‘CORD’ ORNAMENTS ON POTTERY IN THE VISTULA AND DNIEPER INTERFLUVIAL REGION: 5TH – 4TH MILL. BC

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Editor's Foreword

The issues outlined in the above volume of *Baltic-Pontic Studies* (BPS) presented here, can be said to generate several important and complex questions among which, one relating to the topogenesis of 'corded' ornamentation on the bio-cultural borderlands of east and west Europe, gave birth to an innovative research project. In this respect, specialist researchers of the Pontic-Baltic Eneolithic (from Middle and Late Neolithic contexts) chose 45 vessels (mostly fragments) originating from the Dnieper-Southern Bug drainage area and Vistula, dated to the 5th - 4th/3rd mill. BC for the purposes of microscopic analyses conducted with the aim of identifying 'corded' patterns of ornamentation. These laboratory tests were led by an archaeologist specialising in microscopic analysis to identify interdisciplinary, pre-historic and archaic techniques in the textile crafts.

The implications of the above tests would seem to warrant a manifold approach to possible conclusions on the basis of specialist (microscopic) criteria of differentiated - previously identified as macroscopic - in general terms as 'corded' motifs of ceramic ware ornamentation (part 1). This also concerns an outline of investigation drawn from hermeneutics, prompted by various contexts such as historical and cultural assessment of bio-cultural communities and related findings as well as attempts to generate a coherent framework of linguistic and cultural research for 'corded ornamentation on ceramic ware' (part 2).

In discussing further the 'main issues' presented in this publication of BPS 15 in respect to the hand manufacture of ceramic ware of the Vistula and Dnieper interfluvial region and its peoples, a modus operandi of investigation in the context of region has been proposed whereby researchers of this particular project have been given a free hand, as it were, in respect to the degree and forms of application in microscopic analyses and their findings. A series of commentaries has therefore arisen, from various points of view in so far as reflections on research conducted - possible future strategies for vital questions in this matter that are yet to be answered (part 3).

It is assumed therefore that this volume has in some measure initiated a process of the highest consequence, one introducing a new level of off-site investigation into the genesis of corded ornamentation development, which deserves to be supported in addition through a personal engagement in this research field.

Editorial comment

1. All dates in the B-PS are calibrated [BC; see: Radiocarbon vol. 28, 1986, and the next volumes]. Deviations from this rule will be point out in notes [bc].
2. The names of the archaelogical cultures and sites are standarized to the English literature on the subject (e.g. M. Gimbutas, J.P. Mallory). In the case of a new term, the author's original name has been retained.
3. The spelling of names of localities having the rank of administrative centres follows official, state, English language cartographic publications (e.g. *Ukraine, scale 1 : 2 000 000*, Kiev: Mapa LTD, edition of 1996; *Rèspublika BELARUS', REVIEW-TOPOGRAPHIC MAP*, scale 1:1 000 000, Minsk: *BYELORUSSIAN CARTOGRAPHIC AN GEODETIC ENTERPISE*, edition 1993).

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'CORDED' AND 'CORD-LIKE' ORNAMENTATION IN THE VISTULA AND DNIEPER INTERFLUVIAL REGION IN THE 5TH – 4TH MILL. BC. INTRODUCTION TO INTERDISCIPLINARY RESEARCH

The research project whose aims were set out in the previous article [see Kośko, Szmyt..., in this volume], is premised on the inclusion of laboratory analyses to the research of 'cord' and 'cord-like' ornaments. At the first stage, microscopic identification of organic material, technical and craft traits was made, as well as the series of 'corded' ornamentation impressions. In addition, the analysis and interpretation of results, required research at a new interdisciplinary level, taking into account the methods, language of recording and the store of experience from several disciplines and sub-disciplines in the sciences. In the broad context of archaeology as it is understood, the research was focused on techno-archaeology (to be precise, the process of crafting ceramic ware and textiles), taxonomy of ceramics, chronometry, as well analyses of how prehistoric communities based their domestic economy.

In the research conducted into the above fields of production, a broad view of work in ethnography was necessary, especially those studies regarding the crafts technology of archaic societies. To this end, the monumental work of K. Moszyński [Moszyński 1967] was mainly used, while for microscopic analysis and the interpretation of its results, research was based on earlier techniques of textile production [Broholm, Hald 1940; Hald 1950; Łaszczewska 1966; Schlabow 1976; Seiler-Baldinger 1994; Chmielewski 2009]. In one sense, the final fruits of work conducted thus far – and above all the construction of a general framework of cultural studies where our particular research aims were set in the respective cultures of prehistoric societies – can be said to be the cognitive and semantic interpretation of 'corded' ornaments, for the above research aims [further in Kowalski..., in this volume].

This article is an introduction to the following studies to be found in subsequent parts of this volume: (1) taxonomic and spatial (geo-cultural) description

Fig. 1. Location of sites from which ceramic ornament 'cord' i 'cord-like' samples originate under microscopic analysis: 1 – Dereivka; 2 – Mikhailivka; 3 – Khortitsa; 4 – Ihnatenkova Hora; 5 – Sandraki ; 6 – Troyaniv; 7 – Mayaki; 8 – Las Stocki 19; 9 – Karmanowice 35; 10 – Miłocin Kolonia; 11 – Tomice 12; 12 – Opatowice 3; 13 – Kościelna Jania; 14 – Łojewo 4. Catalogue numbers of samples according to Table 1 and Table 2

of analyses from the series of samples, (2) macroscopic detailing of 'corded' ornaments, (3) laboratory research methods, (4) classification of negatives recorded in microscopic research (detailing of results), (5) general nature of results gained as well as (6) the relating of research results to ethnographic study, and finally the present store of knowledge on Neolithic textiles. Moreover, the historical and cultural context of ceramic ware under investigation (especially economic) was discussed further in the subsequent article [Kośko, Szmyt… – part 1, in this volume].

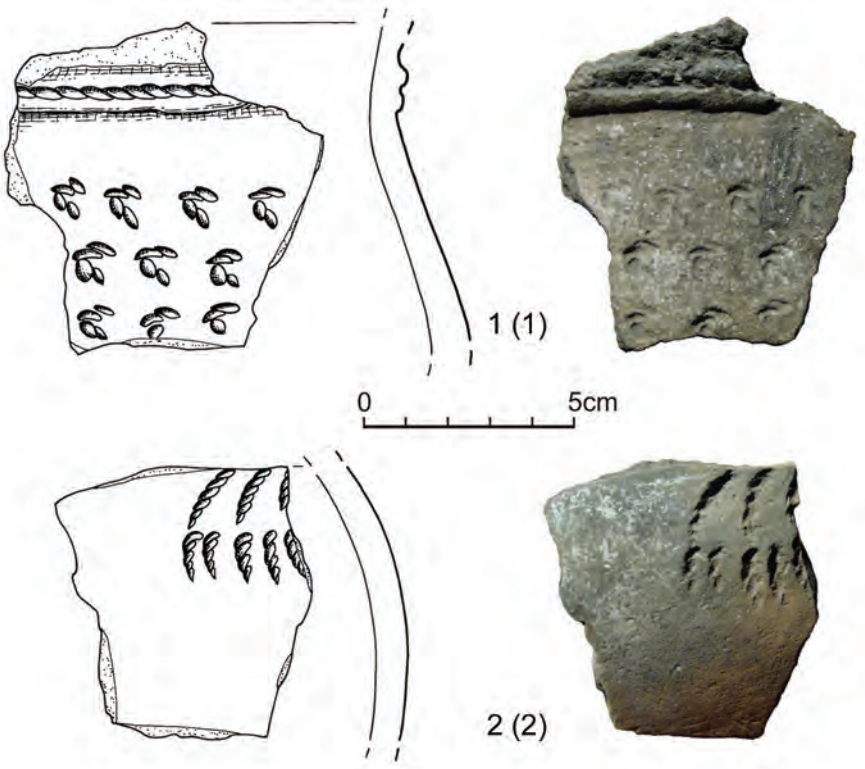

Fig. 2. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

1. TAXONOMIC AND CULTURAL TRAITS OF SAMPLES

For the purposes of this project, 45 samples of vessel ceramic ware were subject to microscopic analysis in the area of present-day Poland and Ukraine. The main information in this regard can be found in Table 1, while the location of related sites is featured in Fig. 1. The entire documentation, drawings and photographs of all objects where research was conducted into ceramic fragments or whole vessels is presented in Fig. 2 – 18.

The analysed collection of vessels details intentional (planned) differentiation in their location (proximity of sites in relation to regional variation of flora) and archaeological taxonomy.

In geographic terms the basic taxonomy assumes a division into the following sites: (***a***) east European forest steppe and steppe in the Black Sea basin and (***b***)

List of ceramic samples from 'corded' and cord-like' ornaments under microscopic analysis

Sample no.	Site	State and administrative district	Geographical zone and region	Taxonomical identification	Type of site
1	Dereivka	Ukraine, Cherkasy	PA: Dnieper steppe	SSC phase II	Settlement
2	Dereivka	Ukraine, Cherkasy	PA: Dnieper steppe	SSC phase II	Settlement
3	Dereivka	Ukraine, Cherkasy	PA: Dnieper steppe	SSC phase II	Settlement
4	Dereivka	Ukraine, Cherkasy	PA: Dnieper steppe	SSC phase II	Settlement
5	Dereivka	Ukraine, Cherkasy	PA: Dnieper steppe	SSC phase II	Settlement
6	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	LMC	Settlement
7	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	LMC	Settlement
8	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	RC phase 1	Settlement
9	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	RC phase 2	Settlement
10	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	RC phase 2	Settlement
11	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	RC phase 2	Settlement
12	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	YC	Settlement
13	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	YC	Settlement
14	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	YC	Settlement
15	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	YC	Settlement
16	Mikhailovka	Ukraine, Kherson	PA: Dnieper steppe	YC	Settlement
17	Khortitsa	Ukraine, Zaporizhzhya	PA: Dnieper island	YC-early	Settlement
18	Khortitsa	Ukraine, Zaporizhzhya	PA: Dnieper island	YC-early	Settlement
19	Ihnatenkova Hora	Ukraine, Cherkasy	PB: Forest-steppe	TC stage CI	Settlement
20	Ihnatenkova Hora	Ukraine, Cherkasy	PB: Forest-steppe	TC stage CI	Settlement
21	Sandraki	Ukraine, Vinnitsia	PB: Forest-steppe	TC stage CII	Settlement
22	Troyaniv	Ukraine, Zhytomyr	PB: Forest-steppe	TC stage CII	Settlement
23	Troyaniv	Ukraine, Zhytomyr	PB: Forest-steppe	TC stage CII	Settlement
24	Mayaki	Ukraine, Odesa	PA: Dniester steppe	TC stage CII	Settlement
25	Mayaki	Ukraine, Odesa	PA: Dniester steppe	TC stage CII	Settlement
26	Mayaki	Ukraine, Odesa	PA: Dniester steppe	TC stage CII	Settlement
27	Mayaki	Ukraine, Odesa	PA: Dniester steppe	TC stage CII	Settlement
28	Las Stocki 19	Poland, Puławy	BA: Lublin Upland	FBC, SE group	Grave

Table 1 cont.

Sample no.	Site	State and administrative district	Geographical zone and region	Taxonomical identification	Type of site
29	Las Stocki 19	Poland, Puławy	BA: Lublin Upland	FBC, SE group	Grave
30	Karmanowice 35, grave 29	Poland, Puławy	BA: Lublin Upland	FBC, SE group	Grave
31	Karmanowice 35, grave 12	Poland, Puławy	BA: Lublin Upland	FBC, SE group	Grave
32	Miłocin Kolonia, grave	Poland, Lublin	BA: Lublin Upland	FBC, SE group	Grave
33	Tominy 12	Poland, Opatów	BA: Kielce-Sandomierz Upland	FBC, SE group	Settlement
34	Tominy 12	Poland, Opatów	BA: Kielce-Sandomierz Upland	FBC, SE group	Settlement
35	Tominy 12	Poland, Opatów	BA: Kielce-Sandomierz Upland	FBC, SE group	Settlement
36	Tominy 12	Poland, Opatów	BA: Kielce-Sandomierz Upland	FBC, SE group	Settlement
37	Tominy 12	Poland, Opatów	BA: Kielce-Sandomierz Upland	FBC, SE group	Settlement
38	Opatowice 3	Poland, Radziejów	BB: Cuiavia	FBC, Eastern group, phase IIIC	Settlement
39	Kościelna Jania	Poland, Starogard Gdański	BB: Starogard Lakeland	FBC, Eastern group, phase settlement IIIC	Settlement
40	Łojewo 4	Poland, Inowrocław	BB: Cuiavia	FBC, Radziejów group, phase V	Settlement
41	Łojewo 4	Poland, Inowrocław	BB: Cuiavia	FBC, Radziejów group, phase V	Settlement
42	Łojewo 4	Poland, Inowrocław	BB: Cuiavia	FBC, Radziejów group, phase V	Settlement
43	Łojewo 4	Poland, Inowrocław	BB: Cuiavia	FBC, Radziejów group, phase V	Settlement
44	Łojewo 4	Poland, Inowrocław	BB: Cuiavia	FBC, Radziejów group, phase V	Settlement
45	Łojewo 4	Poland, Inowrocław	BB: Cuiavia	FBC, Radziejów group, phase V	Settlement

central European mixed forests in the Baltic drainage area [Kondracki 1967: Fig. 1]. This division also has further segmentations whose importance lies in terms of climate, flora, fauna and potentially economy. In particular, this concerns differentiation of the Black Sea region (Pontic) for the peoples of (***aa***) the steppe and (***ab***) forest steppe. In turn, the division of the Baltic Sea area is linked to the communities of (***ba***) old uplands and (***bb***) lowlands. In the series of sample finds under analysis, ceramic ware from Pontic sites (***a***) is more frequent with 22 samples representing ***aa***, the steppe cultures, whereas only 5 that of ***ab***, the forest steppe peoples. There are 18 samples from ***b***, the Baltic basin, from which 10 were found in ***ba***, old upland – and 8 from ***bb***, the lowland.

