



# On the cipher script of the London-Leiden Demotic magical papyrus\*

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## ABSTRACT

The present paper aims to show that the cipher script of the London-Leiden Demotic magical papyrus is a complex cultural artefact whose creation is inextricably connected with that of the magical handbook which contains it. In particular, it is argued that some of its signs can be interpreted as Greek letters in Demotic disguise. This fact can be seen as a confirmation that the graphic shapes employed in writing systems are easily burdened with cultural identity values. Altogether, this contribution also provides additional counterarguments to the view that the script at issue is basically a Greek ciphered alphabet enlarged with Demotic letters.

KEYWORDS: history of writing, Old Coptic, Demotic, cryptography

## 1. *Introduction*

The Demotic Magical Papyrus of London and Leiden (henceforth, also pMagLL) belongs to a group of magical handbooks which were produced in Graeco-Roman Egypt and collect spells written in Egyptian language and Demotic writing. While the amount of discovered magical papyri written in Greek is remarkable<sup>1</sup> and the Coptic magical

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<sup>1</sup> Some figures are given by DIELEMAN (2019: 288f.); edited collections are PGM, SMag and the Greek texts in GEMF; for a general introduction see BRASHEAR (1995).

texts are several tens<sup>2</sup> in number, the extant magical books written in Demotic are not comparably numerous and comprise four major papyri and some minor texts or fragments<sup>3</sup>.

Three of the major papyri, pMagLL (formed by pBM EA 10070 plus pLeiden I 383), pLeiden I 384 and pLouvre E3229, belong to a group of 11 magical manuscripts – also comprising several Greek Papyri and the Greek/Old Coptic magical papyrus P.Bibl.Nat.Suppl.gr. no 574 (PGM IV) – which have been found in the Thebes region in Upper Egypt and are thought to have been part of a same archive, which modern scholars call the “Theban Magical Library”<sup>4</sup>. All of these papyri were acquired in Egypt by the merchant Giovanni Anastasi (1780-1860). Between 1828 and 1829, Anastasi sold one of the two papyrus portions forming pMagLL (i.e., pLeiden I383) – together with the two papyrus portions forming pLeiden I384 – to the Dutch Museum of Antiquities in Leiden. The other portion of pMagLL (i.e., pBM EA 10070) remained in Anastasi’s possession until his death in 1860, after which it was acquired at an auction by the British Museum. The discovery that pLeiden I383 is the continuation of pBM EA 10070 was first published in Hess’s edition of the latter (1892).

The three Demotic papyri included in the Theban Magical Library are dated to the late second or the early third century CE<sup>5</sup>. A fourth non-minor Demotic magical text, pBM EA 10588, perhaps slightly more recent, also dates no later than mid third century CE<sup>6</sup>. All of these four papyri are, in fact, bilingual, since they contain sections in Greek; moreover, all of them exhibit passages written in hieratic script (details in Quack 2010: 321ff.; cf. also Quack 2023). This latter fact

<sup>2</sup> See the texts edited by A. Kropp in AkZ and LOVE (2016); see also PERNIGOTTI (1995), with translations of a selection of texts.

<sup>3</sup> See RITNER (1995: 3343ff.), BRESCIANI (1987: 313, 324 n. 5); see also QUACK (2004: 408) on the fragment pBM EA 10808 (ed. Osing 1976), and QUACK (2023) on the magical fragments in hieratic script contained in P. Leiden Pap. Inst. Inv. 1000 recto, which are to be considered as linguistically Demotic.

<sup>4</sup> See DOSOO (2016), DIELEMAN (2019: 292f.).

<sup>5</sup> Cf. QUACK (2017: 49ff.), DIELEMAN (2019: 292).

<sup>6</sup> QUACK (2017: 54).

suggests that they were produced in Egyptian temple scriptoria<sup>7</sup>, as has been convincingly argued by J. Dieleman (2005: 22, 48ff., 285ff.; 2019: 293; cf. also Ritner 1995: 3335, quoted below)<sup>8</sup>.

In pMagLL, 113 word-occurrences, representing 93 forms<sup>9</sup>, are written in a special alphabet generally interpreted as a means of concealing the text from unwanted readers. A further occurrence of the use of this script is found in a word in Papyrus Leiden I 384, another manuscript of magical content written by the same scribe who wrote pMagLL. The main aim of this paper is to show that the cipher script at issue is a non-trivial cultural artefact involving cases of graphic camouflage whose ratio can only be understood in the light of the peculiar relationship existing in this context between Greek and Enchorial components, seen both as elements of a technology of writing and as symbols of a cultural identity. This will lead us to discard the schematic hypothesis put forth by F. Ll. Griffith and H. Thompson (the first editors of pMagLL) regarding the invention of this script (and recently accepted by Dieleman 2005 and by Faraone and Torallas Tovar in GEMF, p. 137) and to adhere, with additional arguments, to the view expressed by R. Ritner (1995). As we shall see, though concerning a use of writing which is obviously very *sui generis* and is bound to a single historical episode, the invention of the cipher script of pMagLL offers a noteworthy confirmation of the well-known anthropological tendency according to which the graphic shapes employed in writing systems are easily burdened with cultural identity values.

<sup>7</sup> DIELEMAN (2005: 48ff., 285ff.; 2019: 293). As for the dialectological position of pMagLL, see SATZINGER (1984: 141 and footnote 22), who classifies the language of the Old Coptic glosses as an archaic form of Achmimic (differently JOHNSON 1976).

<sup>8</sup> Editions: pMagLL (pBM EA 10070+pLeiden I 383): DMagP (with a hand-written copy by H. Thompson), GEMF 16; pLeiden I384: JOHNSON (1975 – Demotic sections only), GEMF 15; pLouvre E3229: JOHNSON (1977), GEMF 17; pBM EA 10588: BELL-NOCK-THOMPSON (1933), GEMF 18. Photographs: pBM EA 10070 and pBM EA 10588: [https://www.britishmuseum.org/collection/object/Y\\_EA10070-1](https://www.britishmuseum.org/collection/object/Y_EA10070-1), °EA10070-2, °EA10070-3, °EA10588-1, °EA10070-2; pLeiden I 383 and 384: <https://www.rmo.nl/collectie/collectie-zoeker/collectiestuk/?object=172306,°=172312>; pLeiden I 384 JOHNSON (1975); pLouvre E3229: JOHNSON (1977). Translations without text edition: GMPT. Note that the Greek portions of pMagLL correspond to PGM XIV (i.e., to the fourteenth text in Preisendanz's collection).

<sup>9</sup> Cf. the list in DMagP (vol. 3: 109-112).

The relative paucity of the Demotic magical papyri and their being presumably bound to priest milieux of the traditional Egyptian religion lend this textual corpus a particular status within the greater corpus of the magical books coming from the Graeco-Roman Egypt. Thus, if it is true that, in the contemporary Greek magical papyri taken as a whole, a syncretistic religion is represented which assimilated Egyptian, Greek but also Babylonian and Jewish elements (see Betz in GMTP, p. xlvi), the Demotic manuscripts testify a community of practices in which the assimilation of exogenous cultural components, in primis the Greek one, coexists with an allegiance to the indigenous scriptorial traditions, which is culturally relevant in itself. Such allegiance is evident not only, and obviously, in the use of Demotic language and writing, but also in the fact that these papyri not seldom resort to hieratic script for specific passages or even single words or word groups (cf. below)<sup>10</sup>. These cultural coordinates are of fundamental import for the analysis of the cipher script.

