The two Egyptian idioms and the “emphatic” consonants.

By Helmut Satzinger

Does Egyptian have emphatic obstruents ṭ and ṣ? General opinion is negative, as may be seen in the following quotations.

“All branches except Egyptian exhibit a special set of consonants, besides voiced and voiceless pairs, the 'emphatic' series, realised as pharyngealised (velarised) in Arabic and Berber, glottalised (ejective, explosive) in South Arabian, Ethiopian and Cushitic and glottalised (explosive or implosive) in Chadic; Egyptian, incidentally, also lacked voiced consonants (d stands for /t/, t for /th/, in the standard transliteration) ..” (Comrie Major Languages 548).

Or, in the eyes of a more specialised author, viz. Allan R. Bomhard:

1. The earliest Egyptian inherited the triple contrast voiceless aspirated ~ voiced ~ glottalized from Proto-Afrasian.
2. First, the voiced consonants became devoiced. The resulting system had the contrast voiceless aspirated ~ voiceless unaspirated ~ glottalized.
3. Next, the emphatics other than *k’ became deglottalized and merged with the voiceless unaspirated stops ...

(Bomhard "Proto-Afrasian Phonology" p. 81; my highlighting.)

“First, the voiced consonants became devoiced”: This is against all evidence. Proto-Egyptian *b, *d, *g did not become p, t, k. Rather, Egyptian p, t, k go back to Proto-Egyptian *p, *t, *k.

What is true is that Main Stream Egyptian doesn’t have any voiced stops. But not because they had become devoiced stops, but rather, because they had become voiced continuants: *b > b, *d > d, *g > g (?) j.

Another statement in this context — Petr Zemánek, on the emphatic ṭ: “... For Egyptian it is reconstructed in the proto system only by Rössler 1971, whose reconstruction is nevertheless motivated by an obvious effort to postulate a clearly symmetrical system. ... No other analysis of Egyptian phonology includes emphatic ṭ.”

When leading Egyptologists used the transcription symbol t around 1860, they did not, however, intend to indicate any “emphatic” articulation, but rather something like “not quite normal t”:

... Je ne propose pas de transcrire ≡ par le ṭ et M. Brugsch y renonce volontiers. Les coptes ont écarté le ḏ grec de leurs radicaux et, d’un autre coté, quand les hiérogrammates

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1 Satzinger “Voiced Consonants”.
2 Zemánek Pharyngealization 9.
ont voulu transcrire plus exactement l’articulation d, qu’ils rencontraient dans les noms étrangers, ils se sont servis du groupe nt 3. Je préférerais donc ici un j avec le signe d’affaiblissement, en avouant complètement mon impuissance quant à une appréciation plus exacte de la nuance que pouvait représenter le signe שרות. (de Rougé « Note sur la transcription » 72; my highlighting.)

Or Lepsius:

Es läßt sich aber in vielen Fällen eine Neigung zur Erweichung des erten nicht verkennen, worauf auch der koptische Name der Hand selbst Kopt.4 neben TOT5 hinweist. Es scheint daher ganz zweckmäßig zu sein, erten durch j wiederzugeben. [Remarkable the following, H.S.:] Dagegen scheint d dafür zu setzen nicht räthlich, da das koptische Alphabet nie dafür das aus dem Griechischen aufgenommene Σ gebraucht, und die Schreibung erten oder ḫ für d in fremden Namen wie Darius, Dacicus darauf hinweist, daß die Aegypter diesen einfachen Laut nicht besaßen, sonst würden sie nicht noch das erweichende η vorgeschoben haben. (Lepsius „Über die Umschrift“ 79.)

Actually it was until ca. 1900 that Egyptologists transcribed the erten graphemes by j, and even in the third edition of his Ägyptische Grammatik, of 1911, Erman writes (p. 69, § 122):

„erten, das in den Umschreibungen des n(euen) R(eiches) sowohl Σ als Τ wiedergibt, tritt im Kopt. als Τ auf. Da dieses aus erten entstandene Τ… vor den betonten Vokalen des Boh(airischen) nicht aspiriert wird, so wird es ein emphatischer Laut, also Σ, sein.”