A taxonomy of sample finds shows the following division:

culture	**phase/stage**	**site**	**number of samples**
- **Sredniy Stog** (SSC),	**II**	Dereivka	5
- **Lower Mikhailovka** (LMC)		Mikhailovka	2
- **Rogachyk** (RC),	**I**	Mikhailovka	1
	II	Mikhailovka	3
- **Early Yamnaya** (YC)		Mikhailovka	5
		Khortitsa	2
- **Tripolye** (TC),	**C-I**	Ihnatenkova Hora	2
	C-II	Sandraki	1
		Troyaniv	2
		Mayaki	4
- **Funnel Beaker** (FBC):		**south-east group** – four sites	
		Las Stocki 19	2
		Karmanowice 35	2
		Miłocin Kolonia	1
		Tominy 12	5
	IIIC	**east group** – two sites	
		Opatowice 3	1
		Kościelna Jania	1
	V	**Radziejów group** – one site	
		Łojewo 4	6

It should be noted that the vast majority of samples (40) are from settlements, and only 5 from graves (Table 1).

2. MACROSCOPIC RECORD OF ‘CORDED’ ORNAMENTS

The ornaments identified under microscope in ‘cord’ ceramic ware are found in negatives that can initially be considered as the following impressions:

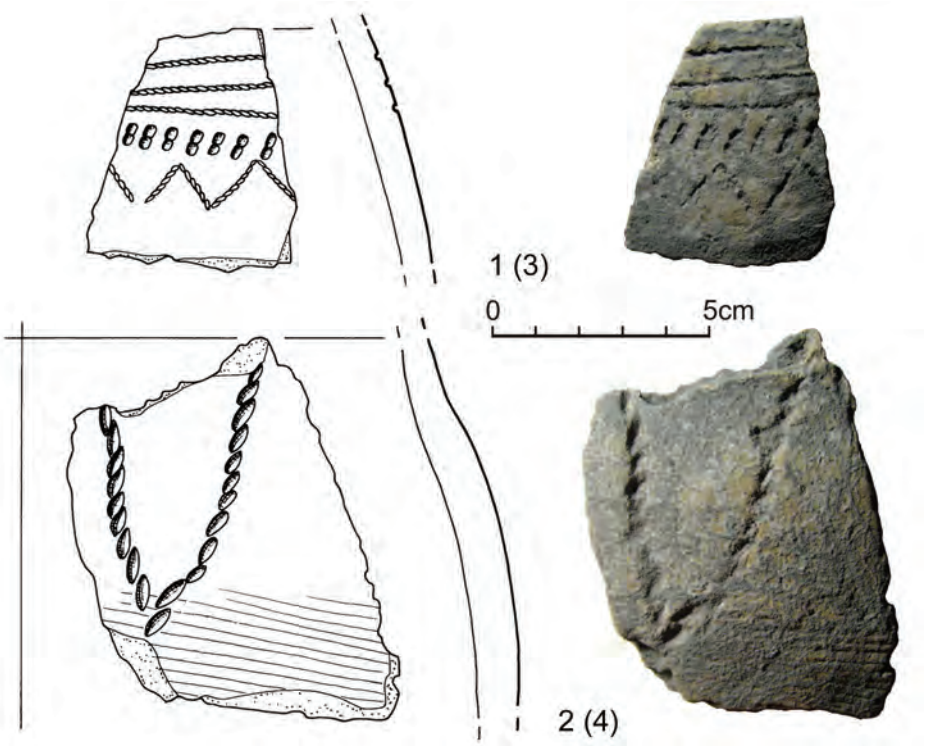

Fig. 3. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

(a) so called two-strand cord;
(b) so called three-strand cord;
(c) so called finger twine cord.

a. The vast majority of samples feature a so called two-strand 'cord' impression. These are mostly in the form of bands, which circle under its spout, in the upper sections of the belly or where the neck and the belly meet. This type of 'cord' is initially identified also as a fibre in the form of small vertical poles, zig zag, garlands, small bows, filled triangles, so called fish bones and so called wolf teeth.

b. The three-strand 'cord' negatives were found only on FBC ceramics from Łojewo 4. They feature vertical bands that circle the vessel under its spout, both outside the receptacle (samples no. 41 and 43), as well as inside (sample no. 42).

c. The impressions of 'finger twine cord' have been identified on 3 samples (no. 8, 10, 15, 16) from the site of Mikhailovka, linked with the RC and YC. In sample 8 the impressions measure approximately 1.5 cm in length, featuring a zig zag

pattern. In the case of samples no. 10, 15 and 16, vertical and horizontal bands are featured in a regular design.

3. MICROSCOPIC ANALYSIS METHODS

For the purposes of research, fragments of ceramic ware were chosen, and in 3 cases, entire vessels (samples nr 38-40), whose surface reveals traces identified under macroscopic (megascopic) analysis as ornaments made with the aid of impressing a 'cord'. Microscopic analysis was conducted by Andrzej Sikorski, based in this context on his earlier research in identifying textile negatives made among others, on vessel ceramic ware from various stages of prehistory and the early Middle Ages [Sikorski 1998; 2000; 2003; Michałowski, Sikorski 2005], conducted at the Institute of Prehistory, Adam Mickiewicz University in Poznań. Technical data of importance here relates to the use of a NIKON SMZ 800 and 1000 stereoscopic microscope and a total of 1,124 laboratory measurements and notations.

In this context, the research results for every sample can be found in articles in subsequent parts of this volume – though a general picture for the above is set out in Table 2.

This table and related information therein was drawn up for the purposes of comparative analysis on an inter-regional basis (see articles in part 3).

4. CLASSIFICATION OF MICROSCOPIC RESULTS (GLOSSARY OF TERMS)

In the section below, the definitions of terms used in recording microscopic observations are presented, though only in respect to the details revealed in the negatives of ceramics under analysis, in relation to: (A) textile type, (B) technical data of raw material (organic material type and metrical measurement), (C) technical data of textiles, (D) application means of ornament on vessel surface, (E) associated works, as well as (F) presence or lack of organic substances in the impressions (remains after firing).

Before discussing the above in detail it should be noted that the results of measurements presented below are not an exact model of the original textiles – in all its imperfections – that were used to embellish or fill out the relatively soft

Table 2

Results of microscopic analysis: identification of 'corded' and 'cord-like' ornaments on ceramic samples (see pages 29–32 for commentary)

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
1	Dereivka	1-plaiting	1- threaded yarn 2- 0,016-0,025/**0,020**	1- Z/2' - 48° 2- 0,579- 0,688/**0,645** 1 thread S 0,322 3- 6-8 eyes/1cm	3?	2- smooth out between impressions	1	
		2- macramé	1- threaded yarn 2- 0,025-0,050/**0,040**	1- Z/3S? - 35° 2- 1,804-2,214/**1,968** 1 thread S 0,656 3- 1 knot/1cm			1	
2	Dereivka	3- sprang (netting?)*	1- threaded yarn 2- ?	1- Z/2S? - 35° 2- 0,492-0,656/**0,574** 1 thread S 0,287 3- 6 eyes/1cm	1- ad hoc	2- polishing effect	1	*inner and outer sides
		4- fringes	1-yarn 2- ?	4- horiz.+vertical. 2- 2,25-2,50/**2,30** 3- 6 threads+3 threads (warkocz)	1- ad hoc	2- polishing effect	1	
3	Dereivka	5- needlework?*	1- yarn 2- ?	1- Z i S (?) - 40° 2- 0,361-0,492/**0,410** 3- 6 eyes/1cm	1- ad hoc	3?-glazing	1	*textile type IIIA and/or IIIC
4	Dereivka	5- needlework?*	1- threaded yarn 2- 0,013-0,024/**0,016**	1- S/2Z - 36° 2- 0,4920,558/**0,525** 1 thread Z 0,264	1- ad hoc	3- levelling out, using textiles *	1	*planing of sides before cord application
		6- plaited cord**	1- five-strand cord 2- 0,033-0,050/**0,041**	1- 5Z - 30° 2- 3,936-4,428/**4,155** 1 element Z 0,831	1- ad hoc	1	1	**impressed inexactly
5	Dereivka	5- needlework?*	1- threaded yarn 2- ?	1- S/2Z - ? 2- 0,688-0,787/**0,726** 1 thread? 0,363	1- ad hoc	1	1	*on external side

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
		6- turned cord*	1- three-strand cord 2- 0,016-0,025/**0,022**	3- 6 braids? /1cm 1- Z/2S - 35° 2- 2,624-2,952/**2,747** 1 element Z 0,915 1 thread S 0,457	1- ad hoc	3?- planing, using textiles	1	*with 3 threads Z/2S
6	Mikhailovka	1- plaiting	1- threaded yarn 2- **0,016**?	1- Z/2S - 22° 2- 0,754-0,902/**0,824**	3	1- rubbed with fat 2- partially planed on purpose	2- tar substances	
7	Mikhailovka	3- elaborate netting - similar to elaborate sprang? 3- simple netting - similar to elaborate sprang?	1- threaded yarn 2- 0,013-0,016/**0,014** 1- threaded yarn 2- 0,016?	1- Z/2' - 25° 2- 0,656-0,738/**0,683** 1 thread 0,341 3- 2,5 eye/1cm 1- Z/2S - 22° 2- 0,492-0,656/**0,615** 1 thread S 0,307 3- 6 eyes/1cm	3 3	2- partially planed 3- planing, smoothing out damp sides	1 1	
8	Mikhailovka	6- turned cord* 'finger twine'	1- two-strand cord 2- 0,016-0,020/**0,018**	1- Z/2S? - 32° 2- 0,984-1,480/**1,230** 1 thread S 0,615	1- ad hoc	2- external wall features planing with textile?	1	* two-strand
9	Mikhailovka	5- needlework	1- two-strand cord 2- ?	1- S/2Z? - 32° 2- 0,984-1558/**1,098** 1 thread Z? 0,549	1- ad hoc	1- on a strongly smoothed surface		* two-strand
10	Mikhailovka	1- plaiting (basket?)*	1- plaits/bands** 2- 0,250-0,270/**0,264**	1- Z - 30° 2- 1,640-1,804/**1,763** 3- 4 braids/1cm	1- ad hoc	1-2	1	*cross-rib technique ** from turned plaits
11	Mikhailovka	5- needlework?	1- threaded yarn 2- 0,013-0,016/**0,015**	1- Z/2S - 30° 2- 0,607-0,738/**0,685**	1- ad hoc	3- used for planing	1	

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
		6- plaited cord* + knots	1- wool? three-strand cord 2- 0,013-0,016/**0,015**	1 thread S 0,342 3- 6 eyes/1cm 1- Z/2S 2- 2,296-2,624/**2,501** 1 element Z 0,836 1 thread S 0,418	1- ad hoc	surface of sides	2- remains of a burnt cord and knots (burnt wool?)	*from 3 components
12	Mikhailovka	1/6- plaiting with knots? made out of cord*	1- five-strand turned cord 2- ?	1- Z/5S- 30-35° 2- 1,640-1,804/**1,591** 1 element S 0,318 3- 3 turns/1cm	3?- textile matrice	1-2 before and after application	2- traces of burnt organic parts (textiles)	*from 5 single threads
13	Mikhailovka	1- plaiting - tape (inkle?)	1- threaded yarn 2- ?	1- S/2Z - 35° 2- 0,492-0,738/**0,602** 1 thread Z 0,301 3- 6 braids/1cm	3- textile "matrice"	1-3?	1	
14	Mikhailovka	5- needlework	1- threaded yarn 2- 0,025-0,082/**0,051**	1- Z/2S - 26° 2- 0,820-1,394/**1,086** 1 thread S 0,543 3- 3 braids/1cm	1- ad hoc?	1	1	
15	Mikhailovka	1- plaiting (basket)	1 2- 0,150-0,220/**0,200**	1- Z - 40° 2- 1,640-1,804/**1,706** 3- 5 braids/1cm	3- spun around the matrice	1	1	
16	Mikhailovka	3- elaborate sprang (netting?)	1- threaded yarn 2- 0,016-0,018/**0,016**	1- Z/2S - 35°-45° 2- 0,656-0,820/**0,738** 1 thread S 0,359 3- 2 eyes "turned" /1cm 4 looped eyes 1cm	2- pin/knurl 3- spin-impression?	2- planing*	1	*slanted planing
17	Khortica	1- plaiting	1- two-strand cord/threaded yarn 2- 0,033-0,049/**0,041**	1- Z/2S? - 25° 2- 0,820-0,902/**0,850** 1 element S 0,425	2- pin/knurl 3- spin-impressed?	2- partially planed intentionally*	1	*lower part of negative

