

Early Thai orthography

Innovative tone-marking or recent hoax?

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Orthographic complexity in Thai is traced diachronically to account for non-linear relationships in the current writing system. As a result of orthographic conservatism over a period of phonological change, an earlier direct phoneme-grapheme isomorphism has shifted to a complex configuration with abstract reinterpretation. What were originally segmental graphemes have acquired hierarchical functions in suprasegmental tone marking. However, aspects of this account have been challenged. A debate has arisen regarding the origins of Thai writing. An early inscription with consistent use of tone marks has been deemed a fake, causing a local uproar. This inscriptional debate is described in some detail as it provides a context appropriate for examining more general questions raised by Share & Daniels (2016) and others regarding multi-dimensional hierarchical depth in orthographic systems. Central to Thai orthographic depth is the claim that early Thai writers marked phonemic tone.

Keywords: abugida, akshara, alphasyllabary, attribution, graphematic hierarchy, orthographic depth, suprasegmental, Thai, tone

1. Introduction

How did Thai orthography originate? A public debate in Thailand over the past three decades challenges the authenticity of a key early source. The dispute upsets the established heritage of written Thai, as well as arousing sensibilities regarding kingship and national identity. Shifting indexical attributions have become attached to orthographic components. Along with local significance, aspects of the Thai debate engage with more general writing-system concepts. These include approaches to orthographic depth and its possible consequences for typological change. The main purpose here is not to settle the debate, but rather to relate such wider orthographic perspectives to claims and counter-claims regarding earlier

stages of written Thai. In this way the Thai debate provides an apt context for probing more general proposals in writing-system analysis and for applying them in new directions.

As for background, Thai is a tone language with texts written in an Indic-derived script going back some seven centuries (Haas 1956; Court 1996). Thai arranges consonant graphemes (more technically: aksharas) from left to right. No lower/upper-case distinction is made. Word spacing is not regularly used, nor are vertical consonant conjuncts. Instead, consonant clusters are represented horizontally: กลม [klom] ‘round’. Currently some mid and low vowels are interpreted as inherent, e.g. short [o] as in the preceding example. Others are overtly indicated by syllable-initial symbols on the horizontal line: ๒ [t^he:] ‘to pour’, with the [e:] component written first. High vowels are shown by superscript and subscript diacritics: มี [mi:] ‘to have’. Main features are illustrated by Burnham, et al. (2013). The full system is described in Haas (1956), Danivivatana (1987) and Diller (1996a). Old Khmer (Jenner 1981) is deemed to be the immediate precursor orthography but influence from other scripts is possible, as mentioned below. Fedorova (2012: 8–9) illustrates the current inventory in a comparative setting.

The preceding summary would be accepted by most participants in the Thai debate. The controversy focuses on one particular stone inscription that both purportedly dates and exemplifies the original Thai script. It records a date equivalent to 1283 CE for the invention of Thai orthography. This contested source is remarkable for distinguishing *aspirated continuant consonants* as a series through consistent digraphs. Furthermore, *a regular system of superscript diacritics marks phonemic tone*. Is this the first such tone-marking system intended for practical use? Or are critics justified in taking this impressive orthographic feature as evidence of fakery?

Another surprising innovation: the inscription’s graphemic representation of high vowels is entirely on the horizontal line – an arrangement found neither in present-day Thai nor in the Old Khmer prototype. This unexpected linearization has also alerted the inscription’s disparagers. Some presuppose a ‘natural’ diachronic evolution along the lines of: *syllabary* > *alphasyllabic* or *abugida* > *alphabet*. Since the orthographic structure of the suspect inscription is situated toward the alphabetic end of this sequence, the historical progression, say disparagers, points to a hoax. It is too “alphabetic” to be a true origin for written Thai. Specifically, one key allegation introduced in the following section is that the suspect inscription is actually a deception produced in order to impress Western colonial powers in the mid-19th century (Krairiksh 2004).

This provocative challenge to the traditional 13th-century dating evokes a *principle of unidirectional development* in the sequence above moving typologically towards an alphabetic terminus. The one-dimensional evolutionary vector

advocated by I. J. Gelb (1952) incorporates this perspective. However this assumption has been seen as unsubstantiated and controversial (Daniels 1996: 7; Daniels 2006). Daniels provides a sustained critique of the unidirectional conception. Section 5 below questions whether Thai orthography has developed along such a simple path.

