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Looking at the Material: One Hundred Years of Studying Ostraca from Egypt

Ceramic potsherds were one of the most commonly used writing materials in the ancient Mediterranean and beyond. The widespread use of pottery fragments for writing was probably due to the fact that they were easy to find and came at no cost to anyone who could write.¹ Inscribed sherds, which are usually referred to as ‘ostraca’, are studied primarily for the texts they bear, without much attention paid to the material aspects of the writing support, such as the type of clay, the treatment of the surface, or the type of vessel from which the sherd came. Ceramologists rarely get involved in the analysis of ostraca because sherds chosen for inscribing often don’t come from the so-called ‘diagnostic’ parts of the vessel, such as rims, handles, or foots, but from the body and may therefore not be particularly informative for understanding the usage and distribution of pottery. Although numerous editions of ostraca published during the last century reveal little interest beyond textual parameters on the part of the editors, some studies stand out for the attention paid to material aspects of inscribed sherds and especially for the resulting observations and conclusions. In this contribution, I will first provide an overview of several such studies in which observations regarding physical properties of ostraca—even though far from a systematic approach and with a focus on peculiarities—contribute to the identification and better understanding of practices associated with their usage. I will then discuss more recent attempts at developing consistent and systematic methodologies in the study of ostraca through instances of recent or on-going research, including my own. Throughout, I will be pointing out ceramological parameters of ostraca, the recording and analyzing of which have the potential to render the application of multidisciplinary methodologies in the study of ostraca more successful.

¹ For general observations on the practice of writing on ostraca, see Depauw 1997, 77–78; Bagnall 2012, 117–137.

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1 Observing Peculiarities in the Material Aspects of Ostraca

Until recent decades, scholars dealing with ostraca tended to note physical features of the sherds only if they seem peculiar when compared to others, while the general introduction to the use of pottery sherds for writing has remained Ulrich Wilcken's magisterial study of Greek ostraca from Egypt and Nubia. Published in 1899, it consists of a volume devoted to a general study of ostraca and a volume presenting descriptions and editions of 1624 ostraca from major museums and private European collections.² The documents edited in the volume range in date from the third century BCE to the seventh century CE and, for the most part, are receipts for various taxes. Wilcken opens his study with a chapter on the use of pottery sherds as writing material in which he provides a historical survey of the practice from the ostracism in Classical Athens through the Late Roman period in Egypt and discusses possible reasons for the use of sherds for certain types of texts. This section is a very stimulating in-depth reflection on ostraca not only as texts but as ceramic fragments. Wilcken speculates that the fabrication of a ceramic container and the inscribing of the sherds derived from it were relatively close in time. He further observes that the appearance and colors of the fragments used for writing can be characteristic of different historical periods or localities due to distinct production techniques and sources of the clays.³ The scholar also discusses the layout and format of texts inscribed on ostraca, as well as factors affecting preferences in the choice of the side of a sherd, convex or concave, for writing.⁴

Wilcken's observations on the material aspects of ostraca and considerations of possible practices in which they were used were truly innovative. Furthermore, he highlighted the desirability of more detailed studies of the ceramic aspects of ostraca, something for which he did not find himself sufficiently qualified.⁵ In fact, there was little scientific understanding of the ceramic production in Egypt at the time,⁶ and Wilcken's appeal was not taken up until the later part of the twentieth century. In the

2 These include the collections of the following institutions: Königliche Museen in Berlin, Musée du Louvre and Bibliothèque Nationale de France in Paris, British Museum in London, National Museum of Antiquities in Leiden, Musei Vaticani in Rome, Museo Egizio e di Antichità Greco-Romane in Turin, Museo Archeologico in Florence, Ashmolean Museum in Oxford, and various private collections including the Finlay Collection, the Flinders Petrie Collection, and Wilcken's own private collection: see Wilcken 1899, vol. 1, 27–57.

3 See Wilcken 1899, vol. 1, 3–19, especially 13–18.

4 In the volume with the editions (Volume II), ostraca are not accompanied by illustrations. Only three tables with *facsimilia* of six ostraca (nos. 8, 43, 173, 842, 1027, 1266) are published at the end of Volume I (Taf. I–III).

5 See Wilcken 1899, vol. 1, 13.

6 For the first scientific publications concerning Egyptian ceramic productions, see Rodziewicz 1976; Egloff 1977; Peacock/Williams 1986. See also *Cahiers de la Céramique Égyptienne*, the series published by the Ifao (Le Caire) since 1988.

intervening time, however, there have been occasional instances in which observations of peculiar or idiosyncratic physical properties of ostraca have allowed scholars to identify features characteristic for certain types of texts, or to trace writing habits of individuals, or to determine provenance of the documents. What follows will be a brief look at some of these studies.

1.1 Peculiar Sherds for Certain Texts: Coptic Ostraca from Thebes

In 1902, Walter Ewing Crum produced a volume containing editions of Coptic ostraca from various collections.⁷ The largest part of the work was formed by the ostraca excavated by the Egypt Exploration Funds in Der al-Bahri and kept in the British Museum. The next in size are the ostraca from the Cairo Egyptian Museum, which comprises pieces from various sources and of largely unknown provenance.⁸ Both pottery sherds and flakes or slices of white limestone, a material used for writing in the Theban area since Pharaonic times, are included in Crum's edition. In the section on materials used as writing supports, the scholar notes that ceramic sherds seem to have been preferred for everyday documents (as opposed to legal and ecclesiastical) and gives a general description of the ceramic used while also recording the following peculiarity:

The pottery used by Copts is generally easy to recognize: of ill-baked, coarse material and dull brown or chocolate, pale dun, more rarely red colour, with many and often deep ribs, it has little resemblance to that made in earlier times. These are however not the characteristics of one series of our ostraca, namely the official tax-receipts [...], the material of which is always without ribs, glazed and generally of a light yellow colour. The shape of these too is usually triangular [...] and they are further distinguished from the generality of the pottery ostraca in having survived almost always intact.⁹

Through the most basic observations on the material properties of Coptic ostraca, such as differences in the shape and in treatment and color of the surface, Crum was able to establish that sherds used for official tax receipts differed from those inscribed with other types of texts such as private contracts, letters, accounts, etc. A few decades later, Walter C. Till expanded on the ceramological aspects of Coptic ostraca from the Theban area when he elaborated further on the surface treatment and the density of clay of the ceramic used for official tax receipts.¹⁰ In 1952, Elizabeth Stefanski and

⁷ Since the middle of the nineteenth century, thousands of Coptic ostraca have been found in the Theban region, both potsherds and limestone. So far, about 4500 ostraca on potsherds and 1000 ostraca in limestone have been published. Bavay/Delattre 2013, 379.

⁸ The volume also includes ostraca from minor collections, see Crum 1902, vii, ix and 88–92.

