University of Pretoria

MAPUNGUBWE MUSEUM REPORT

MAPUNGUBWE PERMIT REPORT: RESTORATION OF LOW FIRED CERAMICS FROM MAPUNGUBWE AND K2 COLLECTIONS, UNIVERSITY OF PRETORIA

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MAPUNGUBWE MUSEUM REPORT

DATE: 2006/11/07

TO: SAHRA, MARY LESLIE, 111 HARRINGTON STREET, CAPE TOWN, 8000

FROM: SIAN TILEY-NEL, CURATOR MAPUNGUBWE MUSEUM

TEL: 012 420 3146 FAX: 012 420 4918 EMAIL: SIAN.TILEY@UP.AC.ZA

RE: MAPUNGUBWE PERMIT REPORT: RESTORATION OF LOW FIRED CERAMICS FROM MAPUNGUBWE AND K2 COLLECTIONS, UNIVERSITY OF PRETORIA

As requested by the SAHRA permit No.80/05/10/017/51 dated 14 November 2005, I gladly provide a status report on the restoration of the low fired ceramics from the Mapungubwe and K2 Collections as curated by the Mapungubwe Museum at the University of Pretoria. As per the permit conditions issued under Section 35(4) of the National Heritage Resources Act, Act No.25 of 1999, the conservation and restoration project of these ceramics has been a great success and continues from strength to strength.

Detailed object treatment reports including photographic records are attached herewith providing a clearer view of interventive treatments which forms the basis of the report. A poster presentation on 'Archaeological Conservation' at the Association of southern African Professional Archaeologists (ASAPA) Conference held in Pretoria was also presented this year. A copy of the poster print is enclosed herewith for SAHRA's reference.

Based on the professional and successful restoration of the Mapungubwe Museum's low fired ceramics project (as well as the time consuming efforts of restoration of a single vessel which may take up to a complete month), the Museum kindly requests an extension of the permit for at least another year ending 2007 or 2008.

The Conservation Project for the Museum is on going with weekly training of a volunteer and of recent funding applications for the restoration of the clay figurine collection and a gold restoration project. SAHRA will be kept informed of any new developments in this regard.

Hoping that the extension of the above permit is granted, looking forward to hearing from you. Should any SAHRA representative be in Pretoria I also extend an invitation to view the restoration project, since it is a worthwhile initiative in restoring our heritage objects for future generation.

Yours sincerely

S.TILEY-NEL

CURATOR

MAPUNGUBWE MUSEUM

ATTACHMENTS: OBJECT TREATMENT REPORTS & POSTER PRINT OUT

DEALING WITH 13TH CENTURY CERAMICS IN THE 21ST CENTURY

Report on the restoration of the Mapungubwe low-fired wares

A review of an internship at the South African Institute for Objects Conservation

November 2005

By Sian Tiley-Nel

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"The understanding of archaeological conservation requires the heart of an artist, the mind of a scientist and the soul of connoisseur"

This report forms part of an almost four week internship (15 - 17 August & 5 - 23 September 2005) at the South African Institute of Objects Conservation at Twee Riviere in the Eastern Cape. The main aim of the internship was to acquire the necessary training and sufficient level of professional skill in the restoration of open pit low fired porous vessels of an archaeological nature. A prerequisite for the internship was the successful completion of the Introductory Certificate Course in ceramic conservation also presented by the SA Academy of Ceramics, a branch of the same institute. The selection of ceramic vessels for restoration came from the Mapungubwe Collection under my curatorship at the Mapungubwe Museum, University of Pretoria. To place the results of the internship and overview of the treatment into context, a brief introduction to Mapungubwe is necessary. This paper also hopes to serve as a guideline to restorers, archaeologists and museum conservators who have to deal with aspects of archaeological conservation.

Introduction to Mapungubwe

The ceramics earmarked for the internship, date to the 13th century (± 900 – 1300 AD) and originate from a Late Iron Age site known as Mapungubwe, today a National Park and World Heritage Site. The ancient kingdom of Mapungubwe is situated in the Limpopo Province bordering South Africa, Botswana and Zimbabwe, and was the most influential kingdom of its time in southern Africa. In 1220 - 1290 AD, Mapungubwe became the first hierarchically based kingdom, where it exercised widespread political and economic control, by means of its gold commodities and expansive trade with the Indian Ocean trade network.

