

# **Parthian, Sasanian and Early Islamic Pottery: dating, definition and distribution**

## **A specialist workshop at The British Museum**

Organised by Seth Priestman & St John Simpson  
*Department of the Ancient Near East*  
*The British Museum*

### ***INTRODUCTION***

The purpose of this workshop was to discuss current issues concerning the dating, definition and distribution of selected types of Parthian, Sasanian and Early Islamic pottery, particularly in the light of recent fieldwork or new research on old collections. Many of the speakers illustrated or showed actual examples of pottery, which could be compared to selected sherd material from the collections of The British Museum. We are also very grateful to Dr Venetia Porter for kindly facilitating the handling of Samarra pottery from the Department of Asia. This meeting was limited to a small number of specialists, including archaeologists and archaeological scientists, thus the presentations were focused on particular problems rather than describing the overall state of ceramic studies or material culture in general. The presentations themselves varied from formal presentations to “hands-on” discussions over objects, although time unfortunately did not always allow for questions. However a great deal of information was shared and it was felt that it would be useful to publish the presentations, or a summary of what was said, accompanied by selective transcripts of the discussion. In most cases we have not attempted to support statements with the usual referencing and data which would be provided with the formal presentation or publication of the material, although we have included a summary list of key references referred to by some of the speakers. It should also be born in mind that unless the speaker supplied a written text, the texts have been transcribed directly from the spoken word, with the minimum of alteration, and therefore the words and syntax chosen are not necessarily those the authors would have chosen to select for a written presentation. The structure of this web-publication is as follows:

- Programme
- List of speakers and discussants
- Individual presentations with selected illustrations
- List of references cited

**PROGRAMME**

09.30 *Assemble*

- 10.30 Ian FREESTONE (The British Museum), *Partho-Sasanian glass and glazes*  
 11.00 Julian HENDERSON (University of Nottingham), *Early Islamic glaze and glaze analyses at Raqqa (Syria)*  
 11.30 David HILL (University of Austin, Texas), *Scientific analyses of ceramics from the Deh Luran plain, south-west Iran*  
 12.00 Prof. Tatsuo SASAKI (University of Kanazawa), *Sasanian-Islamic pottery from Hulayla, Ras al-Khaimah (United Arab Emirates)*

12.30 *Lunch*

- 14.00 Søren ANDERSEN (University of Aarhus, Moesgard), *Parthian pottery from graves on Bahrain*  
 14.30 Derek KENNET (University of Durham), *The Sasanian-Islamic sequence from Kush (United Arab Emirates)*  
 15.00 Carl PHILLIPS (CNRS, UMR 7041), *Late finds from Kalba (United Arab Emirates)*  
 15.30 Seth PRIESTMAN (The British Museum, Sackler Fellow), *Fine Orange Painted Ware*  
 16.00 Beatrice DE CARDI (London), *Londo-ware: a Parthian-period ceramic in Baluchistan*  
 16.30 Gabrielle PUSCHNIGG (University College London), *Beyond Merv: Sasanian pottery in its regional context*  
 17.00 St John SIMPSON (The British Museum), *Parthian and Sasanian pottery in northern Iraq*

**SPEAKERS AND DISCUSSANTS**

- BC – Beatrice de Cardi (Independent, UK)  
 CP – Carl Phillips (CNRS, UMR 7041, France)  
 DH – David Hill (University of Austin, USA)  
 DK – Derek Kennet (University of Durham, UK)  
 GP – Gabriel Puschnigg (UCL, UK)  
 HS – Hanae Sasaki (University of Kanazawa, Japan)  
 IF – Ian Freestone (The British Museum, UK)  
 JH – Julian Henderson (University of Nottingham, UK)  
 RC – Rob Carter (UCL, UK)  
 RT – Roberta Tomber (The British Museum, UK)  
 SA – Søren Andersen (University of Aarhus, Denmark)  
 SP – Seth Priestman (The British Museum, UK)  
 St J – St John Simpson (The British Museum, UK)  
 TS – Tatsuo Sasaki (University of Kanazawa, Japan)  
 VP – Venetia Porter (The British Museum, UK)

**Ian FREESTONE:*****Partho-Sasanian Glass and Glazes***

Ian Freestone is Deputy Keeper of the Department of Conservation, Documentation & Research at The British Museum, and Honorary Professor at the Institute of Archaeology, University College London. He specialises in the technology of ancient glass and glaze and has published widely on subjects related to this workshop (Freestone 2003; Freestone & Gorin-Rosen 1999; Freestone, Politis & Stapleton 2001; Freestone & Gaimster eds 1997).

We have little firm knowledge as to the scale on which Sasanian glass and glaze was made. On the Levantine coast, in the Byzantine and Early Islamic periods, soda-lime-silica glass was made in large slabs, as at sites such as Bet She'arim and Bet Eli'ezer (Freestone & Gorin-Rosen 1999) but similar evidence has not been reported from Mesopotamia.

Both the western Roman/Byzantine tradition and the Partho-Sasanian tradition in the East both produced soda-lime-silica glasses. However, they were very distinctive compositionally. Roman/Byzantine glass has very low potassium and magnesium oxides ( $K_2O$  and  $MgO$ ), reflecting the use of naturally-occurring mineral soda deposits, such as so-called "natron" from Egypt, as a flux. On the other hand, Partho-Sasanian glasses contain higher levels of potassium and magnesium; this is generally considered to represent the use of plant ash as a source of soda and plant ash is compositionally very complex.

We have analysed about 35 Sasanian glasses, mainly from Nineveh and Babylon, for major elements, using energy dispersive X-ray analysis in the scanning electron microscope. A small number of glasses which were imported from the West can be identified quite easily as they are of the low-potassium, "natron" variety, whereas the bulk were made using plant ash.

Comparing our own data with those from other sites published by Robert Brill (1999), although there aren't clear-cut differences between sites, there is some tendency to cluster in simple graphs, so there is some hint that there may be different compositional groups that relate to production centres. The limitation is that the chronological control is not very good, and the analysed glasses range from the 2<sup>nd</sup> to the 6<sup>th</sup> centuries AD. Therefore it is not clear if we are looking at variations in the location of production or chronological changes in composition/recipe, or both.

Progress has been made in the analysis of glass from Roman/Byzantine and early Islamic contexts because the discovery of major production sites and the characterisation of their products has provided a series of compositional "anchors", allowing us to understand the variation within a production assemblage and the significance of the differences between assemblages. It is very hard to get a handle on what is going on just from analysing vessels from consumer sites, particularly when the sample is very limited. In the first instance, the success of this sort of work really does depend on the quality of the archaeological sample rather than the analytical technique chosen.

We have looked at the glazes from about 15 Sasanian ceramic vessels, some from the museum's collections and some excavated at Aksum: they are a range of fairly pale translucent colours, blue, green, brown yellow, what you would expect. They are generally crazed (indicating a poor fit to the body), flawed and also very badly weathered. They are soda-lime-silica glazes with magnesium and potassium oxides at plant ash levels. Most, if not all, of the glazes we have looked at have had copper added to them at levels of about 1-2%, which is responsible for the green or the blue colour. Associated with the copper you often get small amounts of lead and tin, reflecting the use of scrap copper alloy to colour the glazes. The use of scrap copper alloy as a colorant was characteristic of glass, glaze and pigment production throughout much of the ancient world.

Comparison with published Partho-Sasanian glaze analyses suggests that all are similar and indeed similar to Assyrian and Neo-Assyrian glazes in the Iron Age a thousand years before, so there was a very stable tradition of glaze-making. Consistencies in the data

suggest that the glazes were made using essentially the same type of plant ash, presumably from the alluvial plain of the Tigris and Euphrates.

There are some consistent differences between glasses and glazes, suggesting that the glass makers and the glaze makers worked separately and used their own preferred plant ashes. I suspect that they were quite separate industries, although with a common origin at some time in the past.

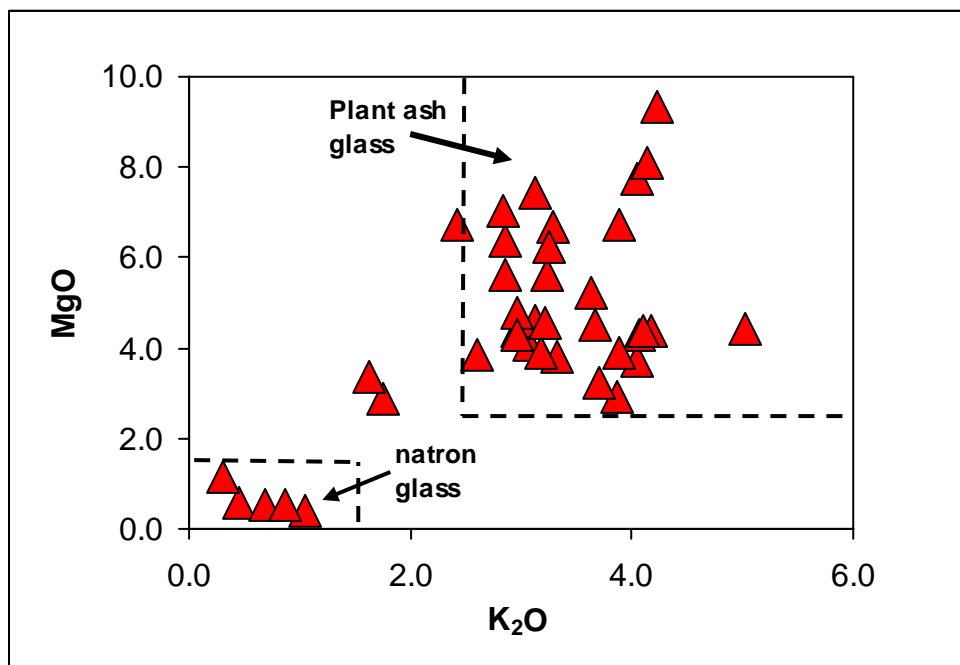


Fig. 1 Compositions of glasses analysed, showing fields of natron and plant ash glasses

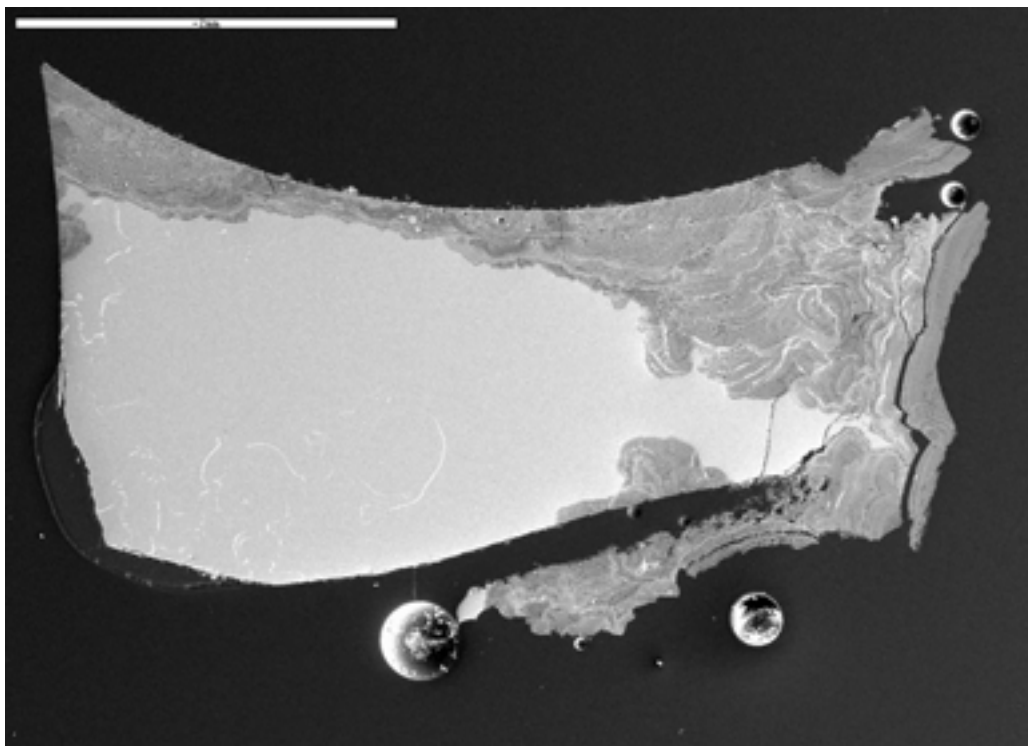


Fig. 2 Sample of Sasanian glass seen in the scanning electron microscope showing thick weathering layer surrounding fresh glass. Scale bar is 2 mm.

