Abstract
The aim of this paper is to discuss the phonetic value that should be ascribed to the misspelling "εἰκϑουν" which occurs in the Papyrus Fayum 114. This document is dated from the very beginning of the second century AD (4th year of Empire of Trajan).

The form "εἰκϑουν" stands here for Classical χθών. Tonnet (1993: 41), in his History of the Modern Greek, reads it [ικθιν], with a (velar) stop followed by a (dental) fricative in accordance with the modern writing system. Indeed, spirantisation of the ancient aspirated stops is recorded to have occurred in this period (details further).

On the other hand, similar misspellings occur in the two previous centuries. Examples are: ἔκθος - 19 BC (norm. ἐκθος); δαίνεκθιντες - 117 BC (norm. δαινεκθιντες); ύπελειπθοςαν - 3rd cent. BC (norm. ύπελειφθοςαν). Such forms are usually read with [ktʰ], [ptʰ] i.e., with a (velar/ labial) non-aspirated stop followed by a (dental) aspirated stop, in accordance with the classical writing system (Sturtevant 1940: 83, Allen 1974: 26).

Arguing that those phonetic values rest on erroneous assumptions regarding the evolution of obstruent clusters, I will defend [ɛkʰtʰras], [iχʰtʰin] instead, with a (velar) fricative followed by a (dental) aspirated stop for both sets of data.

This proposition might surprise according to both the classical writing system and the modern one. And yet I will show that it perfectly matches with the phonological system and evolution of this period, while both the other values lack to receive any fulfilled phonological account.

1. Datings
From the beginning of the first century AD to the end of the 2nd cent. AD, ancient aspirated stops were changed into fricative consonants. This dating is well established by philological and comparatistic studies: there are good pieces of evidence that spirantisation did not occur before the
end of the first century BC and that it was generalised at the end of the 2nd century.

Occlusion is evidenced until the end of the 1st cent. BC by graphic alternations with "π" for "φ" (Teodorsson 1977: 173, 1978: 113), by Latin borrowings with p (not *f) in ampulla < ampor-la < ampora < gr. 'αμφορά (Rix 1976); for "χ", by graphic alternation with "κ" (Teodorsson 1978: 50, 85); for "θ", see Bubenik (1980), Hoffman (1965), Grammont (1948: 223) etc.


I admit this chronological limits. What will be contested here is the usual postulation (generally undiscussed) that this spirantisation occurred in every phonological context. Crucially, the spirantisation in the position after obstruent (C_) is never illustrated by comparatistic evidence. Hence, nothing proves that, in ancient clusters of two aspirated-stop consonants, the second segment would have spirantised. This will be decisive in the hypothesis proposed here.

2. Usual diachronic description

The evolution of those consonants is usually supposed to have been as follows:

Table (1) Usual description of the evolution of ancient aspirated consonant in Demotic

<table>
<thead>
<tr>
<th></th>
<th>First step – SPIRANTISATION</th>
<th>Second step – DISSIMILATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. pʰtkʰano</td>
<td>&gt; fθano</td>
<td>&gt; fθano</td>
</tr>
<tr>
<td>(e)kʰtes</td>
<td>&gt; (e)xθes</td>
<td>&gt; (e)xθes</td>
</tr>
<tr>
<td>skʰole</td>
<td>&gt; sθole</td>
<td>&gt; sθole</td>
</tr>
<tr>
<td>genesʰai/e</td>
<td>&gt; jenesθai/e</td>
<td>&gt; jenesθai/e</td>
</tr>
<tr>
<td>1b. pʰillis</td>
<td>&gt; fllis</td>
<td>= fllis</td>
</tr>
<tr>
<td>epʰaistos</td>
<td>&gt; efestiona</td>
<td>= efestiona</td>
</tr>
<tr>
<td>tʰalassa</td>
<td>&gt; θalassa</td>
<td>= θalassa</td>
</tr>
<tr>
<td>atʰena</td>
<td>&gt; aθena</td>
<td>= aθena</td>
</tr>
<tr>
<td>kʰaris</td>
<td>&gt; xaris</td>
<td>= xaris</td>
</tr>
<tr>
<td>brakʰos</td>
<td>&gt; vraxos</td>
<td>= vraxos</td>
</tr>
</tbody>
</table>

➢ First diachronic step: (uncontextual) SPIRANTISATION (1a), during 1st and 2nd cent. AD when spirantisation is recorded in forms such as (1b).
Second diachronic step: progressive **DISSIMILATION** of fricative clusters affecting form of the (1a) type\(^1\).