Nevertheless, he transcribes it as d. Not long after, it was forgotten that d does not denote a voiced stop in this case.

It was only in 1971 that Otto Roessler, as mentioned by Zemánek, revived the old knowledge, by showing that the phoneme in question is emphatic, rather than voiced.6 The voiced counterpart, on the other side, had mutated to a laryngeal, ʾ. This phonetic

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3 In the footnote: « Il parait en effet, par des exemples, tels que Mendes et Zbendetes, que l’entonant t, l’a- doucissait en d. »

4 Today we can safely state that this Coptic word for “hand” has no etymological connection with any word with d: the first consonant, s [ʃ], of its Upper Egyptian form sniff, points unequivocally to an original velar plosive that was later palatalised.

5 Bohairic TOT, Upper Egyptian Toot (pre-pronominal state), from Egyptian dr.t (čá t- < čárt-).

6 Roessler „Das Ägyptische.“
value is evidenced by Egyptian renderings of Canaanite words and names, like

\[ \text{ki-n-‘anV ‘Canaan’} \]

\[ \text{‘a-ga-'tV ‘wagon’} \]

In respect to the Egyptian \( \iota \) graphemes, evidence is not so clear: they are used to render both \( d \) and \( \iota \) of Semitic words and names.

The Egyptian language of the 3\textsuperscript{rd} millennium BC and later existed in two idioms (if not more): one conservative, one progressive. An exemplary distinguishing feature are two phonetic developments, or sound shifts, that affected one of them (let’s call it “the Progressive”), though not the other one (hence, “the Conservative”):

1. In the Progressive Idiom, an \( R/L \) sound became a glottal stop \([ʔ]\), or similar; written with the \( \text{⟨⟩} \) graphemes (implicit also in 2-consonant signs like \( \text{⟨⟩w, ⟨⟩b, ⟨⟩h, etc.} \Jordanian\textsuperscript{difference:} \( \text{⟨⟩', ⟨⟩b', p', f', etc.} \)). NB. Another \( /r/ \) phoneme, rendered by \( \text{⟨⟩} \), transcribed as \( r \), was preserved in both idioms, though it became a glottal stop in syllable-final position, as did also \( /t/ \):

\[ \text{nåçV > nåtV'} \] Coptic \( nūtō \) “god”, though \( nāçårat > natåra'} > Coptic \( ntōrō \) “goddess”.

2. In the Progressive Idiom, a \( d \) sound (in which had merged Afroasiatic *\( d \), *(d)z, *(d)ð, *(d)l, according to Rössler) became a voiced laryngeal \([ʕ]\), or similar; written with the \( \text{⟨⟩d} \) graphemes (as implicit also in 2-consonant signs like \( \text{⟨⟩', 'n, 'h, etc.} \Jordanian\textsuperscript{difference:} \( w', h', h', etc.} \) transcribing Semitic \text{"} in the II\text{nd} millennium. What is rendered by \( \text{⟨⟩d} \) is basically an emphatic sound \([t]\) (Rössler, and Schenkel and colleagues following him, consequently transcribe it as \( \text{⟨⟩} \).

A number of phonetic root doublets testify to this, like the following.

| Some are words with \( \text{'} \) as one of their consonants that have a variant root with \( n \) in the place of \( \text{'} \). And there are words with \( \text{'} \) as one of their consonants that have a variant root with \( d \) in the place of \( \text{'} \). | In many cases, the \( \text{'} \) root is attested earlier than the \( n \) root. | In many cases, the \( \text{'} \) root is attested earlier than the \( d \) root. |
"increase" (since Pyr)

variant/doublet of $\text{h} \text{i} \text{w}$ (MK).