## 2. *The graphic and linguistic repertoire of pMagLL*

The graphic and linguistic repertoire of pMagLL has been described in depth by J. Dieleman (2005, 2006). Since, as we will see, practically all of its elements are involved in the creation of the cipher script, it is necessary here to spend a few words on it. The papyrus contains 93 spells and is mainly written in the Egyptian language in Demotic script (indeed, it notoriously represents a major source for the study of late “Demotic Egyptian”). In addition to normal Demotic,

<sup>10</sup> An anonymous reviewer of this journal questions the interpretation of the choice of Demotic in cultural identity terms and wonders whether it is simply that the scribe felt more at home with the Egyptian language. However, what is important here is the *written* form of language. Thus, if it is obvious that a native speaker of Egyptian would have felt more at ease in communicating orally in Egyptian, the use of Demotic as a written language in Roman Egypt is by far less obvious; indeed, for this period, it seems reasonable to think that the number of people literate in Demotic outside the priestly milieux might have been very low (if not zero; cf. TAIT 1992: 307). On the other hand, that the priestly class represented a stronghold of the indigenous cultural identity is a truism. On the creation of pMagLL as a cultural operation, see also GORDON (2019: 103f.).

the following writing systems are used: Greek; an alphabet of the Old Coptic kind<sup>11</sup>; hieratic; a special use of Demotic letters.

Three spells contain parts written in Greek script: spell n. 2<sup>12</sup> contains a long invocation in Greek, spell n. 18 a Greek formula accompanied by a quasi-equivalent passage in Demotic, spell n. 35 a long invocation of Typhon Seth in Greek. These uses of Greek do not necessarily indicate a raw incorporation of non-adapted material into the Demotic book. In spell n. 2, the Greek invocation is preceded by a Demotic passage which states that the invocation had to be recited in Greek (*mtw=k* <sup>š</sup> *p<sup>3</sup>y.y* <sup>š</sup> *n mt.t wynn r-r=f* 'And you should recite this formula in Greek to it', col. IV, l. 7<sup>13</sup>). Thus, it was the magical practice itself which was bilingual<sup>14</sup>.

In other passages, the use of the Greek language is of a different kind. Spell 73 is followed by a short indication in Greek and several spells (nn. 48, 51, 55, 59, 63, 64) comprise some Greek names of plants<sup>15</sup>, animals, minerals and illnesses. In these cases, the Greek words are often flanked by their Demotic equivalents, to make full use of both Greek and Egyptian nomenclatures. Other spells contain magical words or names in Greek letters: spell n. 65 reports a graphic formula in Greek letters to be copied on a metal strip; in spell n. 75 a short list of magical names is written with the Greek alphabet.

Frequently, the Demotic text is provided with supralinear glosses written in a particular kind of Old Coptic alphabet (on which see

<sup>11</sup> Old Coptic texts are texts in the Egyptian language and Old Coptic script not belonging to the cultural milieu (Christian, Gnostic, Manichaeen) to which the term Coptic is normally applied and dating between the 1st and the 4th century CE (on a different definition of the distinction between Coptic and Old Coptic, see QUACK 2017: 56; on the issue, see also QUAEGBEUR 1982). Old Coptic alphabets consist, like the Coptic ones, in the Greek alphabet supplemented by some additional letters of Demotic origin. On the origin of the Coptic alphabets from the Old Coptic ones, see QUACK (2017) – on Old Coptic texts and alphabets, see also SATZINGER (1991), KASSER (1991), CREVATIN (2018).

<sup>12</sup> Spells are numbered according to RITNER (1995: 3339-3342).

<sup>13</sup> Text and translation according to GEMF (pp. 150f.; cf. DMagP, vol. 1, pp. 40f.).

<sup>14</sup> Note also the passage in pMagLL col. 15, ll. 24-30 (GEMF pp. 194f.; DMagP, vol. 1, pp. 108f.), where two parallel invocations are given, the one in Greek and the other in Egyptian. As concerns, in particular, the bi-ethnic character of the cult of Imhotep/Imouthes (Asclepius), cf. BRESCIANI (1987: 319).

<sup>15</sup> On these glosses and on the kind of reference manuals that the scribe was probably consulting, see BETRÒ (1988 and 2016).

Quack 2017: 49ff.). These are often used to clarify the pronunciation of the voces magicae<sup>16</sup>.

Some short passages in Egyptian language are written in hieratic script instead of Demotic. In the Demotic magical papyri hieratic pericopes are found, in particular, in invocation and incantation formulas. As has been shown by J. Quack, while in some cases the sentences written in hieratic are also archaic from a linguistic point of view – which suggests that the compiler of the book took an older hieratic text as a source for the passage at issue – there are also cases in which this possibility can be ruled out with certainty (cf. Quack 2010: 322-324): thus, the fact that in pMag LL 23, 21-31, the hieratic script is used to write the vox magica *Abrasax* is revealing, given that voces magicae are typical of Greek papyri and do not appear before the 1st century CE (cf. Brashear 1995: 3430). This indicates that the compiler of the text, who probably coincides with the author of the manuscript, had an active competence in hieratic writing.

Moreover, as in the other Demotic magical papyri, Demotic writing itself can also be used according to special conventions aiming at indicating vowel sounds, albeit in an inaccurate way as to quality distinctions. This “special alphabetic Demotic” has been thoroughly studied by Quack (2004).

### 3. *General features of the cipher script*

Though it has been sometimes described simply as a script in which the signs express one sound each and which includes vowel signs (e.g., Quack 2017: 50), the cipher script is probably better defined as a (ciphered) Old Coptic alphabet. The feature which most blatantly points to such a classification is the fact that it uses a digraph sign for render-

<sup>16</sup> The term “voces magicae” refers to words generally conceived as special names of divine entities provided with magical invocatory power. Though several voces magicae originated as linguistic expressions – often in Hebrew or Aramaic – they must have been meaningless sound sequences for the magical practitioners. On voces magicae and their use in Graeco-Egyptian magical papyri, see BRASHEAR (1995: 3429ff.; 3576ff.) and the papers collected in TARDIEU, VAN DEN KERCHOVE & ZAGO (2013).

ing /u/, /w/: thus, the word  $\mu\alpha\omicron\gamma$  (*maou* /maw/) is written as  $\mu\tau\text{z}\lambda$ , where the  $\text{z}$ -shaped sign corresponds to an omicron and the  $\lambda$ -shaped sign corresponds to an upsilon; similarly, the word  $\mu\omicron\gamma$  (*mou* /mu/) is written as  $\mu\text{z}\lambda$ . Analogously, as happens in Coptic, a sequence  $\epsilon\iota$  can be used to write a simple /j/ or /i/ sound (cf. the ciphered word  $\pi\alpha\epsilon\iota\omega\epsilon$  at col. 13 l. 24).

A further noteworthy peculiarity of the cipher script is that ciphered words are written from left to right even if they are normally placed in lines in Demotic script that are otherwise written from right to left. This fact might be interpreted as a means of enhancing secrecy, but is also a form of allegiance to the Greek/Coptic direction of writing. In the same way, in the Medinet Madi bilingual ostraka, Greek words written in Greek alphabet, though included in Demotic lines, also retain their usual left-to-right direction<sup>17</sup>.

According to the list in DMagP (vol. 3: 105-107), the cipher script comprises 36 signs. This high number, which clearly exceeds that of a normal Old Coptic alphabet, is due to the fact that several sounds can be represented by two (and in some cases three) graphemes. This non-uniqueness of encoding can be viewed as a means of enhancing the difficulty of breaking the code, but it is also connected, as we will see, to the multiplicity of sources from which the signs are taken: it is not infrequent that one of two equipollent signs is of Demotic and the other of Greek origin. At the same time, two graphemes can represent more than one sound: sign. n. 13 corresponds to  $\gamma$ , but also to  $\text{z}$  (*h*); sign. n. 29 corresponds to  $\text{x}$   $\check{\text{c}}$ , as expected on the basis of its shape, but also to  $\tau$ .

