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Abraham van As

EDITORIAL

The first volume of the *Newsletter of the Department of Pottery Technology (Leiden University)* appeared in 1983. Via this *Newsletter*, the Department of Pottery Technology wished to address itself to people making use of the facilities of the Department in order to keep them informed of recent developments. We hoped that through the *Newsletter* fresh contacts would be established with archaeologists and institutes interested in aspects of the ancient pottery craft as well as ceramic ethnoarchaeological research.

Ten years later, partly as a result of the *Newsletter*, the Department had become increasingly involved in a large number of archaeological research projects. Today, we continue to participate in many Dutch and international projects although our staff has been reduced. Unfortunately, we lost the inspiring cooperation with Maria Beatrice Annis. We are much indebted to her for her enthusiastic efforts to the research and teaching activities of our Department. She published many internationally appreciated articles on ceramic ethnoarchaeological research, which she carried out in her native island Sardinia.

Since the *Newsletter* has gradually broadened its geographical scope it obtained the character of a journal. Therefore, we have decided to rename the *Newsletter of the Department of Pottery Technology (Leiden University)* into the *Leiden Journal of Pottery Studies (LJPS)*. Also, we have installed an Editorial Board consisting of two members of the Faculty of Archaeology: Corinne L. Hofman (Caribbean Archaeology) and Miguel John Versluys (Classical Archaeology). Gloria A. London, who is a chairperson of the American School of Oriental Research (ASOR) Outreach and director of the Tall al'U-mayri Teachers' Institute, kindly agreed to participate in the Editorial Board as an external member.

With this *LJPS* vol. 20 (2004) we make a new start. In general, the concept of the renamed *Newsletter* remains the same. The *LJPS* will include articles, reports and notes on archaeological and anthropological investigations of pottery. Occasionally, book reviews will be included. The *LJPS* will reflect the 'Leiden approach' to pottery studies focused on the linkage of laboratory analysis with production studies, the use of ethnographic and ethnoarchaeological observation and experimental archaeology. The *LJPS* will deal with the technology, function and style of ancient and modern traditional pottery. Other contributions will place the technology in a social, economical and cultural framework, or consider the typo-chronological consequences of technological pottery analysis.

LEIDEN STUDIES IN POTTERY TECHNOLOGY

Abraham van As

Abstract

This contribution has been written for the occasion of renaming of the 'Newsletter of the Department of Pottery Technology (Leiden University)' to the 'Leiden Journal of Pottery Studies'. It mainly addresses itself to those readers who are not familiar with the analytical technological-archaeological pottery studies initiated by Professor Henk J. Franken and the ceramist Jan Kalsbeek at Leiden University. Their innovative pioneering work on the Early Iron Age pottery of Tell Deir 'Alla in Jordan has led to a great number of research activities at the Section 'Pottery Studies' of the Leiden Faculty of Archaeology (former Department of Pottery Technology) to study pottery from various parts of the world. In a short chronological overview, I present here the so-called 'Leiden approach' to archaeological pottery studies, with its focus on the analysis of the pottery production sequence (chaîne opératoire) in addition to and including archaeometry, experimental archaeology and ethnoarchaeology beginning in the early 1960s up to the present.

Introduction

In the early 1970s, when I was a student in Western European prehistory and Near Eastern Archaeology at Leiden University, the shelves of the library contained only a few books with information on the topic of pottery technology specifically written for archaeologists. First there was Anna O. Shepard's *Ceramics for the Archaeologist* (Shepard 1956) and, secondly, some chapters of Henry Hodges' *Artifacts, an Introduction to Early Materials and Technology* (Hodges 1989: 19-53, 194-205). Although quite a number of textbooks have meanwhile been published (e.g., Orton et al. 1993; Rice 1987; Rye 1981), Hodges' book still is obligatory reading material for first year students of the Leiden Faculty of Archaeology. In spite of a few shortcomings, such as the limitation of illustrative examples referring almost entirely to ceramics from the South-Western United States and Mexico and the omission of a discussion of glazes (see Hodges 1989: 182), Shepard's book still is a 'classic' for every student of archaeology, providing an understanding of the nature of ceramic materials and techniques. All topics described in her book are current issues in modern archaeological ceramic research. She pays attention to the properties and sources of the raw materials; the

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ceramic practices of pre-wheel potters; ceramic analysis; problems of pottery classification; and the interpretation of ceramic data. *Ceramics for the Archaeologist* made considerable contributions to ceramic studies in its own right, both practical and theoretical and has had an important impact on archaeological ceramic research in later years (Bishop and Lange 1991).

Another pioneer in archaeological ceramic studies is Frederick R. Matson, who organized a conference entitled *Ceramics and Man* held at Burg Wartenstein in Austria in 1962 "to evaluate the contribution of ceramic studies to archaeological and ethnological research" (Matson 1965a: vii), but also "to convince many anthropologists that ceramic studies extend beyond simple description and classification" (Rouse 1965: 274). In his contribution to the conference, Matson coined the term 'ceramic ecology' as "one facet of cultural ecology, that which attempts to relate the raw materials and technologies that the local potter has available to the functions in his culture of the products he fashions" (Matson 1965b: 203). He considers pottery to be an ecological and socio-cultural product *par excellence* enabling us to use pottery for solving problems related to social organization and human behaviour. The opening sentence of his contribution – "Unless ceramic studies lead to a better understanding of the cultural context in which the objects were made and used, they form a sterile record of limited worth" (Matson 1965b: 202) – is often quoted to emphasize that the study of excavated pottery must result to knowledge of what is called in pre-Columbian archaeology 'the Indian behind the pot'. Matson stands at the beginning of the 'contextual phase' in the history of archaeological pottery studies (Orton et al. 1993: 13-22), a phase he calls the 'explanatory phase', beginning from 1960 onwards. Pottery studies were no longer focused on answering the questions 'when?' and 'where?', as in the preceding typological phase of pottery studies, but were at once focused on an answer to the questions 'how?' and 'why?' (van der Leeuw and Pritchard 1984: 6).

Matson's ceramic ecological approach has inspired Dean Arnold to develop a theory of ceramics that elucidates the complex relationship between ceramics and their environmental and cultural context (Arnold 1985). He noticed that this approach was not only used by himself in describing pottery making communities in Peru and Guatemala, but also by Charles C. Kolb (1976) in his study of South American ceramic technology and by Sander E. van der Leeuw to study archaeological pottery (van der Leeuw 1976). According to Helen L. Loney, van der Leeuw is a representative of a group of scholars from Leiden University in the Netherlands that complements the American ceramic ecology movement (Loney 2000: 651). She gives the archaeological ceramic research done by this group the label 'Leiden School'. In her words, the research of the 'Leiden School' is focused on "a theory of pottery typology, the use of ethnographic and ethnoarchaeological observation, and linkage of laboratory analysis with production studies" (Loney 2000: 652). James M. Skibo, in a review of an article on our archaeological ceramic research in Northwestern Anatolia (van As et al. 1995), calls the Leiden approach "a holistic approach including archaeometry, experimental archaeology and ethnoarchaeology" (Skibo 1997: 150). The initiator of this approach was Henk J. Franken, one of the pioneers in modern archaeological ceramic research who was inspired by the work of Shepard.

The Leiden approach to archaeological ceramic studies

The pioneers: Henk J. Franken and Jan Kalsbeek

In a period when pottery studies in archaeology were still mainly focused on the description and classification of vessel shapes and some other features it was refreshing to prepare my M.A. thesis on the Iron Age pottery of Haren, North-Brabant in the Netherlands, under the enthusiastic guidance of professional potter Jan Kalsbeek. He viewed ancient pottery as the product of a craft and taught me to understand ancient craftsmanship. Kalsbeek pioneered the study of ancient pottery techniques with Franken. Their approach became known as the 'Franken-Kalsbeek method'. From the beginning of the 1960s, they worked together in the Institute for Palestinian Archaeology at Leiden University on the analysis of the Early Iron Age pottery excavated by Franken at Tell Deir 'Alla in the Jordan Valley. Franken had learned to recognize ancient Palestinian pottery forms during excavations at Jericho under the leadership of the Late Dame Kathleen Kenyon. The publication was inspired by an article on Tell Beit Mirsim Iron Age pottery by Kelso and Thorley (1943). His goal was to find new ways of studying pottery. Franken had an eye for the consequences of the technological approach of Kelso and Thorley for typological pottery studies. He questioned if the classification of pottery would not become more rewarding if the observed characteristics, like colour, hardness etc., on which pottery classification was normally based could be supported by explanation. To carry out a study for his pottery from Tell Deir 'Alla, he succeeded to hire Jan Kalsbeek at the Institute for Palestinian Archaeology. Kalsbeek offered information and ideas that could not been found in other archaeological pottery studies. He analysed the various features of the pottery in terms of the forming and firing technique. Next, he tested his ideas about the pottery production sequence (*chaîne opératoire*) by simulation experiments. At the same time, Jonathan Glass introduced Henk Franken to the microscopic analysis of the (added) non-plastic inclusions in the clay. The relation between the reconstructed, forming technique and workability properties of the clay was investigated.

The analytical study of the Early Iron Age pottery of Tell Deir 'Alla (Franken and Kalsbeek 1969) was quite innovative. The research work was based on a systematic 'scientific' approach to ceramic studies with a theoretical base, which included the proposition that the 'genesis' of pottery is important in order to be able to make full use of this form of material culture. It demonstrates that understanding the work of the ancient potter is a prerequisite for all typological work on ancient pottery. Paul Lapp (1970) describes Franken's first attempt to provide valid explanations for observed features to be a challenge to Palestinian archaeology. Also, in his later pottery reports, Franken presents explanative pottery typologies that diverge from the traditional descriptive typologies (Franken 1974, 1992, in press; Franken and Kalsbeek 1975; Franken and Steiner 1990). Franken's approach has had significant consequences for evaluating the value of traditional pottery typologies used in the dating of archaeological finds. By emphasizing the concept of tradition in his technological ceramic studies, he finds an argument that can help us to discover the possibilities of, and, limits to, the activity of making ceramic horizons (Franken 1987). In a response to certain discussions and criticisms, arising from publication of the Iron Age pottery of Jerusalem (Franken and Steiner 1990), Franken gives in a somewhat philosophical manner a clear and convincing apologia of the theoretical grounds for his approach to ceramic studies (Franken 1995). He argues that the current practice of typological systems based on vessel form including the search for parallels or 'parallel quoting', an aspect of routine procedures of pottery studies in the Near East, is invalidated given the wrong assumptions, such as the definition of a pottery 'type' as defined by a description of morphological features (see Franken 1995: 88).

So far, I have summarized the main aspects of the new approach to ceramic studies developed by Franken in close cooperation with the ceramist Kalsbeek. Like other archaeologists in the early 1960s, he was dissatisfied with the traditional archaeological pottery studies. He found new ways of studying pottery by focusing on the analysis of technological characteristics. This approach opened wider fields of study with pottery as the primary source of information. The role of the 'Franken-Kalsbeek method' in the archaeology of the Levant has been discussed by Gloria A. London in her Ph. D. dissertation (London 1985).

Further developments

The technological approach of Franken and Kalsbeek has not been confined to Palestinian archaeology. Fellow archaeologists asked them to study the technology of pottery from other regions, such as the Iron Age pottery from the Netherlands and pottery from Tellem, Mali. Accordingly, the 'Pottery Technology Project' originated. In the early 1970s van der Leeuw was engaged by the Netherlands Organization for Scientific Research (NWO) and devoted four years to this project of the Institute for Palestinian Archaeology at Leiden. In this context, he cooperated with Kalsbeek on the technological study of Neolithic Beakers from the Netherlands, Medieval pottery from Haarlem (the Netherlands), and pottery from Ta'as, a Medieval Syrian village on the Euphrates river in Syria. The three 'case studies' of very different groups of pottery formed part of his Ph.D. dissertation in which he focused in a theoretical chapter upon "developing a theoretical framework in which the technological approach to pottery may be fitted and upon the goals for which one may strive with technological analysis of pottery as a tool " (van der Leeuw 1976: 2).

The 'Pottery Technology Project' included the participation in the archaeological research and rescue excavations in the Tabqa region threatened with inundation by the construction of a dam in the Euphrates near Tabqa (the present-day Lake Assad) in

Northwest Syria. The aim of the excavations financed by NWO was to stratigraphically collect a diachronic series of pottery in this geographically restricted area of approximately 80 x 10 km, in order to obtain an insight into the kind of pottery traditions in this area (continuity, discontinuity/change) by means of techno-analytical research. Another aim of the project was to study the relationship between clay composition and the different pot-making methods occurring in this area through time. In order to answer these questions, the area was surveyed, and excavations took place at three different sites (Jebel Aruda, Tell Hadidi and Ta'as). Apart from a gap in the Iron Age, pottery could be collected from a succession of cultural periods: the Uruk period (Jebel Aruda), the Bronze Age (Tell Hadidi), and the Byzantine/Early Islamic period (Ta'as and Tell Hadidi). After van der Leeuw obtained a new academic position in Cambridge, it fell to me to investigate these pottery assemblages (van As 1984, 1987, 1989). My study demonstrated that the potters used the same homogeneous calcareous Euphrates clays over many centuries. Due to the nature of these raw materials, the methods of potting were fairly basic and only required the strict continuation of existing methods rather than inventiveness (see also Franken and van As 1994).

The Department of Pottery Technology

At the end of the 1970s we see an increasing demand by Dutch and foreign archaeologists for an analysis of the technological aspects of their pottery. This development culminated in 1980 to the establishment of the Department of Pottery Technology directed by Franken. At that time it formed a section within the Department of Archaeology of the Faculty of Arts at Leiden University.

When one considers the length of time that Franken worked as a minister on Bali (1947-1951), where he gained a detailed background of anthropological concepts (see Franken 1951), it is not surprising that his technical approach to ceramics led to the inclusion of anthropological material into archaeological pottery studies. In the first volume of the *Newsletter of the Department of Pottery Technology (Leiden University)*, he enthusiastically introduced the ceramic ethnoarchaeological research of Maria Beatrice Annis in Sardinia as a promising discipline for the Department's analytical ceramic studies (Franken 1983). Until recently she contributed greatly to our Department, not only in the field of ceramic ethnoarchaeology, but also as a classical archaeologist studying the technological analysis of Roman amphorae (Annis et al. 1995; Docter et al. 1997). Annis directed the technological analysis of pottery from the Riu Mannu Survey Project in Sardinia, which was one of the projects of the Faculty of Archaeology (Annis 1998, 1998/1999).

After the retirement of Franken in 1984, I became responsible for the Department of Pottery Technology. In 1978, the ceramist Loe Jacobs had succeeded Kalsbeek. In 1997 the Department of Archaeology and the Faculty of Prehistory merged, and the Department of Pottery Technology joined Science-Based Archaeology of the Faculty of Archaeology housed within the Archaeological Centre in Leiden, where the Ceramic Laboratory and a documented study collection are also accommodated.

A technological ceramic research program is being carried out in cooperation with various national and international archaeological research groups. We fully participate in the teaching curriculum of the Faculty of Archaeology and are involved in Ph.D. studies in which pottery forms an important source of information. We also teach outside the Netherlands starting in 1993 at the Yarmuk University (Irbid, Jordan). In December 2003 a course 'Archaeological Ceramic Research' was taught for the fourth time for students of the Department of Archaeology of the University of Damascus. In April 2004 a similar course has been taught at the Bilkent University in Ankara.

Research program

In 1985, the Department of Pottery Technology initiated the research program *Explaining the technical aspects of the pottery craft within the frame of the archaeological discipline.* It aims at setting up an explicative model of archaeology-related pottery research by means of studying the relations among technical, functional and scientific aspects of ancient pottery. The program is based on a systematic 'scientific' approach to ceramic studies. Essential to the program is studying the craft in its entire scope, including the production and trading in the products. The program also deals with such questions as how to recognize and define production centres or workshops, pottery traditions and the history of traditions.

The research program covers: (1) the analysis of pottery (sherds); (2) the analysis of clay samples, and (3) ceramic ethnoarchaeological research.

The analysis of pottery

The technological study of pottery (both whole pots and sherds) focuses on the production sequence of ceramics. It comprises: (1) the analysis of the (prepared) raw materials that were used by the potters (fabric analysis), and (2) the reconstruction of the manufacturing technique (forming, decoration and firing).

Fabric analysis

The fabric analysis concerns the microscopic analysis of the mineral inclusions and pores in the clay body. This kind of 'low-tech' fabric analysis is given priority over 'high-tech' analysis. The latter corresponds with the opinion of Mike S. Tite, who emphasized at a conference about the aim of laboratory analysis of ceramics in archaeology "the importance of using low-technology methods whenever possible; the need to undertake petrology before chemical analysis and the importance of considering both cultural and functional explanations of pottery technology" (Lindahl and Stilborg 1995: 171). 'Low-tech' fabric analysis needs minimal equipment. Furthermore, many sherds can be processed in the field and the method is inexpensive. The 'low-tech' analysis forms the basis for the selection of samples for mineralogical thin-section analysis and for the various more costly 'high-tech' chemical analyses such as Scanning Electron Microscopy (SEM) and Neutron Activation Analysis (NAA). For the execution of 'high-tech' analyses there are good connections with a number of specialized laboratories. These analyses are primarily important instruments for archaeological provenance studies.

Reconstruction of the manufacturing technique

The reconstruction of the forming technique is based on the observation and interpretation of the traces left by the potters such as throwing spirals, smoothed surfaces and other features. The surface colours and the core colour seen on a fresh break indicate the original firing atmosphere of a pot. The original firing temperature of a vessel can be estimated by re-firing a fragment in a neutral to slightly oxidizing atmosphere at several different temperatures, increasing 50°C at a time, from 750°C to 1000°C. The hardness and porosity of the fragment is inspected after each 50°C increment in the firing temperature. As soon as the hardness and porosity change, a temperature higher than the original one has been reached. Subsequently, the reconstruction of the manufacturing techniques is followed by simulation experiments undertaken by professional potter Loe Jacobs.

The analysis of clay samples

The analysis of clay samples is another essential aspect of technological pottery studies. Clay samples taken in the direct surroundings of an archaeological site are used for simulation experiments to verify, or more cautiously, to obtain an idea concerning the plausibility of our reconstruction of the forming techniques based on the interpretation of observed technological features. The clay samples are tested for their workability properties since there is a relationship between these properties and the various forming techniques that can be applied. Pinching and throwing, for instance, needs a relatively plastic clay. For coiling, on the contrary, potters use a relatively short clay. If the natural clay is not suited for a certain forming technique the clay has to be prepared into a workable clay body. A natural clay, i.e., as found in nature, that is too plastic has to be tempered by adding non-plastic material to the clay. If a natural clay is too lean, the potters will levigate the clay (artificial process of sedimentation). We also use clay samples to help determine the pottery production location (provenance studies). If the composition of the clay samples taken close to the excavation of the pottery matches with the fabric of the pottery it is assumed that the pottery was made locally.

Ceramic ethnoarchaeological research

Ethnoarchaeology is, like experimental archaeology, a valuable component of archaeological-technological ceramic research. It is the study of extant peoples engaged in any activity relevant for clarifying the human behaviour that contributes to the form, finish and function of artefacts. Ceramic ethnoarchaeology often involves studies of traditional potters, that means those who work without the use of modern technology. The goal is to investigate a wide range of subjects related to pottery production, decoration, distribution, use, reuse, discard, social and economic settings, among other topics.

Van As and London (1998/1999) following Longacre (1991: 6-7) make a distinction between the objectives of short-term and long-term ceramic ethnoarchaeological fieldwork. Short-term ceramic ethnoarchaeological fieldwork is mainly focused on recording the raw materials, preparation, and manufacturing techniques of traditional potters. It is often a last opportunity since the traditional ceramic industry is rapidly disappearing. Long-term projects are designed to address specific issues such as standardization of the work of craft specialists, learning frameworks for potters, and use-life of pottery. Both – short-term and long-term field work – are included in the Leiden archaeological pottery studies.

Short-term ceramic ethnoarchaeological fieldwork or 'fortuitous ethnoarchaeology' (Longacre 1991: 6) comprises the technological observations made during the short visits to traditional potters working nearby the archaeological sites under excavation in Iraq, Turkey and Greece where Jacobs and I carried out the technological analyses of excavated pottery [see *Newsletter of the Department of Pottery Technology (Leiden University)* volumes 3, 4, 6, 7/8 and 16/17; van As and Wijnen 2001]. These short visits added useful information to the technological analysis of the ancient pottery excavated at the site. Long-term fieldwork concerns the ceramic ethnoarchaeological research of Annis in collaboration with Herman Geertman. Her ethnoarchaeological study focuses on the social and economic aspects of pottery making and their mutual relationships during a time of radical transformations in Sardinia. Annis' articles about the investigations have been published regularly in the *Newsletter of the Department of Pottery Technology (Leiden University)* from vol. 1 (1983) to vol. 16/17 (1998/1999), and also elsewhere (Annis 1985, 1988, 1996, 1998).

According to Miriam T. Stark in an article dedicated to the memory of Carol Kramer, one of the leading scholars in the field of ceramic ethnoarchaeology, this disciplne has now become an established tradition in archaeological research. She demonstrates the viability and vibrancy of ceramic ethnoarchaeology and presents this approach as an integral component of world archaeology (Stark 2003).

A selection of current projects

In the frame of our research program we are involved in a number of archaeological research projects. Apart from the projects of the Faculty of Archaeology, there are also projects financed by the Netherlands Organization for Scientific Research (NWO). Additional projects are executed and financed through international cooperation. Some projects pertain to on-site or period-specific issues, while others look at the broader issue of developments in ceramic technology over time. The current projects are mainly focused on the ancient Near East, Anatolia and the Balkans. Another region of special attention is the Caribbean. Following is a selection of five current projects.

A Corpus of Mesopotamian Pottery (second millennium B.C.)

At the request of Leon de Meyer and Hermann Gasche (University of Ghent) a small collection of pottery from the second millennium B.C. (Old Babylonian and Kassite periods) excavated at Tell ed-Dēr by the Belgian Archaeological Expedition to Iraq has been studied by Franken and Kalsbeek (Franken and Kalsbeek 1984). The results of this technological study stimulated a further technological research into the pottery of this period on a larger scale by Hermann Gasche who initiated the compilation of a Corpus of second millennium B.C. pottery from a number of archaeological sites in Mesopotamia: Tell ed-Dēr (University of Ghent), Nippur (Oriental Institute/Chicago), Isin (University of Munich) and some other sites. One of the questions dealt by the International Working Group of Mesopotamian Pottery was the determination if there is a break in the Old Babylonian pottery traditions after the arrival of the Kassites in the second half of the second millennium B.C. The aim is a pottery study to be used as a reference system in which the relation between shape and technique will be clarified. As part of this project, Leiden is responsible for the investigation of the technological aspects of the pottery. Between 1985 and 1990 van As and Jacobs investigated the archaeological pottery during the excavation seasons of the various expeditions in Iraq. The preliminary results of the technological analysis have been published in volumes of the *Newsletter of the Department of Pottery Technology (Leiden University)* and elsewhere (van As and Jacobs 1992a; Gasche et al. 1998: 27-30). The final publication is still in preparation.

Excavations at Tell Sabi Abyad, Syria

Our involvement in the Dutch archaeological investigations of the pottery from Tell Sabi Abyad in northern Syria dates from the end of the 1980s, when we started a technological analysis of Late Neolithic and Early Halaf pottery excavated by the University of Amsterdam under the direction of Peter M.M.G. Akkermans (van As and Jacobs 1989). We continued our cooperation with Akkermans when he became a curator of the Near Eastern Department of the National Museum of Antiquities in Leiden. Excavations at Tell Sabi Abyad were then sponsored by the Museum. Meanwhile Olivier P. Nieuwenhuyse had begun his Ph.D. research on the rise of regional pottery styles in the Syrian and northern Mesopotamian plains. We provided the technological data for this study. Some results have already been published (van As et al. 1996/1997, this volume; Nieuwenhuyse et al. 2001, 2002). The ceramic research confirms the idea that the rise of the Halaf culture was neither a sudden event, as long assumed, nor the result of the arrival of people from elsewhere, but the outcome of a lengthy, continuous process of local cultural change in the plains of northern Syria and adjacent Iraq.

For the technological study 'high-tech' analysis proved extremely useful (Connan et al. 2004). Our initial identification of the black pigment as an organic material for the Late Neolithic black-painted pottery from Tell Sabi Abyad was confirmed by refiring selected sherds in the Ceramic Laboratory in Leiden. The initial identification of the matte, fugitive black pigment as an organic material was confirmed by re-firing selected sherds, during which the paint disappeared. 'High-tech' chemical analysis by Jacques Connan in the Laboratoire de Substances Naturelles of the Louis Pasteur University in Strasbourg confirmed that the black material is bitumen. Subsequently, a comparison in the Strasbourg laboratory with known reference samples from modern locations of bituminous sources in the Near East demonstrated that the bitumen on the Tell Sabi Abyad pottery came from at least two different source areas in northern Iraq. This type of research documented unexpected evidence of Late Neolithic exchange networks that must have existed at that time between what is now northern Syria and northen Iraq.

Archaeological Research Project in the Eastern Marmara Region, Turkey

Our share in the multidisciplinary research projects, financed by the Netherlands Organization for Scientific Research (NWO) and executed under the direction of Jacob Roodenberg of the Netherlands Institute of the Near East in Leiden, concerned the technological analysis of the Neolithic and Chalcolithic pottery from Ilıpınar Höyük and Menteşe, plus the Early Bronze Age pottery from Hacılartepe. These three archaeological sites are situated in the Eastern Marmara Region in NW Anatolia. One objective was the study of early farming communities in the border area between Anatolia and the Balkans. The purpose was to determine whether NW Anatolia formed a contact zone for the introduction of Neolithic cultures into the European continent. Another objective was to focus attention on the prehistoric chronology of NW Anatolia. The results of our technological study of the Neolithic/Chalcolithic pottery from Ilıpınar have been published in van As et al. (1995) and in contributions to two volumes on the excavations at Il›p›nar (Roodenberg 1995; Roodenberg and Thissen 2001). Roodenberg et al. (2003) published the technological data of the early pottery of Menteşe. The production sequence of the Early Bronze Age pottery of Hac›lartepe has been presented in van As et al. (1993/1994), while the stylistic aspects of this pottery have been described in Eimermann (2004). Our ceramic research activities in the Eastern Marmara region will continue in the coming years as part of a recently awarded NWO grant entitled *Yenişehir II – The earliest link in the agricultural history of northwest Anatolia.*

Southern Romania Archaeological Project (SRAP)

The *SRAP*, under the direction of Douglass Bailey of Cardiff University and Radian Andreescu of the National Historical Museum in Bucharest, has been active since 1998 investigating prehistoric land-use and settlement patterns in the Teleorman river valley in the Lower Danube Plain. The project is financed by the British Academy among others. Pottery studies form an essential part of the *SRAP*. Laurens Thissen is responsible for the over-all ceramic research. Given our familiarity with the technological aspects of contemporary Neolithic pottery from the Eastern Marmara Region in NW Anatolia we were invited to provide a similar technological analysis of the *SRAP* pottery. In the summer of 2003, in close cooperation with Thissen, we investigated the pottery of Teleor 003 belonging to the Starčevo-Criş and Dudeşti periods dating to the sixth millennium B.C. (this volume). In 2004 we analysed the pottery of the succeeding Vadaştra period dating to the end of the sixth millennium B.C.

Mobility and Exchange. Dynamics of material, social and ideological relations in the pre-Columbian insular Caribbean

Since the early eighties, we have been involved in a technological study of pottery from the Caribbean (van As and Jacobs 1992b; Hofman et al. 1993; Hofman and Jacobs 2000/2001, this volume). The Laboratory is also helping to direct and advise M.A.-students who work on pottery from this region (e.g., Bloo 1997; Arts 1999; Dorst this volume).

Recently, the Netherlands Organization for Scientific Research (NWO) has granted funding for a research project to be conducted by Corinne L. Hofman of the Department of Indian American Archaeology of the Leiden Faculty of Archaeology. The project is entitled *Mobility and exchange: dynamics of material, social and ideological relations in the pre-Columbian insular Caribbean.* It considers the interactions and feedback loops of the dynamic relationship between the material, social and ideological dimensions of insular Caribbean culture during the Ceramic Age of the pre-Columbian period (400 B.C. - A.D. 1492). The Lesser Antilles, including Trinidad and the Virgin Islands, represent the research core region. This area is considered ideal for research of this kind because of its geographical constitution as a chain of islands between the landmasses of the South American mainland and the Greater Antilles. The research attempts to answer questions of social relationships in the Caribbean. Ceramics, like lithics, as well as particular shell and bone objects, are useful indicators to study contact networks and exchange mechanisms. Pottery and clay samples from the different islands will be analysed in our laboratory. The determination of the pottery production location plays an important role in the project. Fabric analyses will be determined in order to identify the provenance of raw materials as well as the distribution of the pottery. Radiogenic isotopic analysis, performed in cooperation with Prof. G.R. Davies of the Faculty of Earth and Life Sciences of the Vrije Universiteit (VU, Amsterdam), will provide characteristic isotope ratios of raw clay samples, enabling comparison with archaeological pottery samples. The Laboratory of Pottery Technology will cooperate by studying the workability properties of the clay samples and the technological aspects of the pottery.

Concluding remarks

In the 1960s the archaeologist Henk Franken started, to work together with the ceramist Jan Kalsbeek, to find new ways of studying the Iron Age pottery from the excavations at Tell Deir 'Alla in Jordan. It was at a time when, under the influence of the work of Shepard, the contextual phase in archeological ceramic research began (Orton et al. 1993: 5). In this new phase aspects of technology, scientific research techniques and ethnographic studies started to be integrated into archaeological ceramic studies. Ceramic studies began to extend beyond simple description and classification. It was a reaction against the 'sherds as culture type-fossils' attitude of the preceding typological period. The interests shifted to examine new, almost unexploited, aspects of excavated pottery.

In Leiden, the efforts of Franken and Kalsbeek led in 1980 to the establishment of the Department of Pottery Technology, at present a section of the Faculty of Archaeology. Here, technological ceramic research is being carried out in cooperation with various (inter)national research groups. Geographically, we have crossed the borders of the original field of study, viz. the archaeology of the Levant. Since the retirement of Franken, we unfortunately hardly deal any longer with the pottery from the still ongoing excavations at Tell Deir 'Alla by his successor. In the past twenty years, however, our technological research focused mainly on pottery from other parts of Western Asia, the Mediterranean, the Caribbean and recently from the Balkans.

Pottery analysis considerably contributes to our knowledge of ancient technology and its place in the social, economical and cultural framework. Furthermore, it gives a solid basis for archaeological pottery classification. The understanding of the work of the ancient potter is a prerequisite for all archaeological-typological work on ancient pottery.

Acknowledgements

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DIFFERENT OR ALIKE?
A TECHNOLOGICAL COMPARISON BETWEEN LATE-PREHISTORIC CERAMICS AND MODERN-DAY FOLK POTTERY OF ST. LUCIA (W.I.)