$\text{b} \text{i} \text{b} \text{i} \text{t}$ "virility" (Pyr & later), of a root $\text{b} \text{i} \text{b}$

"to beget"; $\text{b} \text{n} \text{b} \text{n}$ "to beget; to become erect (penis)" (NK); $\text{b} \text{n} \\
\text{w} \text{t}$ "virility" (MK).

Devine name $\text{M} \text{6} \text{h} \text{i} \text{f}$, "he who looks behind himself" (Pyr), variant $\text{M} \text{n} \text{h} \text{i} \text{f}$ (CT).

$\text{b} \text{a} \text{b} \text{a} \text{t}$ "virility" (Pyr & later), of a root $\text{b} \text{a} \text{a}$

"to beget"; $\text{b} \text{n} \text{n}$ "to beget; to become erect (penis)" (NK); $\text{b} \text{n} \\
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$\text{g} \text{w} \text{z}$ "to pull tight" (since Pyr); LEng. $\text{gwn}(?)$

Copt. $\text{s} \text{o} \text{o} \text{y} \text{y} \text{n} \text{e}$ "bag".

$\text{g} \text{w} \text{z}$ (since CT) "to push off (falcon), to set sail"; cf. Copt. $\text{B} \text{h} \text{w} \text{o} \text{y} \text{y} \text{i}$ zu SL $\text{h} \text{w} \text{o}$ "push; to (make) set sail".

$\text{d} \text{f} \text{z}$ "food" (since Pyr), and cf. $\text{d} \text{f} \text{n}$

"provider of food" (Gr)

$\text{j} \text{d} \text{t} \text{h} \text{i} \text{k}$ (since OK), $\text{j} \text{d} \text{n} \text{t} \text{h} \text{i} \text{k}$ (since MK), a kind of bread.

$\text{j} \text{d} \text{t} \text{h} \text{i} \text{k}$ (since MK), var. $\text{n}$ (NK royal tombs); $\text{d} \text{j}$ "here" (< *$\text{d} \text{i}$ ? — since Amarna).

$\text{b} \text{n} \text{b} \text{n}$ "to spew; to ejaculate" (Pyr); $\text{d} \text{i} \text{d} \text{i}$ "to ejaculate" (BD); $\text{d} \text{n}$ "to soak" (OK), "to refill (with water)" (math).

$b$ (OK), Coptic $\text{B} \text{o} \text{w} \text{t}$ "horn"; $\text{d} \text{b}$ (med),

Coptic $\text{t} \text{a} \text{m}$ "horn".

$\text{b} \text{b}$ "to knock (on door)" (since MK); cf. $\text{d} \text{b} \text{d} \text{b}$ "to pound (of the heart) (since med.)"; base root *$\text{d} \text{b}$ "push".

$\text{h} \text{f}$ (since Pyr), $\text{s} \text{f} \text{d}$ "to touch (with fingers)" (since CT).

", or "; arm", inter alia in m- "at", lit. "in the hand of..."; $\text{d} \text{j} \text{r} \text{h} \text{n} \text{d}$ "at", lit. "in the hand of..."; cf. $\text{d} \text{j} \text{f} \text{i} \text{t}$"gift" (since MR); $\text{d} \text{j} \text{f} \text{v}$ (since Pyr).

Abbreviations: Amarna = Amarna Period (Dyn. 18, NK); BD = Book of the Dead (from NK on); CT = Coffin Texts (Middle Kingdom); Dyn(asty); Gr = Greek Period; LEng = Late Egyptian (from Dyn. 19 on); math = mathematical papyri (from MK on); med = medical papyri (from MK on); MEg = Middle Egyptian (from before MK on); MK = Middle Kingdom; NK = New Kingdom; OK = Old Kingdom; Pyr = Pyramid Texts (OK); ramess = ramesside (Dyn. 19 & 20).


Satzinger "Aleph" 200.

Osing Nominalbildung II, 778 /A. 964.

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A probable doublet is $\text{h} \text{f} \text{t}$ "meal" (since Pyr; Schenkel „Verschluß- und Reibelaute“ 144).