⁹ He specifies that in his work there is no occasion to refer to the employment of pottery as a writing material during the pre-Christian period and that this matter had been fully discussed by Wilcken (Wilcken 1899), see Crum 1902, x–xi.

¹⁰ Till 1947, 525–543, especially 525.

Miriam Lichtheim published a group of four hundred Coptic ostraca from the Theban area, this time from excavations conducted in 1929–1930 by the Oriental Institute of the University of Chicago in Medinet Habu.¹¹ Most of them date to the seventh and eighth centuries CE and come from the central part of the Coptic town of Djeme.¹² The editors provide the following description of the ceramic material used for writing:

Apart from a small number of white limestone flakes, the texts are written on pottery sherds of various kinds. The dominant type among them is a dark-brown, strongly ribbed ware which came primarily from wine jars. This pottery is thick and durable, and most of the more important business contracts in this collection were written on it. In the letters, a greater variety of pottery types can be observed (in addition to the use of limestone flakes). Those written on thin sherds are almost always fragmentary. As to the tax receipts, W. Till has observed that they are usually written on one particular type of pottery which is characterized by a glaze, yellow or reddish in color, which hardened the surface and made for a durable sherd. This observation, however, requires some modification; for while it holds true for the majority, there is in this volume a substantial minority of tax ostraca written on unglazed sherds of various types.¹³

Evidently, Crum, Till, and Stefanski and Lichtheim all noticed the same peculiarity in Coptic ostraca from the Theban area, namely that official tax receipts were usually issued on different sherds than those used for other types of documents. It was not, however, until 2013 that Laurent Bavay and Alain Delattre decided to investigate what kind of pottery the sherds used for Coptic ostraca come from and in particular what pottery could account for the peculiar sherds inscribed with tax receipts.¹⁴ On the basis of careful visual examination they were able to determine that the majority of Coptic ostraca¹⁵ inscribed with such texts as letters, accounts, contracts, etc. come from the Egyptian wine amphorae classified as Late Roman Amphora 7 and from Fine Ware produced in Aswan; these potsherds are contemporaneous with the texts they bear. The tax receipts, they concluded, are written on fragments of slightly varying types of amphorae, which all date to the Ramesside Period of the New Kingdom.¹⁶ The

11 Hölscher 1931, 50; Stefanski/Lichtheim 1952, v.

12 Five more Coptic ostraca from Djeme, all tax receipts dated to the first half of the eighth century CE, were published in 1979 by Jean Gascoü. For each ostrakon, he provides the paleographic information and some characteristics of the writing supports, such as the color and surface treatments of the sherds, see Gascoü 1979, 77–86.

13 Stefanski/Lichtheim 1952, 6 and 31–44.

14 Bavay/Delattre 2013, 379–384. See also Bavay 2008.

15 For the ostraca found during the recent excavations at Medinet Habu, at Sheikh Abd el-Gurna (topos of Epiphanius and TT29), at Qurnet Murai, and at Deir el-Bakhit, see Heurtel 2007, 727–749; Boud'hors/Heurtel 2010; Eichner/Fauerbach 2005, 139–152. On Greek and Coptic tax receipts from Djeme, see also Delattre/Fournet 2013, 161–175; Delattre/Vanthieghem 2014a, 89–102; Delattre/Vanthieghem 2014b, 103–113; Boud'hors et al. 2014.

16 The amphorae of the Ramesside period have different types of fabrics (“Marl D”, “Marl F”, and “Marl A4”, according to the Vienna System) but similar surface treatments, such as a thick layer of slip which is yellowish or reddish in color), see Bavay/Delattre 2013, 382–384. See also Nordström/

writing support is therefore over 2,000 years older than the texts written on it, which in Djeme are dated to the years 713–729 CE. The fragments of the pharaonic period amphorae must have been plentifully available among the ruins of the mortuary temple of Ramses III, on which the town of Djeme grew,¹⁷ and the choice of this material must have been very deliberate. The smooth surface of the sherds was suitable for the rapid cursive writing of professional scribes, whose work it was to issue official tax receipts, while the light slip ensured good readability of the text written with black ink.¹⁸

1.2 Peculiar Shapes and Writing Habits: Ostraca from Narmouthis

An intriguing group of ostraca comes from the temple complex in Kom Medinet Madi, ancient Narmouthis, in the Fayum, where in 1938 Achille Vogliano (University of Milan) discovered one of the most interesting archives of ostraca known to date.¹⁹ After a break caused by the Second World War, archaeological exploration of the site resumed in 1966 under the direction of Edda Bresciani (University of Pisa).²⁰ Since Vogliano's work at the site, numerous publications detailing archaeological activities as well as editions and studies of the textual finds at the site have appeared.²¹

Most of the ostraca from the site, an incredible number of 1550 pieces, were recovered by Vogliano in two rooms of a house, which consequently was called 'House of the Ostraca', located on the east side of the court in front of the entrance to the temple dated to the Middle Kingdom. The majority of the ostraca (1300) were found in Room III, some deposited in two large terracotta containers and some around the north wall, while the remaining 250 were recovered in Room IV of the same house, which was used as a wheat storeroom.²² The ostraca are inscribed with documents in

Bourriau 1993, 143–190, especially 181–182, pl. VII; Bourriau/Nicholson 1992, 37–41; Aston 2004, 187–191. See also Wilfong 2003, 88–91, especially 91 fn. 2.

17 The abundant presence of these vessels in Medinet Habu was noticed during the excavations carried out by the Oriental Institute of Chicago, see Hölscher 1954; Bavay/Delattre 2013, 383–384.

18 Bavay/Delattre 2013, 384.

19 Vogliano 1938, 533–549; Vogliano 1942; Davoli 1998, 224–232; Bresciani 2003, 197–230.

20 On the excavations and the site in general, see Davoli 1998, 223–252; Bresciani et al. 2006; Bresciani/Giammarusti 2012; <http://www.egittologia.unipi.it/pisaegypt/medinet.htm> (last accessed: 01.07.2017).

21 The edition of the ostraca from Medinet Madi (*O. Medin.Madi*, *O. Narm.* I–II, and *O. Narm.Dem.* I–III) was the goal of a research program developed by the Department of Egyptology at Pisa University under the direction of Edda Bresciani. A digital photographic archive of the ostraca was created for the originals kept in the Cairo Egyptian Museum, see Messeri/Pintaudi 2001, 253–282; Bresciani et al. 2002, 163–174; <http://www.egittologia.unipi.it/pisaegypt/BibMedinet.htm> (last update 2007). For a survey of the editions of ostraca from Medinet Madi, see Messeri Savorelli/Pintaudi 2002, 209–237. See also Menchetti 2005b; Bagnall 2007, 13–20; Giannotti 2007, 117–152; Menchetti/Pintaudi 2007, 227–280, especially 227 fn. 2; Menchetti/Pintaudi 2009, 201–238.

