

ILLUSTRATING SAMIAN WARE

Edited by Edward Biddulph

Contributions by Joanna Bird, Geoffrey Dannell, Kay Hartley, Guido Heinz, Vivien Jones, Allard Mees, J M Mills, Paul Tyers, Peter Webster and Felicity Wild



STUDY GROUP FOR ROMAN POTTERY

SAMIAN WORKING GROUP

© 2014 authors

The Study Group for Roman Pottery was formed in 1971 to further the study of pottery of the Roman period in Britain. It provides a forum for the presentation and discussion of the latest research, and of issues affecting the subject and its practitioners. Membership is open to all those interested in the study of Roman Pottery, whether actively working in, researching, interpreting or teaching the subject of Roman ceramics.

For information about the group, visit www.romanpotterystudy.org/.

The Samian Working Group was established in 2008. It provides a forum allowing samian specialists, general pottery specialists and other interested parties to meet to discuss methodological, practical and theoretical issues, find out about new sites and assemblages, handle samian, and help develop skills and knowledge. Meetings are held twice-yearly, or as demanded. Contact between members outside meetings is maintained through an email group.

For information about the group, email:

Edward Biddulph (edward.biddulph@oxfordarch.co.uk)

or

Gwladys Monteil (Gwladys.Monteil@nottingham.ac.uk).

ILLUSTRATING SAMIAN WARE

CONTENTS

List of Figures

Acknowledgements

The history and importance of illustrating samian 5
Felicity Wild

The case for rubbing samian 11
Geoffrey Dannell

How to take rubbings 15
Peter Webster and Joanna Bird, with photographs by Vivien Jones

Name stamps 21
Kay Hartley and Joanna Bird, with a contribution by Paul Tyers and photographs by Vivien Jones

Line drawing 26
Felicity Wild

Scanning and digital photography 31
Guido Heinz and Allard Mees

Publication 34
Felicity Wild and Edward Biddulph

Archiving and storage of rubbings 35
J M Mills and Peter Webster

Resources 38
Edward Biddulph

Bibliography

List of Figures

- Figure 1 Two bowls from Bowes, illustrated by Wm. Hutchinson (1776)
Figure 2 A sherd from Durobrivae, illustrated by E.T. Artis (1828, pl. XLVIII, 2)
Figure 3 Form 29, illustrated by Robert Knorr (1919, Taf. 74E) Scale 1:2
Figure 4 Illustration by photography of casts (Mees 1995, Taf. 136, 2) Scale 1:2
Figure 5 Ovolo, with terminal separately applied to the tongue. Scale 1:1
Figure 6 Example of the degradation of an ovolo over time. Scale 1:1
Figure 7 Comparative illustrations of a Cinnamus ovolo. (a) scanned rubbing, (b) Stanfield's ovolo 3 (Stanfield and Simpson 1958, fig. 47), (c) Rogers (1974) B143. Scale 1:1
Figure 8 Comparative rubbing and drawing of a badly degraded sherd from Cardean, Angus. Scale 1:1
Figure 9 Four related ovolos, A-D
Figure 10 Close-up of ovolo C
Figure 11 Drawing (a) of a bowl in comparison with a rubbing (b)
Figure 12 Drawing of Diana and hind
Figure 13 Rubbing in practice: Drag. 30, decorated sherd
Figure 14 Rubbing in practice: Drag. 29, larger decorated sherd
Figure 15 Rubbing in practice: Drag. 37, large decorated piece, approximately two-thirds of the bowl
Figure 16 Rubbing in practice: Stamp on Drag. 31R
Figure 17 Rubbing in practice: Stamp on Drag. 33
Figure 18 The Samian5 font: selection of the stamps from the Names on Terra Sigillata catalogue
Figure 19 The Samian5 font: preparing a stamp reading in BabelMap
Figure 20 Two views (a and b) of a bowl of Modestus recorded with a 3D scanner
Figure 21 Two views (a and b) of Modestus' bowl transformed using flattening projection
Figure 22 Viewing a stamp of Calvus using Reflectance Transformation Imaging (RTI), varying light direction and additional illumination parameters (a and b)
Figure 23 Viewing a stamp of Primus using Reflectance Transformation Imaging (RTI), varying light direction and additional illumination parameters (a and b)

Acknowledgements

The editor is enormously grateful to the section authors not only for their contributions, but also their support throughout the production of this volume. The editor would also like to acknowledge the very useful comments and advice provided by the members of the Samian Working Group and the committee of the Study Group for Roman Pottery. The editor is indebted to Vivien Jones for her superb photographs of samian rubbing 'in action', and to Joanna and David Bird for organising the photography session. Special thanks are owed to Derek Hurst and Andrew Peachey for respectively copy-editing and typesetting the guidelines. The editor would especially like to thank Gwladys Monteil for her support and encouragement throughout this project.

THE HISTORY AND IMPORTANCE OF ILLUSTRATING SAMIAN

by Felicity Wild

One of the most important parts of a samian report is the illustrations. It is the illustrations to which many readers will turn first. Accurate and detailed illustrations not only attract the interest of the general reader, but help to determine the value of the report to the samian specialist. Illustrative disasters, which have been known to take many forms, can render it all but useless. Simple errors, such as sherds wrongly numbered or published upside down, sideways or at an inappropriate scale, can, and should, be prevented by sending a draft to the author of the report for checking before publication. The most common problem, however, lies in illustrations that are insufficiently detailed, drawn by artists who, despite their best efforts, do not fully understand the significance of what they are drawing – and, not being samian specialists, why should they? The purpose of this Technical Paper is to explain the nature and significance of samian ware and its decoration, what the specialist looks for in an illustration and to suggest the methods by which this may best be achieved.

What is samian ware and why is it important?

The red, glossy tableware known on the Continent as *terra sigillata*, and in Britain as samian ware, may seem often to be the subject of privileged treatment among the range of Roman artefacts. For those who deal with it on a day-to-day basis on sites and in the pottery shed it is the ubiquitous ‘red stuff’, which appears in embarrassingly large quantities, and which traditionally has been the subject of special study. The reasons for this attention are not far to seek. Samian is a common find on sites occupied during its period of production, from the 1st to the mid-3rd centuries AD. Not only is this class of pottery readily identifiable, but it has standardised features, which enable comparability across the area within which it was produced and sold. It is perhaps a unique example of large-scale integrated production in a pre-industrial society. The Italian producers’ wares were carried as far as India in the east, to Britain in the west; the Gaulish factories are represented as far south as Meroë in the Sudan, to the Baltic States in the north, while appearing in most of the provinces of the Western Empire.

Samian has important social and economic implications for the sites on which it occurs. In addition, its wide distribution, together with the fact that many of the vessels are stamped with the name of the potter or factory that produced them, make it the most closely datable form of Roman pottery. It is, thus, of crucial importance in dating sites by association. And because of the way it was made, samian is also more susceptible to typological and statistical treatment.

Historical overview of samian illustration

The development of samian illustration has, inevitably, been tied closely to the development of samian research and contemporary technology. To the early antiquarians, samian vessels were worthy of note for their highly distinctive colour and decoration. In the second edition of *An excursion to the lakes in Westmoreland and Cumberland* (1776), William Hutchinson illustrates two bowls from the fort at Bowes, County Durham (Fig.1).

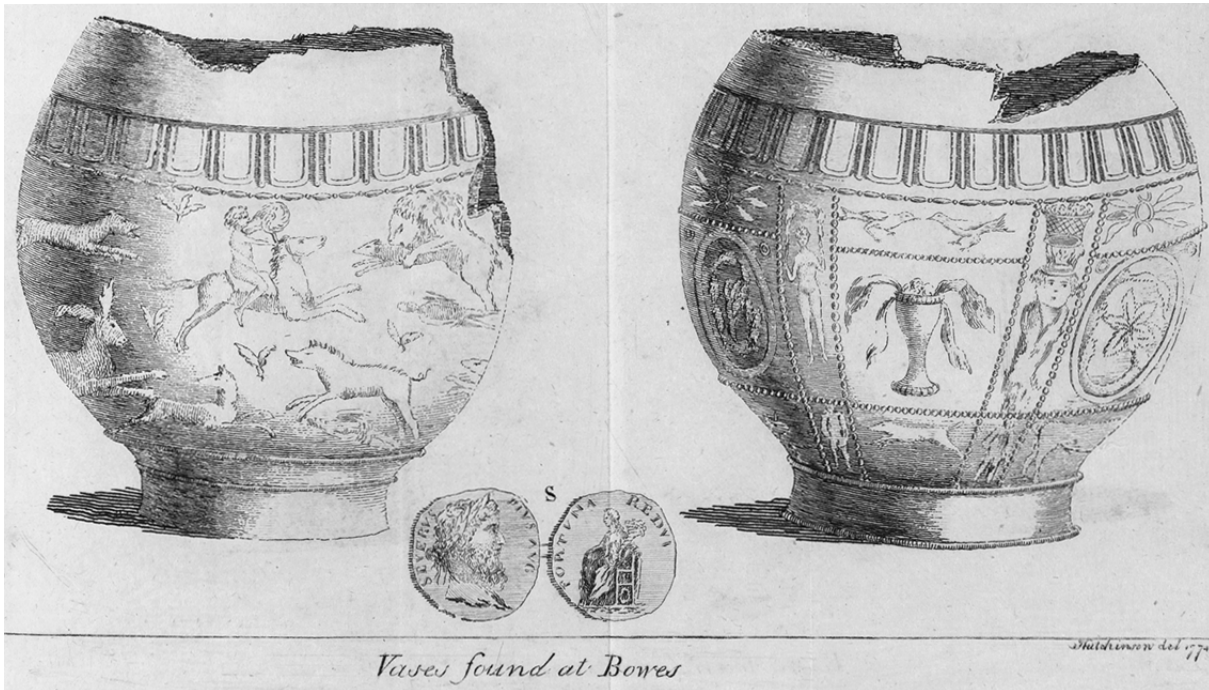


Fig.1: Two bowls from Bowes, illustrated by Wm. Hutchinson (1776)

Although accurate in neither shape nor decoration, they are clearly recognisable as Central Gaulish bowls of Antonine date. The 19th century gradually saw the development of a more methodical approach to archaeology in general, and by 1828, E T Artis, the first excavator of the Nene Valley, was publishing beautiful drawings of both sherds and complete bowls of what he describes as 'fine red ware in relief' (Fig. 2). At only slightly less than 1:1, the figure types and details are accurate and recognisable, though slightly distorted through portrayal of the curvature of the sherd.