The remains of Mapungubwe lay untouched for 700 years until, in the early 1930's the site was discovered by prospectors, who then, fortunately reported their finds to the University of Pretoria. The university is fortunate to have played a significant historical role over seventy-two years, by its promotion, preservation and publicity of the finds at Mapungubwe in a permanent museum. The Mapungubwe Museum therefore serves as an official recognised archaeological repository of the original artefacts associated with the World Heritage site. The museums' unique archaeological collection is today becoming one of our nation's greatest national icons.

The museum is in its fifth year of existence and advocates professional sound museum management. Most importantly, it maintains that conservation is the most important function of any museum. Restoration, like conservation is a specialised scientific field, but none the less a vital component of any museum. No professional museum should be without a conservator. Conservation after all is a practise within archaeology as a scientific discipline and like other archaeological practices, conservation aims to increase our understanding and preservation of the past for future generations.

Archaeological conservation aims to prevent objects disintegrating once they have been exposed as a result of excavation and to discover the true nature of the original artefact. This generous internship was kindly offered by the South African Institute of Objects Conservation with the hope that good conservation procedures in restoration will be carried out on the Mapungubwe ceramic collection.

Furthermore the internship serves as a means of ensuring the preservation of Mapungubwe's heritage. Conservation and restoration is part and parcel of archaeology; without it, much archaeological heritage would be lost or left unexplained.

Overview of the internship

The first step of the internship was to design and compile a template document in conjunction with Ms. Julia Greiner, a fellow intern in her second year from a diploma course for ceramics conservation at the *Istituto per l'arte e il restauro* in Florence, Italy. This document would serve as a basis for a condition report, object assessment and technical treatment plan. Physical written records, electronic information and digital photographic records, together with taking relevant samples for possible future scientific analysis were recorded as vital information resources for the internship throughout restoration procedures.

Five ceramics consisting of a sub-spherical bowl, a deep bowl, a beaker and two shouldered pots were earmarked for restoration. These ceramics are unique, non-renewable heritage resources as they were provenanced from archaeological deposits originating from the most important Iron Age sites known as K2 and Mapungubwe Hill. The five ceramics were selected according to two main criteria, firstly vessels that had been previously restored and secondly those which exhibited extensive wear and damage as a result of excessive encrustations resulting from burial deposit.

The categories of assessment for each of the vessels were documented according to detailed object information (object name, material type, physical description etc…), measurements, damage and condition (amongst others characterization of the ceramic surface), materials and techniques of manufacture, structural form and shape, as well as previous interventions and restoration, alterations and degradations and finally a proposed treatment, treatment record and assessment of the treatment record. The above categories all posed challenges for a first time intern in determining best practice for archaeological restoration.

The research below is an attempt at providing a summary explanation of archaeological conservation techniques employed when working with Iron Age pottery, using the internship notes and general details relevant to the conservation and restoration procedures conducted on low fired archaeological ceramics.

TECHNIQUES OF ARCHAEOLOGICAL CONSERVATION

The most common definition of conservation is the preservation of objects that are part of our cultural heritage and archaeological conservation is that which is concerned with objects that have been buried and excavated from the soil or sea. Conservation is a practice within archaeology. Like all archaeological practices, whether reconnaissance, excavation, or research, archaeological conservations' aim is to increase our understanding of the past. Archaeological artefacts can be deceptively fragile, and one must always assume that archaeological artefacts are more fragile than they seem. Conservation has two basic principals, to preserve the object and to reveal information.

The true nature of an archaeological object includes evidence of the technology and materials used in its original construction and any subsequent pre-burial modifications, its usage, and the circumstances and nature of its burial environment. Repairs or alterations made subsequent to its excavation may also be significant to the object's history, in which case they too should be fully recorded and/or preserved.

Decisions on appropriate action should be made in conjunction with other specialists, e.g. archaeologists, curators, researchers - after careful examination and research. In order not to change the true nature of the object, two rules should be observed in its care and maintenance; conservation should be preventive or interventive. With archaeological objects, the first priority should be preventive conservation. Preventive conservation is concerned with temperature, humidity, light levels, packaging and storing objects in a good environment to minimize deterioration, as it is essential for the long-term survival of the objects. Interventive conservation is concerned with examination, cleaning, stabilization, repair and restoration of the objects. In archaeological conservation this treatment should be in most cases reversible.