22 All these ostraca are currently kept in the Cairo Egyptian Museum. For the ostraca of the archive published by Vogliano, see Vogliano 1953, 508–515. See also Gallo 1997, xli. In 2006, the Archeological

Demotic, Greek, or both Greek and Demotic, and contain a miscellany of texts of different kinds, such as notes, accounts, payments, tax receipts, legal documents, school texts,²³ prescriptions, rules concerning the priests and the temple, horoscopes,²⁴ as well as name-ostraca and lists of names.²⁵ Certain groups are discernible within the stash: for example, there is a series of ostraca written mostly in Demotic and numbered, in Greek, from one (α) to 154 ($\rho\nu\delta$).²⁶ These texts are penned by the priest Phatres, son of Hormenios, and many appear to be notes meant for composition of legal documents, such as petitions.²⁷

The scale of the finds, the variety of types of scripts, and apparent presence of series of ostraca sharing common features, all warrant detailed attention to their material aspects. Some editions of the Narmouthis ostraca give short descriptions of the shape of the potsherds. Thus, in their edition of 131 Greek ostraca (*O. Narm.* I), Rosario Pintaudi and Pieter J. Sijpesteijn discuss the shape of a sherd and its relation to the layout of the text inscribed. For the most part, texts are written on the convex side of a sherd, follow its shape, and occupy its entire surface.²⁸

Paolo Gallo devotes more attention to material aspects of ostraca in his edition of 66 Demotic and hieratic pieces from the archive of Narmouthis.²⁹ Dating from to the second half of the second century to the beginning of the third century CE, the documents appear to relate to teaching and some instruct the novices recruited by the priests regarding their services in the temple.³⁰ On the ceramics of the fragments, Gallo reports that they are “[...] in ceramica a pasta calcarea, oppure ricoperta di un ingobbio bianco, chiaro e molto tenace, che con il tempo è talora ingiallito.”³¹ Only few among them are made of reddish Nile clay. Gallo speculates that the scribe chose

Mission of the University of Pisa found five more ostraca (three in Demotic and two bilingual) belonging to the archive of the ‘House of the Ostraca’ excavated by Vogliano in 1938. They are now in the General Storehouse of Kom Aushim (Fayum), cf. Bresciani et al. 2010, 65–70. See also Blasco Torres 2015, 350–359, especially 351, fn. 3.

23 Menchetti 1999–2000, 137–153; Menchetti 2003, 23–31; Giannotti/Gorini 2006, 121–139; Giannotti 2008, 49–57.

24 At least 58 Demotic horoscopic ostraca have been edited and translated so far, see Ross 2009, 61–95; Ross 2011, 47–80, especially 73. See also Menchetti 2005a, 237–243, on the cryptographic system attested in documents from Medinet Madi and often associated with astrological contexts.

25 On lists of names and name-ostraca, see Bresciani et al. 2010, 67–69, 82–126.

26 Menchetti 2005b, 15.

27 About a tenth of the ostraca found by Vogliano in 1938 can be attributed to the activities of the scribe Phatres, son of Hormenios. He lived and worked in the temple of Narmouthis in the second half of the second or in the early third century CE, see Bresciani/Giannotti/Menchetti 2009, 39–59; Bresciani/Giannotti/Menchetti 2010, 55–70.

28 Pintaudi/Sijpesteijn 1993, 17.

29 Gallo 1997, li–liii.

30 Gallo 1997, xliv–xlvii; for further discussions of texts in the archive, see Messeri Savorelli/Pintaudi 2002, 210 fn. 4; Bagnall 2007, 13–20.

31 Gallo 1997, liii.

these fragments because of their light surface, which contributed to the legibility of texts written in the black ink.³² He discusses the ink and the type of tool used for writing, but he does not elaborate on the types of containers from which the sherds may have been come.³³

More detailed observations regarding the size of the sherds in relation to the texts written on them can be found in the edition of Demotic and bilingual ostraca written by the priest Phatres, son of Hormeinos, by Bresciani, Giannotti, and Menchetti.³⁴ These ostraca come from the stash found deposited together in the ‘House of Ostraca’, and although their study is still in progress, six distinct dossiers of Demotic, Greek, and bilingual ostraca have been identified among them.³⁵ Interestingly, Bresciani, Giannotti, and Menchetti note that in one of the dossiers, concerning the past stories of Phatres’s father Hormeinos, the scribe’s choice of writing support displays consistent preferences. For example, small sherds were used for brief annotations, numbered in series, which seem to have been later copied on larger sherds on which they could also be corrected, annotated, and organized in sections.³⁶ The ostraca in this series tend to be of a peculiar triangular shape with the number of the series always inscribed on top and often separated by a line from the rest of the text; the letters constituting the numerals are often reinforced with red ink.³⁷ It seems plausible that these ostraca were filed in such a way that the numbers inscribed on the upper points of the sherds would be easily visible.

1.3 Peculiar Features and Identification of Provenance: The Case of Ostraca in the Thermenmuseum, Heerlen

Physical features of the sherds considered together with paleographic characteristics of the inscribed texts can help determine the origin of unprovenanced pieces. This was the case with four Greek ostraca kept in the Collection of the Thermenmuseum in Heerlen (The Netherlands),³⁸ which were published in 1986 by Klaas A. Worp.³⁹ He noticed that four pieces, which had been considered part of a group of Theban ostraca and dated to the Roman period, differed from other documents in the group in

³² Gallo 1997, liii.

³³ On the ceramics from the site, see Bresciani 1968, 53–58; Bresciani et al. 2006. For the ceramics from Temple C, see especially Bartoli 2006, 167–221.

³⁴ Bresciani/Giannotti/Menchetti 2010, 55–70.

³⁵ Bresciani/Giannotti/Menchetti 2010, 55–56.

³⁶ Bresciani/Giannotti/Menchetti 2010, 56, 60–63, nos 11–18.

³⁷ Gallo 1997, 1–li. See also Bresciani/Giannotti/Menchetti 2010, 55–59; Menchetti 2005b, 15.

³⁸ The Katakombenstichting Foundation (Valkenburg) acquired more than 200 ostraca in 1920 through the German archaeologist Carl M. Kaufmann, see Worp 1986, 191–194. The collection also includes a series of hieratic and Demotic ostraca, see Vleeming 1994.

³⁹ Worp 1986, 191–194.

their textual and material characteristics. *O. Heerlen* BL 218, a beer-tax receipt, had a light brown outer surface and shared paleographic characteristics with some ostraca found in Tebtynis;⁴⁰ while three other receipts, *O. Heerlen* BL 323, 334 and 345, had a reddish-brown exterior surface and pitched inner side similar to fragments on which receipts coming from Edfu are written.⁴¹ In his publication of the four pieces, Worp records dimensions, color, treatment of the surfaces, and the state of preservation of the ink.