Fig.2: A sherd from Durobrivae, illustrated by E.T. Artis (1828, pl. XLVIII, 2)

The scientific study of samian ware can be traced back to an article published in 1849 by C Roach Smith, 'The red glazed pottery of the Romans, found in this country and on the continent', illustrated with plain, clear drawings at a stated scale and described by Oswald and Pryce (1920, 248) as 'the first scholarly essay on the subject'. In this, Smith points to the importance of the potters' name stamps, types and ovolos, and concludes that their origins were neither British nor Italian, but Gaulish. Over the second half of the century, important work was progressing on the Continent, too. Hans Dragendorff (1895) produced the first classification of forms and demonstrated the potential of samian ware for dating sites.

In 1904, Joseph Déchelette, from his study of material from the kiln sites in French museums, published the first catalogue of figure types, numbered and accurately drawn at 1:1, noting the names of the potters who used them. Rather than undertaking the drawings himself, he employed an artist for this purpose, a practice also followed by Dragendorff, and later by Frédéric Hermet (1934), in his publication of the production site at La Graufesenque, Millau, in southern France. This proved a wise precaution. Although there are outstanding exceptions, such as Knorr and Stanfield (who was a professional draughtsman), the majority of samian scholars were not particularly artistic. With the understanding of the importance of figure types and the ability to compare them directly with accurate numbered drawings came the practice of drawing the decoration of a bowl flattened out, so that all the types could be drawn to scale (Fig. 3).

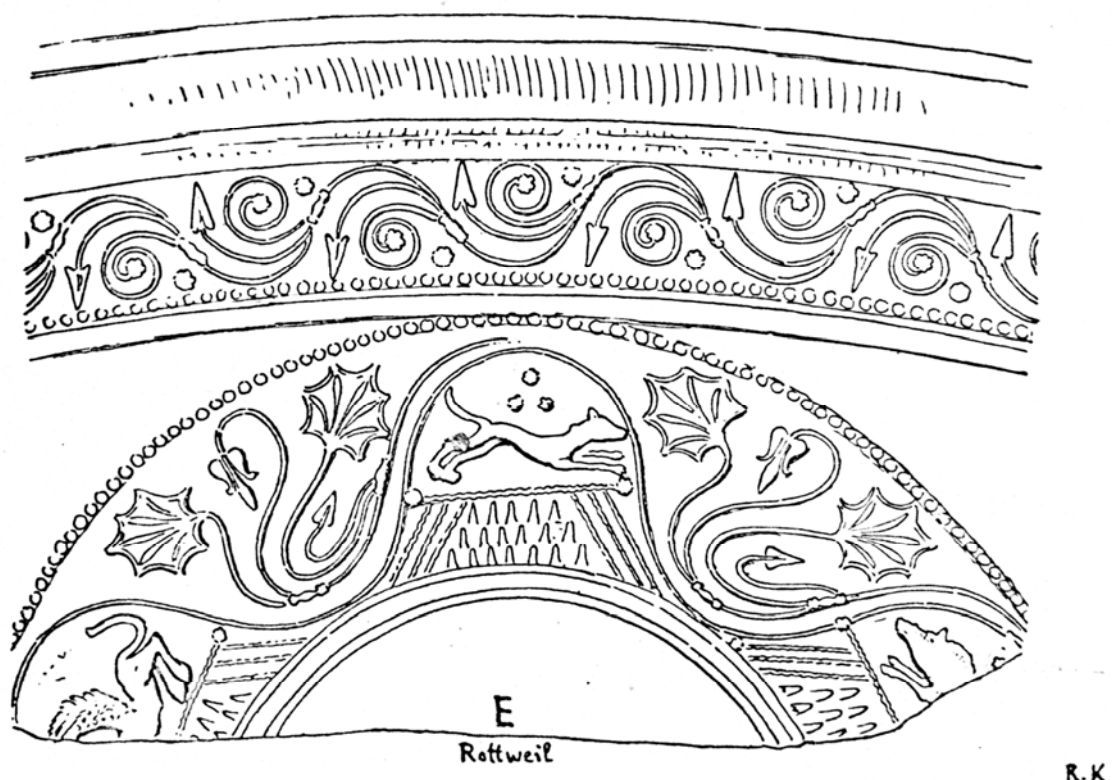


Fig.3: Form 29, illustrated by Robert Knorr (1919, Taf. 74E)

As a method of recording figure types accurately and as a preliminary for drawing, casts in various materials were used. The origin of making rubbings as a basis for drawings now seems to be lost in the mists of time. We know that they were made by Déchelette, as Thomas May wrote to him in 1902 enquiring about the technique, after which he clearly made rubbings himself. In his catalogue of the pottery from Silchester (May 1916), rubbings are used to illustrate the decorated ware, then photographed and published at the somewhat awkward scale of 2:5. The rubbings were made using a hard, waxy substance, presumably heelball or even wax crayon. Much in advance of its time, the publication of rubbings to illustrate samian ware was not taken up again until the end of the 20th century.

Meanwhile, in Germany, the production of accurate illustrations of samian ware moved in a different direction. To illustrate the decorated ware from his excavations at Rheinzabern, Ludowici made clay copies from the moulds and sherds, which were then flattened out, dried and photographed (Ludowici 1905). His successors continued this practice, and the catalogue of Rheinzabern types and details (Ricken and Fischer 1963) is illustrated photographically throughout. Similar methods, using latex and plaster, were followed in Mees 1995 (Fig. 4).



Fig.4: Illustration by photography of casts (Mees 1995, Taf. 136, 2)

Over the second half of the 20th century, rubbings became an increasingly important part of samian research in Britain. In his study of potters' stamps, Brian Hartley realised that the potters listed by Oswald (1931) often concealed more than one potter of the same name, and that these could only be disentangled by examination of the individual dies, best recorded with rubbings. A major programme of research work also got under way at La Graufesenque, rubbing the mass of previously unrecorded material. The advent of computer technology has meant that rubbings can be scanned for publication or for dissemination on the web. The first, pioneering, report to be illustrated by scanned graphite rubbings at 1:1 was Colchester (Symonds and Wade 1999). In the 21st century, more are following.

Plain ware and its illustration

Samian ware is conventionally divided into two main types: plain ware and decorated ware. The plain ware comprises a range of cups, dishes and bowls, wheel-made in a number of standard forms. The forms were classified originally by Hans Dragendorff (1895), with the series later extended by scholars such as Déchelette (1904), Knorr (1919) and Walters (1908), and further additions by Ritterling, Curle and Ludowici. Although the numbering system may seem unnecessarily complicated, it is well known and accepted both in Britain and abroad, the best argument against complicating the situation still further by attempting to rationalise and change it. A number of the commonest plain forms tend to be stamped with the potter's name stamp, normally across the centre of the base. The most up-to-date introductory guide to samian ware is Webster (1996), though this deals only with the commonest forms. For a greater variety of the less common forms, the best source of information, though now slightly out of date, remains Oswald and Pryce (1920). Other useful introductory works include Hartley (1969) and Bulmer (1980). Plain vessels are drawn in profile as line drawings, like other types of pottery. A section on this appears below (p.29), as does a section on illustrating potters' stamps (p.21).

Decorated ware and its illustration

The commonest type of decorated ware is the mould-made bowl. Other less common types of decoration include barbotine, incision, rouletting and appliqué. Vessels such as beakers, decorated in these ways, are normally illustrated, like plain ware, in profile at 1:4. A full account of the manufacture of decorated bowls in moulds impressed with figure types and other decorative details (*poinçons*) is given in Webster (1996) and the other introductory works mentioned above. Their importance lies in the fact that, along with potters' stamps, they are the most closely datable type of samian ware. Potters had their own repertoire of figure types and motifs. By noting the occurrence of these types and motifs on different bowls, a picture of the potter's style can be built up. Where the bowl carries a name stamp, the style can be attributed to a particular potter or factory and where similar motifs occur with different name stamps, potters can be linked into contemporary groups who clearly worked together. Even where the style remains anonymous, its occurrence on historically datable sites will enable the date of production of the vessel to be established with some degree of accuracy.

A catalogue of figure types was first published by Déchelette (1904), though unfortunately copies of this work are hard to find today. Although the number of types included is limited, the illustrations are excellent, and some specialists have preferred to quote his type numbers in reports rather than those of his successor, Felix Oswald, whose *Index of figure types on terra sigillata* (1936-37, reprinted by the Gregg Press in 1964) is much fuller and more easily available, though the drawings are not up to the standard of those in Déchelette, either artistically or in accuracy.

More diagnostic than the figure types are the decorative motifs, perhaps especially the smaller motifs, including space fillers and border junction motifs, which tend to be used by fewer potters and are sometimes unique to a single potter. No exhaustive catalogue of these motifs yet exists for South Gaul. Rogers (1974) has produced a useful catalogue for Central Gaul, though here, too, the drawings leave much to be desired. For Rheinzabern, the largest and most important of the East Gaulish potteries, Ricken and Fischer (1963) have produced a catalogue of both figure types and details, illustrated with photographs at 1:1.

Of the details, perhaps the most important of all, as well as the most difficult to draw accurately, is the ovolo, the 'egg and tongue' pattern which regularly occurs above the decoration on forms 30 and 37. It consists of a core, the 'egg', framed, normally, by either one or two borders. At one side is the tongue, which may be plain, beaded or corded, and often ends in a terminal, such as a rosette or a blob, with or without a central dot. Particularly popular in South Gaul was a trident. The terminal may be placed

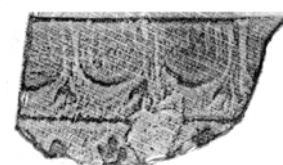
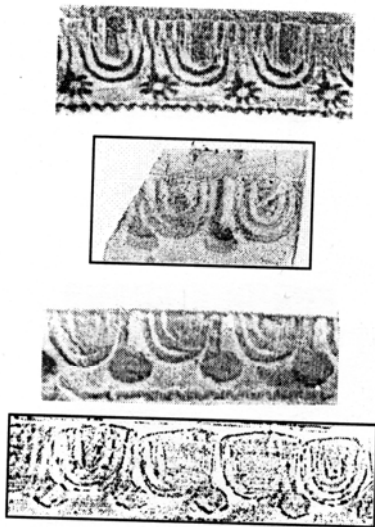


Fig.5: Ovolo, with terminal separately applied to the tongue.

centrally at the end of the tongue, or be twisted to right or left. In South Gaul, there is evidence, from the fact that the terminal may miss the end of the tongue completely, that it was sometimes applied separately (Fig. 5), raising the question of potters using the same ovolo with different terminals. These details, though apparently minor, are of importance not just for identifying the potter, but for establishing the way in which he worked and are vital to samian research.