Osing Nominalbildung II, 778 /A. 964.

Zeidler, review "Petráček Altägyptisch" 208; Schenkel „Verschluß- und Reibelaute“ 140.

Zeidler, review "Petráček Altägyptisch" 208.
In other cases, both variants are attested at approximately the same period.

| 3wr, 3wj “to tremble” (since Pyr) (*hwr > hwj); nwr “to tremble” (since Pyr).<sup>20</sup> | 3wr, 3wj “to tremble” (since Pyr) (*hwr > hwj); nwr “to tremble” (since Pyr).<sup>20</sup> |
| zns “to open”, and cf. zis “to unstop (the ears)” (both in Pyr). | *h*b in CT II 203 is probably a synonym of twn, “to gore; to attack”; cf. hdb “to overthrow, subdue” (since MK) |
| dng, d̬g (PT), otherwise dng (since OK), “dwarf”. | 3*b.t “oppression; damage, impairment” (since Dyn. 18); cf. ndb “to injure” (Dyn. 19); base root *db “push”, with root prefix *l-. |
| snm “be sad” (since CT); s̄m, variant/double of snm; s̄m.t “mourning hair-dress” (CT). | |
There are also cases where the \( n \) variant is attested earlier than the \( \ddot{a} \) variant.

\[ n^e \text{ “to be smooth”; } sn^e \text{ “to make smooth”} \]
(since OK), and cf. \( \ddot{a}^e \text{ “to coat with plaster; to repair” (Dyn. 19).} \]
\[ wjn \text{ (since MK) and } wj:\text{ (LEg), “to reject”.} \]
\[ gnf \text{ (MR), } gjf \text{ (Gr) “to rebuff, to repel”.} \]
\[ nsb \text{ (med), } \ddot{s}sb \text{ (BD) "to burn".} \]

There are also cases where the \( d \) variant is attested earlier than the \( \ddot{a} \) variant.

\[ d\text{rp} \text{ “to offer; to feed; to present” (since Pyr); } \ddot{a}b \text{ “to offer; to present” (Dyn. 25 & Gr).} \]
\[.hdby.t, of a group of massacred enemies (ramess); } h'bj.w, a term used for enemies: “those to be subdued”? Cf. } hdb \text{ “to overthrow”, above.} \]

In some cases, there is a perfect correlation between the sound changes \( d > \ddot{a} \), and \( n (=l) > \ddot{a}. \)
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\ddot{a}^e \text{ “to spew; to ejaculate” (Pyr); } \ddot{d}n \text{ “to soak” (OK), ”to refill (with water)” (math.) — however, there is also the “compromise” stem of } \ddot{d}d\text{ “to ejaculate”, with the progressive feature } \ddot{a} \text{ (for old } *l \text{) on the one hand, and the conservative feature } d \text{ (for old } *d \text{) on the other.} \]
\[ \ddot{a}^b \text{ “oppression; damage, impairment” (since Dyn. 18); cf. } ndb \text{ “to injure” (Dyn. 19).} \]
In the following, the conservative variant has \( r \), rather than \( n \) (the variation \( b ~ p \) is hardly attested elsewhere): \( \ddot{a}b \text{ “to offer; to present” (Dyn. 25 & Gr);} d\text{rp “to offer; to feed; to present” (since Pyr);} \]
In other cases, the liquid is progressive (\( \ddot{a} \)) in both cases:
\[ \ddot{a}^b \text{ (kind of tree; Pyr); } \ddot{d}b \text{ “fig”, “fig tree” (since Pyr)} \]
\[ \ddot{a}^j \text{ (since MEg); } dj \text{“here” (< } *d\text{? } — \text{ since Amarna)} \]
Or the voiced stop is progressive (\( j \)), with variation (\( j ~ n \)) in the liquid:
\[ \ddot{a}^e \text{ “to coat with plaster; to repair” (Dyn. 19); } n^e \text{ “to be smooth”; } sn^e \text{ “to make smooth” (since OK).} \]
\[ \ddot{a}^j \text{ (since MEg), var. } n \text{ (NK royal tombs)} \]
Or the voiced stop is conservative (\( d \)), with variation (\( j ~ n \)) in the liquid:
\[ jd\ddot{a}t-hi=k \text{ (since OK), } jdnt-hi=k \text{ (since MK), a kind of bread.} \]

