

Article

Greek *Ostraca*: An Overview

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1. Some basic definitions

With the word *ostrakon*, the ancient Greeks indicated tortoise and seashells (the word ‘oyster’ has the same root, too). The term was also used for other objects of a sunken form such as pots and, more specifically, sherds of broken pottery. Nowadays, we use the word *ostrakon* in this latter sense to refer to potsherds used as a writing surface. In analogy, the word *ostrakon* also denotes limestone flakes used as a writing material; even though fragments of this kind do not come from pottery, they share the dimensions and typologies of use with *ostraca* in the strict sense of the word: being interchangeable, fragments of pottery and limestone flakes share the same name.¹

It is useful to note a number of basic points before we turn to *ostraca* in more detail:

– nowadays, a potsherd is only called an *ostrakon* if it bears a text;

– a potsherd with a written text on it is only considered an *ostrakon* if we can assume the pot was already broken when it was written on.

Writing on pottery was not uncommon, but we cannot call a fragment of a jar an *ostrakon*, for example, if the text allows us to assume that it was written when the jar was still in one piece. A typical case is that of *tituli picti* (also called *dipinti*), short texts written on a container to specify its content, its origin, its destination, etc. Texts written when the pottery was still sound are conceptually different from *ostraca* because the text is linked to the vessel, while in ‘true’ *ostraca* the potsherd is merely a writing surface. This is the reason why *tituli picti* are normally edited as a specific typology of texts in modern editions (i.e. they are not mixed with ‘true’ *ostraca*). Sometimes, however, the situation is ambiguous – usually when the text is too short or too incomplete.

2. The study of *ostraca* and the boundaries between disciplines

It is worth explaining why *ostraca* are studied by papyrologists as this might not be not immediately obvious. The

reason lies in the contents of these texts, their chronology and the culture they belong to. Texts written on *ostraca* are of the same kind and in the same languages as those written on papyrus, and they were produced in the same period, in the same places and by the same people. As we will see, the use of various writing materials in everyday life was completely normal and each text that we find on an *ostrakon* could equally have been written on papyrus.

Manuals and general overviews about the different ‘disciplines of the book’ are at times based on misunderstandings: papyrology, for example, is often thought to be exclusively linked to papyrus, a kind of ancient writing material. Even if the name is rather misleading, the main focus of papyrology today is not on the writing material itself, but rather on the kind of texts preserved and their co-existence with papyri. So if they are the product of the same culture that produced papyri, then parchment, wooden tablets (used to write directly on with ink or covered with wax and then carved) and other less frequently attested materials fall under the domain of papyrology.²

Since we have just mentioned the ‘jurisdiction’ of papyrology, some further specifications are needed now to introduce the study of *ostraca*. Papyrology is essentially conditioned by environmental factors. Egypt (or rather, certain parts of it) is almost the only country where papyri have been preserved, thanks to environmental factors that prevented the deterioration of such writing materials (viz. its climate and characteristics of the soil). The principal consequence of this geographical limitation is that our papyrological evidence is almost entirely limited to what has been found in a single country. A country which, admittedly, was very important in the Mediterranean area (politically, culturally and economically), but nevertheless just *one* country (and not the mother country of the Greeks, for instance). As is well known, papyri, *ostraca* and other inscribed materials were also found outside Egypt (see below), but the number of them found and their impact on our discipline are rather small.

¹The most relevant and extensive work on Greek *ostraca* (which is still the standard introduction on this subject) is Wilcken 1899. The general aspects have been illustrated well by Bartoletti 1963.

²An overview of the distribution of the different writing materials is provided by Bülow-Jacobsen, 2009, 4 (the figures are not up to date, but the range and distribution are still reliable). On the special category represented by *ostraca* used for ostracism, see below.