Mould-made bowls were produced in huge numbers. Sometimes bowls appear to have been removed from the mould carelessly before they had dried adequately, leading to smudging or blurring of the decoration. Moulds became dirty and worn in use, as did the *poinçons* used to make them, leading to loss of detail. *Poinçons* might break, as might the ends of potters' stamps. Where these remained in use, the signs of wear and breakage will be seen upon the bowl. When *poinçons* needed renewing, they could be replaced by the process of *surmoulage*, taking an impression from an existing mould, or a cast from a type on a bowl. These copies will, naturally, be smaller than the originals, allowing for the shrinkage of the clay of the *poinçons* in firing, and are likely to lack the crisp detail of the original. The more frequently this has taken place, the more degraded the type will become (Fig.6). The size and degree of degradation of the types and motifs are important to samian research, and can indicate the date of the piece within the lifetime of the potter or workshop.



Poor workmanship and degraded types are, alas, not the only problems to beset the illustrator. The acidic soil conditions of the highland zone of Britain, particularly in Scotland, Wales and the Pennines, can have the effect of softening the fabric and corroding the surface of the pottery, removing much of the surface gloss, and with it the decoration. The problems of illustrating samian ware in this condition are noted below (p.12 & 29).

Fig.6: Example of the degradation of an ovolo over time.

What should be illustrated?

Decorated pieces described in the samian report should be illustrated, unless they are too small, or the decoration too hackneyed, to be worth it. The selection will include, of the stratified pieces, those which are relevant to the dating of the site or phase as well as those that are intrinsically interesting as samian; of the unstratified material, only those pieces which are of intrinsic interest are worth inclusion. In the case of a closely-dated site or deposit, such as a fort with a limited period of occupation, or a pottery shop, all the decorated ware worth illustrating should be included. Not just will the context help to date the samian, but the range of potters and styles present will demonstrate links and contemporaneity.

THE CASE FOR RUBBINGS

by Geoffrey Dannell

Illustration of decorated ware is problematic. The three-dimensional nature of the bowls means that any translation to two-dimensional representation must inevitably cause some distortion, but this is really not the crucial issue. The core of the problem lies in the need for absolute accuracy, in the detail of both the compositions and components. Here, it must be obvious that the intervention of the illustrator, however good, imposes certain subjective criteria, even if those be only the individual's style and technique. At best, illustrations can allow the specialist to recognise the vessel under consideration. There are a host of illustrations of varying quality in terms of accuracy and comparability (see Figs 9-10), but at worst they are virtually useless (see Fig. 11).

There are a limited number of alternatives which may avoid these problems. The first is photography, which is inhibited by the three-dimensional nature of the subject, but which can be used for small pieces. The next is the cast/photographic method. This presents an accurate two dimensional impression, but is time consuming, and probably fails on the grounds of cost/benefit. Then there is the possibility of scanning the vessel using a three-dimensional digital scanner (see Heinz and Mees, below). At present these devices are slow and capital-intensive, but as technologies advance, it is worth while keeping an eye on developments. Finally there are rubbings, using thin tissue paper and flake graphite. These have one major disadvantage, which, in the case of decorated ware, is the difficulty of translating a three-dimensional shape to a two dimensional plane. However, rubbings have great advantages: they are relatively quick to make; they are accurate; they show the condition of the vessel, and they can be scanned digitally, to be used as publication material or to form archives.

We would suggest the following approaches:

- **Plain and other vessels where profile and sections are necessary.** Standard line drawings similar to those employed for other ceramic vessels.
- **Samian stamps.** Here the choice is really between rubbings, photography, or line drawings. One of the paramount difficulties with stamps is to get the scale exactly correct, because identical spellings of names (the stamps were produced from dies) can often be distinguished only by their size. A well lit photograph probably avoids most of the technical difficulties which can be associated with getting complete rubbing impressions from deep vessels, while drawings can be affected by the subjective vagaries alluded to above. For this reason, rubbings remain the preferred methodology, with photography the next best.
- **Decorated vessels.** Currently, we would suggest that the only two viable options to satisfy the criteria of accuracy and comparability are casting and rubbing. Both remove artistic interpretation. However, since the casting method is time consuming, we would suggest that the most useful option is to publish rubbings. A good quality rubbing, scanned, will provide a more accurate representation than a less than perfect drawing (Fig. 7). This is not to say that samian should never again be drawn. We may note that drawing is still preferred in France (Rigoir and Rivet 1994), and in cases where the surface is badly degraded, a good rubbing may not be possible and a drawing may well be clearer (Fig. 8).

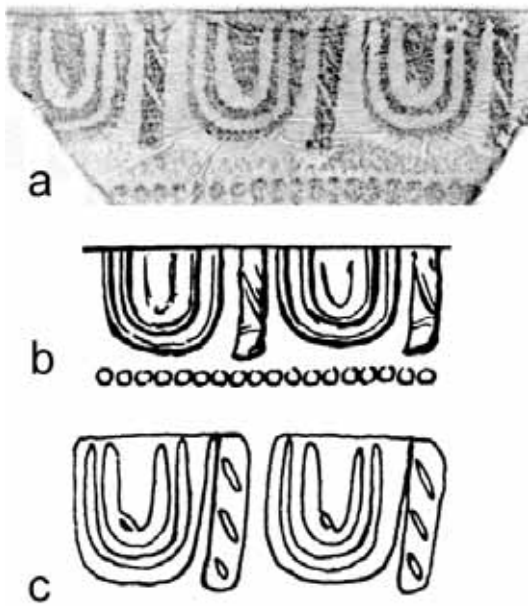


Fig.7: Comparative illustrations of a Cinnamus ovolo. (a) scanned rubbing, (b) Stanfield's ovolo 3 (Stanfield and Simpson 1958, fig. 47), (c) Rogers (1974) B143.

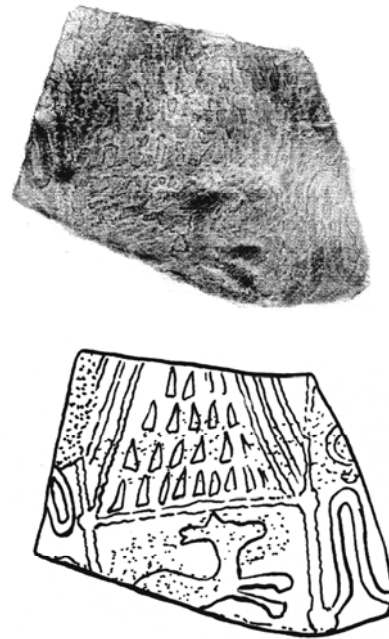


Fig.8: Comparative rubbing and drawing of a badly degraded sherd from Cardean, Angus.

The value of rubbings is evident after consideration of typical illustrative problems. One issue is the need to be scrupulously accurate when dealing with the ovolo motifs, which the potters used as the upper friezes of some of the decorative forms. In Figure 9, the four ovolos shown as A-D are all related. A careful examination of B and C shows that a fault developed in the inner border, which can be seen on the rubbing of B (see a close-up of C in Fig. 10). The rubbing A shows the ovolo before this fault develops. It is therefore of chronological significance. The drawing D is so stylised as to be useless for both identification and comparative purposes.



A

B

C

D

Fig.9 (left): Four related ovolos, A-D

Fig.10 (below): Close-up of ovolo C



We can then look at a drawing made by J Stanfield of a bowl from London stamped by the La Graufesenque potter Damonus, published by Robert Knorr (Knorr 1919, Taf 22A), in comparison with a photocopy of a rubbing of the same bowl (Fig. 11 a and b). Stanfield is considered to have been an excellent illustrator, and his drawings for the major corpus of Central Gaulish samian ware are widely regarded as being benchmarks for accuracy. However, here the deficiencies of even a master are exposed. In the upper zone, we see that the small rosettes in the field do not show as having central dots, clear on the two on the left in the rubbing. Equally the large rosettes have not either the right petal structure, nor are the centres correctly represented. The central frieze has been simplified. The central leaf of the frond of which it is composed should be hollow, not solid. Turning to the lower zone, we can see that the animals have lost most of the detail of their pelts, the tail of the deer is at the wrong angle, and its antlers are not represented accurately. Finally the publication scale is entirely incorrect, being some 14% oversize (although this may have been a production aberration).



Fig. 11a: Drawing (a) of a bowl in comparison with a rubbing (b)



Fig. 11b

The details in Figure 12 are sketchy to say the least. It is difficult to know whether the ovolos from the two drawings are in fact meant to be the same type. The models of the Diana and hind on the left, and the draped female to the right were used by many mould-makers with minor, but significant differences. They cannot be detected here.

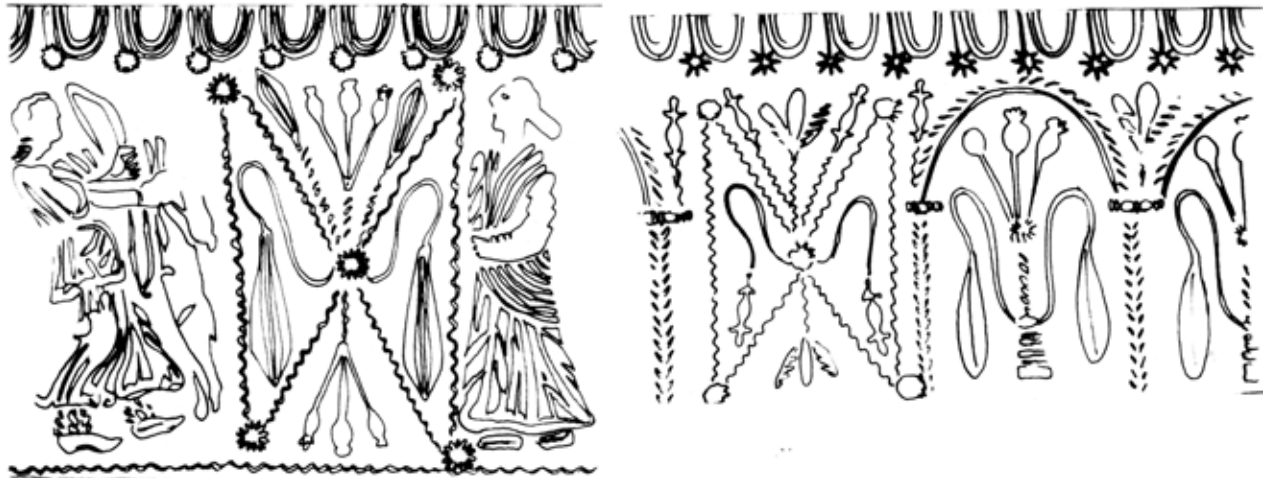


Fig.12: Drawing of Diana and hind

If these criticisms seem pettifogging, it should be stressed that there are thousands of known decorative details which were employed at the various factory sites, and often tens of variations on a particular theme. Scrupulous accuracy is therefore of paramount importance. To some extent, the remarks above represent a 'cri de coeur'; enormous time, energy and resource have been spent over the past in producing drawn illustrations, which at the end of the day are entirely useless for most purposes. They do not enable reliable identification of the workshops engaged in the manufacture of the moulds and bowls cast from them. This means that they can neither be used for accurate dating, nor to plot the distribution of the products, inhibiting social and economic analyses. Moreover, the costs involved, mean that most publications have only a few 'representative' pieces. With the resources currently available it is impossible to publish full archives of the samian found during an excavation, but the rubbing technique does allow such archives to be constructed.

