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ABSTRACT

Discussing pottery standards – an everlasting story? Proposal of a basic recording system for African ceramics

Friederike Jesse – Ulrike Nowotnick

We present here a recording scheme for archaeological ceramics in Africa. This is an outcome of workshop discussions within the priority program Entangled Africa and is put up as methodological report for further discussion. This basic recording scheme is intended to provide a common terminology for pottery recording which is easy to handle as well as to facilitate comparison between pottery assemblages of the Entangled Africa sphere in Saharan and sub-Saharan Africa. It is hoped that other projects will be interested in expanding its data with further materials and thus contribute to a broader interdisciplinary exchange on African pottery.

KEYWORDS

Africa, Pottery, Recording scheme, Decoration

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Introduction

1 Pottery, as one of the most important artefactual categories for archaeological research, is widely used as a basic tool for creating chronological schemes and archaeological cultural units. Yet, pottery vessels are highly diverse objects that encompass a wide range of raw materials, shapes and appearances. Each pot is assembled by individuals choosing from a broad range of possible configurations, which result in multiple combinations of parameters. Assuming that these combinations are not random but reflect specific skills, practical considerations and technological options, as well as cultural values and social concepts, this high variability in pottery needs to be organised in order to answer specific research questions.

2 The archaeologist, when faced with masses of pottery from excavations or surveys, needs to choose the most important parameters from the vessel and record these in a spreadsheet or database, before the pottery can be sorted into types and classes .[1] Thus, the pottery documentation process (recording, photographing, and drawing) represents an important intermediate step between fieldwork and ceramic analysis. It provides a link between the actual objects, which are often stored away in find magazines, and the subsequent scientific evaluation (Ozainne 2017). The appropriate tool for this data collection is a pre-defined recording scheme, which ensures the documentation of primary information about the objects in a consistent and economic way. These field notes can then be turned into a digital file and used as database for analysis or as catalogue to accompany vessel drawings in publications.

1 The recording scheme discussed here refers to diagnostic ceramics at a stage when the entire assemblage has been reviewed. The undiagnostic material, e.g., the mass of small or of undecorated body sherds, is commonly treated in a preliminary step by counting, weighting and recording in a quantitative assessment (for further details cf. Orton – Tyers – Vince 1993: 166-181; Verdan 2011; PCRG – SGRP – MPRG 2016; Livingstone Smith – de Francquen 2017). What is regarded as diagnostic is determined by the researcher and depends very much on the site and context the ceramics come from. A smaller pottery collection will generally be completely recorded, a large pottery collection with thousands of sherds will be sampled.

3 For want of a common recording standard, there is a multitude of archaeological schemes to record and classify pottery in African archaeology. These different approaches are often shaped by and bound to local research traditions and thus vary considerably, hampering cross-cultural comparisons in African pottery studies, even on a regional scale. For this reason, the last decades have seen a growing interest by those working on African pottery to exchange in workshops and meetings.

4 To name but a few examples:

- several « Tables rondes » in Aix-en-Provence, organised by A. Gallin and D. Commelin, outcomes were the web page of CERAFIM (https://lampea.cnrs.fr/cerafim/) and the Actes de la Deuxième Table Ronde « La Céramique imprimée du Sahara et de ses marges » (Gallin – Commelin 2004)
- a 2-day-symposium « La céramique nubienne antique » in Lille (June 2006), organised by B. Gratien;
- meetings on roulette decoration, organised by A. Haour und K. Manning, resulting in the publication "African Pottery Roulettes" (Haour et al. 2010);
- various meetings on pottery from the Bayuda, Sudan, organised mainly by J. Phillips, R. David and S. Büchner (www.academia.edu/28723474/Bayuda_project_proposal);
- workshop on Saharan and Sub-Saharan handmade pottery organised by the Trans-SAHARA project, 2015 in Leicester (Gatto 2020);
- pottery workshops at conferences of the International Society for Nubian Studies (ISNS), e.g., in Prague 2016 and Paris 2018;
- workshop on "Ceramics of Ancient Nubia", in Warsaw (May 2018), organised by A. Berlin, G. Majcherek and T. Rzeuska (https://www.asor.org/levantineceramics/workshops-2018).

5 These meetings aimed at 1) a scientific exchange for comparing pottery at a regional or supra-regional level and 2) agreeing on correlations between various terms and schemes employed by ceramic studies in different regions and research periods. They were triggered by the need to achieve a broader knowledge for comparing regional ceramic materials and the need for a common language in pottery studies and classifications. These meetings as well as a number of publications on African ceramics clearly show a range of cross-cultural similarities in African pottery traditions, both, over wide geographical distances as well as over great time depths (e.g., Drost 1967). Examples for widespread ceramic characteristics in Sub-Saharan Africa are:

- shaping with the paddle-and-anvil technique, also known as "pounding the clay with a paddle into a concave mould"[2];
- surface texturing of vessels by rouletting or mat impression[3];
- prominence of impressions as decoration technique (e.g., the ubiquitous use of rocker stamping in its different varieties) and certain decorative patterns, like the Saharan "Wavy Line" and "Dotted Wavy Line" patterns[4];
- intentional blackening of the pot's surface by fumigation, i.e., by adding carbon-rich vegetal matter during the firing process or by sprinkling organic substances on vessels still hot from firing[5].

6 These over-regional similarities in African ceramic traditions are not to be seen in the sense of essentialist culture concepts, implying that all potters shared these

2 e.g., Crowfoot 1925; Williams 1983: 29-36; Huysecom 1994; Gosselain 2000, 2008; Mayor 2011; David – Evina 2016.

3 e.g., Gosselain 2000; Livingstone Smith 2007a and b; Gatto 2010, 2020; Phillips 2010; Mayor 2011.

4 e.g., Sutton 1974; Jesse 2003; Mohammed-Ali – Khabir 2003.

5 e.g., Crowfoot 1925: 131-132; Schneider et al. 1989: 18; Gosselain 2008.

traditions or had common cultural roots. They should rather be considered as a chance to identify and analyse the mechanisms behind these trans-regional commonalities in ceramic technologies and styles.

7 Comparison is fundamental to archaeology but it is usually employed on a regional scale. In a broader perspective, a common recording language and a detailed documentation scheme are essential to evaluate pottery in a consistent way and to achieve meaningful results. They provide the analytical basis to acknowledge wider connections within the African continent, for example in the transmission of craft practices and technical know-how beyond cultural boundaries or through mobility patterns. The manner of comparisons and how they are used is at the discretion of the researcher. Points of interest for cross-cultural ceramic comparisons are decorative patterns (e.g., Livingstone Smith 2007b) as well as for example details of manufacturing techniques, the correlation between vessel function and wall thickness or temper, or the morphological variability in relation to subsistence practices or degrees of mobility, etc. One of the Entangled Africa members, the Connecting Foodways project, investigates entanglements in culinary traditions through the comparison of food-related coarse wares across different cultural complexes, taking into account functional traits like e.g., vessel form, temper, and use-wear traces (Matthews 2022; Nowotnick – Matthews 2022). Accordingly, large corpora of undecorated and utilitarian ceramics stand ready to be exploited as indicators of cultural interaction within Africa.

8 It is the commonalities beyond cultural boundaries that make past and future efforts worthwhile to establish correlations between different recording systems, or to go one step further and create a common framework. This should consist of an easy-to-handle basic standard for recording pottery and, most important, a common language respectively terminology. The importance of the terminology to be used in the description of pottery was already agreed on in the 1960s at the Second Conference of West African Archaeologists in Ibadan, however no final conclusions were reached upon since that time (WAAN 1967: 44; Gosselain – Livingstone Smith 2013). A common basic framework for pottery recording would facilitate comparison, on a regional but in long-term perspective also on a cross-regional and even a diachronic scale when focussed on specific research questions.

Entangled Africa pottery workshops

9 Researchers involved in the priority program Entangled Africa[6] have started to approach this task. The Entangled Africa program aims at studying inner-African relations between the rain forest and the Mediterranean between c. 6000 – 500 BP. It comprises projects with diverse research agendas and study areas, ranging from West African potting terms in Mali to ancient pathways in Northern Ethiopia, and from prehistoric axes to medieval palaces (Linstädter – Sigl 2021). Notwithstanding their wide geographical, temporal, and methodological range, many of the Entangled Africa projects use pottery as a marker for cultural and chronological groups. Pottery thus provides the best means to facilitate collaboration of the involved projects in studying cross-cultural contacts and interaction within Africa and to start with within the geographical Entangled Africa sphere which means Saharan and sub-Saharan regions.

6 The priority program 2143 Entangled Africa ("Intra-African relations between rain forest and Mediterranean, ca. 6000 – 500 BP") was established by the DFG in 2017 for a period of six years. The first phase started in 2018 and included twelve different projects (https://www.dainst.blog/entangled-africa/en/home/).

Fig. 1: First ceramic workshop of the Entangled Africa researchers at Goethe University in Frankfurt/Main, June 2019. Participants presented pottery finds from different study areas for direct comparison to gain an understanding of possible technical, typological and decorative similarities across Saharan and Sub-Saharan Africa.

10 A first Entangled Africa pottery workshop was organised in June 2019 in Frankfurt/Main, bringing together researchers of various projects and their ceramic finds[7]. Spreading out pottery sherds from different study areas in Nigeria, Chad, Sudan and Ethiopia on the table in Frankfurt stimulated discussions on similarities and inter-regional parallels that can be drawn between the different regions, cultural phases and ceramic styles (Fig. 1). Soon after, discussions shifted from the actual pottery sherds to the various uses of specific ceramic terms. It thus became obvious that a consistent terminology and a common approach to recording pottery are of utmost importance for any cross-cultural comparison between ceramic inventories wide apart.

11 At the annual Entangled Africa meeting in Berlin in December 2019 we emphasised the necessity to find a common understanding on certain terms and to establish a basic set of criteria for pottery recording. For this purpose, we compiled the existing ceramic recording schemes used by the involved projects[8] and examined them for common features in their systematics. Based on this synopsis, we created a synthesis representing those categories that occur in all ceramic recording schemes, such as shaping technique, firing condition, surface treatment, etc. This provides the framework for a mutual comprehension between different ceramic inventories and the basis for a common recording scheme. For decoration, the most complex issue of pottery

7 Participants were: C. Breninek (Leipzig), J. Eger (Münster), F. Jesse (Köln), T. Karberg (Münster), J. Linstädter (Bonn), C. Magnavita (Frankfurt), U. Nowotnick (Berlin), D. Raue (Leipzig); https://www.dainst.blog/entangled-africa/en/report_2019_03/

8 Project 1: Prehistoric axes in the Sahara: a neglected find category. Haches à gorges, necked axes, Darfurbeile – contextualization of a special form. Project 2: Connecting Foodways: Cultural Entanglement and Technological Transmission between the Middle Nile valley and central and eastern Africa during the Early Iron Age. Project 3: Interregional Linkage Investigations in Northern Kordofan (InterLINK). Project 4: The Lake Chad Region as a Crossroads: first archaeological and oral historical investigations into early Kanem-Borno and its intra-African connections. Project 7: Routes of Interaction: Interregional Contacts between the Northern Horn of Africa and the Nile Region. Project 9: Connecting the lower middle Niger through borrowed words and shared objects: Archaeo-linguistic network analysis and modelling of cultural entanglements between the Malian Sahara and the Nigerian forests (AD 700-1500). For more information see https://www.dainst.blog/entangled-africa/en/the-projects/.

classification, a short catalogue of decorative patterns was compiled to facilitate a quick general characterisation of a pottery assemblage.