2 Towards a More Systematic Study of Material Aspects of Ostraca

The works discussed above demonstrate that even sporadic observations and unsystematic descriptions of the physical aspects of ostraca might significantly contribute to scholarly understanding of the material. Yet, for a long time such studies remained exceptional and most of the editions of ostraca continued to provide textual information only rarely accompanied by a brief reference to the physical features of the inscribed fragment. This disconnection between studies of material and textual aspects of ostraca was reflected upon by Sven P. Vleeming in his 1994 volume of *Ostraka Varia*, which contains unpublished pieces from the collections of the Thermenmuseum in Heerlen,⁴² the Pontifical Biblical Institute in Jerusalem,⁴³ and the Museo Egizio in Turin,⁴⁴ along with re-editions of some ostraca from other European collections.⁴⁵ In the introduction to the volume, in the section entitled “External Features”, Vleeming aptly addresses the reasons for the persisting neglect in scholarly literature towards the consideration of material properties of ostraca:

40 Worp 1986, 191–192.

41 Worp 1986, 194.

42 The collection of the Thermenmuseum Heerlen consists mainly of hieratic, Demotic, Greek and Coptic ostraca which were bought by Kaufmann at the beginning of the twentieth century on the antiquities market of Luxor, see Vleeming 1994, 1.

43 The Pontifical Biblical Institute in Jerusalem houses a small collection assembled by Father Mallon in the 1920s, which consists of Demotic, Greek, and Coptic ostraca. Vleeming deals mainly with 14 Demotic ostraca, most of which come from Elephantine and date to the first half of the Ptolemaic period, see Vleeming 1994, 2.

44 The collection of Demotic ostraca kept in the Museo Egizio in Turin consists mainly of texts found during the excavations of Ernesto Schiaparelli in Gebelein. Nine ostraca from this Museum are published in the volume, see Vleeming 1994, 2.

45 Other ostraca come from the Bodleian Library, the Zürich Archaeological Institute, the Berlin Museum, the Bruxelles Museum, and the Petrie Museum, see Vleeming 1994, 2. The volume (*O. Vleem.*) contains 65 ostraca in total: (62 plus three ostraca with numbering 1A, 11A, and 31A): 40 in Demotic, 6 in Greek, and 19 in Greek-Demotic; 42 ostraca out of 65 are published for the first time. All of them come from Egypt, mainly from Elephantine, Hermonthis, and Thebes.

The obvious reason for this neglect is that the results, obtained through much hardship for the philologist, are rather inconclusive. Pottery studies just might profit more from obtaining information about dated material than *vice versa*, as the dates obtained from the wares are never more precise than what may be inferred from the texts' scripts. A philologist would like to know, for example, whether a particular group of texts dates to the reign of Ptolemaios III rather than that of Ptolemaios IV, but one may not expect a precise answer to this question from the external features alone. On the other hand, the archaeologist would like to know the types of the original pots, but he can never hope to obtain these from the ostraca, as these are always body sherds, the typical parts of the crockery, such as rims, handles, and foots, having been avoided in the selection as these constitute awkward writing surfaces.⁴⁶

Although Vleeming expresses some doubts as to the systematic collaboration between philologists and ceramologists, he emphasizes the potential usefulness of carefully recording the physical properties of ostraca. In the section devoted to the physical description of the published pieces, he points out that one of the main problems a scholar interested in material features of ostraca faces, derives from inconsistency in the terms used for describing ostraca. Comparing descriptions of what is likely to be the same material made by the archaeologist René Van Walsem, on the one hand, and by Girgis Mattha and Sten V. Wångstedt, on the other,⁴⁷ Vleeming notes "the inevitable variation in the descriptions, if they are made by different pairs of eyes, possibly also if they are made at different times."⁴⁸ Other difficulties that a ceramologist may encounter when analyzing ostraca, Vleeming adds, are the impossibility of obtaining a fresh fracture and the poor state of preservation of some ostraca.⁴⁹

To remedy the problem of inconsistency of descriptions, Vleeming provides short definitions of the terms in his survey and discusses briefly some tendencies in the formats and ways of inscribing ostraca under consideration. He also appends a list, created with the help of Van Walsem, in which physical features of the ostraca published in the volume are tabulated.

In the last couple of decades, more accurate methods in studying ostraca have been developed by ceramologists in collaboration with archaeologists and papyrologists, which, among other things, address the difficulties articulated by Vleeming. Of crucial importance for the development of these new approaches are numerous recent works on Egyptian pottery,⁵⁰ while systematic studies and chemical analysis of ceramics performed during archaeological excavations on the well-documented and consequently contextualized and datable material help advance analysis of the material aspects of ostraca. Thus, examination of morphological characteristics and

⁴⁶ Vleeming 1994, 2–4.

⁴⁷ Mattha 1945, 8; Wångstedt 1954, 9.

⁴⁸ Vleeming 1994, 149.

⁴⁹ "A practical difficulty in assessing the relevant data lies in the fact that one cannot expect the Museum directors to agree to breaking the ostraca, whereas apparently, nothing is more informative about a given sherd than a fresh break" (Vleeming 1994, 149).

⁵⁰ See above fn. 6.

analysis of the fabric can help not only determine the origin of sherds but also allow a ceramological classification of ostraca within a given site that may reflect certain tendencies in their usage. In what follows, I will illustrate the development and recent applications of multidisciplinary methods in the study of ostraca through a survey of several research projects that have been carried out both in the field and on a collection material.

2.1 Archaeological Approach: Ostraca from Kellis

The first example is the volume produced by Klaas A. Worp that contains editions and studies of 293 Greek texts inscribed on ceramic sherds found at Ismant el-Kharab, ancient Kellis, in the Dakhla Oasis (*O. Kellis*).⁵¹ The ostraca were recovered during excavations directed by Colin A. Hope (Monash University, Melbourne) over a period of fifteen years.⁵² Among inscribed documents are a range of text types, including tax- and other receipts, orders for deliveries of various commodities, accounts, private letters, lists of names, contracts, memoranda, school and astrological texts, and jar dockets; chronologically they range from the second through the fourth centuries CE.⁵³ The volume includes a chapter authored by Hope on the archaeological contexts in which ostraca were found accompanied by a detailed examination of potsherds used for writing.⁵⁴ Hope emphasizes that his team's approach was to consider ostraca "[...] not simply as a body of texts generally from the site but as a category of finds that possess contexts, geographic, temporal and spatial, that can inform us about a wide range of activities throughout its period of occupation."⁵⁵ After describing potential contributions of the study of ostraca to establishing the chronology of the site and detailing economical and administrative practices that took place there, he adds that "knowledge of the different fabrics in which the pottery ostraca are made and their place of origin not only enables the place of manufacture of the potsherd to be determined but also sheds light upon the possible origins of certain texts and the commodities they mention."⁵⁶

The ostraca in the volume are described according to their technical and morphological features as well as in relation to the archaeological context in which they were

⁵¹ Worp 2004, 1–4 and 169–178. For the edition of the Coptic ostraca, see Gardner/Alcock/Funk 1999, 280–281 (= *P. Kellis V, O. Kellis Cop.* 1–2); Gardner 1999, 195–200.