Corinne L. Hofman and L. Jacobs

Abstract

Ceramics collected during archaeological surveys on the island of St. Lucia in the Lesser Antilles have proved that it is often very difficult to distinguish contemporary local earthenware ('folk pottery') from Amerindian or so-called 'Carib' potsherds dating to the late pre-Columbian and early colonial periods. This ambiguity has also been described for other islands in the Caribbean. Yet, attributes as vessel shape, temper, surface finish and thickness have been proposed in order to distinguish between the two wares. However, no useful classificatory scheme has been devised to date that would enable a positive discrimination at first sight. The purpose of the present study is to list the similarities and differences between the two earthenwares. It may serve as a useful tool for archaeologists carrying out surveys on the islands of the Lesser Antilles.

This article focuses on the technological sequences of the two pottery traditions and uses ceramics collected on St. Lucia during archaeological surveys in 2002 and 2003. These data are complemented with the results of experiments carried out at the Laboratory of Pottery Technology, Leiden University, and information gathered from a modern-day potter on St. Lucia. A detailed illustration of the vessel shapes, decorative modes and vessel nomenclature, the different steps in the manufacturing process including the identification of clay and temper materials, the techniques of shaping, finishing and decoration as well as the methods of firing, of the two wares form the core of the analysis.

Introduction

St. Lucia's settlement history commences around A.D. 200 with the first Amerindian occupants of the island (Figure 1). These earliest inhabitants originated in the northern part of South America and carried the ceramics of the Cedrosan Saladoid subseries with them. The Saladoid series produced arguably the most sophisticated ceramics in the Antilles. With the successive Troumassoid series or Troumassan Troumassoid subseries, i.e., between ca. A.D. 800 and 1150, a stylistic decline set in and pottery became gradually coarser and carried less complex decorations. Quantitatively, however, pottery production reached its climax during late pre-Columbian times, i.e., after A.D. 1150,

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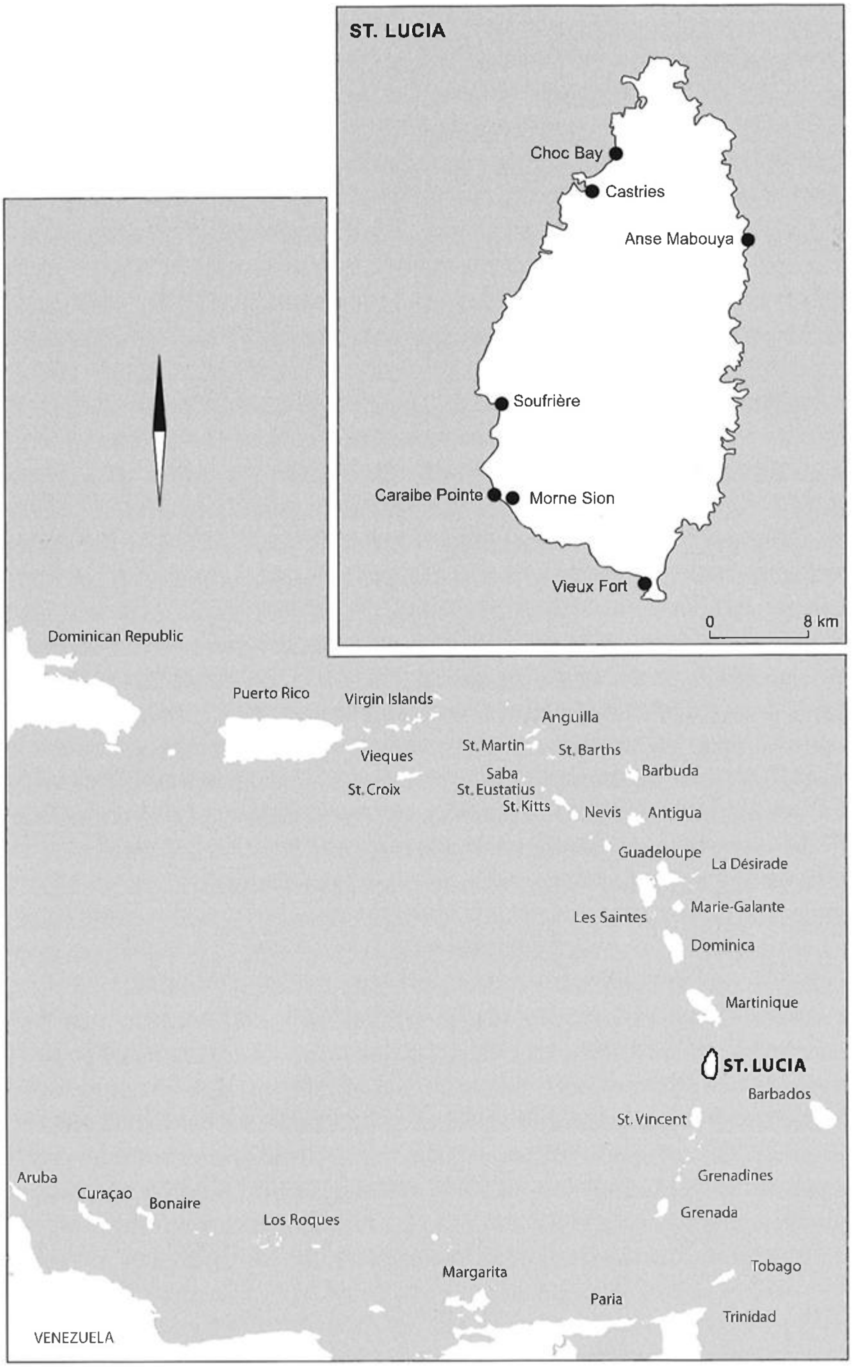


Figure 1. Map of the Lesser Antilles with detail of St. Lucia.

with the pottery of the so-called Suazoid series or Suazan Troumassoid subseries (Rouse and Faber Morse 1995), which is often referred to among local people as 'Carib' pottery. However, generally qualified as the least sophisticated and coarsest pottery of the region, this series also includes a fine ware (Boomert 2002).

The decimation of the Amerindian population on the islands by the European colonists and the introduction of black slaves from West Africa led to a breakdown of the indigenous culture and the replacement of the local Amerindian pottery tradition by a series of Afro-Caribbean wares. From a technological point of view, the Afro-Caribbean ceramics can be regarded as local Caribbean adaptations integrating a blend of skills and techniques from African, European and Amerindian – 'Carib' – pottery manufacturing traditions both in form and function (Heath 1999). However, there is no consensus among scholars regarding the exact composition of the influences going into the blend (Petersen et al. 1999: 160). The Afro-Caribbean wares once had a wide distribution throughout the Lesser Antilles, contrary to the present-day situation. Traditional potters producing so-called 'folk pottery'[1] survive to this day on the Lesser Antillean islands of Nevis, Antigua, Martinique (St. Anne) and St. Lucia (Pointe Caraïbe, Morne Sion) (Keegan et al. 2003; Petersen et al. 1999; Vérin 1963; Victor 1941; Wernhart 1986).

One technique, two manufacturing traditions

Pre-Columbian pottery of the Suazan subseries

The Suazan Troumassoid subseries, which succeeded its Cedrosan Saladoid and Troumassan Troumassoid predecessors after A.D. 1150, extended from as far south as Tobago to as far north as Martinique and Les Saintes, near Guadeloupe (Allaire 1991; Boomert 1986, 1995, 2000; Hofman 1995). Suazan influences are to be found also on islands more to the north (Hofman 1993). The Suazan subseries may have remained in existence until the European colonisation or shortly thereafter. On St. Lucia, the Suazan subseries has been called the Micoid series by McKusick (1960) and includes two successive styles known as Choc and Fannis (Jesse 1968; McKusick 1960: 152-154). The Choc style is named after its type-site in the northwestern part of St. Lucia while Fannis is named after the owner of property at Micoud on the south-east coast of St. Lucia where this pottery was found for the first time (Figure 2).

Shapes and decoration motifs

The dominant vessel shapes of the Suazan subseries of the Windward Islands generally show simple contours, often with unrestricted or independent restricted orifices. Rims are simple and rounded, rounded and slightly thickened, or inward thickened. Finger-notched rims are predominant. Bowls may have wide or flat handles, extended rim handles or rim lugs. Peg-shaped lugs are sometimes added to the rim of bowls. Bases tend to be flat but low ring bases and legs are present as well.

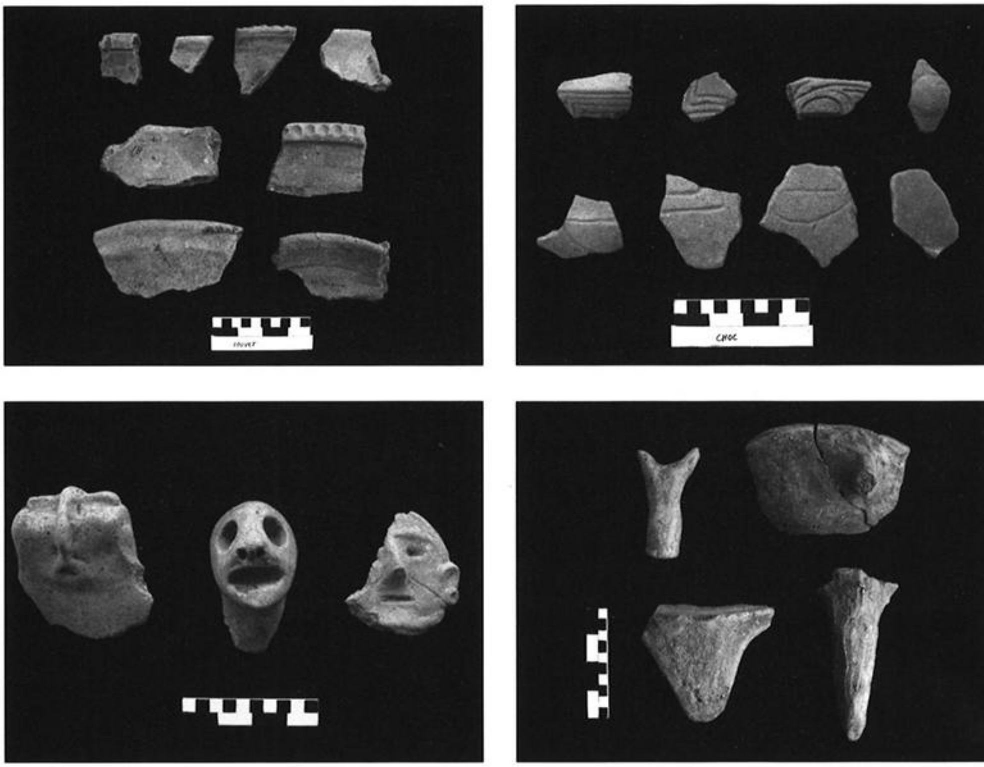


Figure 2. Suazan Troumassoid pottery from various sites on St. Lucia.

Apart from this coarse ware, there is a finer ware with more composite, complex and boat-shaped vessels made of hard fired fine clay and showing polished surfaces. Decoration on these vessels consists of finely or heavily incised lines in parallel designs, circles and dots, wings or scrolls on rims or exterior sides and complicated modelled-incised lugs frequently with human faces. These faces are flat, with appliquéd noses and eyebrows, punctuated or slashed mouths, nostrils and eyes next to pierced ears (Rouse 1992: 129). Overall red-painted surfaces are common, but bichrome painting is rare. Painting consists of aerial and linear designs. Other Suazan characteristics include legs and footed griddles, potstands, spouts, body stamps, spindle whorls, pierced cylinders known as loom weights, freestanding (female?) figurines and clay pestles (Allaire 1977: 318; Bullen and Bullen 1970: 68-71; Bullen et al. 1973: 205; Rouse 1992: 129).

The Choc style is characterized by an extreme simplicity of vessel forms with round or slightly concave bases. Annular bases are rare. The presence of bowl legs in addition to tripod griddles is typical. Decoration is simple and there is an emphasis upon unthickened rim lips. Thickened rims are uncommon and only appear in combination with red paint. The red paint used for decorating Choc ceramics is deeper and darker than the lighter Troumassée reds. Incision occurs along with typical designs such as horizontal bands alternating with a vertical line or dot. The Choc style differs distinctly from Troumassée pottery. However, its overall appearance is rather non-diagnostic as a result of the simplicity and relative crudity of the sherds (McKusick 1960: 115, 141-142).

The Fannis style comprises some other vessel shapes, notably shallow, very crude tripod and tetrapod bowls and large globular pots with slightly flaring rims. Frequently, the shape of the vessels is asymmetrical or irregular. In terms of the exclusive use of overall red paint and the absence of limited-area red this style shows continuities with the Choc style. Overall, the pottery of the Fannis style is heavier and thicker than Choc ceramics. Furthermore, the Fannis style is characterized by notched rims, elbow-shaped legs, crude spouts surmounted by horizontal loop handles, legged ringstands, and the frequent use of modelled-incised designs. Crude, irregular incision also occurs along with finger indentations on rims (McKusick 1960: 116-117).

Suazan clays and temper modes

The Suazan clays are of local provenance. In general, Suazan vessels are thick, poorly made and tempered with a great variety of materials (Bullen and Bullen 1970). Previous analysis of Suazan sherds from Saltibus Point, for example, indicates that the fabrics of the pottery from this site are of volcanic origin, showing a consistent quantity of quartz. Faupl (1986) has suggested that this may point to an origin in the youngest volcanic deposits (Belmont Pumice) of St. Lucia. Fabrics are quite uniform and only differ in the proportion of volcanic rock versus minerals like plagioclase feldspar and quartz. At the Giraudy site, the Bullens (1970: 68) identified fabrics characterized by grit- and crushed-shell temper. McKusick (1960) also noted a paste that is grit-tempered for both Choc and Fannis pottery.

Recently, fabric analysis of sherds from Giraudy, Gayabois, Saltibus Point and La Ressource (the latter found on the surface of the ground during a survey) was carried out as part of the present study. These sherds were compared with samples of folk pottery. It can be noted that most fabrics from Saltibus Point show a normal, or normal to open structure. The same holds for the fabrics from La Ressource, although due to rather high percentages of grains, fabrics are occasionally somewhat crumbly. In most cases this phenomenon occurs when the total number of grains exceeds thirty percent. At both sites a fabric is encountered in which fine quartz grains are abundant. The grain size of this temper is much finer than those of the other fabrics and the sorting is much better. Due to the high number of grains the structure of this ware is crumbly. (This type of fabric can be easily distinguished from the other Suazan fabrics and from the folk pottery fabrics as well. It is more difficult to distinguish between modern folk pottery and the other wares from Saltibus Point and La Ressource.)

Moreover, a sample of Suazan sherds from the island of Tobago, including a category of fine ware and a category of coarse ware, was incorporated in the present analysis. It proved to be easy to distinguish both Suazan wares from the St. Lucia folk pottery fabric. The grains of even the coarse ware appeared to be much better sorted than those of the folk pottery and in fact less coarse. Interestingly, the coarse ware category from Tobago showed a typical surface finish identical to that found on sherds from Giraudy and Saltibus Point (Figure 3).

Compared to the Suazan ware, the structure of the folk pottery seems a little bit coarser and somewhat more open. In most cases the pore structure shows elongated pore shapes. This is probably caused by the presence of a fat clay in the mixture. Such 'wild clay' shrinks a lot and due to the fine character of the particles the resulting package of clay particles is very dense. This in turn influences the manner of porosity development during drying and firing. The pores originate when steam is forced to escape from the dense clay and around grains, which do not shrink themselves. This is confirmed by clay sample A.

The presence of roughly angular shaped weathered rock fragments can be considered to represent another point of differentiation. However, actually this is rather inconclusive, because it is only a quantitative difference and the presence of relatively large sized fragments of weathered rock is observed in only part of the folk pottery fabrics. Moreover, weathered rock fragments are also encountered in the Suazan ware, but both their size and percentage are generally smaller.

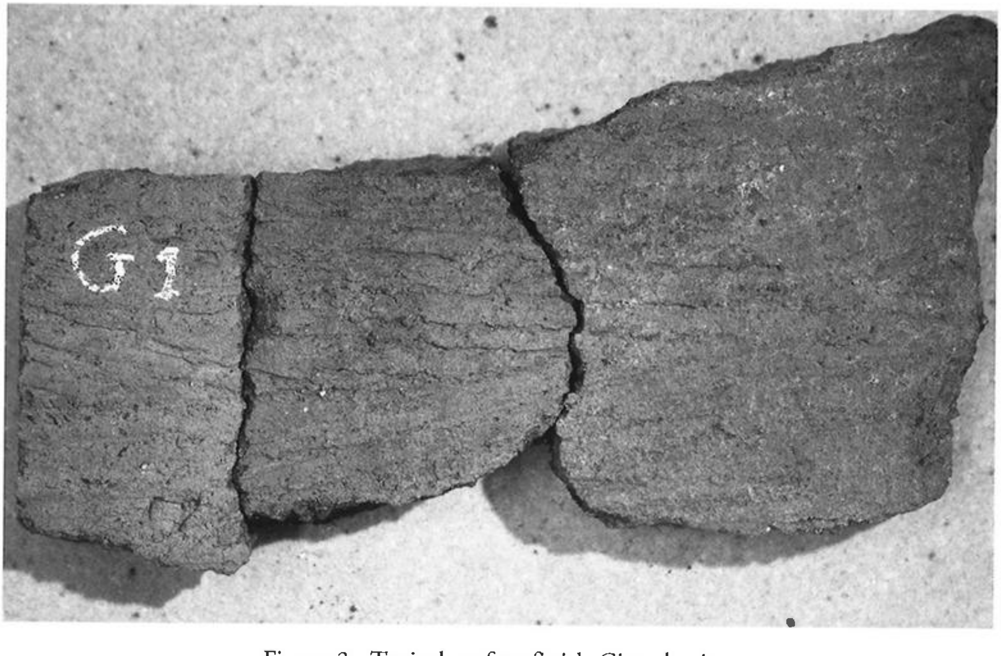


Figure 3. Typical surface finish Giraudy site.

A final distinction between the two wares is the clearly visible presence of mica in part of the folk pottery. Micas like vermiculite and biotite were found in part of the contemporary material, as well as in the folk pottery clay samples. However, a very small amount of biotite also occurs in some of the Suazan pottery from La Ressource. Although micas are rather widespread minerals, their abundant presence in part of the folk pottery is characteristic of that particular earthenware. It was introduced by mixing the clay with a local clay from behind the potter's shed (see Figure 8: a-c).

Manufacturing techniques: results of an experimental program

Shaping involved coiling, but techniques such as flattening, slab building, pinching and moulding were also employed (Figure 4). Ceramic or calabash moulds were probably used for the latter technique (Hofman and Jacobs 2001/2002). Careful analysis and experiments have led to the conclusion that these techniques were applied independently, but also in combination depending on the size and shape of the intended vessel. Scraping to reduce wall thickness during construction was done with a shell or calabash sherd (Hofman and Jacobs 2001/2002) (Figure 5).

Finishing techniques comprise smoothing, burnishing and polishing with a polishing stone. However, most Suazan vessels have a clumsy appearance, are crudely finished and often show scratched surfaces. These scratches result from rubbing the surface with grasses when the clay was in a leather hard condition (Figure 6). Choc and – to an even greater degree – Fannis ceramics are also characterized by unsmoothed surfaces with a coarse, brushed or uneven appearance. Decoration techniques comprise finger impressing, incising and modelling.

Vessels were fired in an open fire in a rather controlled way, under oxidizing to neutral conditions at temperatures generally not exceeding 800°C. The fire was built up as an open structure, so that the wind could blow through. From traces of firing on the sherds it can be concluded that the vessels were placed upside down in the fire in

Figure 4. Pinching (experiment).

Figure 5. Scraping with a shell (experiment).

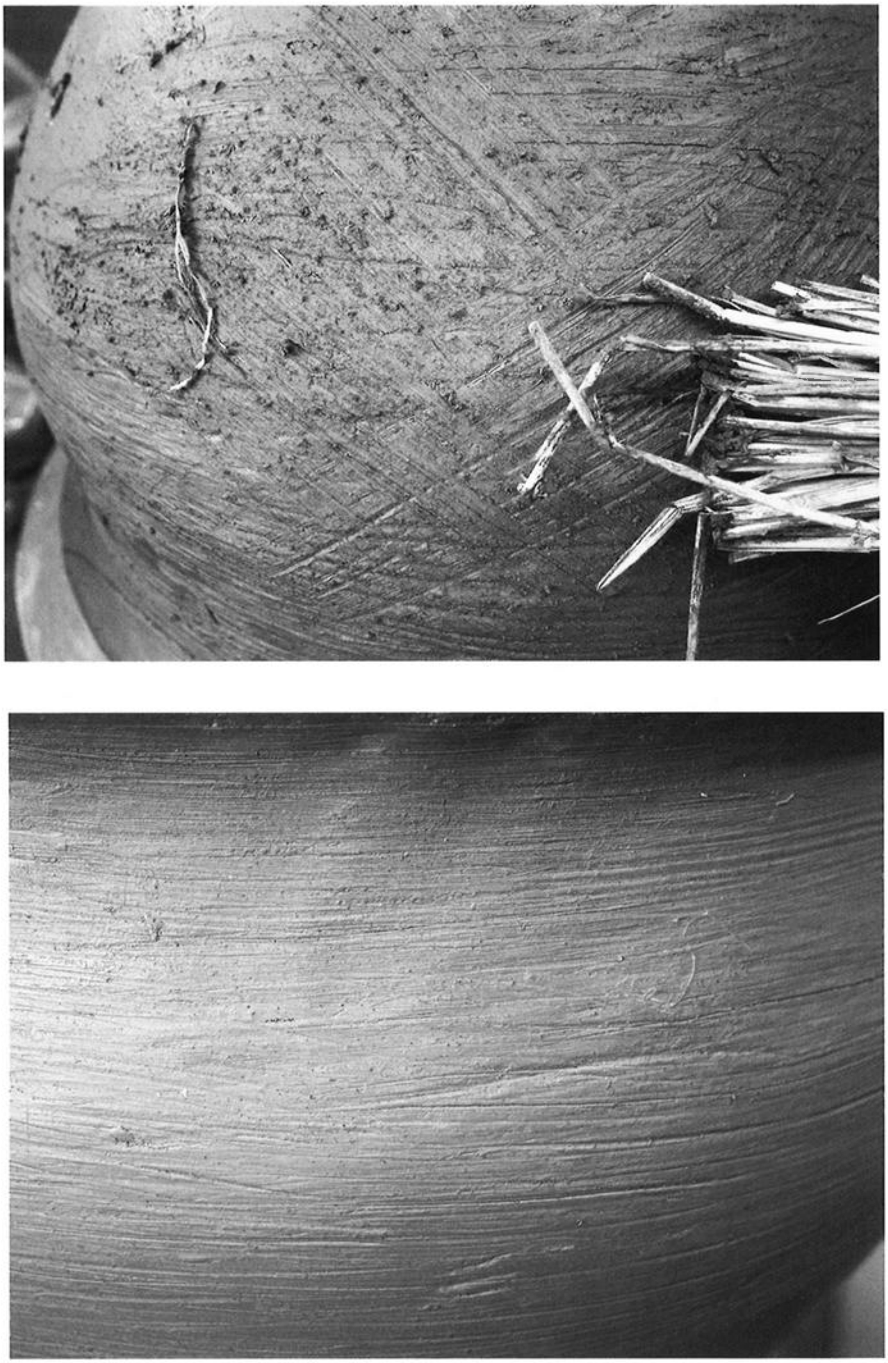


Figure 6. Rubbing the surface with grasses to obtain a scratched surface (experiment).

order to obtain a more equal spread of the heat (Peter O'B. Harris pers. comm.). The proper methods of open firing, which are common knowledge among potters, are mostly based on their own experience or passed by tradition. If not piled properly, open firing will lead to incompletely fired base parts of vessels and many misfirings due to cracking by unequal spread of the heat. Alternatively, firing furniture (e.g., rocks or broken vessels) may have been placed in the lowest part of the pile for similar reasons (Hofman and Jacobs 2001/2002).

Folk pottery

After more than two centuries of traditional manufacture, folk pottery went through a period of declining production from the mid to late eighteenth century, perhaps giving way to inexpensive imported ceramics and cast-iron pots (Armstrong 1990: 157). By the early nineteenth century, interest in the imports waned and folk pottery went through a resurgence that lasted until the onset of industrialization and the modern era. Folk pottery now leads a rather marginal existence, often in the more rural settings at some distance from towns and cities, and predominantly among the poorer members of society. Very little is known about gender and Afro-Caribbean pottery manufacture in colonial times, as the very phenomenon of Afro-Caribbean pottery has gone unstudied until recently. Exclusively women manufacture contemporary Afro-Caribbean pottery, however (Handler 1964; Hofman and Bright 2004; Nicholson 1990; Petersen et al. 1999). Men may assist in carrying out some of the tasks such as quarrying the clay. Besides the widespread local use of clay pots, most pottery production is oriented towards the markets and tourism industry.

Vessel shapes and nomenclature

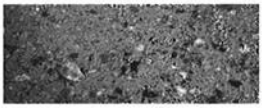
Vessel types that are popular in the folk pottery on St. Lucia today include simple shapes such as the *kannawi* (*canari)* or cooking pot and the *bésin* (*basin*), which is a large bowl. The *kannawi* is a vessel with a simple contour provided with handles at opposite ends. The dimensions of this vessel vary from small to very large (diameter 5 to 70 cm). When used for cooking these pots are placed on three stones called *fouyé* (*foyer*). The *tèson* (*tesson*?) or coal pot is an outward flaring vessel (occasionally decorated with finger indentations on the rim), consisting of two sections. It is wider at the top than at the bottom. The top part shows a perforated bottom, which separates it from the bottom section. The latter has an opening for the removal of ash and admittance of air to the burning coals on the perforated bottom of the upper section. The *chòdyè* (*chaudière*) is a large, flattish vessel used for frying. It is placed on top of the coal pot. In addition, a series of other shapes are known: the *pòt a flè* (*pot à fleur*), the flower pot, the *jar* (*jarre*), which serves as a water container, the *pla* (*plat*), on which food is placed during meals, the *téwin* (*terrine*), which shows two loop handles and is used to wash or cook food or functions as water container, and a vessel with undetermined name used for storage. The *platin* (*platine*), finally, represents a very large plate to bake cassava bread[2]. The rim portion of some vessels is occasionally decorated with finger indentations. It is noteworthy that the term *kannawi* is used in areas colonized by the French; while on English-speaking islands the term *conare*e is used (Figure 7).

On clays and temper modes

Fabric analysis points to the use of local clay and temper materials (Figure 8). Typically the same grain types occur as in sherds from Giraudy (Figure 9: a and b), Saltibus Point (Figure 9: c and d; Figure 10), La Ressource (Figure 11) and Gayabois (Figure 12). After studying the various fabrics it became obvious that all the material was of local origin. Angular crystals and broken grains of transparent quartz were abundant in all the sherds. Additionally, crystalline or partly weathered grains of feldspar were present in all the samples, albeit in lower numbers. Dark minerals like pyroxene and amphibole were found in most of the sherds, but predominantly in relatively low numbers. They showed somewhat higher percentages in only a few sherds from Saltibus Point, one from La Ressource and in clay sample C. However, dark minerals only occur sporadically in two sherds from La Ressource.

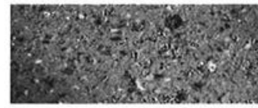
Figure 7. Variety of folk pottery vessels.

a. Folk pottery fabric **clay A**
± 180% of original size.



general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** clear quartz ** feldspar ** pyroxene/amphibole * kaolinite * siltstone * iron oxide siltstone * unresolved clay - lumps (mudstone) * vermiculite * rockfragments
prevailing grain size	50μ – 2 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 35 %
sorting in general	moderately to badly
grain colour in general	mixed prevailing light
colour of the total fabric	brown MSCC 7.5YR4/4
porosity	normal to open structure

b. Folk pottery fabric **clay B**
± 180% of original size.