*Discussion*

DK: One of the key things [with Sasanian and early Islamic glazes] when they are very degraded, [is that] they seem to degrade in consistently different ways. This is certainly [true] at Kush [in the United Arab Emirates]. We believe looking at the material ... that there are certain colours ... that make it look like the composition [of the glaze] may have been different. Of course it is potentially burial conditions, but it doesn't seem to be ... because we are looking at material from one site and a very standardised set of burial contexts. There does seem to be some clear change through the sequence ... in the way that glazes are degrading ... there may be undetectable elements in the composition that may be causing that.

IF: I think that is quite possible. It may be that you have a good dated sample of material where you may see the differences, but it doesn't take much to make a big difference to the degree of weathering ... If you are dealing with glazes, if you are firing at a slightly higher temperature, for example, then you have got a bit more reaction with the body, then a bit more aluminium coming through from the body can make the glaze a lot more stable.

RC: I found a huge amount of variation at this kiln site in Bahrain which was making glazed pottery. It seemed to relate quite a lot to the different layers that [the material] was found in. Some layers, with I think essentially the same kind of glazes on the same kind of vessels, had vanished to just a white powder and on others it was still quite thick and glassy ... within the same kind of date bracket. I think that different local conditions of wetness within the site [can produce a dramatic effect].

**Julian HENDERSON:**  
*Early Islamic glaze and glaze analyses at Raqqa*

Julian Henderson is Professor of Archaeological Science and Chair of the Department of Archaeology at the University of Nottingham. He is currently directing the Raqqa Ancient Industry Project (Henderson 1999; 2002; 2003; Henderson & McLoughlin 2003).

Raqqa is a massive Early Islamic city and short-lived capital set in the flood plain of the river Euphrates. [The Raqqa Ancient Industry Project has been looking at industrial activities located between the medieval city and the original city of al-Raqqa outside of the city walls]. We have found evidence for the production of glass in the 8<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> centuries and production of pottery in all of those phases. Unfortunately [there is] no primary evidence for production of glazed pottery in the 8<sup>th</sup> and 9<sup>th</sup> century, but we do have that from the two later phases. We have the best structural evidence of pottery production in the 8<sup>th</sup> - 9<sup>th</sup> century: we have three separate workshops and I think about 16 kilns in total now ... and a massive amount of wasters. Because we have primary evidence for glass production we can start to address this area of regionality, distribution and trade [at Raqqa]. One of the things we have done is to analyse more than two hundred samples of glass ... [The biplots of the results show that] we have three different sorts of plant ash glasses and one natron glass ... We can identify certainly two fairly large groups of different plant ashes, we even have within that group quite a range of different magnesium levels, inferring perhaps the use of two species of plant ... So we have got that primary evidence then, for these three plant ash glasses being made on site and we don't yet have evidence for the fusion of natron glass. The most likely interpretation there is that it was imported from the Levantine production sites that Ian has already mentioned, where natron glass was fused from right the way through the Roman period right up to the start of the Islamic period ...

So the question is ... is it possible that they were making these glasses in order to make glazes? The kinds of glazed pottery that you find in this phase in Raqqa are the famous Raqqa Ware that goes on into the 11<sup>th</sup> century or so ... One thing that was quite clear even before analysing any of the glazes, and that is they were not making glass of those colours that were used in the glazes. They were making glass in Raqqa that was colourless, pale green, purple and occasionally blue. Those are the raw glasses that we find. So the glazes are an entirely separate range of colours and indeed include the use of such things as copper as a colorant in the turquoise glaze. The glazes are not apparently manufactured from these kinds of glasses [plant ash and natron glasses from Raqqa] ... apparently some of them are manufactured using the experimental glass composition, [a composition mentioned earlier in the talk]. We do not find that difference that Ian mentioned earlier between glasses and glazes. The glasses actually contain low levels of sodium so there is that similarity there. So in Raqqa at least it looks like they are actually making glass not only to make glass vessels from, but also to make glazes from ... This is an interim statement at least.

*Discussion*

DK: Just to clarify, you have got these two quite distinct groups of glass and then this other, maybe one, maybe two sets that look like they are from a local experimental mixing up of bits and pieces, and it seems to be from that that the glazes are coming. Could you just clarify how these sodium glazes are being made? Is it possible that you get glass and grind it up?

JH: I guess so yes.

DK: Is that the way that you would expect glazes of that period to be manufactured?

JH: Yes I don't see why not, because there is obviously a secondary process of adding the colour, but we have not found any evidence of that of course, but that seems to be the most likely interpretation.

St J: Following on from that, is there quite an elaborate recycling industry going on which is feeding on the one hand the glass production and [on the other] the glaze production?

JH: Yes, they are certainly controlling the compositions for a good reason because they understand the properties of the glazes and the glass, and obviously glaze fit is one of the things they would be very concerned with ...

St J: It has implications, doesn't it for the archaeological record, because if you take a recent analogy ... I have been to a glass factory in northern Lebanon [in Tripoli] and seen them sorting the glass and asked them where they got it from and they have these quite elaborate contracts with restaurants and teahouses mainly. So basically all the smashed stuff in the centres of heavy consumption as it were of glass, is gathered up and sold back to the manufacturer and then they just get lots of women to hand sort it by colour. Now that means that quite a lot of glass is being taken out of circulation out of late 20<sup>th</sup> century teahouses and restaurants in Lebanon and I just wonder what implications that would have for all of us who are digging up glass if you have got a similar recycling complex going on.

IF: I think with recycling it must depend to a certain extent upon location, because you wouldn't bother to recycle unless you had somebody who was going to use the recycled material. So if you are in a big urban centre then it makes a lot of sense to recycle everything you can, because there are always going to be glassmakers around who can use it. But it may be that in a more rural area it is much less common or they do it occasionally when a peripatetic glassmaker comes to town ... In the Roman period there are some villas which have got masses of glass ware and people have said this is a high status dwelling because it has got all this glass in it. But it may just be that they were not bothered about recycling it because there was nowhere to send it and so it does have some implications.

St J: For inter-site comparison [at least].

DK: But at the same time the data you show suggests that there isn't much, at least inter-regional, recycling going on.

IF: Well ... if you imagine different resource areas within a region, then it may be that within one resource area everyone is recycling everything and then developing a common composition.

DK: That would become much more difficult for coastal areas wouldn't it? [With] somewhere like Kush which is on the coast, not necessarily near to a single major production centre, you might expect a much more complicated picture.

JH: ... [however] It can't be emphasised too strongly that making glass is not as difficult as it seems ... they can make vast amounts of it in one go from locally occurring raw materials.

CP: In terms of the installations that the manufacturer uses, how different would glassmakers' installations be from say someone processing copper?

JH: Well, you do need equally high temperatures. In these tank furnaces undoubtedly they achieved at least 1250°C; at Raqqa we have certainly discovered that that is the case. But the furnaces are going to be a different shape ... [however] the procurement of raw material is going to involve similar linkages between different groups of people to a point.

CP: If you were familiar with the techniques for processing [and] smelting copper, would you find it difficult to transfer your technological skills to working with glass?

JH: It is a matter of how workshops were set up individually [and] whether there is any contact between different groups of work people in the industrial complex. I guess these results from the Raqqa analysis indicate that there was communication between the potters and the glass workers.



**David HILL:**

*Scientific Analysis of Ceramics from the Deh Luran plain, south-west Iran*

David Hill is completing a PhD at the University of Austin, Texas, on the subject of Partho-Sasanian and Islamic glazed pottery, using material found during the 1968/69 Rice University survey of the Deh Luran plain.

During the Achaemenid, Seleucid and Parthian periods there are only eleven sites [in this surveyed plain] and they all appear to be some kind of fortress. Suddenly in the Sasanian period after this there are at least one hundred sites ... anywhere from small farmsteads to very large towns. [The] population starts to decline really as soon as settlement starts, you start getting fewer and fewer amounts of later ceramics and it almost disappears by the 12<sup>th</sup> century, it almost appears that there is no-one left in the Deh Luran plain at all. There is limited evidence of settled occupation on the Deh Luran plain occurring during the 14<sup>th</sup>-16<sup>th</sup> centuries.

As we all know, for seventeen hundred years the soda-lime silica glaze composition persisted throughout the entire Near East, but ever so often analysis of glaze decorated ceramics reports the presence of 1-2% lead oxide. Then suddenly in [the] 9<sup>th</sup> century ... [with] materials from Basra you start getting a real jump in the amount of lead with the adoption of a lead based flux.

[There is] very limited evidence for ceramic production on the Deh Luran plain. We have [one] possible crow's foot [or trivet], but there are no glaze drips on it. [A] heavily vitrified piece of plain ware jar tempered with limestone [which] could be a kiln waster ... and ... [an object made of] clay [with] about 2mm of transparent green glass [covering one side]. Subsequent analysis of the "glaze" on this latter object found the glaze consisted of silica, calcium, potassium and little else, suggesting that the object represents an interior fragment of a lime kiln.

[The analysis has been done using a Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-ICP-MS) at the archaeometry laboratory at the University of Missouri, which takes samples from very small areas of preserved glaze]. What we get are five composition groups and what I think this may be telling us is there may not be many metallic ore sources or for that matter glaze recipes, that are being exploited during the time between the Parthian and medieval Islamic periods ... This is [over] a whole range of colours: blacks, yellows [and] lots of blues and greens. These colours are used throughout the time period under consideration.

*Discussion*

DK: I'm still trying to grapple with what you are saying here, you have got a range of material that goes from the Parthian/Sasanian period through to the later Islamic period. Within that you can group your glazes into five reasonably distinct composition groups, so you are arguing based on that that there is continuity through time in the way the glazes are being made.

DH: No, not in the way they are being made ... in the sources of the materials ... that are being used as colorants.

DK: So why are you concentrating on colorants when you talk about continuity when you said that you have looked at fifteen elements? (50 elements-DH)

DH: I think that's where most of the element variability might be coming in from ...

DK: It is also possible that those five groups that you have defined are also chronologically distinct; it could be that all the early stuff goes into one group and that the Middle Islamic material goes into another ...

High-lead based glazes are the hallmark of the Samarra Horizon. Soda/lime/silica based glazes were developed some 1700 years earlier, but continue to be produced after the introduction of lead-based glazes.

DH: These composition groups seem to crosscut time and colour of the object ... I don't know what would be causing that except for maybe a limited number of [raw material] sources. Monochrome glazes produced using a soda/lime/silica composition continued to be produced at the same time as lead-based "Samarra Horizon" glazes. Recent INAA (Neutron Activation Analysis) characterisation of the same sample of ceramics as used in the LA-ICP-MS analysis indicates that the "Samarra Horizon" lead-based glazes were produced using different clay resources than the soda/lime/silica glazes. [With reference to the occasional pre-Samarra horizon glazes with low lead levels]. One of my questions now is: is this the precursor technology to developing these high lead glazes? I'm planning to test this using lead isotope analysis.

RC: Can I just ask a general question about lead glazes? Is there any advantage in terms of colouring or ease of manufacture inherent in lead glazes and can we explain why they were introduced?

DH: Differences may be in a lower firing temperature ... and in a wood-poor environment that is something that you would really want to concentrate on.

SP: [The] sherds with the high peak of lead in them: is there any visual difference when you look at them?

DH: No.

SP: If this is a precursor to high lead flux glazes, then if there is no appreciable visual difference, then it would be hard to explain that wouldn't it?

IF: I can see that there are those earlier examples with high lead but I'm just wondering what the actual lead is in those glazes ... is it 2% or 10%?

DH: Yeah, it is like 2%.

IF: So you wouldn't expect a lot of difference in the appearance of the glaze really ... So it is almost like they have thrown a little bit of lead into the mix or something rather than actually making a lead glaze.

DK: Are you getting a bit of imported glass that you are grinding up and chucking in from somewhere else?

JH: There are not a lot of lead glasses around at that time ...

St J: Unless there is some Chinese glass kicking around, which would be very interesting ...

IF: [Or] unless you just use scrap metal and occasionally your scrap metal has a lot of lead in it ... and that is the other possibility.

DH: But the issue with using scrap metal here is that are you aiming to be able to get consistent colour? ... So I think that part of what may be making the Samarra horizon is as much about wood conservation as it is [about] trying to simulate the highly reflective surfaces of Chinese porcelains ...

SP: So what? Do alkaline glazes take longer to fire?

DH: [They do require a] higher temperature ...

DK: Can I just make one more point about this point you have made about wood and the potential that the Samarra horizon is about trying to save fuel. I think there is another thing that we need to consider there and that is the relative abundance of these two different groups ... If you look at the [alkaline] glazes, they are very abundant ... we have got them at ten, fifteen, twenty, thirty percent of the assemblage at Kush. You never have anything like that in the Samarra horizon wares ... Glaze in the 9<sup>th</sup> century becomes a much smaller part of the overall ceramic assemblage, I would guess at almost every site, so it may be that glazes were becoming a much more valuable commodity at the same time and this might also be related to the import of Chinese material to.