12 It was originally planned to discuss these preparatory results in further ceramic workshops in 2020, both internally within the Entangled Africa program as well as with other researchers working on African pottery. Due to the Corona pandemic, all hands-on workshops had been cancelled and our discussions shifted to the virtual space. In six online meetings between June and November 2020, the Entangled Africa pottery specialists agreed on details and approaches for a common recording system (cf. www.dainst.blog/entangled-africa/en/reports/).

13 We agreed to base the recording system on the vessel as major unit, instead of individual sherds. That means that multiple fragments of a pot are counted as one unit, but also a single sherd can represent the complete pot it once belonged to. A vessel unit is thus formed by those sherds which belonged to the same pot[9], whereby common identity is achieved either by sherd joins or by strong indications of shared identity based on the same fabric, form, and finish, etc. (Keding 1997: 36-37; Jesse 2003: 81). Details on this 'vessel unit' then include information on form, manufacturing technique, ware, firing, surface and decoration of the vessel. Although these categories are recorded by most researchers and seem rather trivial, we have observed significant differences in the level of detail and the units of recording. For example, some projects recorded dimensions in real units (in mm or cm) and some in pre-defined size categories (small, medium, large). Moreover, a project dealing with surface material from a survey focused mainly on decorative styles, whilst a project concerned with food-related vessels puts much attention on fabrics and use-wear traces.

14 To overcome such structural differences, unification was necessary. The task was to find a balanced way between a rapid data recording and a core database that is detailed enough to provide all essential information for understanding the assemblage. Striving for systematic comparisons between distant assemblages, two basic requirements should be met:

- a number of main categories need to be present in all recording systems,
- these include sub-categories that should be documented in a consistent way, employing the same terms and units in all schemes.

15 We established a standard minimum list of categories, sub-categories and values to be used for pottery recording by the Entangled Africa projects. It is the outcome of joint efforts, established by all participants of the pottery workgroup. We furthermore provide a user manual (Appendix 1) and a catalogue of decorative effects (Appendix 2) as pragmatic tools to enable quick and easy application.

Basic recording scheme

16 The main aim of the recording scheme is to be applicable to all kinds of pottery assemblages, be it from a survey, an excavation, or a study collection, and be it single sherds or complete vessels. Furthermore, the recording categories should be easily understood by ceramic specialists as well as newcomers to guarantee a broad acceptance and thus a wide application of the scheme. Therefore, simple and very gen-

9 This approach considers the reconstructed pot as historical unit. It does not refer to quantitative means of calculating the minimum number of vessels of a particular ware or type by estimated vessel equivalents (*eves*) or pottery information equivalents (*pies*) (Orton et al. 1993: 171-175).

eral terms were listed as values for the different categories, tallying vessels in open or closed shapes, rims and bottoms as simple or modelled forms, and tempering materials as organic or mineral inclusions, or a mixture of the two. The recording scheme will be briefly characterised below, while a more detailed user manual can be found in Appendix 1.

17 As stated above, the main structuring entity is the "vessel unit", of which a set of technological features, measurements and descriptive details are to be documented. Basic measurements include the weight, the diameter (rim, body, base), the wall thickness and the preserved height of the vessel. The vessel shape as well as rim and bottom forms are described in a very general way, using main vessel classes such as bowl, cup, jar, etc. The manufacturing method differentiates between hand-built and wheelmade or a combined shaping technique. The firing conditions, such as surface colour, firing zones (oxidised, reduced) as well as firing quality and hardness are useful categories to describe involved technologies and craftsmanship. Ware group (fine ware, utility ware, coarse ware), tempering material, surface treatment, use traces and modifications should be recorded as well. For describing decoration, we opted for a two-fold system. The focus of the recording scheme is on the decoration technique and a repertoire of decorative patterns. Additionally, a short catalogue of effects was established to account for a quick characterisation of the pattern (see below and Appendix 2).

18 The basic recording scheme was set up as an Excel spread sheet (Fig. 2) which can be used as pro-forma sheet for field recording of primary data and serve as database for ceramic evaluation. This serves as low-key solution, being both easily accessible and ready to use for managing larger datasets, including data analysis and graphic tools. Spreadsheets provide the link between paper forms, necessary when working in remote areas without reliable power supply or internet coverage, and sophisticated software

vessel unit	vessel part	no. of sherds	weight (in g)	diameter (in cm)			height (in cm)	thickness (in mm)			vessel form	
				rim	body (wall)	base		rim	body (wall)	base	open / closed	sub-category

Fig. 2: Extract of the basic recording scheme to serve for field recording and for post-excavation assessment.

solutions to which the datasets can be mapped for data storage, statistical computing, or open-access communication.

19 Of course, not all criteria can be investigated from every assemblage. And not all categories mentioned in the basic recording scheme are equally apt for comparison. Emphasis was therefore placed on data relevant for cross-regional comparability. Beyond these, further background data need to be recorded, if the scheme is intended to serve as a field record. Basic information to be added are, for example, details on the find spot, the object's place of storage, the state of preservation, as well as references to other documentation media (e.g., photographs, drawings, etc.).

20 Thus, the proposed scheme is to be understood as a basic framework for future ceramic studies. It is always feasible to extend it to individual agendas and requirements of a research project, as long as its basic components and terms are maintained. Following this recording scheme allows for a first rough characterisation of a ceramic inventory, whether from an excavation, a survey, or an archived collection. If applied consistently for multiple assemblages, it enables inter-site and inter-regional comparison between different ceramic inventories, being capable of bridging greater distances, for example to understand similar approaches in potting traditions or in day-to-day activities like food preparation or consumption. To which extent comparison is done, if at all, depends on the respective research agenda and questions.

21 As its individual components have been compiled from various projects across Africa, this recording scheme inevitably represents a compromise. Each Entangled Africa research project has contributed terms and approaches but was also compelled to abandon one or the other familiar vocabulary in order to build the broadest possible consensus. This proved to be beneficial because the joint competences of its participants contributed to critically review individual approaches and to achieve a better appreciation for alternative research strategies.

form				**shaping technique**	**surface colour**		**surface treatment**		**ware group**	**temper type**	**inclusions**
rim form		base form			exterior	interior	exterior	interior			

Pottery decoration - short catalogue of decorative effects

22 Pottery decorations are essential elements for cross-regional comparisons. Although they represent the most complex aspect when recording African pottery, decorations are generally regarded as culturally and chronologically diagnostic. In contrast to more functional features, such as wall thickness or tempering material, specific pottery styles and their distributions are conceived to reflect past sociocultural identities and thus illustrate social spaces of shared knowledge[10]. At a regional level, pottery decoration is often used to define an archaeological group or cultural unit. However, the broad geographical spread of specific decorative patterns, e.g., Wavy Line, Leiterband or single decorative elements such as a plastic wavy band, indicate broader distribution patterns that allow to grasp inter-regional entanglements and connections beyond and between archaeological cultures

23 To deal with the complexity of recording pottery decoration and to provide a system easy to handle, an approach developed during the Cologne research project ACACIA for the Wadi Howar region was adopted. In order to facilitate a quick initial recording of pottery in the field, a so-called "short decoration catalogue" was compiled there. This compilation included rough classification categories that have descriptive and – above all – chronological relevance. Thus, "(Dotted) Wavy Line", Laqiya pattern, Leiterband, but also mat-impressions and roulette are basic categories. The decisive factor for the classification into a category is the overall impression that the decoration of a vessel unit makes on the person working on it. This "short decoration catalogue" has proven to be very effective for initial evaluations of the Wadi Howar ceramic material and therefore seemed a good approach for recording decorative effects in the regions covered by the Entangled Africa projects. Unlike the basic recording scheme, which documents decoration by technique, here the visual effect of the decor is taken into account rather than the tool or the motor action with which it was applied. Very small sherds may not allow to identify layout and pattern, but even in this case a rough classification of the decoration technique as impressed or incised is possible indicated in the basic recording scheme.

24 The main focus of the decoration catalogue therefore is the general impression of the design. This means here, that the combination of layout and decorative pattern is more important than the individual motif or technique. The decoration catalogue shall facilitate a quick descriptive assignment of a pottery assemblage and a first chronological and / or cultural identification. It is, however, not intended to replace a detailed data recording of ceramic decoration, which takes into account that different parts of a vessel can be decorated by different tools, techniques, motifs, etc. A detailed recording of the decoration can be achieved in a separate scheme which is designed in compliance with a project's specific needs. This is also the place to include detailed recording of rim top and rim band decorations as both, especially the rim top, display a special repertoire of decorative patterns.

25 The proposed catalogue is a subjective compilation present in a limited number of assemblages and hence is far from being exhaustive. It reflects the decorative repertoire present in the Entangled Africa projects which participated in the workshop. As such, it already offers a good sample of decorative elements present in Saharan and sub-Saharan Africa.

10 e.g., Keding 1997; Gosselain 2000, 2011; Jesse 2003; Jesse – Keding 2007.

Decorative effects	Dekorationseffekte	Effets décoratifs
Wavy Line	Wellenlinie	Lignes ondées
Herringbone pattern • simple • alternating	Fischgrätmuster • einfach • alternierend	Chevron • simple • alternant
Band/Bands of parallel dotted lines	Band/Bänder aus parallelen Punktlinien	Ruban/Rubans de lignes pointillées parallèles
Row(s) of impressions	Eindruckreihen	Lignes imprimées
Planar decoration bands	Flächige Bänder	Décor en rubans de grande étendue
Zigzag • plain (straight or curved) • dotted (straight or curved) - densely/closely packed - widely spaced	Zickzack • glatt (gerade oder gebogen) • gepunktet (gerade oder gebogen) - eng gearbeitet - weit gearbeitet	Zigzag • spatule (droite ou courbée) • imprimé (droit ou courbé) - imprimé de façon très rapprochée - imprimé de façon étendue
Zigzag lines (incised or roulette)	Zickzacklinien (geritzt oder Roulette)	Lignes de zigzag (incisées ou par roulette)
Leiterband (includ. Halfmoon-Leiterband)	Leiterband (einschl. Halbmondleiterband)	Leiterband (y inclus Halbmondleiterband)
Hatches	Schraffuren	Hachures
Geometric patterns (e.g. triangles, lozenges, checkerboard)	Geometrische Muster (u.a. Dreiecke, Rauten, Schachbrett)	Décor géométrique (par exemple triangles, losanges, échiquier)
Complex geometric pattern	Komplexe geometrische Muster	Décor géométrique complexe
Single imprint / punctuation (linear or planar)	Einzelne Eindrücke (linear oder flächig)	Impression simple (en lignes ou en grande étendue)
Symbol	Symbol	Symbole
Figural motif impressed (comb, stamp), incised, painted, plastic application	Figürliche Darstellung eingedrückt (Kammstich, Stempel), geritzt, Bemalung, plastisch	Représentation figurative imprimée (peigne, tampon), incisée, peinte, application plastique
Application	Plastische Verzierung	Décor par application plastique
rippled / ribbed surface	Gerippte Oberflächen	“rippled surface” (Surface vergée)
Textile texturing (Roulette, Mat impression)	Flechtwerk/Textur	Vannerie (Entrelacs) / texture
Roughening	Aufrauhung	Grattage (rendre rugueux)
Scraping	„Besenstrich“	Grattage
Pattern burnishing	Musterglättung	Lissage en motif
Notched rim	Gekerbter/gezähnter Rand	Bord crénelé

Fig. 3: Main categories of visual decorative effects

26 The table shown in Fig. 3 provides an overview of the decorative effects categorised so far. The illustrated catalogue of effects can be found in Appendix 2. It was intended to create a manageable list of effects that enables an initial and quick characterisation of an assemblage and to define a set of consistent names and terms for these effects. Most important were striking designs which have a specific chronological and cultural relevance but ever present "run-through" patterns, such as zigzag lines, are also included.