⁵² Excavation reports can be accessed at <http://www.arts.monash.edu.au/archaeology/excavations/dakhleh/ismant-el-kharab/index.php> (last accessed: 01.07.2017). See also Bagnall/Davoli 2011, 140 fn. 270–273.

⁵³ The latest date so far attested by texts either on ostraca or papyri from Kellis is in the fourth century CE, see Worp 2004, 1 and 220–226.

⁵⁴ Hope 2004, 5–28.

⁵⁵ Hope 2004, 5.

⁵⁶ Hope 2004, 5.

found. Furthermore, there is a discussion of the frequency of ceramic sherds used for writing in comparison with other materials employed for this purpose at Ismant el-Kharab.⁵⁷ The ceramological study of the material published in the volume is very detailed and systematic. It includes information on the clay, firing characteristics, surface treatment, decoration, as well as identification of local productions and imports. Types of fabrics and wares, recorded for each ostrakon, are designated according to the so-called ‘Dakhleh Oasis Fabric System’ developed by Hope.⁵⁸ Most of the texts are written with black ink on quite small ceramic fragments, mainly originating from the body of a vessel.

Concerning the archaeological contexts in which ostraca were found, it should be noted that the study is restricted “to the architectural units from which the ostraca derive and not sequential deposits within these units.”⁵⁹ The chapter concludes with a comprehensive table in which ostraca are arranged according to their provenance context, with specification of the type of ware, date, and content of the document inscribed.⁶⁰

2.2 Excavating a Dump: Ostraca from Krokodilô

A remarkable study is that of the ostraca found in the Roman *praesidium* of Krokodilô (al-Muwayh), which is located on the Koptos to Myos Hormos road in the Eastern Desert of Egypt. Stratigraphic excavations, during which ca. 800 ostraca were discovered,⁶¹ were carried out by the team of the *Institute français d’archéologie orientale* (Ifao) in 1996–1997, and in 2005 Hélène Cuvigny published the first volume devoted to the finds from the site. The work comprises editions of 151 Greek and Latin ostraca⁶² found in the south-west dump near the southern gate to the fortress, which was formed by the discarded material produced by the renovation of the camp during the reign of Trajan (*O. Krok.*).⁶³ The documents are associated with the military presence in the camp and

⁵⁷ On the texts written on materials other than potsherds within the corpus, see Hope 2004, 9–10.

⁵⁸ Each type of fabric corresponds to a chronological span, which is determined through the study of the manufacturing techniques used during the different historical periods, see Hope 2004, 7–9; Hope 2000, 189–234, especially 194–195. For an update of the description of the fabrics used in the ceramic productions during the Ptolemaic period in the Dakhla Oasis and the Western desert of Egypt, see Gill 2016, 47–51. The same fabric system was also used in the edition of four Greek ostraca from Deir el-Hagar; see Mills/Worp 2004, 155–158.

⁵⁹ Hope 2004, 11.

⁶⁰ Hope 2004, 20–28.

⁶¹ <http://www.ifao.egnet.net/publications/catalogue/?coll=FIFAO&page=3&total=56&nb=10&nv=0> (last accessed: 15.12.2017).

⁶² Most of them are Greek, three are bilingual, and eight Latin.

⁶³ Two other *praesidia* with well-preserved dumps rich in ostraca are Maximianon and Didymoi, see Cuvigny 2005, 1; Brun 2007, 505. On some ostraca and ceramics from Maximianon, see Bülow-Jacob-

in the Eastern Desert in general and date to the early second century CE. The study of the ostraca presented in the volume, which is a result of the cooperation of many specialists, helps elucidate relations among archaeological contexts and activity phases at the station. Both stratigraphical and textual data indicate that ostraca found in the early layers of the dump date to the beginning of Trajan's reign, while the foundation of the *praesidium* probably goes back to at least the Flavian period.⁶⁴

Among the ceramic materials recovered in the ancient dump of Krokodilô, at least three different typologies are recognizable as coming from vessels whose fragments were used as ostraca.⁶⁵ The first group includes fragments attributable to the Egyptian amphora-type 3 (AE 3), which appears to have been the most common container on the site in the Roman period.⁶⁶ Among texts inscribed on these fragments is the dossier of Capito, the curator of Krokodilô during the prefecture of Cosconius, which comprises private documents and copies of official correspondence.⁶⁷ Parts and fragments of AE 3 amphorae are also used for the so-called Amphora of the Barbarians and ostraca inscribed with related documents, as well as for some *dipinti*.⁶⁸

The second group is formed by fragments of Aswan amphorae which are made of kaolinite clay and date mainly to the beginning of the Roman period.⁶⁹ They are characterized by thick walls with smoothed surfaces, often with pink slip. Postal daybooks concerning carriers who left Krokodilô for nearby *praesidia* and copies of circulars sent by the Prefect of Berenice (Artorius Priscillus) to various curators of the Myos Hormos road during his prefecture are inscribed on these fragments, which tend to be large in size.⁷⁰ Two hands, one of which has been called "hand Ephip" because of the writer's propensity to misspell the name of the month, are responsible for most documents in this group.⁷¹

sen/Cuvigny/Fournet 1994, 27–42; Brun 1994, 7–26. On the written materials from Didymoi, see Cuvigny 2011, 2012. Over 9000 ostraca, mostly Greek, were found during the excavations carried out in the quarries at Mons Claudianus, see Bingen et al. 1992, 1997; Cuvigny 2000; Bülow-Jacobsen 2009. See also Bingen 1996, 29–38; Maxfield/Peacock 2006.

⁶⁴ Cuvigny 2003, 83–90; Cuvigny 2005, 2.

⁶⁵ Cuvigny 2005, 8.

⁶⁶ Within the dump there were fragments of 2048 amphorae, of which 1957 specimens have been identified as the type AE 3, variant 5.2–C in Nile clay, dated to late 1st–early 3rd centuries CE. This variant was produced in the area between el-Kab and Koptos, and it spread mainly in the Eastern desert and the Theban region, see Dixneuf 2011, 128 and 340 fig. 111. See also Brun 2003, 503–513.

⁶⁷ Cuvigny 2005, 9–32 and 33–52.

⁶⁸ Cuvigny uses the term *dipinto* to indicate a jar label, see Cuvigny 2005, 135–158 and 173–175.