**Tatsuo SASAKI:*****Sasanian-Islamic pottery from Hulayla, Ras al-Khaimah (United Arab Emirates)***

Professor Sasaki lectures at the University of Kanazawa in Japan, and specialises in the production and trade of Far Eastern porcelain; together with Hanae Sasaki, he has excavated extensively at the sites of Hulayla and Julfar in Ras al-Khaimah (e.g. Sasaki 1995; 1996; Sasaki & Sasaki 1996; 1998).

[A powerpoint presentation of recent finds from a range of contexts from Tatsuo and Hanae Sasaki's excavations at Jazirat al-Hulayla. The finds were from four excavation areas numbered A-D. Areas A and B belong to the 'Abbasid period, Area C belongs to the Middle and Late Islamic period. The finds presented were from Area D. The excavation in Area D concentrated on three points, Mound II, Mound III and a flat area. Finds from each of these areas were presented, including plain and glazed wares and other finds. The glazed assemblage is made up exclusively blue/green alkaline glazed ware on a pale yellow fabric]. I think that Mound II is a little bit earlier than Mound III. We found seven layers [in Mound III] and we found one Chinese coin from Layer I on the surface. The coin is half [its original] size, so it is very difficult to give it a date, but possibly it is [either from the] middle of the 8<sup>th</sup> century or [from the] 11<sup>th</sup> century. There are no finds for the 11<sup>th</sup> century around here ... this is the last find so maybe this site stopped at the middle of [the] 8<sup>th</sup> century ... there are no finds of 'Abbasid pottery. I have found two pieces of Chinese ware and one Chinese coin and I can give [a] date of the 8<sup>th</sup> century to [all of] them.

*Discussion*

DK: It is a very useful assemblage ... it is clear to me now relating to the Kush sequence that what you have got there is an entirely 8<sup>th</sup> century assemblage ... I don't think there is anything earlier ... I would be surprised if it were even early 8<sup>th</sup> century. I think you are looking at a relatively short occupation of 50, 60, 70 years or something like that ... it is crucial what is missing from the assemblage for dating it, if you look at the ed-Dur assemblage from Area F, are a number of the glazed forms from there and [the] early Kush sequence. Below a <sup>14</sup>C date of mid to late 7<sup>th</sup> [century at Kush] we have a whole range of forms which are very common [but] which you haven't got any of in your assemblage at all. Everything else is consistent I think. There is quite a lot of South Asian material in that assemblage, which is what you would expect. [There are] one or two sherds of Indian Red Polished Ware, which I think we can push the dating of [forwards] into the 7<sup>th</sup> or 8<sup>th</sup> century now. It actually fits together very nicely ... The Chinese evidence and the weight of the Islamic evidence makes it a very neatly defined 8<sup>th</sup> century, probably later 8<sup>th</sup> century assemblage and I think for that reason it is going to be very useful.

St J: Adding to that I would say that two diagnostics you have, which are diagnostic of maybe the late 7<sup>th</sup> century and certainly the 8<sup>th</sup> century in southern Iraq, are "honeycomb ware" and the types of stamp you showed, the circular stamps with geometric patterns which is like the Early Islamic tail end of a Late Sasanian tradition. The [comparative] sites which immediately spring to mind in southern Iraq are Hira, Ain Sha'ia near Najaf and al-Qusur [which are all short-lived sites like Jazirat al-Hulayla] (Talbot Rice 1934; Fujii *et al.* 1989; Kennet 1991).

SA: [In relation to the carinated alkaline glazed bowl form that Derek Kennet proposed as a type fossil of the site]. You have similar carinated bowls starting already in the Old Parthian period and it continues more or less through, so it is not a very good shape to use for dating.

CP: [In relation to DK's use of Area F at ed-Dur for dating the site]. I would be a bit cautious on making generalisation based on Area F at ed-Dur. It is very obvious that Area F was being used for very specific purposes in the 3<sup>rd</sup> and 4<sup>th</sup> century AD. Therefore there are many common forms that you might not expect to find there that might be elsewhere.

**Søren ANDERSEN:**  
*Partho-Sasanian Pottery from Bahrain*

Søren Andersen studied classical archaeology at the University of Aarhus in Denmark, where he is now researching his PhD on so-called Tylos-period [Hellenistic-Parthian-Sasanian] material from Bahrain.

Four groups of pottery from the Danish excavations at Qala'at al-Bahrain and the Barbar Temple were presented for discussion.

In the early Seleucid assemblage (Group 1) the red ware, the grey ware and the glazed ware are equally common, whereas when we get into the Parthian period we have a lot more of the glazed ware (Group 2).

The Fine Orange Painted Ware was found at Qala'at al-Bahrain, together with hard fired grey ware and some dark grey thick ribbed vessels (SMAG/LISV<sup>1</sup>) (Group 3), whereas a brown or reddish hard fired ware was found at the Barbar temple site (Group 4). The grey ones from Qala'at, I would say, would be around the 3<sup>rd</sup> century [like] the FOPW, whereas the reddish one from Barbar could be later, 4<sup>th</sup> - 5<sup>th</sup> [century], and some of it could be up to the very Early Islamic period.

INSERT FIGS 3-7

*Discussion*

DK: So this is like Lecomte's 'Fine Grey Ware' [from ed-Dur in the UAE]?

SA: Yes exactly the same ... From the 4<sup>th</sup> – 5<sup>th</sup> century we do not have any finds recognised at Qala'at, so it looks like the site has been abandoned at that time.

SP: What were you saying about the difference with these? [Grey and brown/red fired SMAG/CLNKY]. As far as I have come across there seems to be a transition between a fabric which is ... greyer and 'dry' [looking] with some lime spalling and this one which is much more classically like what Derek is calling SMAG [highly vitrified, brown or grey with a red core or red throughout].

SA: It is also the feeling I have. This fabric starts off very grey and then it becomes more reddish.

St J: How much variation would you statistically expect in a kiln, between that proportion of wares that get reduced and those that get oxidised?

DK: But if you can demonstrate that there is a general trend over time ...

---

<sup>1</sup> SMAG and LISV are class names coined by Derek Kennet from his own work in the UAE and stand for Small Grey Vessels and Large Incised Storage Vessels respectively. Although these wares are now widely recognised and act as useful type fossils for the later Sasanian to Early Islamic period, there is a certain difficulty in applying them to systems of classification developed by other researchers. The main problem stems from the fact that the names themselves represent both a fabric group combined with specific forms. Often in the discussion of these groups there is a tendency to use the terms more generally to talk about a family of fabrics (also including CLINKY), within which one finds a range of types, some of which conform to Kennet's original description. What is needed now is a group term for all of these classes, within which it will be possible to define sub-sets of material for example the groups that Kennet has already defined.

SP: It is not just a question of reduction and oxidisation there is [a difference in the level of vitrification between the two groups], there is a difference in quality.

St J: But you can get that even within a single firing depending on where the pots are stacked.

SP: There are differences in forms as well ...

RT: I've got this type [LISV]; it is not identical but it is in the same family, you can see it, they are really hard grey wares and these occur in the 3<sup>rd</sup> century in the Red Sea ... they are from well-dated contexts.

DK: What I think is key is that it [CLINKY/SMAG etc] is definitely part of a tradition that starts in the 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup> century and continues until about the 9<sup>th</sup> [century]. It is a local coarse ware that is extremely well fired ... and it goes through a number of manifestations ... Seth has had a good go with the Williamson Collection at sub-dividing that and he has come to slightly different conclusions to the ones I have come to, based on a different and a smaller collection at Kush, but it is going to be sub-dividing that tradition which I think is going to be the key to the chronology of that period, and I think we are still some way from getting a close handle on it.

**Derek KENNET:**

***Sasanian and Early Islamic Pottery from southern Iran and the United Arab Emirates***

Derek Kennet is Research Fellow in South Asian Studies at the University of Durham, completed a PhD on Indian Ocean and Gulf trade in the Sasanian and Islamic periods, and directed excavations at the Sasanian-Islamic tell-site of Kush in Ras al-Khaimah (Kennet 1997; 2004).

This presentation described excavations at Kush in Ras al-Khaimah [United Arab Emirates] which have revealed a sequence of pottery dated from the 4<sup>th</sup>/5<sup>th</sup> century to the 13<sup>th</sup> century (Kennet 1997). The lowest levels (Period I) are stratigraphically below a <sup>14</sup>C date of the mid-7<sup>th</sup> century and contain Fine Orange Painted Ware (Namord-ware) [see below] and a number of forms very similar to Mouton and Lecomte's PIR.D assemblage from the nearby al-Dur (ed-Dur) which are dated to the 4<sup>th</sup> century (Lecomte, Boucharlat & Culas 1989; Lecomte 1993). The Period I assemblage can therefore confidently be dated to the later Sasanian period.

The Kush Period I assemblage is an important contribution to our understanding of Sasanian pottery in the Gulf, the study of which, up to now has suffered from a lack of reliably dated assemblages.

Comparison with the assemblages from Pasargadae (Stronach 1978: 157-159, figs 123-24), Qasr-i Abu Nasr (Whitcomb 1985), Mleiha (Benoist, Mouton & Schiettecatte 2003), Jazirat al-Ghanam (de Cardi 1972; 1975: 54-59), Hajjiabad (Azarnoush 1994), Bushehr (Whitehouse & Williamson 1973: 35-39; Whitcomb 1987), Suhar (Kervran & Hiebert 1991; Kervran 1996; Mouton 1992: 180-181) and Tepe Yahya (Lamberg-Karlovsky 1970: 6-22) are beginning to shed light on the chronology of Sasanian pottery in Southern Iran and the Gulf.

Comparison with the Kush Period II assemblage, which is dated to the Early Islamic period (7<sup>th</sup>/8<sup>th</sup> century), also shows a number of quantitative changes between the two periods, as well as the introduction of a limited number of new wares, and the decline of others during the 7<sup>th</sup> century.

These assemblages were described in the presentation. [They have also briefly been discussed in Kennet (2002), are further discussed in Kennet (2004) and references cited above are listed at the end of this document].



**Carl PHILLIPS:*****Late Finds from Kalba (United Arab Emirates)***

Carl Phillips was a lecturer at the Institute of Archaeology in London and is now affiliated to the CNRS (UMR 7041). He has excavated widely in southern and south-east Arabia.

In Kalba we have a certain problem and it relates to burials. There are literally thousands of cairn burials on the coastal plain and on the prominent hills, such as Jabal al-Qaisy. Many of those which were on the plain have been destroyed in recent years. The cairn field extends north towards Fujairah, and beyond this, at many other places along the coast (e.g. Khor Fakkan and al-Luhaya) there are more cairns of the same type. I would also suggest that many of the cairns found south of Kalba, towards the eastern end of the Wadi al-Jizi and the Wadi Suq in Oman, are also of the same type. In the Wadi Bawshar, at the southern end of the Batina near Muscat there is a large area of identically the same types of cairn burial. The cairns frequently occur in discrete clusters so what we have been doing is not excavating individual ones but entire clusters. At Kalba we have excavated four clusters of cairns (K6, K7, K8 & K9) that contain 60 individual tombs. However, the quantity of finds has been small and made the dating of the cairns a problem. For example; out of 26 that constitute the cluster of tombs designated K8, only three finds were forthcoming and these were all beads. These things are not very rich as they are now, in their robbed state.

The first indication we had from these tombs which might shed some light on the date of them came not from one of the separate cairns, but rather an isolated chamber which had been created in the top of an Early Bronze Age mound [K2]. In addition to a leaded bronze bell, the finds included one jar rim of an orange brown fabric, highly fired and brittle. This is the description that I gave long before I heard of SMAG and CLINKY. There was also a glass vessel, and apart from that there were a number of bronze rings, a silver ring, and a small iron ring. There were then a whole lot of beads, small carnelian beads, shell beads, and bone beads, but for dating the tomb you can see that the amount of material is extremely limited. Initially the only designation made was post-Iron Age / pre-Islamic, in other words, between c. the 3<sup>rd</sup> century BC and the 7<sup>th</sup> century AD. This is clearly an unsatisfactory terminology and too large a date range.

[K6 was one of the first groups of tombs excavated], somewhat ironically we got more material from this rather dilapidated cluster of tombs than we got from any of the ones that we subsequently excavated ... Again the finds comprise a mere four bronze rings, a small bronze plate, several bronze bells, a small silver bead, a black etched bead, a small stone pendant and a small bone pendant or bead. The other finds from this group of tombs were several hundred beads, shell beads, bone beads, carnelian beads, but predominantly small glass beads. From this area of K6 we also found a number of sherds. Three of these are green glazed sherds, one with a handle, and one rather thick grey burnished body sherd with a raised cordon. The coloured glass beads are comparable with the "Indian trade-beads" that are quite common around the beginning of the 1<sup>st</sup> millennium AD. Analysis of some of the beads from K6 suggests that they have a North Indian origin. The glazed wares are similar to the Partho-Sasanian types found elsewhere in the Gulf and the grey burnished sherd is similar to some of the grey wares from ed-Dur. However, at ed-Dur these wares are not normally so burnished, if at all. It is possible that the burnished grey ware from K6 is also an Indian import. These finds might suggest a date in the first few centuries AD.