Hence, according to the usual description, the modern reflex with fricative-stop (such as \(\text{flano, xtes}\)) of the classical forms in aspirated stop-aspirated stop (\(\text{p}^\text{h} \text{t}^\text{h} \text{ano, k}^\text{h} \text{t}^\text{h} \text{es}\)) would result from *two events*, phonologically and diachronically non-dependent.

And yet, while the dating of the spirantisation is well established, it is less accurate for the supposed second event, i.e., the supposed dissimilation.

Browning dates it from the Early Middle Age because writings of the \(\varphi \tau \alpha \nu \omega\) type regularly appear in the 11th-12th centuries. But Mirambel and Tonnet dates it back to the 3rd-5th cent. AC. Tonnet even records such a writing form in a document of the middle 2nd cent. AC ("\(\gamma \epsilon \nu \varepsilon \sigma \alpha \alpha\)" in BGU 846, classical "\(\gamma \epsilon \nu \varepsilon \theta \alpha \alpha\)"). He assumes that the dissimilation was sporadic then, because the graphic misspelling is not general. And yet, as we know, an absence of change in writing is not a reliable piece of evidence against a phonological change. Considering that the writing presents a delay in languages in general, and taking into account the Atticist Movement that had taken place, such a regular writing in Greek would even be unexpected. Hence, the fricative-stop realisation may have been regular in 2nd century AC.

The consequences are not trivial: *in fine*, the "dissimilation" seems to be synchronic with the spirantisation. So the look of events is now very different. We could assume that a dissimilation rule occurred as soon as fricative clusters were created. But we can assume, too, that there never was dissimilation rule at all. Indeed, the fricative-stop realisation may receive a very different phonological account if the supposed step with two fricative consonants (\(\text{f} \theta \alpha \nu \omega, \text{x} \theta \varepsilon \nu \omega\)) did never occur in early Demotic Koine. This alternative analysis will be given in section 4.

For now, let us consider slightly earlier misspellings and the phonetic values which are usually ascribed to them.

### 3. Two phonological paradoxes under the usual assumptions

This section presents the phonetic values that are proposed for misspellings in \(~100\ AC\) and \(19\ AC\), respectively. The problems that the authors encounter when dealing with them under the above diachronic description are evaluated.

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\(^1\) This progressive dissimilation of two adjacent fricatives is usually linked to the regressive supposed dissimilation of two adjacent stops.
As was alluded in the introduction, Tonnet (1993: 41) reads the written form "εικθούν" with [kθ] in accordance with the late phonological and writing system: this system opposes stop to fricative consonants: hence the grapheme "θ" is given a fricative value [θ] and "κ" a stop one [k]. Note that this is the period when spirantisation is occurring. Hence the opposition fricative versus stop is being constituted and is maybe not already accomplished.

Tonnet, admitting that the realisation [ixθin] is the regular one in this middle 2nd century, gives this transcription of the cluster the phonetic value [kθ], in accordance with the post-spirantisation phonological and writing system. But he falls on the phonological event that this form should point out. He postulates a dissimilation of two adjacent fricative consonants, but he is puzzled by its direction:

"Il y a une incertitude dans les groupes consonantiques spirants. Ils peuvent se dissimilier – c'est-à-dire que l'un de leurs éléments devient occlusif –; mais cela ne se produit pas dans le sens attendu: ιχθούν → ικθούν." 2 (Tonnet 1993: 41).

Indeed, the postulated dissimilation xθ > kθ is regressive, while the one which will finally become regular is progressive: xθ > xt. Since the progressive dissimilation of fricatives shows a clue less than one century further ("γενστ στοτ" in BGU 846), such a phonological reversal begs the question. In 150 years, three phonological phenomena would have affected the obstruents:

➢ Firstly, spirantisation (that did not begin before 0) should be necessarily achieved in 100 in order that 2 occurs.
➢ Secondly, a regressive dissimilation occurs around 100 AC and finally fails.
➢ Thirdly, a progressive dissimilation occurs around 150.

Although there is no evidence against Tonnet's proposition, such a reversal is unlikely and another phonological account should be expected for the form "ικθούν". Before proposing it, let us consider the second set of data.