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
18	Khortica	5- needlework? 5/1 - needlework or plaiting*	1- threaded yarn 2- 0,025-0,033/**0,030** 1-single turned yarn 2- ?	1- Z/2S - 36° 2- 1,066-1,148/**1,111** 1 thread S 0,555 3- 3 braids/1cm 1- Z or S? - 36° 2- 0,492- 0,656/**0,591**	2/3 - pin/ knurl/ or spin	2- impression partially planed intentionally 2- planing of side and ornament fragment*	1 1	 * on the inner and outer sides
19	Ihnatenkova Hora	6- turned cord	1- two-strand cord 2- 0,030-0,033/**0,031**	1- Z/2S? - 30° 2- 2,310-2,970/**2,658** 1 element S 1,329	1- ad hoc	2- smoothing out plaiting or needlework*	1	*horizontal and slanted
20	Ihnatenkova Hora	5/1 needlework or plaiting?	1- threaded yarn 2- ?	1- S/2Z? - 20°-35° 2- 0,902-1,148/**1,025** 1 thread Z 0,512	1,3- spun and ad hoc	1- dried vessels smoothed and then impressed with a matrice	1	
21	Sandraki	1?/5 plaiting? needlework	1- three-strand cord 2- 0,025-0,033/**0,028**	1- S/2Z 2- 3,444-4,264/**3,772** 1 element S 1,257 1 element Z 0,628	1,3 - ad hoc and spun?	2-3 smoothing out plait impressions or needlework	1	
22	Troyaniv	6- turned cord	1- four-strand cord 2- ?	1- S/4Z? - 30° 2- 1,722-2,050/**1,886** 1 element Z 0,471	1- ad hoc	1-2-3 horizontal negatives planed	1	
23	Troyaniv	6- plaited cord* 1/5 plaiting or needlework?*	1- three-strand cord 2- ? 1- single yarn 2- ?	1- S 2- 2,624-3,444/**3,083** 1 element S 1,028 1- S 2- 0,984-1,148/**1,038**	1- ad hoc	2- negatives partially planed	1	Ceramic calender * from 3 strings and shallow impression of a textile (also on inner side)

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
24	Mayaki	3- netting*	1- string/threaded yarn 2- **0,025**?	1- Z/2S- 25° 2- 0,820-0,984/**0,836** 1 element S 0,418	3- spinning method	2- partially planed	1	* fastened a single or with multiple turn on the belly 'noose' impression
25	Mayaki	1- plaiting*	1- string/threaded yarn 2- **0,032-0,042**	1- Z/2? - 25° Z/2S- 25°-35° 2- 0,492-0,574/**0,529** 1 element 0,264 0,738-0,902/**0,830** 1 element S 0,415	3- spinning method	2- textile impressed before polishing	1	* made from turned cord
26	Mayaki	3- netting*	1- string/threaded yarn 2- ?	1- S/3Z? - 26° 2- 1,476-1,722/**1,585** 1 element Z 0,528	3- spinning method (spindle)	2- lower part of negative intentionally planed	1	* fastened with a single and multiple turn
27	Mayaki	3- netting*	1- string/ single yarn 2- ?	1- Z ? 2- **0,550** 3- 2-3 eyes/1cm	3- spinning with use of matrice	2- planing above and below negative	1	* fastened with a single and multiple turn
28	Las Stocki 19	5- needlework*	1- threaded yarn 2- 0,013-0,016/**0,015**	1- Z/2S - 32° 2- 0,820-0,984/**0,930** 1 thread S 0465 3- 6 eyes/1cm	2/3 - spinning technique or spindle/knurl	2- lower part of needlwork was planed	1	* with an open-work 'turn-buckle'
29	Las Stocki 19	1/5- needlework? or plaiting?	1- single yarn 2- 0,016-0,025/**0,020**	1- Z - 24° 2- 0,492- 0,604/**0,547** 3- 6 braids/1cm	2/3 - on spindle or knurl?	2-3- plaiting used for planing	1	
30	Karmanowice 35 (grave 29)	6- plaited cord	1- yarn* 2- 0,082-0,164/**0,114**	1- Z/2S? - 32° 2- 2,624-3,280/**2,924** 1 element S? 0,492	2/3 - spinning method with aid of spindle/knurl	1- applied before galzing and polishing	1	* bark strips

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
31	Karmanowice 35 (grave12)	6- plaited cord	1-fibre* 2- 0,230-0,246/**0,242**	1- S/2Z - 20° 2- 3,608-4,100/ **3,813**** 1 element Z 0,635	1 - ad hoc	1-before cord impression	1	* bark strips or thicker fibres (roots) **single element S 1,148-1,312/**1,270**
32	Miłocin Kolonia	1/5- triangle needlework* or basket plaiting	1- single yarn 2- ?	1- Z -? 2- 0,492-0,574/**0,512**	3- spinning method	1-2 -before and after application of impression	1	* triangle turn-buckle
		5- needlework	1- single yarn 2- ?	1- Z - ? 2- 0,492-0,656/**0,574** 3- 6 braids/1cm	3- spinning method	1-2 - before and after application of impression	1	
33	Tominy 12	5- needlework	1- threaded yarn 2- 0,016-0,032/**0,021**	1- Z/2S? - 30° 2- 0,623-0,738/**0,653** 1 thread S 0,326	1/2 - ad hoc or spindle?/ knurl	1-2- before and after application of impression	2- burnt textile re-mainder in negatives - organic crust	
34	Tominy 12	5- needlework*	1- threaded yarn 2- 0,032-0,041/**0,035**	1- Z/2S? - 45° 2- 0,820-1,066/**0,943** 1 thread S 0,471	3- spinning method	1/2- applied after final vessel drying, though before glazing	1	* with a turn-buckle
35	Tominy 12	5- needlework	1- threaded yarn 2- 0,016-0,025/**0,021**	1- Z/2S? - 34° 2- 0,574-0,738/**0,636** 1 thread S 0,318	3- spinning method	2- part of the impressions planed before glazing and final polishing	1	

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
36	Tominy 12	5- needlework*	1- threaded yarn 2- 0,016-0,025/**0,021**	1- Z/2S? - 34° 2- 0,574-0,738/**0,636** 1 thread 0,318	3- spinning method	1/2- applied after final levelling out of vessel, before applying the glaze	1	* with a turn-buckle
		5- needlework or hosiery	1- threaded yarn 2- **0,016**?	1- Z/2S? - 38° 2- 0,492-0,656/**0,558** 1 thread S 0,279	3- spinning method	1/2 - jw.	1	
37	Tominy 12	5- needlework*	1- threaded yarn 2- 0,016-0,024/**0,020**	1- Z/2S? - 30° 2- 0,820-0,984/**0,888** 1 thread S 0,444	3- spinning method	1-2 -before and after applying impressions	1	* type IIIA or IIIB
38	Opatowice 3	1/5- plaiting or needlework? (outflow-outer side)	1 - yarn or fibre* 2- 0,050-0,164/ **0,088***	1- Z - 36° 2- 0,820-1,066/**0,956**	2- knurl/ spindle	1-2 -before and after applying impressions	1	*bast
		1/5- plaiting or needlework? (outflow-inner side)	1- yarn or fibre** 2- 0,130-0,164/ **0,140****	1- Z - 35° 2- 0,656-0,822/**0,750**	2-knurl/ spindle	1-2 - jw.	1	**bast
		1/5- plaiting or needlework? (belly)	1- yarn or fibre 2- 0,055-0,082/**0,072**	1- Z - ? 2- **0,610**	1- ad hoc	2- partially planed	1	
		6- plaited cord (“garland” belly)***	1- single string 2- ?	1- Z 2- 2,050-2,296/**2,152** 1 element Z - 30° 0,717	1- ad hoc	2- part of the impressions carefully planed	1	***plaited cord from 3 Z threads
39	Kościelna Jania	1/5- plaiting or needlework	1- threaded yarn or fibre* 2- 0,033-0,050/**0,040**	1- Z/2S? - 36° 2- 0,820-1,066/**0,956** 1 thread S 0,478	2- knurl or spindle	2- planed (glazed-polished)	1	* bast

Sample no.	Site	A Textile types	B Technical data of raw material	C Technical data of textile	D Application means	E Associated works	F Remains after firing	Remarks
40	Łojewo 4	6- plaited cord*	1- cord 2- 0,016-0,032/**0,028**	1- Z/2S 2- 1,476-1,886/**1,702** 1 thread Z 0,567 1 element S 0,282	2? -spindle or knurl**	2- planed and polished	1	* from 3 Z/2S elements **knurl from single wound cord
41	Łojewo 4	5- needlework?	1- threaded yarn 2- 0,025-0,033/**0,030**	1- Z/2S? - 35° 2- 0,902-1,066/**0,968** 1 thread S - 0,483 3- 3 braids/1cm	3- spinning method	2- partially rubbed after application	1	
42	Łojewo 4	5- needlework	1- threaded yarn 2- 0,025-0,050/**0,033**	1- Z/2S? - 30° 2- 0,738-0,984/**0,853** 1 thread S 0,427 3- 3 braids/1cm	3- spinning method or using a spindle	2- after applying impression carefully planed	1	
43	Łojewo 4	1- plaiting (vertical bands) 1- plaiting (“herring bone”)	1- fibre* 2- 0,049-0,164/**0,125*** 1- fibre* 2- **0,082**	1- Z - 30-40° 2- 1,640-1,722/**1,700** 1- Z? - 30° 2- 1,558-1,804/**1,695**	2- knurl/ spindle 2 - jw.	2-3 - side polished 2-3 - jw.	1 1	*bast, bark strips
44	Łojewo 4	1- plaiting (vertical impressions) 1- plaiting (“herring bone”)	1- fibre* 2- 0,164-0,229/**0,197*** 1- fibre* 2- ?	1- Z - 40° 2- 1,148-1,312/**1,253** 1- Z? - 45° 2- 1,640-1,804/**1,722**	2- knurl/ spindle? 2- knurl/ spindle?	1-2 -before and after applying impression	1	*bast?, straw *bast?, straw
45	Łojewo 4	1- plaiting (vertical impressions) 1- plaiting (“herring bone”)	1- fibre* 2- 0,082-0,197/**0,136*** 1- fibre* 2- ?	1- Z - 30° 2- 1,230-1,312/**1,291** 1- Z? - ? 2- 0,984-1,804/**1,279**	2- knurl/ spindle? 2- knurl/ spindle?	1-2 - before and after applying impression	1	*bast, bark strips?

sides of receptacles. In this context it is important to note that for the negatives gained, regardless of the process and means of 'finishing' the textile ornament, some contraction occurred during the drying, firing and finishing process (i.e. smoothing out of impressed textile) and usage of vessels.

A. TEXTILE TYPES USED FOR ORNAMENTATION

1. Plaiting – Hand-made out of thread, yarn, straw, hair, string or twigs, used for simple instruments or plaited 'without them, holding tensed threads on the toe or in some other way holding the thread still' [Michałowska 1995:188]. Usually the impressions of 'flat', three-dimensional (linen interlace), slanted or wound around plaiting have been found on ceramic wear. Most likely these were tapes, strips and plaited string.

2. Macramé – A textile tied by hand from string or yarn (threads), pin or crochet needle. 'Macramé is characterised by various strong, tensed knots tied, thus creating small ridges, festoons, loops and fringes' [Michałowska 1995:210ff], made out of tautened string as an elastic, openwork textile.

3. Sprang (Netting) – Made out of 'plaited threads of only one system' [Maik 1988:44-45, also see for further literature]. This can be viewed as a technique 'of forming flexible, linked 'eyes' that grow incrementally in a net or close-net pattern' [Michałowska 1995:189]. Sprang can either be fastened (single, double or multiple twist) [Łaszczewska 1966:37; Schlabow 1976: Fig. 1, 2], plaited (similar to linen 1/1 plait) and intertwined (from two plaited threads and lightly turned at the same time) [Michałowska 1995:189]. In the case of samples 2, 7, 16, 24, 26, 27 regular impressions of tautened fibre were retained on the side of the vessel.