From K6 there were also a handful of un-diagnostic body sherds. These were described as light brown fabric with sand and vegetal temper, coarse grey fabric with sand and vegetal temper, red fabric with sand and grit temper, and, grey fabric with burnished and blackened exterior. At the time of excavation there was no comparable pottery known to us from the Kalba area.

Our attention in more recent years has turned very much to a site in the cultivated palm gardens area of Kalba called K4. This has turned out to be an extremely large Early

Bronze Age tower site, like the ones in Hili Gardens near al-Ain (e.g. Hili 8) and Tell Abraq. The Kalba site was occupied from the 3<sup>rd</sup> to 1<sup>st</sup> millennium BC and witnessed several major phases of rebuilding and enlargement. Occupation probably came to an end around the middle of the 1<sup>st</sup> millennium BC. Prior to that, we know that at this site it was a focus of various manufacturing industries. Throughout the sequence there is evidence for copper smithing activities, shell artefact manufacture, stone vessel manufacture and that kind of thing.

A couple of years ago we became aware of a small assemblage of pottery found in the bottom layers of a large intrusive pit on the eastern side of the site. The pit cuts through earlier Bronze Age and Iron Age strata and the pit contains predominantly residual finds from these two major periods. However, the finds from the lowest levels of the pit were very surprising and one became immediately alerted to their significance because more than half of them are glazed. Unfortunately none of the glazed sherds have any additional diagnostic features. a sherd of Indian Red Polished Ware, another sherd of Indian or Asian origin, a coarse grey handled jar, a sherd of thick grey ware with incised wavy line and punctate decoration, and one sherd comprising a coarse brick red fabric. The Indian Red Polished ware and the glazed wares again suggest a date in the first few centuries AD. I think it is going to be possible on the basis of what we have seen today, to make comparisons with most of that material, what interests me most [though] are ... [the] rather distinct, soft coarse wares, gritty and vegetal tempered, and with a range of shapes and decoration, which were completely unknown to me or at least was until we came across this assemblage ... [of] about 15 out of the 50 sherds, although latterly the fabrics are possibly comparable with some of the undiagnostic body sherds found several years earlier at K6 [and described above]. Of the 15 sherds we can argue for there being at least five separate vessels so it isn't just a one off. So here we have this extremely coarse rather distinct pottery assemblage, which is totally unfamiliar to me from ed-Dur, from Mleiha or from any of the other late-period (possibly urban) sites that I have visited, either in the UAE or in the Sultanate of Oman ...

I'm hoping that what we have done here is to define a small component of a local assemblage and I think that this is extremely important. It might be that the pottery is of a later date than ed-Dur or Mleiha (i.e. later than the 4<sup>th</sup> century AD) and apparently the date range of Indian Red Polished ware is no longer confined to the 1<sup>st</sup> - 3<sup>rd</sup> century AD as was once thought, and can extend up to the 7<sup>th</sup> century. The absence of comparable coarse wares at the site of Kush in Ras al-Khaimah is however slightly problematic. What I would like to suggest is that this coarse ware with distinct incised decoration, is a component of the local assemblage at Kalba which existed alongside the imported glazed wares and other imported types.

If you bear in mind the vast number of identical type of cairn tombs throughout the Batina region, you can visit any of these cairn fields and you can hardly find a sherd anywhere in close proximity to them, but maybe that is because we are all looking for the readily identifiable glazed sherds or recognisable imported sherds.

Inevitably there is a temptation to group these late pre-Islamic finds from K4 with the mass of cairn burials, for which no contemporary habitation site has yet been found. The precise date of these needs to be further refined. However, it is improbable that late pre-Islamic sites such as ed-Dur and Mleiha can be seen as typical, of the entire population of the region at any one time. There must surely have been a "rural" population whose burials might be expected to differ slightly and a population which was also engaged in the manufacture of its own range of local products that was occasionally supplemented with imported prestige goods.

**INSERT FIGS 8-15**

Fig.8. Tomb K2

1. Orange –brown fabric. Sand and some grit temper. Highly fired – brittle. Traces of brown wash on exterior.
2. Green/yellow opaque glass.
3. Cu/bronze bell.
- 4-6. Cu/bronze rings.
7. Silver rings.
8. Iron ring.

Fig.9. Tombs K6.

- 1-4. Cu/bronze rings.
5. Cu/bronze plate.
6. Bronze bells.
7. Silver bead.
8. Black etched bead.
9. Stone pendant.
10. Bone pendant.

Not illustrated pottery from K6

1. Fragment of jar handle. Light beige fabric. Thick blue/green glaze.
2. Thick green/beige fabric. Dark blue glaze.
3. Grey fabric. Black burnished exterior with raised bands.
4. Light brown fabric with sand and vegetal temper.
5. Coarse grey fabric with sand and vegetal temper.
6. Small rim sherd. Light beige fabric. Blue/green glaze.
7. Red fabric with sand and grit temper.
8. Grey fabric. Burnished black exterior.

Fig.10. Tombs K6; glass beads

Fig.11. Turayf and K10

1. Stone bowl (Turayf)
2. Glass vessel ( “ )
3. Black/grey glass (K10)

Fig.12. Kalba 4.

1. Fine orange fabric. Red burnished slip. IRPW.
2. Fine light brown fabric. Black paint.
3. Grey - brown fabric with sand and some grit temper. Black core. Brown – black burnished exterior.
4. Light grey - brown with sand temper.
5. Thick grey - black fabric with sand and vegetal temper. Incised decoration.
6. Brick red fabric with sand, grit and shell temper.

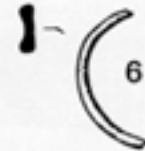
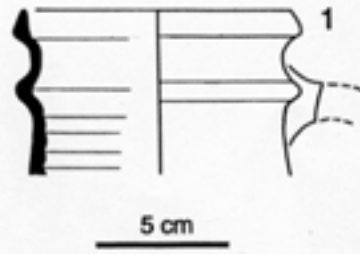
Fig.13. Kalba 4.

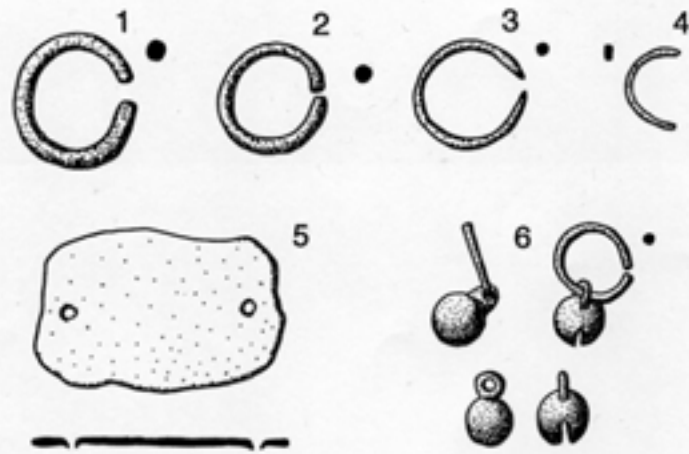
1. Red - orange fabric, grey - brown towards interior surface. Sand, grit and shell temper. Exterior surfaces wiped brown - black. Soft, coarse texture. Incised decorated around rim.
2. As above.
3. As above.
4. As above.
5. Light brown fabric with sand and small grits temper. Some vegetal content. Incised decoration.
6. As above.

Fig.14. Kalba 4. Seal impression/bulla

Fig.15.

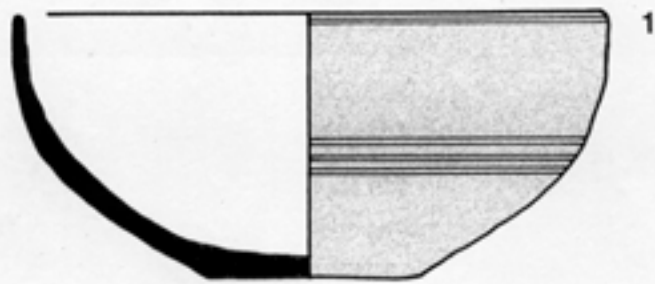
1. Jazirat al-Hulayla
2. Naslah 1, Wadi al-Qawr.