⁶⁹ On the ateliers and the productions of the amphorae from Aswan, see Ballet/Vichy 1992, 113–116.

⁷⁰ Cuvigny 2005, 53–75 and 77–112.

⁷¹ The second hand is characterized by a bilinear script, which is described as regular but without elegance, see Cuvigny 2005, 99.

The third and the least commonly attested type of production is comprised by fragments of calcareous clay with yellow or white slipped surfaces. These sherds come from vessels used for liquids that were manufactured in the Theban area. Their fabric, light in color, creates excellent contrast with the ink, while the absence of pitch on the inner side allows for writing on both concave and convex sides. The porosity of the sherds which is characteristic for this type of fabrics, however, caused dripping of the ink and resulted in thickened writing. Mainly letters are written on these sherds.⁷²

Of note is the group of sherds inscribed with dates and military movements between different *praesidia*.⁷³ It contains eight ostraca, or tesserae, with watchwords and seven daily tesserae each mentioning a toponym. These ostraca come from the same stratigraphic unit and possibly belong to the same office. The texts are short and the sherds, on which they are inscribed, have relatively small dimensions. According to Cuvigny, the watchwords on the tesserae were added to the sherds, which had been prepared in advance,⁷⁴ but she is not too sure whether the same procedure was followed for the second kind of tesserae.⁷⁵ Similar documents from the *praesidium* of Maximianon include a date and the names of the *praesidia* of departure and destination. The tesserae from Krokodilô include the date, but only rarely a toponym, which, Cuvigny speculates, may suggest that they were prepared in advance to be further inscribed later. However, she adds that the fact that the tesserae in Maximianon were clearly written in one go does not support this hypothesis.

2.3 Ceramic Classification of a Collection Material: Aramaic Ostraca from Elephantine

Another instance of the application of modern methods to the study of ostraca is the publication of the material from the island of Elephantine from the Clermont-Ganneau Collection in Paris. The ostraca were found during archaeological campaigns carried out under the direction of Charles Clermont-Ganneau and Jean Clédât between 1906–1907 and 1910–1911.⁷⁶ Most of the documents in the collection (315) are written in Aramaic⁷⁷ and were edited by H  l  ne Lozachmeur in 2006.⁷⁸

⁷² Cuvigny 2005, 114–115 and 132–133.

⁷³ Cuvigny 2005, 187–192.

⁷⁴ Cuvigny 2005, 188.

⁷⁵ Cuvigny 2005, 190.

⁷⁶ The volume also contains some jar inscriptions and five wooden labels, see Lozachmeur 2006, 451–455.

⁷⁷ There are also six Demotic, four Phoenician, two Arabic, as well as a few ostraca written in Neo-Punic, Syrian, Mandaic, Greek, and Coptic, see Lozachmeur 2006, 164–167.

⁷⁸ On the history of objects with writing in the collection, see Lozachmeur 2006, 11–12.

The first volume contains a prosopographic study of the different ethnic and linguistic origins of the soldiers who belonged to the military garrisons stationed on the island of Elephantine and Syene in the first half of the fifth century BCE and formed part of the Judeo-Aramaic community there.⁷⁹ It is followed by a paleographic study that discusses the tools and ink used for writing and provides a classification of the recognizable hands. To achieve a better understanding of the material in the collection, specialists from different fields were invited to participate in the study of the writing supports,⁸⁰ with Pascale Ballet in charge of the ceramic analysis of the potsherds used as ostraca.⁸¹

In her work on the collection, Ballet developed a twofold approach to the study of ostraca and jar inscriptions from Elephantine. First, on the basis of the morphology of the sherds and the appearance of their fabrics, she established a ceramic classification of the ostraca, which enables either confirmation or revision of the connections and groupings of ostraca made on the basis of paleographical and textual parameters. This classification helps to date and to identify technical properties of the ceramic sherds used as ostraca. The second line of inquiry is concerned with the types of containers that were used as writing supports.

Among ostraca in the collection, three main groups are discernible, characterized by the vessel's area of manufacture. These groups are further divided into a series of sub-groups in accordance with the type of vessel and the type of clay.⁸² Surface treatments, morphological variations, and production techniques are also indicated. Most of the sherds (81%), which constitute sub-group 1, originate from Egyptian ribbed amphorae and are made of calcareous clay possibly produced in the Theban area; there are small quantities of fragments from containers produced in workshops close to the Valley with local Nile clay (5.8%), sherds made of local kaolinitic clay from Aswan (1%), and imports from the Mediterranean basin, including Aegean (1.3%) and Levantine areas (1.6%). Notably, the same hand classified as type Ia recurs almost always on the same type of fragments.⁸³ Thus, at least 239 texts in Aramaic, all described as short messages and dating to the first half of the fifth century BCE, were penned by this hand on ceramic supports belonging to the sub-group 1.⁸⁴ For the most part, they are incompletely preserved.

79 The texts are mostly short private messages concerned with everyday life of the community, such as lists and memoranda, as well as administrative documents; see Lozachmeur 2006, 81–95.

80 Christian de Vartavan was responsible for a carpological study (Annexe II) and Léonidas Tsacas and Jean Menier for the entomological survey (Annexe III); see Lozachmeur 2006, 134–139, 140–141 and 142–143.

81 Ballet 2006, 106–133. The physicochemical analysis of the doughs was done by Anne Schmitt (Annexe I); see Lozachmeur 2006, 134–139.

82 Ballet 2006, 107.

83 Lozachmeur 2006, 145–161, and especially 154–158 for the hand called Ia.

84 Ballet 2006, 107, 112–116.

Morphological classification of the ostraca carried out by Ballet supplement textual and paleographic information with data on their physical parameters. It also suggests that the sherds used for most of the texts possibly came from the same source, such as a dump, which may have been relatively close to the area in which the people mentioned in the texts lived.⁸⁵

In my own work, I aim to integrate and further develop methodologies designed by Hope and Ballet for studying ostraca derived from controlled excavations and for those in a museum collection respectively. At present, this work pertains to the recording and analysis of two corpora of Greco-Roman ostraca found during stratigraphic excavations in Dime, ancient Soknopaiou Nesos, in the Fayum, and in Amheida, ancient Trimithis, in the Dakhla Oasis.⁸⁶ Examination of both sets of ostraca is based on integration of the data pertaining to the content of the documents, their archaeological context, and their ceramological classification.

Ceramological and archaeological parameters of the ostraca are classified in accordance with methodologies developed by Hope and Ballet. On the basis of the analysis of the resulting groups, it is possible to observe some correlation between the morphological characteristics of the sherds and the type of text inscribed on them, as well as to detect criteria according to which a ceramic fragment could be chosen for writing. Application of the same stratigraphic method of excavation and the system of registering the finds implemented by Paola Davoli (University of Salento, Lecce), archaeological director of both missions, makes it possible to perform a comparative analysis of the materials and contexts from both settlements.