4. 'Fringe' – a finishing element of turned, plaited or threads (yarn) tied in a loop.

5. Needlework – a time-consuming technique [Hald 1950:292-297] 'making it possible to create rows of elastic eyes of endlessly long thread with the help of two or more pins' [Turnau 1979:19] – or crochet needles. Traces remaining after the needlework can be observed in the negatives, which horizontally mirror the cord (filled 'eyes') with a characteristic 'lattice' between impressions [Michałowska 1995:245].

6. Cord (string) – turned (single or several 'thread-strands'), plaited ('pigtail') or wound around (twisted). Most often it was applied individually, which is indicated by differences in the concavity of negatives.

B. TECHNICAL DATA OF RAW MATERIAL (RAW MATERIAL TYPES AND METRICAL MEASUREMENTS)

1. Yarn – single or threaded. The former could be anti-clockwise (S) or clockwise (Z). Threaded yarn could be 'composed of two or several threads per se, intertwined into one' (i.e. Z/2S; S/2Z) [Michałowska 1995:38]. This was the basic element out of which such textiles were made.

2. Textile Fibre – bast, small hoops of bark, thin roots and straw.

3. Cord (string) – two-strand, three-strand (and n-strand), turned, plaited or wound around.

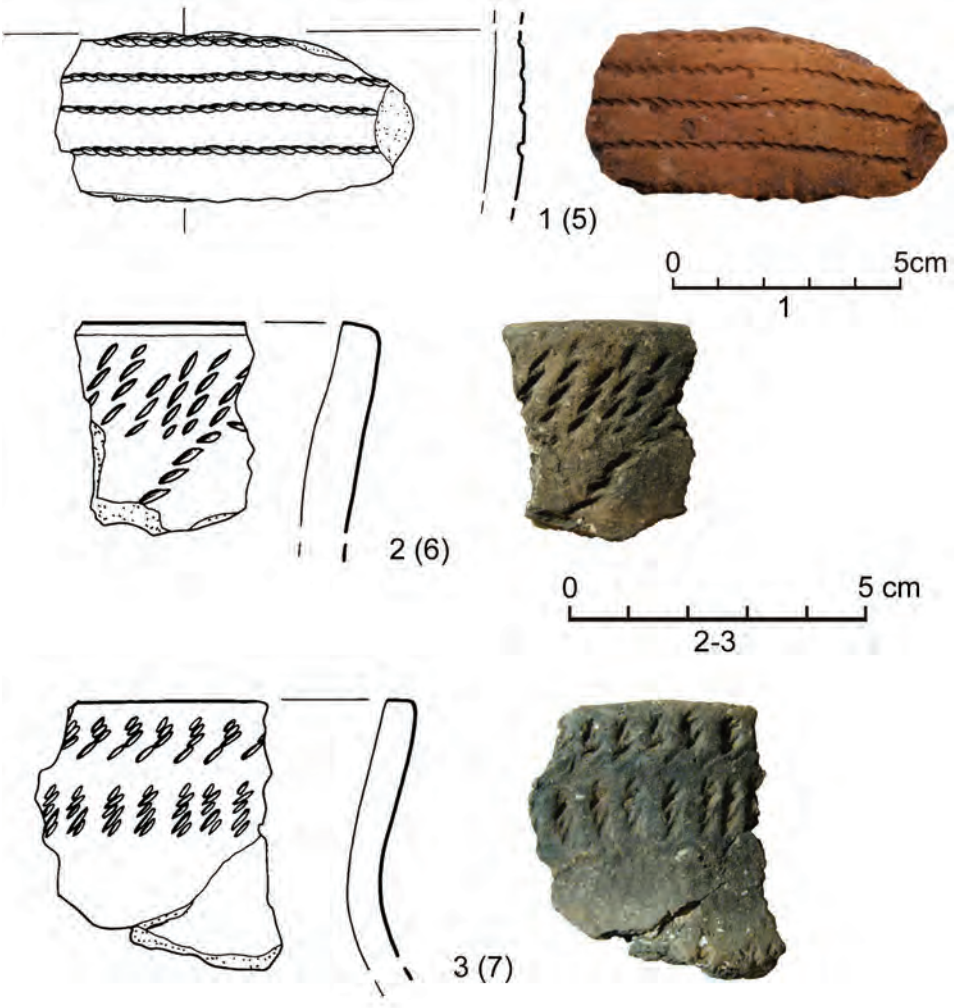

Fig. 4. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

Measurements – in each case the thickness of fibres is given from which, yarn, thread or cord is made; the diameter is marked in bold (mm).

C. TECHNICAL DATA OF TEXTILES

1. Twist of yarn, textile fibre or cord – right (Z) or left (S), the degree of fibre turn given (0).

2. Thickness of yarn/thread/cord – results of measurements (mm), with thickness given of contributory elements in the case of yarn thread or multi-strand cord; diameter in bold (mm).

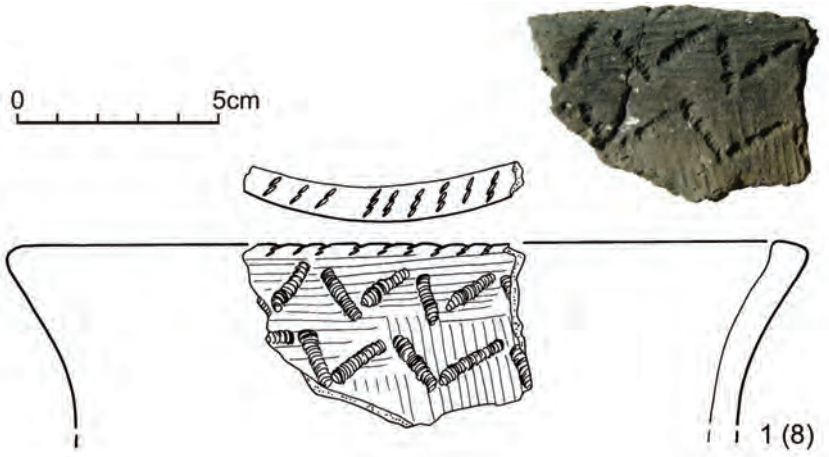

Fig. 5. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

3. Closeness – number of eyes (knots) or interlace for 1 cm.
4. Design – horizontal, vertical, slanting.

D. APPLICATION MEANS OF ORNAMENTS ON VESSEL SURFACE

1. Ad hoc – individual design, resulting in a lack of regularity and little precision in impressions.
2. Knurl – wound around (or turned) around a small cylinder.
3. Turning (matrix) – a textile fastened (stretched) across a surface, whereas the receptacle was turned. As a result, on the vessel surface the lack of join is marked from beginning to end of the impressed plaiting, etc.

E. ASSOCIATED WORKS

Traces of smoothing out and glazing have been identified as well as a glazing substitute where a fatty coat of clay was present on the vessel wall, as a result of intensive surface polishing.
1. Levelling out of the vessel surface (planing) before ornamentation is applied by hand or textile apparatus.
2. Partial erasure of fibre impressions (leaving only a 'readable fragment of the ornament in a horizontal position or other), after impression is applied.
3. Rubbing of the impression surface after firing (polishing, making it shine).

F. PRESENCE OR ITS LACK IN ORGANIC SUBSTANCES IN IMPRESSIONS (REMAINS AFTER FIRING)

1. Lack of an organic substance in negatives – more or less, deep impressions 'clean', rinsed.
2. The presence of an organic substance in negatives – flattened impressions, compressed tar substance (if not the remains of object filling or cultural layer, then the receptacles could have been fired along with a fibre around them).