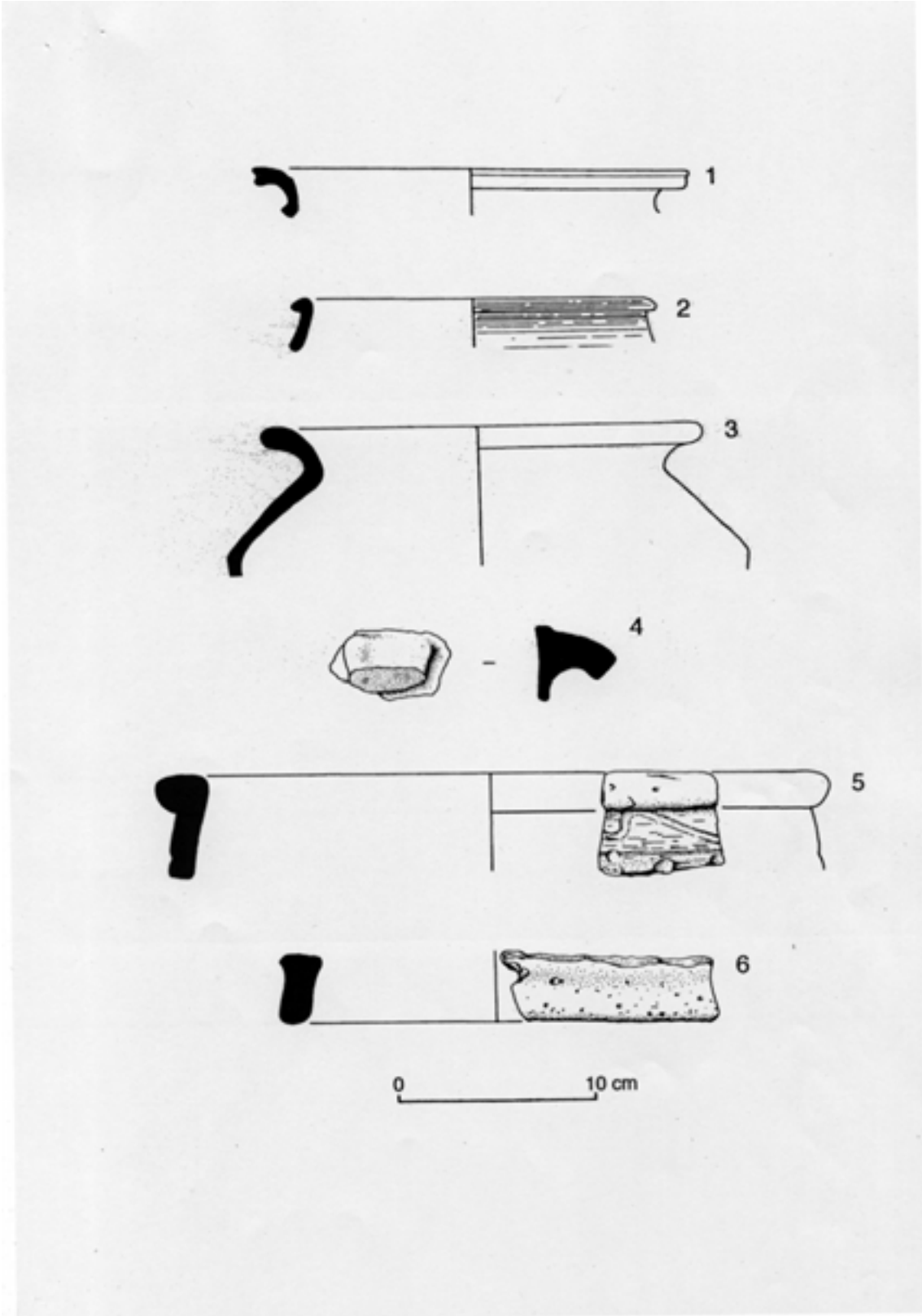


2 cm

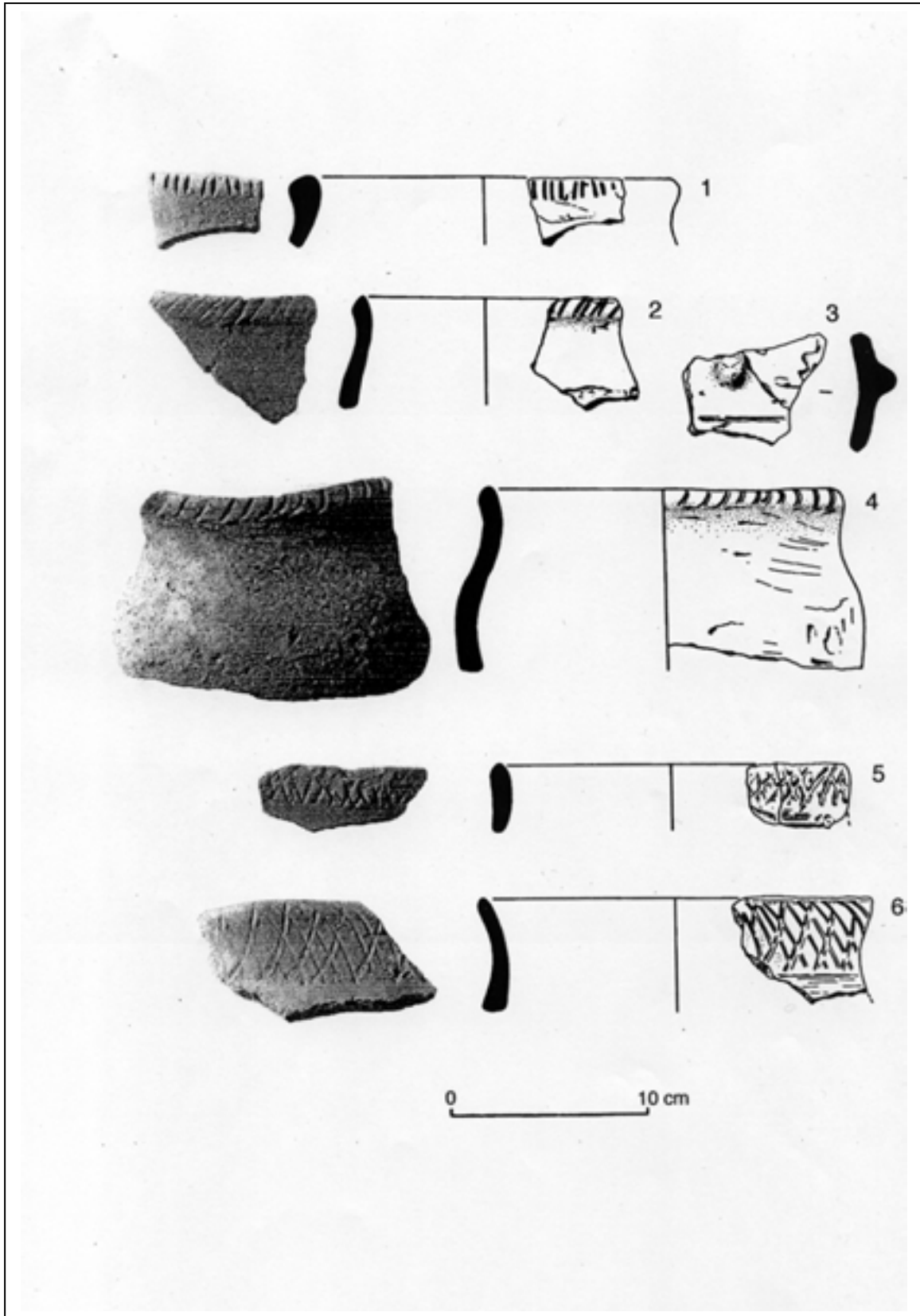
Page 4 didn't scan well, table of beads from Kalba.



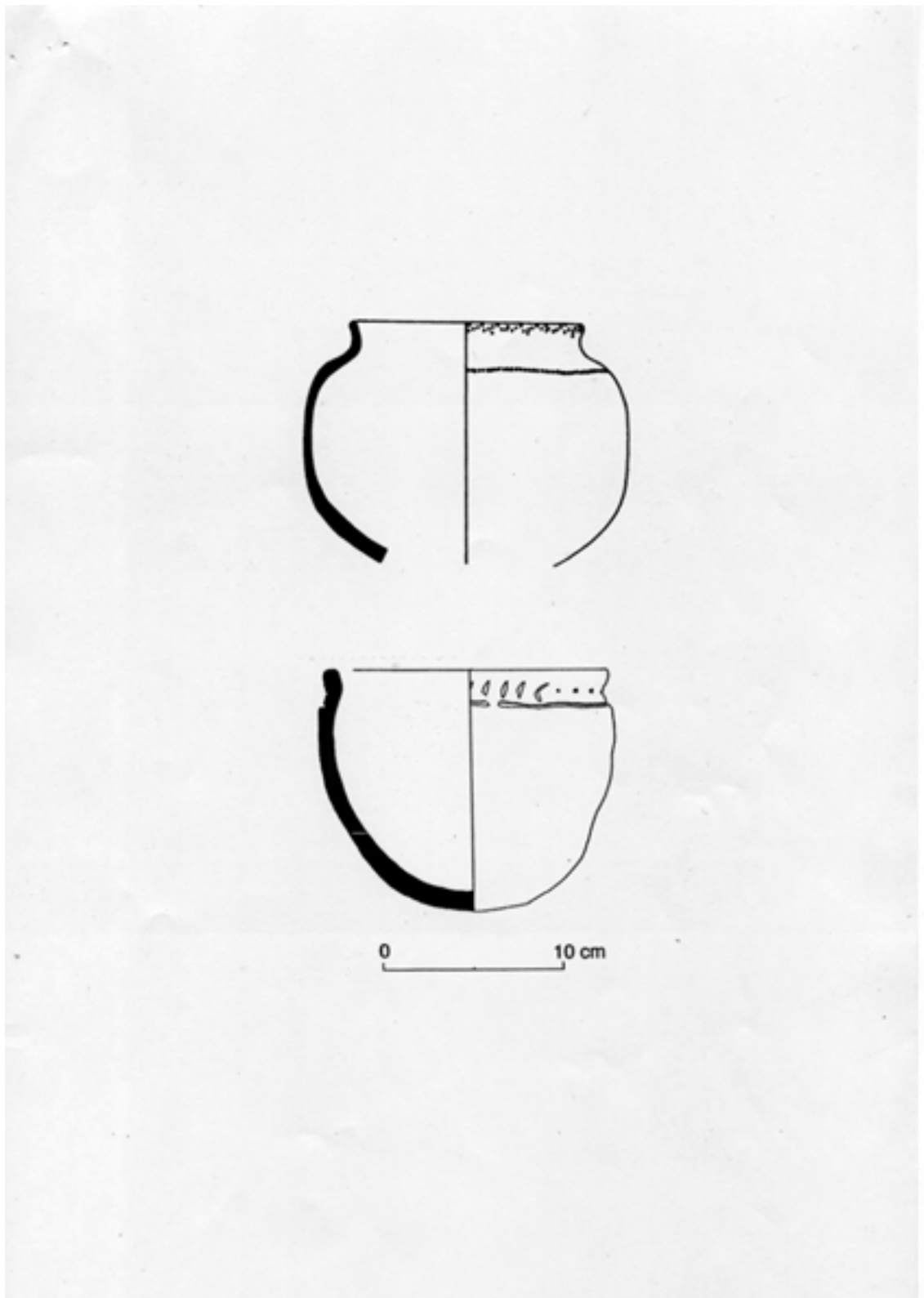
2 cm







Page 8 doesn't scan well, copy needs to be taken from original.



Age there is always present a crude handmade element. Such vessels are admittedly few in the earlier periods and look like amateurish copies of fine-ware shapes. However, coarse wares certainly increase in the Late Bronze Age and Iron Age levels. I think what we have isolated at Kalba is an element of a perhaps local, rural pottery tradition. The pottery is not high quality and I imagine it would not survive very well

when exposed to the elements. This might explain why we know of so few Late pre-Islamic sites, other than the main sites we are all aware of (ed-Dur, Mleiha, Kush). But throughout the UAE we have the odd Late pre-Islamic burial stuck in an earlier tomb, identified by imported exotic items. For example at Bidya, Fashgha 1 and Sharm. All of these sites are on or near the eastern sea board of the UAE and yet no settlements, or so it appears are located nearby. Maybe we have to try and locate this new category of coarse ware amongst later coarse wares (of Julfar type etc) in and on the outskirts of more modern, present day villages. However, I don't think this will be easy and we obviously need more criteria to work with.

RC: Is there some Samad stuff like that? ... I've seen some with incised criss-crosses.

CP: It is not the same, the vessel forms are different, the fabrics are different ... But what I envisage is the widespread production of pottery at a local level. Therefore there could be a range of similar forms and decoration and a similar technology regarding basic clay menus, bonfire kilns etc. But stuff produced at one end of the region (e.g. Samad) might inevitably look and feel different than something produced on the other side of the region (e.g. Kalba). I've always thought that it's strange that we have the Samad culture in Oman and not in the UAE, it's as if the border between the two countries was better defined two thousand years ago than it is today, We need to see what there is in the area between, or try and see how uniform the Batina is and how it compares with the Sharqiya, and how these compare with the Gulf Coast and so on.

RC: Could they be African or something?

CP: Well, I'm always extremely cautious about making such long distance comparisons and especially when we have so little to go on. However, I think I have met this category of coarse pottery I've been talking about on a previous occasion. In the late 80s when we excavated a Late Bronze Age tomb at Naslah in the Wadi al-Qawr (Naslah 1) we found that the tomb had continued in use throughout the Iron Age. Also, at a later date there was an intrusive burial with some scraps of iron and a pot. This pot, I now realise, is probably comparable with the stuff I've been describing from Kalba. Of course at that time I knew of no parallels. However, Beatrice drew my attention to a single pot from Jazirat al-Hulayla that is published in John Hansman's Julfar report. In this report Hansman suggests that this one pot might be of African origin. At the time I couldn't quite see why this should be and I am obviously even less inclined to accept this now - perhaps it came from Kalba!

**Seth PRIESTMAN:**  
*Fine Orange Painted Ware*

Seth Priestman has researched the Williamson Collection of pottery collected on archaeological surveys in southern Iran between 1968-71 as his MA dissertation at the University of Durham (Priestman & Kennet 2002; Priestman 2003), and the Sasanian and Islamic component of the Stein Collection in The British Museum where he was the Sackler Fellow for 2003 (Priestman 2004).

The purpose of the talk was to outline the recent research that I have been doing on Fine Orange Painted Ware [FOPW] looking at material in the Williamson and Stein collections (Figs 16-17).

Fig. 16 *Selection of FOPW sherds from Qal'at al-Bahrain, note one typical FOPW.3 sherd in the bottom left hand corner.* [Slide No 3]

Fig. 17 *Selection of FOPW sherds from the Stein Collection, note one typical FOPW.1 sherd in the top left hand corner.* [Slide No 1]

Within the Williamson Collection there is the single largest body of this material that has ever been brought together, with 707 sherds from 64 separate sites. The general distribution of that material is clear. The greatest concentration occurs within the Halil-Rud area, particularly the lower Halil-Rud or Rudbar area as well as from the Minab Delta. In addition there are a few outlying pieces from Bushehr. Other investigations have picked up additional outlying pieces in Baluchistan, Ras al-Khaimah, Umm al Qaiwain, Jazirat al-Ghanam, Bahrain and Yemen. From this information it seems highly likely that the pottery was manufactured either in the Minab Delta or slightly inland in the lower Halil-Rud and exported from there by sea to a few sites in the lower Gulf and beyond and overland to few outlying site to the east. This conclusion seems to be supported by Stein's survey, which approached the area starting right over in eastern Baluchistan, but only picked up significant quantities of the ware once he reached Kerman. Sajjadi has also surveyed the area, this time approaching from further north close to Jiruft. Again most of his FOPW sites lie in the Lower Halil-Rud basin (Sajjadi 1989) (Fig. 18).



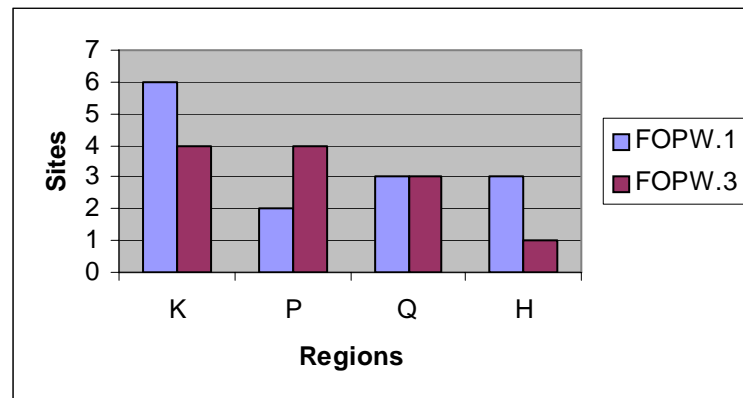
Fig. 18 *Distribution of FOPW based on material in the Stein and Williamson Collections*

One of the things that is lacking from Williamson's data, despite its range and quantity, is information on the sites themselves. It has therefore been informative to have the opportunity to study the Stein Collection material in some detail. Although there are only a small number of sherds and sites involved, the quality of site description provided has been informative. Eleven sites can be identified where Stein picked up FOPW. Interestingly none of the material appears to come from mortuary sites. All of the material from the core area of the wares distribution has been picked up off the surface of settlement mounds with deep stratigraphy extending well back into the prehistoric period. Most of the sites are tells and all on a considerable scale. It is difficult to interpret this pattern, however, as far as it is possible to assess from the description of the lower Halil-Rud area, it appears to have been quite densely packed with large archaeological tells, as I have said, with very long occupational histories. I presume that this is a reflection of a fairly stable aggregated agricultural society, which one imagines, would have been able to meet most of their need at a local or regional level of exchange and communication.