The basic techniques of archaeological conservation involve the handling and care / retrieval of artefacts, marking and labelling artefacts, examination, cleaning, stabilization, repair, reconstruction, restoration, documentation and then storage or exhibition. Four processes of archaeological conservation can be identified; pre-excavation considerations, on site conservation, laboratory conservation and long-term conservation where the condition of archaeological artefacts is affected by several factors such as prior use, burial conditions, excavation and recovery methods and analysis and curation.

The Archaeological Conservator and the Object

All professional actions of the archaeological conservator are governed by a respect for the physical, historic and aesthetic integrity of the object. Responsibility for the welfare of the object should begin when the object is removed from its burial environment, and continue through all the post-excavation stages. Concern for its future should include protection against further deterioration, damage and loss. Regardless of any opinion of its value or quality, the archaeological conservator should adhere to the highest and most exacting standard of treatment with every object he or she undertakes to conserve.

Archaeological objects are often of no great financial or artistic worth, but are important for the archaeological and technological evidence they can provide. Although circumstances may limit the extent of treatment, the quality should never be lowered. While special techniques may be required during the treatment of large groups of objects, these procedures should be consistent with respect for the integrity of the individual objects, suitability of treatment, and reversibility. The archaeological conservator should not perform or recommend any treatment, which is not appropriate to the preservation of the object. The archaeological conservator should endeavour to use techniques and materials which, to the best of current knowledge, will not endanger the true nature of the object, either immediately or in the long term, and which will not impede further treatment or the retrieval of information through scientific examination. There should be minimum intervention to objects destined for scientific analysis.

In the knowledge that few treatments are completely reversible, the archaeological conservator should evaluate carefully the possible effects of any techniques or materials, and where possible select those which current research shows will alter the object to the least possible extent, and which can be reversed most easily and completely with the least damage to the object. An improvement in conditions of display, storage or use may often be preferable to physical intervention. Nothing should be removed from an object unless there is sufficient evidence that it is not part of the original condition of the object, or indicative of the object's use or history.

To conclude this section, it is essential the conservator must take the following principals into account: the nature and condition of the object, evidence that may be revealed and which needs to be preserved, aesthetic consideration, how the object will be exhibited, equipment and materials used, the skill, knowledge and expertise of the conservator who will do the work, and the expectations of the owner.

Condition of Iron Age Pottery

The condition of much of the pottery from the Iron Age in South Africa today largely depends on its original manufacture. The preparation of the ceramic body, the shaping of the pottery, drying, firing and water proofing are four essential processes for the successful manufacture of Iron Age pottery or ceramics. Raw clay was sought after along riverbanks and streams, where owing to the presence of small quantities of tannic acid derived from decaying vegetation, a high degree of temporary plasticity has been attained. Plasticity in clay is due primarily to the presence of water that is mixed mechanically with the masses of clay and them combined with silicates such as quartz, feldspar, or sand to form the essential ingredients of the clays. As no clay in its natural state is ready for pot making, the 'body', as the mass of the raw clay is called, must be prepared. Small stones and other foreign material must be separated from it, and it must be pounded usually with the addition of water, in order to bring it to the proper consistency for working. Then various substances called tempers, usually silicates, must be added to it. The three main effects of these additives or openers result in the reduction of shrinkage during the drying process, they aid the escape of moisture due to the presence of water and of steam during firing and they serve to hold together during drying thus serving as a binder as well as a temper.

The most common opener used in Iron Age pottery is clean sand, which reduces the risk of the pot developing cracks whilst it is drying. Generally ground pottery sherds have a similar effect as it increases the porosity of the clay and assists in the escape of steam when the pot is being fired. It is the porosity of low-fired wares that determines the deterioration and interventive treatment.

In the shaping of Iron Age ceramics, clay was manipulated, using the simplest tools. Three main methods are known:

(i) By forming the clay into a ball or lump from which the pot was worked up.

(ii) By rolling the clay into rings or long sausage-like cylinders that are used as successive coils to form the vessel. This is most commonly referred to as the coiling method.

(iii) By making flattened slabs of clay with which the pot was built up.