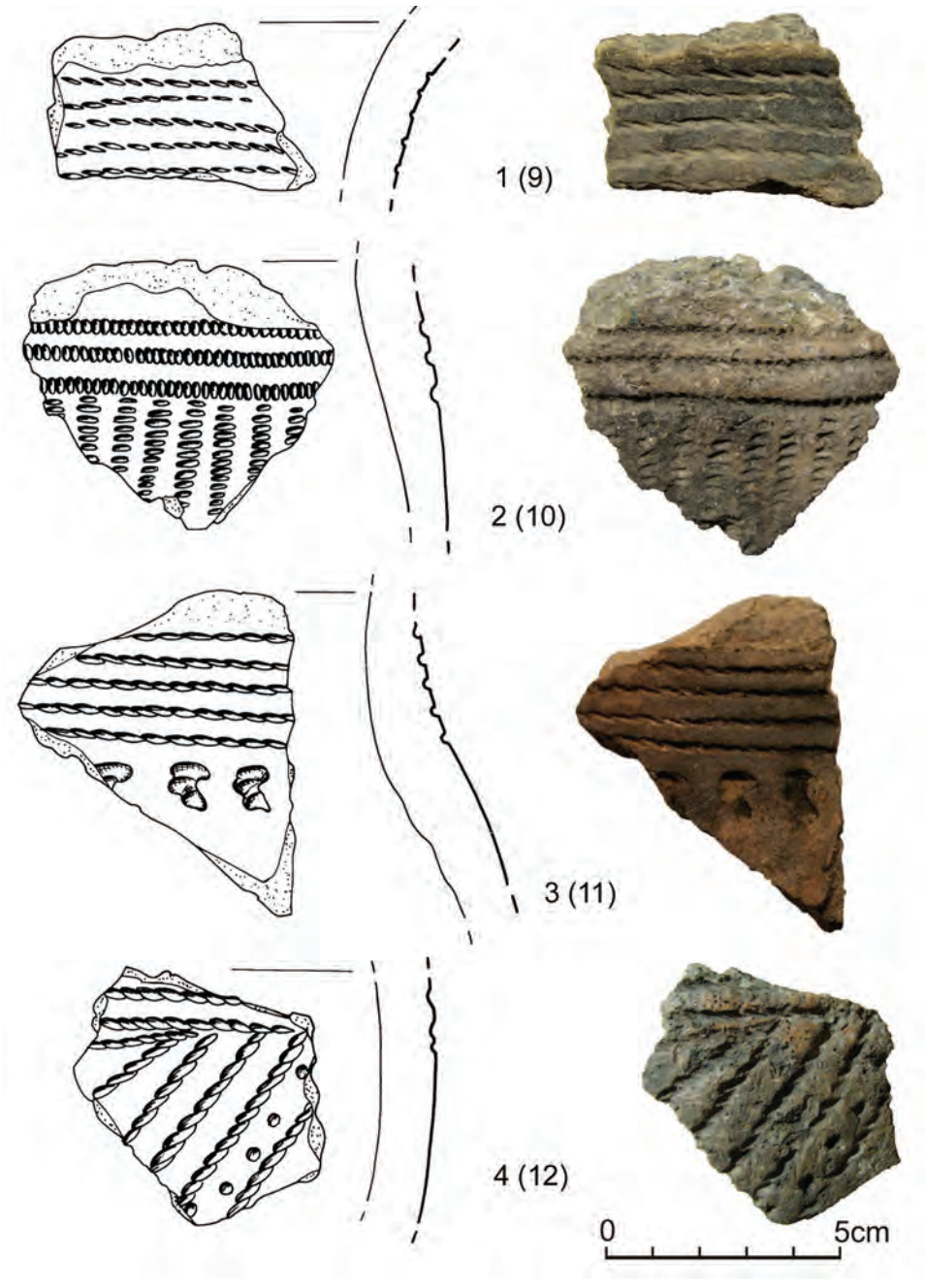

Fig. 6. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

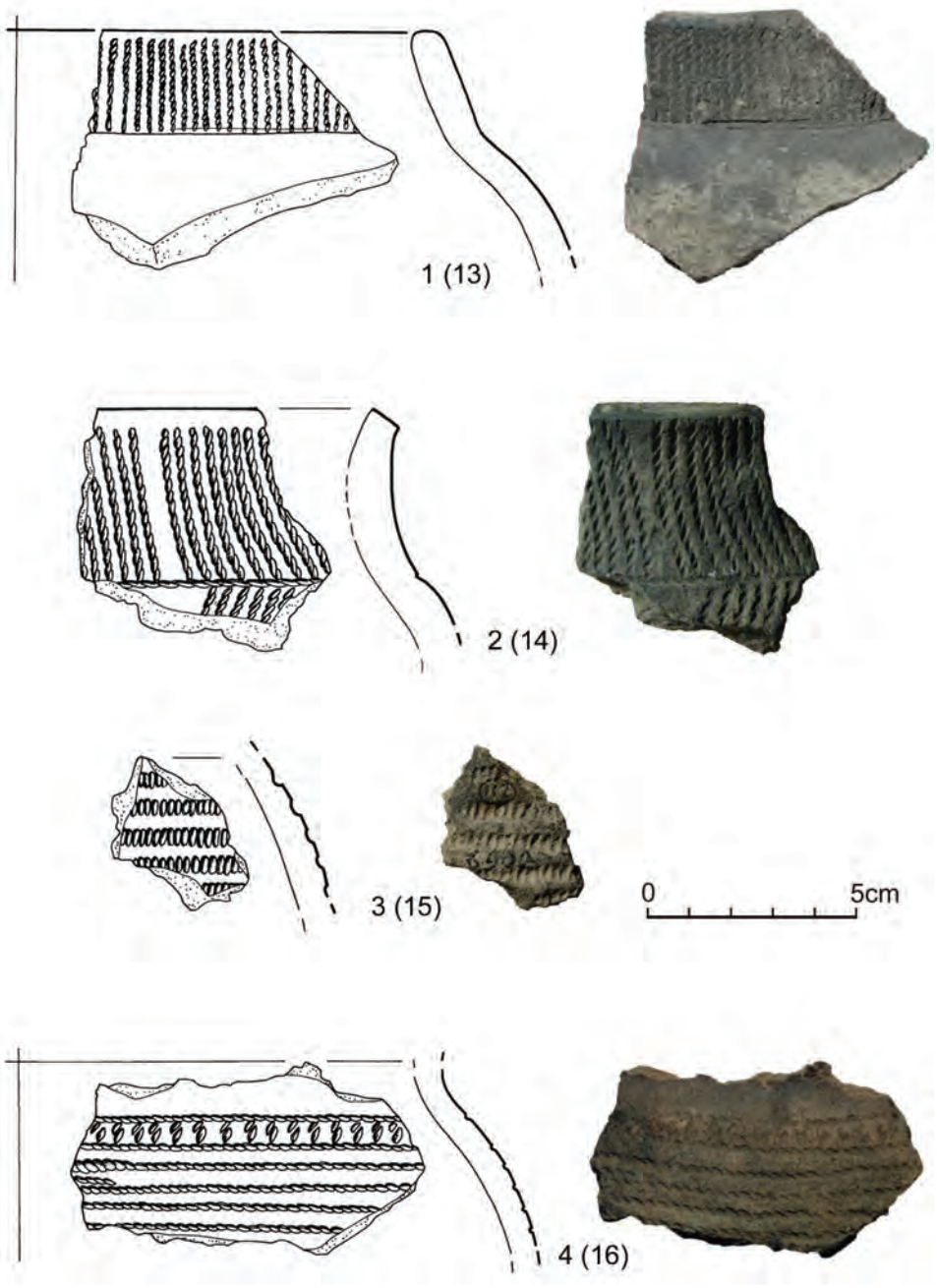

Fig. 7. Documentation of drawings and photographs of ceramics of ‘cord’ and ‘cord-like’ ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

5. GENERAL NATURE OF MICROSCOPIC RESEARCH RESULTS

Observations have revealed under microscope a differentiation of 'cord' impressions (categorised as 'one-strand-cord', 'two-strand cord', 'three-strand cord' and 'finger twine cord'), which has demonstrated to be much greater than first thought – as well as more complex.

First, in the vast majority of samples (both fragments of ceramic ware and entire vessels) impressions have been identified not only of cord, but also of other textiles (see Table 2:A). A review of results allows the view that on the sides of vessels for the most part 'simple' (from a technical point of view) non-woven textiles were impressed, which did not require practically any further tools. These were not only cords or strings [Jażdżewski 1936:250]; usually they were in the form of needlework (14 cases), plaiting (12), plaiting or needlework (5), netting (5) and to a much lesser extent, macramé (1) and fringes (1).

The impressed cords (11 in sum) also testify to the relative popularity of these negatives that once were a complementary element of embellishment. In several cases it is possible that impressions were identified of so called baskets, cross-ribbed technique of plaiting (sample nr 10 and 15). In the series of samples under investigation, however, no impressions have been noted of material (fabric) itself. This does not mean that the latter did not exist, for other findings have indeed suggested otherwise [Novitska 1960; Łaszczewska 1966:23ff; Grygiel 2008:1878, 1881, Fig. 1464]. One possible conclusion therefore is that the results of research discussed above testifies to the fact that in the 5th and 4th mill. BC, material was not used in the application of 'corded' ornaments on ceramic ware.

An important finding of the research conducted is the conclusion that a very similar visual effect was attained in the application of various textile techniques. One example of this could be ornaments that under macroscopic analysis are read as a 'two-strand cord' impression. Microscopic analysis was conducted with the use of various fibres such as plaiting (needlework), netting (sprang), needlework or cord (plaiting and turned). 'Finger twine cord', however, could in fact be the traces of applying fibres in the cross-rib technique (basket plaiting) or other 'matrices' (shells, closely set shell beads). It is only the ornaments associated with 'three-strand cord' (present in 3 samples) that were made by using plaiting.

The next aspect of differentiation concerns the means of applying embellishments. Three have been identified: ad hoc, so called knurl and matrix. The former two were applied in relatively straightforward ornaments, whereas for the more complicated ones that linked manifold, close impressions, a matrix was used. This usually took the form of a net upon which a layer was added (sewn?) that was the positive (original) of the intended ornament. In such cases impressions were

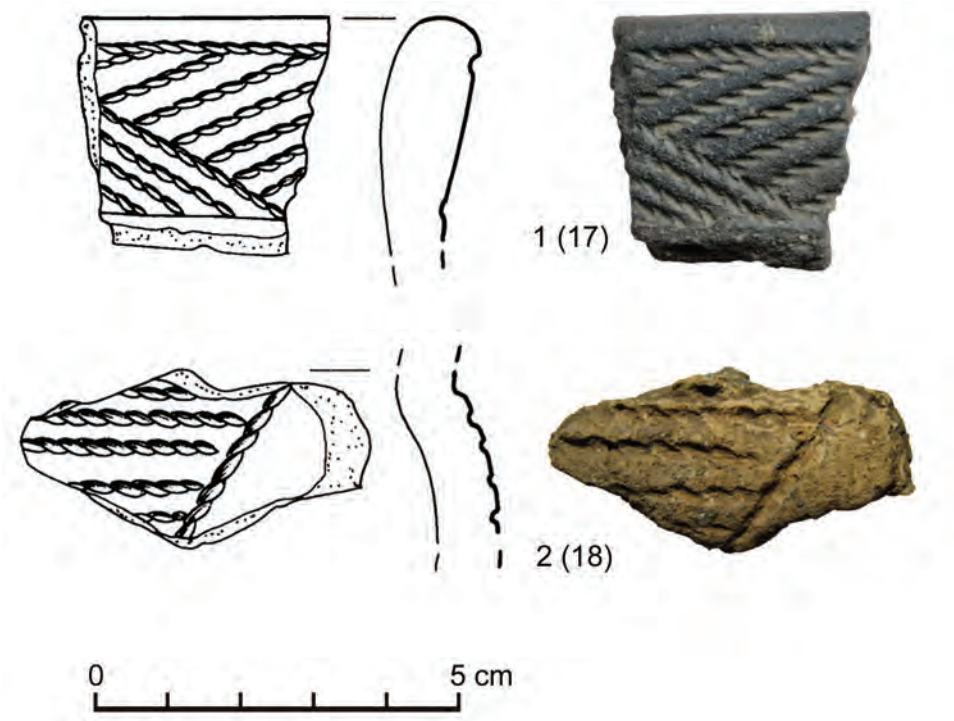

Fig. 8. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

gained by turning the vessel and at the same time, pressing it to the accordingly tensed matrix.

Moreover, microscopic analysis has revealed applications that have not been identified under macroscopic investigation such as partial planing of ornaments, which occurred when at first these were impressed on a larger set of vessels so as to finally leave only a selection. Traces of such procedure have been recorded in 9 samples (nrs 17, 18, 21, 22, 23, 26, 28, 35, 38).

6. RESEARCH RESULTS BASED ON KNOWLEDGE OF TEXTILE CRAFTS IN PREHISTORY (NEOLITHIC)

The store of knowledge to date in respect to archaic techniques of applying textile fibre in Europe can be said to embrace two groups of information. The

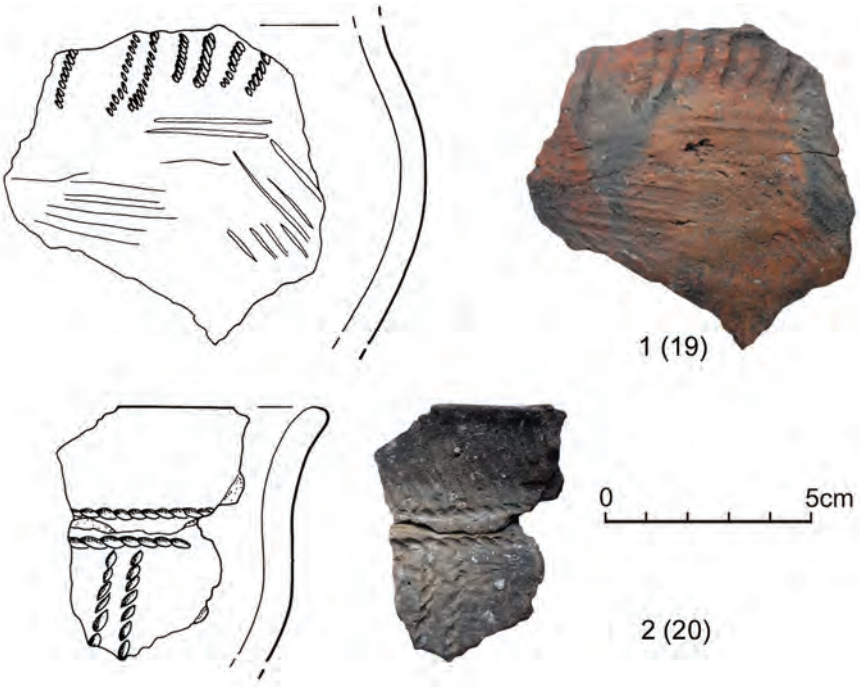

Fig. 9. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

first, (6.1), much wider and richer in source documentation is determined by ethnographic observations, whereas the second (6.2), is decidedly less numerous and detailed, and is informed by prehistoric findings of materials. Both of these groups have been used in the discussion below for the purposes of contextualising them in respect to the above (see part 2) categories of identified textiles. There shall be a focus therefore on issues tied to (a) types of fibres whose traces have been identified on ceramic ware as well as (b) the raw materials that were used for their creation. Here, the relevant context of technical data (closeness of application or thickness of thread), however, shall not be addressed.

6.1. RESEARCH RESULTS IN THE CONTEXT OF KNOWLEDGE ON ARCHAIC INDIGENOUS TEXTILE CRAFTS

Of particular significance is the sum of knowledge presented in the monumental study by K. Moszyński [Moszyński 1967], based on ethnographic materials