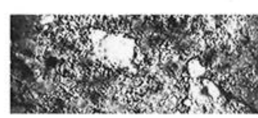


general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** clear quartz ** feldspar ** weathered feldspar ** pyroxene/amphibole ** pyroxene/amphibole * siltstone * vermiculite * weathered granite
prevailing grain size	50μ – 2 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 30 %
sorting in general	moderately
grain colour in general	mixed prevailing light
colour of the total fabric	brown - strong brown MSCC 7.5YR4/4 - 4/6
porosity	normal to open structure

c. Folk pottery fabric **clay C**
± 180% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz *** pyroxene/amphibole ** feldspar ** vermiculite * weathered feldspar * iron ox siltstone * kaolinite * magnetite nodules
prevailing grain size	50μ – 3 mm.
prevailing shape	angular and sub angular
prevailing quantity	35 to 40 %
sorting in general	moderately to badly
grain colour in general	mixed light and dark
colour of the total fabric	reddish brown - red MSCC 2.5YR5/4 - 5/8
porosity	open structure, bit crumbly

d. Folk pottery fabric Gayabois
sherd GBF ± 155% of original size.



general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz ** feldspar ** feldspar ** feldspar ** feldspar * kaolinite * rock fragments ~ iron ox siltstone
prevailing grain size	50μ – 3 mm. (incidentally up to 10 mm.)
prevailing shape	angular and sub angular
prevailing quantity	about 30 %
sorting in general	badly
grain colour in general	mixed prevailing light
colour of the total fabric	gray to brown MSCC 7.5YR5/1 - 5/4
porosity	bit open structure, with long pores

Figure 8a-d. Folk pottery clay fabrics.

a. Suazoid fabric Giraudy
sherd G1. 155% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	** *** *** clear quartz ** feldspar ** kaolinite ** pyroxene/amphibole * iron oxide siltstone
prevailing grain size	50μ – 2 mm.
prevailing shape	angular to sub angular
prevailing quantity	about 30 %
sorting in general	moderate to good
grain colour in general	light
colour of the total fabric	gray to reddish brown MSCC 5YR5/1-5/6
porosity	normal to open structure

b. Suazoid fabric Giraudy
sherd G2. ± 155% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	** *** *** clear quartz ** pyroxene/amphibole * feldspar * kaolinite * iron ox siltstone
prevailing grain size	50μ – 2 mm.
prevailing shape	angular to sub angular
prevailing quantity	10 to 15 %
sorting in general	moderately
grain colour in general	light
colour of the total fabric	yellowish red MSCC 5YR4/6
porosity	cracked but relatively dense hard structure

c. Suazoid fabric Saltibus Point
sherd SPa. ± 155% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	** *** clear quartz * feldspar * pyroxene/amphibole * siltstone brown * siltstone brown ~ kaolinite
prevailing grain size	50μ – 2 mm.
prevailing shape	angular prevailing
quantity	15 to 20 %
sorting in general	moderate to bad grain
colour in general	light
colour of the total fabric	red MSCC 2.5YR4/8
porosity	normal to dense structure

d. Suazoid fabric Saltibus Point
Sherd Sp. ± 155% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** clear quartz * weathered feldspar * pyroxene/amphibole * kaolinite * feldspar
prevailing grain size	50μ – 25mm.
prevailing shape	angular to sub angular
prevailing quantity	about 15 %
sorting in general	moderate
grain colour in general	light
colour of the total fabric	reddish yellow MSCC 5YR6/6
porosity	normal structure

Figure 9 a-d. Fabrics from pre-Columbian sherds from the sites of Giraudy and Saltibus Point.

a. Suazoid fabric Saltibus Point
sherd 1.± 180% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	* ** *** clear quartz ** pyroxene/amphibole * weathered feldspar * feldspar * iron oxide siltstone * kaolinite * unresolved clay - lumps (mudstone)
prevailing grain size	50µ – 1..5 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 25 %
sorting in general	moderately to badly
grain colour in general	mixed prevailing light
colour of the total fabric	reddish brown MSCC 5YR5/3 –5/4
porosity	normal structure

b. Suazoid fabric Saltibus Point
sherd 2. ± 180% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** clear quartz *** pyroxene/amphibole ** feldspar ** weathered feldspar iron oxide siltstone * siltstone * kaolinite
prevailing grain size	50µ – 2 mm.
prevailing shape	angular
prevailing quantity	about 30 %
sorting in general	moderately to badly
grain colour in general	mixed light and dark
colour of the total fabric	reddish brown - red MSCC 2.5YR5/4-5/6
porosity	normal to open structure

c. Suazoid fabric Saltibus Point
sherd 4. ± 170% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** unresolved clay - lumps (mudstone) ** clear quartz ** pyroxene/amphibole * weathered feldspar * feldspar * kaolinite
prevailing grain size	50µ – 2 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 20 %
sorting in general	moderately to badly
grain colour in general	mixed light and dark
colour of the total fabric	reddish brown - red MSCC 2.5YR5/4-5/8
porosity	normal to open structure

d. Suazoid fabric Saltibus Point
sherd 5. ± 200% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz *** pyroxene/amphibole ** iron ox concretions ** feldspar * kaolinite
prevailing grain size	50µ – 2 mm. (strong concentr. 250µ - 500µ)
prevailing shape	angular
prevailing quantity	about 35 %
sorting in general	moderately to badly
grain colour in general	mixed light and dark
colour of the total fabric	yellowish red MSCC 5YR5/6
porosity	very crumbly and soft structure

Figure 10 a-d. Fabrics of pre-Columbian sherds from the site of Saltibus Point.

a. Suazoid fabric La Resource
sherd 8. ± 200% of original size.

general grain types with their presence	**
	***
	*** clear quartz
	** weathered feldspar
* ≈ 2%	** kaolinite
** ≈ 4%	** kaolinite
*** ≈ 6%	** kaolinite
~ = eventually	** kaolinite
prevailing grain size	50μ – 1..5 mm. occasionally up to 2 mm.
prevailing shape	angular
prevailing quantity	about 30 %
sorting in general	badly
grain colour in general	prevailing light
colour of the total fabric	brown MSCC 7.5YR5/4
porosity	normal structure, bit crumbly

b. Suazoid fabric La Resource
sherd 6. ± 200% of original size.

general grain types with their presence	**
	***
	*** clear quartz
	*** pyroxene/amphibole
* ≈ 2%	** feldspar
** ≈ 4%	** kaolinite
*** ≈ 6%	* iron ox concretions
~ = eventually	* iron ox siltstone
	~ rock fragments
prevailing grain size	50μ – 2 mm. (concentration around 250μ)
prevailing shape	angular and sub angular
prevailing quantity	about 35 %
sorting in general	moderately to badly
grain colour in general	mixed light and dark
colour of the total fabric	reddish brown - red MSCC 2.5YR5/4-5/8
porosity	soft and crumbly, lose structure

c. Suazoid fabric La Resource
sherd 10. ± 180% of original size.

general grain types with their presence	***
	***
	*** clear quartz
	** feldspar
* ≈ 2%	** haematite
** ≈ 4%	* iron oxide siltstone
*** ≈ 6%	* pyroxene/amphibole
~ = eventually	* kaolinite
	~ biotite
prevailing grain size	50μ – 2 mm. occasionally up to 5mm.
prevailing shape	angular and rounded
prevailing quantity	30 % to 35 %
sorting in general	badly
grain colour in general	prevailing light
colour of the total fabric	reddish brown MSCC 5YR4/4
porosity	normal to open structure, bit crumbly

d. Suazoid fabric La Resource
sherds 7; 9. ± 180% of original size.

general grain types with their presence	***
	***
	*** clear quartz
	*** feldspar
	*** weathered feldspar
* ≈ 2%	** pyroxene/amphibole
** ≈ 4%	* iron ox siltstone
*** ≈ 6%	* sandstone
~ = eventually	* kaolinite
	~ rock fragments
prevailing grain size	50μ – 2 mm. (strong concentr. 250μ - 500μ) occasionally up to 7 mm.
prevailing shape	angular and sub angular
prevailing quantity	35 to 40%
sorting in general	rather well
grain colour in general	prevailing light
colour of the total fabric	brown; reddish yellow MSCC 7.5YR5/4-6/6
porosity	very crumbly and soft structure

Figure 11 a-d. Fabrics of pre-Columbian sherds from the site of La Ressource.

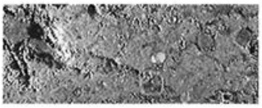
a. Suazoid fabric Gayabois
sherd GB4. ± 180 % of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** feldspar *** clear quartz *** weathered feldspar ** kaolinite ** siltstone * pyroxene/amphibole
prevailing grain size	50μ – 500μ occasionally up to 2 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 30 %
sorting in general	good grain
colour in general	light
colour of the total fabric	yellowish red MSCC 5YR5/6
porosity	normal to open structure, bit crumbly

b. Suazoid fabric Gayabois
sherds GB1;3;5. ± 200 % of original size.

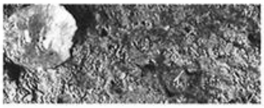
general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz ** feldspar ** weathered feldspar ** kaolinite * iron ox. concretions * pyroxene/amphibole
prevailing grain size	50μ – 3 mm. occasionally up to 5mm.
prevailing shape	angular and sub angular
prevailing quantity	30 % to 35 %
sorting in general	moderate
grain colour in general	prevailing light
colour of the total fabric	strong brown MSCC 7.5YR5/6
porosity	normal structure, bit crumbly

c. Suazoid fabric Gayabois
sherd GB2. ± 230% of original size.



general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** clear quartz * pyroxene/amphibole * iron ox siltstone
prevailing grain	size 50μ – 2 mm. some up to 3 mm.
prevailing shape	sub angular / sub round
prevailing quantity	about 15 %
sorting in general	moderately to good
grain colour in general	light
colour of the total fabric	yellowish red MSCC 5YR5/6
porosity	normal structure

d. Suazoid fabric Gayabois
sherds 8;31. ± 300 % of original size.



general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz ** feldspar ** weathered feldspar * kaolinite * iron ox. concretions * pyroxene/amphibole
prevailing grain size	50μ – 4 mm. occasionally up to 5 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 30 %
sorting in general	moderate
grain colour in general	prevailing light
colour of the total fabric	yellowish red MSCC 5YR4/6
porosity	normal bit crumbly structure

Figure 12 a-d. Fabrics of pre-Columbian sherds from the site of Gayabois.

The manufacturing process: account from a potter at Morne Sion[3]

Clays (*tè gwa*) are collected from neighbouring quarries. The (female) potter may, in some cases, have to pay for the clay if the 'quarry' does not belong to her. When quarried, the clay is piled. The inhabitants of the neighbouring village know to whom each pile belongs and would never take clay from anybody else's pile. The potter collects big chunks of red clay from her pile, which she deems to be of good quality for making pottery (Figure 13). The parts of the clay that have black spots in them are rejected. The clay is then transported to the potter's shed in a bag, which is carried on her head. Behind the shed is another 'quarry'; here white clay from the bottom layer of the pit is collected (Figure 14). The mixing of the chunks of red and white clay with water makes the clay suitable for pottery making. A large stone is wetted and the mixed clay is put on top of the stone, forming a small pile. The potter splashes a little more water on the pile, and then uses a long pestle-like wooden tool, that is thin at the top and thick at the bottom, to pound the clay (Figure 15). She stops every few minutes to turn the clay, putting it back on the pile. In between the pounding she kneads the clay with her hands. The process takes about 5-10 minutes. The pounded clay is then taken into the workshop.

For shaping purposes, the potter uses a clay bowl with rounded edges, which she places on her lap. She takes a handful of clay from a pile to her right, and begins to knead the clay with her hands. She makes a long coil and smoothens it out, forming the base of the pot. Then the clay is flattened with her hands. Now she takes more clay

Figure 13. Clay quarry.

Figure 14. Clay pit behind the potter's shed.

Figure 15. Pounding the clay with a wooden pestle.

from the pile and forms shorter lumps. These lumps are worked into the clay she has in her hands. She kneads the clay by turning the base and adding the lumps, forming the walls of the pot (Figure 16). The potter adds more lumps, turning and working the sides of the pot with the coils, going higher and higher (Figure 17). In order to scrape the clay on the inside and outside of the vessel the potter uses a calabash sherd or scale (*cau* or *kay;* see *couebi* in Allaire 1976, 1977: 64) (Figure 18). She wipes the rim of the pot with a wet cloth. The vessel is then left to dry until the next day, because the clay is still too soft to smoothen. Sometimes, depending on the shape of the pot, a ceramic mould is used to form the base part. The potter makes finger-notched impressions on the rims of some of the pots as a form of decoration.

A pebble is used to burnish the vessel surface (Figure 19). The potter collects these stones on the beach. The surface of these pebbles is smooth albeit not shiny. The vessels are burnished when in an almost dry condition, i.e., a stadium in which the clay has definitely lost all of its plasticity. The result is a smooth but not very glossy finish. The entire outer surface of the vessels is burnished by rubbing firmly with the pebble. The reason for this way of finishing is its producing a tight and thus better appearance of the surface. While rubbing the relatively hard pebble crushes protruding grit particles. During the preparation of the paste these same grit particles were added to the clay body by mixing the latter with the tempering clay from behind the shed.

Figure 16. Smoothing out a coil to form the base part.

Figure 17. Adding lumps of clay to build the wall of the vessel.

Figure 18. Scraping the pot with a calabash sherd.

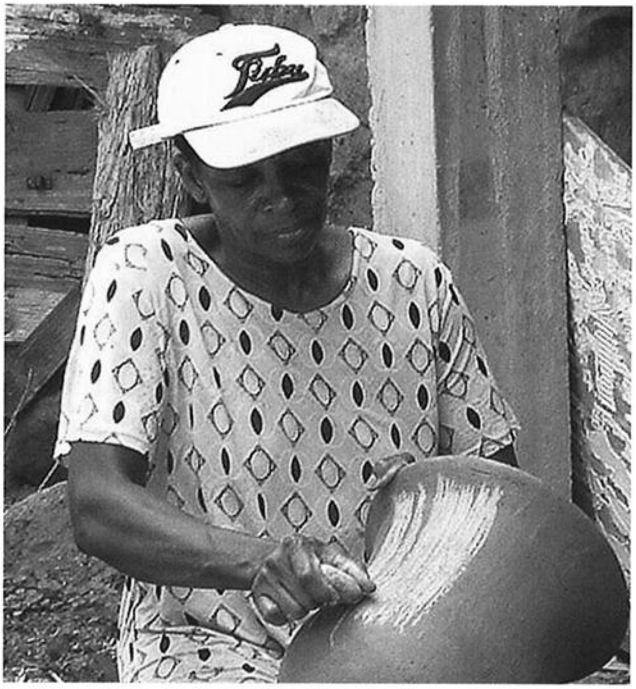


Figure 19. A pebble is used to burnish the vessel.

The pounding of the mixture with the heavy wooden pestle during preparation is meant to crush and at the same time mix the grit particles through the clay body. Although their size needs to be reduced by breaking them, the grit particles are considered to be a very suitable material. In fabric analysis these greyish/white particles are indicated as weathered feldspar and/or weathered granite/kaolinite. The structure of these crushable half-hard grains is an open, somewhat sandy one. The material is able to let water pass through easily and therefore helps to open the clay body by its presence, a favourable property comparable to that of grog. Since the basis of the clay body is a rather plastic clay with a linear shrinkage rate of about 10%, the addition of a rather high amount of non-plastic temper, including this opening material, seems to be no superfluous luxury. Many of these grit particles are not adequately reduced in size by the pounding of the clay during preparation. After building and drying the vessels many of them protrude through the outer surface. By burnishing the surface with the hard pebble these protruding grains are partly crushed after all and become even with the rest of the vessel wall, in this way dramatically improving the latter's surface. Nevertheless, some large grit fragments that escaped from crushing seem to be characteristic of the fabric of the folk pottery. Their presence was at least observed in all of the examined folk pottery from Gayabois (see Figure 8: d) and Morne Sion (Figure 20).

a. Folk Pottery fabric sherd 11.
± 180% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	** *** *** clear quartz *** weathered feldspar *** weathered granite ** pyroxene/amphibole ** kaolinite * iron oxide siltstone
prevailing grain size	50µ – 2..5 mm.
prevailing shape	angular and sub angular
prevailing quantity	about 35 %
sorting in general	badly
grain colour in general	mixed prevailing light
colour of the total fabric	yellowish red MSCC 5YR5/6
porosity	lose, open crumbly, long pore structure

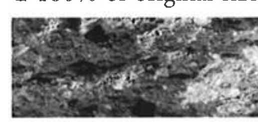
b. Folk Pottery fabric sherd 12.
± 180% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz ** weathered granite ** feldspar ** pyroxene/amphibole * iron oxide siltstone * biotite
prevailing grain size	50µ – 2 mm. (incidentally up to 5 mm.)
prevailing shape	angular and sub angular
prevailing quantity	about 30 to 35%
sorting in general	badly
grain colour in general	mixed preailing light
colour of the total fabric	strong brown MSCC 7.5YR5/6
porosity	normal to open structure, bit crumbly

c. Folk Pottery fabric sherd 13.
± 180% of original size.

general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** clear quartz *** weathered feldspar ** pyroxene/amphibole * feldspar * kaolinite * iron oxide siltstone * manganese siltstone * vermiculite ~ weathered granite
prevailing grain size	50µ – 2..5 mm.
prevailing shape	angular and sub angular
prevailing quantity	30 to 35%
sorting in general	moderately to badly
grain colour in general	mixed light and dark
colour of the total fabric	yellowish red MSCC 5YR5/6
porosity	long open structure bit crumbly

d. Folk Pottery fabric sherd 14.
± 180% of original size.



general grain types with their presence * ≈ 2% ** ≈ 4% *** ≈ 6% ~ = eventually	*** *** *** clear quartz ** feldspar ** weathered feldspar ** weathered granite * pyroxene/amphibole * kaolinite * rock fragments ~ iron ox siltstone siltstone
prevailing grain size	50µ – 3 mm. (incidentally up to 10 mm.)
prevailing shape	angular and sub angular
prevailing quantity	about 35 %
sorting in general	badly
grain colour in general	mixed prevailing light
colour of the total fabric	yellowish red MSCC 5YR5/6
porosity	bit open structure, with long pores

Figure 20. Fabrics of folk pottery from Gayabois and Morne Sion.

The potter explains that she does not fire the vessels she has made until she can fire a large batch at once. When sufficient vessels are ready to be fired, wood is placed to cover the pots, and then more vessels and pieces of wood are piled until a height of about 1.60 m is reached. Additional wood is placed against the sides of the pile, which is fired until all the wood has burned (Figures 21 and 22).

Figure 21 a-d. Building up the pile.

Figure 22. Firing the pottery.

Concluding note

Pottery manufacture was a household affair in pre-Columbian times and it still is at present. Today, although men may assist during some parts of the production process (quarrying the clay and chopping the wood), pottery manufacturing is a woman's task. It is speculated that women were also most likely the principal potters in pre-Columbian times as is the case today among many indigenous people in northern South America. Men may have played a role in producing Suazan ceramics as well considering the fact that there is some evidence that the manufacture of pottery was perhaps a male activity among the Kari'na of French Guiana during the mid-seventeenth century (Biet 1896: 39). However, from the early eighteenth century onwards pottery manufacture among the Kari'na has been a female activity (Boomert 1995: 32; see also Hofman and Jacobs 2000/2001).

Suazan pottery represents an indigenous pre-Columbian development of the Windward Islands while folk pottery has its roots in West Africa but is definitely the result of the mingling of traditions. Despite their different origins and unicity, both earthenwares have much in common in terms of their appearance and general manufacturing techniques. Both wares are made by hand, typified by simple shapes and fired at low temperatures. Certain specific differences, however, have been noted regarding vessel types, fabrics, shaping techniques, finishing techniques and the amount of variation with regard to decorative modes and techniques.

Although simple vessel shapes characterize both earthenwares, Suazan pottery includes vessels with simple contours which often have unrestricted or independent restricted orifices and simple rounded, rounded and slightly thickened, or inward thickened rims. Folk pottery is also characterized by simple contours and unrestricted orifices in a variety of sizes. These vessels often have handles attached horizontally to the vessel wall. It is apparent that each vessel type is related to a particular function and bears its own name. It is probable that a similar system existed for the Suazan pottery considering that it is also an observable fact among the mainland Kari'na (Vredenbregt 2002: 113, this volume).

Interestingly, Suazan jars and bowls have flat bases and low ring bases, but legged bowls are present as well. Flat bases predominantly characterize folk pottery. The griddle for baking cassava bread is common in both traditions, although its shapes and sizes differ. Moreover, Suazan griddles predominantly have three legs. Folk pottery griddles are placed on three stones.

Although the Suazan ceramic repertoire often contains thick-walled pottery, this seldom seems to represent the walls of complete vessels, whereas for folk pottery a thick wall seems to be given characteristic. Except from miniature vessels the ceramic assemblage hardly contains thin-walled pots. Therefore, vessels with generally thick walls are considered to be characteristic of folk pottery. Probably this was a way of dealing with the vulnerability of the soft, low-fired earthenware.

Fabric analysis indicates that while both wares use clays of local origin, their texture and composition are partly different. Part of the Suazan pottery shows a fine crumbly texture, resulting in a soft fabric when high quantities of very fine quartz and feldspar grains predominate. In a few Suazan sherds unresolved clay lumps or mudrock were clearly visible. This may point to the practice of mixing fat and lean clays shortly before use.

Part of the Suazan pottery closely resembles the folk pottery. Both wares show a normal to open structure and have moderately to badly sorted fabrics. Modern folk pottery is characterized by a somewhat coarse, badly sorted (coarse and fine grains of several types), open (bark-like) texture, with a mixture of angular crystalline, transparent quartz grains, feldspars and weathered feldspars, lower quantities of dark minerals and rock fragments like weathered granite and some siltstone. These differences determine the distinctiveness of at least part of the ware and could possibly be used to discriminate between the wares during field surveys.

As far as the manufacturing process is concerned similarities as well as differences can be noted. Regarding the shaping techniques, coiling is generally considered to represent the most common technique used to manufacture Suazan pottery. However, this technique seems often to have been combined with other techniques, i.e., flattening, slabs building, pinching and moulding. Although coiling is reported for today's pottery as well, fashioning with small lumps of clay is the method employed by the potter in Morne Sion and is known from other islands, for instance Antigua (Allaire 1976). Moulds of pottery are used in both traditions but the pre-Columbian potters may also have used calabash moulds. On the other hand, calabash tools are used in both cases. These tools are used to scrape the pottery in order to level and thin out the surface. The potter at Morne Sion used a hard plastic tool for this purpose as well, alternating it with a calabash tool to smoothen the vessel surfaces.

Scratching or scraping is often used as a finishing technique on Suazan vessel surfaces. Smoothed, burnished and polished surfaces similarly occur. In contrast, folk pottery surfaces are exclusively smoothed and burnished. Apart from the finger-notched rims, today's folk pottery remains largely undecorated and does not bear any slip. A polishing stone is used to burnish or polish the surface of both earthenwares. Actually, in comparison with modern folk pottery the Suazan earthenware shows a greater variety in ways of finishing.

Decorated vessels are uncommon today and are rare within the coarse ware of the Suazan subseries, consisting predominantly of finger-notched patterns on rims. However, the fine ware of the Suazoid series has incised, painted and modelled designs often on red-slipped surfaces. Low-fired pottery characterizes both traditions. Firing is done in an open fire. In both cases this results in rather soft and friable earthenware and the risk of producing misfirings is rather high. Ethnographic observation at Morne Sion showed a breakage ratio of about 10% during the firing process. Of the 40 vessels Kathy had fired four showed cracks.

It is the combination of particular features that distinguishes folk pottery from Suazan pottery.

Differences between folk pottery and Suazoid pottery:

- Folk pottery has always burnished surfaces, whereas Suazan pottery has may be burnished, smoothed, red slipped, polished, painted, scratched, incised, modelled bear appliqués.
- Folk pottery is overall thick-walled (even the miniatures are relatively thick-walled). Suazan pottery shows more variety in wall thickness, from thick to thin in the same vessel. It seldom is as uniformly thick-walled as folk pottery.
- Folk pottery has a coarse and badly sorted fabric. The quantity of dark minerals, if any mostly is relatively low. It is a fabric with clear quartz, feldspar and weathered feldspar/ kaolinite. Remarkable is that the latter rock fragments are particularly badly sorted and occur as fine, medium and coarse and very coarse grains. These very coarse grains do occur in each of the wares from Gayabois and Morne Sion. Their percentage in the total fabric is quite low (2 to 5%), yet they are a characteristic

feature of folk pottery fabrics. Moreover because of their relatively low percentages they can easily be overlooked, for instance when dealing with small fragments. Suazan pottery has much more variety in fabric types as well as in colors. Some of the fabrics incidentally contain larger lumps and rock fragments, but such fragments never occur as consistently as in the folk pottery fabric. Probably their occurrence in folk pottery is related to the practice of pounding part of the ingredients while mixing the two clays together. Pounding is necessary to break the bigger (relatively soft) rock lumps, although that the pounding/mixing does not reduce all the lumps to an upper grain size limit of 2 to 3 mm.

- Though micas are generally related to clays and therefore quite abundant, the presence of the gold colored vermiculite in folk pottery fabrics is remarkable.

Similarties between folk pottery and Suazan pottery:

- Both folk pottery and Suazan pottery are hand-made. Folk pottery is made by molding, lump smearing / pressing and modeling. Suazan pottery is made by coiling, molding, flattening, modeling and slab building.
- Both have simple vessel shapes and contours.
- Both show a variety in sizes and types (Suazan probably more than folk pottery).
- Both are made from local clays.
- In both contexts mixing clays to prepare a clay body was a common practice.
- Both wares are low fired in an open pile.

It may be concluded that based on the above-mentioned criteria, folk pottery sherds can be distinguished from Suazan sherds in most cases. Only when the fragments are rather small, the distinction is more difficult to make. In this respect fabrics GB1, GB3, GB5 and GB31 are the most problematic. This is because, these fabrics resemble that of folk pottery, their surfaces are burnished, their colors vary from reddish brown, brown and reddish yellow to grey / very dark grey and moreover their size is limited. Only the absence of relatively large sized lumps of weathered feldspar / kaolinite betrays that these fragments are of Suazan origin.

Analysis of the Suazan and folk pottery from St. Lucia contributes to the understanding of the manufacturing techniques of both traditions. Suazan and folk pottery are characterized by a unique set of techniques, shapes, finishing techniques and decorative modes, clearly dominated by the personal choices and preferences of the potters during pre-Columbian and modern times and brought about by social and cultural changes through time.

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Notes

1. Other names under which these earthenwares are known are peasant ware, Yabbas, Creole (or criollo) ware, African ware, Afro-Caribbean pottery and colono-wares.

2. The terminology for the various vessel shapes is given in *patwa* or patois, the *kwéyòl* or Creole language spoken on St. Lucia today (Frank 2001). The *kwéyòl* language shows African influences. Although the African languages were suppressed as soon as the slaves arrived on the island, the French planters still needed to communicate with their workers and gradually a common language evolved based on French but interlarded with African and English words.

3. See also Hofman and Bright 2004.

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MANZANILLA 1:
CREATING A SITE-SCALE POTTERY CLASSIFICATION AT A MULTI-COMPONENT CERAMIC AGE SITE ON TRINIDAD

Marc C. Dorst

Abstract

Between 1997 and 2003 a series of archaeological excavations were carried out by successive teams of Dutch archaeologists at the pre-Columbian multi-component settlement site of Manzanilla 1 (SAN-1), Trinidad. The technological and stylistic characteristics of the ceramics found at this site form the subject of this article. The study of the Manzanilla 1 pottery aimed at creating a classification, on a site-scale level, to be used as a tool for relative dating and for the interpretation of the spatial layout of the site. This classification may serve as an instrument to assess the validity of the concept of ceramic styles and their social aspects within the Caribbean region.

Introduction

This article discusses the pottery assemblage of the pre-Columbian site of Manzanilla 1 (SAN-1) on the east coast of Trinidad, West Indies. This multi-component settlement site was investigated in 1997, 2001 and 2003 by successive teams of Dutch archaeologists. The pottery encountered at this Ceramic Age site appeared to be varied, both technologically and stylistically. Furthermore, as the bulk of the ceramics derives from shell-midden contexts, the mixing of materials complicated the analysis of the local ceramic assemblage. The aim was to establish a site-specific pottery seriation. First, a data set of the individual elements of technology and style was established. The purpose of creating such a site-scale ceramic seriation was to provide an instrument for ascribing shell-midden layers and individual middens to Trinidad's known ceramic complexes. Thus, the middens could be dated and used as tools in order to study the spatial and temporal distributions of the different habitation locations at the Manzanilla 1 site. The combined data of technological and stylistic analyses of the 1997 fieldwork resulted in the establishment of an initial site-specific classification system of different ware types. On the basis of these ware types the pottery could be ascribed to specific Trinidad complexes. This classification system was refined after the 2001 fieldwork and tested for its usability during the 2003 fieldwork.

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Trinidad: geography, prehistoric culture and ceramic styles

Geography

Trinidad is a continental island, which became detached from the South American mainland due to the global sea-level rise in the post-Pleistocene era. It forms the southernmost island of the Caribbean archipelago. Trinidad is situated just north (18 km) of Venezuela beyond the mouth of the Orinoco River system, separated by the water channel known as the Serpent's Mouth. It lies between 9°40' and 10°50' N lat, and 60°55' and 61°56' W long. The island measures 83 x 59 km; its total area covers 4772 km^2. Trinidad's eastern shore faces the Atlantic Ocean, while its west coast is washed by the calm, brackish waters of the Gulf of Paria (Figure 1). Tobago, which is situated some 32 km north of Trinidad, represents Trinidad's closest island neighbour. Both islands are separated by the sea channel called the Galleon's Passage. Trinidad's climate is characterised by humid and tropical conditions. Precipitation shows two seasons. Its distribution is related to the island's physiographic nature. Unlike many other West Indian islands, which are often of volcanic origin, Trinidad mainly consists of sedimentary rocks, with only a small patch of igneous rocks present in its north-eastern portion. The island's scenery varies from mountainous regions to flat plains and swamps (Liddle 1946).

Prehistoric culture

The time span of the cultural groups that are discussed here ranges between 250 B.C. and circa A.D. 750. The first Amerindians that used pottery, i.e., the Saladoid series, arrived around 250 B.C. in Trinidad. They encompassed small groups of horticulturists who practiced swidden cultivation by burning plots of forest. Subsequently, food plants, notably bitter cassava, were grown in the ash-fertilized soil. Furthermore, animal food was obtained by practising hunting and fishing. Settlements were located at environmentally strategic locations, usually at the boundaries of many different ecological zones. Accordingly, the sea, fresh-water rivers, brackish estuaries as well as swamps and forests could be explored within the neighbourhood of the settlement. It is believed that Saladoid society was egalitarian, showing a tribal socio-political system. Society consisted of semi-independent local communities, made up of a few descent groups. Close interaction existed among these local groups, consisting of exogamous marriages, elaborate networks of trade and reciprocal exchange, political and military alliances as well as shamanic religious and ceremonial interaction (Boomert 2000: 383-385). Although particular shamans or war party leaders could become supralocal authorities, their decision-making authority was probably not comparable to that of the heriditary chiefs. A supposed hierarchy could have existed for some time. This is referred to as a short-term chieftaincy (Redmond 1998: 10).

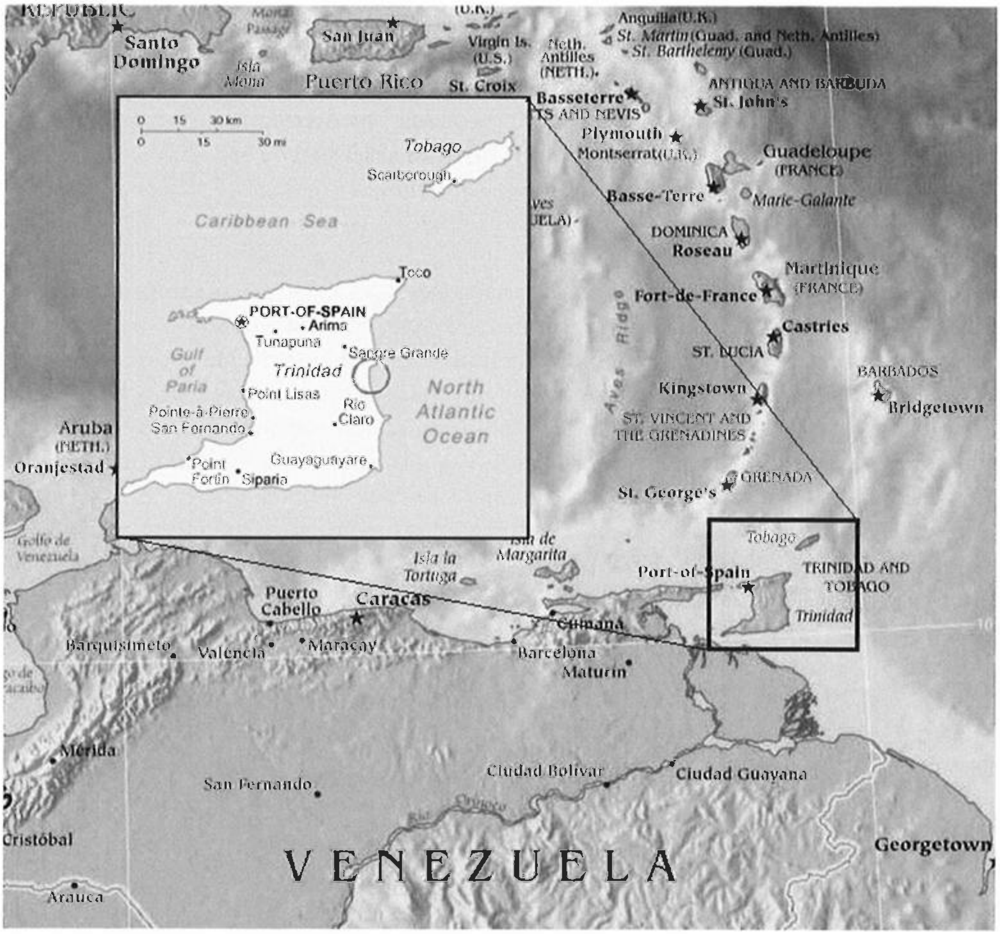


Figure 1. Map of the Southeast Caribbean, showing the situation of Trinidad and that of the Manzanilla 1 (SAN-1) site.