It is very likely that the two shapes that Griffith and Thompson consider as two variant forms of sign n. 15 (=  $\text{B}$ ), i.e.,  $\langle \text{z} \check{\text{c}} \rangle$  and  $\langle \text{z} \acute{\text{c}} \rangle$ , are in fact two distinct graphemes having the same value (cf. below). Moreover, a certain doubt might be raised as to whether sign n. 2  $\langle \text{F} \rangle$  – to which Griffith and Thompson assign the value  $\lambda$  – might be a third graphic variant of the very similar sign n. 1  $\langle \text{f} \rangle$  or  $\langle \text{f} \check{\text{c}} \rangle$ , which represents an  $\epsilon$ . This hypothesis is perhaps strengthened by the fact that sign n. 30, which indicates  $\tau$  (*t*), seems to be identical to sign n. 2.

<sup>17</sup> On the use of Greek script for writing Greek loanwords in the Demotic ostraka of Narmouthis, see also LOVE (2020: 323).

Since graphemes representing two sounds seem not to be the exception rather than the norm, it seems not impossible that sign n. 2 is simply a sign. 1 traced in such a way that it is not distinguishable from sign 30.

A further sign must be added to Griffith and Thompson's list, i.e., < ρ >. It appears in the only ciphered word contained in pLeiden I 384. According to Johnson's suggestion (1975: 47), it may correspond to the Demotic *h*, one of whose shapes is < ρ > (from hieroglyphic  $\text{—}_{F18} + \text{—}_{Y1}$ )<sup>18</sup>, with the dot (coming from  $\text{—}$ ) being omissible. However, this identification is not certain, since the word in which it appears is obscure and in the second ciphered alphabet reported in the decryption table of pMagLL (see below) there is a similar sign which has the value of omicron.

The cipher script is usually employed for two kinds of words: terms indicating ingredients necessary to fulfil the practices prescribed for the spell and terms indicating the effect of a spell.

#### *4. Griffith and Thompson's hypothesis on the creation of the cipher script*


Griffith and Thompson, the first editors of pMag LL, hypothesized a two-step creation process for the cipher script. In their words (vol. 3 p. 108): «The cipher was probably greek in origin, that is, was invented by a Greek, because (1) a certain number of the signs are demotic and represent those sounds in the egyptian language which are wanting in the Greek language. Thus they would afford some concealment in greek writing, but none in demotic; (2) there are some signs ... [i.e., nn. 28, 18, 31] which occur only in greek words and which therefore may have conveyed to greek ears a different sound from any letters in egyptian; (3) there is no special sign for the aspirate, vowel signs being used instead; (4) there is no differentiation between the sounds τ and χ, which an Egyptian could scarcely have failed to distinguish».


These four arguments have been accepted in more recent years by J. Dieleman in his treatment of the cipher script (2005: 87-96, espe-

<sup>18</sup> In the present paper, hieroglyphic signs are always written with their right-to-left shape, which is the only one relevant to the discussion, and numbered according to GARDINER (1957).

cially p. 88). However, as I shall try to show, none of them stands up to critical examination.

As to the second argument, one of the three letters mentioned (sign. n. 31) corresponds to a *z* and it is therefore expected on phonological grounds that it is found only in Greek words. Indeed, in Coptic words of Egyptian origin, *z* is extremely rare and can only occur as an optional graphic variant of *c* (*s*) restricted to the postnasal position (where /*s*/ was realized by a voiced allophone [z]). A not too dissimilar case is that of sign. 18 <Ⲭ> which, in my opinion, is very likely a compendium of the graphic nexus *nq* <ⲛⲑ><sup>19</sup>, where *n* is the arch placed above and *q* is the sign placed below. The sign is used in correspondence of both Greek κ [k] and Greek ρ [g], but it can be observed that a partly analogous digraph – i.e. *ng* – consisting of *n* plus the sign of a dorsal plosive (in this case *g*) is one of the strategies adopted to render a Greek ρ in Demotic script<sup>20</sup>. This fact suggests that the primary value of sign. 18 was also ρ [g]. If so, its presence in Greek words only is expected, since Egyptian has no [g] sound (except for the postnasal allophone of /k/). When it corresponds to κ [k] in a Greek word, it can be easily interpreted as a graphic hypercorrection, which is easily possible if the writer is an Egyptian (not

<sup>19</sup> In pMagLL, this nexus can be observed in col. 31. 34 (in the word sequence *nqwqwt*, GEMF p. 148 cf. DMagP vol. 1, p. 38f.); where it appears as follows (manuscript photograph): . One of the reviewers for this journal writes that, in her/his opinion, this interpretation of sign 18 <Ⲭ> is “palaeographically” unlikely. Since unfortunately s/he does not elaborate this claim further, the best that can be done here is to let the reader judge for herself on the basis of the images (the drawing of sign 18 given above is taken from Thompson’s drawings in DMagP). A point, however, must be stressed: by no means is the thesis defended here that sign n. 18 originated as a palaeographical evolution of the nexus <ⲛⲑ>. Rather, I am suggesting that the sign at issue was invented with the shape of that nexus in mind. The two perspectives are obviously profoundly different. Analogous considerations hold for the similar comments that the same reviewer wrote about the interpretation of sign n. 17 (to be considered in my opinion as an invented sign which was created taking hieratic *q* as a model rather as a palaeographical evolution of hieratic *q*) and of sign n. 20, on which see below.

<sup>20</sup> This can be seen in the relationship between the supralinear glosses in Greek alphabet and the Demotic words to which they refer. For instance, in pMagLL col. v26, l. 6 (GEMF, p. 274, cf. DMagPP, vol. 1, pp. 198), the alphabetic Greek ΓΩΓΥΘΙΞ corresponds to the Demotic sequence *ng<sup>3</sup>ngetsyks* with *ng* ( where *n* is the bow above) for Γ:



On the correspondences between Greek letters and the special alphabetic Demotic of the magical papyri, see QUACK (2004: 433).

a Greek) speaker. In other words, the Egyptian speaker who categorizes both [k] and [g] as /k/ but knows that some of the sounds that he categorizes as /k/ should be written, according to the Greek norm, with ρ, may easily overapply this grapheme. Thus, a sole grapheme remains for which its restriction to Greek words is not expected, i.e., sign n. 28, which renders c [s]. Indeed, in Egyptian words, another sign is attested for this sound, i.e., n. 27. However, one should bear in mind that there are several sounds which can be written with two different graphemes. Therefore, it may be simply due to chance that for one of these pairs one of the two signs is only attested in Greek words. Moreover, since sign n. 28 <ϱ> is probably a reversed Greek lunate sigma provided with a tail, its graphic origin may have conditioned its distribution.

The third argument is void, as well. As already noted by Griffith and Thompson themselves (vol. DMagP vol. 3: 107; see also Quack 2017: 54; cf. also Kasser 1991: 43sg.), the use of a same grapheme to write both /h/ and /u/ is also found in the convention of the special alphabetic Demotic. Thus, in pMagLL the voces magicae which in Greek writing, as is shown by the Old Coptic supralinear glosses, begin with γ followed by a vowel, are rendered in Demotic with *h* (or *h̄*) in the place of γ. Therefore, the graphic association between /h/ and /u/ is not only not proof of a Greek origin of the cipher script, but, on the contrary, is consistent with a graphic peculiarity specific to the Demotic papyri<sup>21</sup>.

<sup>21</sup> One of the reviewers of this journal, after observing that this is «due to the fact that Greek words beginning with *y* practically always have a *spiritus asper*», concludes that such a peculiarity «is rather an indication that this notation came about in a Greek milieu or at least under strong influence from the Greek language». As the reader already understood, there can be no doubt that this graphic use is due to the special circumstance according to which Greek words beginning with <υ> at the graphic level regularly exhibit an initial /hy/ phonologically. Therefore, the role of the Greek language is out of the question. However, the issue here is whether the graphic refunctionalization of the letter <υ> is more likely to have been introduced by native speakers of Greek primarily literate in Greek or by native speakers of Egyptian primarily literate in Demotic. Now, from the point of view of a Greek, it is perfectly normal that an initial /h/ sound is not written at all (lack of breathings is normal in non-literary papyri) and that a vowel is written; from the point of view of a person primarily literate in Demotic, on the contrary, the norm is that an initial /h/ sound is written, while a vowel is not. Of course, in order to devise it, the inventor of this refunctionalization must have had some experience of Greek words written in Greek alphabet, but this is no proof that he belonged to a Greek milieu: he may well have been a native speaker of Egyptian with some degree of biliteracy.