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2 "There is a hesitation in fricative consonant clusters. They can dissimilate – this means that one of the two parts becomes stop –; but it does not happen in the expected direction.” (Tonnet 1993: 41).
Less than one century earlier, misspellings of the same type are recorded. Thus "ἐκθραζ" (19 BC) is quoted in Sturtevant (1940: 83), Allen (1974: 26), Teodorsson (1977: 241). Such misspellings are recorded as soon as the 3rd cent. BC:

Table (2) Misspelling of the 3rd-1st cent. BC

<table>
<thead>
<tr>
<th>Misspelling</th>
<th>Date (BC)</th>
<th>Normalised Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a. δαινεκθέντες</td>
<td>117</td>
<td>δαινεχθέντες</td>
</tr>
<tr>
<td>2b. ὄπελειπθησαν BGU VIII 1844, 21</td>
<td>~3rd cent.</td>
<td>ὄπελειφθησαν</td>
</tr>
</tbody>
</table>

According to the fact that spirantisation has not occurred yet, those authors read them with a non-aspirated stop [k] for the grapheme "κ" and with an aspirated stop [tʰ] for the grapheme "θ", in accordance with the ancient phonological and writing system.

For this type of forms, such as the preceding one, the phonetic value is generally not discussed. The cluster in "ἐκθραζ", for instance, is read [ktʰ]. What attracts the authors’ attention is the further evolution of the forms: Allen (1974: 26) does not get explicitly taken on the phonological interpretation, but he writes:

“Modern Greek developments, however, suggest that this change was not general.”

Indeed, from the postulated input *ektʰras, the further evolution of aspirated stop into fricative would give the later form cktʰras, which is not attested in any modern dialects.

Furthermore, the previous tendency is against this postulation too: if we ask what kind of phonological phenomenon this de-aspiration indicates, a proposition could be that we face a regressive dissimilation of aspiration between two adjacent segments. But this phenomenon would be in the opposite direction with the previous phonological one: until classical time at least, a regressive assimilation of the laryngeal property was regular between two obstruents: thus root-obstruent clusters are limited to those of the same laryngeal property (kt, kʰtʰ, gd but *kʰt, *ktʰ, *gt, *gtʰ, *kd, *kʰd); and the following morpho-phonological

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process confirms it: for instance, krypph kryptē "κρυφή" (noun) ~ kryptō "κρύπτω" (vb.), pemppē "πέμπω" (pres. act.) ~ epempphēn "ἐπέμψθην" (aor. pass.). Into a morpheme and between several morphemes, the first obstruent of any cluster takes the same laryngeal property as the following one.

In other words, this dissimilation of two adjacent aspirated obstruents, which would have occurred between the third and the first century BC, would be the exact opposite of the earlier (classical) tendency to assimilate adjacent obstruents. Here again we would face to any unexpected phonological reversal.

Bringing together the values proposed above and usually postulated for each of the two misspellings "ἐκθραζ" (19 BC) and ἐκθόν (~0), we would face five phonological different developments, as in Table (3).

Table (3) Five phonological shifts under the usual description

<table>
<thead>
<tr>
<th>500</th>
<th>400</th>
<th>300</th>
<th>200</th>
<th>100</th>
<th>0</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ík喉咙</td>
<td>Íπελείθησαν</td>
<td>ἔκθραζ</td>
<td>Ík💫όν</td>
<td>γενέθαι</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. kʰth</td>
<td>b. kʰ</td>
<td>c. x₀</td>
<td>d. kθ</td>
<td>e. xt</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3a. regressive assimilation (of aspiration, among others)
3b. regressive dissimilation of aspiration without further development ☒
3c. unconditionned spirantisation
3d. regressive dissimilation of fricative clusters without further development ☒
3e. progressive dissimilation of fricative clusters.

In sum, four different processes (3b, 3c, 3d, 3e) would have occurred in 150 years (i.e., between ~19 BC and ~150AC). Furthermore, two of them (3b and 3d) have no further development, and 3b is in contradiction with the previous tendency (3a), while 3d goes to the opposite from 3e. A more unified account can be given. This is exposed in section 4.

4. Alternative phonological proposition

Based on typological facts, I was led to postulate that the consonant evolution of the Demotic Koine is not the result of dissimilations
contrary to what is usually hold (see for instance Mirambel (2002), Holton, Mackridge & Philippaki-Warburton (1997), Tonnet (1993) etc\textsuperscript{5}). Rather than that, it may be a lenition affecting consonants depending on the weakness of their position in the word (Seigneur-Froli 2001, 2003).

