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Adam Łukaszewicz

DIVISO ACU.

WAS A NEEDLE USED IN PAPYRUS MANUFACTURING?

Many pages have been dedicated by papyrologists to problems of papyrus manufacturing in antiquity. These modern descriptions unavoidably depend on the famous passage of Pliny the Elder concerning the manufacturing process of the papyrus writing material (*Nat. Hist.* XIII. 74-82).

Pliny most probably did not see himself, how papyrus paper was made. His knowledge came from books — no doubt he compiled his description from some hellenistic works on the subject. Pliny's sources are now entirely lost. We may only search for confirmation of Pliny's assertions in archaeological evidence (chiefly by analyzing extant papyrus sheets) and in modern experience in manufacturing papyrus.

Strangely enough, there are no extant descriptions of papyrus manufacturing dating from pharaonic Egypt.

Let us therefore turn our attention again to the original text of Pliny, *Naturalis historia*, XIII. 74:

Praeparatur ex eo charta diviso acu in praetenuis sed quam latissimas phyllyras; principatus medio, atque inde scissurae ordine. Hieratica appellabatur antiquitus religiosis tantum voluminibus dicata etc.

The famous text has been thoroughly analyzed by Naphtali Lewis in his book on *Papyrus in Classical Antiquity*. Here we only intend to reconsider some words of this passage.

Lewis gives the following translation of the passage quoted above:

"Paper is made from the papyrus plant by separating it with a needle point into very thin strips as broad as possible. The choice quality comes from the

centre, and thence in the order of slicing. The (choice) quality in former times called 'hieratic' because it was devoted only to religious books ...".¹

In Pliny's description there follows a series of other names of papyrus categories in a descending order of quality.

Ex eo refers obviously to *papyro*, and indeed the word "*papyrum*" occurs in the precedent text. But the ablative form *diviso* is separated from *ex eo* by the word *charta* and is pending in the air. Without a necessary explanatory complement such position of *diviso* causes some problems of style.

It would be only natural to connect *diviso* with the neighbouring ablative *acu* and to understand *diviso acu* as an *ablativus instrumenti*.

Thus, *praeparatur ex eo charta diviso acu* would mean "papyrus is prepared from it (i. e., from the papyrus plant) with a divided needle". However, such a "two-forked needle" as an implement to "slice" the papyrus would be even more bizarre than the usage of a normal needle. That would also imply an incoherence of the two parts of the sentence: *praeparatur* does not agree with *in praetenuis*. The logical connection of words in this sentence is *diviso acu in praetenuis* etc., since *dividere in*, unlike the supposed *praeparare + in*, is a correct Latin.

Diviso acu may nevertheless be regarded as a standard ablative usage. *Diviso acu in praetenuis sed quam latissimas philyras* could mean "after the *acus* had been divided into strips as large as possible". This, however, excludes the meaning "needle". And indeed "needle" is not the only possible meaning of *acus*. The word may also mean chaff, ἄχυρον (German "Spreu", French "balle" or "paille"). *Acus* in that sense usually has a correct genitive form *aceris*, but there is evidence, e. g., from Columella II 10, 14² of a plur. fem. *acus* (an error *per analogiam*). Therefore also the ablative *acu* is not very much surprising.

Could the word *acus* possibly be used by Pliny to designate the stalk of the papyrus plant? It is certainly a question. *Acus*, like the Greek ἄχυρον, may not only mean husk or chaff but also straw, as a synonym of *palea* (cf. French *paille*). Pliny himself gives a definition of *acus* (*frumenti*), but he means rather chaff than straw (XVIII 99: *acus vocatur cum per se pisitur spica tantum, aurificum ad usus, si vero in area teritur cum stipula, palea, in maiore terrarum parte ad pabula iumentorum*).³ Straw, however, is a possible meaning and perhaps not an unfitting word in a context in which stalk of a plant is mentioned.

Thus, we would obtain the following sense of Pliny's passage:

"Paper is made from it (i. e., papyrus) by cutting the 'straw' (i. e., 'pieces of stalk') into very thin strips as broad as possible etc."

¹ N. LEWIS, *Papyrus in Classical Antiquity*, Oxford 1974, p. 37.

² *Thesaurus Linguae Latinae* I, s. v.

³ O. SCHNEIDER, *In C. Plini Secundi Naturalis Historiae libros indices*, Hildesheim 1967, s. v. "acus".

The long papyrus stalk was undoubtedly cut into shorter pieces before it underwent further manufacturing process. This fact could possibly justify Pliny's use of an appellation like "straw" applied to the raw material used for papyrus production.

But another approach to the whole question is also possible. In Pliny's Book XXV 53 we find in connection with another plant a statement about dividing (*findere*) *medullam acu in longitudinem*. The entire passage reads as follows:

antiqui radicem cortice quam carnosissimo seligebant, quod tenuior eximeretur medulla — hanc umidis sponseis opertam turgescentemque acu in longitudinem findebant, dein fila in umbra siccabant his utentes — nunc ramulos ipsos ab radice quam gravissimi corticis ita dant.

In this context it would be much more difficult to reject the interpretation of *acu* as "with a needle". (An attempt to conjecture *acum* instead of *acu* is not to be accepted).