During this period the favoured habitation locations are characterised by a littoral orientation while the majority of settlements are situated on small hilltops. Villages consisted of either one single, large communal house or several small, round or oval-shaped houses. These houses were sometimes arranged in a horseshoe-shape or circular configuration around an open, communal area (*plaza*). Population density per dwelling is believed to have ranged, depending on size and number of the houses, between 16 and 60 persons. The habitation floor was kept clean and waste was dumped at the back and around the houses. Since a major component of the Saladoid diet consisted of shellfish, these waste dumps accumulated in extensive shell middens. Other refuse, including broken pottery, was dumped on these middens as well.

The pottery is hand-formed and was probably made by women, although in some cases it may have been a joint undertaking of men and women (Roe, cited by Boomert 2000: 393). However, according to Sanoja and Vargas (1978: 107), some vessel types of particular ceramic styles may have been produced by occupational semi-specialists, possibly male craftsmen.

Ceramic styles or complexes

The cultural framework of Caribbean archaeology has largely been devised by Irving Rouse. His chronological model has formed the starting point for the classification of ceramic styles or complexes. Over the years, it has been modified in order to accommodate new archaeological finds and find ways and means to render more clearly different kinds of interaction processes such as acculturation, transculturation and migration (Oliver 1992). Rouse's cultural classification is composed of three main elements: the 'complex' (also known as 'ceramic style'), the 'subseries' and the 'series'. A complex is defined here as an assemblage or a set of related assemblages occurring at a type site, i.e., the first site at which this complex was defined, and reoccurring at a number of other sites. This represents the material culture of a group of people during a certain period of time. A complex is called after its type site. Sets of complexes, related in time and space, are grouped into a subseries. The name of a subseries is formed by adding an '-an' suffix to that of its most typical complex or earliest member. A subseries represents a set of complexes or styles that diverged or evolved from a common ancestor. Members of a subseries are less strongly connected to each other than the groups in a complex, and develop separately from each other by adopting elements from other subseries due to acculturation and diffusion.

Finally, a set of subseries forms a 'series'. The name of a series is formed by appending the suffix '-oid' to that of its most typical or earliest member. Series are units that arise from and are formed by comparing complexes in terms of all their cultural traits. This means that series are based not only on similarities among sets of subseries, but also on shared patterns of development among its members. However, each complex distinguished is still solemnly based on the three main characteristics of ceramic style, i.e., pottery morphology, type of decoration and mode of manufacture and temper.

In terms of ceramics, two pottery complexes belonging to two different series have thus far been recognised at the Manzanilla 1 site. The Saladoid series is represented by the (Late) Palo Seco complex (A.D. 300-650), a member of the so-called Cedrosan subseries. A second ceramic complex at the site belongs to the Arauquinoid series (A.D. 650-1400). However, this Arauquinoid complex has not been sufficiently defined yet. Both complexes originated from the Orinoco region on the mainland of South America and reached Trinidad in subsequent periods of the pre-Columbian epoch. From the beginning of our era Saladoid pottery in Trinidad was increasingly influenced by a ceramic series known as Barrancoid, called after the site of Los Barrancos in the Lower Orinoco Valley. The local Barrancoid-influenced ceramic complex is known as Palo Seco, called after a site on Trinidad's south coast. This complex ranged in time from the beginning of our era to A.D. 650. Based on the degree of Barrancoid influence on Palo Seco pottery, this complex is separated into two phases: Early Palo Seco (0-A.D. 350) and Late Palo Seco (A.D. 300-650).

The Palo Seco complex was defined by Rouse in his 1947 classification and chronological framework of the Ceramic Age in Trinidad. His definition was based upon the analysis of stylistic features of the pottery typifying the Palo Seco site. According to Rouse, the Palo Seco complex shows the following traits. The vessel repertoire is mainly characterised by bowls and jars, which are present in a large variety of forms. The dominant vessel shapes are open bowls with vertical or out-sloping sides. Most vessels are provided with heavy concavo-convex rim flanges, which form the dominant rim type (Boomert 2000: 156-160). Palo Seco pottery is, generally speaking, moderately thick and soft. The non-plastics/temper types vary from pounded potsherds (grog) (Harris 1972: 6-7), pounded stone (grit) (Rouse 1947) and crushed shell, quartz (river) sand, mica-schist particles and combinations of these (Boomert 2000: 155).

A large portion of Palo Seco ceramics are decorated by one or multiple types of decorative modes. Decoration includes painted designs, incised patterns and simple and complex modelling. Vessel surfaces covered all-over with red-slipped designs and red-painted flanged rims are the most common decoration motifs. White- and black-painted designs occur as well; polychrome white-on-red- (WOR) designs are less common. Incised patterns usually involve simple, fine and thin or wide lines, situated on the upper parts of flanged rims or the inner parts of the vessel walls. A special type of incised decoration, zoned-incised crosshatching (ZIC), is an exclusively Cedrosan Saladoid decorative mode. Furthermore, more elaborate designs are also found, usually accentuating modelled decorative motifs. Modelled designs involve simple knobs, button-and-bars and 'slit' or 'coffee bean' eyes, applied to the vessel rims. Complex modelling includes large incised appendages in the form of geometric, anthropomorphic and zoomorphic head lugs, so-called *adornos*. They are usually situated on the rims of bowls, on handles and stoppers and represent a large variety of animals as well as human faces or combinations of both. These *adornos* are in many cases accentuated with incisions and painted designs (Boomert 2000: 161-169). The majority of the Palo Seco jars and bowls functioned as cooking, serving and storage vessels of food and drinks. The most elaborately decorated vessels were most likely used for ceremonial purposes such as the drinking of hallucinogenics, as mortuary gifts and probably as trade (prestige) items.

The ceramics of the Arauquinoid series show remarkable differences in comparison with the preceding Saladoid (i.e., Palo Seco complex) earthenware. The following features typify these ceramics. Vessels have thin walls, are relatively soft and predominantly tempered with pounded shell and to a lesser extent with grog and quartz sand. Mica-schist particles and fresh-water sponge spicules (*cauixi*)[1] form new and uncommon temper categories. Due to its exotic origin the latter is considered to reflect a social relationship with the Lower Orinoco region (Boomert 1985; Harris 1985).

The most striking feature of the local Arauquinoid pottery is that decoration is very rare. Only 2-3% of the sherds of the most common Arauquinoid complex in Trinidad, the Bontour complex, have some kind of decoration, including punctated, incised and simple modelled designs. Small rim knobs, wall appendages and triangular, trapezoidal and 'horned' rim lugs, sometimes showing a central perforation, and a few zoomorphic *adornos* also occur. Appliqué motifs appear for the first time. According to Harris (1978), the shift towards the Arauquinoid series in Trinidad is caused by a downfall in power of the Barrancoid on the mainland around A.D. 600-700. A result of this was that the Arauquinoid people were able to expand downriver from the Middle Orinoco, ultimately touching upon Trinidad and introducing a completely different ceramic style in the island.

The Manzanilla 1 site: geography and status of research

The Ceramic settlement site of Manzanilla 1 is located in the county of St. Andrew near the village of Lower Manzanilla on Trinidad's east-central coast. It is to be found some 400 m south of the point where the Eastern Main Road reaches the Atlantic coast and continues as the Manzanilla-Mayaro Road running parallel to the south along Cocos Bay. The site occupies a low hill facing the large Nariva swamp, and is covered with tropical rainforest. Intensive archaeological research started at the Manzanilla 1 site in 1997 and continued in 2001 and 2003. During this fieldwork the site was mapped, an augertest programme was carried out and several large units were excavated (Dorst 2000; Nieweg 2000; Nieweg and Dorst 2001; Dorst et al. 2003, in prep.). As a result of these investigations the following conclusions can be drawn:

- The total extension of the site is some 200 x 250 m.
- Four zones of almost equal extensions (ca. 60 x 30 m), which yielded practically no midden materials, surrounded by thick midden deposits, could be identified. These 'empty zones' (all located on the flat hilltop) are interpreted as vacant spaces (*plaza* areas and house locations) with surrounding dump areas on the edges of the hill and its slopes.
- Charcoal samples from the site yielded two radiocarbon dates, 1590 ± 40 B.P. (GrA-13,865) and 1220 ± 40 B.P. (GrA-13,867). They indicate a habitation span between cal A.D. 406-556 and A.D. 688-892.
- One of the habitation areas, which was studied more intensively in 2001 and 2003, appeared to consist of a *plaza* surrounded by several house structures. These structures are encircled by contemporary burials. The majority of the ceramics analysed was recovered from several middens and to a lesser extent from the fill of features that belonged to this habitation area. It was inhabited during (Late) Palo Seco and the beginning of the Arauquinoid series.

Manzanilla 1 ceramics

During the years of fieldwork a descriptive database of the Manzanilla 1 pottery was developed. It is based on the study of both the technological and the stylistic features of the ceramics encountered. The majority of the sherds were found in the midden deposits. Thus far in all 5,956 sherds have been recovered and studied. In 1997, the technological aspects of a small sample were more extensively analysed. This involved a microscopical analysis of the textural and mineralogical features in cooperation with Loe Jacobs. For this purpose, aspects of the pottery fabric such as its general texture next to types, shapes, quantity and distribution of non-plastics were determined. In all 169 sherds were investigated, selected from several superimposed layers of a single midden deposit. Cross sections were made of the sherds by using a diamond saw and smoothing the section with fine sandpaper. All samples were then fired for 30 minutes in an oxidizing oven at a temperature of 750C. This enhanced the visibility of the inclusions while any organic impurities in the samples were removed. Subsequently, the cross sections were analysed using a stereomicroscope with a magnification of 10-50x. In addition, the firing conditions and surface finishing of the samples were determined. The stylistic analysis involved recording the decoration types and, if possible, the vessel shapes, rims and bases. For this purpose the coding system for Caribbean pottery developed by Hofman (1993), and the vessel shape classification for the Cedrosan Saladoid vessels of Trinidad by Boomert (2000) were used.

The characteristics of the SAN-1 ceramic assemblage are discussed below. Firstly, the general features of both the technological and stylistic aspects of the Manzanilla 1 pottery are described, and secondly an interpretation of these combined aspects is presented, resulting in a classification of different ware types per ceramic complex.

Technological aspects

Textural and mineralogical analysis

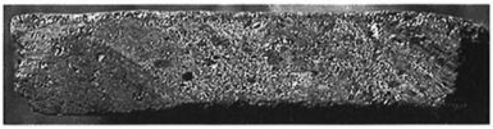
Various ceramic textures are present in Manzanilla 1 pottery. It includes hard and compact reddish brown sherds, hard and more porous sherds of various colours, ranging from brownish grey to orange pink, and porous orange pieces. Regarding the non-plastic inclusions, the following classes can be distinguished:

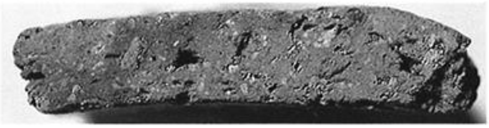
- siltstone with quartz sand in different quantities;
- siltstone with different quantities of fragmented shells;
- mixed quartz sand;
- siltstone with different quantities of pounded quartz;
- siltstone with (burned) organic material;
- siltstone with quartz sand including mica and glimmer particles;

- siltstone with quartz sand and small chips of chert;
- siltstone with pounded pottery (grog);
- siltstone with an unidentified type of black particles;
- *cauixí.*

Photos of the cross-sections (scale 1:1) and fabric descriptions are presented below (Figure 2). Sherds with (red) siltstone particles and a low quantity of quartz sand dominate. The size of the siltstone grains varies between 100 and 6000 mÌ, while the average sorting was moderate. The mean quantity of siltstone grains in the total sample was about 10-30%. Without optical devices these particles appear to be grog. However, microscopic analysis indicated that they are too rounded and too soft to be pounded pottery (Dorst 2000: 112-113). These reddish siltstone particles are very similar to the soft sandstone rocks of Brigand Hill, a rock formation some four km to the west of the Manzanilla 1 site. The siltstone particles are subrounded to subangular, indicating some degree of wear. This may have been caused by the, possibly unintentional, mixing of eroded sandstone with the clays used for the pottery. This is also suggested by the analysis of a sample of the natural clay of which the Manzanilla 1 hill is composed of. Microscopic analysis of this sample showed that the composition of the natural clay (iron oxide siltstone, rounded quartz particles and black minerals) is almost identical to the composition of the majority of the pottery sherds. The clay used was plastic and had good cohesive qualities and workability. This was due to the non-plastics included, such as the siltstone particles and sand. However, adding more non-plastics would have improved the already good quality of the clay body (Loe Jacobs pers. comm.). This proves that local clay sources were utilized providing good quality clays, which needed no (or hardly any) deliberate addition of non-plastics to obtain good workability.

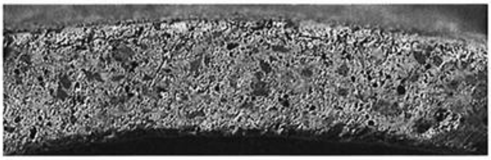
Sherds with other types of non-plastic inclusions have been recovered in smaller amounts. Specimens with large quantities of quartz sand, i.e., showing a siltstone-sand ratio of 75-25% or more, pure mixed sand, many fragmented shells, pounded quartz and *cauixí* most likely originally belonged to vessels to which temper was added deliberately. Sherds containing only small quantities of fragmented shells, pieces of grog, unidentified black particles, burned organic materials or small chips of chert have been encountered in very small numbers. Therefore, these non-plastics can be identified as 'pollution', originating from the mixing of habitation refuse with the potter's clay during the process of extracting and handling the clay. A small number of sherds have mica and glimmer particles in the fabric. These specimens can be regarded as belonging to import pottery, since these inclusions are locally not available in the Manzanilla region. The closest sources are to be found in the mountains of Trinidad's Northern Range, which are located some 20-30 km north of the site.

fabric class 1	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	siltstone
prevailing grain size	moderately sorted, medium to large 100-5000 μ
shape of dominant non-plastic inclusions	subangular-subrounded
prevailing quantity of non-plastic inclusions	10-30%
general texture of the fabric	compact with moderate pores

fabric class 2	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	siltstone+sand in 75-25% ratio
prevailing grain size	siltstone: moderately sorted, medium to large 100-5000 μ sand: well sorted, fine 100-1000 μ
shape of dominant non-plastic inclusion	both siltstone and sand subrounded-subangular
prevailing quantity of non-plastic inclusions	both siltstone and sand 20-30%
general texture of the fabric	compact with moderate pores

fabric class 3	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	siltstone+sand in a 50-50% ratio
prevailing grain size	siltstone: moderately sorted, medium to large 100-500 μ sand: well sorted, fine 10-500 μ
shape of dominant non-plastic inclusion	both siltstone and sand subrounded-subangular
prevailing quantity of non-plastic inclusions	both siltstone and sand 20-30%
general texture of the fabric	compact with moderate pores

Figure 2. Photos of cross sections and fabric descriptions of the Manzanilla 1 pottery wares.

fabric class 4	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	siltstone+shell (≈75-25% ratio)
prevailing grain size	siltstone: moderately sorted, medium to large 100-5000 μ shell: well sorted, fine 100-1000 μ
shape of dominant non-plastic inclusions	both siltstone and shell subrounded-subangular
prevailing quantity of non-plastic inclusions	together up to 40% in a 75-25% ratio
general texture of the fabric	compact with moderate pores

fabric class 5	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	shell
prevailing grain size	moderately sorted, medium 100-1500 μ
shape of dominant non-plastic inclusions	subangular-angular
prevailing quantity of non-plastic inclusions	10-30%
general texture of the fabric	compact with moderate pores

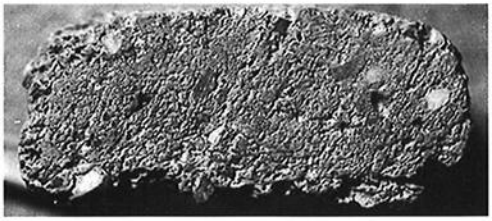
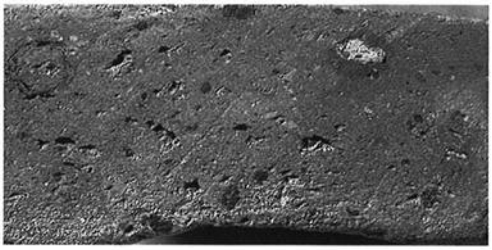
fabric class 6	
distribution of non plastics	homogeneous
dominant non-plastic inclusion	sand mix
prevailing grain size	moderately sorted, medium 100-1500 μ
shape of dominant non-plastic inclusions	subrounded-angular
prevailing quantity of non-plastic inclusions	wide range between 20-50%
general texture of the fabric	compact with moderate pores

Figure 2. (continued)

fabric class 7	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	crushed quartz
prevailing grain size	badly sorted, large 100-5500 μ
shape of dominant non-plastic inclusions	subangular-angular
prevailing quantity of non- plastic inclusions	10%
general texture of the fabric	compact with moderate pores

fabric class 8	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	cauixi
prevailing grain size	well sorted, fine 400-500 μ
shape of dominant non-plastic inclusions	needle shaped
prevailing quantity of non-plastic inclusions	40-50%
general texture of the fabric	compact with moderate pores

fabric class 9	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	siltstone+crushed quartz (some quartz)
prevailing grain size	siltstone: moderately sorted, medium 100-3000 μ crushed quartz: moderately sorted, medium 50-1500 μ
shape of dominant non-plastic inclusions	siltstone: subrounded-subangular crushed quartz: subangular-angular
prevailing quantity of non-plastic inclusions	siltstone: 20-30% crushed quartz: 1%
general texture of the fabric	compact with moderate pores

Figure 2. (continued)

fabric class 10	
distribution of non-plastics	homogeneous
dominant non-plastic inclusion	siltstone with burned organic material
prevailing grain size	siltstone: moderately sorted, medium 100-3000 μ burned organic material: well sorted, fine 100-1000 μ
shape of dominant non-plastic inclusions	both siltstone and burned organic material: subrounded-subangular
prevailing quantity of non-plastic inclusions	siltstone: 20-30% burned organic material: 5%
general texture of the fabric	compact with moderate pores

Figure 2. (continued)

Firing atmosphere

The method of determining the relationship between firing colour and firing atmosphere was adopted from Rice (1987: 345). Core and outer zone colours of freshly broken pottery sherds were determined using the Munsell Soil Color Charts. The majority of the pieces of the Manzanilla 1 site show features of complete reduction; the category of relatively oxidised sherds ranges second. The other categories distinguished, i.e., incomplete oxidation or reduction, incomplete oxidation and complete oxidation, are represented by smaller numbers of sherds. Based on this large variety of different core and outer-zone colour combinations it can be concluded that pottery was most likely fired in open fires. It is true that vessels fired under these conditions show a wide range of different colours. However, the relatively high percentage of sherds with features indicating conditions of complete reduction suggests that most of the pottery was fired in a somewhat closed atmosphere, possibly a covered pit (Rye 1981: 98).

Surface finishing

The last technological element that was analysed is the surface treatment. The following surface- finishing classification was determined for the pottery from Manzanilla 1:

- Unfinished walls characterised by overall, uneven surfaces and a powderish feeling (25% of the pottery). Small holes and striations are noticeable and the coils from which the vessel was constructed are (clearly) visible.
- Smoothed walls with a regular, overall texture and a matte rather than glossy appearance (ca. 70% of the pottery). Walls are even and smooth, and coils are not or hardly visible. This technique is usually applied with tools like a piece of cloth or leather, a bundle of grass or hard tools such as a pebble (polishing stone) when the vessel is not yet dry (Rye 1981: 89).

- Burnished or polished walls (ca. 5% of the pottery). Burnished-wall surfaces may be regular, but the tool is used directionally as a result of which a pattern may be produced. As the burnished lines have a consistent lustre, the overall effect is a combination of lustre and a matte or non-uniform lustre (Rye 1981: 90). This technique is applied when the vessel is leather-hard to almost dry. Polishing involves the same technique as burnishing but is performed more carefully and regular, creating a more uniform lustre (Rye 1981: 90). Burnished or polished surfaces are often completely covered with red slip first.

Stylistic aspects

Vessel forms

Due to the fragmentation of the ceramics from the Manzanilla 1 site only a limited number of pottery sherds could be used for the reconstruction of vessel shapes (Figure 3). One form is predominant:

- open, round or oval bowls and dishes showing simple contours with unrestricted orifices and straight rims (T/T Cedrosan Form 1, Boomert 2000: 132). This vessel form is variable in size. Undecorated as well as elaborately decorated specimens occur.

The following forms range second and third:

- bowls or dishes with simple contours, unrestricted orifices and horizontally flanged rims (T/T Cedrosan Form 2, Boomert 2000: 132).
- bowls or dishes showing inflected or composite contours, independent restricted orifices and heavily flanged rims (T/T Cedrosan Form 6, Boomert 2000: 136).

In all 10 forms are rare, i.e., represented by one to five pottery sherds:

- bowls with independent restricted orifices and composite contours (T/T Cedrosan Form 3, Boomert 2000: 132).
- bowls with unrestricted orifices and wide, interiorly concave, flange-like rims showing inflected or composite contours (T/T Cedrosan Form 4, Boomert 2000: 136).
- bowls with unrestricted orifices showing inflected or composite contours with exteriorly, thickened rims (T/T Cedrosan Form 5, Boomert 2000: 136).
- jars with simple contours, restricted orifices and straight rims (T/T Cedrosan Form 9, Boomert 2000: 132).
- bowls or jars with restricted orifices, composite contours and concave walls above a corner point (T/T Erin Form 10, Boomert 2000: 208).
- jars with restricted orifices, simple contours and unmodified rims, showing their largest diameters in the upper half of the vessel (T/T Erin Form 8, Boomert 2000: 208).
- jars with independent restricted orifices, showing inflected contours (T/T Erin Form 9, Boomert 2000: 206). This vessel type is represented by various subforms showing outflaring necks (type B3.1, Hofman 1993: 64-65), curved necks (type D3.1,

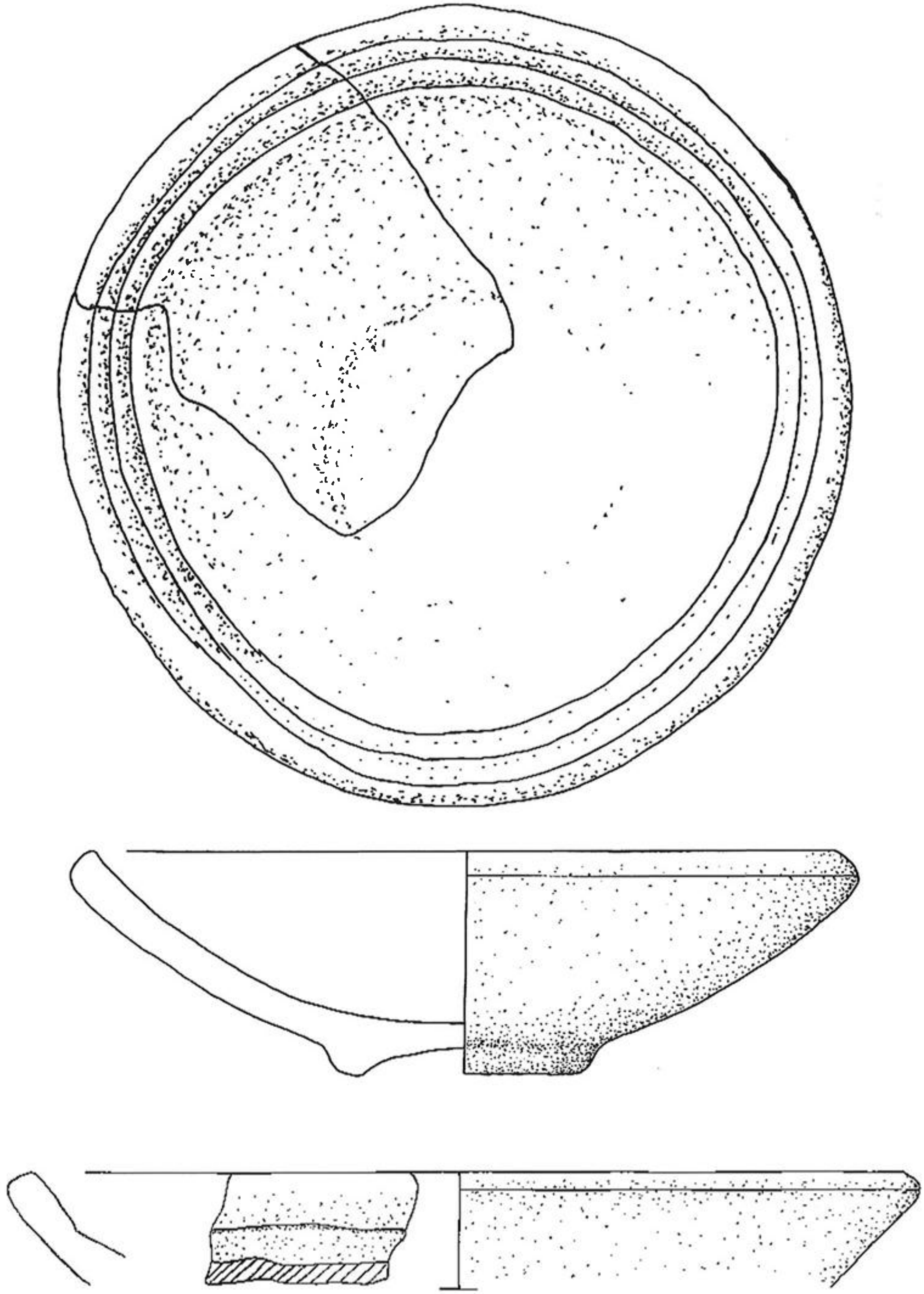


Figure 3. Overview of the Manzanilla vessel shapes (not to scale).

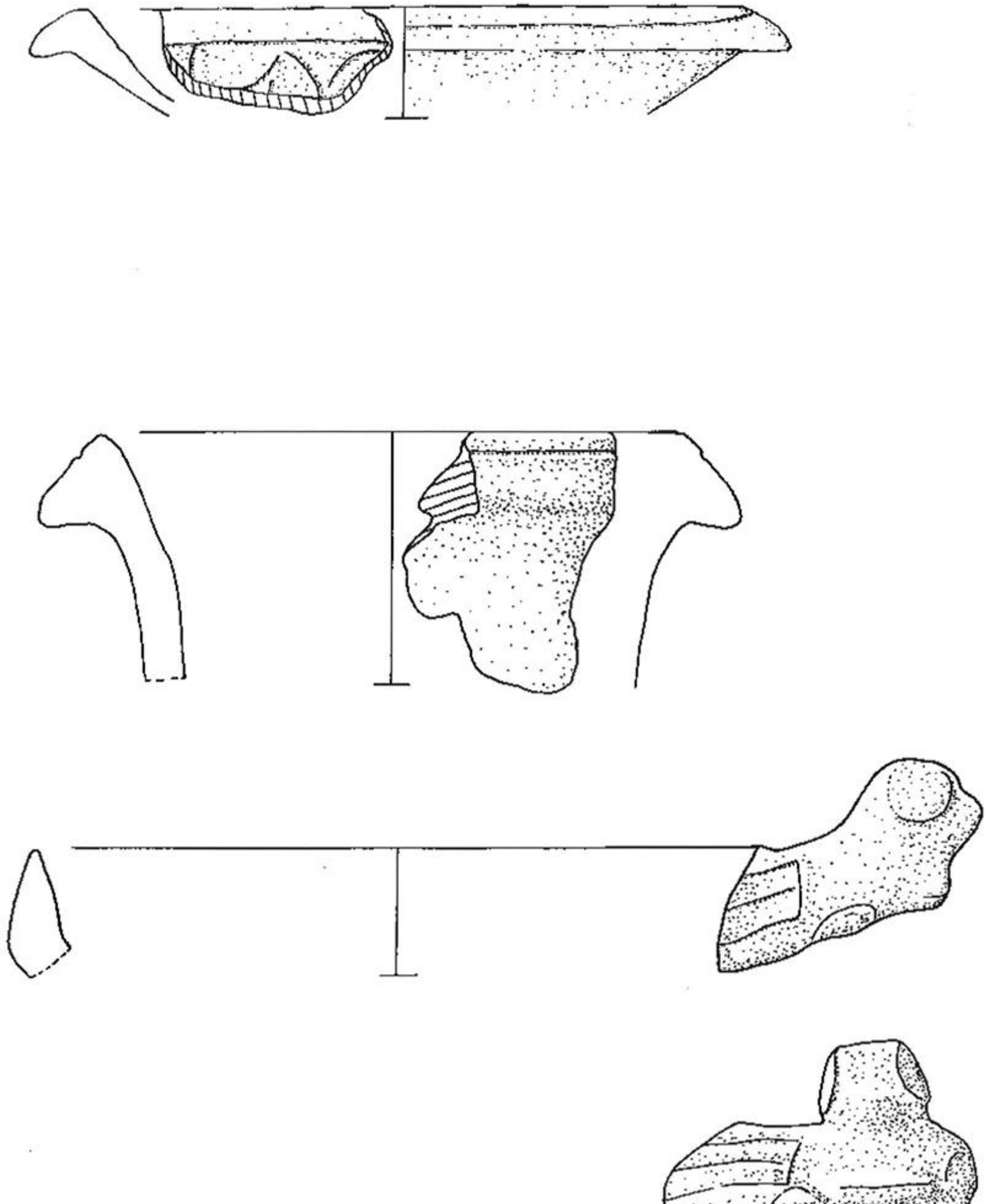


Figure 3. (continued).