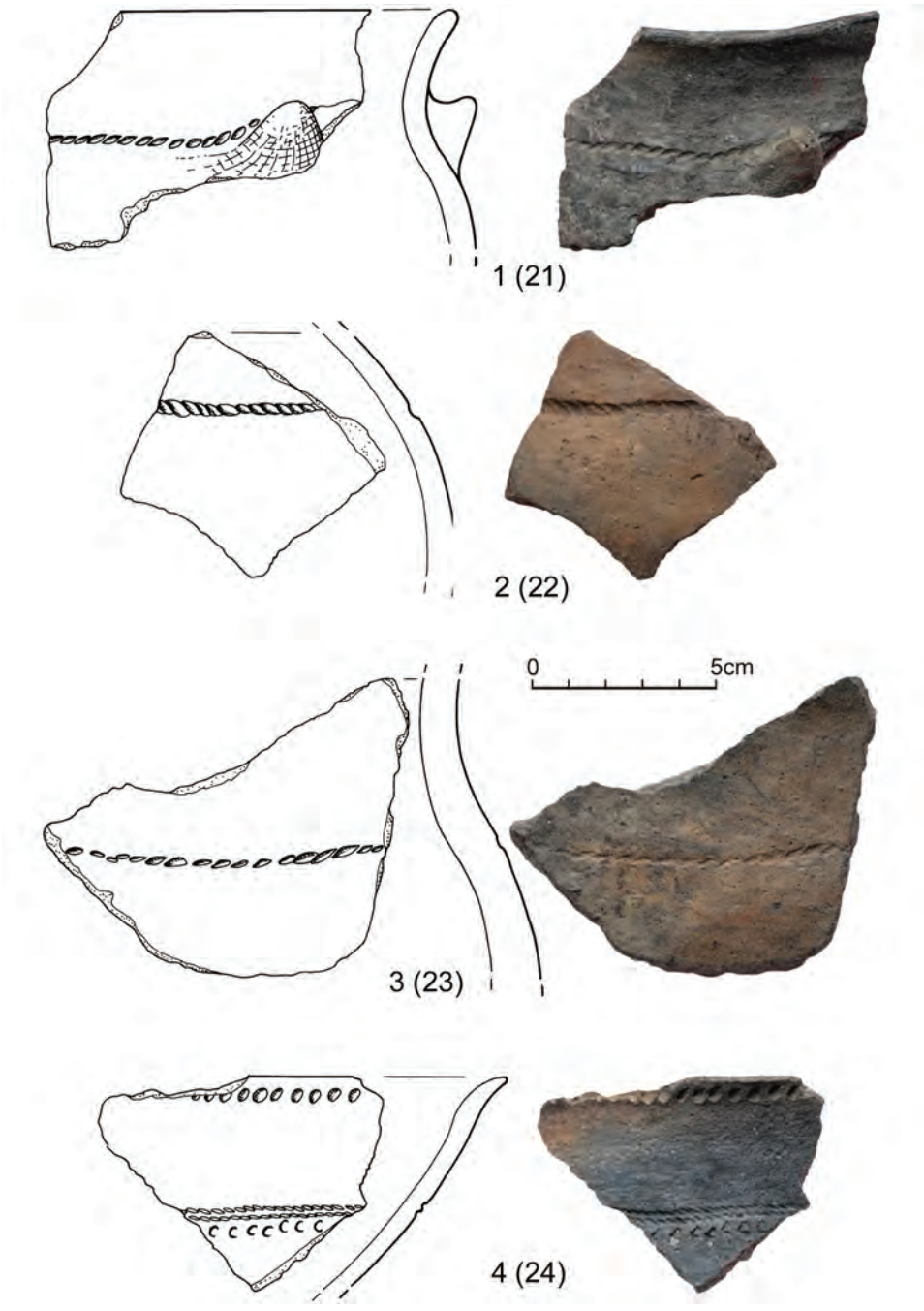

Fig. 10. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

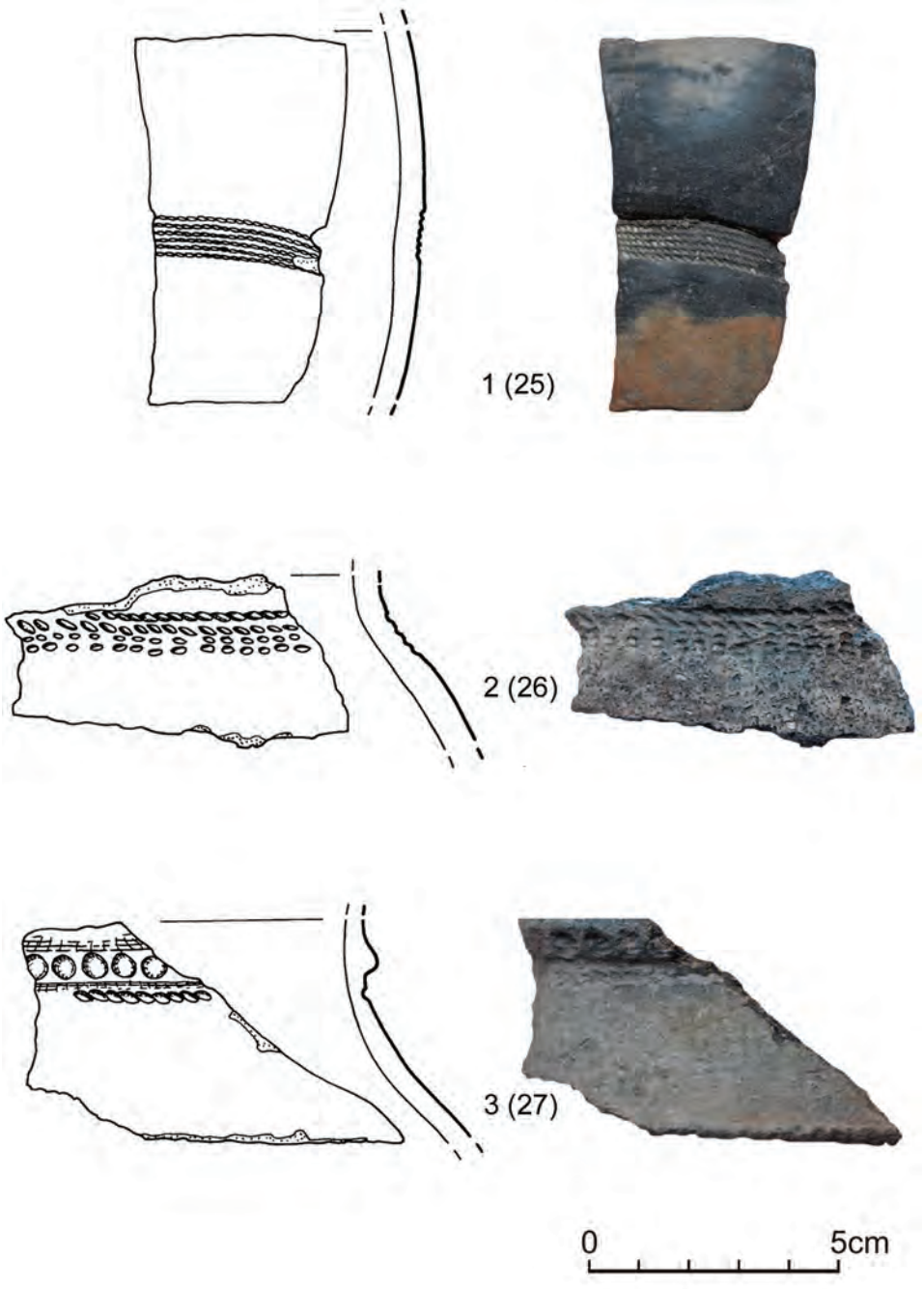

Fig. 11. Documentation of drawings and photographs of ceramics of ‘cord’ and ‘cord-like’ ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

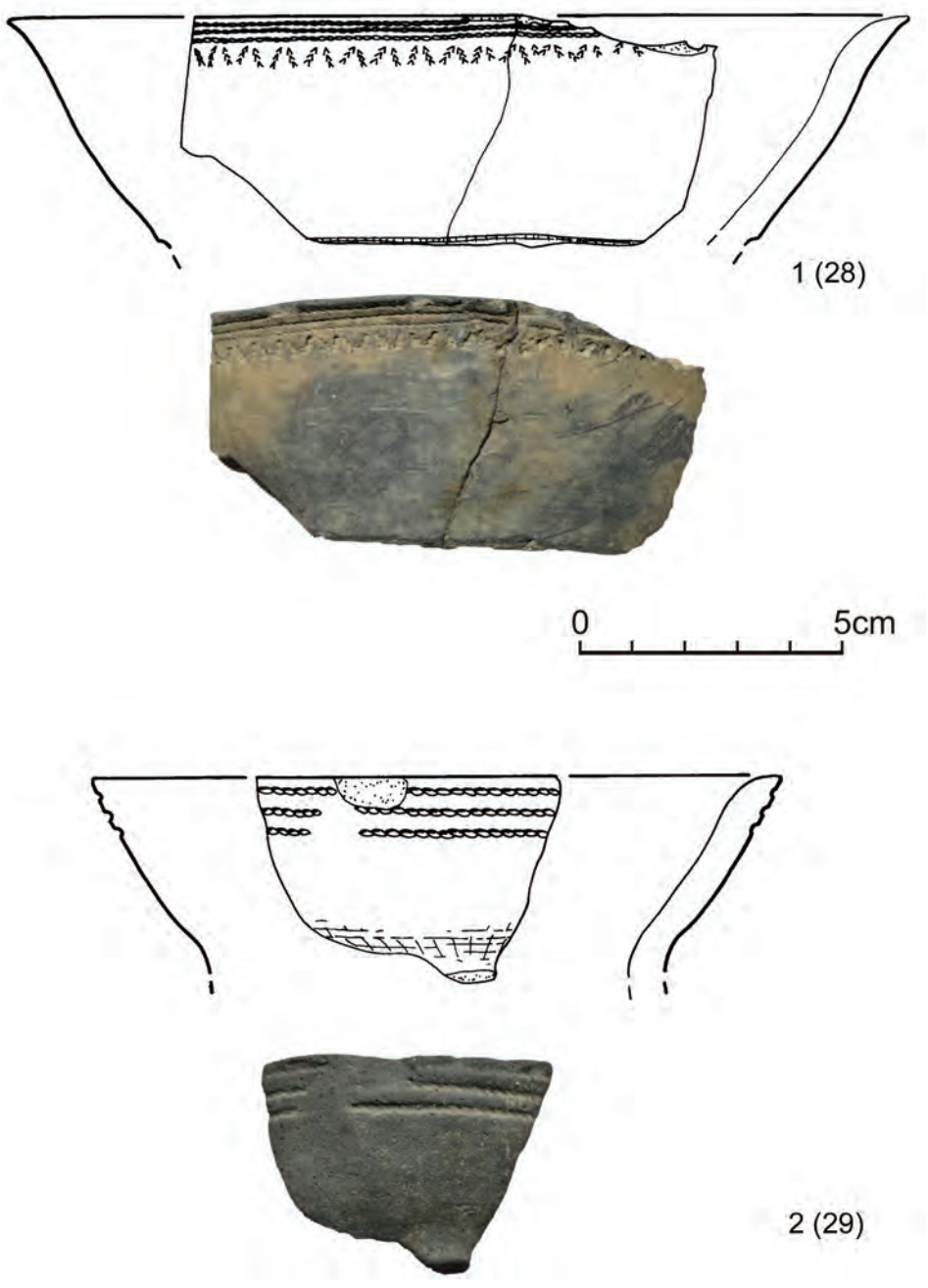

Fig. 12. Documentation of drawings and photographs of ceramics of ‘cord’ and ‘cord-like’ ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

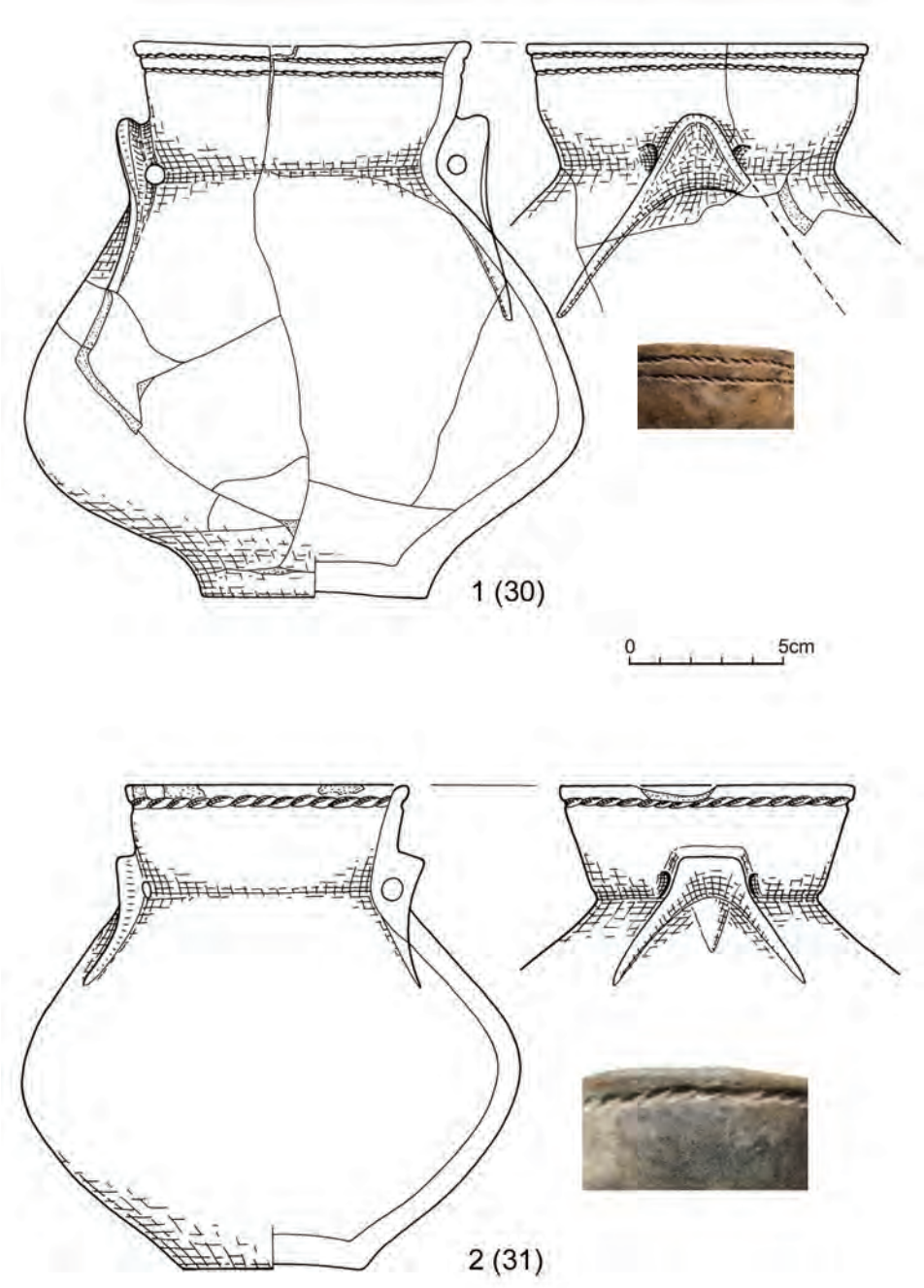

Fig. 13. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

from the 19th c. and start of the 20th, which was gained from the 'lands of relicts' in the territories of the Slavic peoples where the Polesie area proved to be particularly productive in terms of archaeological research.

a. Types of ornaments

The above quoted author in fact recorded all the basic techniques and non-woven textiles impressed on receptacles, which are presented below.