2.4 Integrating Collection Study with Field-Work Results: Ostraca from Soknopaiou Nesos

The Soknopaiou Nesos Project, directed by Capasso and Davoli (University of Salento, Lecce), began excavating at Dime in 2003.⁸⁷ By the season of 2014, we were able to uncover the area of the main temple (labeled ST20) and to complete the topographical and ceramological surveys of the settlement and surrounding territory.⁸⁸ About 600 ostraca were found during the seasons from 2003 to 2014.⁸⁹ The results of the

⁸⁵ Ballet 2006, 132–133.

⁸⁶ I would like to thank Paola Davoli, Mario Capasso, and Roger S. Bagnall for giving me this opportunity. The material under investigation comes from the excavation seasons from 2003 to 2012 in Dime and from 2004 to 2013 in Amheida.

⁸⁷ For the history of the site, see Capasso/Davoli 2012, 11–18. See also www.museopapirologico.eu (last accessed 01.07.2017).

⁸⁸ Chiesi et al. 2012, 56–66.

⁸⁹ All the ostraca found during the modern excavations are now kept in the general storehouse for the Fayum in Kom Aushim, the site of ancient Karanis.

first seven seasons, from 2003 through 2009, are published in the volume *Soknopaiou Nesos Project I* (SNP I), edited by Capasso and Davoli.⁹⁰ It contains a detailed and complete analysis of the archaeological contexts from which the objects and ceramics came from and a report on the quantities and types of written materials found in the excavated areas.⁹¹ There is also a sample book of the main ceramic types along with their associations with petro-fabrics, which has been produced on the basis of the work conducted in the field.⁹² The ceramological repertory for the site, which extends chronologically from the Ptolemaic period through the eighth century CE, is used to identify all ceramic fragments found there, including inscribed sherds.⁹³ Chapters five and six on Demotic, Greek, Coptic, and pictorial ostraca and papyri in this volume form a preliminary study for an eventual edition of the texts in the projected Volume II of the Soknopaiou Nesos Project,⁹⁴ which will be devoted entirely to textual finds.

Before recent excavations at the Soknopaiou Nesos Project, the most significant discovery of ostraca on the site was made during the expedition of the Königlische Museen of Berlin directed by Friedrich Zucker, who, in collaboration with Wilhelm Schubart, carried out two campaigns there between February 1909 and January 1910.⁹⁵ Zucker and Schubart report that a group of Demotic ostraca was found in the north-western part of the site, just outside the *temenos*. Of these ostraca, 222 are now kept in the Ägyptisches Museum und Papyrussammlung in Berlin, while six more are in the Ägyptische Sammlung of Zurich University. The provenance of the latter as from Soknopaiou Nesos was determined by Karl-Theodor Zauzich.⁹⁶ These ostraca, all of which are in Demotic, were published in 2006 by Sandra Lippert and Maren Schentuleit in *Demotische Dokumente aus Dime I (O. Dime I)*.⁹⁷ The texts are dated paleographically mainly to the Roman period (late first century BCE–second century CE) and are grouped into two categories. The first group consists of ostraca related to the administrative organization of the temple, such as *Phylai* lists (*O. Dime I* 1–23 and 24–35),⁹⁸ lists of names without any apparent grouping (*O. Dime I* 36–85), and

⁹⁰ Capasso/Davoli 2012.

⁹¹ Davoli 2012, 119–227.

⁹² Dixneuf 2012, 315–361.

⁹³ The study of these ostraca, together with those found in Amheida/Trimithis (Dahkla Oasis), was the subject of my PhD thesis defended in 2014 at the University of Salento.

⁹⁴ Capasso 2012, 231–247; Stadler 2012, 254–263; see also Arlt 2013, 7–17.

⁹⁵ On Zucker's excavation, see Zucker/Schubart 1971, 5–55 especially 14. See also Zucker 1909, 178–184.

⁹⁶ These six ostraca were published in 1965 by Sten V. Wängstedt, together with pieces of Theban origin. In 1973, Zauzich suggested on the basis of their paleographic and onomastic features that they originate from Soknopaiou Nesos; see Wängstedt 1965, 52–53, nos. 47–52; Zauzich 1997, 1056–1060. See also Lippert/Schentuleit 2006, 1–2. A small number of Greek ostraca found during the Michigan Excavations in Dime (1931–1932) are now in Ann Arbor.

⁹⁷ Lippert/Schentuleit 2006.

⁹⁸ Lippert/Schentuleit 2006, 9–102.

small ostraca with short texts consisting of one or two names (*O. Dime* I 86–169 and 170–173).⁹⁹ The second group includes texts pertaining to economic activities, such as food provision for the priests and various types of accounting related to the temple (*O. Dime* I 176–204).¹⁰⁰ The absence of a detailed study of the ceramic supports in the volume of Lippert and Schentuleit can be explained by the fact that it was published before the results of systematic excavations were made available, and consequently ceramological considerations could not be taken into account in editing the ostraca. It was only in 2016 that I was able to study physical aspects of the ostraca from Soknopaiou Nesos in the Berlin collection. The aim of the study was to integrate textual information with physical properties of the ostraca in accordance with the newly compiled ceramological data for the site, and to complete the documentation concerning the corpus of the ostraca found during the modern excavation at Soknopaiou Nesos. Among other results, while analyzing the ostraca in the Berlin collection, I was able to recognize some joins between ostraca published as separate documents. Similarities in the fabric, the state and treatment of the surfaces, as well as the morphology of the fragments appeared to indicate that some of the inscribed sherds originated from the same amphorae. Physical joining of the fragments confirmed not only that they do indeed belong to the same vessel, but also that they carried continuously inscribed texts.¹⁰¹

Demotic ostraca found in the recent years come from inside the *temenos*, from the area along the two exterior walls of the temple ST20, while ostraca found in 1909–1910 by Zucker came from the area just outside the *temenos*. Since the two sets of ostraca were found in different areas, I was interested in comparing them. Unsurprisingly, examination of the Berlin pieces confirmed that the so-called name-ostraca in the collection had the same physical characteristics as the name-ostraca found recently by the Soknopaiou Nesos Project. On the other hand, it revealed that for certain types of texts, such as name lists or accounts, large parts or perhaps even almost complete containers of the type Egyptian amphorae 3 (AE 3) were used. While evidence for this practice has been known elsewhere in Egypt, it is its first attestation in Soknopaiou Nesos.¹⁰²

99 This is the best represented category of texts in the collection. They contain a male name and a patronymic (sometimes the grandfather's name as well), usually written over two or three lines.

100 Lippert/Schentuleit 2006, 103–125 and 127–138. The third section includes a number of uncertain and fragmentary texts (nos. 205–229).