HOW TO TAKE RUBBINGS

by Peter Webster and Joanna Bird, with photographs by Vivien Jones

Preliminaries

You will need:

Graphite

This is sold as a commercial lubricant so can be obtained from an engineering supplier. It comes in tins any one of which should be sufficient to supply you with all the graphite you will ever need. **DO NOT USE POWDERED GRAPHITE.** Although some specialists prefer to use it, powdered graphite has a tendency to blow around and is potentially a serious health hazard. It also produces smudgy rubbings. We therefore recommend flaked graphite. In the absence of a tin of graphite, the pared-down lead in a pencil is a useful substitute, though is not ideal, especially if many rubbings are to be taken.

You are advised to decant your graphite for use into the smallest jars you can find – the small ‘individual’ pots of jam/marmalade used, generally for breakfast at certain hotels, especially but not exclusively on the Continent, are ideal. Flake graphite is light and any container is easily knocked over. It is a good deal less easy to gather up again.

Fine tissue paper

The paper should have a matt finish and as little grain as possible. You may need to experiment before you find the ideal paper. Most units and museums will have acid-free tissue to hand and this can be used but is a little too hard and rigid to be ideal. The tissue needs to have enough ‘give’ in it to ‘grip’ the decoration and thus not move with the rubber’s finger/thumb – otherwise the result will be a fuzzy rubbing.

Cleaning agents

Some means of removing graphite from your fingers will be necessary. Handy soap and water is fine. Wet wipes/wipes also work well. Graphite and food or books do not mix well.

Making the rubbing

General principles

Decant a small amount of the graphite into a jar lid or similar container. You are advised to work on a sheet of paper so that any graphite which spills can be decanted back into the tin. Cleaning graphite off a table surface is a time-consuming business.

Cut out a piece of tissue paper about twice the size of the sherd to be rubbed and wrap it round the pot, adjusting it to avoid creases as far as possible. You need to be able to hold the paper on the sherd while you rub so that the paper is tight over the sherd and does not move as you rub. With practice you will find that you can use smaller pieces but it is advisable to be fairly generous at first.

Dip your thumb into the graphite and rub it over the surface of the tissue in small circular movements. You will need to move across the sherd in small areas at a time. The most common reason for poor rubbings is a tendency to use the thumb like a scrubbing brush moving it from one end of the sherd to another. This causes the paper to move about and results in a fuzzy rubbing. If you work one motif at a time the paper will 'give' sufficiently to grip the design and prevent movement. Some people prefer using their index finger rather than their thumb. It is essential to be able to exert an even amount of pressure over the whole of the pot surface. For stamps it is occasionally effective to use a finger nail to get into crevices.

This should result in a reasonable rubbing. With practice you can achieve an even contrast and you will also find that you can return to some motifs and enhance them by further rubbing – but to begin with you are probably best to get out while you are winning! It can be useful to take further details of specific details – ovolos, figures etc. – but this is not generally necessary.

Remember to write on the rubbing all the information you are likely to need. This should include the form of the original vessel. It is not always easy to tell a form 29 from a form 37, for instance, just from the rubbing of a small area. It is also often useful to indicate which way up the piece is. You also need to record standard site and context details. One open window or slamming door can scatter rubbings very effectively, and rubbings without context are no more useful than any other unprovenanced find.

Bear in mind that not all sherds will rub equally effectively. Rubbing can 'restore' the design on a sherd with damaged slip for instance, but if soil conditions have degraded the surface beyond a certain point, it is ineffective. Equally, decoration which stands out beyond the normal or has eroded to an almost flat surface can be difficult to rub well. Soil conditions on some upland sites can also produce samian which is too soft and powdery for rubbing. If the soil reduces the samian to a powdery state, both casting and rubbing will cause physical damage to the sherds. Rubbing can result in more powdered samian on the underside of the paper than it does graphite on the upper. A method of reproduction which does not involve contact with the pottery is required, in this case digital photography.

Remember also that, once mounted, rubbings transfer a design from a curved surface onto a flat one. Distortions on smaller sherds is minimal and can be ignored. For larger sherds and complete bowls, you will need to think how you are to deal with the curvature. This may involve using more than one sheet of rubbing paper to achieve your desired effect and, on a complete bowl, this is almost certain to be the case. The change of direction on a form 29 will mean that you will need to think about how the rubbings are to be mounted.

When possible, avoid exposing rubbing paper to heat, including the sun; it is much better to keep it in a relatively cool place. Do not attempt to do rubbings after handling pottery; it is advisable to clean hands for making rubbings.

Rubbing in practice

Drag 30, decorated sherd (Fig. 13)



1. Sherd, and piece of paper large enough to wrap round it



2. Sherd with the paper wrapped securely round to hold it firmly in place while working



3. Rubbing, using the thumb



4. Rubbing, using the nail to get the details precisely



5. Finished rubbing, with sherd (including form and fabric) and context information written on

Fig.13: Rubbing in practice: Drag. 30, decorated sherd

Drag 29, larger decorated sherd (Fig. 14)

Note: the problem with 29s is that the upper and lower zones are on different planes. On strongly carinated bowls, the two zones can be rubbed separately. Rub the upper zone first. At the end of the upper zone, holding the paper firmly, begin to rub the lower zone and continue while allowing the rubbing of the lower zone to curve away from the upper zone.



6. Graphite, paper and sherd



7. Paper wrapped securely round the sherd. Use as little graphite as possible to allow a clear impression of the decoration.



8. Rubbing the upper zone first



9. Rubbing the lower zone



10. Completed rubbing still in place



11. Finished rubbing with details, and sherd

Fig. 14: Rubbing in practice: Drag. 29, larger decorated sherd

Drag 37, large decorated piece, approximately two-thirds of the bowl (Fig. 15)



12. The bowl



13. Bowl with a piece of paper large enough to go round



14. Cutting the paper round the footring; if the paper is taken over the footring it can be awkward to work, and distort the results

15. Holding the rubbed area firmly while moving on to the next section. With a panel design like this, it is easier to rub the decoration in sections if it proves difficult to do it in one piece



Fig. 15: Rubbing in practice: Drag. 37, large decorated piece, approximately two-thirds of the bowl



16. Working round the bowl, gently easing the paper around the curvature of the bowl.



17. Keeping the paper firmly secured while continuing round the bowl, to prevent distortion.



18. Completing the last panel



19. The finished rubbing just removed from the bowl



20. The rubbing with details added, and the bowl

Fig.15 (Contd): Rubbing in practice: Drag. 37, large decorated piece, approximately two-thirds of the bowl

NAME STAMPS

by Kay Hartley and Joanna Bird, with a contribution by Paul Tyers and photographs by Vivien Jones

Method used in *Names on Terra Sigillata*

Most of the stamps in the *Names on Terra Sigillata* volumes (Hartley and Dickinson 2008-12) are published as drawings. These are based on carefully selected rubbings of stamps from individual dies. Using a 'Grant projector', tracings were made of them at a scale of 4:1. The tracings were tidied up and corrected having constant access to the rubbings; these drawings were then checked and finally inked. Every attempt was made to produce as definitive a facsimile for each die as possible and all shading was avoided in the interest of accuracy. Although appropriate for such a work, it was an expensive and time-consuming process. Some stamps recorded later were very successfully added as scans of rubbings (as well as published drawings and so on of names which were otherwise unrepresented).

The second, third and fourth paragraphs of the 'Introduction' (ibid) contain particularly pertinent comments concerning the recording of stamps. They rightly emphasise the necessity for obtaining exact replicas and the importance of being able to identify the precise die used. It should be remembered that differences between dies can be slight, but they are important if the data are to be accurately recorded and used to their full potential. A good rubbing is not only the most inexpensive way of recording individual stamps, but one of the most accurate methods of making a facsimile. Even if you are intending to draw a stamp it is advisable to make as good a rubbing as possible first. Apart from concentrating the mind, it can show latent features which are not immediately apparent on sight. Whatever method is being used for producing the drawing, the rubbing will be a helpful guide. A good rubbing is often, if not always, more accurate than a drawing.

Records, archives and publication

Most stamps occur on the basal interior of vessels. However, some decorated vessels have stamps among the motifs, on their rims, and even under their footrings. There are also more rarely, cursive signatures found among the decoration, and in the zone between the decoration and the footring. The latter can be very difficult to rub, and here a cast, or photograph under oblique light may be more successful. More care can be taken in getting an impression of all its details and it is easier to compare it with other stamps.

All stamps should be rubbed if possible even if you think that several are identical. Some dies have only minute differences, some of which develop over time. Having a complete record can be very useful in the long run and it is essential as a record for posterity. The general shortage of funds and the fact that good scans can be achieved suggest that suitable scans can be considered for publication. It is a particularly good method for the record or archive so that perfect facsimiles of stamps which may not have been published are accessible. Scans or rubbings if necessary have a degree of accuracy not possible in mere readings.

There may be occasions where it is necessary for a rubbing to be fixed down into the archive, but it is generally more useful to keep rubbings loose instead of sticking them to cards – they can be more easily inspected and compared.