The geographical limitation of papyrology also implies a chronological limitation related to the various ancient languages: Greek papyrology is limited to the period of Greek and Roman domination of Egypt, i.e. between the conquest by Alexander the Great in 332/31 BCE and the Arab conquest completed in 642 CE (the boundaries of this period are rather fluid, of course, as contacts between Greeks and Egyptians – and written accounts of these contacts – also existed before Alexander’s time and continued to exist once Egypt became part of the Caliphate). Two aspects of the written production of this period of about a thousand years are worth mentioning for our purposes:

- the Egyptian language continued to be spoken and written in various alphabets: after the Greek conquest, Egyptian society was essentially bilingual, with the dominating language known only by a minority; bilingual documents (written both in Greek and in Egyptian) are fairly common;

- even after the Roman conquest (30 BCE), the long-established administrative machine of Egypt was basically left unaltered and Greek remained the language of documents as well as the language of the predominating culture. This is why the languages of the texts found in Egypt remain the same, even under Roman domination (comparatively few Latin texts exist).³

3. Ostraca as writing material

Coming back to the subject of *ostraca*, one might ask why – especially in Egypt, the land of papyrus – anyone would write on this kind of material. The reasons are actually fairly simple: *ostraca* were cheap (virtually free) and easy to find – a piece of broken pottery may be found in any household and in any rubbish heap. Pottery was, of course, largely used in everyday life, and one could find dumps of broken pieces in every village (especially near the pottery manufactures).

We can sum up the most important features of *ostraca* as pieces of pottery. What kind of pottery was used for them? Mostly amphorae, especially amphorae bodies (pieces of other kinds of vessels such as jars, cups and plates were used, too, but they are comparatively rare). The reason for the prevalence of amphorae bodies is easy to explain: amphorae are quite large and have a large bend radius, so (a) one can obtain a large amount of *ostraca* from a broken amphora, and (b) (probably more importantly) the writing surface offered by a sherd from this part of the vessel is ‘flatter’ than any other and thus more convenient to write on. We can therefore assume that the choice of certain kinds of potsherds was guided by several criteria, particularly their high availability and convenience of use. In Egypt, over the centuries, a variety of forms of amphorae and other vessels were used. The clay used varied, and the inclusions also differ as well



³ The database of literary texts (see fn. 9) lists 2,124 Latin texts out of a total of 16,506 records. On the documentary side, the proportion decreases significantly: the database devoted to this kind of evidence (see fn. 10) lists 2,242 Latin texts (or bilingual texts involving Latin) out of a total of nearly 70,000 records.

Fig. 1: *Ostraca* from Kerameikos excavation, Athens, bearing the name of Themistokles, son of Neokles, ostracised in 472 or 471 BCE. They come from different types of pottery: mouth of cooking vessel, foot of transport amphora, roof tile, amphora handle, foot of *krater*.

as the kind of firing. As a result, we find *ostraca* of various colours, including yellow, light grey, pink, red and brown. Ceramic material of a darker colour was mostly avoided as a writing material since the ink would not have stood out enough.

The writing was usually traced on the outside of the potsherd, i.e. on the convex part. Writing on both sides is less common. The inner side, by the way, was sometimes useless because if the sherd came from a vessel used for storage or transport of wine or other liquids, it was pitched (i.e. coated with resin inside). Conventionally, we call the outer, convex part of an *ostrakon* ‘recto’ and the inner side ‘verso’.

The surface of the potsherds was not treated before writing; the only preliminary operation, if there ever was one, was probably to choose a fragment flat enough for writing and whose size was convenient for the length of the text that one intended to write. The writing was traced with the same ink and with the same ‘pen’ – the *kalamos*, a sharpened reed – used to write on papyri. Some *ostraca* are graffiti, but they are comparatively rare. Amphorae were wheel-thrown and therefore had throwing lines on their body and neck. In *ostraca* with deep throwing lines, the writing is usually parallel to these grooves, but throwing marks were often ignored if the surface was smoother, even if they were visible, which meant they were not regularly used as a kind of ruling for the writing. The layout of the text depended on the shape of the sherd and on the typology of the text itself, of course: we usually find the same layout conventions as in papyri (indentation/indentation of some parts of the text, paratextual signs, etc.). We should note that even though *ostraca* were cheap and fairly easy to find, there are some extant cases of palimpsest: an existing *ostrakon* was ‘erased’ (ink could be washed away with a sponge and water) and then reused for a new text.