Iron Age pottery probably developed by manufacturing small or moderate sized vessels, usually all round based, made by starting from a potsherd that can be rotated as the work proceeds. Larger vessels may have been constructed in two pieces or built up from the rim, with the body inverted and added as a separate piece. The pot is rotated from left to right, with fresh clay added with the right hand, while the left is inside the pot supporting the work as it proceeds, both hands being continually moistened. The surfaces are scraped smooth with a horn or smooth shell and the rim is formed. At this stage the pot is worked over with a piece of wet leather as a finishing tough and any incised or stamped decoration is added to the wet clay, after which it is set aside to dry. Iron Age ceramic surfaces appear roughened specifically to receiving decoration prior to firing and many of the undulated edges and surfaces of the ceramics suggest that they were made while the vessels were still fairly wet.

Drying procedures were simple; the wet ceramics were placed in a sheltered place, sometimes even buried in the soil for usually one day until the water in the clay has dried out and the clay had hardened. Thereafter the surface was given a fine polish by rubbing it with a smooth pebble (burnishing merely means rubbing with a stone or pebble). During this time details of decoration may be retouched or added. The ceramics are then again put away and left for several (3-6 days) until quite hard.

Iron Age peoples did not use a kiln but at the most merely a hole or depression in the ground in which the pottery is placed and burnt with dried cow dung, dry grass, wood, or aloe leaves. The firing has the effect of driving off the combined water in the clay and reducing its plasticity, after which the shape of the pot cannot be altered. Firing pots then, in a sense, amounts to little more then dehydration. The hand-moulded vessels were fired individually or in small groups in open firing pits.

In such open firing, the weather conditions, types and dryness of the fuel and size of the fire would all influence the quality of the final product. Unless uniform firing conditions were stringently maintained, quality could also vary between adjacent pots within the same firing or even across the surface of an individual vessel. Good quality firing is accomplished by a combination of first achieving and then maintaining temperatures of 850° or higher, depending on the nature, size and thickness of the ceramic body. This enables irreversible chemical changes in the clay to occur and for the 'ceramic' to be formed. If the firing process takes place under reduction (that is, in the absence of oxygen but with an excess of carbon dioxide) the pottery would appear coloured to a deep bluish grey or even a metallic black. And if firing takes place under oxidization, the pottery appears lighter and redder in appearance.

Although Iron Age open firings can achieve temperatures of between 600° C and 900° C, they are characterized by a rapid rise and fall in temperatures and only a short firing time, sometimes less than 30 minutes. The rapid temperature changes result in less stress being set up in the ceramic, partly to compensate for the inorganic inclusions most often added to the clay. Short firing times may not allow for uniform heating of the clay within the vessel resulting in only partial firing. The physical result of open firing can therefore be a vessel that has a hard outer surface covering a porous, often friable core, which still contains some clay material.

Porosity is characteristic of low fire Iron Age wares, and it does have the disadvantage of not being watertight. In some cases a type of varnish is applied to the surface of the pot. This could be any concoction of animal fat, ash and pulp made from leaves. In some cases the vessels, while still hot from the firing process, were placed on a mass of foliage and the dense smoke raised made its way into the pores of the pot filling them with a deposit of a tar like substance. Similarly, the newly made pots could be suspended over an open fire or in thick smoke to in a similar attempt at waterproofing.

Post depositional features should also be identified before interventive treatment and may include natural weathering or excavation removal damage on the rims or ceramic body which may have been buried close to the surface of the soil exposed to weathering and climatic variations. Another major contributing factor towards the excavation condition of ceramic or surface ceramics is of course the South African climate. Today's climate is somewhat different to that of the Iron Age and over a thousand year time span, the ceramics have been exposed to fluctuating temperatures ranging from dry conditions to moderate or high rainfall. Pottery that has been buried in the soil will have been subjected to either damp or severely dry conditions. Moisture often softens low fired ceramics and in some cases sherds exhibit warping or mould growth. Vessels, over time, are obviously crushed by the pressure of the overlying soil and may warp, however some vessels are recovered at a depth of a meter or two and are complete but only cracked.