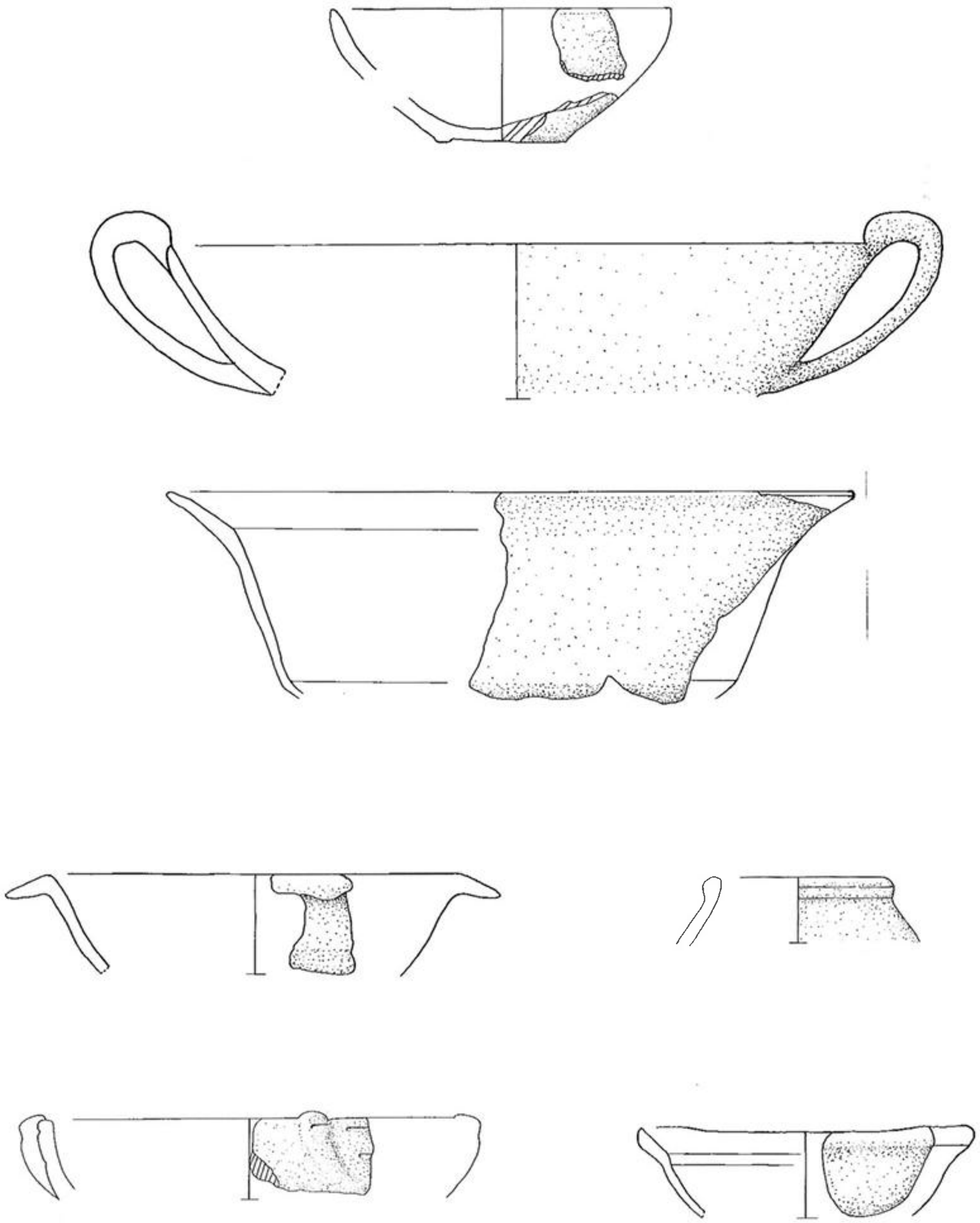


Figure 3. (continued).

Hofman 1993: 64-65), straight walls or curved necks and the largest diameter in the lower half of the vessel (types D3.3 and D3.4, Hofman 1993: 64-65).
- bowls with a composite contour, unrestricted orifices and nearly vertical walls above a corner point (T/T Cedrosan Form 11, Boomert 2000: 136).
- kidney-shaped bowl with unrestricted orifice showing simple contours (T/T Erin Form 14, Boomert 2000: 209).
- bowl with attached tubes, a so-called 'sniffing' or nostril bowl. (T/T Cedrosan Form 19, Boomert 2000: 159).

The different vessel shapes can be ascribed to several functional categories, including the preparation, cooking and serving of food, the storage of dry items, food and liquids. One particular vessel form was definitely used for ritual purposes, i.e., the bowl with attached tubes. This 'sniffing' or nostril bowl was clearly employed for inhaling or drinking hallucinogenics, perhaps tobacco water. Apart from vessels, fragments of cassava griddles have been found, albeit in very small numbers. Due to the very open, crumbly character of these griddle sherds, it is most likely that most griddles have been pulverized. The handle forms present in the Manzanilla 1 assemblage are predominantly simple and D-shaped. Spout handles have been found as well. Bases are predominantly flat, although bases with a pedestal or ring-shaped foot also occur.

Decorative motifs

A large number of decoration modes are present within the Manzanilla 1 assemblage. These different decorative types can be grouped into four main categories: slipped and painted designs, incisions, modelled and appliqué motifs, and combinations of these designs.
- Red-slipped surfaces form the most common decoration type. It varies from just a red-slipped flanged rim to completely red-slipped inner or outer vessel walls. Painted decorations with red slip are rare. Vessels showing some parts painted with black or white designs are also less frequent, while polychrome decorations (red, white and black next to white-on-red (WOR) motifs) were only found on 12 sherds to date.
- Incised decorative motifs range second. Incised designs vary from simple single or multiple-parallel lines or dashed lines on flanged rims to elaborate, geometric patterns consisting of curvilinear and rectilinear design patterns. Zones filled with incised crosshatched patterns (ZIC) are also present.
- Modelled designs include simple forms such as small knobs, curved-wall extensions and coffee bean-shaped pellets on vessel rims. Zoomorphic and anthropomorphic lugs (*adornos*) comprise human or animal heads, legs, paws and beaks with are added to the vessel rims and walls. Thus, transforming these vessels into different types of animals. Moreover, human legs which may formerly have supported anthropomorphic vessels have been found. Appliqué designs, including human legs or arms, are rare.

- Different combinations of decorative motifs occur frequently, e.g., the combination of red-slipped and incised patterns. Simple modelling is most often accentuated by incised lines, thus creating punctated pellets (nubbins) and eye-shaped buttons. Zoomorphic and anthropomorphic *adornos* are most often covered with red slip and accentuated by white or black paint, as well as incised details such as ears, eyes, noses, fingers and toes.
- Two other vessel features must be mentioned, although it is questionable whether these can be regarded as design motifs: a few sherds show a black pitch covering and one specimen is perforated. Both probably represent functional modifications.

Manzanilla 1 ware- types classification

The combination of the technological and stylistic characteristics of the ceramic assemblage of the Manzanilla 1 site has resulted in the following classification of ware types. To date the data set of vessel forms is too small to allow linking particular vessel shapes to specific ware types. Only the presence of flanged rims, a characteristic Palo Seco trait, is noted thus far. The characteristics of the recognised ware types are presented first, while subsequently their spatial distribution over the site's middens is discussed.

Characterization of the ware types

Ware type 1
This type is characterised by a hard, compact reddish-brown fabric and smoothed inner and outer vessel walls. The original coils can not be seen or felt by hand. Outer and inner walls are burnished or (highly) polished. The majority of this type of sherds is decorated. Nearly all specimens show completely red-slipped surfaces while, in addition, incised and modelled designs occur. ZIC motifs are found predominantly on this ware type. The non-plastic inclusions of this ware type consist exclusively of siltstone and fine quartz sand. Only a few sherds show a fabric with some small chert chips. Flanged rims are frequently associated with this ware type.

Ware type 2
This type shows a hard and soft orange fabric and smooth inner and outer walls. The fabric is often porous, but more compact sherds also occur. This is the most frequently decorated ware type which shows all known decorative motifs, including ZIC, WOR and polychrome painting in red and white. The latter designs are only found on this ware type. Furthermore, almost all zoomorphic and anthropomorphic, with one exception, are associated with this type. In addition, it is characterised by the widest variety of non-plastic inclusions including siltstone, siltstone with quartz sand, siltstone with shell, siltstone with organic materials, and siltstone with unidentified black particles. Flanged rims are present, but appear to be rare.

Ware type 3
This type shows a hard, dark brownish-grey to orange-pink fabric. Wall surfaces are uneven and not very well finished; they have a powdery feeling. Coils are (clearly) visible and the fabric is generally porous in nature. This ware type is only associated with siltstone and quartz sand inclusions in the fabric. Its most striking feature is the low percentage of decorated sherds. Designs include red-slipped surfaces, simple modelling, and crude, irregular wide-lined incisions. Combinations of more than one type of decoration are rare. Flanged rims are absent.

Ware type 4
This shows a hard, greyish orange-red fabric containing a large quantity of quartz sand, often with mica particles. Both inner and outer wall surfaces are flat but have a granular feeling. Decorated sherds are not associated with this ware type, but this may be due to its generally rare occurrence.

Ware type 5
The majority of the pottery sherds at the Manzanilla 1 site belong to this ware type. It shows a hard fabric with a wide range of colours, ranging from reddish-brown to light, brown-orange. Both the inner and outer wall surfaces are smoothed and generally well finished, but more uneven than those of the type 1 sherds, while irregularities are present. Occasionally, the wall surfaces are burnished or polished. The fabric can be described as semi-porous. All forms of designs, except WOR, are present. Decorated sherds are rare when compared to ware types 1 and 2. All non-plastics distinguished within the assemblage are associated with this ware type. Flanged rims are common.

Ware type 6
This ware type is represented only by two sherds showing a hard, compact reddish brown to black fabric. Both sherds are thin, both inner and outer walls are smooth and highly polished so as to show a metallic lustre. This fabric contains siltstone inclusions with fine sand and glimmer. One sherd is covered with red slip.

Discussion

At the Manzanilla 1 site, refuse middens are present that yielded all recognised ware types next to middens with only some of them. The lower layers of the deepest deposits produced mainly ware types 1, 2 and 5, of which specimens of ware type 5 are predominant. Ware types 1 and 2 are present in smaller quantities. Types 4 and 6 are also present, but are represented by only a few specimens. This suggests that these ware types represent ceramics that are not local to the Manzanilla 1 site. Most likely they represent imported ceramics. This is certainly the case with the pottery sherds of ware type 4, since micaschist is not to be found in the surroundings of the site. Most pottery sherds in the upper layers are associated with ware types 5 and 3. Ware types 1 and 2 are present as well, but in very small numbers. The possibility exists that this is the result of post-depositional mixing of midden materials.

Based on its characteristics and stratigraphic situation, the Saladoid series at the Manzanilla 1 site is represented by the ceramics of the (Late) Palo Seco complex. Ware types 1, 2, 4, 5 and 6 can be ascribed to this complex. The pottery of the subsequent Arauquinoid series is associated with ware types 5 and 3. It can not be ascribed to a specific ceramic complex to date as these ware types most likely represent a transitional phase between the Saladoid and Arauquinoid series at the Manzanilla 1 site. Ware types 1 and 2 can be regarded to form the fine pottery within the Palo Seco assemblage. This conclusion is based on the well-finished, polished or burnished, appearance of the sherds of these ware types, the large percentage of decorated specimens and, finally, on the fact that they form a minority within the Palo Seco assemblage. Ware type 5 represents the plain ware; it is less well finished, less sherds are decorated and the ware type forms the bulk of Palo Seco pottery. Ware types 4 and 6 represent import ceramics within the Palo Seco complex at the site. Pottery with mica inclusions has been found in Palo Seco context, while it forms an Arauquinoid ceramic mode as well (Boomert 1985; Harris 1985).

Regarding the spatial distribution of these clusters of ware-type combinations, the following can be stated. Several specific middens are present in the habitation area at the site, that was studied in detail by excavating large units in 2001 and 2003. It appeared that middens yielding the (Late) Palo Seco combination of ware types 1, 2, 4, 5 and 6 are to be found at the western side of the *plaza* area, while refuse deposits with predominantly the combination of ware types 5 and 3 and sporadically that of types 1 and 3 occur at its opposite side. Therefore, the conclusion can be drawn that the houses that were arranged around this *plaza* did not represent a single, contemporary habitation phase. During Palo Seco times the Amerindian settlement most likely formed a horseshoe-shaped, spatial pattern consisting of a few houses. This was mirrored during the transition period between Palo Seco and the Arauquinoid series, about A.D. 600-750. Since the dwellings of both habitation phases were arranged around the same *plaza* area, it can be suggested that the youngest occupation phase at the site, i.e., the (Late) Palo Seco/Arauquinoid period, followed uninterruptedly from the earliest habitation phase, i.e., that of the (Late) Palo Seco complex without any interruption.

Trinidad's transition of the Saladoid series towards a simpler ceramic style, i.e., the Arauquinoid series, around A.D. 650-700 is echoed in the Windward Islands by the alteration from Saladoid to Troumassoid. Often this change is regarded as a somewhat sharp cultural break, but as Boomert states: "…this essential continuity in cultural development was lost sight of due to the introduction of the term Troumassoid series for the various individual pottery complexes of the 'Terminal' Saladoid epoch…" (Boomert 2000: 244). The ceramic stratification at the Manzanilla 1 site clearly indicates an uninterrupted development. The transition between the two series is noticeable in the ceramic repertoire and can be regarded as rather swift. However, it certainly does not suggest a cultural break. This remarkable cultural transition can be interpretated adequately only if it is assumed that at the time pottery (rapidly) lost its function as a medium for conveying symbolic values.

Conclusions

The classification of the individual sherds according to ware types proved to be an adequate way of ordering the wide variety of ceramics in the middens of this multi-component site. In this way it was possible to ascribe individual refuse deposits and midden layers to particular ceramic complexes. This, in turn, provided a useful instrument for the interpretation of the spatial distribution of the various habitation phases at the site. Clearly, the determination of ware types of the total ceramic assemblage of a multi-component site provides an excellent tool for the study of differences among the various ceramic complexes represented on the lowest (i.e., site) level. Using this approach, the specific elements, e.g., pottery fabric, surface finishing, non-plastic inclusions, decorative motifs and vessel shapes, that constitute these ceramic complexes can be recognized more easily and will facilitate the study of the local ceramic development. However, it must be noted that the larger the data set of ceramic samples per single site, the more accurate and useful the classification will be. Therefore, any data set must be updated after each fieldwork campaign. Also, it is necessary that all midden deposits of the various habitation locations are tested in order to provide a useful, site-scale ceramic seriation. For this purpose, radiocarbon dating of refuse deposits or midden layers with different ware type combinations is essential. The classification of the Manzanilla 1 ceramic assemblage discussed here is still in its initial phase. An attempt to obtain additional samples for radiocarbon dating will be made during the 2004 fieldwork campaign.

Acknowledgements

The initial phase of the Manzanilla 1 research project (1997) formed the result of a cooperative effort between the Department of History of the University of the West Indies (UWI), St. Augustine, Trinidad, and the Faculty of Archaeology of Leiden University, The Netherlands. The following stages of the excavations (2001 and 2003) were funded exclusively by the UWI and the individual members of the research teams. Thanks are due to Keith O. Laurence of UWI and Corinne L. Hofman, Menno L.P. Hoogland and Arie Boomert of Leiden University for their help and advice throughout the project and for making it possible in the first place. Special thanks are due to Loe Jacobs for his assistance and guidance during the study of the technological aspects of the Manzanilla 1 ceramics. The author wishes to acknowledge Arie Boomert for his serious revision of this article, and for his helpful comments. Finally, thanks to Monique Vilders for correcting the English text.

Note

1. Several species are represented, e.g. *Drulia* sp., *Trochospongilla* sp., and *Stratospongilla* sp.

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FROM MYTH TO MATTER: THE CERAMIC TRADITION OF THE KARI'NA OF NORTHEAST SURINAME

Anne-Lise Vredenbregt

Abstract

Insight into the relationship between material and non-material culture can provide archaeology with a tool for comprehending and interpreting the society behind the artefact. A study of Kari'na pottery, its manufacturing process and its use, supports the notion that in the Circum Caribbean region artefacts are permeated with the animistic and mythological worldview of the cultural context in which they were made. The raw materials of the different artefacts are closely related to the spirit-world and to mythology. Spiritual beings and mythological characters inspire the crafts persons, and demand a certain code of conduct. Present through the entire manufacturing process, these beliefs are an essential part of the finished product and its use, rendering it a symbolic content.

> Long, long ago, a group of women went to the sky to look for clay, for there was no clay to be found near their village. They found a good clay source in the sky, and they loaded up their baskets. Then they set off again to return to their village, leaving behind a trail of clayey footprints. The people in the village waited for the arrival of the women, but they never returned. Their traces, however, can still be seen in the sky: *ori:no ka:naŋ wena:po*, 'the clay fetchers' tracks', the Kari'na name for the Milky Way.[1]

Introduction

Ethnographic data from the South American lowlands show that artefacts are deeply interrelated with the non-material aspects of the cultural context in which they were made, and that, consequently, they can provide much information about that culture. Artefacts, which are related to myths and legends, can be seen as the material carriers of cognitive culture, i.e., the immaterial values of a cultural group. Understanding of the relationship between the material and non-material culture in present Amerindian societies can provide the archaeologist with a useful tool for interpretation of the past. This article attempts to demonstrate this interwovenness of material culture and cultural beliefs by describing the ceramic tradition of the Kari'na Indians of Northeast Suriname. It is based on data that were collected during a ten-month period of fieldwork in the Kari'na villages Christiaankondre and Langamankondre, together known

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as Galibi, on the Maroni (*Marowijne*) River of Suriname in 2000 (Vredenbregt 2002). This fieldwork formed part of a research, resulting in a Master's thesis (Vredenbregt 2002), and the following article is an abstract of the extensive thesis material.

'Orin:no'[2], the pottery tradition

The Kari'na are a Cariban-speaking ethnic group living in a series of villages in the Orinoco Valley of Venezuela and the coastal regions of Guyana, Suriname and French Guiana. Fishing is the main source of subsistence for the Kari'na on both shores of the lower reaches of the Maroni River, which forms the political border between Suriname and French Guiana (Figure 1). In addition, they practice slash-and-burn cultivation in gardens in the vicinity of their villages. With the introduction of enamel, aluminium and plastic ware, pottery with utilitarian functions has virtually disappeared from the daily lives of the Kari'na. However, the craft of pottery manufacture is still vivid. Most of the ceramics that are produced these days are made for commercial purposes. Pottery making for the tourist industry is an important contribution to the cash income for some female potters in Christiaankondre and Langamankondre. They sell their pottery from their own home to tourists making a village tour, or to the two women who own a little tourist shop in Christiaankondre. Some women also take or send their pottery to the market or shops in Saint-Laurent-du-Maroni on the French side of the Maroni River and to shops in Kourou on the central coast of French Guiana, and to Paramaribo, the capital of Suriname.

It is remarkable that, while many people are quite willing to sell their own personal traditionally made objects, the objects produced for the sale to tourists are mainly modelled according to European examples and differ distinctly from traditional Kari'na objects. The only vessels still made for personal use are the *sabe:ra*, the *sama:ku* and the *para:pi*, which will be discussed below. Derivations of these and miniature versions are sometimes made for commercial purposes, but the bulk of the commercial pottery consists of differently modelled animal shapes and all kinds of pots in phantasy shapes, European-type vases, ashtrays, etc. There is a distinct difference in the appearance and finish of the objects made for traditional use and those produced for tourists. The former are finer, more delicate, and more detailed. This goes for the vessels themselves as well as for their decorations. Also, it seems that certain decorating dyes and slips are used exclusively on pottery made for traditional purposes, and never on ceramics produced for commercial purposes. These are the plant extract *ka:rawi:ru*, the white slip called *ta:wa* and the yellow slip named *ka:muyu*.

As is illustrated by the origin myth of the Milky Way, *ori:no ka:naŋ wena:po*, pottery making is a female activity in Kari'na culture. When a boat is needed to fetch the clay, or when the *kuwepi* tree (see below) needs to be cut down, a woman is accompanied by a male family member, but the actual pottery production is solely in the hands of women.

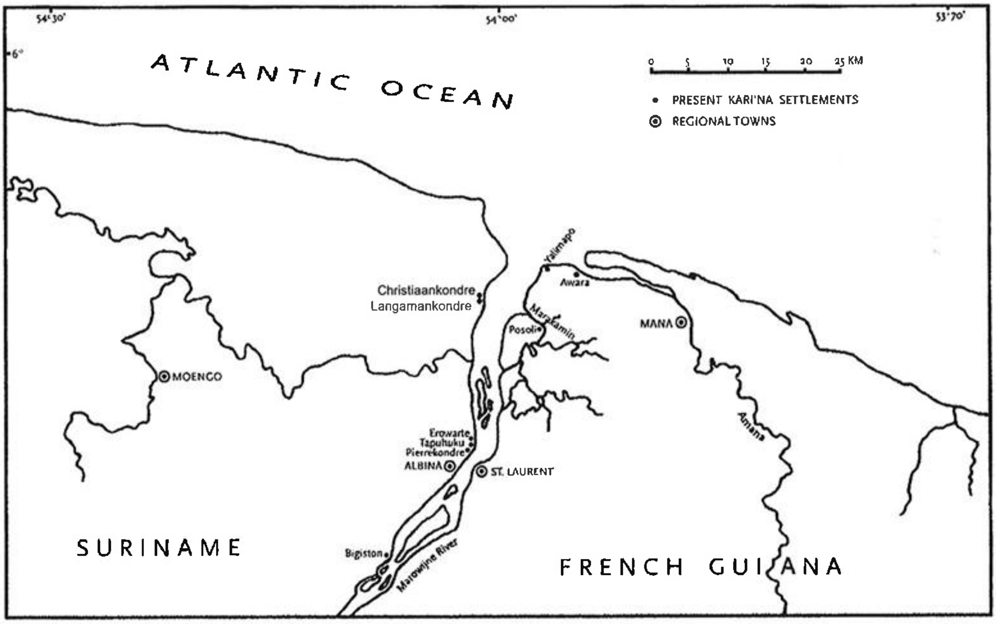

Figure 1. The lower Maroni River area (drawing: A. Vredenbregt).

'*Sabe:ra, para:pi*' and '*sama:ku*', the ceramic objects[3]

The *sabe:ra, para:pi* and *sama:ku* are the three traditional vessels that are still manufactured and used these days. The *sabe:ra* is a bowl, either small or big, that is used for drinking *kasi:ri*, i.e., cassava beer (and occasionally tobacco water in healing rituals). It is an unrestricted vessel showing a simple contour. The wall profile is sometimes somewhat thickened on the outer surface, just under the rim, so that on the outside the vessel appears to be slightly restricted. The outer surface is usually slipped white or yellow and decorated with rather simple geometrical patterns, sometimes only consisting of coarsely applied dots and cross-hatched lines. Its inside surface is typically decorated with traditional designs, painted in thin, dark brown lines, and covered with a hard and shiny layer of natural varnish. The rim of the *sabe:ra* is usually undulating, lobed, or decorated with widely spaced single or double notches (Figure 2).

The *para:pi* is usually somewhat larger and thicker than the *sabe:ra*. The vessel has a simple contour and is either unrestricted or slightly restricted, usually with a smooth, un-modelled rim. Its finish is much like that of the *sabe:ra*. Ahlbrinck (1931: 388) mentions the *para:pi* as a food container, but these days, and according to my informants also in 'old times', it is mainly used to take herbal baths for medicinal or ritual purposes.

The *sama:ku* is a large container, sometimes more than a meter in height, used for the fermentation and storage of *kasi:ri*. It is an independent restricted vessel with a

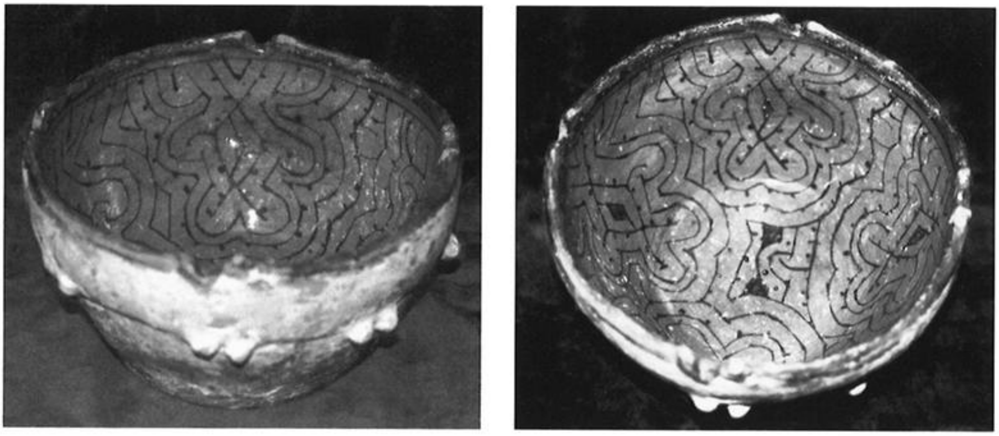

Figure 2 a-b. A *sabe:ra* drinking bowl (Kloos 1975, p. 14, afb. 9).

composite or complex contour. The outside surface of the *sama:ku* is sometimes decorated with painted designs and occasionally modelled nubbins (Figure 3).

Clay and 'kuwepi', the raw materials

Ori:no is the generic term for pottery products, and also for clay, its raw material. In both Kari'na villages various types of clay are known, each with a different colour and texture, taken from several locations. Generally speaking, only the clay used for making the actual pottery vessels is referred to by the generic term *ori:no,* while clays that are used as slips to decorate the vessels are referred to by their proper names, e.g., *ta:wa, ku:li* or *ka:muyu.* More specifically, the different sorts of *ori:no* are called after the localities where they are found, while the *ta:wa, ku:li* or *ka:muyu* are always referred to by these terms regardless of their source areas.

The clay, *ori:no,* that is most often used in Christiaankondre and Langamankondre is a river clay which is taken from *Ura:ni,* a locality on the Surinamese bank of the Maroni River, about 30 minutes upstream by motorboat. Once there was a village on this spot, but the river is said to have eroded so much of the land that the actual place of the former village is now in the river. It is exposed only at low tide. This is the place where these days the potters' clay is collected. Some women extract the clay when the tide is actually so low that the clay can be taken directly from the ground, but others take it from the river bottom through the water. Now a little *sabe:ra* is made with a lump of the clay just dug up, and this is left on the spot or sunk into the water for the *ori:no akï:rï,* the spirit connected with the clay which is considered to reside here. This clay spirit is connected to and forms a manifestation of the water spirit *okoyu:mo,* but it carries a different name for each sort of clay. For instance, clay, *ori:no,* taken from the location called *Ura:ni* is called *Ura:ni*; its spirit, its *ori:no akï:rï,* is *Ura:ni akï:rï,* the

Figure 3. A large *sama:ku* vessel (photo: A. Vredenbregt).

spirit residing at *Ura:ni*. The clay is collected with the hands, formed into roughly shaped balls and in this form put into the boat to be taken to the village. Here these balls of clay are left to dry until they are needed. Before the clay can actually be used for pottery making, the clay has to be tempered, and this is done with *kuwepi*.

Kuwepi is the name of the burned and ground bark of particular trees which is mixed with the clay. The Kari'na potters explain that the addition of *kuwepi* to the clay is needed to make a good mixture that will ensure stern pottery. A technical explanation could be that mixture of the clay with *kuwepi* is necessary in order to give the fired vessels a porous texture. This porosity allows the water stored in water jars to remain fresh through a kind of sweating process. In cooking pots this porosity gives a resilience that is needed to prevent the vessels from breaking while they are exposed to the forces of shrinking and expanding caused by heating. These properties are less important these days since water storage and cooking are done in modern plastic, aluminium or iron containers and cooking pots, but tempering with *kuwepi* is still practiced. Apart from the Kari'na, *kuwepi* or *kwep* is used for this purpose by several other Amerindian groups, e.g., by the Palikur of French Guiana and Brazilian Amapá (van den Bel et al. 1995).

The Kari'na distinguish between two different trees used for obtaining *kuwepi*. One is called *ara:naba:ri* and has a bark of about 3 cm in thickness, the other is called *kuwepi* and has a bark of about 1 cm in thickness. The finished product, the burned and ground bark ready to be mixed with the potter's clay, is referred to as *kuwepi* regardless of the tree of origin. I was unable to find information on *ara:naba:ri* in the existing literature. *Kuwepi* (also known in the literature as *caraipé*), has been listed as belonging to the *Licania* genus by Ostendorf (1962: 67-68). However, Ahlbrink (1931: 255) identifies it as belonging to the *Couepia* genus. Courtz (1998) lists *Couepia* as well as *Licania* (both belonging to the Chrysobalanaceae family) as being named *kuwepi* in Kari'na. Since the *ara:naba:ri* tree is often referred to by the Kari'na women as the *kuwepi* tree, it is possible that either *Couepia* or *Licania* could actually be identified as *ara:naba:ri*. Neither *ara:naba:ri* nor *kuwepi* are said to house a specific tree spirit. Both trees are believed to be inhabited by forest spirits in general, and when entering the forest to collect the bark these spirits need to be respected. Hence, menstruating woman should not go and collect the bark since they are not supposed to enter the forest as their 'smell' would upset the spirits.

Both the *kuwepi* and the *ara:naba:ri* trees are found in the forest behind Christiaankondre and Langamankondre, and at *Ura:ni* where the clay is collected. The bark is taken from the tree and brought home where it is placed in the sun to dry. When it is completely dry, it is put on a sheet of corrugated iron or on a bed of potsherds, and burned to form ash and charcoal. This residue is ground in a wooden mortar and sifted through a wickerwork sieve, the *mana:rï* (Figure 4). The degree of grinding depends on the vessels intended to be made with the clay mixture. Coarsely ground temper particles are felt suitable to mixture with clay for large vessels while they are more finely ground for small vessels. While some women state that *ara:naba:ri* is best used to make larger vessels and the ordinary *kuwepi* to make smaller vessels, others state that both can be used if you just know how to treat and mix them properly.

Some women crush the dried clay balls in the mortar, then add the crushed *kuwepi* and sift this mixture, after which water is added to the dry mixture to make the clay workable. Others grind and sift the clay and *kuwepi* separately, then mix them and add water to the mixture, while yet others first mix the ground and sifted clay with water and then knead the dry *kuwepi* powder into it.

Figure 4. The burned *kuwepi* is sifted through a *mana:rï* (photo: A. Vredenbregt).

The manufacturing process

The shaping of most vessels is started by flattening a lump of clay on a little wooden board in order to form the base. The clay is then cut to the desired diameter and the rest of the vessel can be built on top of it. Coils of clay are used to build the body of the vessel. The clay is formed into coils by rolling a clay ball on a wooden board with the palm of the hand. One coil is then affixed to the base and another one attached on top of it. In this way the vessel body is built up (Figure 5). After adding a few coils, the inside and outside surfaces are smoothened with a *kupewa*, a piece of calabash rind shaped for this use, in order to attach the coils firmly together. If necessary, excess clay is scraped off the body to acquire the desired wall thickness. When the vessel has attained a certain height, it is set aside to dry for some time before new coils are applied. Otherwise the body would collapse under its own weight. Usually two or more vessels are made at the same time so that they can be worked on by turns. When (part of) the vessel is leather dry, it is first smoothened with the *kupewa* or with a knife, and

Figure 5. The vessel body is built up with coils of clay (photo: A. Vredenbregt).

afterwards polished with a polishing stone or the kernel of the *maripa* (cocorite) palm (*Maximiliana regia*). The polishing strengthens the body and closes off its surface, increasing impermeability. It also gives the vessel a somewhat shiny appearance. The preferred instrument used for polishing is the *ta:kuwa*, a special red pebble (Figure 6).