4. Typology of contents

Ostraca were used extensively in the ancient world. The first papyrologists’ belief that *ostraca* were strictly linked to the Greek culture and that their use was imported into Egypt by the Greeks has been abandoned: Egyptians began

using *ostraca* for writing and drawing from at least the New Kingdom (half of the sixteenth century BCE, more than 1,300 years before the Greek conquest).⁴ But it is still true that a huge amount of *ostraca* is written in Greek or in the other languages used in Egypt after the Greek conquest, and we know for sure that Greeks used *ostraca* in their mother country.

We should, of course, say a few words about a practice in Athenian democracy that derives its name from *ostraca*: ostracism. Ostracism was a procedure used in Athens (and in some other Greek towns) during the fifth century BCE and originally intended to expel citizens thought to be a threat to democracy – such as potential tyrants – for a period of ten years (in practice, it was often used by political factions as an instrument to eliminate opponents). During an assembly, the citizens scratched the name of the man they wished to expel on potsherds (fig. 1 and 2) and deposited them in urns.



Fig. 2: *Ostraca* from Kerameikos excavation, Athens, with diverse name forms (name, father’s name, demotic name): Kallias, Kallias son of Kratios, Kallias Alopekethen (of the Athenian deme Alopeke), Kallias Kratiou Alopeke. Kallias was ostracised in 485 BCE.

Provided that a quorum was met, the person whose name was written on the most *ostraca* would be banished; he had ten days to leave the city and if he attempted to return without permission, the penalty was death. Around twelve thousand ‘political’ *ostraca* have been excavated in the Athenian agora and in the Kerameikos area; they bear the name of a host of important Athenian political personalities of the fifth century

⁴ For a quick overview (and bibliography) on Egyptian *ostraca*, see Helck 1982. For a survey on *ostraca* written in languages other than Greek, see Bagnall 2011, 123–130.

BCE.⁵ These *ostraca* form a special category in many ways: they were used for a specific procedure, they each contain only one name and they are incised. As a result, they are mostly studied by epigraphists and archaeologists.

Being a common writing material, Greek *ostraca* were found in many parts of the Hellenized world, provided that environmental conditions allowed their preservation.⁶ But as we have already said, Egypt is by far the most important source of our evidence. A huge number of *ostraca* were found during the excavation campaigns that began at the end of the nineteenth century and are still going on in some cases. In certain areas and specific sites, *ostraca* findings were particularly conspicuous, and it is likely that in more isolated parts of Egypt or areas far from the manufactures of papyri, *ostraca* were used more than elsewhere. Take, for example, the village of Kellis (in the Dakhleh Oasis, Western Desert) or the Mons Claudianus (a quarry in the Eastern Desert), or the region of Thebes and more generally Upper Egypt. Surveys and excavations in these places have gathered a great deal of *ostraca* and only a few papyri, revealing a range of texts written on potsherds wider than elsewhere. One can also observe a certain pattern of distribution relating the text typology to the materials used as writing supports: papyrus had to be imported from the Fayum or from Lower Egypt and was therefore reserved for longer and more important documents, while shorter, less important or ephemeral texts were written on *ostraca*. Roger Bagnall recently published some important remarks on reasons that might explain the very different finds of *ostraca* in the various excavation campaigns:⁷ the aims and methods of the excavations played an important role here since the earliest campaigns mostly looked for papyri and were conducted without much attention being paid to what can easily be mistaken for useless fragments of broken pottery. The environment is important as well: *ostraca* have withstood humidity much better than papyrus. Another factor to be taken into account is the habit (perhaps more common in some regions) of burning discarded papyri as fuel (while *ostraca*, of course, cannot be used in the same way and thus survived).⁸