Method

General principles

One should always check that the stamp is clean before rubbing. Look at it carefully. Write down exactly what you can see, especially noting dots and bars or their absence, for example Λ instead of A, or a diagonal bar. Some details can be in low relief and it is useful when rubbing to be able to glance at your reading, especially, for example, to see where there are dots or other details. Trying to look underneath the rubbing paper to check is not a good idea. Also the rubbing will on occasion show features which you will not have noticed. Check afterwards if you think you should alter your transcription.

It is important to use as little graphite as possible; using more will obscure all contrast. If you have graphite on your fingers before rubbing the stamp, do not use more unless it becomes essential, and then with care. It is important to keep the paper still and to press the paper into the stamp. The back of the index finger nail is very useful when rubbing stamps, the end of the nail also, but you have to judge carefully how far you can go without risking breaking the paper or introducing undesirable marks. Cotton-wool buds can be very useful in getting graphite to sit in the corners of stamps. Some dots in corners of stamps can be extremely difficult, but it is usually possible to get an indication of these to show on the rubbing; this is sufficient to help a samian expert to identify a die. A large enough piece of paper must be used to allow all relevant details of the form, code and the name of the site to be added – not just Site X, but Site X, Chichester, for example. It is always necessary to have the basic name of the provenance. If it is an extra rubbing of a stamp on a decorated bowl your details should indicate which bowl it is from.

Never tamper with the evidence. This is perhaps the most important point to be made. Never attempt to improve on the rubbing by inserting pencil marks where you think strokes either do not show or are not clear enough. It is then impossible for a samian expert to attribute the stamp with complete confidence. Do a better rubbing. If you cannot and are convinced that pencilling will help, you should do a second rubbing and use the pencil on the least successful of the rubbings. The untouched rubbing is always the correct one. Non-existent potters or dies can be created by enthusiasts who are over-sure of what a stamp reads.

A large number of ideas, rules and suggestions have been made by several authors in this publication. These have been made not with any intention of constraint, but to help in avoiding problems which have been experienced in the past. They are all based on experience, acquired knowledge and common sense. Practice, avoiding using too much graphite, and a little care are all that is required to produce a good rubbing.

It may be a good idea to have graphite and paper on hand whenever possible, but never feel that because you do not have graphite and/or suitable paper to hand, you cannot do anything apart from attempting to read a stamp. An emergency is the occasion for ingenuity. On one occasion the rubbing of a mortarium stamp was made on toilet paper with museum dust serving as graphite! It was a poor rubbing, but perhaps surprisingly the potter was identifiable; what made this rubbing indispensable was the fact that the reading supplied with it would never have identified the potter. If anyone thinks it was someone who was hopeless at reading stamps and they would do better, then think again; it was one of our foremost archaeologists at the time. It is always better to have a picture of the stamp, however it is produced, than to have only a reading.

Rubbing in practice

Stamp on Drag 31R (Fig. 16)

Note: the problem with 31R and a small number of other forms is the raised 'kick' inside the base, which can distort the impression of the stamp and needs more care in rubbing than a simple flat stamp



21. Paper placed so that it can be held over the 'kick'



22. Working over the 'kick'; it's usually best to do one side first as the paper can slip when the other side of a stamp like this is rubbed

Fig. 16: Rubbing in practice: Stamp on Drag. 31R



23. Completed rubbing

24. Second rubbing: a second rubbing can help the specialist identify the details of the stamp. With a broken stamp it can be helpful to indicate the approximate centre of the stamp and thus its overall length

25. Finished rubbing with details, and the sherd

Fig. 16 (Contd): Rubbing in practice: Stamp on Drag. 31R

Stamp on Drag 33 (Fig. 17)

Note: the problem with cups is that the stamps can be deeply impressed; they can also lose their ends, especially on small curved bases such as Drag 27



26. Stamp with the paper in place



27. Rubbing with the thumb



28. Using the nail to get into the detail



29. Using a blunt toothpick to get into the end of the stamp (care is needed not to tear it at this stage)



30. The finished rubbing

Fig. 17: Rubbing in practice: Stamp on Drag. 33

THE Samian5 FONT

by Paul Tyers

The Samian5 font was developed to represent the readings of samian stamps in the catalogues published in the *Names on Terra Sigillata* volumes (NOTS; Hartley and Dickinson 2008-12). Standard fonts, such as those distributed with most computer operating systems, do not contain the complex ligatures and other symbols required to adequately represent samian stamps. The idea of developing a set of special characters goes back to Brian Hartley's earliest computerized drafts of the stamp catalogues, using a long-defunct word processing system called ChiWriter that incorporated a system for the production of non-standard symbols. Images of over 200 symbols were recovered from Hartley's files and these provided the starting point for the development of Samian5 (Dannell 2013).

The use of a font rather than embedded images to represent the non-standard glyphs has the advantage that a standard visual style can be maintained with the standard letter forms in the readings. The readings can then be incorporated into documents of different types, both printed and digital, including databases, and resized as appropriate.

Samian5 is distributed as a Unicode TrueType (.ttf) font (see: http://en.wikipedia.org/wiki/Unicode_font; <http://en.wikipedia.org/wiki/Truetype>), which can be installed on most common computing platforms. The font includes a range of standard characters (upper- and lower-case latin characters, digits and punctuation) alongside the samian glyphs. It is not intended as a substitute for a full word-processing font, but is intended for the presentation of the samian readings only. The surrounding text in a document would normally be in one of the standard system fonts, such as Times Roman.

In most word-processors the samian glyphs can be inserted using a 'Special Character' menu entry. Figure 18 shows a small selection of the NOTS catalogue with a stamp reading in the Samian5 font highlighted, and the character selection window displayed. The samian glyphs will usually be displayed towards the end of such a display within the Unicode Private Use Area (http://en.wikipedia.org/wiki/Private_Use_Area), starting at location U+F500. The code-point is conventionally referred to by its hexadecimal address, hence U+F500. As a historical side-note, the name Samian5 reflects that this was the 5th iteration of testing different software and coding until we ended up with a solution that worked on all the combinations of software that were in use in the project. The earlier versions had occupied blocks of code-points starting at U+F100, U+F200 and so on.

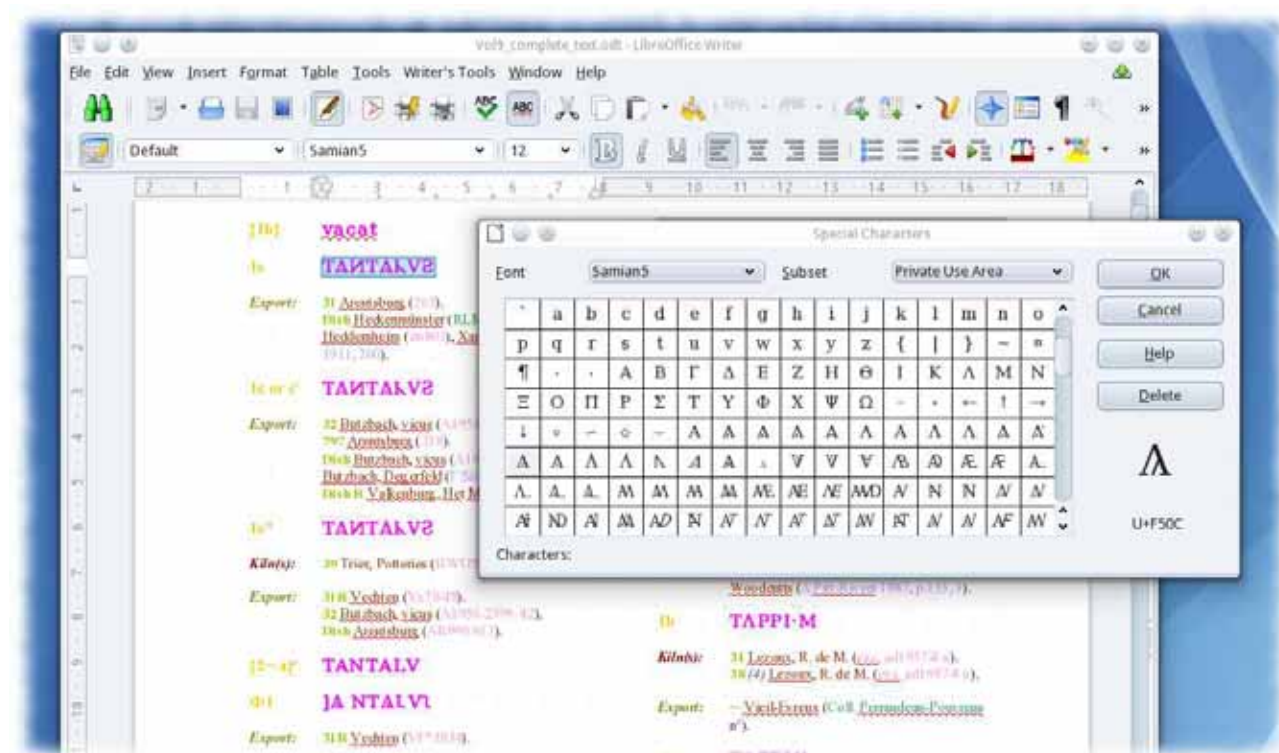


Fig.18: The Samian5 font: selection of the stamps from the Names on Terra Sigillata catalogue

An alternative method of compiling readings is to use a program such as BabelMap (<http://www.babelstone.co.uk/software/babelmap.html>) which displays all the characters in a font in a scrolling grid and allows strings to be built up, then copied and pasted into another application. BabelMap was used during the editing of the NOTS catalogues. Figure 19 shows the preparation of a stamp reading in BabelMap. When pasted into a word-processor it is usually necessary to highlight the newly inserted text and set the font to Samian5, otherwise the characters are likely to be displayed as empty boxes, black boxes or Asian characters, depending in the configuration of the system and software.