Conclusion

27 This paper describes efforts made in unifying ceramic recording schemes and proposes a standard for African ceramics, listing the minimum range of variables required to be recorded. It is intended as a methodological report serving as a guide for practical and educational purposes and to trigger further scientific discussion. In respect to the wide range of collaborators and their diverse scientific backgrounds, it is hoped that the suggested recording scheme represents a good starting point for optimising collaboration within the field of African ceramic studies. The intention is less to convince everybody to adopt this scheme but to invite researchers to participate in networked and better coordinated research activities.

28 With these efforts, we hope to establish a useful standard for data recording as well as a common vocabulary to describe archaeological pottery in Africa. We placed emphasis on using criteria that are well-established in ceramic processing rather than introducing new ones. Agreeing on common categories and sub-categories shall also limit recording much additional data that would mean intolerable extra work for the archaeologists, who are oftentimes overloaded with the amounts of pottery finds recovered.

29 For newcomers in pottery analysis, this proposed recording scheme may provide a helpful guideline for data collection which is immediately applicable in practice and which can be extended to individual research objectives. For long-established projects, the most likely option would be to map pre-existing data to the criteria of the recording scheme. In the case that mapping is not feasible, additional work will be inevitable in order to complete the minimum list of values. This would be a worthwhile effort as it provides a number of benefits. First, an "extended" ceramic scheme allows for a much greater sphere of application. When all basic categories are recorded in a systematic way, they can be used for comparisons by a much wider circle of researchers, far beyond the involved project members. Second, a more comprehensive pottery database is better suited for future assessments, as it avoids the need to re-evaluate original finds for answering new or hitherto unconsidered research questions. Third, the manual provided in Appendix 1 can be used as practical guide for field recording.

Perspectives and future tasks

30 The Entangled Africa pottery workgroup furthermore considered sustainable perspectives of research data management principles, especially with regard to challenges dealing with big data, long-term data storage, and the growing importance of Open Access policies. The transfer from paper datasheets or Excel files to a curated database is a necessary step for long-term storage, for data analysis as well as accessibility of primary data by other researchers, within Africa and beyond. Inspired by developments

in natural science studies which established common tools for data repositories, e.g. the Neotoma Paleoecology Database (www.neotomadb.org) or OssoBook (www.archaeobiocenter.uni-muenchen.de/forschung/datenbank/index.html), the Entangled Africa pottery workgroup explored similar ways of adopting digital tools.

31 As the best solution for attaining these objectives we opted for the iDAI.field database. IDAI.field is an open source database system for fieldwork records from excavations and surveys that was established as part of the iDAI.world documentation system by the German Archaeological Institute (DAI) (Cuy et al. 2019; http://field.dainst.org/#/). It provides an adjustable platform and serves for sustainably managing and storing ceramic data among others. Several archaeological projects of the DAI, have successfully migrated pre-existing ceramic data into iDAI.field (Hamel et al. 2022). Our established ceramic recording scheme is currently implemented there. This will then be tested first with ceramic data from Elephantine (Egypt), and successively expanded with data of the Entangled Africa projects. IDAI.field ensures sustainability of data storage and accessibility and furthermore acts as an online publication tool for research data.

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Appendix 1 - User guide

This practical guideline shall guarantee a proper and concise handling of the recording scheme. Comply with the following instructions to minimise difficulties in completing it:

- Data should be recorded using a consistent terminology.
- It is not necessary to fill out all fields.
- Where data is missing, empty fields can be avoided by stating “not determinable” (nd), to indicate that this variable had been considered by the recorder.
- If one of the default options is not applicable, state “other” in the field. Note that the variable “other” does not lead to any meaningful database queries or comparisons.

The following section explains the categories and sub-categories to be recorded and defines its values. It also includes some practical notes and examples which had emerged in the Entangled Africa workshop discussions[11].

1) vessel unit / Gefäßeinheit / unité de vase

   - give a unique identifier (ID number) to clearly determine the main unit

   Basic recording unit is the vessel, i.e. the idealised complete pot, even though we often deal with single sherds. All entries therefore refer to the vessel.

   Example: The fragment is a strap handle with parts of the vessel wall. To record the “manufacture”, consider the technique used to produce the vessel. Thus, although handles are hand-modelled, the whole vessel was shaped on the wheel and would thus be classified as “wheelmade”.

2) vessel part / Gefäßteil / partie du récipient (Fig. 4)

   - indicate whether the pot is complete or which vessel parts are present (multiple entries are possible)

   Note: “Complete” means that the full form of the vessel can be reconstructed, even if it is fragmented. Multiple entries are designed for rim + handle, or rim + base. There is no need for a multiple entry when rim fragments have larger parts of the body attached (indicate this as “rim” only).

complete	komplett	entier
rim	Rand	bord
body / wall	Körper / Wand	paroi
base	Boden	base
handle	Henkel	anse
spout	Tülle / Ausguss	bec (verseur)

3) number of sherds / Anzahl der Scherben / nombre de tessons

   - quantify the number of sherds belonging to this vessel unit

4) weight of sherds / Gewicht / poids

   - determine the weight for all fragments of the vessel with a kitchen scales (in gram)

11 A more detailed discussion of pottery variables and their relevance to different research objectives can be found in Shepard 1956; PCRG 2010; Rice 2015.

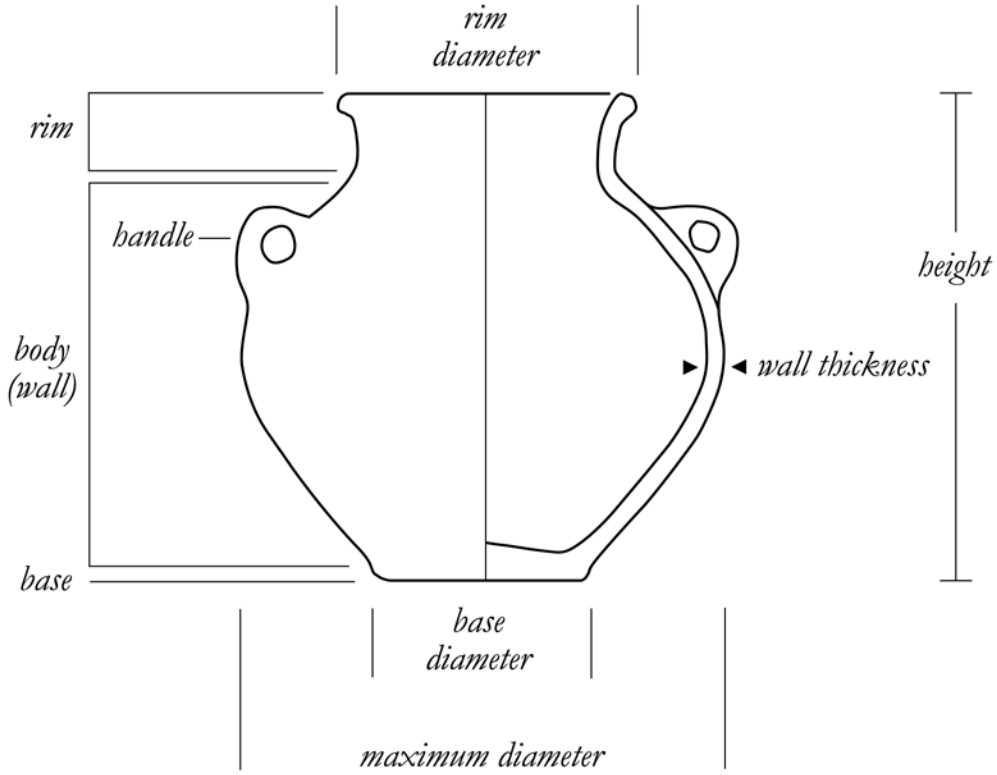


Fig. 4: Schematic illustration of vessel parts and measurements.

5) diameter / Durchmesser / diamètre (Fig. 4)
   - measure the diameter with a rim chart in cm, for
   a) rim
   b) body (This value shall indicate the maximum diameter of the pot.)
   c) base
   Rim charts are available for download, e.g., https://potsherd.net/atlas/topics/tools
   Note: For open forms, like bowls, the maximum diameter often is the same as the rim diameter.

6) height / Höhe / hauteur (Fig. 4)
   - indicate the preserved vessel height in cm
   Note: The height of sherd(s) corresponds to their correct orientation within the vessel. Take this measurement from the length of the centre line in a drawing.

7) wall thickness / Wandungsstärke / épaisseur du paroi (cf. Fig. 4)
   - measure the thickness of the vessel wall at the a) rim, b) body / wall, and c) bottom, in full mm.
   Note: If wall thickness varies considerably within a vessel, choose a representative value.

8) vessel form / Gefäßform / forme du récipient

a) distinguish between open or closed form (This should be recognisable for most diagnostic sherds. Vessels with a straight profile are considered open forms.)
Note: If a wide bowl has a slightly inturned rim / lip, it would still be an open vessel. Thus, always consider the entire vessel if it represents an open form or a restricted form.
b) if possible, further specify the general vessel sub-category using the indicated types (Fig. 5)
Note: Recording vessel forms always implies a certain degree of subjectivity and a grouping is always reliant on the full corpus. Therefore only general shape categories are provided here.

open	*offen*	*ouvert / evasée*
bowl	Schale / Schüssel	bol
cup / beaker	Tasse / Becher	tasse / gobelet
plate / dish	Teller / Platte	assiette / plat
pot	Topf	pot
closed, restricted	*geschlossen*	*fermé / retrécie*
jar, neckless	Kumpf, Kugeltopf	pot (sphérique)
jar, necked	Kanne, Krug	jarre, cruche
bottle, amphora	Flasche, Amphore	bouteille, amphore
other (lamps, lids, burners, etc.)	*Sonderform* (Lampe, Deckel, Räuchergefäß etc.)	*autre* (lampe, couvercle, cassolette etc.)

