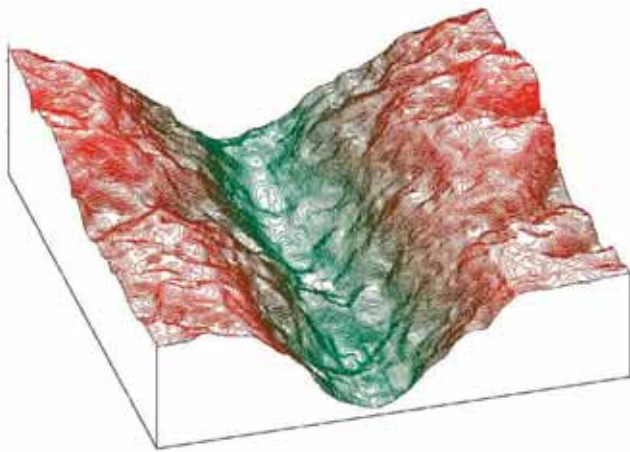
sition, five of which have been identified: horse, canine and three border panel decorations. As regards houses, the rolled-up prows of ships and the ship's crew, I cannot discern such distinct conformity.

There are numerous other examples, but these have been dealt with elsewhere.<sup>23</sup> The stone carvers would seem to have used the templates mainly to position the outer contours of the motifs, later filling in the details by free hand. A modern comparison would be our use of gingerbread cutters to create a uniform gingerbread man, which we then decorate with icing by free hand. The lack of details in the template may be due to its soft material. If the template is pliable, the details cannot be cut out, since the template would then fall apart. A harder template of several layers of leather glued together would be strong enough to enable the cutting out of smaller details and extremities. Templates could also be made of thin sheets of lead. Complete templates of leather, metal or fabric have been suggested, in the case of English stone sculptures.<sup>24</sup>

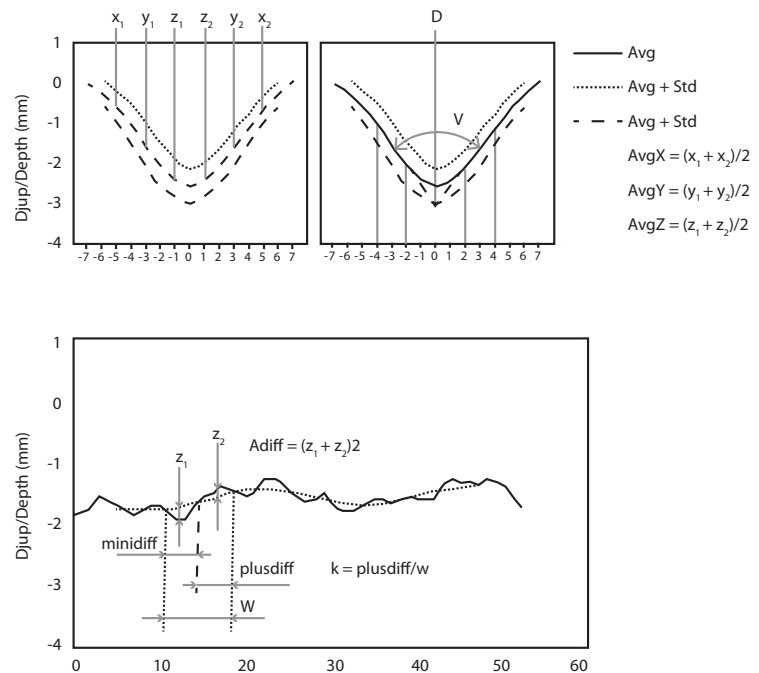
Can the use of templates tell us anything over and above the working methods of the individual stone carver? The creation of a design and the transference of a motif onto an object were actually two separate activities in some other craft connections, and it would thus seem to be a feasible argument for an increase in specialisation and professionalism within a certain craft.<sup>25</sup> One partially contemporaneous example is the tortoiseshell brooch, which could be cast in moulds which had been produced from existing jewellery. The bronze caster needed no more than a master model. Although craftsmanship was a prerequisite, he did not need to have artistic talents. As a result, some older designs may have had a long life, which complicates dating and provenance.<sup>26</sup> In the same way, somebody might have copied a motif on a picture stone and transferred it to another. One hypothetical possibility is that figures have been traced over to stone with the aid of fabric. If the figure is transferred to a fabric, the stone carver, by tapping on



The canines on the ALSKOG TJÄNGVIDE I and ARDRE KYRKA VIII stones have the same basic shape, but different designs in the details. On the ALSKOG TJÄNGVIDE I stone, the dog has a soft rounding of the nose and paws, while these are abruptly chopped off on the ARDRE KYRKA VIII stone. 3D-model and illustration by the author.



Variables for cut mark analysis of runestones. The table top right shows variables in cross section with distance from the groove base in mm. The table bottom right shows the characteristics in the longitudinal direction with distance along the groove bottom in mm. Graphic by the author.



the picture on the fabric, can create both the outer contours and inner details.