'Ta:kuwa', the polishing stone

The *ta:kuwa* polishing stones[4] originally derive from the river *Si:pu*, which is the Kari'na name for the Upper Essequibo River in Guyana. In the past there were Kari'na settlements on this part of the river and people visiting these villages would bring the stones to the Lower Maroni. It is said that *Si:pu* was a dangerous place where strong and powerful spirits dwelled. The stones are a prized possession. Since there is no new supply, only a few women have these special pebbles and they hand them down from generation to generation. The polishing stones are shaped by use and have edges in the form of the bends of the pots that they are used on. The *ta:kuwa* pebble belongs to the realm of the powerful water spirit *okoyu:mo*. It is not easily found and it is said: 'It lies in the water at special places. You cannot just pick it up, you have to be careful, you have to know what you are doing and you have to talk to the spirit. You say: I have come to take a few stones, and maybe you leave the spirit a small *sabe:ra* in the water.'

Figure 6. The *ta:kuwa* polishing stones (photo: A. Vredenbregt).

An elderly informant, whose children and grandchildren were not interested in learning the craft of pottery making, expressed her sorrow at the fact that she could not hand down her *ta:kuwa*. Since her offspring did not appreciate, or respect, the special stone sufficiently, she kept it hidden at a place where it would remain when she dies. Women who do not have a *ta:kuwa* make do with the 'stone' (kernel) of a *maripa* palm fruit, or with a *to:pu*, an 'ordinary' river pebble. Though less special, pebbles of this kind also belong to the water spirit, and are treated with respect as well.

The following is a summary of a story told by Alfons Stjoera, the former chief of Bigiston, a Kari'na village on the Maroni River bank south of Galibi. It was recorded and transcribed by Hoff (1968: 360-365) and relates how *ta:kuwa* should be collected.

> I have often heard a tale, I have often heard a tale of my grandmother. Long ago, long ago my grandfather lived who was a very great chief. He went everywhere, all rivers were visited by him, and then he was... It was he who went to fetch pebbles, to a river called what... Essequibo. Yes, he went. Now when he went he took a dog with him. If there was no dog available he would carry a banana stem. Now furthermore at that place there was the ferocious water spirit *Muro:koto*, *Muro:koto* a water spirit, he is a water spirit. If you should come just so (without precautions), he would eat you. When you go to pick up pebbles you carry a basket. Then you jump into the water. You jump; so. Then because of this... What... a real Carib we cannot throw as food for the water spirit. No, no; that is, we have just found something else for our purpose. A dog, a banana stem; if a dog is available we paint a dog red and then we throw it plump! into the water. *Muro:koto* then

hurries toward it and meanwhile you move your basket at once: swish! you carry it, you carry it on shore. You carry it on shore, then you pour them out, what... you sort them. You pick up the red *ta:kuwa*. You pick them up. So. And if you want to go twice and if there is no dog, then you may also peel srrr! a banana stem, you paint it with *kuse:we*[5], and then you throw the banana stem, plump! After this you go again to pick up some, and *Muro:koto* again hurries towards it. He thinks that it is a Carib, because of there being the smell of *kuse:we*. Then you go running again to pick up some, pick up some again: swish! and you carry it again yonder on shore. Then the *ta:kuwa* are picked up by you, and thus it is finished: twice only. Yes, twice only you pick them up, you do not go too often. If you go too often, if you do not go about it in this way you will be lost. *Muru:koto* will eat you, *Muru:koto* will tear you to pieces. Long ago I have often heard the story from my grandfather and my grandmother.

Slips

When the vessels are leather dry or dry, slips can be applied to colour them. Often the slipped surface will form the background of a design to be applied after firing of the vessel. When the slip has been applied, the moist layer is frequently polished again in order to produce a smooth and shiny surface. Three different clay slips are used for colouring: *ku:ri*, *ta:wa* and *ka:muyu*. *Ku:ri* is a red, very fine-grained clay. It is taken from the riverbed, kneaded and formed into a lump and left to dry (Figure 7). In this form it is kept and when needed the desired amount is scraped off with a knife and mixed with water to form a slip that can be used as pigment. It is applied with a piece of cotton to the unfired dry vessel. Usually it is applied with broad strokes, drawn along the rim of a vessel or across the body, dividing the latter into different sections. Vessels shaped like jars are either covered entirely with *ku:ri* or only on their lower halves. *Ta:wa* is a white pipe clay. It is prepared in the same way as *ku:ri*, only instead of water *kasi:ripo* (the juice that results from processing bitter cassava tubers) is used to mix the clay in order to form a pure white slip. It is applied after firing,[6] mostly on the outside of drinking bowls like the *sabe:ra*, often as a base for design patterns painted with *kume:tï*. Prior to applying the *ta:wa*, the vessel is smeared with *kume:tï* juice to make the *ta:wa* stick better. *Ka:muyu*, finally, is a yellowish clay with the structure of pipe clay. It is prepared and used on pottery in the same fashion as *ta:wa*.

Firing

When the vessels are completely dry, they are ready to be fired. First a sheet of corrugated iron or some potsherds are put on the sand, on top of which a layer of dried bark is spread out. The vessels are placed on this base. Once the bark has been set to fire, firewood is stacked around the pottery in a cone-like manner. The burning wood is kept standing around the pottery as long as possible, but eventually only smouldering charcoal and ashes remain. This is gathered around the vessels and occasionally rearranged. Every now and then a pot is taken out to check whether the firing process has been completed.

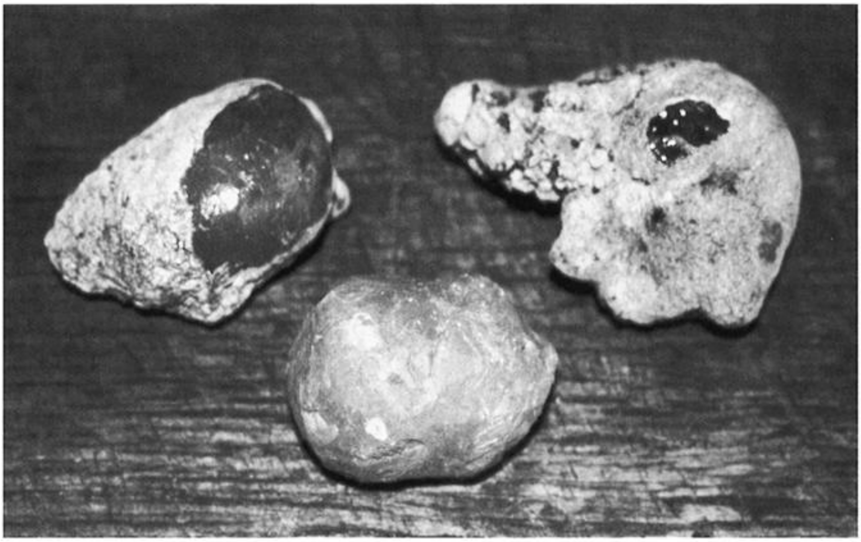

Figure 7. Two lumps of *simi:ri* resin (above) and a lump *ku:ri* clay (below) (photo: A. Vredenbregt).

Paints

The fired vessels are now ready to be decorated and varnished. The characteristically Kari'na pottery decorations, the *sabe:ra me:rï*, consist of fine-line paintings made with the dyes of different plant extracts. The following is a description of the various dyes, their preparation methods and use.

Kume:tï is a reddish-brown dye that is extracted from yellow wattle (*Vismia guianensis*), a small forest tree. First a thin layer of the outer bark of this tree is scraped off with a knife in order to expose the moist, red inner bark. Consequently this inner bark is scraped off and these slivers are collected from the ground and taken home. They are put into a bowl with some water and squeezed thoroughly (Figure 8). The extract is poured through a sieve and is now ready to be used or stored. When it is stored in a bottle the extract can be kept for about a year. In its pure form the pigment gives a reddish-brown colour, but it can also be mixed with *kuse:we* in order to get a more reddish colour, or with sooth to get a black paint. *Kume:tï* is applied to the pottery after firing by the use of a small piece of cotton to create broad lines, or by the use of an *awu:leya*, a feather paintbrush, to create thin lines.

Kuse:we is a bright red dye extracted from the seeds of annatto bush (*Bixa orellana*). The seedpods of the *kuse:we* plant are opened and the bright red, powdery seeds are put into some *kume:tï* extract. They are mixed well with the liquid and left to soak for a while, so that the coloured powder will loosen and dissolve into the water. After some time the mixture is sieved and the seeds are thrown away. This mixture can be used to create bright red design motifs on the pottery.

Figure 8. The slivers of *kume:tï* bark are squeezed in water (photo: A. Vredenbregt).

Ka:rawi:ru is a beige to light-brown dye, extracted from the leaves of the *ka:rawi:ru* liana (*Bignonia chica*). In the dry season, when the leaves of the *ka:rawi:ru* are bright red, they are collected and cooked with water. Pieces of red bark from the *wosiwosi* tree (*Vochysia guianensis*) and leaves from a shrub called *pirapisi* are added to stimulate the release of the pigment. This mixture is cooked until it has a syrupy thickness. It is then sifted through a sieve to take out the coarser particles and then sifted through a suspended piece of cloth. The residue is left in the cloth to dry and harden. For use on pottery the residue is dissolved, either in *kasiri:po*, in the juice from the inner bark of the *morototo'u* (matchwood) tree (*Didymopanax* and *Schefflera* sp.), or in the juice of *kwasisi* (*Solanum* sp.) leaves. *Ka:rawi:ru*, like *kume:tï*, is applied to the pottery after firing with the aid of the *awu:leya*.

Karai, or *arina:du karai:rï* is the black (*karai*) soot taken from the bottom of the griddle (*arina:du*), i.e., the cassava baking-plate. The soot is used as a black dye, combined with different materials varying according to the intended purpose. For use on pottery the soot is mixed with *kume:tï*.

Ka:rasai is the name of a species of *na:pi* (*Ipomoea batatas*), the sweet potato. The tuber, which is dark-red on the inside as well as on the outside, is used to give a purple-reddish colour to certain kinds of *kasi:ri* beer, and can be used as a pigment for pottery (mainly when *ka:rawi:ru* is not at hand). To colour *kasi:ri,* the pulp of the grated tubers is mixed with the fermenting ingredients of the drink. For use on pottery, the grated pulp is squeezed out, which produces a thick, dark-red juice that can be used for painting. It has to be used directly and cannot be kept. Ahlbrinck (1931: 233, 473) also describes a dye called *tëpuru* or *tupuru*, which is extracted from the *tupuru na:pi*, a kind of sweet potato that gives a dark red juice. In his time, apart from colouring the *kasi:ri*, this dye was used on pottery when *ka:rawi:ru* was not at hand. The term *ka:rasai* cannot be found in Ahlbrinck (1931). Kloos (1971: 33) uses the name *ka:rasai* for the tuber with the characteristics described above, and both names are given by Courtz (1998), but they are placed in his list of (to him) unknown plant species and the names are not further specified. Whether the two names represent two different tubers or one and the same is unclear. It is certain that they are *na:pi*, i.e., sweet potato (*Ipomoea batatas*).

Varnishing

Once the designs have been painted, a varnish is applied to some vessels in order to form a waterproof layer that seals off and preserves the decoration, thus protecting the vessel surface. *Epu:kuru*, tree resin, is used for this purpose. *Simi:ri* is the name of the tree resin that is used as a varnish on pottery. The *simi:ri* tree (*Hymenaea courbaril*) secretes a white resin (*simi:ri epu:kuru*) that turns transparent when it is hard and dry (Figure 9). These glass-like lumps are taken from the tree or picked up from the ground. The pottery vessels are first fired and decorated. When the painted designs are completely dry, the vessels are heated over a fire. The lump of *simi:ri* resin is then moved over the vessel surface so that the resin melts and can be applied evenly. It forms a varnish-like, waterproof layer when the resin has cooled again. For places that are hard to reach, like the inside of a vase, the *simi:ri* resin is stuck to a stick which is inserted into the heated vessel.

Enculturation, the learning process

At present various processes of change affect the continuation of the performance of the craft of pottery making (and other handicrafts). As an example an impression will be given of the enculturation process, i.e., the way in which the skills needed to perform these crafts are acquired in Kari'na culture. In the past, a man had to be capable of providing his wife with the basketry items she needed in daily life, in order to be an eligible spouse. Likewise, a woman had to be capable of producing the pottery items that were needed in the household. By now, these qualities have disappeared as a condition for finding a good spouse. The pots that were used for cooking and storing

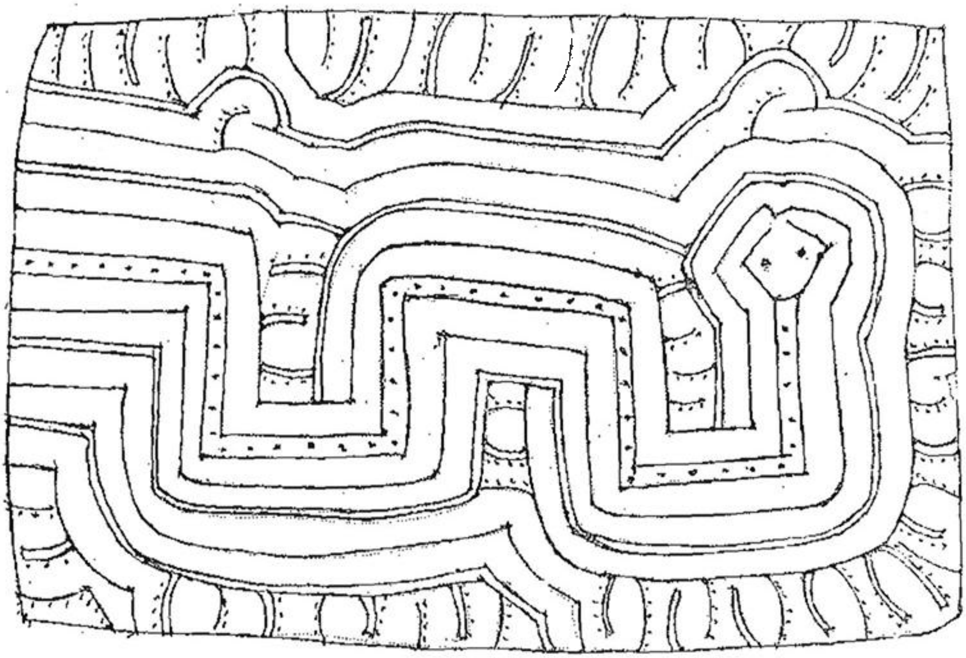

Figure 9. A design pattern representing the mythical snake *Ara:mari*
(collection Ren Spoelstra, Surinaams Museum, Paramaribo).

food and drink have been replaced by enamel and aluminium ware, and more recently also by plastic ware. Skilful basketry making prevailed for a long time as a marriage condition since basketry, needed for the processing of manioc, still plays an important role in the modern Kari'na household. However, nowadays young people are no longer expected to possess these skills. When certain basketry wares are needed they are ordered and bought from one of the skilful elder men of the village, and when certain pottery vessels are needed for rituals, an older lady, who still knows the craft, is asked to make them.

Whenever I asked informants how they had learned to make pottery, basketry, or any other kind of handicraft, they would answer by saying that they had 'taught it to themselves'. They acquired the skill by looking at their parents or grandparents at work, and by trying out for themselves the techniques they witnessed. When I asked how they had learned to make the different decoration motifs, they would answer that they had learned this in a similar manner, i.e., by watching an adult at work and by copying designs from other objects. Later on, they themselves would have thought of designs to make. Besides, the spirit of the material at hand can make people dream of certain objects and decoration motifs. 'When you have such a dream', it is said, 'you should not tell anyone about it in the morning, you should keep it to yourself.

Then, a little later, you go and try, you try to make what you have dreamed of. It's the spirit, the spirit lets you dream'.

A Kari'na who excels in pottery making, basketry weaving, or any other craft, will be praised for his or her skill, but they are not regarded specialists. In the past the skills needed to produce the different artefacts were a general quality, a prerequisite for everyday life. As a consequence, learning the skills was also part of everyday life, it was a rather individual affair and held no formal training. Children would learn by accompanying their parents when they went to gather the materials, and they witnessed the production process. They learned by looking at elder people at work, and by copying what they saw. Parents or grandparents encouraged the child to learn and try, but no formal training was given.

Elderly people regret that nowadays the young generation no longer acquires these skills. 'Young girls are vain these days', the old Kari'na women say, 'they are lazy, they no longer want to get their hands dirty on the clay'. The children go to school and they are no longer at home where they can see their parents and grandparents at work, and they do not accompany them to the places where the raw materials are gathered any longer. Also, they ceased to learn which spirits reside in these materials at the source locations, and how these should be dealt with. Apart from going to school, the 'laziness' that is attributed to the Kari'na girls is also explained by referring to the disappearance of the female initiation rite.

The female initiation rite, which was performed after the first menstruation of a girl, emphasised industriousness as a good and necessary quality in women. The symbolism of the rite is almost completely centred on the female economic role (Kloos 1969). When a girl is having her first menstruation, a secluded spot is made in the house where she will stay for eight days. The mother of the girl invites an old man and an old woman, renowned for their industriousness, to come to the house early in the morning on the eighth day. During the following ritual the old woman places a bit of cotton in the hands of the girl and sets it to fire. The girl now has to throw the cotton from one hand to the other in order not to burn herself. Then the old man puts her hand in a bowl of big, biting ants. All this is done to ensure that the girl's hands will always be busy, like they are when throwing up the burning cotton, and that she will be as industrious as the ants. The girl is now perceived of as an adult woman and she is expected to take on the responsibilities associated with that status. A girl of about thirteen, who can have her first menstruation any time, is regarded as lazy. She is chaffed about this and teasingly threatened with the amount of ants she is going to have to endure to transform her into an industrious woman (Kloos 1969).

These days a lot of girls attend school in Paramaribo and experience their first menstruation during their stay in town. The initiation rite is not performed for these girls and the old women explain this as a reason for their 'laziness', i.e., their unwillingness to acquire the skills needed to make traditional Kari'na pottery.

Design patterns

Me:rï is the Kari'na word for 'spot', 'drawing', 'writing', or 'letter'. It is used to denote the decoration motifs on the different artefact categories: *sabe:ra me:rï*, 'drawing on pottery' (literally this means 'drawing on the *sabe:ra*', but it is also the generic term for drawings on all ceramic objects), *waru:ma me:rï*, 'drawing on basketry', and *ya'mu? me:rï*, 'drawing on the body'. There are at least two different Kari'na myths that explain the origin of all decoration patterns. The following one was recorded by Penard and Penard (1907), and was transcribed by De Goeje (1943: 28).

> Long ago a woman died and left her only daughter uncared for. The Indians ill-treated the child and sent it to Heaven to visit her mother. But she did not know the way, approached the moon too closely and he married her. She told the moon how she had been ill-treated and he was indignant and sent a flood to kill all bad Indians. 'For', he said, 'all virgins are under my care and woe to him who steals but a single one'. Up to that time the Indians knew of no designs with which to decorate the objects they carved out of wood or plaited. One day, however, this moon-woman seated on a turtle came to visit them and said: 'In the shell of this sea turtle you will find my blood *tulala-li* (properly: 'my charm') and in it everything you are looking for'. (It is also said that the moon-spouse's blood stains the turtle shell every month.) And when the people examined the shell they found on the inside the figures with which they decorate all their things even now. The moon-woman returned to the moon. She still remains close to her husband, but at full moon she is clearly visible, for then she is sitting on her turtle inside the moon.

Two different versions of another myth on the origins can be found in the work of Magaña (1986: 23, Nos. 26 and 27). In this story the design motifs are said to have their origin in the markings of the mythical snake *urupuru*, or *urupere*, that were once left on the body of a man.

> A boy is seized in the forest by the snake *urupuru*, a snake with many tongues. The boy grabs hold of a tree trunk, and with his free hand he cuts off the snake's tongues with a bamboo knife. Finally he frees himself from the animal but his body is covered with patterns. In the village he posts himself in the middle of the ceremonial house and the women copy the patterns on his body onto their pots.

> The snake *urupuru*, who lives under the ground and has twelve heads, seizes a man in the forest. The other villagers wonder what is taking him so long, and they go and look for him. They find him, trying to free himself from the snake. They kill it, and free the man. His body, covered with the marks of the snake, serves as an example for the women who make pots, and for the men who make basketry.

All the Kari'na designs, whether they are used for decorating pottery, basketry, wooden benches or as motifs for body painting, are inspired by the world that surrounds the Kari'na people. They are representations of elements from the natural world, the spirit world, from the stars and constellations, and of mythological characters. To people other than the Kari'na the designs may appear to be purely geometrical, consisting of straight and curvilinear lines, circles and dots, but to the Kari'na they are representations of animals, plants, objects, and mythical and spiritual characters. Except for frogs and snakes (and jaguars on basketry), most animals and plants are not represented as individual specimens, but as conceptualisations. In most cases only a particular part of the subject is depicted, i.e., one that is thought to be characteristic of the whole subject, and/or a part that is especially striking about the subject. This subject, or the element of it, forms the core of the design, but typical of the Kari'na decoration motifs is that this core element is surrounded by an assemblage of parallel running lines, dots and 'fillers' that occupy the entire surface decorated. These elements constitute a body of design patterns that is used by each artist in a personal way. The name of the design is taken from these elements, which can be recognised and 'read' by other persons. The way in which this element or pattern is incorporated in a design differs from artist to artist, but always follows the conventions of the typical Kari'na style described above.

The names of the designs, based on the patterns that are depicted, usually refer to the specific elements that are depicted. This can be illustrated with the example of the name of a common design known as *matu:ni po:tï me:rï*, which translates as 'drawing of the lip or mouth orifice of the *matu:ni* snail'. This motif is said to represent the lines that are made in the sand by the mouth of the *matu:ni* periwinkle when it moves. Another example is the basketry pattern called *waya:mu iŋga:na me:rï*, the 'markings of the tortoise's back', which symbolises the squares of the tortoise shell. Direct questions about the various designs on the different media (like: 'what are the designs that can be made on the body/basketry/pottery') yield no results, the answer being always that 'anything' can be depicted. However, in practice it is obvious that certain designs are depicted exclusively, or especially, on certain media. There is not always a deeper meaning to this fact. The variability of basketry decoration, for instance, is limited because of the technical constraints that the material imposes, while a human body and a *sabe:ra* offer very different frames and bases for a design. There is, however, a certain set of patterns that can be encountered on all the different media, but even then the representations differ to a certain extent, depending on the personal interpretation of the artist and on the restrictions that are imposed by the various materials. Thus, even painted designs on pottery vessels carrying the same name may seem very different due to the personal touch of each artist.

We have seen that there is a relationship between certain decoration patterns and the Kali'na mythological heritage, but the relationship between myths and artefacts encompasses more than only the design patterns. The relationship is a dual one: not only are myths represented in artefacts, the contrary is also the case. Many myths explain the origin of certain artefacts and relate how, when, and by whom they should be used. Apart from explaining the origin of things, myths also explain 'why things are the way they are', and bear the rules of social conduct in them. Artefacts carrying the symbols of persons or elements figuring in myths thus become the material manifestations of mythology. The mythological designs function as graphic symbols or signs, which express – to the insider – certain 'codes' of behaviour, and which convey images and rules. The constant handling of these symbol-laden objects reminds the users of a large body of lore and behavioural norms. It is evident that such a symbolic value of the decoration patterns only has its validity in a restricted setting, since they convey their meaning only to the insider. The symbols must be viewed within their own specific social context and can be understood only within the framework of the cosmological and related behavioural concepts that underlie the culture in which they are encountered.

The spirit world

The Kari'na conceive the world around them as being populated by many different spirits, each with a different origin, different characteristics and different powers. The Kari'na people are dependent on nature and its spiritual aspects as a source of materials and food, and thus people are in a constant relationship with the beings and spirits that inhabit nature. These contacts shape the production processes of pottery and the other traditional artefacts. Within the scope of this article it is impossible to give a complete account of the religious concepts of the Kari'na and their spiritualised world. Based on a few examples, however, I shall try to demonstrate the complexity of the animistic worldview of the Kari'na, and in what way it affects and influences the manufacture and use of artefacts[7].

The *-akï:rï* (actually *a:kï*, *-/rï/* being a possessive suffix) is a concept that is used only in connection with a specific object or place; for instance, the spirit of *tu:na* ('water') is *tu:na akï:rï*; that of *to:pu* ('rock') is *to:pu akï:rï*. Rocks, trees, rivers, tiny creeks, but also houses and gardens have spirits associated with them. These spirits are not the spirits of a certain object or place, rather they are independent spirits who have that object or place as a residence. The term can best be translated as 'spirit belonging with'. It may be said that each 'thing' can have its *-akï:rï*, and likewise it may be said that a *-yu:mï* or *-ta:muru*, best translated as 'father spirit' and 'grandfather spirit', can be connected to everything that 'is', to every animal, plant, tree or natural phenomenon. Apart from these two sorts of spirits there are water spirits, forest spirits, guardian spirits, and the familiar spirits of the *pï:yei*, i.e., the Kari'na spiritual healer or shaman. The different spirits that carry their own name are actually all connected to manifestations of either the water spirit or the forest spirit. For instance, the water spirits that are associated with the different sorts of clay are in fact all manifestations of *okoyu:mo*, the water spirit. However, this does not mean that *okoyu:mo* is a generic term. Neither is it so that they are different manifestations of one and the same *okoyu:mo*. It is more that they are all *okoyu:mo* and *okoyu:mo* is all of them, being a single one and a multitude at the same time.

The different 'sorts' of spirits as described above are not mutually exclusive. They do not represent actual spirit beings as such, but the relationship between the latter and humans. For instance, *popopo yu:mï* is the father spirit of a little night owl, named *popopo*. It is an important spirit for the *pï:yei* and is believed to live in a (certain) tree (*we:we*), of which he is, as a consequence, a *we:we akï:rï*, a 'tree-residing spirit'. The *pï:yei* speaks of this spirit as his *aku:wa*, his 'familiar spirit', but when he gives this spirit to a patient as a form of protection he will speak of it as being an *eko:sano*, a 'guardian spirit'. This example thus shows one spirit being in four different roles (Kloos 1985: 199).

Actually, not every being or every object seems to have or be connected to a spirit, and not all the spirits of all things are known. When discussing certain natural elements with my informants, it was sometimes said that a specific tree, clay, animal, etc., did not have its own spirit. When asked whether this meant that it did not have a spirit at all, the reaction was often: 'Well, maybe it has one, but I don't know it (meaning that particular spirit)'. Kloos (1971: 120) states that in practice only few of all the possibilities are spiritualised, thereby formulating very well the character of Kari'na spiritual conceptions: '...this incompleteness is partly due to the degeneration of the philosophy. But I do not believe that all the possibilities have ever been realised. Carib religion has never been very formal, or thought out to its logical consequences. Based on certain principles it has always been individual and flexible, suiting individual experience and local circumstances.'

While some spirits are more inclined to do harm to people than others, potentially all spirits can do harm, and almost all cases of (serious) illness and death are ascribed to spirits. However, spirits are not believed to harm people without reason, they only do so when they have been provoked. The harm that a spirit causes due to a provocation can be directed to the person who did the offending or to his or her close relatives. Most spirits are provoked by the breaking of certain taboos or particular behavioural restrictions.

However limited, the description given above shows that the Kari'na belief is in essence very instrumental and individualistic in nature, based as it is on a relationship with spirits for which every individual is responsible. The relations with the spirit beings that inhabit the material sources influence the gathering, preparation and use of these materials. They shape the production process of artefacts but are also present in the symbolic value of the object that is made using these materials. Thus, the symbolism is not only expressed in the final product, but all through the manufacturing process, from the gathering of the raw materials to the ultimate use of the object. Therefore, the materials used, the production process and the ultimate object should be seen as an inseparable unit. The beliefs concerning the gathering and processing of the materials are supportive or complementary to the social significance of the object itself (Guss 1989: 127).

Synthesis and conclusions

When asked, the Kari'na will state that 'anything' can be used as a subject for a design and that no special designs are applied to important items like the *mara:ka*, i.e., the calabash rattle, of the *pï:yei*. This was also recorded by Ahlbrinck (1931: 285), who was convinced that the Kari'na patterns had no symbolic meaning whatsoever. Ahlbrinck pondered about the origin of the design motifs and questioned whether the Kari'na designs were inspired by nature or whether they originated completely independent from the natural environment. He concluded that the latter was the case and that originally the patterns were designed independently from nature, and only later became connected to it by names that were derived from resembling natural elements. When representing nature was not the original intent of the Kari'na, how could the patterns in any way be intended to have a symbolic significance, he reasoned. A symbolic significance that would have been attached to the designs after their creation seemed equally unlikely to him for, as he states, this significance would still have been known or at least be retraceable, and this was, according to Ahlbrinck, not the case.

I think we can safely state that at least Ahlbrinck's hypothesis on the origin of the design patterns needs some refining. There is no doubt that the Kari'na patterns are representations of the Kari'na world, including the surrounding natural elements, and that they originated as such. A similar alliance between decoration patterns, (social) environment and mythology is also present amongst the Wayana (Boven 1997) and other indigenous groups in the Guiana region. All the Kari'na design motifs are inspired by the same frame of reference, namely the world that surrounds the Kari'na people, a world that is not only inhabited by humans, plants and animals, but also by numerous spirit beings. To Ahlbrinck these representations might not have been apparent, but they are undoubtedly there, even well into our time.

We have seen that the different materials that are used for the different artefacts are closely related to the spirit world. Most of these materials have their 'own' spirit, which should be treated with respect when the materials are gathered and used. These spirits are also a source of inspiration for the designs that are applied to the artefacts, since they can make the artist dream of a certain design. By following the manufacturing process of the pottery from the gathering of the raw materials to the finished objects, I hope to have illustrated the complex set of concepts that is represented by the final artefact. I hope to have shown that indeed the entire production process, permeated as it is with the beliefs that are attached to the different materials and their use, should be seen in relation to the symbolic content of the final object and its accompanying decoration and use.

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Notes

1. Freely rendered from different versions of this myth, by Ahlbrink (1931: 347), Cirino (1977: 37-38), and Magaña and Jara (1982, 1983a, 1983b)

2. For the transcription of Kari'na words I use the method of Hoff (1968).

3. This description concentrates on the present state of the Kari'na ceramic tradition. For discussions of older vessel types and typologies, the reader is referred to Ahlbrink (191: 343-347), Boomert (1986), and Cornette (1992).

4. *Ta:kuwa* also refers to the hearing-bone of animals. Ahlbrink (1931: 452) notes that the hearing-bones of some animals were worn around the neck on a string, either as a form of jewellery or as a medicine or charm, depending on the animal.

5. *Kuse:we* is a red pigment discussed below.

6. According to Cornette (1992: 82), *ta:wa* is applied before firing, as is *ku:ri*. However, according to my experience, in Galibi *ta:wa* is applied only after firing.