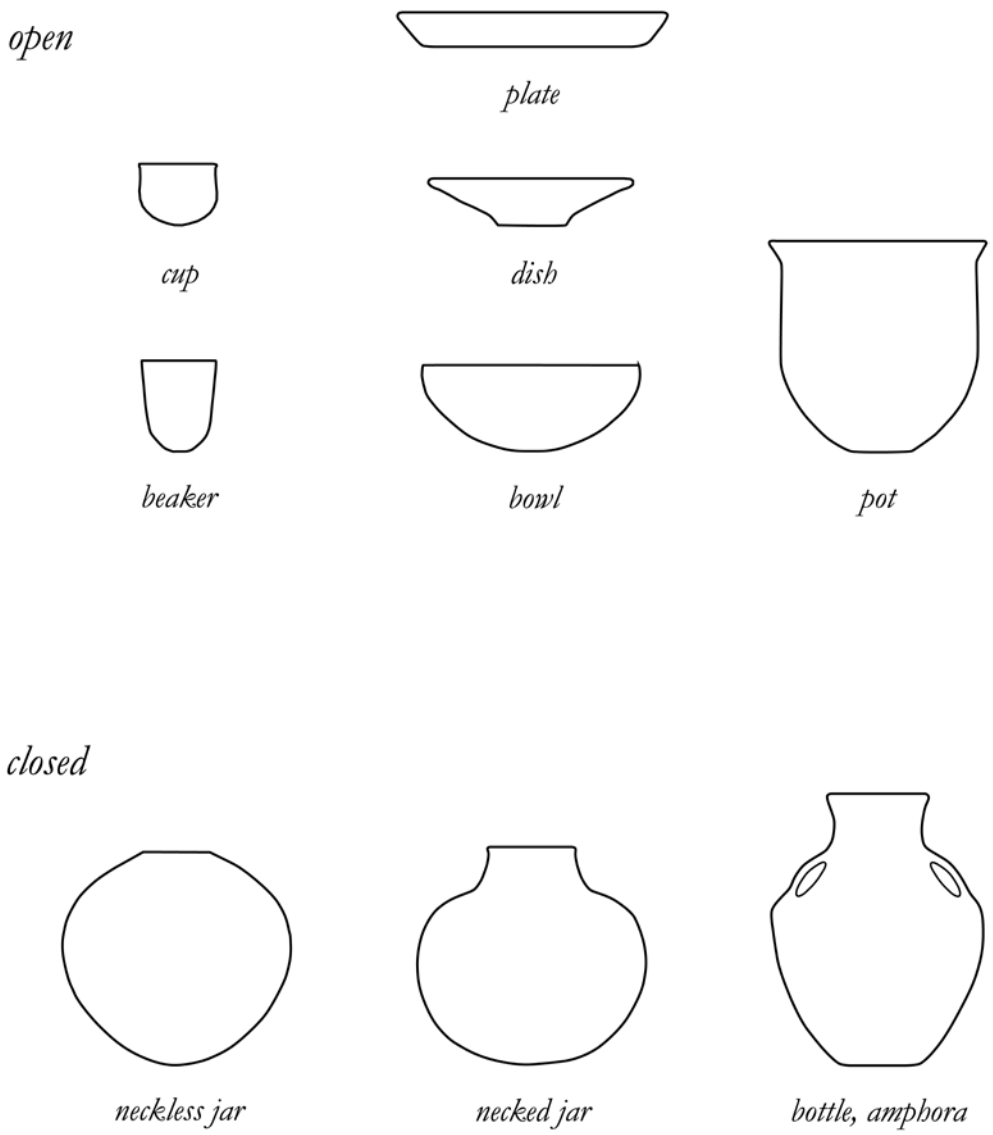


Fig. 5: Basic vessel forms. General shape categories are illustrated because each basic vessel form comprises a multitude of subtypes and sizes.

- cup/beaker: generally small-sized vessel, practical for hand-held use. In contrast to a cup, the beaker has a larger volume and a taller shape (height is larger than diameter).
- plate/dish: shallow shape with flat contour (diameter much larger than height).
- bowl: vessel with wide mouth opening (diameter is often greater than height).
- pot: deep neckless vessel with more or less straight contour.
- jar: globular to ovoid container with narrow mouth, can be subdivided into forms with and without neck.
- bottle/amphora: container with very narrow opening and long neck, may have handles (e.g., amphora, jug, etc.).

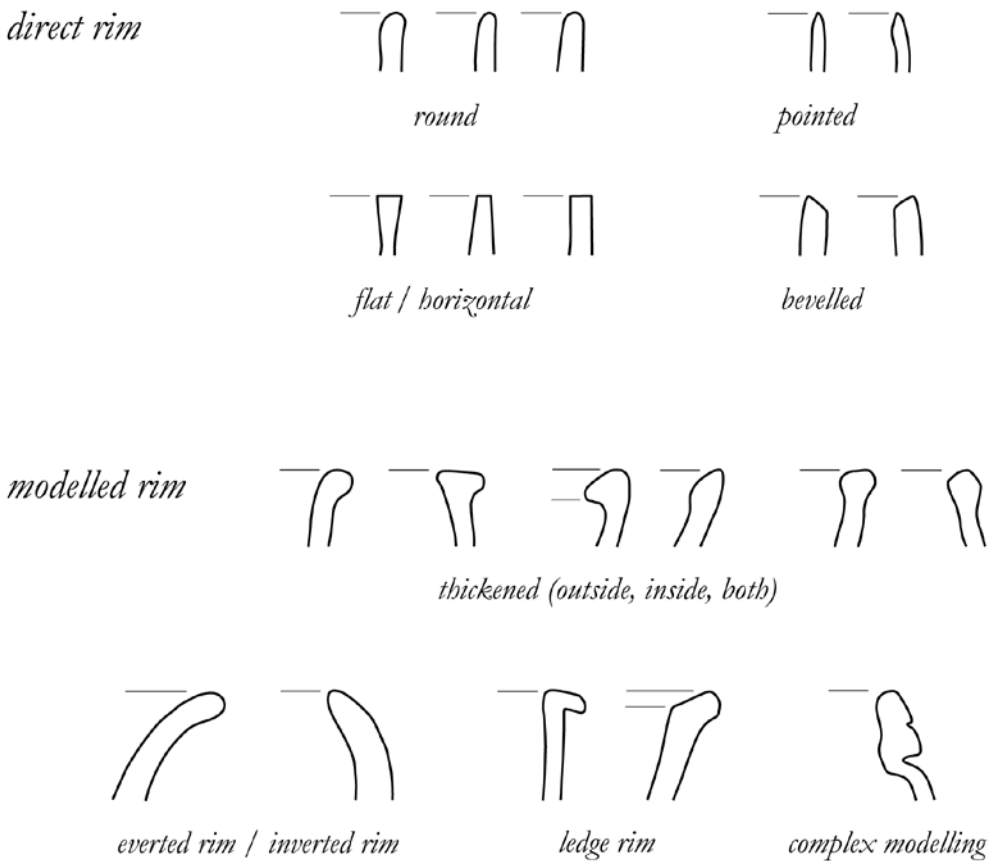


Fig. 6: Main kinds of rim forms.

9) rim form / Randform / forme de bord (Fig. 6)
a) distinguish between direct (simple) and modelled rims
b) further specify the rim form using the indicated values
Note: direct rims include simple forms that end in round, flat, pointed or bevelled tops; modelled rims can be quite sophisticated in their design.

direct rim	*einfach*	*simple*
round	rund	rond (arrondi)
flat / horizontal	flach / gerade abgestrichen	plat
pointed	spitz	pointu
bevelled	schräg	oblique
modelled rim	*modelliert*	*modelé*
thickened (outside, inside, both)	verdickt (außen, innen, beidseitig)	épaissi (à l'extérieur, à l'intérieur, sur les deux)
everted rim / inverted rim	ausgebogen / eingebogen	évasé / inversé
ledge rim	umgelegt (90°)	plié (90°)
complex modelling	komplex modelliert	façonnage complexe

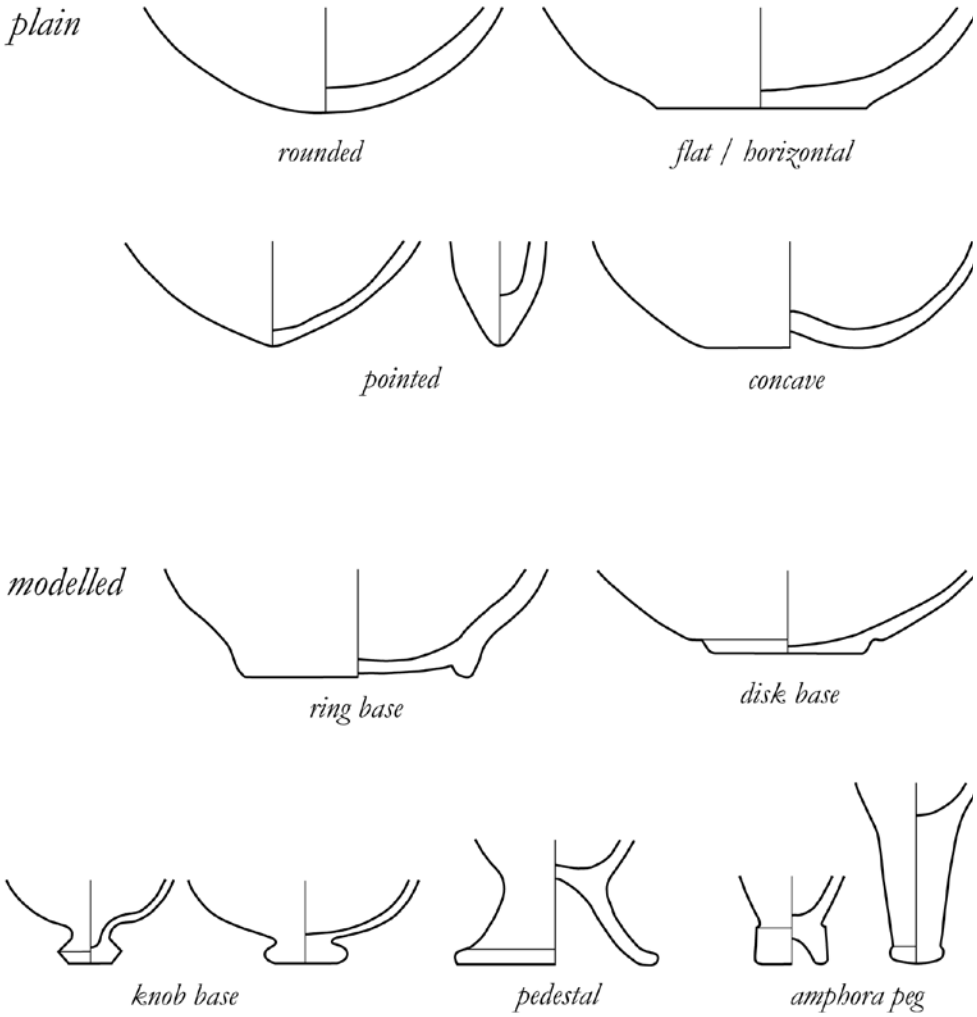


Fig. 7: Main kinds of base forms.