Indeed, in world languages, dissimilations of two consonants which have got the same way of articulation are often recorded when being of the same place of articulation\textsuperscript{5}. By contrast, dissimilation is not recorded when the place of articulation is different, as in the Greek case.

On the other hand, the fact that consonants are more affected by lenition processes in some positions than in other ones has been recorded for a long time. Two contexts of special resistance to lenition processes are recorded in the world languages: the beginning of the word, parametrically according to the languages\textsuperscript{6} and the post-consonantal position\textsuperscript{7}.

\textit{Table (4) Repartition of strengh depending on the position in world languages}

\begin{tabular}{lll}
\_C (implosive) & \{(#), V\}_V & \{(#), C\}_\text{(after obstruent)} \\
Weaker context & Middle-weak context & Strong context \\
\end{tabular}

Under the hypothesis that the evolution of the stops in \textit{Demotic Koine} reflects a phenomenology of this kind\textsuperscript{8}, then a unified account can be given of it, and the misspellings given below will receive a fulfilled phonological account. The evolution of primary non-aspirated stops in

\textsuperscript{4} See Teodorsson 1977: 239 too, who gives a slightly different dichronic description: “There is no conclusive evidence of the changes [pt] > [pʰt] and [pʰtʰ] > [pʰtʰ] (MG [fʰt]).”

\textsuperscript{5} See Grammont (1895).

\textsuperscript{6} On this point, see Seigneur-Froli (2001), Kijak (2005).

\textsuperscript{7} In some languages, the position after sonorant may be strong (for example French, Germanic). For a review of these phenomenologies in many languages, Scheer & Ségéral 1999.

\textsuperscript{8} This interpretation for Greek was proposed by two authors only, as far as I know. Fourquet (1956) first postulated it, but he was interested in Germanic Diachrony and devoted only one page to the Greek question; more recently, the hypothesis was submitted by Pagoni (1992, 1998), although the phenomenology that she deals with is the one which is not here, i.e., the primary non aspirated consonants, ex. pteron > ftero. She conceives it as a synchronic modern fact. Hence none of the two authors discusses the diachronic data. They do not discuss the dissimilation hypotheses either. Reversely, it seems that their proposals are not known in hellenistic studies since, as far as I know, there is no discussion against or in favour of those propositions.
Koine instantiates the difference of strength between the two weakest contexts, i.e. _C, and the middle-weak one: ptéro > fléro when lipos = lipos, pater > pateras. In (5) the evolution of ancient aspirated is presented.

All the data quoted above witness one diachronic phonological event: a lenition that began by affecting the weakest context, which is the implosive position. Further, lenition affected the middle-weak contexts, i.e., word-initial before vowel and intervocalic. The lenition in the weakest context occurred between the third century BC and the second century AC. The middle weak context was affected along the two next centuries, while it did never occur in the strongest position, i.e., the position after obstruent.

The relation between the phonetic value and the writing forms will be examined in the next section. For now, let us describe the evolution of classical aspirated-stop in Demotic Koine according to the typological repartition of the weak and strong contexts:

<table>
<thead>
<tr>
<th>Period 0</th>
<th>Period 1</th>
<th>Period 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspir. assimilation</td>
<td>Spirantisation in _C</td>
<td>Spir. in {#,V}_V</td>
</tr>
<tr>
<td>4a. ikʰṭyn</td>
<td>ixtʰin</td>
<td>= ixtʰin *ixθin</td>
</tr>
<tr>
<td>pʰṭʰano</td>
<td>ftʰano</td>
<td>= ftʰano *fθano</td>
</tr>
<tr>
<td>kʰṭʰes</td>
<td>xtʰes</td>
<td>= xtʰes *xθes</td>
</tr>
<tr>
<td>4a’. skʰole</td>
<td>skʰole</td>
<td>= skʰole *sxole</td>
</tr>
<tr>
<td>genestʰai</td>
<td>g’jenestʰai</td>
<td>= jenestʰe *jenesθe</td>
</tr>
<tr>
<td>4b. pʰillis</td>
<td>pʰillis</td>
<td>&gt; fillis</td>
</tr>
<tr>
<td>epʰaistos</td>
<td>epʰaistos</td>
<td>&gt; efestiona</td>
</tr>
<tr>
<td>tʰalassa</td>
<td>tʰalassa</td>
<td>&gt; ṭalassa</td>
</tr>
<tr>
<td>atʰena</td>
<td>atʰena</td>
<td>&gt; aθena</td>
</tr>
<tr>
<td>kʰaris</td>
<td>kʰaris</td>
<td>&gt; xaris</td>
</tr>
<tr>
<td>brakʰos</td>
<td>brakʰos</td>
<td>&gt; vraxos</td>
</tr>
</tbody>
</table>