7. The majority of the inhabitants of Galibi are baptised Roman Catholics, and the Christian God plays an important role in the lives of most people. Nevertheless, modern Kari'na religion is actually a syncretic complex built up of elements from the traditional animistic belief system and Christianity, influenced by the Surinamese Creole and Maroon religious traditions.

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EARLY POTTERY FROM LATE NEOLITHIC TELL SABI ABYAD II, SYRIA

Abraham van As, Loe Jacobs and Olivier P. Nieuwenhuyse

Abstract

This study focuses on a more precise understanding of the pottery technology underlying one of the earliest ceramic traditions in Syria. It presents the results of a technological analysis of the early pottery excavated by the National Museum of Antiquities, Leiden under the direction of Peter M.M.G. Akkermans at Late Neolithic Tell Sabi Abyad II, a small archaeological site situated in the Balikh Valley, northern Syria. This pottery assemblage (ca. 6900 cal B.C.) precedes the plant-tempered pottery found in northern Syria during the later Pre-Halaf period. This later pottery is known as Standard Ware. From a technological perspective, the links and differences between the pottery of the two stages are discussed.

Introduction

In the Near East, the introduction of pottery marks the shift from the incipient, Pre-Pottery stages of the Neolithic to the later, so-called Pottery Neolithic. In Syria this occurred at approximately 6900 cal B.C. (Faura 1996a. 1996b; LeMière 1986; Tsuneki and Miyake 1996). Why people began making pottery remains to be elucidated, but may have been invoked by changes in subsistence patterns, diet and ideology (Akkermans 1993; Akkermans and Schwartz 2003; Barnett and Hoopes 1995; LeMière and Picon 1999; Moore 1995; Verhoeven 2002, 2004). Although the past decade has witnessed a sharp increase in projects investigating the earliest stages of the Pottery Neolithic, our understanding of the ceramics themselves remains poor.

This study presents a technological investigation of the early pottery from Tell Sabi Abyad II, a small (0.9 ha) archaeological site situated in the Balikh valley, a perennial tributary of the Euphrates in northern Syria (Figure 1). Tell Sabi Abyad II forms part of a cluster of four small, prehistoric tells surrounding the mound of Tell Sabi Abyad (Akkermans 1989, 1996; Akkermans and Verhoeven 1995). The valley is rich in early Pottery Neolithic sites. In addition to Tell Sabi Abyad II, early Pottery Neolithic contexts were excavated at Tell Assouad (Cauvin 1972; LeMière 1979, 1986), Tell Damishliyya (Akkermans 1988, 1993), and, recently, at Tell Sabi Abyad I. The pottery from these sites, radiocarbon dated to between 6900 – 6500 cal B.C, mark the earliest ceramic horizon presently known in northern Syria (LeMière 1986; LeMière and Picon 1999)[1].

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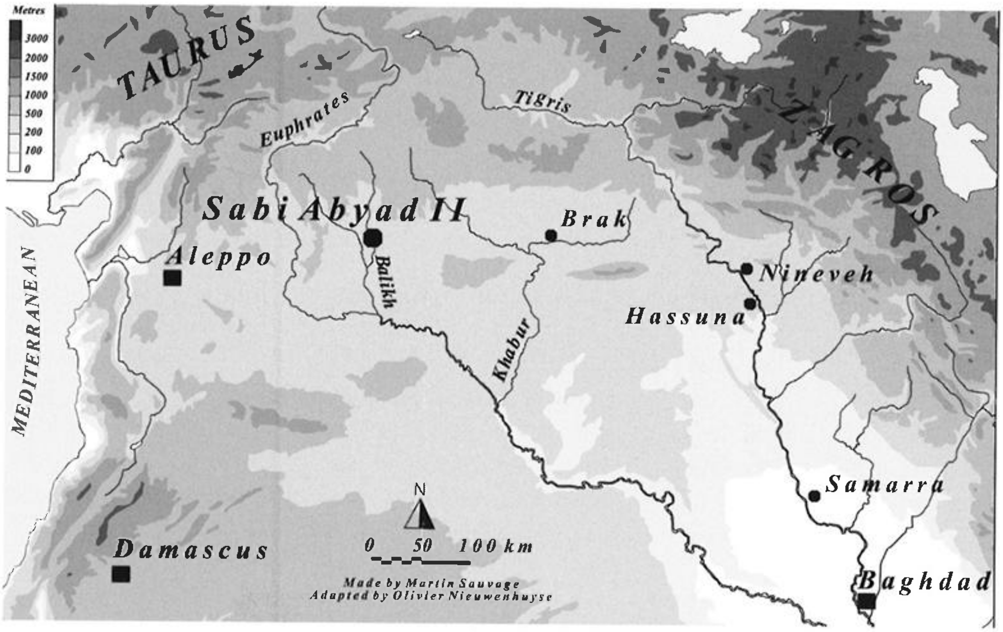

Figure 1. Map of Syria, showing the locations of sites mentioned in the text.

At Tell Sabi Abyad II, a small number of pottery sherds were retrieved from a large pit (pit A) that represents the final stage – termed 'level 1' – of a long pre-pottery occupation. Dug from the surface of the mound, the ash-filled pit contained 137 pottery sherds in addition to various other small artefacts. No architectural features were found in association with the pit, and the mound seems to have been largely deserted at his stage (Verhoeven 2000)[2]. The morphology and the technology of the sherds were studied macroscopically (Nieuwenhuyse 2000). This left a number of questions pertaining to the ceramic technology. In particular, we wished to gain further insight into the selection and the preparation of the clay fabric, the shaping methods used and the firing techniques adopted by the early potters. Also, we wished to investigate the relationships between the earliest ceramic production and the more extensively studied 'Standard Ware' dating to later stages in the Pottery Neolithic. Sixty-six fragments were selected for study in Leiden (Figure 2).

The pottery

The early pottery found at Tell Sabi Abyad II can be characterized as being coarsely organic-tempered, imprecisely shaped and roughly finished, handmade pottery. Technologically, the studied assemblage comprises a single, albeit heterogeneous group. Wall thickness is highly variable from one vessel to the next. Characteristically, it varies

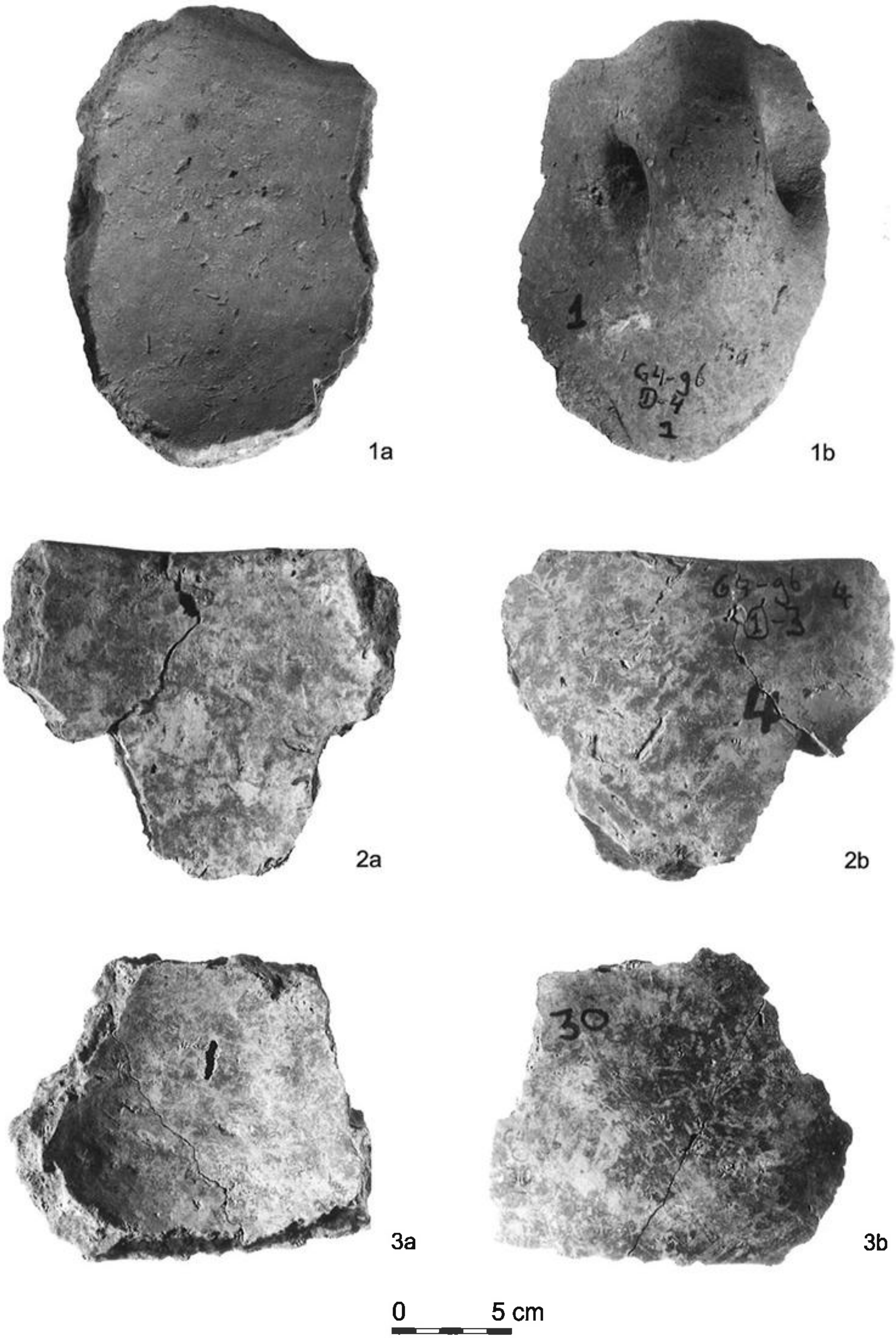

Figure 2. Tell Sabi Abyad II. A selection of analysed sherds.

considerably even on a single vessel. On the whole, though, there is a tendency towards a thick vessel wall. Also, the base is usually rather thick-walled. The rims are wobbly and irregular, and the vessel height often varies considerably.

The early potters fabricated a very limited range of vessel shapes (Figure 3). According to Faura (1996b), LeMière (1986), and Nieuwenhuyse (2000) it is difficult to establish discrete typological distinctions. The various morphological categories shade into one another imperceptibly. Main vessel shapes are convex-sided bowls and hole-mouth pots. A very characteristic shape is a tall pot with vertical walls and thick,

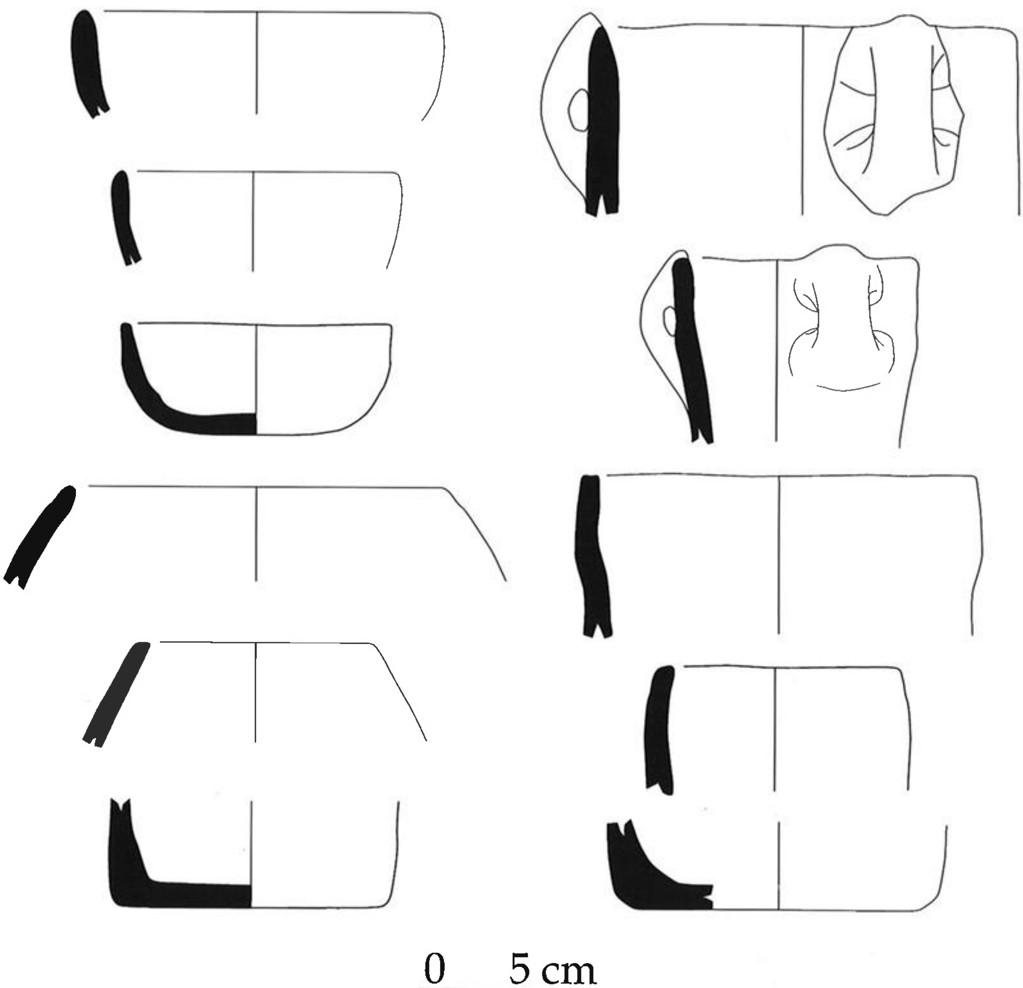

Figure 3. Tell Sabi Abyad II. Characteristic vessel shapes of the ceramics from level 1 (after Nieuwenhuyse 2000).

coarse loop handle. Usually, the pottery sherds have simple, plain rims; flat bases predominate.

The raw materials

In order to test the assumption of local production, we took a series of clay samples in the direct vicinity of Tell Hammam, situated some five km west of Tell Sabi Abyad in the Balikh floodplain. The results of the workability tests indicate that the early pottery of Tell Sabi Abyad II was made locally (see Appendix 1). Most of the local Balikh clays were suitable for pottery production. We may assume that the potters selected the most usable clays.

Fabric analysis of the pottery sherds shows that the potters prepared the clay by adding organic material. Adding organic plant fibres to the clay improved the cohesive strength. Mixed with organic fibres the clay can be worked into a more pliable condition without losing its strength. Such an organic-tempered clay body facilitates coiling, because the coils will not easily break. At the same time, the more pliable condition of the clay improves the capacity of the coils to adhere to each other. Furthermore, it reduces the risk of developing cracks during drying and firing. Finally, the organic material results in a more 'open' structure, which facilitates moisture to escape quickly and freely from the clay. One proportion of fibres of one to three volume parts of dry clay, or less, really opens the fabric structure, irrespective of the presence of mineral grains.

Measured in amounts of dry volume the proportions of organic material to clay vary from 1:1 to 1:6. The size of the organic fibres roughly varies between 0.5 mm and 10 mm. In general, the clay-fibre mixtures are not homogeneous. Fibres of different sizes, of dung or chopped straw, were mixed together through the clay. In thin sherds, however, only (very) fine fibres are included.

Apart from the organic fibres, the clay includes mineral grains in various amounts and sizes (Table 1). The dominant grain type is calcite. The other mineral inclusions – less frequently and in smaller quantities – are quartz, several types of siltstone and basalt. Pyroxene, feldspar, iron-oxide concretions, mica's and kaolin grains occur sporadically. A comparison with the clay samples shows that most of the above-mentioned minerals were present in the natural clay from the region.

One single sherd has a relatively high proportion of basalt grains, angular to sub angular in shape. Qualitatively, this sherd shows a somewhat different composition compared to the others. The vessel may constitute an import, although the colour and the matrix of the clay do not differ from the other sherds.

With respect to the workability and the behaviour during drying and firing, a certain amount of mineral non-plastics in the clay was necessary. Under normal firing conditions, with temperatures not exceeding 750°C, a quantity less than 20 % of mineral inclusions would not make the fabric structurally more open, than generally found in pottery assemblages. About half of the sherds show a volume proportion of

Fabric:

Colour:	
complete fabric:	10YR6/3-6/4 (pale brown and light yellowish brown); 10YR8/4 (very pale brown); 7.5YR6/4 (light brown); 5YR7/4 (pink)
cores:	often 10YR4/1-3/1 (dark gray) to 2.5Y3/1 (very dark gray)
surfaces:	are often 10YR8/2 very pale brown; 10YR7/2 (light gray) and 5YR7/3 (pink)
Grains:	
dominant types:	calcite
occuring in low quantities:	quartz; siltstone (several types); basalt
sporadically occuring types:	pyroxene; feldspar; iron oxide concretions; mica's; kaolin
dominant sizes:	100μ - 250μ; 100μ - 500μ; 100μ - 1 mm.
quantity:	variable, 5 to 15%; 15 to 30%; 30 to 40%
dominant shapes:	angular to sub angular and sub rounded
sorting:	moderate and moderate to good
colour:	prevailing light grain colours
Pores:	mostly a relatively high porostity, mainly caused by the elongated voids of burned fibers. Fibers were added in quantities varying from about 15 to 50 % by volume and with sizes roughly between 1 and 5 mm. and between 1 and 10 mm. in length.

Matrix:

normal


to open


Table 1. The early pottery of Tell Sabi Abyad II: the fabric.

less than 20% of mineral inclusions. Even such low proportions of sand reduce shrinkage. The remaining half of the sherds shows a volume proportion of over 20% of grains. This makes the structure notably more open and porous, with favourable effects during drying and firing. An obvious disadvantage of greater quantities of mineral inclusions, however, is a strongly reduced plasticity of the mixture. A proportion of 30% of mineral grains, found in about a quarter of the sherds, may result in a crumbly fabric structure, while 35% or more usually results in a significant reduction of the coherence, found in about one-eighth of the sherds. Two sherds are exceptional in this respect, both having about 40% of mineral grains. They form the upper limit of what is technologically possible in terms of grain quantity. It is remarkable that in two sherds, with a high amount of grains, only a few fibres were added.

Tentatively, three overlapping groups of grain sizes can be made: sizes between 100 and 250μ; sizes between 100 and 500μ; and sizes between 100 and 1000μ or more. It is important to note, however, that these categories are arbitrary distinctions on a continuum, not discrete groups. Most of the sherds contain grains varying in size between 100 and 500μ. The mineral grains are predominantly sub-rounded in shape, although sub-angular and angular grains do occur as well. In general, the grains are of different shapes. Part of the calcite is of the crystalline type that tends to split in typical rhomboidal-shaped grains. These are often transparent or translucent[4]. Other varieties show dull-white to cream-coloured grains of calcite. These are not rhomboidal but arbitrary, and mostly they are sub-rounded and sub-angular in shape. By mechanical forces the crystalline variety of the predominant calcite tends to break in angular-shaped grains. However, because it is a relatively soft mineral (measuring 4 on Moh's scale), calcite erodes quite easily making the grains sub-angular to sub-rounded. Furthermore, the angularity of calcite grains is reduced when the pottery is fired at temperatures above 700°C.

The shaping technique

The shaping methods documented in the studied sample attest to a limited repertoire of shaping techniques available to the potters. In this aspect, too, pottery production was considerably less diversified than it would be in later stages. The potter started with shaping the base. The relatively thick bases are predominantly flat. These were made by flattening out a piece of clay, either between the hands or on the ground. Frequently, the base shows an uneven thickness, being much thicker in the centre than at the transition to the wall. Rarely, potters used a small pit in the ground or a simple mould, in order to create a base that was slightly convex. The lower parts of a discarded vessel may have been adopted as a mould for these bases.

The main hand-building technique used to build the vessel wall is coiling. This is indicated by the finger impressions that can frequently be observed at the interior surfaces, which result from pressing and smearing the individual coils[5]. Other sherds show the attachments of the individual coils in horizontal ridges along the interior surface, suggesting that between 2-4 cm of vessel wall was made with a single coil. Loop handles were placed high upon the vessel wall, simply by placing them on the surface and smearing the clay over the surface. Apart from coiling, small-size vessels were made by pinching a ball of clay between the fingers. Coiling and pinching are the two primary shaping techniques documented. We observed no indications that the potters used slabs or other shaping methods.

Following the primary shaping process the vessel wall was scraped, traces of which can often be observed. Finally, the irregular vessel wall was roughly smoothed, probably by simply using wet fingers. Occasionally, the surface was burnished. In an earlier presentation of this pottery, Nieuwenhuyse (2000: 125) suggested that the majority of the pottery (about 62% of all sherds) was burnished. However, this proportion may be slightly exaggerated. Some of the sherds that were initially considered as being 'burnished', on a closer look appear to have been very carefully smoothed rather than burnished. Occasionally, a somewhat glossy surface effect seems to have resulted from post-depositional processes. Post-depositional processes also led to the accretion of a red surface coating on a number of sherds, which might easily be mistaken for a red 'slip'. However, the use of these surface-finishing techniques was relatively superficial. None of the sherds studied shows the well-smoothed, carefully finished surfaces or the even, regular wall-thickness that are often associated with later plant-tempered Standard Ware from Tell Sabi Abyad (LeMière and Nieuwenhuyse 1996). Thus, the locations of the individual coils are in some cases still visible, and the exterior surfaces, although smoothed, are still comparatively rough and uneven.

The firing technique

According to the Munsell Soil Colour Charts (2000 revised edition) most of the pottery shows dark grey to very dark grey cores (10YR4/1, 10YR3/1, 2.5Y3/1, respectively). It is clear that these result from the way of firing. The pottery will have been fired under prevailing reducing circumstances. The dark-grey core disappeared completely, or almost completely, in refiring tests at 750°C under oxidizing conditions[6]. The strong development of a black core was, of course, encouraged by the abundant presence of variable quantities of added organic fibres in the clay. The firing must have lasted relatively short, while the firing temperatures did not significantly exceed 750°C. This can be deduced from the abundant presence of calcite grains in the clay fabric showing an intact crystal structure. Had the pottery been fired at temperatures exceeding 750°C, this structure would have changed into grains showing a more amorphous shape.

Most likely, the potters used a simple firing method, e.g., a partly covered pit or a pile of ceramic vessels covered with fuel. No such pits were recovered from Tell Sabi Abyad II, where the final occupation level containing the sherds (level 1) consisted of a single, large pit used for, presumably, refuse. The recent excavations at Tell Sabi Abyad I of Early Pottery Neolithic occupation levels, however, occasionally yield ash-filled pits. Although this remains speculative at this stage, some of these may have been used as pottery firing places.

Notwithstanding the dark cores, the exterior surface of the pottery, on the whole, is relatively light coloured. Frequently occurring surface colours include very pale brown (10YR8/2), light grey (10YR7/2, 2.5Y7/2) and pink (5YR7/3). Some general fabric colours, in the outer zones of the original sherds are pale brown and light yellowish brown (10YR6/3; 6/4); very pale brown (10YR8/4); light brown (7.5YR6/4); pink (5YR7/4) (less frequent light grey 10YR7/1, 10YR7/2). The light surface colour may partly be attributed to the development of a surface scum[7], but it also points to a short period of oxidation at the end of the firing process. Presumably, the pile was opened and the ashes removed when still hot. At this stage, at the end of the heating process and during the cooling, oxygen was allowed to penetrate into the pottery. At the same time, the material must have cooled down rather fast, resulting in a limited time-period available for the re-oxidation. In many cases, no more than a small zone at the surface or just the skin of the sherds was affected by the oxidation. In protruding parts, like the rim and handles, the oxidation process could more easily change the colour from dark grey into buff, light yellowish brown or one of the other oxidation colours.

A comparison with the later Pre-Halaf Standard Ware

After the initial introduction of coarsely-made, plant-tempered pottery in northern Syria at around 6900 B.C. the production of plant-tempered ceramics continued for over a millennium. Known as 'Standard Ware', it will gradually give way to the very complex decorated Fine wares from the Early Halaf period, at around 6100-5800 B.C. (Akkermans 1993; LeMière and Nieuwenhuyse 1996; Cruells and Nieuwenhuyse in press). To what degree are the technologies of the two categories comparable?

Comparing the early pottery of Tell Sabi Abyad II with the later Pre-Halaf Standard Ware we may conclude that the potters added organic temper to the clay in both stages. With the abundant use of plant temper, pottery production resembled the preparation of mudbricks. Coiling was the main shaping technique. The main surface finishing techniques found in the earliest pottery, smoothing and burnishing remained important during later stages. The resemblances are such that it may even be difficult to distinguish between the two periods on the basis of non-diagnostic sherds from non-stratified contexts, such as surface collections.

However, there are some major differences too. The earliest clay fabrics, for one thing, are much coarser. They contain higher proportions of non-plastic inclusions, and potters invested less effort in a careful preparation of the clay body than later Pre-Halaf potters would. In later periods, the range of shaping techniques available to the potters expanded and included the use of moulds, to shape a convex base. The range of shapes is rather basic at this early stage, and it does not include any of the complex shapes found later on. Furthermore, although the basic surface finishing techniques are already present from the outset, there can be no doubt that these were used much more intensively in later stages. In contrast to the early period, a somewhat more diverse firing strategy is seen with the later Standard Ware.

However, it is the lack of 'fine'/'coarse' distinctions that perhaps represents the main difference between the earliest products and later Standard Ware. During the later Pre-Halaf period, distinctions existed between 'fine' and 'coarse' pottery, each category having its own decorative styles (or the lack thereof) (LeMière 2001; LeMière and Nieuwenhusye 1996; Nieuwenhuyse et al. 2002). These can be seen as the active expression of social relationships existing between people. In this early stage, however, this pattern does not yet seem to exist.

Conclusion

From a potter's point of view the early pottery of Tell Sabi Abyad II forms a single, albeit variable group. The potters added organic material to clay from local clay beds close to their village [8]. The potters obviously kept an eye on the amounts of non-plastic inclusions present in the clay. When the fabric contained a relatively high proportion of mineral grains, they reduced the amount of fibres and *vice versa.* The pottery is handmade (coiling and pinching), roughly finished and simply fired in a pit.

Within this group, variation in fabric, wall thickness and vessel size can be observed. The clay body used varies considerably in the amount and size of the organic inclusions, as well as in the amount, size and shape of the mineral inclusions. Also, surface finishing techniques show some variation, including scraping, smoothing and burnishing. However, no significant or convincing relationships between the various characteristics like wall thickness, exterior surface treatment and the amount and size of the mineral/organic inclusions can be demonstrated. In other words, the early pottery assemblage does not include distinct 'fine' and 'coarse' categories like it does in the later Pre-Halaf Standard Ware. Apart from technological innovations, these differences suggest modifications in the social role of ceramics in Late Neolithic societies. The recent discovery of well-preserved Early Pottery Neolithic contexts at nearby Tell Sabi Abyad I promises relevant data to further explore this issue.

Acknowledgements

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Appendix 1

Analysis of clay samples

No.	Linear dry shrinkage	Total shrinkage after firing at 700°C ox.	Grain type
1.	9%	9%	calcite / ca.15% / sub angular (SA)/sub rounded (SR) max. size 0.5 mm / sporadically quartz, feldspar, siltstone grains
2.	8%	8%	calcite / 10-15% / SA/SR max. size 1.0 mm
3.	9%	9.5%	calcite / ca. 5% / SA/SR max. size 1.0 mm / sporadically iron oxide siltstone grains (dense fabric)
4.	6%	6%	calcite / 15-20% / SA/SR max. size 0.5 mm / sporadically iron oxide siltstone grains
5.	7%	7%	calcite / ca.10% / SA/SR max. size 1.0 mm / incidentally up to 5 mm
6.	10%	10.5%	calcite / 5-10% / SA/SR max. size ca. 1.0 mm / sporadically siltstone and steatite
7.	10%	10.5%	calcite / ca.5% / SA/SR max. size 1.5 mm
8.	11%	11%	calcite / 5-10% / SA/SR max. size 0.5 mm
9.	11%	11%	calcite / ca.5% / SA/SR max. size 1.5 mm, most smaller incidentally clay lumps up to 7 mm

The colours of the clays when fired under oxidizing conditions at 700°C varies around pink (7.5YR7/3-7/4) and 7.5YR6/3-6/4 (light brown) (MSCC 2000 revised edition). All the clay samples have good firing properties and are baked to a normal to dense fabric.

Once brought in a plastic condition all clays are suitable for making coils. This was established by workability tests. (Mind, that they were selected on this property). Only clay sample no. 4 is a little short, but can still be used without problems. These clays, characterized as silty loams, show a drying shrinkage that is more or less equal to their total shrinkage at 700°C. A natural drying shrinkage of more than 5 to 7 % can be considered as problematic due to the development of cracks during drying and firing. An excellent solution to this problem is the addition of 15 to 25% of non-plastics. Even better is to add fibres, since fibres make the clay mass more coherent during shaping and drying. Obviously, this is what the early potters of Tell Sabi Abyad did.

Notes

1. In terms of the local, regional chronology this stage is known as the *Balikh IIA* period.

2. During the early stages of the Pottery Neolithic the occupation shifted to nearby Tell Sabi Abyad I.

3. Since in all cases calcite is the dominant and mostly the only grain type of significance, the material is grouped according to grain size instead of grain type.

4. Due to the influence of carbon they can also appear grey to dark grey.

5. The smoothing of the exterior surfaces tends to obliterate visible traces of the shaping process.

6. Sherds were sliced prior to the refiring. After the refiring at 750° C very pale brown (10YR8/4, 10YR7/4, 10YR8/2) to pink (7.5YR7/4) are frequently occurring colours.

7. Many sherds also show secondary-surface residues, which can be post-depositional. This includes a red residue that suspiciously resembles a slip. In addition, very fine iron components are sometimes present in the cavities left by burned-out organic matter. Because it mainly occurs in these cavities, this iron residue probably was present in the fibres themselves.

8. The adoption of plant-tempered fabric at Tell Sabi Abyad was part of a much larger supra-regional phenomenon at the beginning of the Pottery Neolithic period.

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THE MANUFACTURING TECHNIQUE OF THE COBA BOWLS AND OTHER LATE-CHALCOLITHIC POTTERY FROM OYLUM HÖYÜK, TURKEY

Abraham van As and Loe Jacobs

Abstract

Oylum Höyük is an archaeological site in southeastern Turkey. It was a regional centre on the boundary between Anatolia and Syria from the fourth millennium B.C. to the Hellenistic period. Excavations took place between 1995 and 2002, and were carried out by a joint project of the Istanbul Section of the German Archaeological Institute and the Hacettepe University in Ankara. This article reports on a technological study of the Late-Chalcolithic pottery from the western terrace of the mound. In fact, the study is a re-examination of the same ceramic assemblage, which had earlier been studied by Barbara Helwing and Atilla Engin. At the request of Barbara Helwing we have analysed the pottery in the excavation house of the Oylum Höyük expedition in the summer of 2000. This contribution deals with a reconstruction based on the observed technical features followed by a simulation experiment of the manufacturing technique of the characteristic mass-produced Coba bowls. In addition, it includes a short summary and some additional remarks on the technological aspects of the other Late-Chalcolithic pottery from Oylum Höyük.