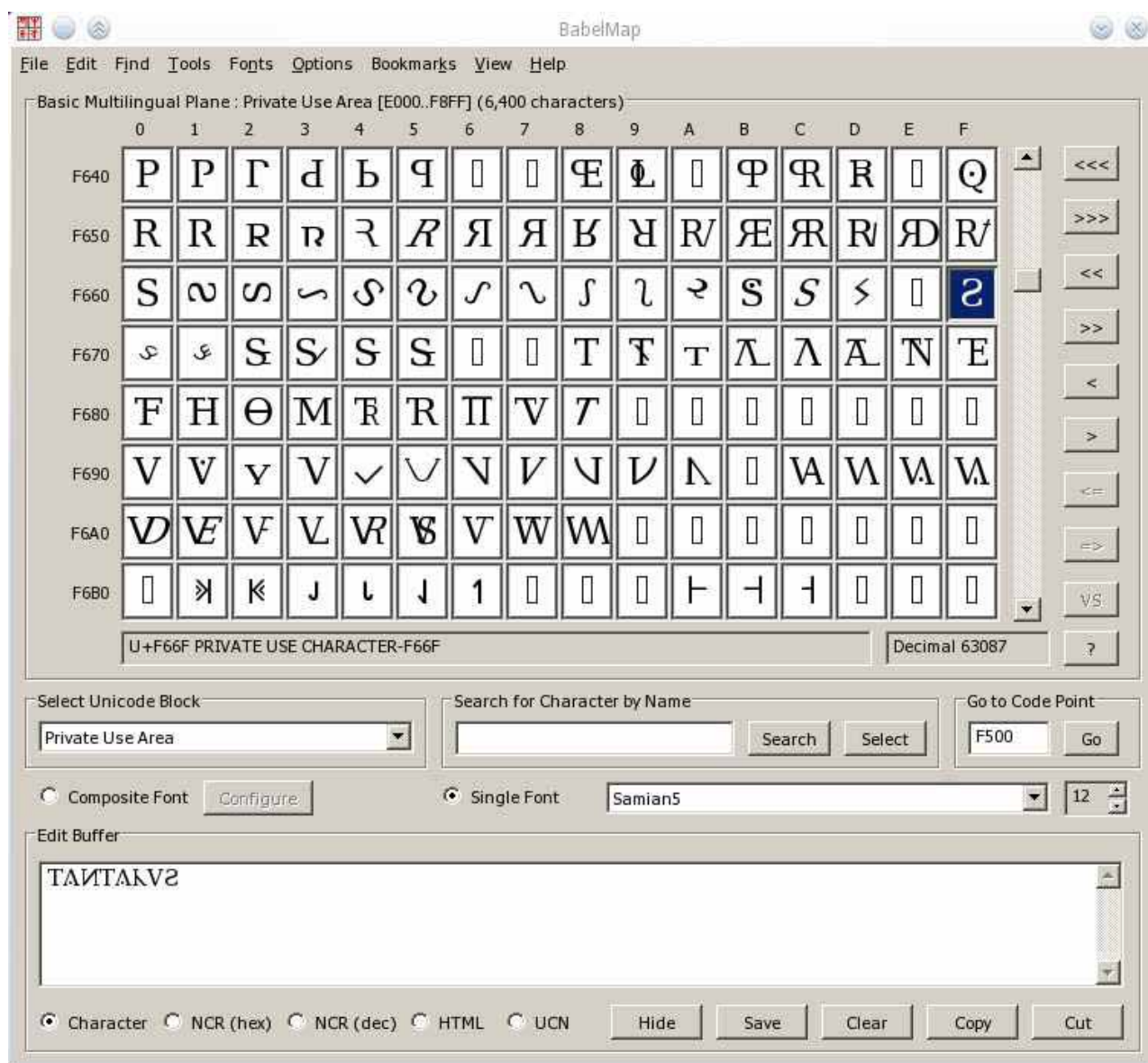


Fig. 19: The Samian5 font: preparing a stamp reading in BabelMap

Finally, when passing on a document containing readings using the Samian5 font, some care must be taken to ensure that the target user can display the samian glyphs accurately. A conventional word-processor file, such as an OpenDocument .odt or a Windows Word .doc file, relies on the fonts installed on the system where the application is being run. So to display a reading in Samian5 in such a file the font must be downloaded and installed on the host system. If it is not installed, the samian glyphs in the document will display as empty boxes (or black boxes or Asian characters), and Samian5 will not appear as an option in the list of available fonts in the font selection dialogue in the application.

However, when a word processor file is converted (or exported) to a PDF file, the Samian5 font will be embedded within the output file, and should be viewable and printable on any system with a suitable PDF viewer, even when Samian5 is not installed on the system.

The latest version of Samian5 can be downloaded from the SourceForge website (<http://sourceforge.net/projects/samian5>). The distribution package contains the font and a short guide to installation and usage.

LINE DRAWING

by Felicity Wild

As will now be clear, the only manner of illustrating decorated ware which will satisfy the needs of present and future samian research (see p.11-14) is by scanned rubbings. A handbook of this type, however, would not be complete without offering some guidance on conventional line drawing, which occasionally should be used in addition to, or instead of, rubbings.

Decorated ware

Accuracy in size and detail of moulded decorated ware is best obtained by tracing from rubbings, though it cannot be stressed too strongly that it should never be drawn from rubbings alone. The original sherds should always be present to check any details which do not appear clearly on the rubbings. Sherds can be traced from rubbings in their entirety, though complete, or almost complete, bowls may pose a greater problem. The decoration on the hemispherical form 37 is conventionally flattened into an arc. Types and motifs must always be accurately depicted, though the spaces between them may need slight 'fudging' to fit the curve. With the carinated form 29, the upper zone is normally illustrated as a straight, or almost straight, strip, with the lower zone, arranged as an arc, adjoining it in the centre (as on Fig. 3 above). Where the decoration is repetitive, consisting, for example, of a number of panels repeating in a regular order, only one complete repeat of the pattern need be drawn. Where it is irregular, and the panels filled with a variety of different types, or types in a different order, it will be necessary to draw the complete decoration. It is not strictly necessary to draw every impression of the ovolo on a complete bowl. Although it may look artistically better, it is extremely laborious! A central group of around six impressions should be sufficient.

It may be helpful, particularly when drawing samian in a badly degraded condition, to have a copy not just of the specialist's report, but also of Oswald's Index of Figure Types and standard works (such as Rogers 1974 for Central Gaulish ware), in order to check what the specialist thinks he or she can see. Without suggesting that artistic integrity should in any way be compromised, if one knows what the decoration may once have been like, it may be easier to see how what may appear to be detached blobs and squiggles once fitted into an overall design. Even where the decoration is clear and well-preserved, it may be instructive to the illustrator to be able to refer to the complete version of a particular type or detail.

Relief decoration is conventionally drawn with the light coming from the upper left-hand side. Each artist is likely to have his or her own preferred method of depicting relief, but it may be found that, when inking, it is easier to obtain more variety in the thickness of lines with an old-fashioned mapping pen than with tubular-nibbed pens such as Rotrings, which produce a more mechanical overall effect.

Care should also be taken over the thickness of lines. If lines are too thick and close together (as in an ovolo), they are likely to close up on reduction; lines that are too fine may disappear altogether. This may not always be the fault of the illustrator. Methods of reproduction and paper quality may also be to blame, but it is something of which the illustrator should be aware. Most pottery illustration is now completed in Adobe Illustrator or other graphics editing programs, but the same considerations apply in any case.

Plain samian

Plain samian ware should be drawn, like any other pottery, with the external elevation on the right and internal features and section on the left. However, as it was produced in standard forms which have been numbered, it is not normally necessary to draw it unless the form is non-standard, or has unusual features felt to merit illustration. A case may be made for the drawing of complete, stamped vessels, to assist research into how various forms developed over time. Beakers with barbotine or incised decoration are undoubtedly worth drawing, particularly where sufficient survives to form a complete, or almost complete profile.

SCANNING AND DIGITAL PHOTOGRAPHY

by Guido Heinz and Allard Mees

Back in 2003, the Römisch-Germanisches Zentralmuseum in Mainz (RGZM) started using close-range 3D-scanners to record the geometry of samian vessels. The scanner used is an industrial measurement system using structured light projection. The point spacing is approximately 0.6 mm, the accuracy approximately 0.1 mm. The result is a triangulated mesh of the surface. The data can then be visualized with varying light directions, rotated, zoomed, and so on, using freely available viewers (Fig. 20a and b). To replace traditional flat drawings, parts of the object were transformed using flattening projection (Fig. 21a and b). The software used to apply these conic projections to the datasets was coded by Guido Heinz of the RGZM.

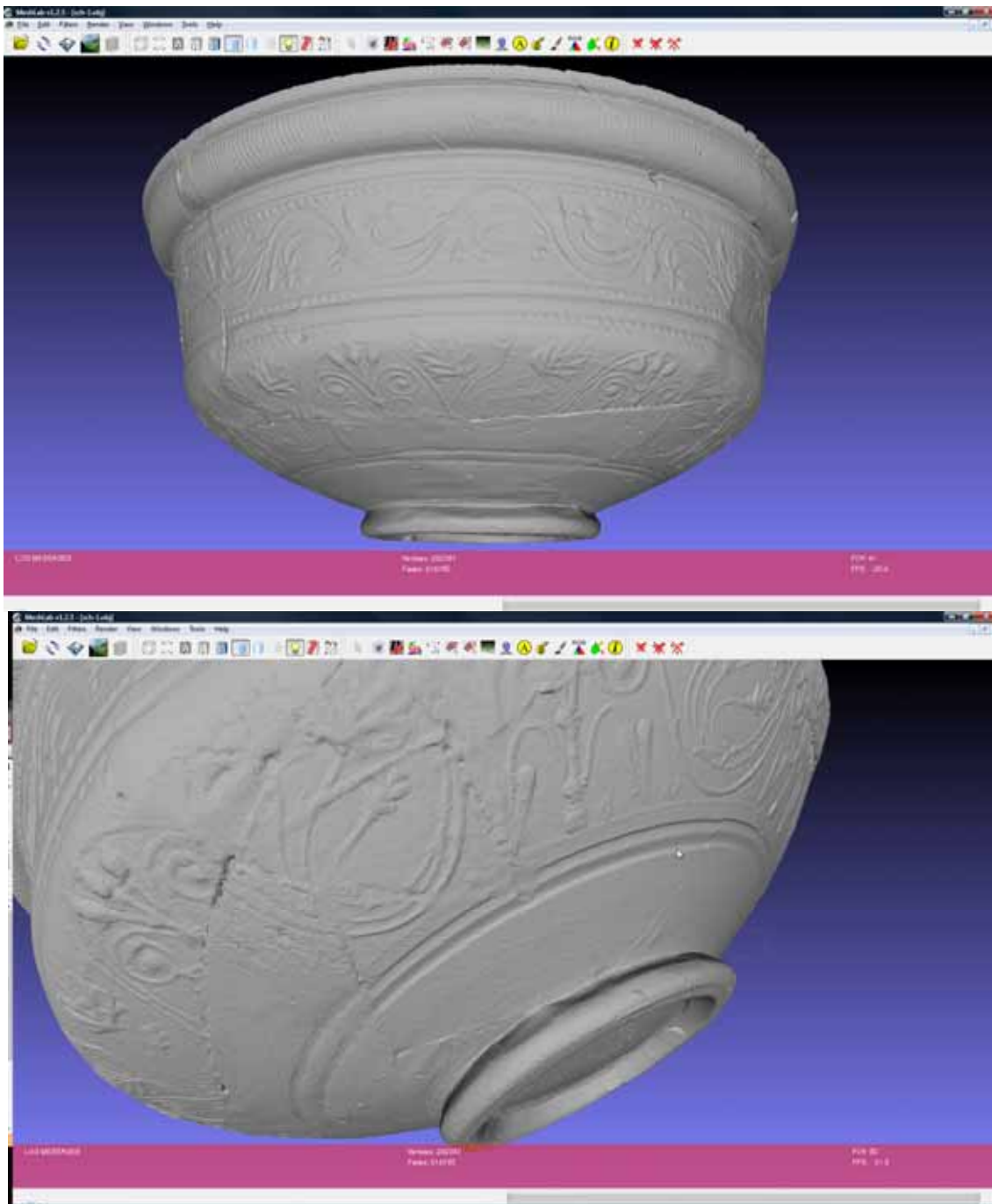


Fig.20: Two views (a and b) of a bowl of Modestus recorded with a 3D scanner



Fig.21: Two views (a and b) of Modestus' bowl transformed using flattening projection