10) base form / Bodenform / form de base (Fig. 7)
a) distinguish between plain (simple) and modelled bases
b) further specify the base shape using the indicated values

plain	*einfach*	*simple*
round	rund	ronde (arrondie)
pointed	spitz	pointue
flat / horizontal	flach / gerade	plate
concave	konkav	concave
modelled	*modelliert*	*modelée*
ring base	Standring	pied annulaire
disk base	verstärkte / abgesetzte Standfläche	fond appendiculé
knob base	Knopffuß	pied en bourrelets
pedestal	hoher Standfuß	piédestal
amphora peg	Amphorenfuß	pied d'amphore

11) shaping technique / Herstellungstechnik / mode de fabrication

The minimum option is to make a general distinction between handmade and wheelmade, because the shaping technique is not easily recognizable when dealing with sherds. Use combined when both main techniques were employed to produce the vessel (for example, when the base was moulded and the rim was added and finished on a potter's wheel).

hand-made *handgeformt* *modelage à la main*
coiling, pinching, slab building, paddle-and-anvil, shaping in concave mould

wheel-made *scheibengedreht* *tourné au tour*
using rotative energy (turning device, slow wheel, kick wheel)

combined *kombiniert* *technique combinée*

12) surface colour / Oberflächenfarbe / couleur de surface

- record the colour of the vessel for a) external and b) internal surface, using the main colours. Multiple entries are possible, starting with the predominant colour.
Note: This category refers to the visible surface colour. The surface colour depends heavily on the clay type, the firing technique, and a possible coating. To ensure comparability, try to avoid complex terms like "light reddish-brown", etc.

red	rot	rouge
brown	braun	brun
ochre	ocker	ocre
black	schwarz	noir
grey	grau	gris
white	weiß	blanc
yellow / green	gelb / grün	jaune / vert

13) surface treatment / Oberflächenbehandlung / traitement de surface

- record the treatment for
a) external surface and
b) internal surface, using the following values

plain *„unbehandelt" / grobgeglättet* *non traitée / grossièrement lissé*
surface is matte and has irregularities (like voids or work traces)

smoothed *geglättet* *lissage*
surface is smooth but matte, no work traces visible

burnished *streifenpoliert* *polissage*
marks of the burnishing tool (e.g., pebble) are visible (horizontal, vertical, diagonal or irregular striations)

polished *poliert, glänzend* *lustrage*
surface is uniform glossy, no work traces visible

roughened *aufgerauht* *rendre rugueux*

surface shows intentional roughening (e.g., finger imprints, additional slurry layer)

scraped / wiped *Kratz- oder Wischspuren* *gratté / traces d'essuyage*

colour coating: wash = thin coat still showing original vessel surface;
slip (engobe) = thicker layer covering original vessel surface

14) ware group / Warengruppe / groupe de façon (groupe de mode de fabrication)
- indicate if vessel is of fine ware, utility ware, or coarse ware

Note: The ware group refers to the general impression of the pot and hints for a first functional characterisation. Although the understanding and definition of fine ware, utility ware, and coarse ware depends on the nature of the assemblage and differs among researchers, a rough categorisation can be achieved for most pots by considering the vessel size, the wall thickness, the fabric and the surface treatment.

fine ware *Feinware* *céramique fine*

thin walls, good workmanship, well-finished or decorated surface (e.g., table ware)

common / utility ware *Gebrauchsware* *céramique utilitaire*

medium wall thickness, routine craftsmanship, wide range of shapes, corresponds to the majority of vessels

coarse ware *Grobware* *céramique grossière*

thick walls, coarse texture, untreated surface, irregular shaping, little attention to decor (e.g., large storage containers or cooking utensils)

15) temper type / Magerung / dégraissant
- indicate which type and size of non-plastic materials were added to the clay, using a two-fold-system of temper type (organic, mineral, mixed temper) and temper size (fine, medium, coarse particles)

Note: Temper is best visible on a fresh break. The study of temper is a complex issue as it is difficult to determine which of the non-plastic inclusions were intentionally added and which were natural components in the clay. The choice for a specific kind and size of temper provides clues to manufacturing traditions and the potential function of the vessel.

organic / organisch / matière organique

fine	fein	fine
few, fine organic inclusions		
medium	mittel	moyenne
moderate, medium-sized organic inclusions		
coarse	grob	grossière
much, coarse organic inclusions		

mineral / anorganisch / minéral

fine	fein	fine
few, fine mineral inclusions		
medium	mittel	moyenne
moderate, medium-sized mineral inclusions		
coarse	grob	grossière
much, coarse mineral inclusions		

mixed / gemischt / mélangé

fine	fein	fine
few, fine mixed inclusions		
medium	mittel	moyenne
moderate, medium-sized mixed inclusions		
coarse	grob	grossière
much, coarse mixed inclusions		

16) inclusions / Einschlüsse / inclusions

- specify the main non-plastic inclusions visible in the break, choosing from the list of values.

Note: Multiple entries are possible but should be limited to the four major types of inclusions. Start with the most dominant kind of inclusion.

dung (fine vegetal remains, ca. 1-3 mm)	Dung (regelmäßige Größe, 1-3 mm)	fumier (fibre fin, c. 1-3 mm)
coarse vegetal fibres (e.g. chaff, straw, grass)	Grobe Pflanzenfasern (Spreu, Stroh, Gras)	fibres végétales grossières (par ex. paillage, paille, l'herbe)
grog (crushed pottery)	Schamotte (zerstossene Keramik)	chamotte (céramique pilée)
rock (indet.)	Gestein (unbestimmt)	roche (indet.)
sand (round)	Sand (gerundet)	sable (arrondi)
crushed quartz (angular)	Quarz (eckig)	quartz (anguleux)
mica	Glimmer	mica
granite	Granit	granite
volcanic rock (e.g., Phonolithe)	vulkanisch (z.B. Phonolith)	roche volcanique (par ex. phonolithe)
calcareous materials (lime stone, calcite, calcrete)	Kalkhaltige Substanzen	matière calcaire
ferruginous materials (rusty red inclusions)	Eisenhaltige Substanzen (rostrote Einschlüsse)	matières ferrugineuses (inclusions rouilles)
shale	Schieferton / Tonschiefer	schiste argileux
clay lumps (e.g. kaolin)	Tonklumpen	morceaux d'argile
molluscs (shell, snail)	Mollusken (Muscheln, Schnecken)	mollusques (coquilles…)
bone, teeth	Knochen, Zähne	os, dents

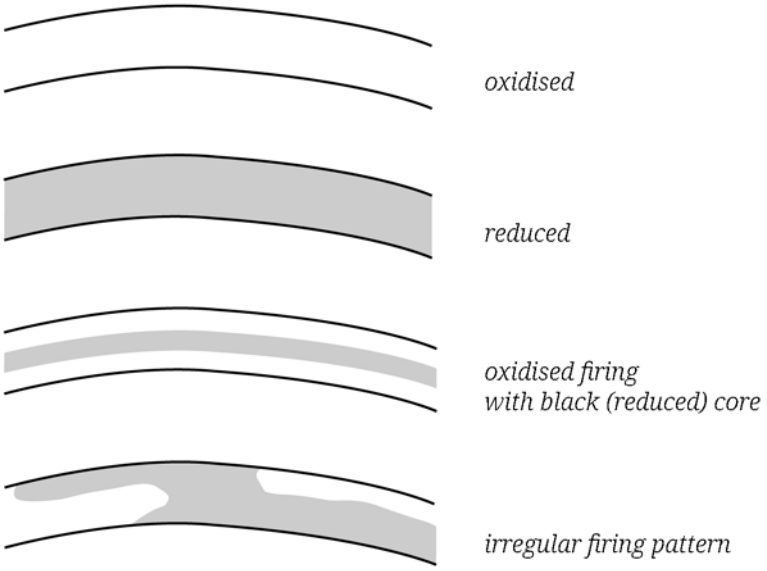


Fig. 8: Patterns of firing zones in a sherd break relate to different firing conditions (adapted from PCRG 2010, App. 8).

17) firing zones / Brandzonen / zones de cuisson (Fig. 8)
- specify the differently coloured firing zones in the fresh break of the sherd
- always start from the exterior surface to the core to the inner vessel face
- use the following codes:
  O for oxidised firing atmosphere (light to red surface colour),
  R for reduced firing atmosphere / lacking oxygen (dark coloured, e.g., dark brown, grey, black), and
  I for irregular firing pattern

Example: for multiple zones use a combination of O and R, such as
- O = fully oxidised vessel
- R = dark fired (reduced) vessel
- OR = only outer surface is oxidised, inner vessel surface is dark (reduced)
- ORO = typical "sandwich firing pattern" with oxidised surfaces and black core
- ROROR = five alternating zones of firing with dark (reduced) surface layers and black core

Note: Firing zones indicate the different atmospheric phases in which the vessel was fired, which strongly influence the surface colour of a vessel. Depending on the atmospheric conditions, the duration and the temperatures in the firing process, a vessel can show different firing zones. The whole vessel unit is addressed here. If firing zones are different on the rim as on other parts of the vessel, choose the most representative value for the vessel.

18) firing quality / Brandqualität / qualité de cuisson

- specify if the firing is even or uneven

Note: This category gives hints for the firing technology as an uneven firing would point to less controlled conditions, such as pit firing, whereas an even firing can be achieved by the use of a pottery kiln.

Black-topped firing pattern is typical for some cultural entities in the Middle Nile Valley, such as C-Group and Kerma. The pot's rim and inner surface was intentionally fired black, while the exterior surface is bright red, which is the result of a special kind of firing technique (upside down).

19) hardness / Härte / dureté

- determine the hardness of a sherd according to the 4-fold-scheme (Schneider et al. 1989: 11)
- this can be achieved by scratching with the fingernail and a knife

Note: Hardness tells about pottery technology: a hard sherd is commonly fired at higher temperatures than a softer one.

soft	*weich*	*souple*

low fired, ca. 600-800°C; can be scratched with finger nail (Mohs-Hardness 1-2)

hard	*hart*	*dur*

ca. 800-900°C; can be scratched with knife (Mohs-Hardness 3-4)

very hard	*sehr hart*	*très dur*

high fired, ca. 900-1000°C; difficult to scratch with knife (Mohs-Hardness 5-6)

chinking	*klingend hart*	*très bien cuite (la céramique sonne")*

very high fired, ca. 1100-1200°C); cannot be scratched with knife (Mohs-Hardness 6 and above)

20) decoration technique / Verzierungstechnik / technique de decoration
- indicate the main technique of decoration, e.g. impression, incision, paint, application, etc.
- further specify these main categories, considering the tool and movement with which the décor was applied
Note: The list presented here is not consistent in its structure. Roulette and mat impressions are at times regarded as impressed decoration techniques or as surface treatments. These were deliberately singled out here as widespread and major surface elements on African pottery. Some decoration techniques have chronological implications in certain parts of Africa (e.g., mat impressions appear in Northeast-Africa from the 2nd millennium BC onwards).