101 A detailed description of the reassembled fragments and a re-edition of their texts can be found in Caputo/Cowey 2018.

102 See previous fn.

2.5 Ostraca and Stratigraphic Excavations: Ostraca from Trimithis

The importance of archaeological contexts in studying ostraca and the material culture of the society that produced them comes into focus in the two-volume publication of ostraca from Amheida, ancient Trimithis, in the Dakhla Oasis, located in the western desert of Egypt.¹⁰³ The ostraca were found during the excavation seasons of 2004–2007 (*O. Trim. I*) and 2008–2013 (*O. Trim. II*) conducted by The Amheida Project¹⁰⁴ under the general direction of Roger S. Bagnall and the field direction of Paola Davoli.

O. Trim. I, published by Bagnall and Giovanni Ruffini in 2012, contains the edition of 455 inscribed pottery fragments, most of which date to the Late Roman period, from the first half of the third to the end of the fourth century CE.¹⁰⁵ The subjects covered include distribution of food, administration of wells, commercial lives of inhabitants, their education, and other aspects of everyday life. The authors provide a full introduction to the technical aspects of terminology and chronology of ostraca, while also situating this important evidence in its historical, social, and regional context.¹⁰⁶ The second volume (*O. Trim. II*), edited by Bagnall and Rodney Ast in 2016, adds 491 items to the corpus of textual evidence from the site.¹⁰⁷

Both publications are supplied by a detailed description of the archaeological contexts from which the ostraca come from.¹⁰⁸ They include comprehensive tables in which ostraca are arranged according to stratigraphic units. Most of the ostraca were found among the dumped materials used for filling the foundation of the buildings or with the materials left inside the structures at the time of their abandonment. For this reason, a meticulous stratigraphic excavation method has been applied by the field director Davoli in order to gain a better understanding of the ancient processes through which most of these objects have become part of the stratigraphic deposits identified in the excavated areas.¹⁰⁹ Furthermore, on the basis of the systematic study

103 Bagnall et al. 2015.

104 The Archaeological Mission started with the sponsorship of Columbia University in 2001, and has continued with New York University-ISAW since 2008 as the primary sponsoring institution. The excavations so far have focused on three areas of this very large site: 1) a fourth-century CE house with wall paintings, an adjoining school, and underlying remains of a Roman bath complex; 2) a more modest house of the third century; and 3) the Temple Hill with remains of the Temple of Thoth built in the first century CE and of earlier structures. A complete list of publications to date about our work at the site can be found at www.amheida.org/ndex.php?content=publications; for most of these publications, a downloadable file or a link to an open-access publication is provided. See also Bagnall et al. 2015.

105 Bagnall/Ruffini 2012.

106 Bagnall/Ruffini 2012, 13–48.

107 Ast/Bagnall 2016.

108 Bagnall/Ruffini 2012, 23–31 and 49–54; Ast/Bagnall 2016, 4–8 and 9–61 ('Tables of Archaeological contexts of the Ostraka with Dates').

109 For detailed analysis of the stratigraphic layers within which ostraca were found, see Ast/Davoli 2016, 1447–1471.

of the ceramics in the field, a sample book of vessel shapes, typologies and fabrics for the site has been created, enabling the application of detailed classifications to the descriptions of the ceramic fragments used as ostraca. Consequently, in the edition of the ostraca, each piece is supplied with a detailed description of the sherd and an identification of the container to which it once belonged. Ceramological data pertaining to the ceramic typologies and fabrics found in context allow a comparison between the date of the potsherds and that of the texts. *O. Trim* II includes a chapter entitled “Ceramic Fabrics and Shapes”, which is devoted to the analysis and identification of the ceramics from which the potsherds used for writing derive.¹¹⁰ There, each ostrakon is classified according to the ‘Dakhleh Oasis Fabric System’ developed by Hope.¹¹¹ Most of the ostraca analyzed are from locally produced vessels (common wares). The majority of them, used as tags inserted in mud jar-stoppers,¹¹² display a relatively constant shape and size, with rectangular and triangular outlines;¹¹³ the rest of the texts are written on fragments with irregular quadrangular shapes (such as letters, accounts, etc.). Careful analysis of the inscribed fragments that constitute the corpus has shown that some categories of texts, primarily tags, were not written on randomly chosen sherds. It seems likely that they were specifically manufactured in large quantities by cutting body sherds into similar shapes to accommodate formulaic texts.¹¹⁴ Two main formulas occur in the tags: the most common is the Πμουν (Pmoun) formula, a term that in Egyptian means “well” or “water”, while the second type of formula is ὕδρευμα Πμουν (Hydreuma-Pmoun), which is formed by a redundant addition of the Egyptian to the Greek word ὕδρευμα with the same meaning.¹¹⁵ While tags with the Πμουν formula come only from contexts pre-dating the phase of construction of the excavated area (275–340 CE), those with the formula ὕδρευμα Πμουν are present mainly above the floors and, thus, are contemporary to the phase of use of the buildings from which they come (340–370 CE). The study of the texts and the stratigraphic methodology followed during the excavation and facilitated a better understanding of the phases of use of the quarters in which they were found. In general, some types of texts found in the layers below the floors do not appear in the layers above the floors, and vice versa.¹¹⁶

110 Caputo 2016, 62–88.

111 See above fn. 57.

112 Bagnall et al. 2017, 195–211.

113 Caputo 2016, 83–84 figs. 17–18.

114 Caputo 2016, 74–82. On the texts of the tags, see Bagnall/Ruffini 2012, 120–164; Ast/Bagnall 2016; Ast/Davoli 2016, 1458–1470.

115 Ast/Davoli 2016, 1461–1467.

116 Ast/Davoli 2016, 1470.

3 Conclusion

Although Ulrich Wilcken in his pioneering study of Greek ostraca already discussed at length the specifics of the material and offered an historical overview of the practice of using pottery sherds for writing, descriptions of physical properties of ostraca remained exceptional for a long time. For the larger part of the twentieth century, studies of ostraca mostly comprised editions of the texts inscribed on them, produced by papyrologists. Occasionally, scholars concerned with editing texts would also describe physical features of the sherds, especially if they appeared to be peculiar when compared to those of other pieces. Observation and analysis of such peculiarities could help establish groups of ostraca that share certain characteristics and lead to a better understanding of practices in which they were used.

More recently, however, there has been a tendency in scholarly works concerned with ostraca to provide systematic accounts of their physical properties. This development has been made possible, on the one hand, by the use of more scientific methodologies in conducting archaeological excavations and, on the other hand, by the ever-increasing interest in collaboration on the part of scholars of different disciplines. Integrated studies of large numbers of ostraca, both coming from the field and kept in collections, demonstrate that the application of multidisciplinary methods can provide instruments for a more complete and detailed interpretation of these objects within their contexts.

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