The use of templates leads us to the next question of whether the stone carvers have had some type of pattern book or set of patterns. The idea behind a pattern book is that motifs can be supplied to those who do not have access to the original. It would thus be more likely for an itinerant rather than a settled artisan to possess a pattern book.<sup>27</sup> Whoever created the pattern would have simplified the composition, focusing on certain details and almost certainly combining components of different originals. The people and animals in the pattern books were primarily intended to be portrayals of posture and actions.

Of greatest importance was to emphasize the outer contours, so that the units became distinct and comprehensible.<sup>28</sup> The templates could be combined in different ways, and the figures assume different characters, depending on which attribute they had been awarded.<sup>29</sup>

Earlier research claimed that the interlace decoration on the Gotlandic picture stones may indicate influences from the British Isles.<sup>30</sup> In another article, I have discussed whether the use of templates for border panels might indicate an attempt to imitate insular Celtic ornamentation without mastering the geometrical principles behind it. My conclusion is that interlace decoration as a motif may have been influenced by Western Insular art style, but the carvers of the Gotlandic picture stones might have been more at home in a Continental craftwork tradition.<sup>31</sup>

The use of templates on picture stones is possibly more in tune with a society which was increasingly adopting these tools. Regarding fine metalwork, the Viking Period saw increased specialisation and organizational development, and the question of whether templates were a sign of mass production has been discussed.<sup>32</sup> The question is whether this bears any relevance to stone

monuments, such as picture stones, which differ considerably from utility goods and jewellery. They are almost exclusively restricted to Gotland, which limits possibilities of a wider market. Even if finer metalwork and picture stone carving can appear to be completely different, the picture stones could still be part of the same development process, where tools such as templates began to be used to a greater degree than previously.

The abundant use of templates on Viking Period picture stones is in strong contrast to the earliest picture stone phase. A number of earlier picture stones from Lindqvist's Group A were examined in a student task on optical 3D-scanning, and the results were recorded in an M.A. dissertation by Anders Larsen. The 3D-scanning revealed that instruments such as compasses and rulers were used on the majority of the stones examined, whilst clear-cut evidence of templates is lacking.<sup>33</sup> This may reflect a progression in craftwork techniques from the earlier phase of picture stones during the Roman Period-Migration Period, to the later Viking Period phase.

### Cut Mark Analysis

A third way to approach to the carver and workshops is analyzing the cutting techniques, using optical 3D-scanning and statistic data analysis. It is a method used within the research of runestones, which has been described in detail in another connection.<sup>34</sup> In short the method is based on mathematically selecting runes and sections of decoration from a number of variables from the digital 3D model. These variables describe the shape of the groove in cross-section and the sequence of impacts along the direction of carving at the base of the groove. This method is suitable for runic inscriptions and for decoration on the picture stones in Lindqvist's Group E, which are actually runestones with a traditional picture stone shape, dating from the 11th and early 12th centuries.<sup>35</sup> The picture stone from HOGRÄN KYRKA 1 is one example (see picture p. 21). A prerequisite for this method of working is that there are distinctly cut lines, known as incised grooves, it

does not work on relief carvings. On the other hand, it can be used for runic inscriptions on monuments which bear relief carvings. The method can pinpoint individual rune carvers, as well as regional differences and differences between carver groups. On the mainland, previous examinations have revealed that known names of carvers actually often comprise a group of several carvers with varying standards of craftsmanship.<sup>36</sup> The comparison of runestones on Gotland can be delimited to the island, so as to clarify the interrelationships between carver and carver groups. It is also possible to conduct a broader regional study, whereby the Gotlandic runestones can be compared with those on the central Swedish mainland, for example. If we presume that rune carvers were somehow connected to individual households, in the long run their constellations might turn out to mirror spheres of interest, administrative regions, common venues or some kind of social solidarity.

### Summary

In this article, I have attempted to demonstrate how analysis using optical 3D-scanning can contribute to the discussion of Viking Period picture stone workshops on Gotland. 3D-scanning is a highly valuable method for the recording and analysis of the carved motifs, cutting techniques, the use of templates and cut mark analysis. The carved image surfaces of 67 Gotlandic picture stones and stone fragments, evenly distributed among Sune Lindqvist's Groups A-E, were 3D-scanned within a research project carried out between 2006 and 2008.

On 13 picture stones, the cutting technique in the picture stone sails was examined and classified. The cutting technique in the sail can be divided into four main groups, depending on how the lozenges in the sail were technically achieved. The different cutting techniques might well reflect contacts between carvers in the coast or inland parishes, alternatively between carvers in the east or west of Gotland. However, more evidence must be produced before any definite conclusions can be drawn.