impression	*Eindrücke*	*Impression*
single	Einzel-Eindrücke	simple, poinçon
comb	Kammstich (mehrzähniges Werkzeug)	simple, peigne (outil à plusieurs dents)
stamp	Motiv-Stempel	cachet (à motifs)
rocker technique	Wiegetechnik	impression pivotante
incision	*Ritzungen*	*incision*
single	Einzel	simple
comb	Kamm (mehrzähniges Werkzeug)	peigne (outil à plusieur dents)
paint	*Bemalung*	*painture*
roulette	*Roulette*	*roulette*
flexible roulette	flexibles Roulette	roulettes flexibles
rigid roulette	starres Roulette	roulettes rigides
mat impressions	*Mattenabdruck*	*impression de natte*
rippled surface	*tiefe Strichglättung* (gerippte Oberfläche)	*“rippled surface”* (surface ondulée)
applications	*Applikationen*	*applications*

21) decoration / Verzierung / décor (see Appendix 2 - Catalogue of decorative effects)

No.	*Decorative effects*	*Dekorationseffekte*	*Effets décoratifs*
01	Wavy Line	Wellenlinie	Lignes ondées
02	Arches / Arch shaped motifs	Bogenmuster	Arcs en forme d'éventail
03	Herringbone pattern - simple - alternating	Fischgrätmuster - einfach - alternierend	Chevron - simple - alternant
04	Band / Bands of parallel dotted lines	Band / Bänder aus parallelen Punktlinien	Ruban / Rubans de lignes pointillées parallèles
05	Row(s) of impressions	Eindruckreihen	Lignes imprimées
06	Planar decoration bands	Flächige Bänder	Décor en rubans de grande étendue
07	Zigzag - plain (straight or curved) - dotted (straight or curved) - densely / closely packed - widely spaced	Zickzack - glatt (gerade oder gebogen) - gepunktet (gerade oder gebogen) - eng gearbeitet - weit gearbeitet	Zigzag - spatule (droite ou courbée) - imprimé (droit ou courbé) - très rapprochée - étendue
08	Zigzag lines (incised or roulette)	Zickzacklinien (geritzt oder Roulette)	Lignes de zigzag (incisées ou par roulette)
09	Leiterband (includ. Half-moon-Leiterband)	Leiterband (einschl. Halbmondleiterband)	Leiterband (y inclus Halbmondleiterband)
10	Hatches	Schraffuren	Hachures
11	Geometric patterns (e.g., triangles, lozenges, checkerboard)	Geometrische Muster (u.a. Dreiecke, Rauten, Schachbrett)	Décor géométrique (par exemple triangles, losanges, échiquier)
12	Complex geometric pattern	Komplexe geometrische Muster	Décor géométrique complexe
13	Single imprint / punctuation (linear or planar)	Einzelne Eindrücke (linear oder flächig)	Impression simple (en lignes ou en grande étendue)
14	Symbol	Symbol	Symbole
15	Figural motif - impressed (comb, stamp), incised, painted, plastic application	Figürliche Darstellung - eingedrückt (Kammstich, Stempel), geritzt, gemalt, plastisch gestaltet	Représentation figurative - imprimée (peigne, tampon), incisée, peinte, application plastique
16	Application	Plastische Verzierung	Décor par application plastique
17	rippled / ribbed surface	Gerippte Oberflächen	"rippled surface" (surface vergée)
18	Textile texturing (Roulette, Mat impression)	Flechtwerk / Textur	Vannerie (Entrelacs) / texture
19	Roughening	Aufrauhung	Grattage (rendre rugueux)
20	Scraping	„Besenstrich"	Grattage
21	Pattern burnishing	Musterglättung	Lissage en motif
22	Notched rim	Gekerbter / gezähnter Rand	Bord crénelé

22) use wear traces / Gebrauchsspuren / trace d'utilisation
- specify possible wear marks from vessel use for
a) external surface and
b) internal surface as well as

surface abrasion, attrition	Oberflächenabnutzung	abrasion / usure de surface
soot, fire blackening	Rußspuren	traces de suie
crust, spilling, residues, limescale	Krusten	croutes

23) modifications / Modifikationen / modifications
- indicate if the vessel was repaired or the sherd was used as a tool

repair	Reparaturen	réparations
perforation (other than repair)	Durchbohrung (außer Reparatur)	perforation (sauf trous de réparation)
worked edges	angeschliffene Brüche	cassures arrondies
token	Rondell	jeton

24) remarks / Bemerkungen / remarques
- state further observations concerning the vessel unit

Appendix 2 - Catalogue of decorative effects

A so-called “short decoration catalogue” was compiled during the Cologne research project ACACIA for the Wadi Howar region in order to facilitate a quick initial recording of pottery in the field. This compilation included rough classification categories that have descriptive and – above all – chronological relevance. Thus, “(Dotted) Wavy Line”, Laqiya pattern, Leiterband, but also mat-impressions and roulette are found as categories. The decisive factor for the classification into a category is the overall impression that the decoration of a vessel unit makes on the person working on it. The “short decoration approach” has proven to be very effective for initial evaluations but can in no way replace a detailed recording of the decoration, which then also takes into account the position of the decoration and the fact that different vessel parts may be decorated differently.

Based on the Cologne experience, a similar list of decorative effects was created for the Entangled Africa pottery workshop, which was successively supplemented by examples in the course of the workshop meetings.

The following table (Fig. 9) thus collates the most common decorative effects to provide a reference for quick identification and classification. As stated above, this primarily concerns the most prominent effect of decoration and the overall impression. Specific details on the individual motifs, the location, and the decoration technique are to be documented in a more detailed project-specific recording.

For each category we compiled technical descriptions, and the occurrence within the Entangled Africa assemblages. These are supplemented by illustrations from actual sherds or schematic drawings of the decorative pattern. We used common and unambiguous terms, employed in relevant publications to ensure an easy recognition and broad application.

The Catalogue of decorative effects can be accessed and downloaded from the following Link: https://doi.org/10.5281/zenodo.6531500.

For more examples of the different categories see the “Entangled Africa pottery reference catalogue”: https://arachne.dainst.org/catalog/969/

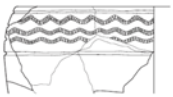
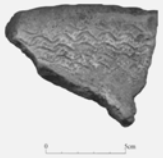
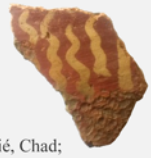
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
01	Wavy line	Incision	Incised wavy line (IWL)	Sahara/Middle Nile Valley *Early to middle Holocene* (9th–5th millennium BC)	 Source: Drawing Forschungsstelle Afrika
01	Wavy line	Incision (using stick or comb)	"Wavy line"	Ethiopia *Pre-Aksumite and Aksumite* (1st millennium BC/AD)	 Yeha, Ethiopia: bowl interior; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)  Melazo, Ethiopia: bowl exterior; Source: DAI, Orient-Dept., Sanaa Branch (J. Kramer)
01	Wavy line	Impression Rocker technique	Dotted wavy line (DWL)	Sahara/Middle Nile Valley *Early to middle Holocene* (9th–4th millennium BC)	 Source: Drawing Forschungsstelle Afrika
01	Wavy line	Impression Rolling tool (rigid roulette?)		Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project: HVU-08-0549 (M. Wetendorf, U. Nowotnick)
01	Wavy line	Impression Roulette, twisted cord roulette, which was knotted over itself		Middle Senegal valley, Tilemsi, North-Mali, Burkina Faso, Cameroon (c. 2500–800 BC)	 Walaldé, Senegal; Source: Haour – Manning 2010 https://doi.org/10.5284/1000120 (TCR3; Image: S. McIntosh)
01	Wavy line	Painted	Vertical wavy lines, white or yellow on red (slip)	Middle Nile Valley *Late- to post-Meroitic, possible Early Medieval* (2nd–7th century AD)	 Akad, Sudan; Source: Akad Excavations (Mohamed Ali Faroug)
01	Wavy line	Painted	Vertical wavy lines, white or yellow on red (slip)	Lake Chad (c. 12th–14th century AD)	 Tié, Chad; Source: Frobenius Institute, Frankfurt/M (C. Magnavita)

Fig. 9.1: Catalogue of decorative effects.

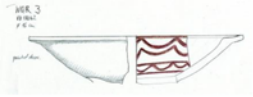
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
02	Arches/Arch shaped motifs	Incision or impression, (concentric)	Incised wavy line (IWL), dotted wavy line (DWL)	Sahara/Middle Nile Valley *Early to middle Holocene* (9th–4th millennium BC)	 Source: Drawing Forschungsstelle Afrika
02	Arches/Arch shaped motifs	Painted	Arched festoon	Ethiopia *Aksumite* (1st millennium AD)	 Wuqro, Ethiopia; Source: DAI, Wuqro Projekt, VU-08-042 (U. Nowotnick)
03	Herring bone pattern Simple	Impression Comb	Herring bone pattern (horizontal or vertical)	Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (B. Briewig)  Dar-al-Arab, site 3-Q-102, Sudan; Source: SARS Anglo-German Expedition to the Fourth Cataract (P. Wolf)
03	Herring bone pattern Alternating	Incision	Incised herring bone pattern (combined with stamp decor)	Northern Ethiopia, Yeha *Pre-Aksumite* (late 2nd millennium BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
03	Herring bone pattern Alternating	Incision	Incised herring bone pattern	Lower Wadi Howar (beginning of 3rd millennium BC)	 Abu Tabari S02/28, Sudan; Source: SFB 389 ACACIA (F. Jesse)
03	Herring bone pattern Alternating	Impression Comb or incision	Alternating herring bone pattern	Lower Nubia *A-Group, „Proto“* *C-Group, Pre-Kerma* (3rd millennium BC)	 Aniba, Lower Nubia (Egypt); Source: Ägyptisches Museum Leipzig, Objekt Leipzig 4333 (M. Wenzel)
03	Herring bone pattern Alternating	Impression Comb, eventually rocker technique	Laqiya-Type pattern	Wadi-Howar- and Laqiya-Region, partly in the Nile Valley (6th/5th millennium BC) chronologically relevant	 Djabarona 84/13, Wadi Howar, Sudan; Source: AAArC (arachne.dainst.org/entity/6064296)
03	Herring bone pattern Alternating	Impression Comb	Impressed herring bone pattern	Egypt, Elephantine *Old Kingdom, 6th Dyn.* (c. 2300 BC)	 Elephantine, Egypt; Source: DAIK, Elephantine-Projekt: Z 3969

Fig. 9.2: Catalogue of decorative effects (continued).