First period: spirantisation occurs in the weakest position (implosive context), so forms in 4a change from pʰtʰ/kʰtʰ to ftʰ/xtʰ, while other (stronger) contexts are not affected (forms in 4a’ and 4b remain unchanged).
Second period: spirantisation affects the middle-weak positions (word-initial before vowel and intervocalic). So forms in 4b are affected. In the strongest position, i.e., after obstruent, no spirantisation occurs, so forms in 4b remain stop. In sum, the phonological event could be very different from what it is usually taken for: there may have never been any dissimilation rule. Rather, a gradual lenition depending on the context.

This proposition may appear to be refuted by modern Greek facts: in particular, the modern alternation _BASIC greek_text_ ~ ft (fBang-an ~ ftana), and the other one pt ~ ft (ephta ~ efta). The dissimilation rule, admitted to have occurred from the Medieval, Byzantine or Hellenistic Koine (according to the different authors, see section 1), are supposed to be still active in Contemporary Demotic Greek. Admitting that those alternations result from a synchronic phonological Demotic rule would forbid to hold the hypothesis here proposed, since it is not able to explain the change /fBang-an/ > [ftana] (as described in most of grammars (for instance, in Holton et al 1997: 18). I argue that this alternation is not synchronic. It results from diglossia rather than from any synchronic phonological rule.

Among others, two sets of data contradict the postulation of the dissimilation rules active now:

Firstly, admitting that a phonological rule operating in modern Demotic would be responsible for such alternations, no account is able to explain why this rule, whatever it be, may convert some forms and may not convert others. Thus, for example, the supposed /left'a/ "money" would be changed to [left'a] by the synchronic rule but this rule would not affect /lept'a/ "minutes": [lept'a] *[left'a]. This is a phonological contradiction. Whatever be the phonological rule, the only issue is that the phonological representations in Modern Demotic are distinct: /lept'a/>[lept'a] "minutes" from the one hand, and /lefta/>[lefta] "coin" from the other one. The phonological rule changing /lept'a/ into /left'a/ does not occur anymore in Modern Demotic. What may be proposed is that the contemporary Demotic form /lepta/>[lepta] "minutes" is an ancient Demotic loan from the Atticist Language. In this precise case, both forms (the one inherited from Demotic and the one borrowed to the Atticist Language, respectively) were kept and finally became distinct. In many cases, both forms were kept side by side in Demotic without getting different meanings. In sum, even if any dissimilation rule would have occurred in the history of Demotic, this rule can not be active now.9

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9 Browning (1982: 89-93) notes that Turkish loans of the 14-15th centuries were not affected by the supposed dissimilation.
Let us look at the phenomenon itself, i.e., dissimilation: how accounting for medio-passive aorist forms such as λείπηκε 'was lacking' (present active λείπω, suffix -ήκε cf. αγαπάω-αγαπηθήκε “to like”) that Holton et al (1997) represent in this way: /lip-θ-ike/ > [lif-t-ike]? They quote the dissimilation rule as follows:

“A consonant cluster with two voiceless fricatives or two plosives is disallowed.” (Holton et al 1997: 18).

Admitting that such a constraint would exist in Modern Greek, pθ should not be affected, since nothing in this input is wrong according to the constraint.

So the dissimilation hypothesis, although widespread, is not so clear.

Under this aspect, the description itself is not the same either, since the step with two adjacent fricatives may have never occurred in Demotic Koine. As was alluded in section 1, the step of fricative clusters presents no comparatistic evidence, while sporadic misspellings indicating fricative-stop realisation are found as soon as the middle second century, i.e. precisely when spirantisation was accomplishing.

How the written forms quoted in introduction can be accounted for under the hypothesis proposed here will be explained in section 5.

5. Phonetic values

Remember that the phonetic value [ktʰ] usually postulated in forms of the two centuries before the Christian Era (ex. "ἐκθραζ"", "ὀπθαλμ") would imply a deaspiration which did not have any further continuance. As for the value [kθ] given by Tonnet for the form "εἰκθόν" in the very beginning of the first century, the phonological account would be much unlikely towards the (just later) development [xt], with a fricative stop sequence.