The use of templates on 18 Viking Period picture stones has been examined. The templates have been used on all selected stones and the use of templates to transfer common motifs, such as horses, people and interlaced decoration, is geographically spread across the entire island. When the same equipment is used on several stones, this would seem to indicate a carver group or a workshop. The abundant use of templates on the Viking Period picture stones provides a distinct contrast with the earliest picture stone phase, where we contrarily find evidence of the use of compasses and rulers.

The third method presented is cut mark analysis, using optical 3D-scanning and statistic data analysis, a method which was earlier used on central Swedish runestones. It can be implemented on runic inscriptions and incised decoration. Cut mark analysis may be an indication of carver groups and carver networks.

## Notes

1. Lindqvist 1941, p. 46, 49; Westphal 2004, p. 422; Eshleman 1983, pp. 300, 303, 306.
2. Kitzler Åhfeldt 2002, pp. 63–65 and quoted literature.
3. O'Meadhra 1987, pp. 166–169 and quoted literature; Thunmark-Nylén 2006, p. 422; Neiß 2009, pp. 94–95, 2010, pp. 137–138; Gustafsson & Söderberg 2007, p. 100, 108.
4. The project *3D-scanning av Gotlands bildstenar: Verkstäder, ikonografi och datering* was carried out 2006–2008 at the Archaeological Research Laboratory (AFL) at the University of Stockholm with funding from the Anna Ahlström and Ellen Terserus foundation. An optical 3D-scanner ATOS II from GOM was used, financed by the Swedish Research Council. The results are available to the public via the Swedish National Heritage Board homepage 3D-data Gotlands bildstenar (<http://3ddata.raa.se/index.html>) by way of downloadable files in the STL-format (Kitzler Åhfeldt, Manuscript a).
5. Oehrl, S. 2009, pp. 544–546, 550 and his article in this volume.
6. A compilation of different interpretations of C och D stones has been made by Böttger-Niedenzu 1982.
7. Hauck 1977, pp. 13–14.
8. See drawing by Alexander och Helena Andreeff in Norderäng & Widerström 2004, p. 86 Picture 3 and Andreeff in this volume.
9. Lindqvist 1941, p. 13.
10. Lindqvist 1941, p. 15.
11. Moltke 1932, p. 338.
12. Cf Bjelland & Helberg 2006, p. 73; Hygen 2006, pp. 20–22, 27; also see Simonsson in this volume.
13. Norderäng & Widerström 2004, p. 87, Fig. 6.
14. Nylén 1982; 1987, pp. 75–84; Edberg 1993; Crumlin-Pedersen 1997, pp. 174–175; for a critical survey see Varenius 1992, pp. 51–54.
15. Nylén 1982, pp. 34–35, 40–41 Picture 3.
16. HALLA BROA IV, KLINTE HUNNINGE I, LÄRBRO TÄNGELGÅRDA I, LÄRBRO TÄNGELGÅRDA III, LOKRUME KYRKA, STENKYRKA LILLBJÄRS III, STENKYRKA LILLBJÄRS XVII, STENKYRKA SMISS I, ALSKOG TJÄNGVIDE I, ARDRE KYRKA VIII, GARDA BOTE, NÄR SMISS I, SHM Inv.no. 45110:I. A more detailed account of the examination has been presented in Kitzler Åhfeldt, Manuscript b.
17. Lindqvist 1941, pp. 46, 49.
18. Adcock 1978, p. 33; Bailey 1978:180–185, 1980:246–253; Lang 1991:48, 2001:28, 45–47.
19. Bailey 1978, pp. 180–185; 1980, pp. 246–253.
20. Snædal 2002, p. 52; Imer 2004, p. 106.
21. Ex. the horse on ARDRE KYRKA VIII, interlacing on NÄR SMISS I.
22. Lindqvist 1941, p. 49; Christiansson 1952–67, p. 459; Lamm 2006, p. 8; Wilson 1995:64.
23. Kitzler Åhfeldt 2009.
24. O'Meadhra 1987, p. 126 and quoted literature; Bailey 1978:183, 1980:253.
25. O'Meadhra 1987, pp. 117–118; Blidmo 1976, p. 11.
26. Jansson 1981, pp. 6–7.
27. Scheller 1963, p. 7, 1995, p. 41.
28. Scheller 1995, pp. 41–42.
29. Scheller 1963, p. 14.
30. Lindqvist 1941, p. 135.
31. Kitzler Åhfeldt 2009, p. 149.
32. Thunmark-Nylén 1995a, pp. 118–119; Callmer 1995, pp. 65–66.
33. Larsen 2009, pp. 28–29.
34. The statistic analyses are described in Kitzler Åhfeldt 2002, but the equipment has been upgraded. Since 2005, an optical 3D-scanner ATOS II (GOM) has been used, with which the entire monument can be 3D-scanned, as well as new, specially designed software; the Groove Measure-function included in the software package DeskArtes Design Expert.
35. Snædal 2002, p. 100.
36. Kitzler Åhfeldt 2002, p. 73.

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