Some figures may be useful to understand the importance of *ostraca* in our evidence and to start outlining the kind of

texts they have preserved. First of all, we need to make a preliminary distinction: papyrological texts are divided into literary, paraliterary (or subliterary) and documentary groups. Literary papyri contain those texts that may be labelled as literature. Paraliterary papyri represent a sort of ‘intermediate’ category including texts such as commentaries, glossaries, school exercises, texts pertaining to medicine, magic and astrology. Documentary texts (such as contracts, private and official letters, wills, accounts, lists, registers, notes and any other text one might have produced) represent – as it is easy to imagine – the bigger category: those written texts are not the remains of a library, a scriptorium or the like; ‘books’ (that is, literary texts) are found, of course (as some people read, copied and created literature), but they are mixed with any written product of everyday life. This distinction between literary, paraliterary and documentary texts is pointed out in any edition of papyri and it is also reproduced in the electronic databases listing the published papyrological texts: we have a database for literary and paraliterary texts⁹ and another database for documentary texts.¹⁰ Unfortunately, the specific database for paraliterary texts is neither complete nor up to date.¹¹

If we look for *ostraca* in the database of published documentary texts, we find that more than 19,000 texts out of approx. 60,000 in Greek (or in Greek and another language) are *ostraca*; in the database of literary and paraliterary texts, we find about 460 *ostraca* out of about 9,000 texts written in Greek (or in Greek and another language). A considerable proportion of these texts (about 380 of them) are paraliterary; the total number of paraliterary texts listed in the database is around 1,400.

These figures show us that:

- *ostraca* make up a large part of the papyrological evidence as a whole and of the documentary texts we have in particular (almost a third of the published documentary texts are written on *ostraca*). We must, of course, bear in mind that these texts are short and that 19,000 *ostraca* are therefore not comparable to 19,000 published papyrus fragments (precedence in publication was usually given to the longer – and thus usually more rewarding – pieces of writing), but still, they remain an imposing number,

- the great majority of texts written on *ostraca* are documentary,

⁵ On ostracism, see Siewert, Brenne, Eder et al. 2002.

⁶ For more on Greek papyri and *ostraca* found outside Egypt, see (among others) Cotton, Cockle, and Millar 1995, Bowman 1998, 143–144, and most recently the survey by Bagnall 2011. For a palaeographical approach, see Crisci 1996. A group of *ostraca* recently found in Rhodes is presently under study.

⁷ See Bagnall 2011, 117–122.

⁸ On this aspect and on the general matter of scarce survival of papyri in some areas, see the remarks by Cuvigny 2003, 265–67.

⁹ LDAB: *Leuven Database of Ancient Books*, <http://www.trismegistos.org/ldab/index.php>.

¹⁰ HGV: *Heidelberger Gesamtverzeichnis der griechischen Papyrusurkunden Ägyptens*, <http://www.rzuser.uni-heidelberg.de/~gv0/>, now also hosted at <http://www.papyri.info>.

¹¹ CPP: *Corpus of Paraliterary Papyri*, <http://cpp.arts.kuleuven.be/>.

– as for the literary and paraliterary categories, *ostraca* are a common writing support for paraliterary texts, while literary texts are comparatively scarce.

5. A closer look at the evidence

a. Documentary texts

The majority of these texts are tax receipts. As a matter of fact, our knowledge of how revenue, tax offices and tax payments worked in Egypt has largely been obtained from *ostraca*. This is doubtless the field of knowledge where evidence provided by *ostraca* is absolutely crucial. How did taxation work in ancient times? The taxpayer went to the office of the tax collector and paid the sum due for a certain tax. The tax collector registered the payment on a papyrus roll – a veritable register intended to include all the payments of a certain tax in a certain place (village, part of a town, etc.) over a certain period of time – and gave a receipt to the taxpayer (written, in most cases, on an *ostrakon*; we also possess some receipts written on papyrus, however). The receipt says that the taxpayer has paid the amount due for one or more taxes.