Now, let us admit the phonological development proposed in section 4. After that [kʰtʰ] / [pʰtʰ] had become [xtʰ], [ftʰ] by an early lenition in the weaker (implosive) context, they did not change. Hence the proposition implies that the phonetic value of the cluster did not change, i.e., remained fricative - aspirated stop, from the 3rd cent. BC to the end of 2nd cent. BC. Both graphic forms, with "κθ" in 2nd cent. BC - 100 AD and with "χτ" in 150 AD must transcribe the same value for consonants, i.e. [xtʰ]. Then what requires an explanation is the writing change
between ~100 AC and 150 AC. I report above the diachrony proposed in section 4 and add the graphic misspellings.

Table (6) One phonological shift under the usual description

<table>
<thead>
<tr>
<th>500</th>
<th>400</th>
<th>300</th>
<th>200</th>
<th>100</th>
<th>0</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\chi\theta\upsilon\upsilon)</td>
<td>(\upsilon\pi\epsilon\lambda\epsilon\pi\theta\sigma\alpha\nu)</td>
<td>(\dot{\epsilon}\kappa\theta\rho\alpha\zeta)</td>
<td>(\epsilon\kappa\theta\upsilon\upsilon\upsilon)</td>
<td>(\gamma\nu\epsilon\nu\sigma\theta\alpha\iota)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. (k^h)</td>
<td>b. (x^h)</td>
<td>d. (x^h)</td>
<td>e. (x)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the consonant did not change in \(\_C\) (fricative) and in \(C\_\) (aspirated stop), what remains to be accounted for is how the fricativisation of consonants in the contexts \{#,\(V\)\}_\(V\), may have produced graphic changes in the unchanged contexts: \(\_C\) and \(C\_\).

As will be seen, each of the writings follows from the phonological system of its period according to the shift which occurred between the two periods. The table (7) sums up the dating.

Table (7) Dating of the writings and shift of the phonological system

<table>
<thead>
<tr>
<th>BC 0</th>
<th>100 AD</th>
<th>150 AD</th>
<th>200AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ST CENTURY A.D.</td>
<td>2ND CENTURY A.D.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Phonological system: -/+ aspirated, -/+ fricative

Precisely between the period ("\(\epsilon\iota\kappa\theta\upsilon\upsilon\nu\)" and the period ("\(\iota\chi\tau\upsilon\nu\)"), spirantisation, which used to have affected only the weakest implosive
context (_C), know affects the middle-weak contexts {#, V}_V, i.e., all the contexts except after obstruent.

So the phonological system of unvoiced consonant topples over from a –/+ aspirated opposition to a –/+ fricative one.

As a result, the same phonetic sequence [x\t^h] is not phonologically perceived in the same way into each of the two periods and the writings follow.

In the first period, the phonological opposition for unvoiced consonants is plus versus less aspirated.

Spirantisation has occurred only in the weakest context: _.C (implosive position), which is a neutralisation position since the beginning of the historical times (see section 3). While the archiphoneme /velar/ used to have two unvoiced phonetic values [kʰ] and [k] in this position before spirantisation, nothing in the new synchronic phonological system informs the speaker that [x] is an allophone for /kʰ/ or for /k/.

The writer hears the phonetic contrast between the two segments of the sequence: fricative [x] / aspirated stop [tʰ]. Since the position_.C is not a distinctive and fricativity is not phonemic yet, the first segment is phonologically unidentified. Since this first segment [x] sounds differently from the second, which is phonologically identified as plus aspirated.

As a consequence, the (first) fricative sound [x] is perceived as /non-aspirated (velar)/ by contrast with the /aspirated (dental)/ [tʰ]. Hence the non aspirated sound [x] is rendered with the non-aspirated grapheme "k":

\[
\text{Phonetic contrast and phonological interpretation}
\]
\[
\text{Consequence on writing}
\]
\[
\text{i}x\text{t}^h\text{i}n
\]
\[
^e\text{l}k\text{θ}^h\text{ι}v
\]
\[
"\text{θ}" \text{for [tʰ]} = / + \text{aspirated (dental) } /
\]
\[
"\text{k}" \text{for [x]} : \text{perceived as / non aspirated (velar) } /
\]

Now let us look at the second period. Fricativity is now phonemic while aspiration is not anymore. The phonetic contrast between the two segments of the sequence is the same as in the previous period (fricative [x] / stop [tʰ]). But the phonological perception is not the same:

Aspiration is not phonemic anymore, since fricativity is now responsible for the phonological opposition.