Another way to present objects with varying surface illuminations is Reflectance Transformation Imaging (RTI) (see <http://culturalheritageimaging.org/Technologies/RTI/>). Standard DSLR camera equipment with a movable flash device, a snooker ball and some freely available software tools for non-commercial applications is all one needs. A set of images is taken with light from different directions and merged into a dataset containing the texture and reflectance information. This time- and cost-effective method can be used to record samian stamps. The light direction and additional illumination parameters can be modified interactively in a browser-based viewer (Figs. 22 and 23).

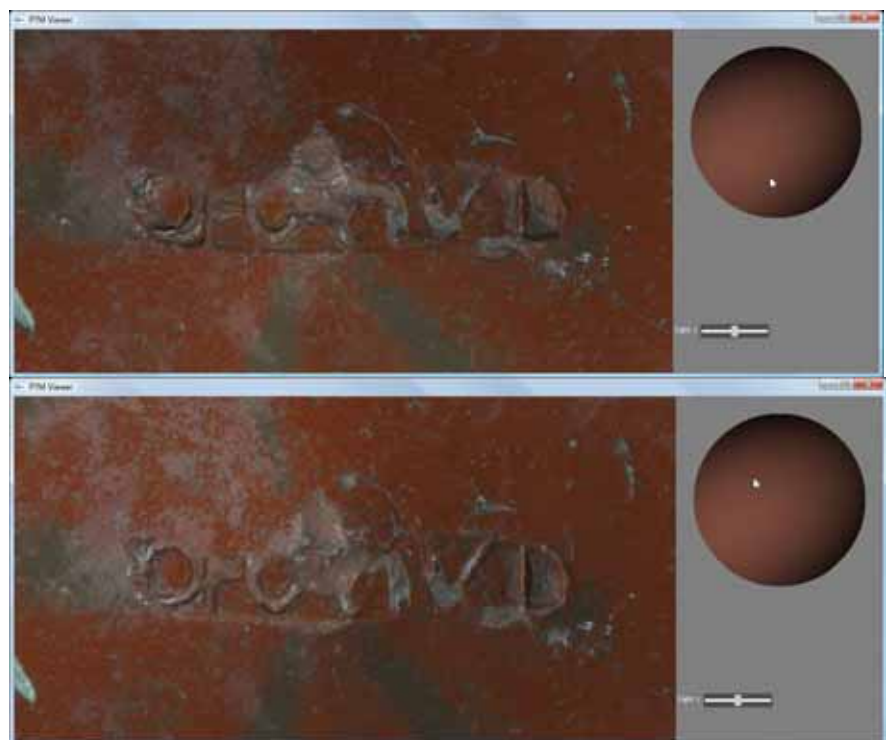


Fig.22: Viewing a stamp of Calvus using Reflectance Transformation Imaging (RTI), varying light direction and additional illumination parameters (a and b)

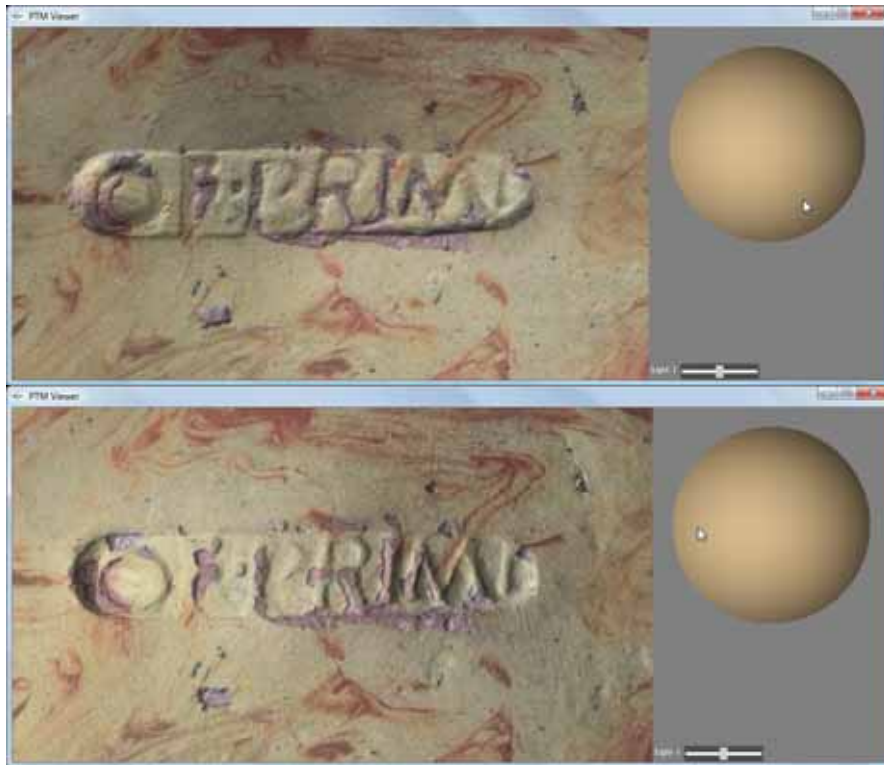


Fig.23: Viewing a stamp of Primus using Reflectance Transformation Imaging (RTI), varying light direction and additional illumination parameters (a and b)

With these techniques, the cost effectiveness for recording samian still remains, in general, directly related to the amount of time invested. However, this is difficult to quantify, since it also depends on available equipment and expertise.

Summary of cost effectiveness

Recording stamps

- Rubbings: quick to process, but problematic with regard to small figure types of decorated samian and deeply impressed plain ware stamps.
- Reflectance Transformation Imaging: reasonable processing time, if the recording processing is automatised. Superior visualisation results. Less suitable for curved objects like decorated samian and therefore only applicable for stamped samian.

Recording decorated samian

- Close range scanner: longer processing, but considerably better in detail. Problematic with regard to the flattening of non-standardised, slightly irregular vessel forms.
- Flattened (plaster) casts and photography of decorated samian: labour intensive, possible distortion when flattening, but produces high quality images of decorated samian, suitable for figure type comparisons.
- Rubbings: quick to process and produces accurate representation. Problematic with regard to pieces with badly degraded surfaces.

PUBLICATION

By Felicity Wild and Edward Biddulph

Scanned rubbings selected for publication should, where possible, be published at 1:1 scale. Line drawings of beakers with barbotine or incised decoration are conventionally published at 1:2. Lion head spouts from the mortarium form 45 should be published full-face and/or in profile at 1:1, with the mortarium itself at 1:4. Moulded decorated ware should be drawn at 1:1 for reduction to 1:2. Plain samian ware, also drawn at 1:1, should be reduced to 1:4 scale. Good examples of the publication of all the features mentioned here can be found in the samian report on New Fresh Wharf (Bird 1986), where particularly effective use is made of photography for the mortarium spouts.

The illustration of potters' stamps has already been described (p.21-25). Where the dies have been identified from Hartley and Dickinson 2008-12, it is unnecessary to illustrate them in site reports. Unidentified and partial stamps should perhaps be illustrated to assist with identification in the future, though this is best done by scanning the rubbings rather than line drawing.

To create the publication figures, the scans and any drawings will, of course, need to be arranged on the page in catalogue number order. The specialist should provide the illustrator with a copy of the catalogue of decorated and other samian. The images should be labelled with the catalogue numbers and a scale bar added to the figure. Increasingly, illustrators are turning to digital methods of 'paging up', using graphic design software such as Adobe Illustrator to arrange digital images on a page template. The process is identical for both digital and printed publication.

Ideally, in the case of printed publication, the rubbing will fit on a single page. Where scans are too large for the page, it may be necessary to crop the scan to show, as with line drawings, only one complete repeat of the pattern, or to reproduce the image at 1:2 scale (though care must be taken to ensure that details are as clear at 1:2 as they are at 1:1). With digital publication, where there are no additional printing costs, the large scan can be split over two pages.

ARCHIVING AND STORAGE

by J M Mills and Peter Webster

Back-ups and electronic storage

by Peter Webster

Once you have the information, back it up with copies – in this case both physical (photocopies) and digital. Mounted rubbings will usually photocopy very well and this is often the easiest means both of achieving multiple copies and of enhancing rubbings for research purposes.

1. Use a flat-bed scanner if available.
2. Set the scanner to 300 dpi GREYSCALE.
3. Although use of an image editor such as Photoshop should ensure reproduction at 1:1, it is advisable to include a scale in all scans.
4. Use an image editor to align the rubbing exactly and to enhance the contrast (one trick is to cut a blank area and then raise the brightness of the whole background to that level).
5. Save as a TIFF file.
6. If you are recording a site archive, use the text facility on your image editor to replace the handwritten information on the original rubbing.
7. If you do this, remember that a new layer will be produced, and you will need to 'flatten the image' before saving to save bytes!