The Egyptian script is made for the Progressive Idiom. In Old Kingdom spelling, \( \ddot{a} \) may be neglected in the same way as the weak consonants \( j \) and \( w \),\(^{23} \) hence it is a weak consonant itself. Some of the uniconsonantal phonetic signs are derived from biconsonantal roots whose second consonant is \( \ddot{a} \). A pronunciation of \( \ddot{a} \) as a glottal stop is more plausible than one as a liquid.

\footnotesize
\[ ^{22} \text{Vycichl “Hausa und Ägyptisch” 59.} \]
\[ ^{23} \text{Edel Grammatik 58–59 § 132.} \]
• $i$ or $j$ depicts a blossoming reed: there must be a word $*i\beta$ “reed”; the conservative doublet reappears in the New Kingdom as $\text{Ilw}$ (sic; $l$ is expressed by $\beta$ plus $r$) or more clearly in syllabic $\text{Ilw}$. Hence $*\text{a-lu}$.

• $h$ depicts some enclosure of reeds, or similar (a zeri?): there may have been a word $h\beta$ or $h\beta.t$ of such a meaning, cf. $h\beta.y.t$ “porch; vestibule, lobby”.

• $k$ depicts a hill slope; its phonetic value is derived from $k\beta$ “high”, $k\beta\beta$ “hill”.

A small number of signs of phonetic function are obviously based on Semitic vocabulary. Although the normal form of the eye, $\text{n}$, was used for rendering the Egyptian eye word $\text{lr.t}$, and consequently for a phonetic use as a sign for $\langle i-r \rangle$, a modified form, $\text{w}$, was used as a phonetic sign for $\langle i-n \rangle$, on account of the Semitic word $*\text{ayn}$ “eye”. Hence, the underlying phonetics of the $\langle \rangle$ grapheme is $[\gamma]$. A cow ear, $\text{w}$, was used for the spelling of words for “ear” ($\text{msdr}$, “nh.wj”) and “hearing” ($\text{sdm}$, etc.); also, however, as a phonetic sign for $\langle i-d-n \rangle$, as in $\text{idn}$ “to replace”; “deputy”, and others — quite obviously based on the Semitic word $*\text{u}\delta\text{yn}$ “ear”. The Egyptian idiom which underlies these take-overs did not realize $\langle \rangle$ anymore as a dental: hence, it was not anymore suitable to render Semitic $*d$, $*z$ or $*\delta$; on the other hand, it was very well apt to render Semitic $\text{`Ayin}$.

A few words for animals that are obviously onomatopoetic seem to support the assumption that the Egyptian script was — grosso modo — the medium of the Progressive Idiom.

• The Egyptian word for “cormorant” is not known; it may be $k\beta$, as this is the phonetic value of the cormorant hieroglyph, $\text{y}$. This may be onomatopoetic, as the bird utters a cry that resembles an $`\text{aaaak}$ (much more than a $\text{daaaak}$). Hence the sign was chosen to render a phonetic $[\gamma-q]$, and not a $[d-q]$.

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24 Cf. $j\beta$, a plant of the Wadi Natrun; $j\beta.t$, a plant (vine?) ?; late Coptic: B $\text{\textmu}$ “fenugreek (trigonella)”?
25 Satzinger „Historische ägyptische Phonologie“.
26 Satzinger “Voiced Consonants”.
27 Satzinger “Voiced Consonants”.
• Also, the word for the Egyptian Vulture (Neophron percnopterus) is unknown. It may have been coined after a typical sound which the bird utters, namely a low grunt.28 As a hieroglyph, its picture serves to render /β/. Now, the low grunt resembles much more a glottal stop than a liquid [r] or [l].