However, while the use of a needle seems to be incontestable, an explicit information that the needle was used to extract fibres from the stalk of a plant *in longitudinem*, evidently contradicts Hendriks' idea of "unrolling" papyrus pith.⁴ Even if a needle was used, it served to divide the pith lengthwise. Therefore — again — tearing off long and thin strips, and as broad as possible, is meant by Pliny.

Papyrologists generally advance three hypotheses concerning the way in which the papyrus plant was cut to produce the writing material:

- 1) Dr Ragab's method of peeling off long and thin slices of the stem.⁵
- 2) Corrado Basile's idea: the papyrus was peeled from three sides of the triangular stem.⁶
- 3) Hendriks' "unrolling" the stalk.⁷

Actually, we do not know, whether the external rind of the papyrus stalk was peeled off before the papyrus was sliced. From explicit evidence we do not know either whether papyrus was cut into slices or "unrolled" to produce one large "sheet". This last method seemed the real solution, e.g., to Hendriks,

⁴ I. H. M. HENDRIKS, "Pliny, *Historia Naturalis* XIII, 74-82 and the Manufacture of Papyrus", *ZPE* 37, 1980, pp. 121-136.

⁵ E.g., H. RAGAB "The quality of the recently manufactured papyrus as compared with ancient Egyptian papyrus", [in:] *Proceedings of the 18th International Congress of Papyrology*, Athens 1988, vol. II, pp. 513-523.

⁶ C. BASILE, "Metodo usato dagli antichi Egizi per la fabbricazione e la preservazione della cartapapiro", *Aegyptus* 57, 1977, pp. 190-199.

⁷ HENDRIKS, *loc. cit.*

Lewis, Parkinson and Quirke.⁸ Papyrus sheets made from narrow strips clearly show a cross pattern which in modern papyrus products is different from ancient papyrus.

Discussion of the exact meaning of *philyra* is not relevant here. The alleged contradiction between *philyras* and *quam latissimas* ("strips very thin but as broad as possible") is only apparent. Hendriks correctly interprets *philyra* as connected with the linden wood. The analogy — we would add — is justified since linden *philyrae* were actually used as writing "tablets". Anyway the *philyrae* are more or less broad strips and not separate fibres which could be stripped with a needle.

Unrolling the papyrus stem to obtain a thin "film" must have produced sheets of unequal quality. The external parts of the stem, closer to the husk contain thick fibres of the vascular system of the plant. In fact most papyrus sheets show thicker fibres.

Interesting evidence on the subject comes from Pliny's further text:

principatus medio, atque inde scissurae ordine (74).

Naphtali Lewis' interpretation of the above Latin passage reads:

"the choice quality comes from the centre, and thence in the order of slicing."⁹

It is quite possible that Pliny's information does not refer to the commercial names of kinds of papyrus, which he enumerates lower, but to the quality of the material inside the roll. Thus, the translation of the passage would be:

"The beginning of a roll comes from the centre, and thence in the order of slicing".

Anyhow, Pliny's words would imply that the slicing begins at the centre and goes on toward more external and therefore less good parts of the papyrus stalk. Dr. Ragab seems to come very close to the ancient manufacturing process — the only problem is the thickness of the strips which in our days are cut from the papyrus pith.

The above assertion is confirmed by a further passage of the text under discussion:

(plagulae) inter se iunguntur, proximarum semper bonitatis deminutione ad deterrimas (77)

⁸ N. LEWIS, *Papyrus in Classical Antiquity, a Supplement*, Bruxelles 1989; R. PARKINSON, S. QUIRKE, *Papyrus*, London 1995, p. 13; HENDRIKS, *loc. cit.*

⁹ N. LEWIS, *Papyrus in Classical Antiquity*, Oxford 1974, p. 37.

This can only mean that the sheets in the same roll are not the same quality. That is in fact a repetition of the statement from 74. The first sheets are the best and their quality deteriorates towards the end.

Whatever the real process of manufacturing, we might therefore assume that Hendrik's method of "unrolling" the papyrus stalk, though ingenious, and perhaps actually applied in antiquity in some cases, is not the same as the process described by Pliny. Hendrik's method must produce sheets containing material of different quality in every sheet, unless the unrolled papyrus "film" is cut into strips to be sorted according to quality. Such cutting and sorting could give broader strips than the peeling described by Pliny and could therefore produce better quality of the writing material.

The pieces of papyrus stalk were probably usually cut lengthwise in two, after which the peeling started from the middle. The quality descended in the order of slicing. The worst material was close to the rind.

The length of the pieces of stalk must have approximately agreed with the width of the papyrus sheets.

Except for Pliny's text, (if *acu* actually means "with a needle"), we do not know anything about the implement used to peel the strips.

We may also suppose that a thing that mattered was the thickness of the stalks used for manufacturing papyrus. Some stalks were particularly thick — they could give much broader strips than others. In less exquisite products the better material coming from the middle part of the stalk could be put at the beginning of the roll. The sheets tended to be rather homogeneous, the rolls of lesser quality were probably not.

By the way, Pliny (XIII 69) asserts (after M. Varro) that before Alexander the papyrus paper was unknown! This strengthens the impression that Mr. Know-All, without whose information we would be often lost in the ancient world, was not always well informed.

[Warszawa]

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