As for the fourth argument, it is true that a failure to categorize the sounds [tʃ] and [t] as different units is expected from a speaker of Greek and not from a speaker of Egyptian. However, Griffith and Thompson's solution is not unproblematic. Indeed, the grapheme which is used for rendering both /tʃ/ and /t/ is of Demotic origin and belongs, therefore, to the subset of graphemes which, according to the hypothesis of the two scholars, were added at the moment in which the script was adapted in order to write Egyptian words. Now, it is rather unlikely that such an operation could have been accomplished by a native speaker of Greek. On the other hand, it is not impossible that the user of the cipher script treated <𐓇> as a perfect equivalent of Greek <τ> because he was influenced by the way in which Egyptian words were rendered in Greek texts (in the case of anthroponyms, such adaptations into Greek must have been relatively common in everyday writing). Indeed, in Greek texts the [tʃ] which in Demotic writing is written with <𐓇> was most frequently rendered by <τ> (less frequently by <θ>, <χ> or <ϙ>), as happened with the anthroponyms beginning with *Dd-hr* 'said the face', whose Greek renderings begin, in most cases, with *Τεω*<sup>22</sup>. This fact, in turn, was effectively due to a case of under-differentiation of phonemes ascribable to Greek speakers who identified [tʃ] as a realization of /t/. Admittedly, such borrowing of a graphic neutralization typical of written renderings of Egyptian words made by Greeks is not banal in an Old Coptic text<sup>23</sup>. All in all, Griffith and Thompson's fourth argument points to a real problem but is by no means conclusive as concerns the origin of the cipher script.

The first argument is apparently the strongest one and is the pivot of the two-step hypothesis. The idea goes as follows: at first a certain

<sup>22</sup> Cf. BLASCO TORRES (2017: 442); see also BRUNSCH (1978: 66).

<sup>23</sup> It can also be observed that in the hieroglyphic/hieratic writing system historical or pseudo-historical spellings are found by which dental sounds are written with signs normally indicating palatals: to mention an instance, in the hieroglyphic text of the trilingual inscription of Gallus (1st century BCE), we find *wdnw* 'offerings' (l. 6) written with 𐓇 *d* instead of 𐓇 *d*, as if it were *wɗnw* (on this instance, see HOFFMANN *et al.* 2009: 57; on the general phenomenon, see GARDINER 1957: 28, § 19 and obs. 2; on the sound change prompting it, see VERGOTE 1973: 20-22). One might wonder whether this kind of non-one-to-one correspondences between signs and sounds may have influenced the users of the cipher script.

Greek ciphered alphabet was created in a Greek milieu, then some Egyptian speaker decided to also apply it to Egyptian, and added, therefore, some Demotic letters to write the sounds that could not be written with the Greek alphabet. In doing so, he did not care to devise new ciphered signs and integrated plain Demotic letters into the script. Interestingly enough, according to this schema, the invention of the cipher script would have had a history parallel to that of the invention of the Coptic script (but independent of it!): the Coptic alphabet is a Greek alphabet supplemented by letters of Demotic origin necessary to write sounds which are absent in Greek.

However, this line of reasoning would only make sense if the non-encrypted Demotic letters comprised in the cipher script were those and only those which render sounds absent in Greek. But, as we shall soon see, it is not so. Moreover, there are some other signs, which also render sounds which *can* be represented by Greek letters, which are clearly taken from the hieratic script (cf. below). Thus, the very prerequisite for Griffith and Thompson's first argument is void.

In fact, Ritner (1995: 3335) already came to what seems to me the only possible conclusion: «Earlier suggestions of a Greek origin for this code cannot be maintained [...] Derived from the Demotic and highly arcane Hieratic scripts, the cipher could only have been composed by an author familiar with Egyptian priestly tradition».

Albeit untenable in its formulation, Griffith and Thompson's idea of a relationship between specifically Greek cipher alphabets and the cipher script of pMagLL contains some elements of truth. Not only is there no doubt that in the milieu in which pMagLL was produced and used, Greek ciphered alphabets were known – an encoding table for two alphabets of this kind is found in an intercolumnar space of pMagLL itself (cf. below) – but it may also be observed, as we shall see, that *some* of the symbols used in cipher script are also present in such alphabets, so that it is likely that they were taken from those sources<sup>24</sup>.

<sup>24</sup> Moreover, it should be mentioned that, as concerns the contents of the papyrus, Griffith and Thompson's hypothesis according to which pMagLL represents «an egyptian version of a greek original [...] indebted for most of its material on egyptian sources» remains viable (see also the arguments adduced by QUACK 2004).



### 5. *The Demotic and hieratic components of the cipher script*



As mentioned above, the cipher script contains a series of non-altered letters of Demotic origin. The following ones correspond to sounds which have no equivalent in the Greek alphabet:


n. 32 <𐓗> = *š* ( $\frac{mms}{m8}$ ); n. 33 <𐓗> = *ḥ* ( $\frac{e}{AA1}$ ); n. 34 <𐓗> = *f* ( $\frac{f}{19}$ ); n. 35 <𐓗> = *ḥ?* ( $\frac{h}{M12}$ ); n. 36 <𐓗> = *kʲ* (from  $g$   $\frac{w}{w11}$ ). To these, the sign <𐓗> found in pLeiden I 384 should perhaps be added (cf. above).

There are at least two, but possibly three signs which are Demotic or have been invented with a Demotic sign in mind and render sounds also present in Greek. An undoubtable case is that of sign n. 11, <𐓗>, which is the only letter used for indicating  $\omega$  ( $\bar{o}$  /o:/): this is a hieroglyphic/hieratic sign (being a variant shape of  $\frac{f}{E37}$ ) used to indicate  $\bar{o}$  in the Demotic special convention which Quack calls “late syllabic writing” (see Quack 2017: 40f., 54). Griffith and Thompson themselves mention that this symbol is also found for  $\omega$  in a Demotic rendering of the Greek name *Ισιδωρα* in a mummy ticket of the Roman period (cf. Spiegelberg 1901: \*16). Indeed, the  $\frac{f}{E37}$  /  $\frac{f}{E37}$  sign is the logogram for *iʒ*, *i* ‘back’, whose late phonological shape was [o:ʔ], as testified by the Coptic preposition in the prepronominal status  $\varrho\omega\omega$  = ‘from’, which contains it etymologically. A second undoubtable Demotic sign is n. 15b <𐓗>, whose value is *β* and which is clearly sign n. 34 (i.e., the Demotic sign for *f*) provided with a diacritical<sup>25</sup> oblique stroke (note that Coptic *β* was a labial voiced fricative or approximant). A third sign of probable Demotic origin is n. 18 <𐓗>, which has been dealt with above. A less certain further case might also be mentioned here. It concerns sign n. 25 <𐓗>. The value of this symbol is *π* (*p*) and its shape is extraordinarily similar to that of one of the Demotic signs for <*b*> (from  $\varrho$   $\frac{L}{Z7 + D58}$ ). The next two photograph crops, an occurrence of this form of <*b*> and an occurrence of sign 25 respectively, can show

<sup>25</sup> This fact, is indeed, interesting per se. On the one hand it implicates a sort of sub-phonemic analysis, on the other it testifies a procedure of letter creation through diacritization which, albeit realized in ways different from that observed here, is not unknown to Coptic alphabets (cf. the Akhmimic letter  $\varrho$ , which is a diacriticized  $\varrho$ , and the letter  $\frac{u}{U}$  of the Lycopolitan of the *Ascensio Isaiæ*, which is a diacriticized  $\omega$ ).

the similarity:  (*b* in the word *ʾlbt* in col. 2, l. 20; GEMF, p. 144, cf. DMagP, vol. 1, p. 28);  (*p* in the encrypted word *κϱκϱπϱϱ* in 10.31)<sup>26</sup>. The reason why a Demotic <*b*> letter would have been used for rendering a /*p*/ sound is not entirely clear<sup>27</sup>. However, the graphical similarity between the two symbols and the phonetic affinity between /*p*/ and the sound normally corresponding to <*b*> (i.e. /β/) leads us not to discard the possibility that sign n. 25 was invented with the <*b*> letter in mind.