The sites where FOPW has been found outside this core area appear to be somewhat different. Both Rishahr and ed-Dur could be seen as quite cosmopolitan by comparison. They were both large thriving cities going into the beginning of the Sasanian period, able to tap into trade links extending throughout the Gulf and into the Indian Ocean. The sites where it has been found in Baluchistan also appear to be somewhat different: Damb-Koh is a small dry-stone built village lying adjacent to a very large cemetery of over 2000 graves whereas Qalat-i-Jamshod appears to be an 11<sup>th</sup> – 12<sup>th</sup> century fort. The presence of FOPW there is isolated and without any other related materials. From this it might be possible to suggest that FOPW served a fairly specific role in amongst the communities that produced it within the core area of its distribution, but that outside that it was traded as a fine ceramic for consumption within rather different types of contexts.

Study of the material in the Williamson collection suggested that there was at least one major sub-division within the group. The first group has a very hard consistent fabric orange to red in colour. The rims are quite strongly everted, the walls

are a completely even thickness and the decoration almost always contains a series of tall elongated triangles or vandykes set below the rim and above the base. The second group has slightly thicker more uneven walls. Slip is less frequently used and consequently the colour is more often within the buff to orange range. The rims are still gently everted on the beaker form, but less so than with the first group. The surface is often more obviously burnished especially on the inside and generally the fabric has a slightly softer smoother feel. The decorative motifs on this second group are different. Most common are the hanging spirals or volutes more familiar from Londo-ware style decoration [see below].



**Fig. 19** Number of sites with FOPW types one and two by survey area. *K = Minab Delta, P = Halil Rud, Q = Rudan and Bulak (between the Halil Rud and Minab), H = Bushehr peninsula.*

From the Williamson Collection data I have looked at the distribution of the two types (Fig. 19). With the first there are a greater number of sites from the Minab Delta and the actual volume of material for this area is greater than inland, although there are still some sherds of this group occurring in the Halil-Rud area. Other parallels for this group come from Kush. For the second group there are a greater number of sites from the Halil-Rud area. With this group there are likewise a few sites in the Minab Delta, but the quantity of material on them is low. Parallels for this group can be found at Jazirat al-Ghanam, Qala'at al-Bahrain and Tepe Yahya. This apparent geographical division of the two types prompted me to suggest that the second group is more closely related to de Cardi's Londo tradition [see below], as it appears to be more similar, both in decoration and general quality and secondly that there may have been two separate areas of production. Søren Andersen has proposed what I now believe to be a much more likely suggestion, that the division is chronological. This interpretation ties in well with the idea that the second group is linked in to the Londo tradition, which probably died out in the 3<sup>rd</sup> century, probably almost at the same time that FOPW first emerged and that the whole group carried on up to into the earliest levels of Kush in the 5<sup>th</sup> or 6<sup>th</sup> century where the best parallels for the first group lie. The evidence from the Williamson Collection may indicate that during that period there was a shift of emphasis, for this ware at least, from the lower Halil-Rud towards the coast and the Minab Delta.

**Fig. 16** Selection of FOPW sherds from Qal'at al-Bahrain, note one typical FOPW.3 sherd in the bottom left hand corner. [Slide No 3]

Fig. 17 Selection of FOPW sherds from the Stein Collection, note one typical FOPW.1 sherd in the top left hand corner. [Slide No 1]

Fig. 18 Distribution of FOPW based on material in the Stein and Williamson Collections [tiff file].



**Beatrice DE CARDI:**

***Londo-ware: a Parthian-period ceramic in Baluchistan***

Beatrice de Cardi conducted pioneering surveys in Baluchistan in the 1950s and in so doing defined a new type of painted pottery called Londo-ware (de Cardi 1951). This paper provides a revised view of the date and distribution of this ware.

When Sir Aurel Stein set out from Quetta in 1927 to survey archaeological sites in Baluchistan he found a wide range of wares which were difficult to date in the absence of a ceramic chronology at that time. He excavated some prehistoric settlement mounds which served to relate a number of wares but others “floated” in a temporal vacuum. To overcome the problem without actually dating such wares Stein usually referred to them as either “late prehistoric” or “early historic” but those terms proved of limited value (Stein 1931). It therefore seemed preferable when I found a “late prehistoric” ware in quantity at Londo, Jhalawan, to coin the name Londo-ware as a convenient means of identification and reference (de Cardi 1951; 1983).

One of the virtues of Londo-ware is the ease with which it can be recognised. The fabric was generally a gritty, grog-tempered pink or red, used for a fairly limited range of forms which were often hand-made and rather thicker than one would expect in an exuberantly painted ware. The vessels were either red or maroon slipped with black-painted decoration, or tan to buff slipped with brown-painted designs. Exteriors were often burnished to a high gloss giving the ware a distinctively smooth feel.

The current range of diagnostic forms was limited to high-necked jars with sloping shoulders (Fig. 20: 1-3), bowls and goblets derived for the most part from surface collections. Three types of bowl were noted, the most common being a vessel with either a flaring rim and bluntly carinated shoulder (Fig. 20: 8, 11, 14, 19) or a variant (not illustrated) with a more rounded shoulder and globular body. Both types were produced in a range of sizes but as all were broken the shape of their bases is unknown. An open bowl with simple pointed rim (Fig. 20: 5) occurred infrequently on the Jhalawan sites but is known at Budi Buthi in Las Bela (Franke-Vogt 2001: fig. 14: 7, 9). Particularly common were goblets, both large and small, with tapering rims and either slightly sinuous, occasionally carinated or bell-shaped sides and a small flat or disc base (Fig. 20: 6, 9, 12, 15).

Londo-ware is sometimes described as being crude but the vigour reflected in the wide range of motifs in the decoration and the use of white (Fig. 20: 13) or polychrome infills has a certain charm. Most noticeable are the bands of hanging spirals (Fig. 20: 1, 3, 5, 10, 16), vine scrolls with a Hellenistic flavour (Fig. 20: 17), geometric elements set within metopic frames together with an assortment of birds and beasts, including notably horses and their stylised heads (Fig. 20: 7, 16, 18, 20).

The goblets were most usually encompassed with innumerable narrow horizontal bands extending from the rim to the girth (Fig. 20: 6, 9). Occasionally, the artist overdoes the decoration, as in the case of some bowls found at Londo which bore flamboyant designs on both surfaces (Fig. 20: 14, 19).

It is not yet clear whether there is any chronological distinction between the maroon and buff slipped versions of Londo-ware. Trial-trenching at Alizai, Jhalawan, had indicated that the maroon slipped ware was restricted to a low spur whereas buff slipped vessels occurred on the surface of the main mound. In view of their different locations, the term “Londo-ware” was applied specifically to the maroon slipped version, whereas the buff slipped ware – which occurred with other wares known elsewhere in Scytho-Parthian and Kushan contexts – was designated “Late Londo”

(de Cardi 1983). Both versions have been found at other sites and a bichrome variant at Kanrach, Las Bela, is regarded as an intermediary (Franke-Vogt, ul-Haq & Khattack 2000).

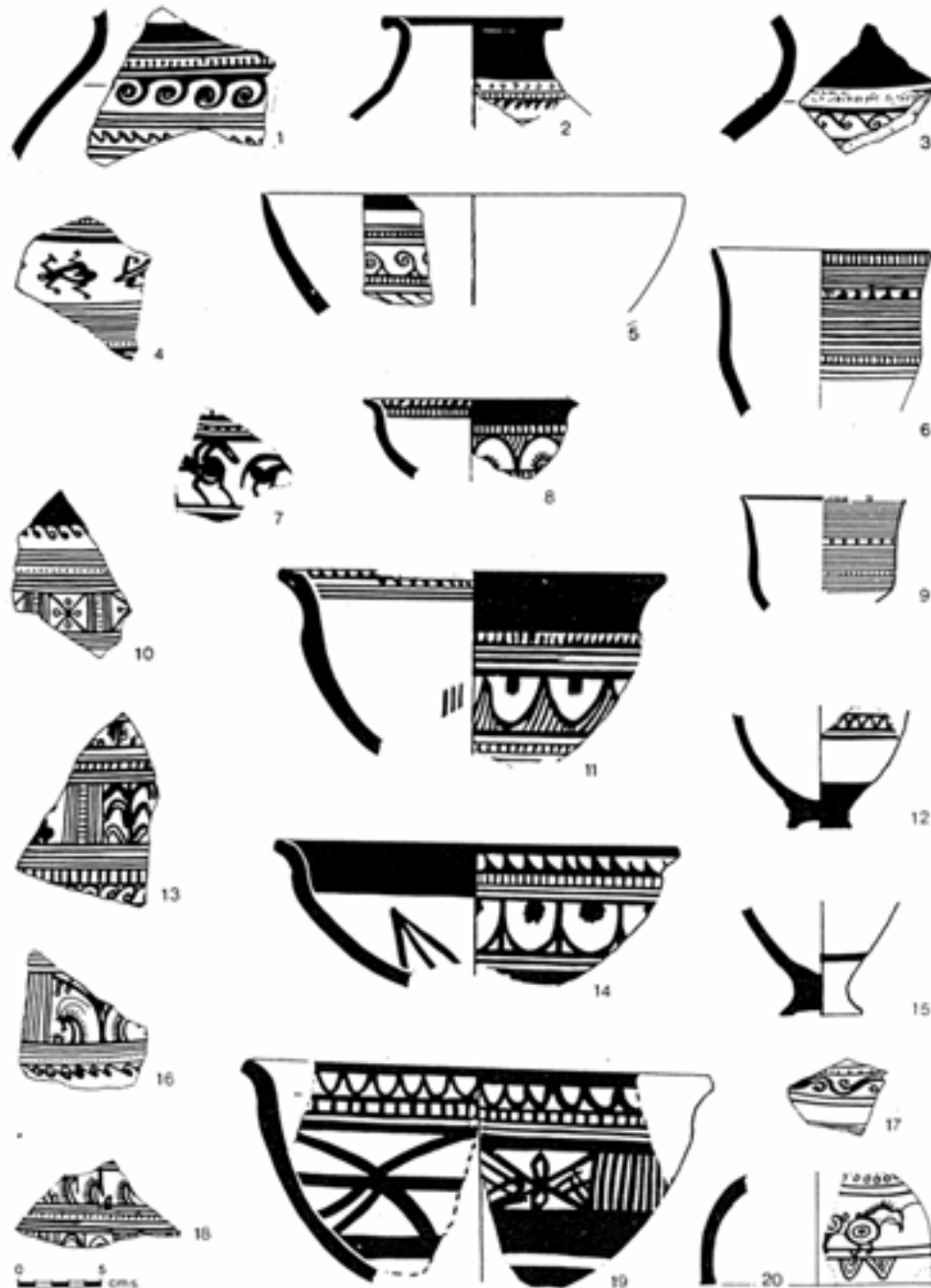


Fig. 20 *Londo-ware*: sherds from Londo (1, 7, 9, 11-12, 14-16, 19), Alizai (2, 4, 18, 20), Hadi (6) and Rais Sher Mohammed (de Cardi 1983: figs 27-29).

### *Distribution*

Stein illustrated Londo-ware from over thirty sites. The most northerly lay in Kharan and Sarawan, with a noticeable increase in Jhalawan which was probably a key production area, despite the absence of known kiln-sites (de Cardi 1983). Recent fieldwork by the Joint German-Pakistani Mission to Kalat has not only extended the distribution of Londo-sites to Las Bela but investigated their function, distinguishing between different kinds of settlements and others of a defensive nature (Franke-Vogt 2001). Surprisingly, Londo-ware did not penetrate through the Kirthar Range to Sind.

In Makran, although the ware is known from various sites including some cairns, it was not recovered from a stratified context during excavations at the Miri Qalat, Turbat. It has, however, been assigned to the Zangian period VI, a Hellenistic/Parthian context (Besenval & Sanlaville 1990; Besenval 1992). It should be noted that although cairns are numerous in the Makran, they are infrequent in both Jhalawan and Las Bela, and none have so far been associated with Londo-ware in those regions.