(1) 'Plaiting does not involve the use of knots and is based on joining the strands purely by turning the edges down, which usually finds a broad application in the domestic economy (...) Plaited textiles (...) are for example mesh-type fishing fences, blankets and bow-nets and other fishing products, shepherd whips as well as other objects for storing supplies or for transport (baskets etc.), some kitchen utensils (sieves, colanders), clothing (plaited belts, bast moccasins, hats); (...) One of the most common forms of plaiting is the so called pigtail (...), cross, (...), rib (...), cord (...) and cross-rib... technique' [Moszyński 1967:329, 332-334].

(2) 'Clearly less commonplace (...) is the net technique, which should not be confused with tying of mesh, for this concerns plaiting of mesh, not tying – the similarity of these is purely external. As a result of turning the edge of thread (secured row by row next to one another), the appropriate finger-work, a very beautiful stretched plaiting is made, one similar to netting without the knots'. From such 'netting', caps and belts were made (...). The netting technique is no doubt a very ancient one. In Egypt for example, it was used 2 mill. BC and not much later, archaeologists have proven its use in Jutland...' [Moszyński 1967:330-331].

(3) '... aprons in the archaic past (...) that in many Slavic lands were used for what later became skirts, and two highly unrefined small aprons, sometimes almost square, rather 'starched' with long fringes (...). It is also similar in shape to rugs and embellished with fringes at both ends a Latvian cape, in the shape of a long rectangle around 2 m, though just over 80 cm wide – a garment also common to Estonia. All of these capes belong to the last remainders of very primitive clothing, from time immemorial. Apparently a rug was found in Jutland among Bronze Age excavations' [Moszyński 1967:429, 430, 436].

(4) 'From the particular fibres taken separately, in general nothing is produced except for threads and cords, as well as felt because these are too weak. It is only through their strengthening by means of turning a larger number together – that in fact through the change into thread or cord, are these plaited threads suitable for use' [Moszyński 1967:309, 310].

b. Raw materials

According to K. Moszyński [Moszyński 1967:309-310]: 'Twigs in the broader sense of the word can be any organic material that autochthons use in the making of plait (plaited belts, straw hats, baskets, screens, fencing etc.), as well as ropes and various types of ties. They can be entirely organic or man-made. Examples

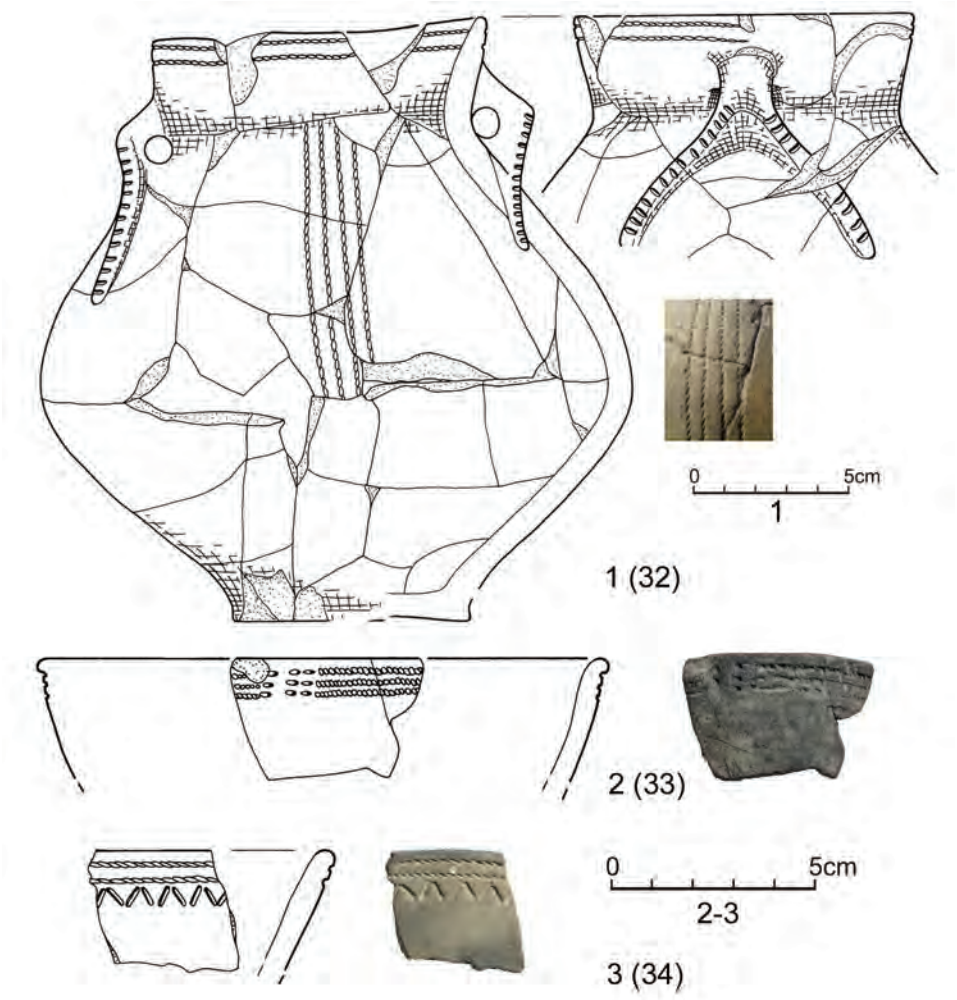

Fig. 14. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

of the former are roots, stems, blades and leaves of grass, willow shoots, slender tree trunks (up to the crown) of young trees and finally, thicker, flexible small branches.' Man-made plaits are among others, leather, bark belts or fine split wood, as well as thread and cord made out of fibre, which to make thread and cord used hair, wool, animal hair and most often, flexible, long, very thin strands in stems and other parts of some plants.

From particular, individual fibres as a rule nothing apart from thread, cord or felt is made, for fibre is too weak. It is only by a process of strengthening

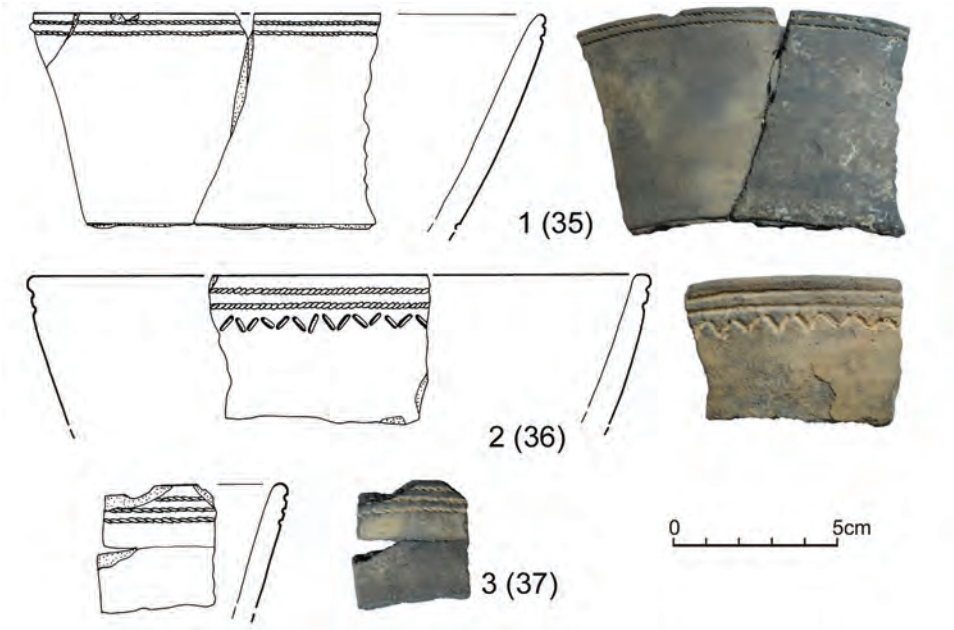

Fig. 15. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

through twisting a greater number together that through this change in thread or cord, a plait is produced suitable for use.'

In the ceramic impressions, on the basis of laboratory observation, there has been identified individual twisted threads of yarn and thicker, stronger elastic yarn thread (multiple thread, usually twined anti-clockwise Z/2S or S/2Z). Moreover, individual threads and strings (thread) were plaited to make a three-strand or multiple cord. Most often it was made out of linen, hemp, nettle, wool or animal hair. Belonging to another category were so called 'starch' yarns and plaits used to make baskets or mats [Moszyński 1967:310].

6.2. RESEARCH RESULTS BASED ON KNOWLEDGE OF TEXTILE CRAFTS IN THE NEOLITHIC

For the purposes of comparison, T.J. Chmielewski [Chmielewski 2009 here older literature] shall be referred to for the spinning and weaving crafts in the Neolithic.

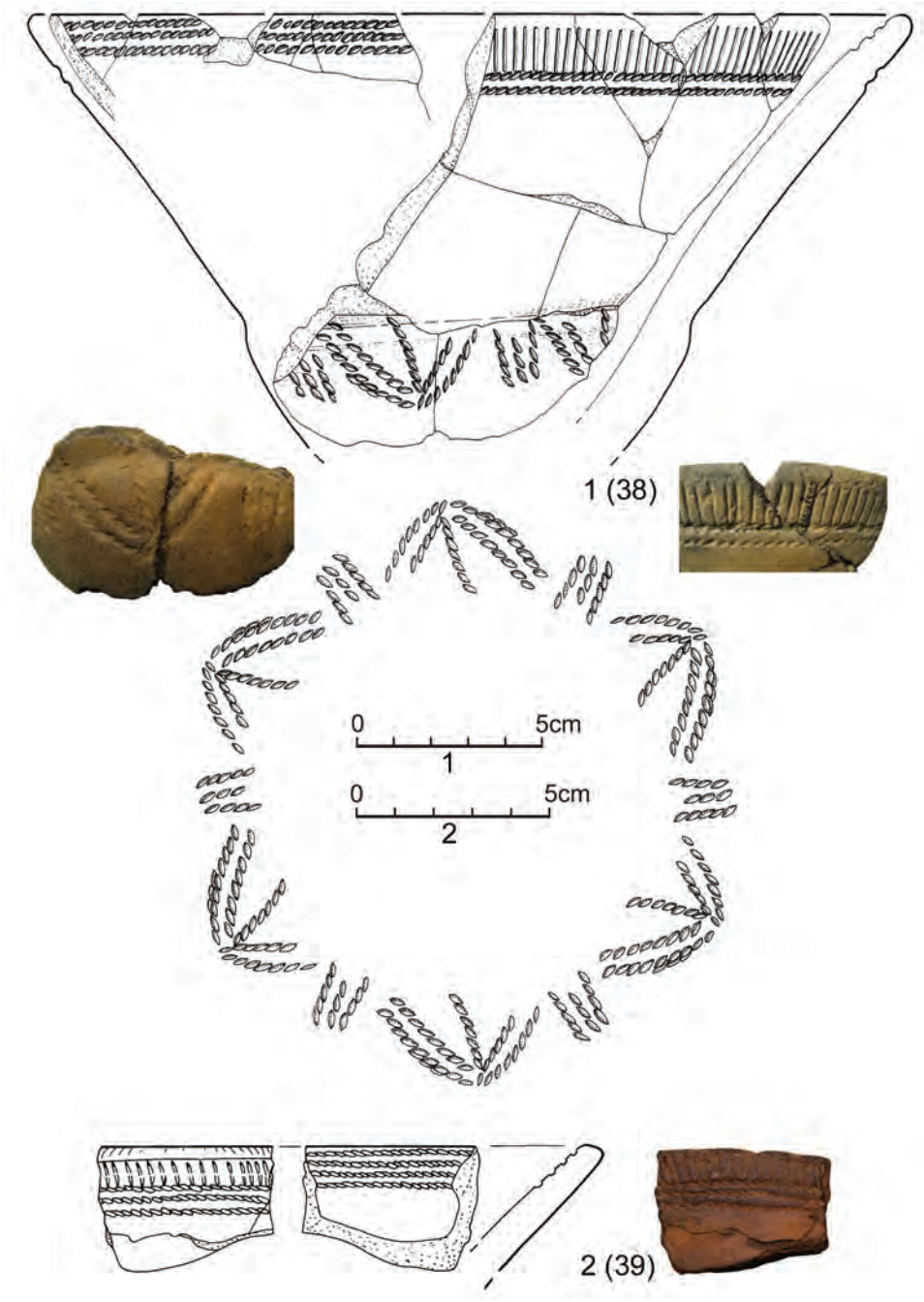

Fig. 16. Documentation of drawings and photographs of ceramics of ‘cord’ and ‘cord-like’ ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