As for the presence of signs invented with a hieratic model in mind, a straightforward case is that of sign n. 17 < >, which renders [k]. Its shape is significantly similar to the hieratic form of the hieroglyphic letter *q* ( $\Delta_{N29}$ ) – i.e.,  <sup>28</sup> – with the only substantial difference being that the vertical lines of sign 17 descend below the horizontal line<sup>29</sup>.

The use of a sign related to Egyptian *q*<sup>30</sup> ( $\Delta_{N29}$ ) as an equivalent of Greek κ is something expected: the Demotic *q*-letter  is used in the same way in some Old Coptic alphabets and in the Coptic alphabet of papyrus Bodmer VI (cf. Quack 2017: 74, 76)<sup>31</sup>. It is therefore very unlikely that the similarity of sign. 17 to hieratic *q* is due to chance.

<sup>26</sup> Note that the seeming additional vertical stroke in the second image is, in fact, a small fracture in the papyrus.


<sup>27</sup> Since in the phonological development of Ancient Egyptian some final *b* consonants yielded *p* (on the conditions of this change see the different treatments by VERGOTE 1973: 16 and PEUST 1999: 135f.), one might wonder whether scribes acquainted with hieratic may have had experience of traditional spellings with (hieratic) <*b*> for contemporary phonological /*p*/ (cf., e.g., Ancient Egyptian *db* ‘horn’, Akhmimic Coptic *τεπ*). However, it must be stressed that, in non-logographic Demotic words, spellings are regularly adjusted to the new phonology as concerns this change (cf. Demotic *tp* ‘horn’, DG 625) – I am grateful to a reviewer of this journal for pointing this fact out to me.


<sup>28</sup> A selection of drawings reproducing the shape of *q* in late hieratic papyri can be found in HP, vol. 3, p. 30, n. 319.

<sup>29</sup> I agree with an anonymous reviewer of this journal about the fact that this sign cannot be considered as a palaeographical evolution of hieratic *q*. Though, as with other analogous cases, given the significant similarity of the shapes and the functional comparability, it seems reasonable to consider it as an invented sign which was created taking the hieratic *q* as a model.

<sup>30</sup> This letter indicates a (possibly ejective) uvular consonant which, by the latest states of the Egyptian language, had evolved into a (certainly non-aspirated and possibly still ejective) velar stop (cf. VERGOTE 1973: 23; LOPRIENO 1995: 32-34).

<sup>31</sup> There is moreover a supralinear Old Coptic gloss (n. 415 in the list in DMP vol. 3) in which the sign 17 of the cipher script is used as an Old Coptic letter of the Egyptian stock corresponding to in Demotic .

Interestingly enough, the downward prolongation of the vertical strokes renders this sign similar to the logogram used for *dm* ‘papyrus roll’, a word also used to cite other magic formularies in expressions such as “another papyrus (says)” (the following image is a photograph crop of an occurrence in col. v27, l. 5: ). Given the centrality of this word in the semantic sphere of magic, one may suspect that this similarity is an intentional allusion.

Another case that seems to me straightforward is that of sign n. 4 <W> which corresponds to *e* (*e*). This sign can be interpreted as modelled on the hieratic shape of the sequence  $\vartheta^{\beta} iw$  – with  $\vartheta_{z7}(w) + \beta_{M17}(i)$ : indeed, the Demotic continuation of this very sequence, i.e., <u>, functions as a single letter which can be used as a vocalic sign for *e* (cf. Spiegelberg 1925: 4f.). The right part of the sign, i.e.,  $\Psi$ , can be interpreted as a simplified version (drawn with a precisely vertical orientation and deprived of its base stroke) of the hieratic form of  $\beta$  (an occurrence of this letter in the papyrus is in the following photograph crop: , col. 6, l. 19, in the word *ip.t* ‘Opet’, written with hieratic letters – GEMF, p. 158f.; cf. DMagP, vol. 1, p. 54f.)<sup>32</sup>. As concerns the left part of the cipher sign, the evolution of  $\vartheta$  into a vertical stroke is also well documented and is also observable in the Demotic letter *b* mentioned above<sup>33</sup>. Sign n. 4 seems, therefore, to be an artificial back-transition into hieratic forms of Demotic <u>, which testifies that the inventor of the cipher was aware of the graphic etymology of that Demotic letter.

A further possible instance of a sign of hieratic origin is n. 20 <h>, which renders  $\lambda$  (*l*). This may be a vertically straightened (and simplified through the deletion of the short stroke corresponding to the lion’s tail) version of the hieratic sign <z>, which continues hieroglyphic

 <sup>34</sup>  
E23 .

<sup>32</sup> A shape worth mentioning here – very similar to the sign  $\Psi$  at issue – is the  $\Psi$  (with a dwarfed base stroke) reported in HP, vol. 3, p. 26, n. 282 for an occurrence of *i* in papyrus Berlin 3135 (second-third century CE).

<sup>33</sup> Cf. HP, vol. 3, p. 18, n. 200b.

<sup>34</sup> In the Demotic text of pMagLL this sign appears as a logogram for *rw* ‘lion’ in the usual oblique form <L> (cf. col 10, l. 27).

## 6. *The Greek components of the cipher script*

As we have seen, the Demotic and hieratic components of the cipher script are, in fact, as a rule, not ciphered. The contrary is true for the Greek components.

In the Greek and Coptic texts of the Roman and Byzantine Egypt, cryptography – which was used in magical texts but also in other contexts (cf. Menci 2008, 2010; Menchetti 2005) – was usually based either on the technique of grapheme substitution or on fantasy alphabets<sup>35</sup>. In the former procedure each letter of the normal alphabet is systematically substituted with a different letter of the same alphabet. In a widespread system belonging to this kind, the enlarged Greek alphabet used for the notation of numbers – i.e. the alphabet that includes the letters stigma ( $\varsigma$ ), koppa ( $\wp$ ) and sampi ( $\lambda$ ) – is divided into three columns and each of these is encoded in a way analogous to that of the Hebrew Atbash system, i.e. with the last letter being exchanged for the first, the second last for the second and so on<sup>36</sup>:

PLAIN	CIPHERED	PLAIN	CIPHERED	PLAIN	CIPHERED
A	Θ	I	ϖ	P	λ
B	H	K	Π	Σ	Ω
Γ	Z	Λ	O	T	Ψ
Δ	ς	M	Ξ	Υ	X
E	E	N	N	Φ	Φ
ς	Δ	Ξ	M	X	Υ
Z	Γ	O	Λ	Ψ	T
H	B	Π	K	Ω	Σ
Θ	A	ϖ	I	λ	P

The second technique is based on invented signs, which are typically obtained by altering the encoded letter in some way. An instance

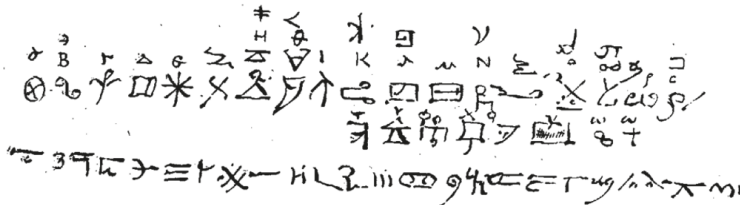
<sup>35</sup> On Coptic cryptography, see DORESSE (1952 and 1991), WISSE (1979), CHASSINAT (1921: 17-21), DIELEMAN (2010).