• The word for “donkey” is iˁ (not aˁ!), Coptic eʰw, hence *’iˁáˁ – a nice rendering of the animal’s cry; whereas a pronunciation *’idáľ would be far off the mark. Which means that those Egyptians who generated and used the hieroglyphic script pronounced as a glottal stop, rather than as l or r, and their *d had already become a [ˁ]. Thus, the Egyptian ⟨⟩ graphemes rendered an ‘Ayin from the start, rather than a [d]; the ⟨⟩ graphemes rendered a light sound like a glottal stop, rather than a liquid. On the other hand, the ⟨⟩ graphemes (like <d>) rendered an emphatic ⟨⟩ (probably a glottalised stop [tˁ]), rather than a voiced one [d].

Proto-Egyptian had the three Afroasiatic rows of stops, voiceless: *t, “emphatic”: *tˁ, voiced: *d. The Conservative Idiom preserved these articulations in approximately the same form. In the Progressive Idiom, however, the voiced stops became fricative29 and in the case of the dental stop, also laryngeal: d > ⟨⟩. The “emphatic” and the voiceless stops retained their articulation more or less, being probably glottalised [tˁ], and aspirated [tˁʰ], respectively. In addition, ⟨⟩, a liquid of a certain quality, developed to a kind of glottal stop [ʔ].

The stem *ldb, denoting some violent action, remained so in the Conservative Idiom, but developed into some [ʔ-ˁ-β] in the Progressive Idiom. Eventually, the conservative form was loaned by the progressive standard language with a modified meaning, forming now a conservative doublet “to injure” of the progressive ˁb “to oppress”; *ldb was spelled ndb. The script of the standard language did not dispose of a grapheme for l (the l sound having developed into [ʔ]). Neither did the language have a phoneme /d/ (this having developed into [ʔ]), nor did consequently the script dispose of graphemic means to render such a voiced stop. Obviously, a compromise had to be made: the graphemes

28 “Usually silent, the vulture grunts, hisses and mews if angry or excited.” (http://www.thecrankshaft.info/2010/05/egyptian-vulture.html).

29 Satzinger “Voiced Consonants”.
chosen for rendering (conservative) /d/ were those for the emphatic stop, /t/, which Egyptology anyway expresses by d. Similarly, the ⟨n⟩ graphemes were usually chosen for rendering a conservative l.

On first sight, it may seem little probable that the graphemes for a voiceless glottalised stop /t/ should be used for rendering a voiced stop [d]. However, there was little other choice. In the Conservative Idiom, the voiced stop was in an opposition to both the voiceless stop and the glottalised stop: d — tʰ — t. In the Progressive Idiom there was only an opposition between voiceless non-glottalised and aspirated, and the voiceless glottalised: tʰ — t. The phoneme in question, /d/, is obviously closer to the latter, t, than to the aspirated stop.30

As for the assumed “emphatic” character of the phoneme /t/ and grapheme ⟨d⟩, as also the phoneme /č/ and grapheme ⟨d⟩, a detailed phonetic account is difficult. Semitic offers two options: pharyngealised and glottalised occlusives (dental, alveolar, velar in the main). In Arabic, emphasis is by pharyngealisation, as also in Berber. The pharyngeal co-articulation is possible with vocal cords lax or tense: both Arabic and Berber have both voiced and voiceless emphatics. Pharyngealised occlusives have a strong effect on their environment, particularly on surrounding vowels, through the contraction of the throat. The Ethio-Semitic languages, on the other hand, have glottalised emphatics: t’, s’, k’, even p’, etc. Glottal co-articulation is only feasible with lax vocal cords, hence no voiced emphatics. It has no impact on the articulation of neighbouring sounds.