The second segment [tʰ] is a C._ allophone of /θ/. But this position C._ is becoming a neutralisation context (as it is in the modern demotic system). Hence /t/ and /tʰ/ are merging in this position.
Since aspiration is not phonemic anymore, the second segment [tʰ] or [t] is perceived as non fricative (be it aspirated or not) by contrast with the first fricative one, which is now phonologically identified.

Now, this is the second (non phonologically identified) segment [tʰ] / [t] which is perceived as phonetically different from the first one in [ixtʰin]

Since this second segment is non fricative, be it still phonetically aspirated or not, it is perceived as non fricative by reference to the first fricative phoneme, and so this non fricative sound is rendered by the non fricative grapheme "τ".

Phonetic contrast and phonological interpretation

<table>
<thead>
<tr>
<th>ixtʰin</th>
<th>&quot;ειχτόυν&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>[x] = / + fricative (velar) /</td>
<td>&quot;τ&quot; for [tʰ]: perceived as / non fricative (dental) /</td>
</tr>
</tbody>
</table>

The state of each period is reported side by side in table (8).

<table>
<thead>
<tr>
<th>Table (8) Phonological perception and consequences for each period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phonological system</strong></td>
</tr>
<tr>
<td>ixtʰin</td>
</tr>
<tr>
<td>Archiphoneme</td>
</tr>
<tr>
<td>Phonological interpretation</td>
</tr>
<tr>
<td>Writing</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The value [xtʰ] proposed here for the graphic misspellings "κθ" of forms from the 3rd cent. BC to the first cent. AC is perfectly coherent with the phonological system of this period. However, one might claim that this reading requires an explanation quite more complicated than the concurrent one. Although that may be the case from the linguist’s point of view, who knows the different steps, this is not the case from the point of view of any speaker of each period: from the synchronic phonological mind of the speaker of the first period, the segment [x] is non aspirated.
and has to be written with the only non aspirated grapheme which he has to his disposal: "κ".

As for the complexity, this proposal supposes a phonological description which is very simple, with only three successive phonetic values \( k^h t^h > x^h t > x t \), conditioned by one phonological process of lenition. Under the concurrent assumption, on the other hand, five phonetic values \( k^h t^h, k^h t, x^h, k^0, x t \) are proposed, and three phonological processes are involved in, with the paradoxes exposed in section 3.

7. Conclusion

The value \( x t^h / f t^h \) that I submit for graphic misspellings such as \( \varepsilon \iota \kappa \theta \omicron \nu \nu \) supposes a phonological evolution which involves only one gradual process: a lenition that affected aspirated stops in accordance with the strength of their position. This proposal can account for all the data (i.e., all the graphic forms and all the attested phonological changes). By contrast with the values given in the concurrent propositions, it need not to postulate the three phonetic forms \( k t^h / p t^h, k^h p^h, x^h / f^h, k t / p t \), which are not corroborated by any other pieces of evidence (whether comparatistic, diachronical or dialectal).

Based on a phonological interpretation which is different from the usual one, the proposition that was exposed here gives the Demotic obstruent another history, since the description itself turns out to be different. Admitting that the modern state of obstruent clusters in Demotic results from a context-conditioned lenition rather than from a dissimilation of two fricatives, the evolution of a form like, for instance, \( \varphi t \zeta \nu \omicron \omicron \omicron \omicron \) is then \( p^h t^h \omicron \omicron \omicron \omicron \omicron \omicron > f t^h \omicron \omicron \omicron \omicron \omicron \omicron > f t^h \omicron \omicron \omicron \omicron \omicron \omicron > \star f^h \omicron \omicron \omicron \omicron \omicron \omicron > f t^h \omicron \omicron \omicron \omicron \omicron \omicron .

Under this assumption, a phonetic value, i.e., \( f t^h / x t^h \), can be given for graphic forms such as \( \varepsilon \iota \kappa \theta \omicron \nu \nu \nu \nu \) dated from both the very early Koine and the Roman Period, while those forms lacked phonological accounts under the values \( p t^h / k t^h \) and \( p^0 / k^0 \), respectively, that used to be proposed.

This proposition, giving a new lighting out these data, may have other consequences on the phonological knowledge of this period. This is the work that remains to be done.
REFERENCES