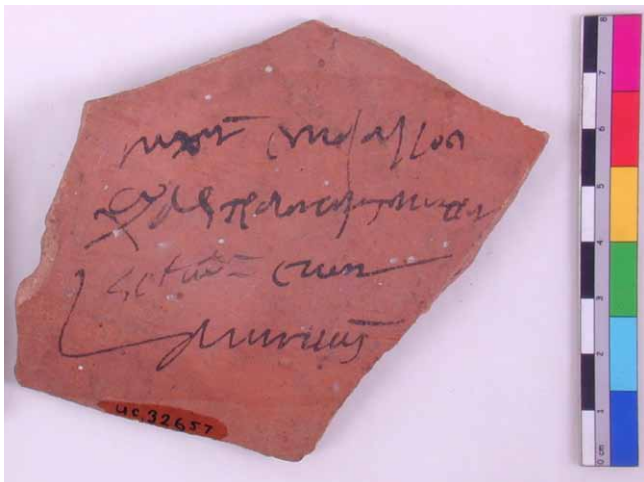


Fig. 3: O. Petr. Mus. 311: a receipt for the payment of three taxes (in *Heidelberger Gesamtverzeichnis der griechischen Papyrusurkunden Ägyptens*).

The receipt always bears the date and sometimes the name of the tax collector. The hands in which these receipts were written are professional, fluent and no doubt quick, some words were actually written in a sort of continuous line (the individual letters are indistinguishable) and abbreviations and symbols were used extensively (fig. 3).

Besides being employed as receipts (for taxes, but also for goods of any kind), *ostraca* were commonly used to write down accounts, lists (of people or objects), labels and warehouse notes – indeed, memoranda of every kind. We also have evidence of *ostraca* being used for longer documents such as private letters (sent to their addresses exactly as if they were sheets of papyrus; see fig. 4) and drafts of petitions

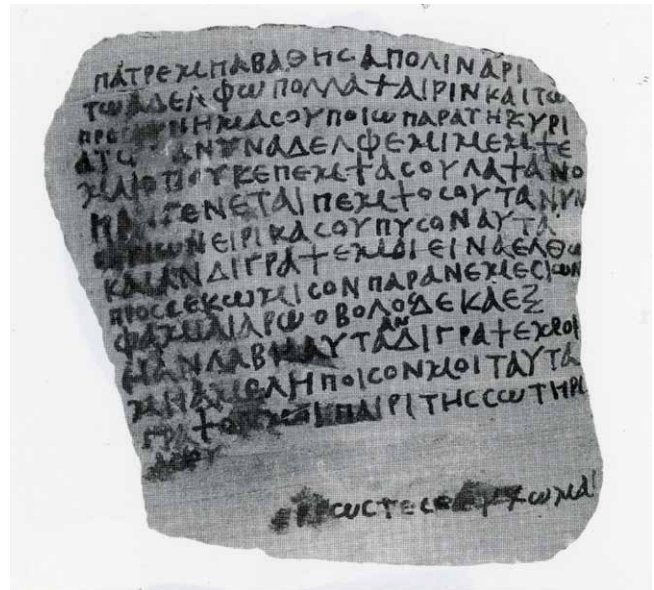


Fig. 4: O. Claud. II 270: a private letter (in *Heidelberger Gesamtverzeichnis der griechischen Papyrusurkunden Ägyptens*).

or contracts (being official, these kinds of documents could not be presented on an *ostrakon*, but an *ostrakon* could prove very useful for preliminary drafts). And we also have evidence of long texts written on various *ostraca* meant to be read continuously.¹²

Ostraca were very frequently kept together by their owners (individuals, families and businesses) and they were therefore found in groups during excavations. We can actually reconstruct a good number of archives due to such finds:¹³ sets of *ostraca* of this kind have had a great impact on our knowledge of various aspects of economics, demography, prosopography and sociology.¹⁴

¹² A famous and ‘extreme’ example is that of *ODN* 100–188, a huge set of 89 bilingual *ostraca* (they are written in Demotic with some passages in Greek) bearing the account of a long legal dispute. Each *ostrakon* has a number on it so they could be kept in order (this set was found stored in a room near the temple of Narmuthis – modern Medinet Madi, in the Fayyum); see Menchetti 2005.