Caution is also needed in accepting references to Londo-ware in the Makran as an entirely different, white-slipped ware adorned with large volutes is known from Jiwanri and some Zangian sites (Stein 1931; Dales & Lipo 1992). The vessel forms, however, which include lenticular flasks, bear no resemblance to the classic Londo shapes. At Tepe Yahya in Kerman, a fine black-on-red ware in Period I levels was originally described as “reminiscent” of Londo-ware (Lamberg-Karlovsky 1970), but this can now be identified as Namord-ware (see below: Date). The most westerly sighting of Londo-ware was at Kaftari in Fars (Caubet 1984), but the few sherds found there are more likely to represent the personal possessions of a migrant rather than trade links with Baluchistan.

### *Date*

The dates originally suggested for Londo-ware (de Cardi 1951) were too early and should be disregarded. Now, on the basis of more stratified material, it is possible to regard the ware as a Parthian-period product. Excavations at Ajab Damb Buthi, near Nal in Jhalawan, have provided a  $^{14}\text{C}$  date of  $2111 \pm 36$  BP, while another charcoal sample from Budi Buthi in Las Bela gave a dating of  $2170 \pm 28$  BP (Franke-Vogt 2001). While those results indicate when Londo-ware was still in use, there is still need to establish when it was introduced and eventually went out of production. In the wide range of Londo material collected from sites in Baluchistan some degree of stylistic difference is apparent. The zoomorphic motifs which are a notable feature on pottery collected from the type-site and a few others in the Surab region, seem to occur less frequently elsewhere. Were they the expression of an individual potter catering for local taste or could their absence be due to an inadequate understanding of the iconography on the part of later craftsmen?

In summarising the association of Londo-ware and several other kinds of pottery, Ute Franke-Vogt has pointed out that the chronological correlation between Appliqué and Rope wares to Londo-ware has yet to be determined (Franke-Vogt, ul-Haq & Khattack 2000). Namord-ware, regarded as directly developed from Londo-ware (Sajjadi 1989), should be added to this list. Stylistically it bears a resemblance to Londo-ware but its fine, hard orange-red fabric and range of shapes is entirely different. It is relevant to add that Namord-ware has been found during excavations at

ed-Dur, Mleiha and a cemetery at Tell Abraq in the United Arab Emirates in contexts dated by their association with Roman “pillar-moulded” glass bowls (Potts 1998). Potts has divided the ed-Dur Namord-ware into two phases, an Early group dated to the mature Parthian period (1<sup>st</sup>/early 2<sup>nd</sup> centuries AD) and a Late group assigned to the early Sasanian period (3<sup>rd</sup> century AD). It would be interesting to know whether Early Namord-ware occurred in a stratified context with Late Londo-ware at Kulliki-an damb, a fort with round tower and semi-circular buttresses found near Nindowari in Jhalawan (Casal 1968).

### *Discussion*

SP: Is it the same fabric across all these forms? [Published in the Kalhat volume].

BC: Yes ... One of the interesting things are the elements of horses, either their necks or their bodies.

GP: Is it usually just this colour range? Is it usually orange?

BC: It varies quite considerably ... the ware from Londo itself was generally a maroon red with black and sometimes white infill.

SP: You said at the beginning that one of the virtues of Londo-ware is that it is easy to define. Why then do you think that so few people seem to feel confident about using this class?

BC: It has been difficult for foreigners to work in Kalhat since the 1960s and that could be one reason for the variation in definition.

SP: The reason why Londo-ware isn't found outside Baluchistan could be the same as why no other Baluchi pottery is found in south-east Arabia or Iran proper.

**Gabrielle PUSCHNIGG:**

***Beyond Merv: Sasanian pottery in its regional context***

Gabrielle Puschnigg is researching Sasanian pottery at Merv in Turkmenistan, a subject on which she wrote her PhD at the Institute of Archaeology, University College London (Puschnigg 2000).

Initially I undertook a quantitative study on the ceramic material from Sasanian levels at Merv and I tried to find a statistical means of dating the material independently, not using any comparative evidence from elsewhere to begin with. Based on assemblage comparison through correspondence analysis a basic sequence for the pottery was established. For this workshop I have chosen a number of pottery types characteristic for the Sasanian period at Merv, which I would like to discuss with respect to their regional distribution.

The pre-Islamic pottery from Merv appears to have been produced locally, which is also supported by petrographic analysis. Still changes in style and decorative techniques are noticeable and occasionally new shapes occur. The question is how does this local ceramic production fit into the wider regional context? In the earlier Sasanian period, the 3<sup>rd</sup> and the 4<sup>th</sup> century, we see some analogies with the neighbouring areas to the East in what would have been then Northern Bactria and what would have been under Kushano-Sasanian administration. These concern vessel shapes (primarily bowls) as well as their decoration. As you go towards Iran you will not necessarily find any comparative shapes, though it might be more instructive to look at certain elements of pottery types and their decorative techniques here. The use of burnish [shown in the first example], which may go back to the late Parthian period, but is often independently dated to Kushano-Sasanian times in Bactria, is found over a considerable region in the north and north-east of Iran at that particular time. Examples of criss-cross burnish on bowls and jars are known from Bactria and Khorezm as well as Gilan. We have also seen that a related tradition existed in Seleucid and Parthian times in the south and east of Iran and we will certainly need more material to define the regional and chronological spread of this tradition.

A diagnostic feature for many closed vessel shapes of the Middle Sasanian period (late 4<sup>th</sup> – 5<sup>th</sup> century) is a vertically rippled effect, most probably produced by chattering (Fig. ...). Usually the upper part of the vessel is covered with this treatment. No analogies of this decoration are known from Central Asia, but archaeologists have identified similar features on pottery from excavations in north-east Iran and surveys around the Caspian Sea. More work is needed to study this material, which is unpublished so far, but we may be able in the future to define a regional style for parts of the Sasanian assemblages in this area.

Single vessel forms at Merv fit with a more general perception of Sasanian ceramic style. To these belongs the trefoil mouth jug (Fig. ....). This example is burnished and shows a rib around the neck-shoulder junction. Many similar jugs are found throughout Iran. The similarity in this case, however, originates from the common source of inspiration, that is Sasanian metalware. The different specimens illustrate various degrees of imitation, some only showing the rib, as at Merv; some are also fitted with a thumb-stop knob on top of the handle, as at Susa.

Another vessel form of widespread popularity is the amphora (Fig. ...). This pottery type is long-lived at Merv, starting in this style from Middle Sasanian times and continuing into the Islamic period. Some variations in vessel proportion and decorative features are noticeable over time, including a general increase in size and details, such as the thumb-stop knobs on the Late Sasanian version. Amphora-shaped

vessels also occur in Sasanian levels at Susa. In this case again it seems inappropriate to assume any direct influence between the various regions, but rather a common source of inspiration, which the long-lasting tradition of this form would have certainly offered.

**St John SIMPSON:**  
*Parthian and Sasanian pottery in northern Iraq*

St John Simpson excavated in Iraq from 1985-1987, completed his DPhil at Oxford (Simpson 1992), is an Assistant Keeper responsible for the Ancient Iran, Arabia and “Alexander to Islam” periods at The British Museum, co-directed excavations at Merv in Turkmenistan (1992-2000), has published a number of articles on Sasanian pottery and material culture in particularly Mesopotamia (Simpson 1996; 1997; 1998; 2000), and is currently preparing a series of final excavation reports on Merv.

I would like to make some observations on material mainly from Iraq but before that I would like to add a thought in the light of what Gabi [Puschnigg] has mentioned in connection with the relationship of pottery and metalware, and draw your attention to a very distinctive class of Late Sasanian pottery which appears to come from north-west Iran. Only a small number of complete pieces are known, some of which I have published (Simpson 1998), but to which may be added another example displayed in the National Museum in Tehran which is said to come from the Siyah Kuh area of Gilan in north-west Iran [unpublished = inv. nr. 18429]. All of the vessels are pitchers and show features very heavily influenced by metalware, such as the general profile and square-sectioned handle. At least one of them also had remains of deliberately applied yellow ochre, analysed by Sylvia Humphrey (then in our Department of Scientific Research), which had been used to highlight figural decoration set in roundels on the body; the vessel was independently authenticated by TL analysis. This decoration is clearly intended to replicate the effect of gilt-silver but what I find intriguing is that as these pitchers were intended to be table wares (rather than kitchen wares) it seems to me very plausible that they were, like the silver, made and sold in sets for those individuals who had pretensions but not the financial resource to purchase silver plate, and perhaps were even used together with decorated bowls which for some reason were not placed in the graves in which these pitchers are thought to have been found. Speculation, I know, but it is always worth thinking how, why and where pots were used, as well as why some shapes were influenced by those in metal (or other media).

Now I want to look at three particular types of pottery commonly found in Iraq and north-east Syria and thus typically used for dating sites in this region. The first consists of so-called diamond-stamped decoration found on the shoulders and bodies of small to medium-sized jars, occasionally glazed but usually plainware. Each stamp contains a small number of blobs separated by diagonal lines and set in a diamond or lozenge-shape. After David Oates excavated at Ain Sinu in the 1950s this type has been widely assumed to be typical of the Parthian period, specifically the 3<sup>rd</sup> century, in northern Iraq. However, the fort belonged to the eastern Roman *limes* and the pottery was apparently sealed within a layer corresponding to a sack apparently by Ardashir I. When we look at other sites where this pottery occurs, we find that most are within the area of the very eastern-most part of the Roman empire at that period (such as Nineveh), whereas very few examples have been reported from Hatra, they are apparently absent at Assur (which marked one of the northern-most Parthian cities at that period), and they are absent from true Parthian sites further south. I suggest that they therefore be regarded as a 3<sup>rd</sup> and possibly 4<sup>th</sup> century type, and primarily eastern Roman. Their distribution therefore does not relate to Parthian settlement which is a misnomer in far northern Iraq.

The second ceramic type is “brittle-ware”. This term was used by Andrew Williamson and others to describe a class of pottery in the Gulf but the same term has

been independently applied to a totally different class in Syria and northern Iraq, namely for a type of cooking-ware. It is very thin-walled and fairly high-fired, hence its modern name, and is usually black or dark red. The petrographic analysis indicates a North Syrian centre of production for this (Bartl, Schneider & Böhme 1995). It is typical of eastern Roman sites, and is often found at military centres (e.g. Ain Sinu, Dibsi Faraj, Nineveh and Seh Qubba), but was rare at Hatra and was apparently absent at Parthian sites. Unfortunately, we don't know what 4<sup>th</sup>-5<sup>th</sup> century cooking-wares look like in this region but at least by the late 6<sup>th</sup> century there is another type in use at Sasanian sites in northern Mesopotamia. This is fired brown and is slightly thicker than the Roman "brittle-ware" but certainly derived from it. It would be interesting to analyse and compare the composition of this pottery with the earlier Roman variety as I suspect it was produced somewhere within the Sasanian *limes*, perhaps at a north-east Syrian city such as Nisibis. The type continued to evolve as late as the early 'Abbasid period.

The next type is Late Sasanian stamped pottery. This was recognised as Sasanian as early as the 19<sup>th</sup> century and described in detail following excavations at Nineveh in the late 1920s, where it was assigned a date between the late 5<sup>th</sup> and early 7<sup>th</sup> century. The distribution and date have been confirmed through fieldwork carried out in Hamrin and Saddam Dam salvage projects in the 1970s and 1980s although there are a few examples known from the Ctesiphon area (including a few sherds in our Asia Department) and a unique jar excavated at Borsippa in the 19<sup>th</sup> century which is in ours. Other complete or semi-complete jars are few and far between although there is one from Tekrit in the Metropolitan Museum [in New York] and two others were excavated at Nuzi. However, comparing these with sherds confirms that the vessels were typically decorated with up to three different stamps, usually circular although occasionally square or rectangular, and impressed in rows around the body. Unusual forms include an incense-burner, a lid and a cooking pot. In other words this is decoration rather than potter's production marks, symbols of ownership or an indication of contents. The motifs include crucifixes and animals, the latter often horned quadrupeds and occasionally with unmistakable Sasanian iconography. These stamps are not only larger than later, Umayyad, stamps but the iconography, style and distribution of the pottery is different, as the later examples are more often geometric, include round-topped stamps with square bases, are cruder, and are found on sites throughout southern Iraq. The reason for the difference in style is because a different type of material was used for the stamps themselves: high-magnification of Late Sasanian stamp impressions by Colleen Stapleton, also formerly of our Department of Scientific Research showed that they were impressed with carved wooden stamps, whereas the Islamic ones appear to have been impressed with fired clay stamps. The great thing for us is that as the Sasanian dies were prone to rapid wear, it has been possible to compare the impressions found at different sites, establish die-links, and thus not only seriate the associated assemblages, but also to begin to see what the (rather limited) distributions for particular stamps were.