Introduction

Oylum Höyük is situated in southeastern Turkey in the foothills overlooking the Mesopotamian Euphrates floodplain, close to the modern town of Kilis near the Turkish-Syrian border. The multi-period site was inhabited from the Neolithic period to Hellenistic times. The first systematic excavations directed by Engin Özgen (Hacettepe University, Ankara) started in 1986. Since 1995 the German Archaeological Institute in Istanbul, represented by Barbara Helwing, joined the project. One of the main objectives of the excavations was to produce a stratigraphic sequence for the western Euphrates region, because the history of this region was virtually unknown, when compared to the intensively researched regions of Cilicia and the Euphrates Valley. For the results of the recent excavation seasons we refer the reader to Özgen et al. (1997; 1999); Özgen and Helwing (2001); and since 1996 annual reports in *Kazı Sonuçları Toplantısı*.

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The Late-Chalcolithic (fifth-fourth millennium B.C.) pottery assemblage discussed here comes from several 4 by 4 metres trenches on the western terrace of the mound. The excavated remains, from each trench, have been stratigraphically analysed, after which the individual stratigraphies have been linked. The trenches document a period of occupation lasting for several centuries during the earlier stages of the Late-Chalcolithic period, Late Chalcolithic 1 and Late Chalcolithic 2 in the current terminology (see Özgen et al. 1999: 35-38).

The Late-Chalcolithic pottery assemblage includes Coba bowls (*Coba Schalen*), standard ware (*Standardkeramik*), fine ware (*Feinkeramik*) and grey-burnished ware (*Graue polierte Keramik*). Although the thorough archaeological study of Barbara Helwing and Atilla Engin (Özgen et al. 1999: 38-43) also paid attention to some technological aspects of this pottery, we were none the less asked to carry out a technological analysis of the same assemblage. A representative sample has been re-examined as to the fabric and applied manufacturing technique. For both the chronological data and the geographical distribution of the various distinguished pottery types, we refer the reader to Özgen et al. (1999: 42-43).

The Coba bowls

Characteristics

The Coba bowls named after Coba Höyük, are mass-produced, open, half globular, flat and deep bowls (Figure 1). Three categories of sizes can be distinguished. The diameter of the rim of the standard Coba bowl varies between 22 and 26 centimetres. A few bowls have a rim diameter that comes to 30 centimetres; other bowls have a rim diameter of less than 12 centimetres. Opposite to the standard and large Coba bowls, the last category of so-called miniature Coba bowls is rather thin-walled.

The standard and large Coba bowls are characterized by its rather thick walls, rough surfaces and traces of scraping and smoothing. The clay body is gritty and sometimes very calcareous. The coarse sand particles can be as large as 5 mm. Taking into consideration the shape of the pores, the bowls have been tempered with chopped straw. In general the colour of the bowls is rather uniform. According to the Munsell Soil Colour Charts (1992 revised edition) the colours at the out- and inside vary between very dark greyish brown (10YR3/2), light grey (10YR7/2), grey (7.5YR5/1), pink (7.5YR7/4) and reddish yellow (5YR7/6). In case of a mottled surface, various colours are visible on one and the same bowl: reddish yellow (7.5YR7/8), very pale brown (10YR7/4), light brownish grey (10YR6/2), dark grey (7.5YR4/1) and very dark grey (7.5YR3/1). Many bowls show a black core. The miniature Coba bowls display the same colour ranges.

A reconstruction of the manufacturing technique

Since the coiling technique is rather time-consuming it seems not very plausible that the mass-produced Coba bowls have been made in this technique as stated in Özgen et

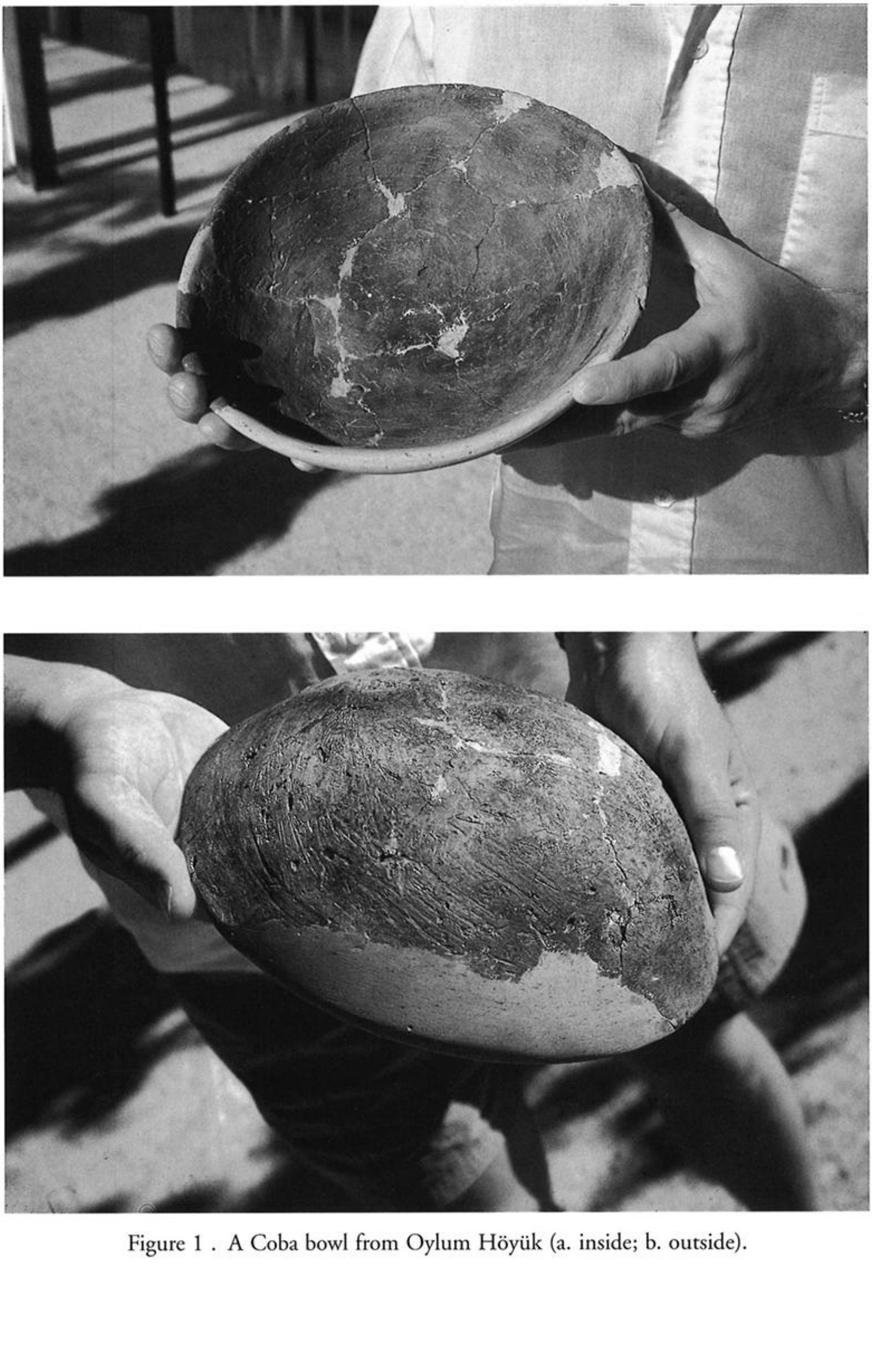

Figure 1 . A Coba bowl from Oylum Höyük (a. inside; b. outside).

al. (1999: 38). Moreover, we have not found clear and convincing traces of the coiling technique, e.g., marks of possible joins (fractures, slight thickenings of the wall or traces of strengthening the wall at these places by tapping, scraping, smearing and smoothing). Although, characteristics of the normal dry-moulding technique have not been observed, the rather shallow form of the Coba bowls points to the use of some support during construction.

The above-mentioned characteristics led to the following reconstruction of the manufacturing technique. First, the potter prepared a rather soft clay body. Since the natural clay was rather short, its plasticity was improved by adding some dung. Furthermore, chopped straw was added in order to ameliorate the coherence of the clay. Then, a piece of clay was flattened between both hands. Supporting and rotating the slab of clay in the palm of one hand, the potter used the fist of the other hand to push the clay into a rough thick-walled bowl-like shape. Also possible is that the potter pushed the clay with using a round stone tool. Next, the potter formed the upper part of the bowl and the rim by pinching. This had to be done fast in this early stage when the cohesive clay was still weak. In a later stage the clay would be too dry for using the pinching technique without the development of little cracks perpendicular to the rim. By pinching the clay in a weak condition this could be prevented. Next, the potter corrected the shape of the wall by pressing and smoothing. After the bowls had been left to dry for a while, the rim was moistened and finished. Since the wall of the lower body of the bowl was still too thick this had to be made thinner by pressing, scraping and smoothing. It seems that a flint tool was used at the inside (see for flint scraping: van As et al. 1996/1997: Figure 8; López Varela et al. 2002). Sometimes, the rim was smoothed again. In this case, the rim was horizontally rubbed and pressed between the thumb and fingers of the potter's wet hand. The potter could also have used a small leather cloth or a plant leaf. Finally, the base was scraped at the outside and after a period of drying the Coba bowls were fired in a bonfire.

Simulation experiments

The reconstruction of the manufacturing technique as based on the interpretation of the visible technical traces was followed by simulation experiments, near the excavation house and in Leiden (Figures 2-10). For this purpose, local clay from the direct vicinity of Oylum Höyük was used. Dung and chopped straw were added to the natural clay. Next, the same forming procedure as described above was followed.

The other Late-Chalcolithic pottery categories

Apart from the Coba bowls the Late-Chalcolithic pottery assemblage from Oylum Höyük includes standard ware, fine ware and grey-burnished ware (Özgen et al. 1999: 39-41).

Standard ware

The standard ware includes bowls, pots, large pots, jars, casseroles, ceramics with a scratched decoration, polychrome painted and straw-tempered pottery, and red slipped pottery. Apart from the fine red-slipped pottery, the standard ware is made of a coarsely minerally- and organically-tempered clay body. The standard ware is handmade and fired in a bonfire at relatively low temperatures.

Some bowls look like the Coba bowls. However, the clay body contains less organic material. The bowls are, also, more carefully finished. Since complete bases were missing and the wall fragments were finished by scraping and smoothing, it was difficult to reconstruct the details of the manufacturing technique. The out- and inside colours are often mottled. They vary between very pale brown (10YR8/4), pink (7.5YR8/4) pink en reddish yellow (7.5YR8/6), pale and light red (10R6/4 and 6/6), and reddish grey (2.5YR6/1). The core is mainly black.

Most of the pots seem to have been coiled. One fragment shows characteristics of the paddle-and-anvil technique. In a few cases, criss-cross traces of burnishing were found. The pots include various shapes. The colour varies between weak red (10R 5/3), pale red (10R 6/2) and dark reddish grey (2.5YR 4/1). Most of the pots have a black core. Some black sooted pots seem to have been used as cooking pots.

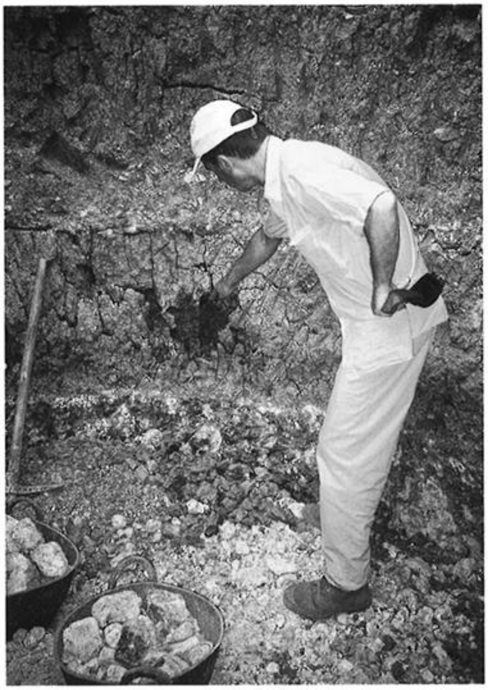

Figure 2. Collecting clay from a pit close to Oylum Höyük.

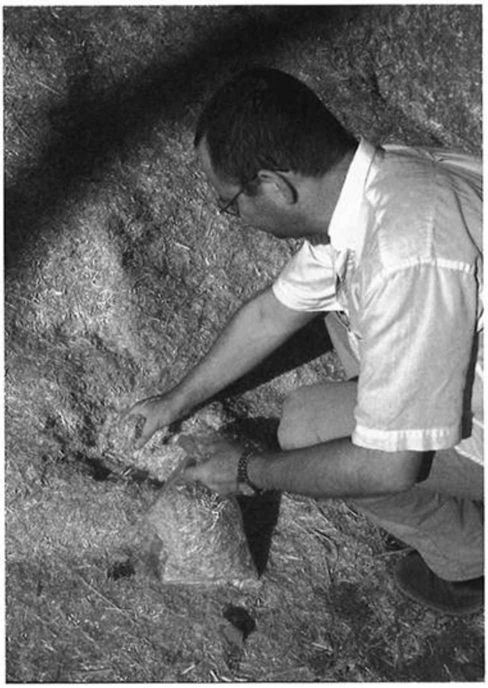

Figure 3. Collecting chopped straw.

Figure 4. Pushing the clay into a rough thick-walled bowl-like shape.

Figure 5. Pushing the clay into a rough thick-walled bowl-like shape with the use of a round stone.

Figure 6. Forming by pinching.

Figure 7. Scraping with a flint tool.

Figure 8. Forming the upper part with pressure.

Figure 9. Firing in a bonfire.

Figure 10. A collection of Coba bowl replicas

The rather thick-walled large pots and jars were made by coiling, apparently in combination with the paddle-and-anvil technique. They were finished by scraping and smoothing the surface at the outside. The colours vary between grey (7.5YR6/1), pinkish grey (7.5YR7/2), light reddish brown (5YR6/3 en 6/4) and weak red (2.5YR6/4). The large jars have a black core.

The casseroles were made by coiling. However, convex bases seem to have been formed like the Coba bowls. Sometimes, the casseroles were roughly burnished on the outside in a horizontal direction. The core is black. The mottled colour at the surface shows various colours such as reddish yellow (7.5YR 6/6), brown (7.5YR 5/2) and dark grey (7.5YR 4/1).

The thin-walled pottery with scratched decoration includes small vessels of various shapes. Their colours are mainly very dark grey (7.5YR3/1), grey (10YR4/1), greyish brown (10YR5/2) and pinkish grey (7.5YR7/2) and with a black core. They were fired in an almost completely reduced atmosphere. The pottery was formed by pinching and/or coiling. Traces of scraping and smoothing, probably with the use of a flint too, have also been observed. A linear decoration was scratched in the dry or leather-hard vessels before firing.

The polychrome painted and straw-tempered pottery is handmade and possibly scraped on the inside with the help of a flint tool. The most remarkable characteristic of this pottery is the painted decoration. It consists of a white engobe on which a red and black linear decoration has been applied with a brush. The pottery itself is very pale brown (10YR 8/2) or weak red (2.5YR 6/4) in colour. This particular category of pottery shows no black core.

The red-slipped (2.5YR6/6) ware was made by coiling and pinching, scraping and smoothing. The pottery itself is pink (7.5YR7/4) or very pale brown (10YR7/4) in colour. It often has a black core.

Fine ware

The fine ware is characterized by its very fine compact clay body with none or hardly any mineral inclusions. The mainly small-sized open vessels have carefully been finished by smoothing. The (carinated) bowls were mould-made. The fine ware includes various forms of decoration: burnishing, scratching, impressions, and red and black slip. Generally speaking, it was fired in an oxidizing atmosphere at relatively high temperatures. The colour of most vessels varies from pale yellow (5Y8/3), reddish yellow (5YR7/6) to light reddish brown (5YR6/4). Also, mottled colours occur.

Grey-burnished ware

The grey-burnished ware is made of a clay body tempered with chopped straw and mineral inclusions. The vessels were made by coiling. In general, the surface was not very carefully burnished. Consequently, the gloss is not very shiny. The colours of the surface vary from grey and dark grey (7.5YR5/1 and 4/1) to dark reddish grey (5YR4/2) and weak red (5YR5/4) or mottled colours. The grey-burnished ware often has a black core.

Epilogue

The ceramic assemblage from Late-Chalcolithic Oylum Höyük consists of handmade pottery. The pottery was often made by using the coiling technique. However, traces of pinching, moulding and the paddle-and-anvil technique have also been observed. The colours of the vessels indicate that the potters fired their products in a bonfire. Considering the workability properties of the clay samples, taken in the direct vicinity of the site, they could very well have been made locally. A remarkable category within the assemblage is the Coba bowls. These bowls are, like the handmade, well-known Mesopotamian bevelled-rim bowls from the Uruk period (see Kalsbeek 1980), mass-produced and standardized. Mass-production of pottery is often considered to be one of the aspects pointing to developing socio-political complexity in the Syro-Anatolian borderland (Özgen et al. 1999: 19; see also Akkermans and Schwartz 2003: 187).

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PRELIMINARY DATA ON STARČEVO-CRIŞ AND DUDEŞTI POTTERY FROM TELEOR 003, TELEORMAN RIVER VALLEY, SOUTHERN ROMANIA

Abraham van As, Loe Jacobs and Laurens Thissen

Abstract

Since 2003 the Department of Pottery Technology has participated in the Southern Romania Archaeological Project (SRAP) directed by Douglass Bailey (Cardiff University) and Radian Andreescu (National Historical Museum, Bucharest). Between 26 August and 9 September of that year a part of the Neolithic pottery from Teleor 003 was technologically analysed in the Teleorman County Museum of Alexandria. The pottery belongs to the successive Starčevo-Criş and Dudeşti periods, dating to the sixth millennium cal B.C. The research-work was carried out in close cooperation with Laurens Thissen who started the over-all archaeological ceramic research (shape typology included) of Teleor 003 a year before. Following are the preliminary results of the analysis of the raw materials and manufacture of the pottery, together with a first impression of the clay samples taken in the vicinity of Teleor 003. The clay samples and pottery samples sent to Leiden have not yet been analysed. The results of these analyses will be included in the final publication.

Southern Romania Archaeological Project

The Southern Romanian Archaeological Project (SRAP) has been active since 1998 investigating prehistoric land-use and settlement patterns in the Teleorman River Valley in the Lower Danube Plain (Bailey et al. 1999; 2001; 2002; 2004). The multi-period site of Teleor 003 (Figure 1) has been excavated since 2002 and was inhabited throughout the sixth millennium B.C. Sites in the close vicinity testify to occupation during the fifth millennium B.C. as well. Ceramic studies form an essential part of the SRAP. Among the major aims are:

- to study pottery use and manufacture in Neolithic societies in Southern Romania;
- to analyse developments through time from the beginning of the adoption of the new technology in the sixth millennium B.C.; to trace the shifts in the ceramic assemblages from Starčevo-Criş to Vădastra times (end sixth millennium B.C.);
- to examine deposition patterns of pottery, and to relate these patterns to the archaeological features (e.g., surface houses, pits, refuse areas, etc.);
- assuming Starčevo-Criş society as partly mobile, or semi-sedentary, to understand how this reflects in pottery use;

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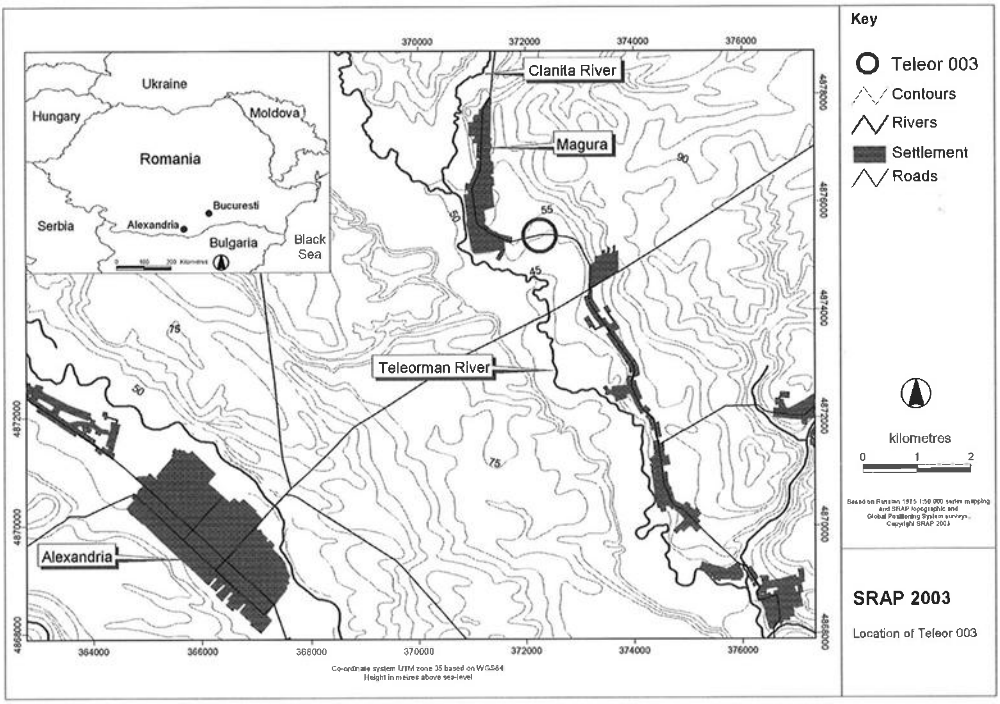

Fig. 1. Location of Teleor 003 in the Teleorman River Valley in south central Romania (courtesy Steve Mills).

– to address questions relating to the adoption of pottery during the Starčevo-Criş period; are there links with Neolithic subsistence change? If so, may the adoption of ceramics be related to new foodstuffs, or to new ways of dealing with food in general? Were cooking methods a continuation from older, previous practices, or had ceramics and new foodstuffs a major impact on ways of preparing food? Did it create new tastes, new ways of eating, and of drinking? Different contexts of eating? Did the new technology change ways of storage? Can we infer use and presence of non-ceramic containers for the period previous to the Starčevo-Criş period?

Below we present some of the technological aspects involved in the manufacture of the Teleor 003 pottery. Some of the other questions mentioned above have been discussed in Thissen (in press). Pottery use and technology from another SRAP site, Teleor 008, Boian period, have been explored in Thissen (2004).

Ceramic material and methods

The technological ceramic research included the study of the fabric (inclusions and pores) and manufacturing technique (forming, surface treatment, decoration and firing) of a ceramic assemblage excavated at Teleor 003 and the gathering of clay samples and samples of various kinds of organic materials and other potential temper in the direct vicinity of the site.

The ceramic assemblage existed of 1,295 (diagnostic and non-dagnostic) pottery sherds. These sherds came from sondage S8 executed in 2001 by Pavel Mirea: 405 sherds dating from the Early Neolithic Starčevo-Criş period from pit B5 and 890 sherds dating from the succeeding Dudeşti period from pit B3.

The analysis of the forming technique and surface treatment was based on the observation and interpretation of technological features. The firing atmosphere was analysed by interpreting the colours of the surface (inside/outside) and core of the sherds using the Munsell Soil Color Charts (MSCC). The original firing temperature was estimated on the ground of the hardness of the sherds and will more precisely be determined by refiring tests in the Laboratory of Pottery Technology.

For the fabric analysis a representative sample of 90 sherds was taken (Starčevo-Criş period: 42 sherds; Dudeşti period: 48 sherds). The fabric was microscopically investigated on a fresh break and a grounded edge (10x magnification). For the identification of calcareous inclusions the HCl test was carried out.

Manufacturing technique

Forming, surface treatment and decoration

All pottery was handmade by using the coiling technique. Some open forms were probably made in a mould. Indications of the sequential slab building technique were not found.

The surface of the Starčevo-Criş pottery was either roughened [surface roughened ware (Figure 2: 1)] or burnished [plain burnished ware (Figure 2: 2)], red slipped ware (Figure 2: 3) and red slipped painted ware. The Dudeşti pottery only includes surface roughened ware (Figure 2: 4) and plain burnished ware Figures 2: 5 and 6).

In some cases the roughened surface seems to be scraped by using a flint tool. In other cases the surface was roughened by applying a rough clay coat on the outside (barbotine ware). The roughened surface gives a better grip.

For the red slipped ware of the Starčevo-Criş period an iron containing *engobe* was used. Apart from the red slipped ware various other decoration techniques could be distinguished: incision, fingernail and tool impression, appliqué, etc.

Firing

Many pottery sherds have a black core. The surface colours are not always uniform, but often show a range of colouring. The colours vary between very dark grey (5YR3/1), grey (5YR5/1), reddish grey (5YR5/2), light brownish grey (2.5Y6/2), brown (7.5YR5/4), very pale brown (10R7/3) and pink (5YR7/3). This indicates that the pottery was fired in a bonfire in a reducing or neutral atmosphere. The red (10R5/6; 10R4/8; 10R5/8; 2.5YR4/8) and reddish yellow (5YR6/6) surface colour of the red slipped ware points to a short period of end oxidation.

The estimated firing temperature of the pottery was ca. 800°C.

Fabric analysis

The fabric analysis included the determination of (1) the sort, size, roundness, percentage, and sorting of the non-plastic mineral inclusions, and (2) the percentage and length of the organic fibres.

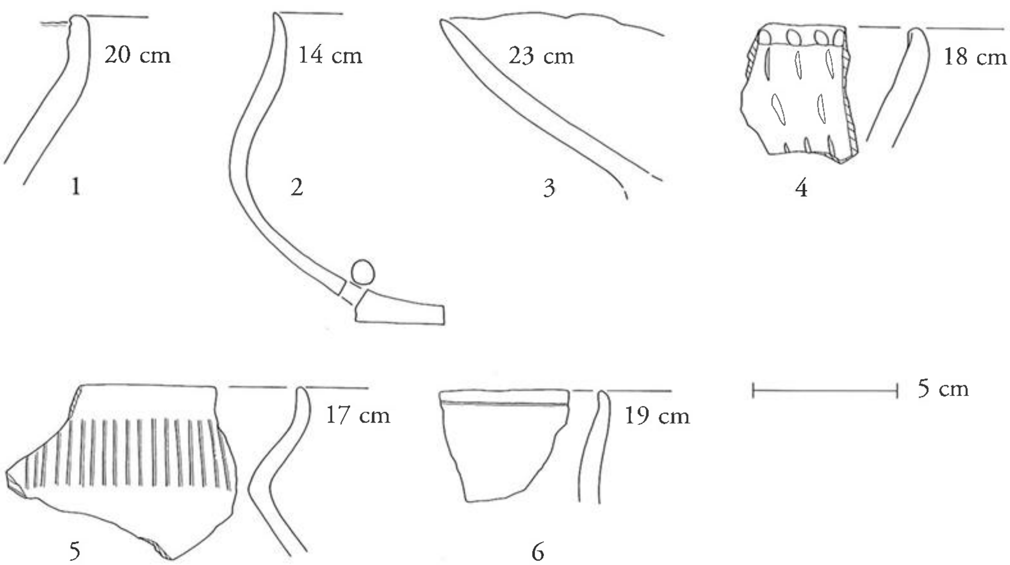

Fig. 2: 1. Starčevo-Criş surface roughened ware: collared pot (Teleor 003, S8/B5).

Fig. 2: 2. Starčevo-Criş plain burnished ware: S-shaped bowl (Teleor 003, S8/B5).

Fig. 2: 3. Starčevo-Criş red slipped ware: everted dish on pedestal base (Teleor 003, S8/B5).

Fig. 2: 4. Dudeşti surface roughened ware: holemouth pot (Teleor 003, S8/B3).

Fig. 2: 5. Dudeşti plain burnished ware: medium-sized bowl (Teleor 003, S8/B3).

Fig. 2: 6. Dudeşti plain burnished ware: collared-carinated bowl with 'chanelled' decoration (Teleor 003, S8/B3).

Because of the dark core of most of the sherds the identification of the mineral inclusions was rather difficult. Since the sherds will certainly turn into a light colour after refiring them in an electric kiln (oxidizing atmosphere) the mineral will be better visible. This verification has still to be done in Leiden.

In Tables 1 and 2 a description of the fabric of the various pottery categories of the Starčevo-Criş and Dudeşti periods is given. In this description only the dominant type and maximum size of the mineral inclusions and fibres are mentioned. Apart from the dominant mineral inclusions, feldspar, iron oxide siltstone, calcareous siltstone and some other mineral inclusions are found in varying quantities.

Starčevo-Criş period	Surface roughened ware	Plain burnished ware	(Painted) red slipped ware
Samples	n = 13	n = 13	n = 16
Mineral inclusions			
Dominant mineral	quartz	quartz	quartz
Maximum size	5 mm	3 mm	3 mm
Roundness	angular (A)/ sub angular (SA) / sub rounded (SR)	A/SA/SR	A/SA/SR
Percentage	10-20%	15-25%	15-30%
Sorting	bad/moderate/good	bad/moderate/good	moderate
Fibres			
Percentage	5-30%	5-25%	5-30%
Maximum length	5 mm	5 mm	8 mm
			N.B. Six samples hardly contained any mineral inclusions above the silt fraction.

Table 1. Fabric of Starčevo-Criş pottery from Teleor 003.

Dudeşti period	Surface roughened ware	Plain burnished ware
Samples	n = 25	n = 23
Mineral inclusions		
Dominant mineral	quartz	quartz
Maximum size	3 mm	2 mm
Roundness	A/SA	A/SA
Percentage	15-45%	10-45%
Sorting	bad/moderate/good	moderate/good

Table 2. Fabric of Dudeşti pottery from Teleor 003.

Clay samples and potential tempering material

Three samples of clay were taken from the floodplain of the Teleorman River. Another eight clay samples were taken from the floodplain of the Claniţa River, a tributary of the Teleorman River (Figure 1). At first sight the clay samples of the floodplain of the Claniţa River seem to conform with the results of the fabric analysis of the Neolithic sherds of Teleor 003. If further research of the clay samples in Leiden confirms this, we may assume that the pottery was locally made. Moreover, the investigation of the clay samples will give information whether the natural clay was prepared by the potters or not.

Preliminary conclusions

It is likely that one basic local micaceous clay was used for the manufacture of the Starčevo-Criş and Dudeşti pottery of Teleor 003. The natural clay contained quartz and other mineral inclusions in varying quantities, amongst which was calcareous siltstone. The potters of the Starčevo-Criş period nearly always added organic material to their clay. Those of the Dudeşti period added organics much less so, and in the sample we studied no fibre-tempered sherds were present. Additionally, in the Dudeşti period we find a fabric that more often seems to contain calcareous siltstone than in the previous period. Although various reasons for this change of clay body can be thought of, for the moment it better supports the idea of a shift to other clay beds used by the potters than an archaeological/chronological important fabric category.

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05-12/05	2004	St. Lucia (W.I.) (A. van As and L. Jacobs).
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