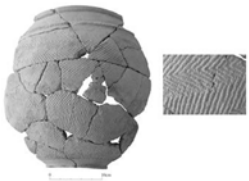
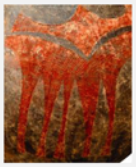
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
03	Herring bone pattern Alternating	Impression Comb		Northern Ethiopia, Yeha *Pre-Aksumite* (late 2nd millennium BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
03	Herring bone pattern Alternating	Impression Fine comb	Diagonally hatched friezes	Northern Ethiopia, Rama (S1, S40) (date ?)	 Rama, Ethiopia; Source: Universität Leipzig, Routes of Interaction: s1.1 (P. Collet/A. Uhlschmidt)
03	Herring bone pattern Alternating	Impression Roulette, braided strip roulette		Niger Inland Delta and adjacent regions, Dogon country (1st and 2nd millennium AD)	 Dangandouloun (Bandiagara Plateau), Mali; Source: Haour – Manning 2010 https://doi.org/10.5284/1000120 (BSR1, Image: A. Mayor)
04	Band/Bands of parallel dotted lines	Impression Single comb impressions (vertical, horizontal, diagonal)		Northern Ethiopia, Rama (S40-AI-1) (date ?)	 Rama, Ethiopia; Source: Universität Leipzig, Routes of Interaction: s40AI-1.1 (P. Collet/A. Uhlschmidt)
04	Band/Bands of parallel dotted lines	Impression, Comb (vertical, horizontal, diagonal)	Dotted lines	Western Sudan, Middle Nile Valley *"Neolithic", Kerma, Meroe* Chad, Niger *„Neolithic"*	 Source: Drawing Forschungsstelle Afrika
05	Row(s) of impressions	Impression		Northern Ethiopia, Yeha *Pre- Aksumite* (late 2nd millennium BC) Eastern Sudan, Gash-Delta *Amm Adam Group* (c. 6000–4000 BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
06	Planar decoration bands	Impression, Comb, rocker stamp, occasionally with colour fill		Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (P. Wolf)

Fig. 9.3: Catalogue of decorative effects (continued).

No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
07	Zigzag	Impression Single impressions, plain spatula	Plain straight zigzag	Middle Nile Valley, Chad to Senegal (1st millennium BC/AD)	 Source: Drawing Forschungsstelle Afrika
07	Zigzag	Impression Rocker technique, straight spatula	Plain zigzag, straight	Ethiopia, Middle Nile Valley, Sahara, Chad to Senegal *Leiterband Complex* *Lower Nubia, A-Group (3rd millennium BC)* *Rama, Yeha (late 2nd millennium BC)* *Meroe (3rd century BC–4th century AD)*	 Source: Drawing Forschungsstelle Afrika
07	Zigzag	Impression Rocker technique, straight or curved spatula	Plain zigzag, curved ("Wolftooth")	Ethiopia, Middle Nile Valley, Sahara, Chad to Senegal *Leiterband Complex* *Lower Nubia, A-Group (3rd millennium BC)* *Rama, Yeha (late 2nd millennium BC)* *Meroe (3rd century BC–4th century AD)*	 Source: Drawing Forschungsstelle Afrika
07	Zigzag	Impression Rocker technique, widely spaced	Dotted zigzag, straight	Nile Valley, Sahara (e.g. *Leiterband Complex*), Chad to Senegal *Khartoum Neolithic, C-Group, Meroitic* (c. 6th millennium BC–1st millennium AD)	 Source: Drawing Forschungsstelle Afrika
07	Zigzag	Impression Rocker technique, widely spaced	Dotted zigzag, curved ("dotted wolf-tooth")	Nile Valley, Sahara (e.g. *Leiterband Complex*), Chad to Senegal (c. 5th millennium BC–?)	 Source: Drawing Forschungsstelle Afrika
07	Zigzag	Impression Rocker technique with tool producing dashes (probably a cord-wrapped implement), narrow zigzag	Closely packed dotted zigzag ("*soft" zigzag*)	Eastern Sahara, Nile Valley (e.g. *Early Khartoum*) (Early-middle Holocene)	 Tageru 84/34, Wadi Howar region, Sudan; Source: AAArC, Image: A. Heege (arachne.dainst.org/entity/6063399).
07	Zigzag	Impression Rocker technique, narrow zigzag	Dotted zigzag ("Narrow zigzag", densely packed)	Egypt, Elephantine *ELE3, Old Kingdom* (2nd Dyn., c. 2750 BC)	 Elephantine, Egypt; Source: DAIK, Elephantine-Projekt: Z 3827
07	Zigzag	Impression Comb, rocker technique	Dotted zigzag, closely/densely packed	Middle Nile Valley *Meroitic – post-Meroitic* (1st century BC–6th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (B. Briewig)
07	Zigzag	Impression Comb, rocker technique	Dotted zigzag, closely/densely packed	Middle Nile Valley, (Eastern) Sahara *Middle Holocene*	 Rahib 80/87; Wadi Howar, Sudan; (F. Jesse)

Fig. 9.4: Catalogue of decorative effects (continued).

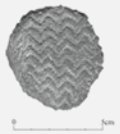
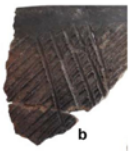
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
08	Zigzag lines	Incision	Incised lines arranged to a coarse zigzag-pattern	Middle Nile Valley *Medieval to Islamic* (6th century AD–present)	 Hamadab, Sudan; Source: DAI, Hamadab Project (M. Wetendorf)
08	Zigzag lines	Incision, combed	Incised zigzag	Ethiopia *Pre-Aksumite/Aksumite* (1st millennium BC/AD)	 Ziban Adi, Ethiopia; Source: DAI, Wuqro Project (P. Wolf)
08	Zigzag lines	Impression Roulette, braided cord roulette		Niger Inland Delta and adjacent regions (1st and 2nd millennium AD)	 Jenné-Jeno, Mali; Source: Haour – Manning 2010 https://doi.org/10.5284/1000120 (BCR4, Image: S. McIntosh)
08	Zigzag lines	Impression Rigid roulette	Carved wooden roulette	Nigeria *So (Sao)* (c. 16th/17th century AD)	 Ngala, Nigeria; Source: Frobenius Institute (U. Nowotnick)
09	Leiterband	Impression Rocker stamp, implement with 3 teeth of different shape, return technique  Source: Drawing Forschungsstelle Afrika	Leiterband (incl. Halfmoon-Leiterband)	Wadi-Howar region, Ennedi, similar pattern also in Northern Mali *Leiterband Complex* (4th–3rd millennium BC)	 Djabarona 80/86, Wadi Howar, Sudan; Source: AAArC (arachne.dainst.org/entity/6064272)
10	Hatches	Incision Parallel vertical or oblique lines, crossed by oblique lines in a non-continuous pattern	Incised crossing pattern	Eastern Sudan *Jebel Mokram Group* (1800–500 BC)	 Mahal Teglinos, Sudan; Source: Manzo 2017: fig. 37

Fig. 9.5: Catalogue of decorative effects (continued).

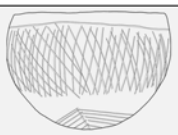
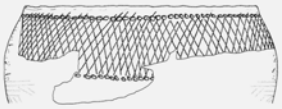
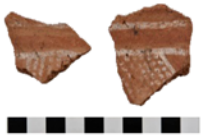
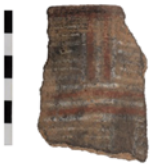
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
10	Hatches	Incision		Egypt, Elephantine *ELE7 A+B, 13th Dyn.–Second Intermediate Period* (c. 1700–1650 BC) Middle Nile Valley, Eastern and Western Desert *Late/Middle-Nubian, „Pan-Grave"* (1700–1500 BC)	 Elephantine, Egypt; Source: DAIK, Elephantine-Projekt Z 4363  Elephantine, Egypt; Source: DAIK, Elephantine-Projekt Z 4094  Elephantine, Egypt; Source: DAIK, Elephantine-Projekt Z 4046
10	Hatches	Incision		Western Sudan, Kordofan (date?)	 Jebel al Ain, Sudan; Source: University of Muenster, InterLINK Project
11	Geometric pattern	Incision, can be colour filled	Triangles	Ethiopia, Yeha *Pre-Aksumite* (c. 1st millennium BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
11	Geometric pattern	Impression Comb	Lozenges	Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 El Tuweina, Sudan; Source: University of Muenster, WADI Project (A. Lohwasser)
11	Geometric pattern	Painted	Geometric	Ethiopia, Middle Nile Valley, Chad *Meroitic* (3rd century BC–4th century AD) *Pre-Aksumite – Aksumite*	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)  Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)

Fig. 9.6: Catalogue of decorative effects (continued).

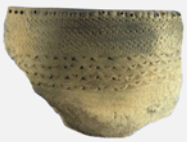
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
11	Geometric pattern	Painted		Lower Nubia *A-Group* (c. 3800–3100 BC)	 Aniba NN13, Lower Nubia, Egypt; Source: Ägyptisches Museum Leipzig, Objekt Leipzig 4341 (M. Wenzel)
12	Complex geometric pattern	Impression, incision		Eastern Sahara, southern Libyan Desert (*Handessi A)*, Middle Nile Valley *(Kerma, C-Group)* also in e.g. Lake Chad area and Horn of Africa (3rd–2nd millennium BC)	 Wadi Shaw 82/31, Laqiya region, Sudan; Source: AAArC (arachne.dainst.org/entity/6064086)
12	Complex geometric pattern	Sgrafitto, pre-firing or post-firing incisions into red slipped ware		Lake Chad area (9th–18th century AD), southern Air (9th century AD), possibly all oases from Lake Chad until Murzuk (Libya)	 Tié, Chad; Source: Frobenius Institute, Frankfurt/M (C. Magnavita)
12	Complex geometric pattern	Incision, colour filled		Lower Nubia *C-Group* (c. 2400–1550 BC)	 Aniba N402, Lower Nubia, Egypt; Source: Ägyptisches Museum Leipzig, Objekt Leipzig 4207 (M. Wenzel)
12	Complex geometric pattern	Impression (rolled tool/ roulette) and incision (incised lines)		Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (B. Briewig)
12	Complex geometric pattern	Impression Fine diagonal rim decor (comb impression), below larger triangles, lozenges, zigzag lines	Zankor group 3–6	Western Sudan *Kordofan, Zankor* (c. 500 BC–500 AD)	 Zankor, Sudan; Source: DAI, Connecting Foodways Project, (S. Matthews)
13	Single imprint/ punctuation	Impression Single pronged tool	„Pseudo-stamp“	Middle Nile Valley *Meroe* (c. 2nd–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (B. Briewig)

Fig. 9.7: Catalogue of decorative effects (continued).

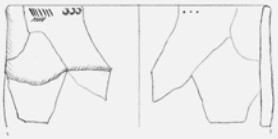
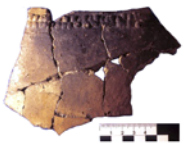
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
13	Single imprint/ punctuation			Bayuda, Wadi Abu Dom	 Wadi Abu Dom, site 69, Sudan; Source: University of Muenster, WADI Project (A. Lohwasser)
13	Single imprint/ punctuation	Impression Single pronged tool		Northern Ethiopia *Early-Aksumite* (c. 1st–4th century AD)	 Yeha; Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
13	Single imprint/ punctuation	Impression Imprint with a single pronged tool from inside out (creating a knob on the outer surface)	„Bouton“	Wadi Howar- and Laqiya-Region (3rd–2nd millennium BC) Nubia *Kerma*	 Wadi Shaw 82/52, Laqiya region, Sudan; Source: AAArC (arachne.dainst.org/entity/6064144)
13	Single imprint/ punctuation	Impression Imprint with a single pronged tool from inside out (creating knob on the outer surface)	„Bouton“	Middle Nile Valley, 4th Cataract *Meroitic* (c. 1st–4th century AD) or intrusive?	 Timmeriya, site 3-Q-33, Sudan; Source: SARS, Anglo-German Expedition to the Fourth Cataract (U. Nowotnick)
13	Single imprint/ punctuation	Impression Imprint with a single pronged tool from inside out (creating knob on the outer surface)	*„Knobbed ware“*	Eastern Sudan, Butana (Kashm el Girba, KG 14) *Pre-Saroba-Phase* (6th millennium BC)	 Site KG 14, Kassala region, Sudan; Source: (F. Jesse)
13	Single imprint/ punctuation	Impression Stamp with motif (figural stamp)	Meroitic stamp decor	Middle Nile Valley *Meroitic* (c. 1st century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (S. Suliman; P. Wolf)
14	Symbol	Incision (pre-firing)	Single symbols	Ethiopia, Yeha *Late-Aksumite, post-Aksumite*	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)

Fig. 9.8: Catalogue of decorative effects (continued).