The fourth and final type is so-called "honeycomb-ware". This term was used by Adams *et al.* to describe a type found on surveys in central and southern Iraq and has been regarded since as a hallmark of the Sasanian period. However, more recent investigations in northern Iraq have shown that this type is only found associated with early Islamic sites, and indeed complete jars decorated with "honeycomb" have been excavated at Samarra. Instead, there is an earlier Sasanian version which I have called "smeared-ware" where a similar rough sandy slip was applied to the exterior of large jars but not regularly impressed with the tips of the fingers. It appears to have been



made like some traditional Pakistani pottery described by Rye and Evans (1976) although what these jars were used for is a guess.

To conclude, we should very careful over what terms we use: definitions easily become “stretched” by other researchers, particularly without direct access to the material itself, and in so doing they lose their chronological significance.

**REFERENCES CITED**

- Azarnoush, M., 1994. *The Sasanian Manor house at Hajjiabad, Iran*. Florence.
- Bartl, K., Schneider, G. & Böhme, S., 1995. 'Notes on 'Brittle Wares' in North-eastern Syria'. *Levant* 27: 165-77.
- Benoist, A., Mouton, M. & Schiettecatte, J., 2003. 'The Artefacts from the fort at Mleiha: distribution, origins, trade and dating'. *Proceedings of the Seminar for Arabian Studies* 33: 59-76.
- Besenval, R., 1992. 'Recent Archaeological Survey in Pakistani Makran'. In C. Marrison (ed.), *South Asian Archaeology*: 25-35. Madison.
- Besenval, R. & Sanlaville, P., 1990. 'Cartography of Ancient Settlements in Central Southern Pakistani Makran'. *Mesopotamia* 25: 79-146.
- Brill, R.H., 1999. *Chemical analyses of early glasses*. Corning: Corning Museum of Glass; two volumes.
- Casal, J.-M., 1968. 'Nindo Damb'. *Pakistan Archaeology* 5: 51-55.
- Caubet, A., 1984. 'Du Golfe à l'Indus (IIIe s. av.-1er s. ap.)'. In R. Bouchardat & J.-F. Salles (eds), *Arabie Orientale, Mésopotamie et Iran Méridional de l'âge du fer au début de la période Islamique*: 351-357. Paris.
- Dales, G.F. & Lipo, C.P., 1992. *Explorations on the Makran Coast, Pakistan: A Search for Paradise*. Berkeley.
- de Cardi, B., 1951. 'A New Prehistoric Ware from Baluchistan'. *Iraq* 13: 633-675.
- \_\_\_\_\_, 1972. 'A Sasanian outpost in Northern Oman'. *Antiquity* 46: 305-310.
- \_\_\_\_\_, 1975. 'Archaeological survey in Northern Oman, 1972'. *East and West* 25: 9-75.
- \_\_\_\_\_, 1983. *Archaeological Surveys in Baluchistan, 1948 and 1957*. London; Institute of Archaeology, Occasional Publication 8.
- Franke-Vogt, U., 2001. 'The Southern Indus Valley during the later 2<sup>nd</sup> and 1<sup>st</sup> millennia B.C. The Dark Age'. In *Kolloquien zur Vor- und Frühgeschichte*, Band 6: 247-290. Bonn.
- Franke-Vogt, U., ul-Haq, S. & Khattack, M.H., 2000. 'Archaeological Exploration in the Kanrach Valley (Baluchistan, Pakistan)'. In M. Taddei (ed.), *South Asian Archaeology 1997*: 191-213. Rome.

Freestone, I.C., 2003. 'Primary glass sources in the mid first millennium AD'. *Annales du 15e Congrès de l'Association Internationale pour l'Histoire du Verre, New York – Corning 2001* : 111-115. New York.

Freestone, I.C. & Gorin-Rosen, Y., 1999. 'The great glass slab at Bet She'arim, Israel: an Early Islamic glassmaking experiment?'. *Journal of Glass Studies* 41: 105-116.

Freestone, I.C., Politis, K.D. & Stapleton, C.P., 2001. 'The Byzantine Glazed Pottery from Deir 'Ain 'Abata, Jordan'. In C. Villeneuve & P.M. Watson (ed.), *La céramique Byzantine et proto-islamique en Syrie-Jordanie (IVe-VIIIe siècles apr. J.-C.)*, Actes du colloque tenu à Amman les 3, 4 et 5 décembre 1994. Beyrouth; IFAPO, Bibliothèque archéologique et historique, t. 159.

Freestone, I. & Gaimster, D., eds, 1997. *Pottery in the Making: World Ceramic Traditions*. London.

Fujii, H., *et al.*, 1989. 'Excavations at Ain Sha'ia ruins and Dukakin Caves'. *Al-Rafidan* 10: 27-88, pls 4-26.

Henderson, J., 1999. 'Archaeological and scientific evidence for the production of early Islamic glass in al-Raqqa, Syria'. *Levant* 31: 225-240.

\_\_\_\_\_, 2002. 'Tradition and Experiment in First Millennium A.D. Glass Production – The Emergence of Early Islamic Glass Technology in Late Antiquity'. *Accounts of Chemical Research* 35/8: 594-602.

\_\_\_\_\_, 2003. 'Glass trade and chemical analysis: a possible model for Islamic glass production'. In D. Foy & M.-D. Nenna (eds), *Échanges et commerce du verre dans le monde antique*, Actes du colloque de l'Association Française pour l'Archéologie du Verre, Aix-en-Provence et Marseille, 7-9 juin 2001: 109-123. Montagnac, France.

Henderson, J. & McLoughlin, S., 2003. 'Glass production in al-Raqqa: experimentation and technological changes'. *Annales du 15e Congrès de l'Association Internationale pour l'Histoire du Verre, New York – Corning 2001*: 144-148. New York.

Kennet, D., 1991. 'Excavations at the site of al-Qusur, Failaka, Kuwait'. *Proceedings of the Seminar for Arabian Studies* 21: 97-111.

\_\_\_\_\_, 1997. 'Kush: a Sasanian and Islamic-period archaeological tell in Ras al-Khaimah (U.A.E.)'. *Arabian Archaeology & Epigraphy* 8: 284-302.

\_\_\_\_\_, 2004. *Sasanian and Islamic pottery from Ras al-Khaimah: classification, chronology and analysis of trade in the Western Indian Ocean*. Oxford; Society for Arabian Studies Monographs No. 1, BAR International Series.

Kervran, M., 1996. 'Indian ceramics in Southern Iran and Eastern Arabia: repertory, classification, chronology'. In H.P. Ray & J.-F. Salles (eds), *Tradition and Archaeology, early Maritime Contacts in the Indian Ocean. Proceedings of the International Seminar Techno-Archaeological Perspectives of Seafaring in the Indian Ocean 4<sup>th</sup> cent. B.C. - 15<sup>th</sup> cent. A.D. New Delhi, February 28 - March 4, 1994*: 37-58. New Delhi.

- Kervran, M. & Hiebert, F., 1991. 'Sohar pré-Islamique. Note stratigraphique'. In K. Schippman, A. Herling & J.-F. Salles (eds), *Golf-Archäologie: Mesopotamien, Iran, Bahrain, Vereinigte Arabische Emirate und Oman*: 337-348. Buch am Erlbach; Internationale Archäologie, 6.
- Lamberg-Karlovsky, C.C., 1970. *Excavations at Tepe Yahya, Iran, 1967-1969*. Cambridge: American School of Prehistoric Research Bulletin 27.
- Lecomte, O., 1993. 'Ed-Dur, les occupations des 3<sup>e</sup> et 4<sup>e</sup> s. ap. J.-C.: Contexte des trouvailles et matériel diagnostique'. In U. Finkbeiner (ed.), *Materialien zur Archäologie der Seleukiden- und Partherzeit im südlichen Babylonien und im Golfgebiet*: 195-217. Tübingen.
- Lecomte, O., Boucharlat, R. & Culas, J.M., 1989. 'Les Fouilles Francaises'. Pages 29-56 in 'The European Archaeological Expedition to Ed-Dur, Umm al-Quaiwayn (U.A.E.). An interim report on the 1987 and 1988 seasons'. *Mesopotamia* 24: 5-72.
- Mouton, M., 1992. *La Peninsule d'Oman de la fin de l'âge du fer au début de la période Sassanide (250 av. - 350 ap. JC)*. Unpublished PhD thesis, Université de Paris I (Pantheon-Sorbonne).
- Potts, D.T., 1998. 'Namord Ware in Southeastern Arabia'. In C.S. Phillips, D.T. Potts & S. Searight (eds), *Arabia and her Neighbours. Essays on prehistorical and historical developments presented in honour of Beatrice de Cardi*: 207-220. Brepols; Abiel II.
- Priestman, S.M.N., 2003. 'The Williamson Collection Project: Sasanian and Islamic survey ceramics from Southern Iran, current research'. *Iran* 41: 345-48.
- Priestman, S.M.N., 2004. 'Leave No Stone Unturned: Stein and Williamson's Surveys Compared'. In H. Wang (ed.), *Sir Aurel Stein: Proceedings of the British Museum Study Day, 2002*: 29-35. London.
- Priestman, S.M.N & Kennet, D., 2002. 'The Williamson Collection Project: Sasanian and Islamic pottery from Southern Iran'. *Iran* 40: 265-67.
- Puschnigg, G., 2000. *A diachronic and stylistic assessment of the ceramic evidence from Sasanian Merv*. Unpublished PhD thesis, University College London.
- Rye, O.S. & Evans, C., 1976. *Traditional Pottery Techniques of Pakistan: Field and Laboratory Studies*. Washington; Smithsonian Contributions to Anthropology.
- Sajjadi, M., 1989. 'A class of Sasanian ceramics from southeastern Iran'. *Rivista di Archeologia* 13: 31-40.
- Sasaki, T., 1995. '1994 Excavations at Jazirat al-Hulayla, Ras al-Khaimah'. *Bulletin of Archaeology, The University of Kanazawa* 22: 1-74 (including plates).

\_\_\_\_\_, 1996. 'Umayyad and Abbasid finds from the 1994 excavations at Jazirat al-Hulayla'. *Bulletin of Archaeology, The University of Kanazawa* 23: 179-222 (including plates).

Sasaki, T. & H., 1996. '1995 excavations at Jazirat al-Hulayla, Ras al-Khaimah'. *Bulletin of Archaeology, The University of Kanazawa* 23: 1-178 (including plates).

\_\_\_\_\_, 1998. '1997 Excavations at Jazirat al-Hulayla, Ras al-Khaimah, U.A.E.'. *Bulletin of Archaeology, The University of Kanazawa* 24: 99-196 (including plates).

Simpson, St J., 1992. *Aspects of the Archaeology of the Sasanian Period in Mesopotamia*. Unpublished PhD thesis, Faculty of Oriental Studies, University of Oxford.

\_\_\_\_\_, 1996. 'From Tekrit to the Jaghjagh: Sasanian sites, settlement patterns and material culture in Northern Mesopotamia'. In K. Bartl & S.R. Hauser (eds), *Continuity and Change in Northern Mesopotamia from the Hellenistic to the Early Islamic Period*: 87-126. Berlin.

\_\_\_\_\_, 1997. 'Partho-Sasanian ceramic industries in Mesopotamia'. In I. Freestone & D. Gaimster (eds), *Pottery in the Making. World Ceramic Traditions*: 74-79. London.

\_\_\_\_\_, 1998. 'Gilt-silver and clay: a Late Sasanian skeuomorphic pitcher from Iran'. In K. Otavsky (ed.), *Entlang der Seidenstrasse: Frühmittelalterliche Kunst zwischen Persien und China in der Abegg-Stiftung*: 335-342. Riggisberg; Riggisberger Bericht 6.

\_\_\_\_\_, 2000. 'Mesopotamia in the Sasanian Period: Settlement Patterns, Arts and Crafts'. In J. Curtis (ed.), *Mesopotamia and Iran in the Parthian and Sasanian Periods: Rejection and Revival c. 238 BC - AD 642*: 57-66, pls 30-34, col. pls XI-XIII. London.

Stein, M.A., 1931. *An Archaeological Tour in Gedrosia*. Delhi; Memoirs of the Archaeological Survey of India 43.

Stronach, D., 1978. *Pasagardae, a report on the excavations conducted by the British Institute of Persian Studies from 1961 to 1963*. Oxford.

Talbot Rice, D., 1934. 'The Oxford Excavations at Hira'. *Ars Islamica* 1/1: 51-73.

Whitcomb, D.S., 1985. *Before the Roses and the Nightingales, Excavations at Qasr-i Abu Nasr, Old Shiraz*. New York.

\_\_\_\_\_, 1987. 'Bushire and the Angali Canal'. *Mesopotamia* 22: 311-336.

Whitehouse, D. & Williamson, A., 1973. 'Sasanian maritime trade'. *Iran* 11: 29-49.