¹³ As Roger Bagnall (2011, 137) has rightly observed: ‘In isolation, they [i.e. *ostraca*] tell us very little, and that not of much broader interest. It is normally as groups that they can give us information.’ Some archives are now scattered between various collections as a result of different excavations on the same sites or of purchases on the antiques market. Studies that aimed to gather *ostraca* pertaining to the same archive and analyse them as a whole are useful: for some recent examples, see Habermann, Armoni, Cowey, and Hagedorn 2005 (where several family archives were reconstructed) and Funghi, Messeri, and Römer 2012, vol. 2, 143–282 (where G. Messeri studied the archive of the freight firm of Nicanor and Sons, operating between Coptos and the harbours on the Red Sea using the roads in the Eastern Desert).

¹⁴ For a recent survey on the contribution of documentary *ostraca*, see Reiter 2009.

b. Paraliterary and literary texts

I would like to focus first on the kind of paraliterary texts that are mostly found on *ostraca*, viz. school exercises and, more generally, texts related to education: *ostraca* provide more than a third of all the evidence we currently possess in this field, being a favourite writing material for pupils and students.¹⁵ The reasons for this preference are the same as those we have already mentioned: potsherds were inexpensive, easy to obtain and ideal for writing down short-lived texts. *Ostraca* provide us with a complete overview of the path that a student of the Greek language should follow: starting with basic writing exercises (such as alphabets, letters written again and again in non-alphabetical order, exercises in syllabification, exercises in writing longer words and so on), the pupils moved to more elaborate texts, learning to write (and learning by heart) short sentences of moral content (such as the *Sayings of the Seven Wise Men*, or the *Menandri Sententiae*), and, later on, longer passages of classical and Hellenistic authors: Homer, theatre authors (above all, Euripides) and passages from lyrical and epigrammatic poetry. Mathematical exercises and arithmetical tools (tables of fractions and the like) are also found on *ostraca*.

The use of *ostraca* in schools was not limited to exercises for pupils, however: we have a number of examples that, in all probability, were models used by schoolmasters. These models were placed in the classroom and the children copied



Fig. 5: O. Claud. II 415 (LABD no. 4632): neck and shoulders of an amphora used to write disyllabic words starting with the letter π, and for a drawing. The fragment was put upside-down to stand up (perhaps for public display).

¹⁵ In her book *Writing, Teachers, and Students in Graeco-Roman Egypt*, 1996, Raffaella Cribiore provided a chart of the different materials used for school texts (p. 76); *ostraca* represent 34% of the total number.

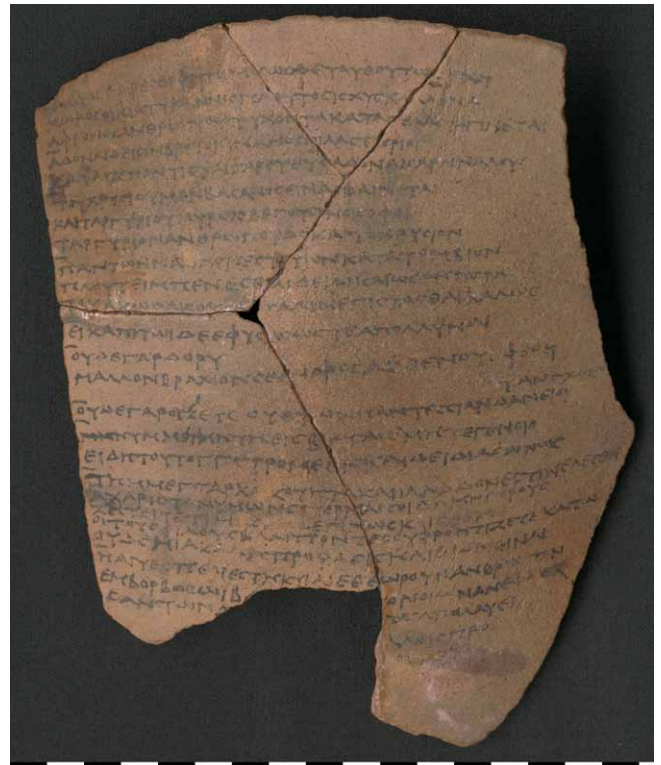


Fig. 6: P. Berol. inv. 12319 (LABD no. 3864): an anthology of passages from various authors, including Euripides, Homer and Hesiod.

from them or used them as a reference. The form of some of these *ostraca* suggests that they were positioned vertically, on public display (see fig. 5).