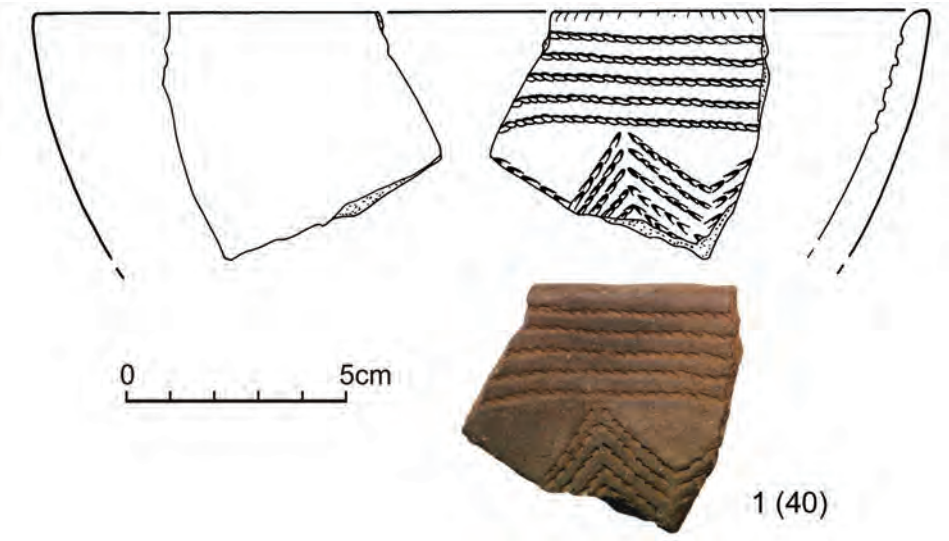

Fig. 17. Documentation of drawings and photographs of ceramics of 'cord' and 'cord-like' ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

a. Types of textiles

In general terms, among the categories referred to in part 4, the best evidence in the Neolithic is for the use of cords and plaits [Łaszczewska 1966:21-22; for earlier epochs cf. Adovasio, Soffer, Hyland 2005] and much less often, textiles made out of sprang netting, the latter identified among others on the basis of negatives preserved on ceramic ware from the Ritzmeck site [Schlabow 1960; 1976:26, Fig. 1, 2], where sprang was used as a complementary element in the production of ceramics. Goods such as clothing and shoes made out of cord and plait have been found among the accessories of the Iceman (3370-3100 BC), which were made out of grass [www.iceman.it]. Another illustration in the general context is the broad range of textile impressions found on TC ceramic ware, especially on vessel bottoms, where among others, there have been identified plaited textiles of thick yarn [Novitska 1960; Burdo 2004b]. Further, in materials dated for 3700-3200 BC in sites of the Maikop culture in the North Caucasus (Novosvobodnaya sites), there have been recorded, among others, textiles made on tablet looms [Shishlina, Orfinskaya, Golikov 2003:333-334].

b. Raw materials

In respect to the Neolithic the use of plants and animals for raw materials has been documented [Chmielewski 2009:16-51], though it ought to be noted that the former were in practice at an earlier time in prehistory. For the latter, the use of linen, hemp, nettle, grass, reeds as well as tree bast (in particular, lime) has been recorded. For the above quoted Maikop culture sites, there have been

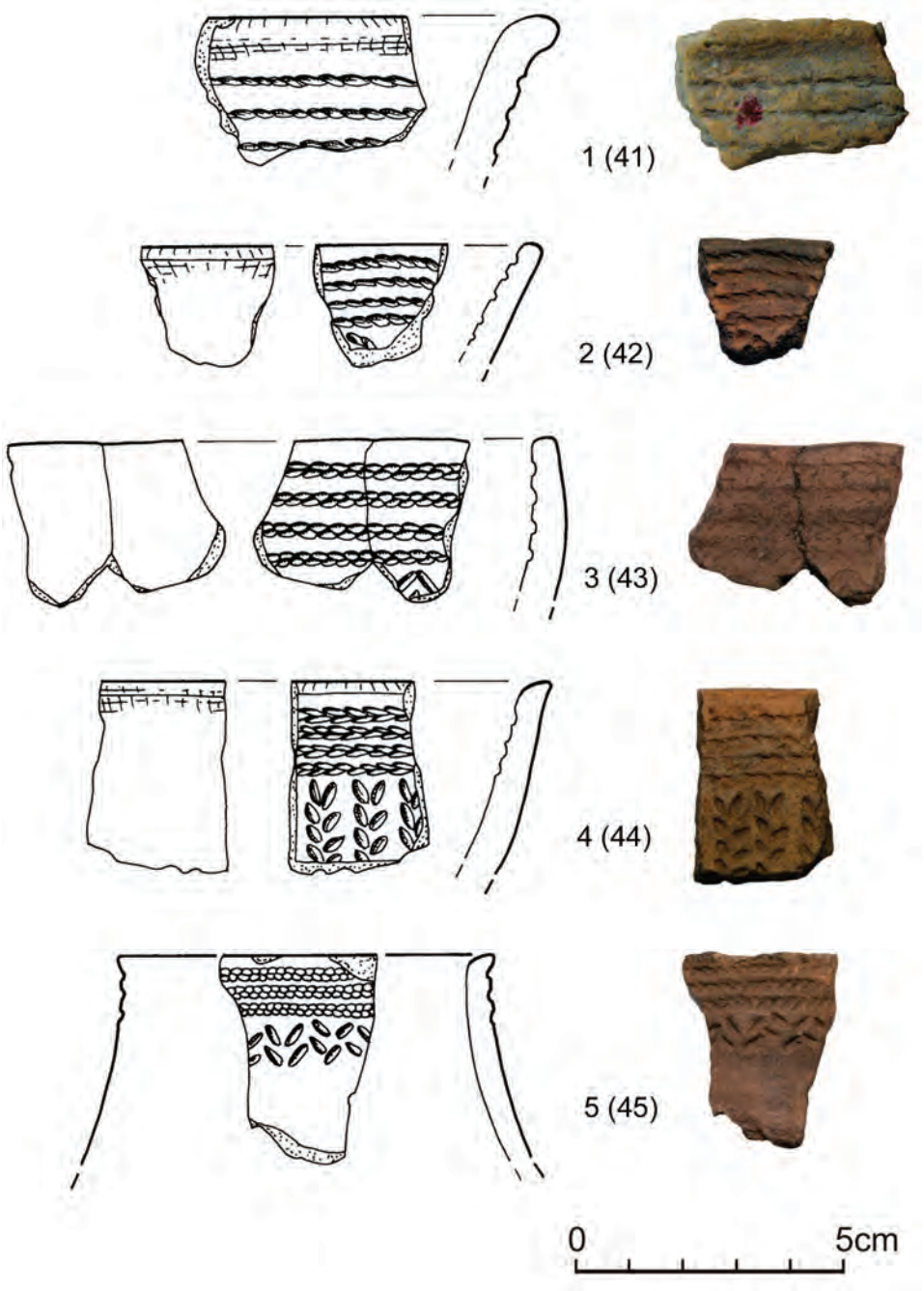

Fig. 18. Documentation of drawings and photographs of ceramics of ‘cord’ and ‘cord-like’ ornaments, under microscopic analysis. Catalogue numbers of samples (in brackets) according to Table 1 and Table 2

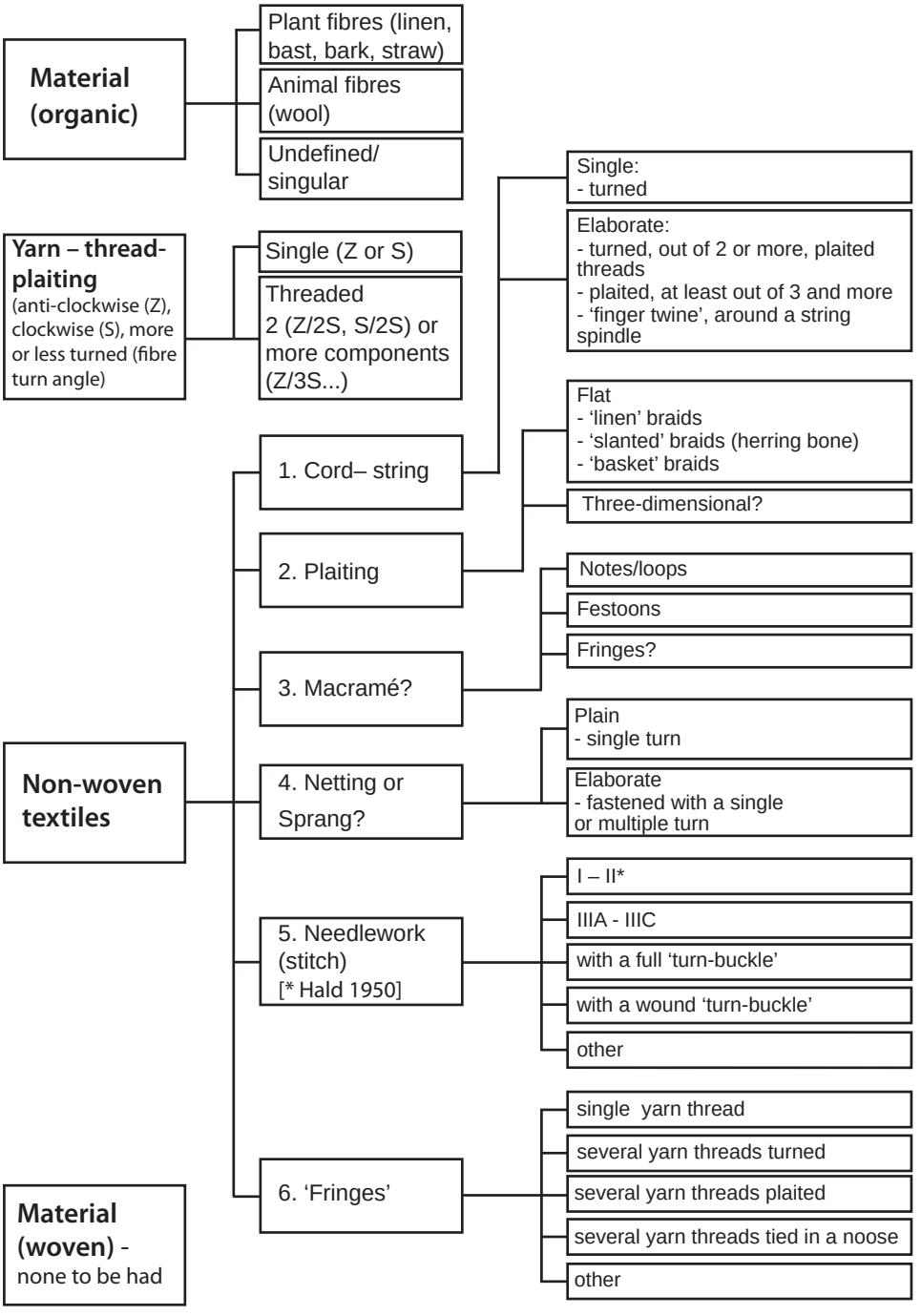

Fig. 19. Impressed textile elements on household ceramic ware – attempt at a framework of identification

identified mixed wool textiles with plant fibres as well as linen with plant fibres similar to cotton [Shishlina, Orfinskaya, Golikov 2003:333-336].

SUMMARY

Research to date on Neolithic textiles might be a good justification for a relatively high assessment of cognitive features in the area of 'stylistic observations' in relation to pottery. The series of specialist research findings focused on sources linked with one of the segments of such crafts – that is, 'cord' ornamentation, would seem to be an inspiring gateway into this field of research.

From the above point of view the main limitation in research terms of the series of ceramic samples under investigation should take into account, in particular the small proportion of intact vessels, which would enable a relatively complete analysis of the type and construction of the textile concerned. It is only as a matter of lesser priority that other limitations should be addressed, as a result of spatial (geographic), chronological or functional problems (division of objects and goods into 'daily' and 'occasional').

Translated by Ryszard J. Reisner

ABBREVIATIONS

AP URSR	–	Arkheologiczni pamiatky Ukrainskoyi Radianskoyi Sotsialisticheskoi Respubliky. Kiev.
BPS	–	Baltic-Pontic Studies. Poznań.
KSIA	–	Kratkiye Soobshcheniya Instituta Arkheologii. Moskva.
KSIA AN USSR	–	Kratkiye Soobshcheniya Instituta Arkheologii Akademiyi Nauk Ukrainskoy Sovetskoy Sotsialisticheskoy Respubliki. Kiev.
MIA	–	Materialy i Issledovaniya po Arkheologii USSR. Moskva. Leningrad.
SA	–	Sovetskaya Arkheologiya. Moskva.

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