… pharyngealization, unlike glottalization, has a strong tendency to spread, both progressively and regressively, as has been shown in many studies on their phonetic characteristics in Arabic. This results in the establishment of pharyngealization as the main type of co-articulation and it covers also other types of co-articulation that existed in proto-Semitic, e.g. lateralization at d.31

Furthermore, there are cogent arguments in favour of the theory that the glottal co-articulation is the original one among the Semitic languages in general, and thus also in the Afroasiatic languages.

Based on the fact that the pharyngealized consonants in Arabic are also voiced, we can judge that pharyngealization is fully set only in Arabic. In other Semitic languages, we can probably come up

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30 A similar option was taken by both Aramaic and Ethiopian in respect to the Greek consonant system. Greek aspirated stops are usually rendered by voiceless Semitic graphemes, Greek unaspirated voiceless consonants by Semitic emphatic graphemes. In Ethiopian, even an emphatic ṭ has emerged which renders Greek π (Lipiński Semitic Languages 116 (11.3); Amharic: Podolsky Historical Phonetics 22 (3.2)).

31 Zemánek Pharyngealization 52.
with some points that could be used for further discussion. It seems that Akkadian did not posses pharyngealized co-articulation. This is based on two facts, that emphatics in Akkadian did not influence the neighbouring vowels, which is a property characteristic for glottalization…, and that emphatic sounds in Akkadian could not co-occur in one word…\textsuperscript{32}

At the beginning of this process there existed glottalized (ejective) consonants (\textsuperscript{32}t', k', s', etc.) that gradually start to change from one type of secondary articulation (glottalization) to another one (pharyngealization). At a certain stage of this transitory process, after the release of the glottal closure, this release is in certain circumstances (voiced neighbourhood, dynamic or emotional meaning) substituted not only by pharyngealization, but also by voicedness.\textsuperscript{33}

The Canaanite idioms of the II\textsuperscript{nd} millennium are particularly important for the study of Egyptian phonetics, on account of renderings of Canaanite words and names in Egyptian, and of Egyptian names and words in the Middle Babylonian of Canaanite documents.

Unfortunately, the arguments pro or contra glottalised co-articulation are ambiguous in respect to the Canaanite of the II\textsuperscript{nd} millennium.

All the arguments mentioned can, however, be applied to Egyptian: no voiced emphatics, as \textit{d = t}, \textit{d = ċ} are believed to be unvoiced; no colouring of surrounding vowels can be observed (in particular, in Coptic). Everything so far points to glottal co-articulation. The problem lies in the Canaanite relations mentioned. In the New Kingdom, Egyptian \textit{d = t} is used much more often for rendering Semitic /d/ than for Semitic /t/.

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<td></td>
<td>\textit{t}</td>
<td>13.7%</td>
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<td></td>
<td>\textit{r}</td>
<td>6.6% (relic of MK system)</td>
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<th>65.9% (!)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>/t/</td>
<td>20.9%</td>
</tr>
<tr>
<td></td>
<td>/t/</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

For comparison:

<table>
<thead>
<tr>
<th>Egyptian \textit{t} renders</th>
<th>/t/</th>
<th>90.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/d/</td>
<td>5.3%</td>
</tr>
<tr>
<td></td>
<td>/t/</td>
<td>4.6%  \textsuperscript{34}</td>
</tr>
</tbody>
</table>

\textsuperscript{32} Zemánek \textit{Pharyngealization} 51.

\textsuperscript{33} Zemánek \textit{Pharyngealization} 52.

\textsuperscript{34} All data after Hoch \textit{Semitic Words} 431–437.
This is to say that Semitic /s/ sounded to Egyptian ears not so very different from Egyptian /t/: they rendered it in five of ten cases by their /t/, but also in four cases by their /t/. Semitic /d/ did not sound very different from Egyptian /t/. “Emphasis” did not mean the same for both languages. Was Canaanite already pharyngealising, whereas Egyptian was glottalising? Whatever the answer is, we have to accept the fact that the phonetics of the Egyptian emphatics were different from those of the Canaanite emphatics in the II\textsuperscript{nd} millennium.

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