The boundary between advanced school exercises, reference books and literary texts used in other contexts is not always easy to identify: some *ostraca*, for example, display fine examples of short anthologies of passages by various authors written in a fluent hand (fig. 6). Ascribing some of these *ostraca* to an advanced educational context is possible, but we cannot rule out the possibility that they represent private anthologies written by someone interested for whatever reason in the passages copied here.

A famous (possibly the most famous) literary *ostrakon* is kept in Florence, Italy (at the Biblioteca Medicea Laurenziana) and contains part of an ode by Sappho (fig. 7).¹⁶ Before the discovery of this *ostrakon*, only a few words of this poem

¹⁶ The *ostrakon* has the number 3904 in the *Leuven Database of Ancient Books*. The record provides references to a bibliography and available images, among other things.

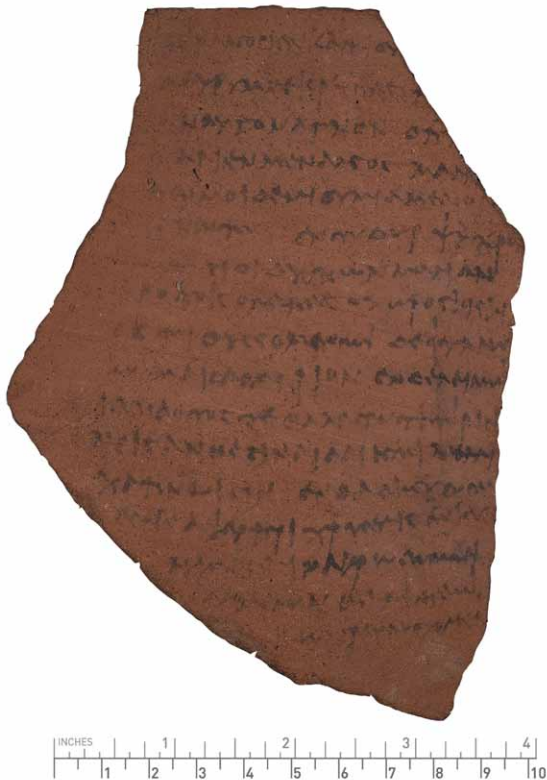


Fig. 7: PSI XIII 1300: 'the Sappho ostrakon'.

were already known in quotations of other surviving authors, and these were thought to belong to two different odes. Ancient lyric poetry, so much loved and celebrated by the Greeks, has largely disappeared; its fragmentary survival is mostly in quotations and on papyri. *Ostraca* have made a small but valuable contribution to our knowledge of Sappho and other authors.

One interesting contribution of *ostraca* worth mentioning – a mixture of documentary, paraliterary and literary texts – concerns monastic life. The huge amount of *ostraca* found in various monastic sites (and bearing passages of the Holy Scriptures, homilies, prayers, letters between priests, documents pertaining to the administration of monasteries, etc.) is of great importance in reconstructing this particular milieu in Egypt from the fifth century onwards.

These few examples make it clear that literary *ostraca* are always single passages of writing that are quite short: the writing surface imposes narrow restrictions on the texts. It would not be easy to imagine a whole 'book' written on *ostraca*, but we can briefly discuss an interesting case: a set of *ostraca* found in Denderah (Upper Egypt) and written by the same hand at the end of the fifth century CE (fig. 8). The extant evidence allows the reconstruction of six potsherds (some of which were lost after their publication) containing the first 127 verses of the *Iliad*. The majority