<sup>36</sup> Cf. GARDTHAUSEN (1913: 311); see also MENCI (2008), MENCHETTI (2005: 237).

of this kind of ciphering is offered by pMichigan inv. 534<sup>37</sup> (+pOslo 75), a magical Greek text dated to the 2nd century CE which is entirely in cipher. Hunt (1929) gives the following decryption table, about which it is important to note that, in fact, the symbol <κ> has the value *eta* and not *zeta* as indicated there<sup>38</sup>:




ϩ	α	ⲃ	θ	Ϛ	ν	ⲕ	υ
Ⲛ	β	Ⲉ	ι	ϛ	ξ	ⲛ	φ
Ⲛ	γ	Ⲉ	ῑ	ⲟ	ο	ⲛ	χ
Ⲛ	δ	Ⲉ	κ	ⲣ	π	ⲛ	ψ
Ⲛ	ε	Ⲉ	λ	ϩ	ρ	ⲛ	ω
*? κ?	ζ	Ⲉ	μ	ⲟ	σ		
Ϛ	η			ⲟ	τ		








Interestingly, as mentioned above, in pMagLL two alphabets of this kind are reported in a sort of decryption table placed vertically between columns 1 and 2 of the verso side<sup>39</sup>:



<sup>37</sup> Editions: Hunt (1929), PGM 57, GEMF n. 8. Photograph: “P.Mich.inv. 534; Recto”, <https://quod.lib.umich.edu/a/apis/x-2437/534r.tif> University of Michigan Library Digital Collections (retr. 8 jan. 2023). Another portion of the same papyrus is pOslo 75 (PGM n. 72). As for the cipher, cf. DORESSE (1952).

<sup>38</sup> Cf. HUNT (1929: 10, note 19); see the writing of the vox magica γουρη in line 19 (GEMF n. 8, l. 58, pp. 40f. – see the photograph cited in the preceding footnote, to be rotated 180°).


<sup>39</sup> Image from DIELEMAN (2005: 39) whose source is C. Leemans, *Papyrus égyptien à transcriptions grecques du Musée d'Antiquités des Pays-Bas à Leide (Description raisonnée I 383)*, 2 vols., Leiden, 1839. A new drawing has been published in GEMF, p. 246. However, there are some details in which this seems to be less reliable than Leemans' one. In particular, as regards the first letter of the alphabet placed at the bottom of the table, GEMF has  instead of . An inspection of the photo published by the Rijksmuseum at the url <https://www.rmo.nl/imageproxy/jpg/247550> confirms, as far as I can see, the shape drawn by Leemans. Here is the detail (converted in grayscale via color-filtering): . This is relevant to our issue, since the shape of sign n. 1 coincides with that of Leemans' drawing.

These are fantasy alphabets suitable for encrypting Greek. In fact, pMagLL does not use these cipher alphabets in their entirety, but some of the signs of the cipher script coincide with some symbols included in this table. As already noted by Griffith and Thompson, signs nn. 1 <  > α, 31 <  > ζ, 23 <  > η, and 10 <  > ω are found in the alphabet placed at the bottom of the table (the values of the signs are inferable from their position according to the alphabetic order). It may be added here that sign n. 30 <  > τ is probably a variant – with doubling of the horizontal stroke – of the τ contained in the same alphabet (τ̄), and sign n. 30 <  > Δ is rather similar (except for the fact that its right vertical stroke is not doubled) to the Δ of the upper alphabet (Δ̄). Moreover, sign n. 6 <  > Η (ē) – which in fact is a minimally modified version of Η – is substantially identical to an Η sign of pMichigan inv. 534 (see above)<sup>40</sup>.

Among the kinds of deformation recurrently exhibited by the glyphs of fantasy alphabets, three are of major importance to our topic<sup>41</sup>:

- 1) rotation or (vertical or horizontal) mirroring;
- 2) geometricization;
- 3) deletion or partial deletion of an element.

Examples of rotation and mirroring are shown in the following table (see also the signs nn. 13 and 19 of the cipher script in the appendix below and the signs for mu, sigma and tau of the script of pMichigan inv. 534 in the table above):

<sup>40</sup> In fact, this sign, obtained through the deletion of the upper part of the right vertical stroke of the eta, is very similar to the etas of some papyri from the Hellenistic period onward and of some cursive scripts (cf. GARDTHAUSEN 1913, tables 1 and 4a). An example is the eta of p. Hamburg II 153 (late 3rd century BC) – e.g.,  in line 272 (fr. 6) – which is interpreted by Cavallo and Maehler as influenced by contemporary cursive (2008: 68). There can be little doubt, however, that in the manuscripts here at issue this sign was conceived as a slightly altered version of the majuscule sign.

<sup>41</sup> On the modifying methods employed in the cipher of pMichigan inv. 534 see also BAJNOK-PATARICZA (2003). Another kind of recurrent alteration is the doubling of some stroke.

SOURCE	GREEK IN pMAG. LL	CIPHER SCRIPT IN pMAG. LL	2ND ALPHABET IN pMAG.LL TABLE	pMICH. INV. 534
epsilon	ϵ	⤴	ϵ	↓
iota	ι	/	ι	ι
omega	ω	ϑ(=0), Ϟ(=0)	ω	—
alpha	α	(see below)	(see below)	α

Geometricization is the term I use here for a kind of transformation which simplifies the shape of the letter to an extreme degree to obtain a figure consisting of geometrically basic elements (segments and dots) arranged in a geometrically basic disposition (e.g., parallel or intersecting so as to divide the round angle into equal parts). Obvious examples are the following signs for  $\mathfrak{n}$  and  $\mathfrak{z}$  (but see also the signs for khi and psi of the script of pMichigan inv. 534 above):


	GREEK IN pMAG. LL	CIPHER SCRIPT IN pMAG. LL	2ND ALPHABET IN pMAG.LL TABLE
nu	$\mathfrak{n}$	, ✕	
zeta	$\mathfrak{z}$	≡	≡

Clear examples of deletion, in which the altered form is, in fact, very similar to its original shape, are the following:



	GREEK IN pMAG. LL	CIPHER SCRIPT IN pMAG. LL	2ND ALPHABET IN pMAG.LL TABLE	pMICH INV. 534
tau	τ	—	τ	—
eta	η	η	—	η

A further likely example is sign n. 15a of the cipher script (cf. the table in the appendix), which can be interpreted as an altered  $\mathfrak{b}$ .

The examples mentioned so far show that a strict analogy exists between the Greek elements of the cipher script and a Greek

ciphered alphabet of the fantasy type such as that of pMichigan inv. 534. Nonetheless, even the Greek part of the cipher script must have been devised by a person literate in Demotic. A fact suggesting this conclusion is that the rotated omega signs are normally used for encrypting the letter omicron<sup>42</sup>. Indeed, this was made possible by the fact that the inventor of the script chose to rely on the sign  to indicate the long vowel of *o*-quality<sup>43</sup> corresponding to Coptic  $\omega$ . It remains difficult to say why an altered  $\omega$  – and not an altered  $o$  – was used for *o*. It may be noted, however, that in the script of pMichigan inv. 534  $o$  is the only letter which is used with its plain shape.

But there is another fact which, in my opinion, demonstrates even more clearly that the inventor of the encrypted Greek letter belonging to the cipher script of pMagLL was literate in Demotic: that is the fact that in some instances the operation which is carried out is not only to alter the Greek letters so that the reader does not recognize them as such, but also to alter the Greek letters in order to make it appear that they belong to the Demotic script. The inventor of the cipher script noticed that some opportunities of camouflage were at hand and seized them. Three cases seem to me hardly ascribable to chance.

The most accomplished camouflage is perhaps that concerning the letter mu. In the Greek parts of pMagLL, mu has a shape similar to that which is typical of the Alexandrine majuscule, i.e., . Sign n. 21, which encodes mu, is clearly obtained by depriving  of its leftmost curvilinear stroke.