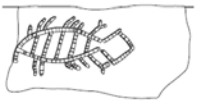
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
14	Symbol	Incision Graffito, incised (often post-firing)	Single symbols	Middle Nile Valley *Meroe* (c. 2nd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (S. Büchner)
14	Symbol	Painted, white on red (slip)		Middle Nile Valley *Late- und post-Meroitic* (c. 3rd–6th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (I.Wagner)
14	Symbol	Appliqué		Ethiopia *Pre-Aksumite*, *Aksumite* (1st millennium BC–1st millennium AD)	 Wuqro, Ethiopia; Source: DAI, Wuqro Projekt (U. Nowotnick)  Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
15	Figural motif	Impression Comb		Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (I. Auer)
15	Figural motif	Painted		Middle Nile Valley *Meroe* (3rd century BC–4th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (P. Wolf)
16	Application	Decorative moulding, plastic décor/application	Moulded ledges or lug handles	Middle Nile Valley *Kuschite to Islamic* (9th century BC–present)	 Hamadab, Sudan; Source: DAI, Hamadab Project (B. Briewig)  Hamadab, Sudan; Source: DAI, Hamadab Project (M. Wetendorf)

Fig. 9.9: Catalogue of decorative effects (continued).

No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
16	Application	Decorative moulding, plastic décor/application	Combination: comb imprints on lug handles (Pre-Aksumite) Rope imitation (Early-Aksumite, Pre-Aksumite?)	Northern Ethiopia *Pre-Aksumite* (c. 10th–5th century BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
16	Application	Decorative moulding, plastic décor/application	impressed modelled ledges	Sudan *Hagiz Group* (500 BC–500 AD) Wadi Abu Dom (Bayuda)	 Site UA 29, Sudan; Source: Manzo 2017: fig. 48  Wadi Abu Dom, site 295, Sudan; Source: University of Muenster, WADI Project (A. Lohwasser)
17	Rippled/ ribbed surface	Deep ripple burnishing with pebble, extensive	„*Rippled ware*“, Ripple polish	Egypt, Lower Nubia *Badari* (bifacial), *Early/classic A-Group* (exterior) (4th/3rd millennium BC) Laqiya-Region: *“Desert A-Group*“	 Wadi Sahal 82/38, Laqiya region, Sudan; Source: AAArC (arachne.dainst.org/entity/6063534)
17	Rippled/ ribbed surface	Fine horizontal ribbing on beakers/mugs of fine ware, by fast rotating potter’s wheel	*Ribbing* (horizontal wheel marks with decorative character)	Egypt and Kush *Late Period Egypt, Napatan* (c. 8th–4th century BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
17	Rippled/ ribbed surface	Deep parallel horizontal grooves (irregular)	Horizontal comb with decorative character	Northern Ethiopia, Yeha *Late-Aksumite* (c. 5th–10th century AD)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
17	Rippled/ ribbed surface	Impression, Comb (vertical, oblique/ diagonal)	Vertical combed grooves	Northern Ethiopia, Yeha *pre-Aksumite* (late 2nd millennium BC?)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)

Fig. 9.10: Catalogue of decorative effects (continued).

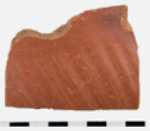
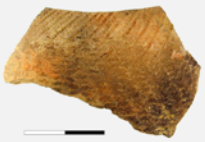
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
17	Rippled/ ribbed surface	Vertical or diagonal ribbing (long narrow parallel waves)	Channelling	Northern Ethiopia *Aksum* (c. 1st–10th century AD)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
18	Textile texturing (Roulette, mat impression)	Impression Flexible roulette (creating dents)	Cord roulette	Lake Chad area and beyond (early 1st millennium AD and before until 16th–19th century AD) Middle Niger: twisted or braided cord, or composite cord roulettes (1st mill BC–2nd mill AD)	 Tié, Chad; Source: Frobenius Institute, Frankfurt/M (C. Magnavita)
18	Textile texturing (Roulette, mat impression)	Impression Flexible roulette (creating knolls)	Strip roulette (Folded or braided strip)	Lake Chad area and beyond (9th–19th century AD) Middle Niger (1st millennium BC–2nd millennium AD)	 Garu Kime, Chad; Source: Frobenius Institute, Frankfurt/M (C. Magnavita)  Kéniéroba, Mali; Source: Frobenius Institute, Project Borrowed Words and Shared Objects (S. F. Pedersen)
18	Textile texturing (Roulette, mat impression)	Impression Rigid roulette, e.g. by corncob, carved wooden roulette	Carved roulette	Upper Niger (2nd millennium AD) Kenya (recent)	 Kéniéroba, Mali; Source: Frobenius Institute, Project Borrowed Words and Shared Objects (S. F. Pedersen)
18	Textile texturing (Roulette, mat impression)	Impression Mat, textile, basketry	Mat impression	Northern Ethiopia, Yeha *Late-Aksumite to post-Aksumite* (c. 5th–10th century AD)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch, (O. Thiel)
18	Textile texturing (Roulette, mat impression)	Impression Mat, textile, basketry	Mat impression	Middle Niger, Niger Bend (c. 1st–2nd millennium AD)	 Tongo Maare Diabal, Mali; Source: University College London (N. Gestrich)

Fig. 9.11: Catalogue of decorative effects (continued).

No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
18	Textile texturing (Roulette, mat impression)	Impression Mat, textile, basketry	Mat impression	Western Sudan *Kordofan, Zankor* (c. 500 BC–500 AD)	 Zankor, Sudan; Source: DAI, Connecting Foodways Project, (S. Matthews)
18	Textile texturing (Roulette, mat impression)	Impression Mat, textile, basketry	Mat impression	Southern East-Sahara *Handessi-Phase* (Handessi B) (2nd millennium BC)	 Wadi Hariq S01/1, Sudan; Source: AAArC (arachne.dainst.org/entity/6064210)
18	Textile texturing (Roulette, mat impression)	Impression Mat, textile, basketry	Mat impression	Middle Nile Valley *Kerma to Islamic* (3rd millennium BC–recent)	 Hamadab, Sudan; Source: DAI, Hamadab Project (J. Weschenfelder)  Hamadab, Sudan; Source: DAI, Project Connecting Foodways, (S. Matthews)
19	Roughening	Impression Finger imprints at base (functionally relevant, partly with additional clay/slurry layer)	Roughening, base corrugation	Middle Nile Valley *Kerma to Islamic* (3rd millennium BC–18th century AD) also Wadi Howar	 Hamadab, Sudan; Source: DAI, Project Connecting Foodways (S. Matthews)
19	Roughening	Impression Finger imprints at base (functionally relevant, partly with additional clay/slurry layer)	Roughening, base corrugation	Western Sudan *Kordofan, Zankor* (c. 500 BC–500 AD)	 Zankor, Sudan; Source: DAI, Connecting Foodways Project, (S. Matthews)
19	Roughening	Impression Coarse irregular imprints at base (functionally relevant)	Roughening, base corrugation	Middle Nile Valley *Kerma to Islamic* (3rd millenium BC–18th century AD)	 Hamadab, Sudan (U. Nowotnick)
19	Roughening	Surface roughening		Northern Ethiopia, Yeha *Late Aksumite to post-Aksumite* (c. 5th–10th century AD)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (O. Thiel)

Fig. 9.12: Catalogue of decorative effects (continued).

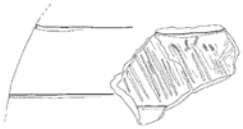
No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
20	Scraping	Incision (scraping) Shallow parallel scrape or wipe marks across the body (scraping with comb, bone, wiping with grass)	„*Scraped ware*“	Eastern Sudan *Butana Group* (4th-early 3rd millennium BC) *Gash Group* (2500–1800 BC) *Jebel Mokram Group* (1800–500 BC) *Hagiz Group* (500 BC–500 AD)	 Site UA 113, Sudan; Source: Manzo 2017: fig. 15e (Butana Group)
20	Scraping	Incision (scraping)		Northern Ethiopia, Yeha, Rama *Pre-Aksumite, Early Aksumite* *(c. 10th century BC–3rd century AD)*	 Rama, Ethiopia; Source: Universität Leipzig, Routes of Interaction: s40.21 (P. Collet/A. Uhlschmidt)  Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
21	Pattern burnishing	Decorative smoothing of parts of the vessel surface	Pattern burnishing Pattern smoothing	Northern Ethiopia, Yeha *Pre-Aksumite* (late 2nd millennium BC)	 Yeha, Ethiopia; Source: DAI, Orient-Dept., Sanaa Branch (I. Wagner)
21	Pattern burnishing	Decorative smoothing/ slipping of parts of the vessel surface), can be combined with mat impressions		Middle Nile Valley *Post-Meroitic* (4th–6th century AD)	 Site ELG 13/25, Sudan; Source: University of Muenster, El Gol Project (A. Lohwasser).

Fig. 9.13: Catalogue of decorative effects (continued).

No	EFFECT	TECHNIQUE	NAME	TIME/SPACE	ILLUSTRATION
22	Notched rims	Impression Imprints on rim top (with fingertip, fingernail, stick, etc.)		Middle Nile Valley, Bayuda *Meroitic – Post-Meroitic* (1st–5th century AD)	 Hamadab, Sudan; Source: DAI, Hamadab Project (B. Briewig)
22	Notched rims	Impression Imprints on rim top (with fingertip, fingernail, stick, etc.)		Wadi Howar, Gala Abu Ahmed *Napatan* (1st millennium BC)	 Gala Abu Ahmed fortress (site 84/95), Wadi Howar, Sudan; Source: AAArC, Image: F. Jesse (arachne.dainst.org/entity/5046358)
22	Notched rims	Impression Imprints on rim top (with fingertip, fingernail, stick, etc.)		Ethiopia *Pre-Aksumite* (c. 10th–4th century BC)	 Addi Akaweh, Ethiopia; Source: DAI Orient-Abteilung, Wuqro (K. Pfeiffer)
22	Notched rims	Impression Imprints on rim top (with fingertip, fingernail, stick, etc.)		Eastern Sudan *Butana Group, Gash Group* (4th–1st millennium BC)	  Mahal Teglinos, Sudan; Source: Manzo 2017: fig. 22.b, g, h (Gash Group)

Fig. 9.14: Catalogue of decorative effects (continued).

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1) Spreadsheet for pottery recording:
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2) Entangled Africa pottery reference catalogue:
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