Ceramic surfaces may look visually stable but are dry and friable in the interior and any form of intervention may result in dissolution. In acidic conditions, typical of Iron Age ceramics, there may be damaging biological agents such as accretions, slats, mould, fungi or calcareous deposits and the invasive action of plant root and animal tunnels. Such damage can be irreversible and can often cause the surface of the whole body of the pot to disintegrate into a mass of 'crumbs.'

Surface examination is an important aspect of conservation, preferably at an early stage after excavation as it may show traces of evidence of burial practice, use or decoration which may be removed during further interventive treatment. This, sadly however is not the case for the Mapungubwe vessels, which had in fact not been professionally examined on excavation removal and lay in storage for most of the time. In a few instances, these ceramics were merely described and categorized for research purposes and limited information is available in a few publications. The beaker and bowls were most probably however either domestic wares or used as burial goods. None of the vessels contained evidence of food remains or charred deposits nor was there any evidence of dried organic remains within the vessels. Some of the vessels were heavily encrusted with burial deposits mostly excessive soil and dirt.

The previous restorations consisted of adhesion and gap filling with calcium based fillers or plaster of Paris. Besides incised decorations, none of the vessels indicated deliberate pigmented decoration, only a fine white ashy paste (resulting from middens or burial conditions) or surface burnishing which are characteristic of Iron Age decoration. A majority of the vessels surfaces are undulated with either a smooth marbled burnished finish or encrusted with calcareous layers resulting in a patchy appearance.

The complete detailed treatment records and condition assessments on each of the individual vessels are attached to the end of this report, and will not be discussed here. Materials used in the restoration of the ceramics are also clearly outlined in these treatment records.

Conclusions

It is also envisaged that from the internship and training received by South African Institute of Objects Conservation that a short term and long term conservation and restoration project on the Mapungubwe Collection can lead a way forward in future restoration of an expansive low fired ceramic collection. Furthermore, it is hoped that the basis of this report and findings will be presented at the Association of Southern African Professional Archaeologists national conference held in Pretoria in April 2006, in the hope of promoting archaeological conservation in South Africa.
In conclusion, it is clear that conservation and the restoration of archaeological material is coming of age in its development in South Africa. Archaeology has successfully introduced a variety of analytical techniques to the study of cultural material, but incorporating the results obtained from conservation science and these techniques into broader archaeological conservation remains a challenge. In addition, issues of deterioration, and stabilisation, preventive or interventive conservation and references to conservation research, interpretation, or archaeological conservation are rare regarding Iron Age archaeological objects. The courses offered by the South African Institute is a means of addressing this imbalance and the ongoing conservation and restoration project at the Mapungubwe Museum serves as an outstanding example of how conservation contributes to our understanding and preservation of heritage.

Acknowledgements

To the South African Institute of Objects Conservation at Twee Riviere in the Eastern Cape and all the staff who patiently assisted throughout the internship, especially to Adriaan and Hazel Botha. To Julia Greiner, a fellow Tuks student and now a 2nd year student at the *Istituto per l'arte e il restauro* in Florence, Italy for her willingness to share her European expertise and companionship. Furthermore to the University of Pretoria for their financial contributions and compliance to agree to my absence from the Mapungubwe Museum for almost two months.

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TO: :SAHRA, MARY LESLIE, 111 HARRINGTON STREET, CAPE TOWN, 8000

FROM: :SIAN TILEY-NEL, CURATOR MAPUNGUBWE MUSEUM

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Yours sincerely

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From: Sian Tiley-Nel <sian.tiley@up.ac.za>
To: <cscheermeyer@sahra.org.za>
Date: 2007/02/01 02:06 PM
Subject: RE: Mapungubwe Museum permit S Tiley
Attachments: MM Permit restoration report 7.11.2006.dot; Report SAIOC.doc; MM SAHRA Restoration permit report.doc; sian.tiley.vcf

Dear Collette.

Thanks for looking into the matter again, I have been waiting for sometime now and would be grateful for an extension on the restoration permit, however not only on the low fired wares, I have begun to work on ivory, bone and metals, beginning with those objects most at risk from deterioration. Perhaps the permit could be for the Archaeological collection at the Mapungubwe Museum, originating from K2 and Mapungubwe Hill.

Here's the documentation I do have. I have sent hard copies of the report and treatment reports in November already.

Thanks, hope to hear soon.

Sian Tiley