GREEK LETTER		CIPHER
	deletion →	

<sup>42</sup> A possible occurrence of sign n. 9 with the value  $\omega$  is in the word  $\epsilon\omega$  at col. 3, l. 27 and col. 30v, l. 11.

<sup>43</sup> From the point of view of those scholars who assume that the graphic distinction between Coptic  $o$  and  $\omega$  renders an opposition of quality (mid-high vs. mid-low) rather than of quantity (short vs. long), this was a (short) mid-high vowel.



It is important to note that three Demotic signs that serve as a model in the examples just mentioned – i.e., <ⲓ>, <Ⲟ> and <Ⲡ> – are elements of very high frequency<sup>44</sup>. Given that the Demotic signs are several hundred, the fact that the result of the transformation of a Greek letter ends up as similar to one of the numerous Demotic signs might be accidental. But this is by far less probable if we limit ourselves to considering the high-frequency signs. Indeed, it is obvious that the more frequent the models of the camouflage are, the more effective the camouflage itself is.

A fourth possible case is that concerning sign n. 12 which appears sometimes as a monogrammic equivalent of the digraph οϣ. It seems highly probable that this sign is substantially a vertically mirrored compendium οϣ in which the ϣ is placed above the ο and fused with it. Thus, the source shape might have been analogous to the <ϣ> which appears several times – used, in particular, at the end of a line as a means of saving space – in the Coptic manuscript pBodmer VI, written one or two centuries later than pMagLL<sup>45</sup>. This shape, as is known, will become a widespread ligature in the majuscule book scripts of the subsequent centuries (cf. Gardthausen 1913, tables 2 and 3). Interestingly the shape of sign 12 has the additional property of being slightly asymmetrical, with its left portion being straightened:

GREEK LETTER		CIPHER
ϣ	vertical mirroring → ϣ straightening of the left part →	R

This particular transformation might have been chosen by virtue of the fact that the resulting shape is equivalent to a vertically mirrored

<sup>44</sup> In the corpus on which the DPDP (Demotic Palaeographical Database Project, <http://129.206.5.162>, ed. by J. F. Quack, Heidelberg University) is based, the *p*<sup>3</sup>-logogram is the 4th most frequent sign, the *s*-letter the 22nd. As for the “stroke plus dor” sign of the genitive particle, it is particularly frequent in pMagLL because in this text it is often used, instead of the simple horizontal stroke, not only for the genitive *n*, but also to write the *n*-repositions (cf. DMagP, vol. 3: 42f).

<sup>45</sup> Two instances can be seen in the photograph at [https://iif.unige.ch/iif/2/1072205347\\_017/full/full/0/default.jpg](https://iif.unige.ch/iif/2/1072205347_017/full/full/0/default.jpg) (cf. the edition in KASSER 1960: 32).

high-frequency Demotic sign representing *w*, with the only difference that the eyelet of the latter is open to the left <Ϝ>. Taken alone, this last case appears as a mere possibility, but at the light of the three cases previously observed it is at least worth of mention.

That this kind of camouflage is identifiable only in three or perhaps four signs does not weaken the approach proposed here. Indeed, all in all, it is expected that it was not always possible to create a shape allowing – so to say – a double interpretation. Of course, this kind of camouflage could only be devised by a person who was literate in both Greek and Demotic.

### 7. *Aims and connotations of the cipher script*

As mentioned above, the words typically written in cipher are ingredients and effects. These are of course pieces of information of maximal importance, since, without knowing them, the unwanted reader can neither perform the spell nor select the spell apt to his aims. Moreover, some of the “effects” are quite objectionable – for instance, there are spells aimed at making people die. These facts seem to be consistent with the idea that the main goal of the use of the cipher script was secrecy<sup>46</sup>.

At the same time, as happens in other cases with the cryptographies of the Graeco-Roman Egypt, there are reasons to doubt that the want of secrecy was so authentic, and it seems possible to speak of an aspiration to – when not a pretence of – secrecy (cf. in particular Menci 2008: 262). Not only does the script contain several letters of Demotic origin which are not encrypted, but there are some parallel passages in which the same word is written here in cipher and there in plain writing – indeed, W. N. Groff, who deciphered the script (in Groff 1900), took advantage precisely of these passages to break the code. This may in part be due to the probably collectaneous nature of

<sup>46</sup> Interestingly, the much later (9th or 10th century CE) Coptic Medical papyrus published by CHASSINAT (1921) uses the Atbash-like encoding mentioned above in a similar way, since it mostly ciphers materials necessary to the practices.

the manuscript. Nevertheless, an authentic want of secrecy would have required a more careful control<sup>47</sup>.

Anyway, the aspiration to secrecy is at most capable of explaining half of the problem, i.e., to answer the question as to why, in order to write the words at issue, cryptographic writing was chosen. But there is another half of the question: i.e., why those particular words were written in ciphered Old Coptic rather than in a possible ciphered Demotic writing. As to this issue, it is not out of place to guess, in Griffith and Thompson's vein, that this choice might have been favoured by the fact that a tradition of Greek cipher alphabets existed; as we have seen, even if it cannot be said that the inventor of the cipher script adopted an already existing Greek cipher script as a whole, he probably took some of the signs from such encrypted writings. At the same time, the choice of an Old Coptic script, with its tendentially phonological organization and its ability to render vowel sounds, had the advantage of minimizing the amount of graphic ambiguity, which could be particularly precious precisely for the words that are found written in cipher, given their textual importance. The writers of the Demotic magical papyri were well aware of the superiority of the Greek/Old Coptic writing from this point of view: this is indeed the reason why they supplied the voces magicae written in Demotic script with supralinear Old Coptic glosses. It should be mentioned, however, that the spellings of the ciphered words, in addition to using <ⲃ—> for both /t/ and /tʃ/, show some possible inaccuracies with respect to the vowel quality distinction /a/ : /e/<sup>48</sup>.

If phonological accuracy might have been one of the reasons favouring the choice of Old Coptic as the system underlying the cipher

<sup>47</sup> It is also to be noted that “enigmatic” kind of writings which do not aim, in fact, at secrecy are also not unknown to the Egyptian tradition. Thus, inscriptions in enigmatic writing found in the tombs of Ramses VI and Ramses IX exhibit special “deconventionalized” spellings whose main aim, as shown by STAUDER (2020), seems to be to provide a dazzled experience of reading and which, moreover, are placed in inaccessible locations (which excludes secrecy as a goal).

<sup>48</sup> QUACK (2006: 208ff.) has shown that some occurrences of sign n. 3a/3b (elsewhere readable as ε) seem to correspond to *a*-vowels (however, as concerns the occurrences of the word corresponding to Sahidic ΗΝ Bohairic ΕΝ ‘ape’ – nn. 8 and 14 in the list of words in cipher in DMagP – it should be said that the vocalism of this form is problematic per se). Moreover, one might suspect that sign. n. 2, whose occurrences seem to represent an *a*, is, in fact, a third variant of sign n. 3a/3b.

writing, then the way in which the ciphering was carried out had a very relevant advantage: it allowed the writer of the papyri to use a writing system of the Greek type, while reasserting, at the same time, the Enchorial cultural identity through the use of graphic shapes reminiscent of the indigenous scripts<sup>49</sup>.

Even if the papyrus at issue contains passages in the Greek alphabet and language, it is not out of place to attribute to our scribes a consideration of this kind. As we have seen, the overall evidence concerning shapes and functions of the cipher signs shows that the attitudes of the inventor (or inventors) of the script towards the two sources (the Egyptian scripts and the Greek alphabet) are different: while Greek letters are systematically disguised, signs of Egyptian origin or inspirations can be used without their nature having to be concealed, and this independently of whether they render sounds that can be represented by the Greek alphabet or not (as signs 11 and 15b clearly prove). Thus, though not rejecting the Greek component of late Egyptian magic, the Demotic papyri are the product of a milieu which must have conceived itself as a preserver of indigenous traditions. This is perfectly consistent with the hypothesis that the creators (and the intended audience) of the Demotic magical handbooks were likely native Egyptian priests (see Section 1 above)<sup>50</sup>.