of them are written on both sides, the potsherds were not very big and the verses on them were copied continuously – with two dots to separate them – to save space. Two of these potsherds were numbered (they have now been lost, unfortunately), and it is possible that all the *ostraca* in the set originally bore consecutive numbers, useful for reading (and keeping) them in the right order.¹⁷ We do not know how much of the *Iliadic* text was copied in this set; no potsherd with any other verses of the first book (or other parts of the *Iliad*) was found together with it. Considering the fact that the first book of the *Iliad* consists of 611 verses, writing it in full would have required 29 *ostraca* of about the same size as those of the extant group. It should be noted here that the whole *Iliad* consists of nearly 15,700 verses and would therefore have required almost 750 *ostraca* to be copied in full. It is difficult to say what the purpose of these *ostraca* was: the hand is fairly fluent, but not calligraphic, and the text contains mistakes and corrections. An educational context seems probable. Another continuous literary text copied on numbered *ostraca* is provided by a set of ten pieces found in Upper Egypt and written in the fifth or sixth century CE: they bear part of St. Luke's Gospel (22:40-71) in an abridged form (some passages are omitted) and they were found together with ten other pieces containing passages from other gospels,

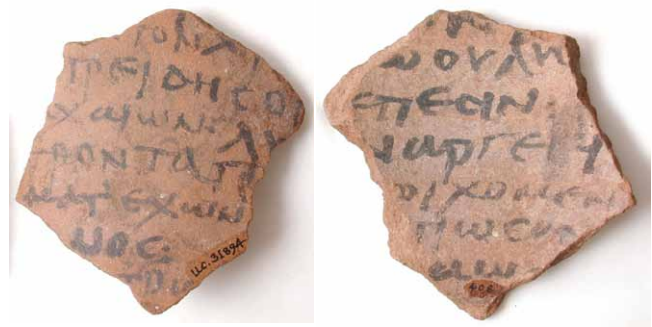


Fig. 8: O. Petr. Mus 23 (LABD no. 113383): one fragment of a set containing at least vv. 1–127 of the first book of the *Iliad*; the potsherd was written on both sides and the verses were copied continuously.

all written by the same three hands. These possibly represent (part of) a collection of passages from the New Testament used by a small group of Christians (although it is impossible to say exactly what purpose they were used for).¹⁸

An interesting question arises at this point: did *ostraca* play a role in the transmission of literary texts? We can say

¹⁷ On this set of *ostraca*, see Funghi, and Martinelli 2008.

¹⁸ These *ostraca* (number 2991 in the *Leuven Database of Ancient Books*) were published by Gustave Lefebvre in 1905.

that they theoretically did – and that they certainly did in a way. In the case of school texts, one or more passages of a literary work might have been copied over and over again by several pupils from a model represented by an *ostrakon*. In the case of a composition of a literary text, notes or passages written on an *ostrakon* possibly became part of a larger ‘book’. In either cases, *ostraca* may have functioned as a sub-archetype (even if of a specific passage) and their textual peculiarities may have passed in their descendants. It is clear, however, that such a transmission would be very limited and it is highly improbable that it could have affected the transmission of a text over the centuries.¹⁹

6. Conclusions

Ostraca were used extensively and were a common writing material for short and/or ephemeral texts. Receipts, notes of any kind, drafts and exercises are the most frequent texts found on *ostraca*. Their high availability and economical nature played a very important role in the choice of *ostraca* as a writing material (in a way, *ostraca* may be considered the ‘papyrus of the poor’). The use of *ostraca* increased in places where papyrus was difficult to find, but it was nonetheless limited and it never replaced papyrus completely. We have found examples of all the kinds of texts we find on *ostraca* on papyrus as well, but we have not been able to find any long texts written on *ostraca* to date.

¹⁹ One famous ancient witness of the writing of longer texts on ‘poor’ material such as *ostraca* is Diogenes Laertius, *Lives of Eminent Philosophers*, VII, 174, where we are told that the philosopher Cleanthes ‘wrote down Zeno’s lectures on ostraca and the blade-bones of oxen because he lacked money to buy paper’. In view of the nature of *ostraca*, these texts were likely to have been notes rather than a full transcription of Zeno’s lectures.

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