Archiving and storage

by J M Mills

Use of graphite-on-tissue paper rubbings to record decorated and stamped samian as an aid to identification and as a recording method suitable for wider dissemination, whether within published reports or digital archives is increasingly becoming accepted as an accurate and relatively cost-efficient technique. Few of us, however, are likely to have considered the long-term survival of this material. By long-term it is meant not only to the end of the individual specialist's career, but beyond, so that future researchers may benefit.

Digital media will not be covered in depth here; emphasis will be on the physical archive. Whether electronic and digital media will all be kept up-to-date as systems and programs evolve is yet to be seen, and may depend on the dedication of a few individuals. However, it is possible that the huge amount of material already on the internet (e.g. Samian Research at <http://www.rgzm.de/samian/home/frames.htm>) will ensure that formats are transmutable to newly developed platforms.

Once individual rubbings are created, they are treated in different ways by different specialists. It may not be possible to ensure very long term survival of rubbings, but there are means which may be harmful and those less so.

Rubbings will form part of a paper archive, the general recommendations for which are (Walker 1990, 6):

- Dust-free environment
- Dark storage away from direct sunlight (protect from ultra-violet light)
- Temperature between 13°C and 20°C
- Relative humidity RH 50-65% (with no rapid fluctuations)
- Absence of metals (staples, paper clips, ring binders etc.)
- Horizontal storage
- Air circulation, six changes per hour

Acid-free papers are considered to be the most long-lasting, and although acid-free tissues are available, many rubbings have been made on 'cigarette' paper (and still are). The pH of several examples of cigarette paper have been tested and they are all weakly acidic.

Graphite itself is not affected by light and will not fade (pencil is one of the longest-lasting writing materials); but as it is a powdery substance it is not well bonded to the paper, and the quality of a rubbing will inevitably deteriorate with use and handling. Once made, what ever happens to a rubbing next will affect its physical and chemical stability.

Firstly (and as stated above), it is important to attach a minimum of three pieces of information to a rubbing. This must include the site code, context number and form/fabric. It is also useful to include a place name, but be aware of names which need to be identified by county, such as Dorchester. This is best done by writing in pencil (not too soft) as close to the rubbing as possible. The key thing is not to trim this off. Other than pencil, Indian ink is recommended for archival longevity. Marker pens and ball-point pens like Biro's are generally not recommended.

What usually follows is that: i) rubbings are now stored loose; or ii) rubbings are mounted onto backing paper before storage. Before final storage rubbings might be used as reference points for identification; they might also be copied in some way – photocopied, or increasingly commonly scanned onto a computer.

The rubbings may now come into contact with various papers (backing paper, envelopes, and card wallets), plastics (folders and sleeves) and glues.

Strictly speaking, all of these materials should be inert. Papers should be acid-free, plastics should be polyester, and glues starch- or methyl cellulose-based. In no event should adhesive tape (such as Sellotape) be used. The glues on these tapes fail very quickly and can cause staining. The cheap poly-pockets which are readily available are usually PVC based. PVC (polyvinyl chloride) releases hydrochloric acid when it decays. Many types of glue, including popular brands of glue sticks, are PVA-based. PVA (polyvinyl acetate) yields acetic acid as it breaks down. In both cases even small quantities of acid will adversely affect the paper rubbing and the backing sheet, changing their pH even if they are acid-free papers. Additionally, if glue fails and the rubbings part company from their backing sheets they will be separated from their identifying numbers unless that information is on the same piece of paper as the rubbing. It is a chilling thought to imagine a bag of rubbings and a piece of paper with site codes, numbers and so on written randomly on its surface! It is, however, probable that all starch-based glues (essentially refined flour and water paste) are 'wet' glues, so although they may be inert and long-lasting the difficulty in using them with fine tissue may mitigate against their use.

Acid-free papers are expensive (perhaps as much as 20 times more expensive than normal photocopying paper), as are archival quality polyester pockets or sleeves. There seems little point in using expensive papers and sleeves if the glues we use are likely not only to fail, but to produce acidic by-products, and the rubbing paper is also acidic, unless they minimize the potential damage caused by paper and glue sufficiently to be cost effective. Loose rubbings should fare well in acid-free envelopes or polyester sleeves, especially if stored flat in acid-free boxes.

The final area of concern is the actual bond between graphite and tissue paper. Walker (1990, 5-6) recommends using a hard pencil on the grounds that if the pencil marks are lost the indentations in the paper may well still be readable! Well-made rubbings of crisply-moulded samian leave rather good repoussé reproductions of the decoration, but this is lost if the rubbing is stuck onto paper. Using any kind of poly pocket or sleeve will involve a certain amount of static which will always attract some of the graphite from the surface of the tissue; this is increased if sheets are slid in and out of the sleeve. Inevitably rubbings will be less clear as they age and are used. Often rubbings not protected by sleeves are sprayed with fixative. Such sprays are likely to include plastic, which in time may degrade and at best discolour. Paper conservators assure me they do not use such products and if PVC- or PVA-based they could in effect be a built in time-bomb if they decay in an acid-producing way. It is also possible to see on rubbings where the identifying codes and numbers have been written with ordinary ball-point pen, as the application of spray fixative separates the ink, rather like chromatography, resulting in a pink halo around the writing. It can surely only be a matter of time before this writing entirely disappears.

To sum up: graphite-on-tissue rubbings are a valuable aid to identification and classification of stamped and decorated samian. Digital recording and storage of scanned rubbings will only be a suitable form of long-term storage if systems and archives are regularly and consistently up-dated. However, correct storage is important and, stored well, paper will generally last a very long time. Finally, do not rely on one copy in one medium, but back it up using a different method.

RESOURCES

by Edward Biddulph

Flake graphite

Flake graphite comes in a variety of flake sizes. Grade used to be measured by the term foliac. Foliac 2a is a small- to medium-sized flake which most people seem to find the easiest to use, although the larger flake size, Foliac grade 2b, is preferred by some. However, the term is not generally used now by suppliers. Today graphite is measured in terms of microns. Flake graphite has a typical sizing of between 250 and 500 microns ($\frac{1}{4}$ to $\frac{1}{2}$ mm). In contrast, graphite powder is milled to a particle grading of 150 microns.

An internet search brings up a number of suppliers. One such supplier is:

Graphite Trading Company

72 Carters Lane
Halesowen
West Midlands
B62 0BS
UK

17831 109201

www.graphitetrading.co.uk

enquiries@graphitetrading.co.uk

Coarse flake graphite (flake size is not specified) can be obtained from this suppliers in 1 or 2 kilo-sized tins.

Paper

Traditionally, cigarette paper has been used for rubbings. The small gummed strips for those rolling their own cigarettes are fine and usable in this form for stamps or small details, although the gummed strip should be removed before taking the rubbing. Larger sheets have been obtained from the manufacturer, Rizla, with its Mascotte tissue paper (17 gms), sold in quantities of 300 sheets, each 520 mm x 735 mm, being preferred. However, no contact details or product information (save for the manufacturer's standard high-street products) are given on Rizla's website (and users must in any case be over 18), and so obtaining the paper is not terribly convenient.

Alternatively, acid-free tissue paper – the sort that is used for the storage of artefacts in museums and archaeological practices – can be obtained from many suppliers of office materials and online retailers such as Amazon (at the time of writing, packets containing between 25 and 100 sheets can be purchased from Amazon for less than £5 each).

Ideally, you should use fine paper which is matt and has little grain.

BIBLIOGRAPHY

Artis, E T, 1828 *The Durobrivae of Antoninus Identified and Illustrated in a Series of Plates, Exhibiting the Excavated Remains of that Roman Station, in the Vicinity of Castor, Northamptonshire*, London

Bird, J, 1986 Samian Ware, in Miller, L Schofield, J and Rhodes, M, *The Roman Quay at St Magnus House, London*, London and Middlesex Archaeological Society Special Paper **8**, 139-185

Bulmer, M, 1980 *An Introduction to Roman Samian Ware*, Denbigh (reprinted from *Journal of the Chester Archaeological Society* 62 (1979))

Dannell, G B, 2013 From Oswald's Index to Hartley and Dickinson's Names, in Fulford, M and Durham, E (eds), *Seeing Red: New economic and social perspectives on terra sigillata*, London, 18-27

Déchelette, J, 1904 *Les Vases Céramiques Ornés de la Gaule Romaine*, Paris

Dragendorff, H, 1895 'Terra Sigillata', *Bonner Jahrbücher* **96**, 18-155

Hartley, B R, 1969 'Samian Ware or Terra sigillata', in Collingwood, R G and Richmond, I A, *The Archaeology of Roman Britain*, 2 edn, London, 235-251

Hartley, B R, and Dickinson, B, 2008-12 *Names on Terra Sigillata*, London

Hermet, F, 1934 *La Graufesenque (Condatomago)*, Paris

Hutchinson, W, 1776 *An excursion to the lakes, in Westmoreland and Cumberland: with a tour through part of the Northern counties, in the years 1773 and 1774*, London

Knorr, R, 1919 *Töpfer und Fabriken Verzierter Terra-Sigillata des Ersten Jahrhunderts*, Stuttgart

Ludowici, W, 1905 *Katalog II. Stempelbilder römischer Töpfer aus meinen Ausgrabungen in Rheinzabern, 1901-1905*, München

May, T, 1916 *The Pottery Found at Silchester*, Reading

Mees, A, 1995 *Modellsignierte Dekorationen auf Südgallischer Terra Sigillata*, Stuttgart

Oswald, F, 1931 *Index of Potters' Stamps on Terra Sigillata ("Samian Ware")*, Margidunum

Oswald, F and Pryce, T D, 1920 *Terra Sigillata*, London

Ricken, H and Fischer, C, 1963 *Die Bilderschüsseln der römischen Töpfer von Rheinzabern*, Bonn

Rigour, E and Rivet, L, 1994 *De la Représentation Graphique des Sigillées*, Soc Française d'Étude de la Céramique Antique en Gaule, Supp. **1**, Marseille

Rogers, G B, 1974 'Poteries Sigillées de la Gaule Centrale, I – Les Motifs Non Figurés', *Gallia*, supplement **19**

Stanfield, J and Simpson, G, 1958 *Central Gaulish Potters*, London

Symonds, R P and Wade, S, 1999 *Roman pottery from excavations in Colchester, 1971-86*, Colchester Archaeological Report 10, Colchester

Walker, K, 1990 *Guidelines for the preservation of excavation archives for long-term storage*, London

Walters, H, 1908 *Catalogue of the Roman Pottery in the British Museum*, London

Webster, P, 1996 *Roman Samian Pottery in Britain*, London