In the framework of the interpretation proposed here, it is easy to understand why the cipher script includes signs of hieratic and Demotic origin which are not encrypted, at risk of diminishing the efficiency of the system in guaranteeing secrecy. It is not because an idle encryptor, in adapting a Greek ciphered alphabet to the Egyptian language, did not take the trouble to invent additional ciphered signs, but because, by limiting himself to encoding non-indigenous letters, the inventor of the script could enhance – so to say – the Demotic-hieratic

<sup>49</sup> That writing systems can be seen as symbols of cultural identities cannot surprise (on this issue from a general ethno-anthropological point of view, see CARDONA 1981 § 3.6, MANCINI 2014, with further references). Obviously, there is no reason to believe that this should not hold for a cipher script. In fact, since it selects a strictly closed group of potential recipients, the possibility that a cipher writing assumes an identitarian connotation is even more easily understandable.

<sup>50</sup> On the relationships between priesthood, literacy in Egyptian writing and magical practices in Graeco-Roman Egypt see also FRANKFURTER (1996: 210-214).

flavour of the code<sup>51</sup>. This is in line with E. Love's observation according to which the fact that plain Old Coptic writing was often used as a *supplement rather than substitute* indicates that «it was seen as a low form of writing, compared to the high forms comprising endographic Egyptian scripts» (Love 2020: 336).

### 8. *Concluding remarks*
















To conclude, the cipher script of the Demotic magical papyrus of London and Leiden is a complex cultural artefact which combines non-masked Egyptian elements with Greek elements masked as Egyptian ones. The way in which our cipher was devised confirms that letter shapes are often seen as culturally non-neutral and that writing, whether plain or encrypted, is a privileged locus for the affirmation of the identity of social groups.

















The creation of this script turns out to be connected with that of the magical books which contain it: the heterogeneity of its sources – hieratic, Demotic and Greek – faithfully mirrors that of the graphic repertoire exhibited by the texts that those manuscript collects. At the same time, this triple literacy, which involved the mastering of hieratic, Demotic and Greek and which was shared by authors and readers of the Demotic magical papyri points to a temple milieu. Ostraka from Narmouthis (Fayum) dating to the late 2nd century CE clearly show that, in this period, young Egyptian priest-scribes not only studied hieratic (cf. Gallo 1997) but were also taught to compose texts in Greek (cf. Bresciani *et al.* 1983: 3; Prada 2012: 632; Clarysse 2019: 308).














The cultural identity of such an environment clearly shows through the shapes of the cipher signs.

<sup>51</sup> Partially encrypted writing systems are by no means exceptional. For instance, in the cryptographic hieroglyphic-Egyptian texts of the New Kingdom, signs are occasionally used according to their normal value (see WERNING 2020: 202); in the Atbash-like encoding (cf. above) the letters ε, η, φ, when not disguised according to a different technique, are left unencoded; in the fantasy alphabet of pMichigan inv. 534 the omicron is not encoded; in the “Greek-Arabic numerical code” (WISSE 1979: 115; cf. DORESSE 1991: 67) used in a 14th century Bohairic manuscript, the letters λ from to θ in the alphabetic order are not encoded.

*Appendix: annotated table of the cipher script*

	SIGN	VALUE	NOTES ON GRAPHIC ETYMOLOGIES AND CAMOUFLAGES
1		λ	A geometricized λ rotated 45° counterclockwise. <u>Camouflage</u> : it is identical to a vertically mirrored genival particle.
2		λ	? Perhaps a variant of 3b.
3a		ε	Maybe an altered ε.
3b		ε	Perhaps a variant of the preceding sign in which the two horizontal strokes are merged.
4		ε	A transposition of Dem. < 11 > i'w (from hierogl. 9β) into hieratic shapes.
5a		ε	An epsilon rotated 90° clockwise.
5b		?π	? [Value not certain; only two dubious occurrences, cf. DMagP, vol. 3: 105.]
6		η	A slightly altered Greek eta.
7		ι	An iota rotated 45°.
8		?ι	? [Value not quite certain according to Griffith and Thompson; indeed, in two occurrences (nn. 10 and 11 in Griffith and Thompson's list of words in cipher) it seems to represent η.]
9		ω	An omega rotated 90° counterclockwise.
10		ω	A vertically mirrored omega.
11		ω	It is the variant shape *** of hieroglyphic/hieratic ω.
12		οϵ	Probably a vertically mirrored ligature omicron + epsilon. <u>Camouflage?</u> : it might perhaps be interpreted as a vertically mirrored version of the Demotic sign < 5 > (w), but with a closed eyelet.
13		ϵ, 2	A vertically mirrored epsilon.

14		Υ,ϵ	? One might speculate whether it is a rotated epsilon provided with a tail (some confusions between <ε> and <Υ> is found: sign n. 13 is used for <ε> in two occurrences, cf. DMagP, vol. 3: 106).
15a		Β	Probably a Greek beta deprived of its vertical stroke and provided with a diacritic (perhaps by analogy with the equifunctional 15b).
15b		ϥ	It is the Demotic sign for <i>f</i> provided with a diacritic in order to distinguish it from n. 34.
16		Δ,Τ	Probably an altered Greek delta. It is similar to the delta of the first ciphered alphabet contained in the decryption table of pMagLL. Camouflage?: it is similar to the determinative of <i>iny</i> 'stone'.
17		κ	It is a hieratic form of hieroglyphic Δ <i>q</i> (it is also similar to the determinative of <i>d'm</i> 'book').
18		Γ,Κ	Very likely a ligature for Demotic <i>nq</i>  .
19		λ	A vertically mirrored Greek lambda.
20		λ	It may be a vertically straightened and simplified form of the hieratic sign for hieroglyphic  <i>r/l</i> .
21		μ	A Greek mu deprived of its right stroke. Camouflage: it is identically to a horizontally mirrored Demotic sign of the masculine singular definite article.
22		μ	?
23		Ν	A geometricized Greek nu.
24		Ν	A variant of the preceding sign in which the three strokes are arranged so as to form an asterisk.
25		Π	It is probably modelled on one of the most common Demotic signs for <i>b</i> .
26a		Ρ	A Greek rho horizontally mirrored and deprived of the upper part of its eyelet. Camouflage: it is identical to a Demotic sign for <i>s</i> .

26b		p	It is the preceding sign provided with a diacritic probably in order to distinguish it from the Demotic sign for <i>s</i> .
27		c	? [It is similar to the “spitting mouth” determinative which is used in the same papyrus in the hieratic form for water <𐎗𐎍>. One might wonder whether it is a geometricized form <<> of the Greek lunate sigma <C> provided with a detached tail in order to make it look like that determinative.]
28		c	Probably a horizontally mirrored Greek sigma (similar to the one adopted in pMich inv. 534) provided with a tail.
29		z, τ	It is the Old Coptic <i>čanča</i> , i.e., the simplified variant of the Demotic letter <i>d</i> (whose shape derives in turn from hieroglyphic  ).
30		τ	Probably a Greek tau altered by deleting the left portion of its horizontal stroke and doubling the right one. It is very similar to an encrypted tau included in the first ciphered alphabet of the decryption table of pMagLL.
31		z	A geometricized Greek zeta. Camouflage?: it is identical to a hieratic form for <i>mw</i> ‘water’ used in the same papyrus, but this could also be a matter of chance.
32		ω	It is one of the shapes of Demotic <i>š</i> .
33		z/h	Demotic <i>h</i> .
34		q	Demotic <i>f</i> .
35		?z/h	Value uncertain (a single occurrence is found). Apparently a Demotic <i>h</i> .
36		σ, κ	Demotic <i>g</i> .
37		?	This sign appears once in pLeiden I 384. It is perhaps a Demotic <i>h</i> .

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