For investigating directionality a concept of *orthographic depth* is revealing. In the Thai case, this needs to cover associative functions potentially involving both synchronic and diachronic processes. As Share & Daniels (2016: 23) observe, Thai is similar to English, French, etc., in that a morphophonemic dimension of depth is due to retention of historical spellings despite language change. Further, whereas Rimzhim, Katz & Fowler (2014) present a unitary depth scheme, Share & Daniels review this proposal and, instead of a single parameter, recommend a multidimensional assessment of complex interrelationships.

Included in such an approach could be non-linear principles supplementing linearity with hierarchical phonological/orthographic arrangements, similar at a conceptual level to hierarchical graphematic structures discussed for English and German orthographies by Evertz & Primus (2013). In the Thai case, graphematic hierarchy involves consonants, tones and syllabic parameters of length and coda type. Over time, consonant akshara letters have shifted in what they represent and have acquired partial tone-marking functions. A summary is provided in Table 1 with more detailed discussion following, however a full formal treatment along these lines is outside the present scope. (For descriptive purposes at hand, the term ‘grapheme’ is used below loosely in a sense of a distinctive akshara-like unit; ‘digraph’ is used to indicate two components, elsewhere independent graphemes, conventionally coalescing to make a systematic orthographic contrast.)

In this way, current principles of abstract orthographic interpretation in modern Standard Thai (Diller 1996a; Burnham, et al. 2013) can be seen as residue of sound changes – at least following the generally-accepted diachronic account of Pittayaporn (2016), Gedney (1991) and others. Major shifts advocated by these historical linguists are summarized in Table 1 and are discussed in following sections. The table shows that during a critical sound-change period, consonantal distinctions are lost along with increase in tonal distinctions. This synergy conforms to recognized tonogenetic processes (Gedney 1991; Brunelle & Kirby 2016). Orthographically however, throughout the phonological realignment, component elements of the Thai writing system have mainly remained in place. Apart from a few added symbols, what changes is interpretation: orthographic components have come to acquire new and more complex demands on construal. Section 4.9 provides more substantive detail.

Table 1. Summary of Thai sound changes affecting orthographic depth

Centuries CE	13th–14th	critical sound-change period	18th–present
initial consonant phonemes	37	aspirated continuants merge with unaspirated; 21 voiced stops merge with voiceless, aspirated; voiced fricatives merge with voiceless; preglottalized stops become voiced;	
cons. graphemes (incl. digraphs)	44	several new symbols added to inventory; limited respelling related to mergers;	49
tonal phonemes	3	tonal splitting and some coalescence;	5
tonal superscripts	2	two new symbols added to inventory;	4
grapheme-phoneme correspondence	mainly direct	variable; evidence of experiment; consonant classes come to mark tone.	abstract and complex

In what follows, we concentrate on orthographic concerns relating to the writing system. Outside of current scope must remain most of the wide-ranging social, historical and archeological facets of the Thai inscriptional debate. Treatment of this array of issues – many still under debate – is taken up elsewhere (Vickery 1991a, 1991b; Wyatt 2001; Krairiksh 2004; Terwiel 2010; Woodward 2015). However some consideration of contextual issues is introduced where relevant, especially in examining questions of orthographic indexicality and attribution, with a sense of *attribution* here intended along lines developed in work of Sebba (2015).

In the debate’s Thai setting, orthographic analysis is of less popular concern than the inscription’s textual message. (A translation is available in Chamberlain 1991: 445–450). This has been significant in political discourse framing national identity (Reynolds 2006; Wyatt 2001). The contentious inscription is taken as highly relevant to current Thai events through the text’s depiction of a quasi-utopian view of early Thai life under benign royal authority. This is apt to arouse present-day left/right political sentiments. Critics charge that the inscription’s romantic and nostalgic images pander to rightist or nationalistic chauvinism (Puriwanchana 2016).

Regrettably, this polarization rubs off on technical discussions of early writing. Shifting *attributions* of orthographic indexicality come into play: early lettering is taken as a token or branding of ideological stance. The inscription’s writing system becomes tainted and, as one authority has written, the whole matter becomes “too hot to handle” (Woodward 2015: 197). What follows is an attempt to cool down the discourse with more technical considerations of the inscription’s standing in Thai orthographic history. While the purpose here is not to settle the debate definitively, evidence discussed poses several challenges for the hoax hypothesis.

2. Discovery (or fakery?) of the Ram Khamhaeng inscription

According to the traditional account, the inscription noted above, that of King Ram Khamhaeng of Sukhothai (r. 1279–1298?) is the first extant example of written Thai (Na Nagara & Griswold 1992). The inscription was located in 1833 by a Thai crown prince, at that time in the Buddhist monkhood while his half-brother was on the throne. The monk-prince was on a pilgrimage trip, accompanied by a large entourage, visiting rural Buddhist sites. In the course of two days spent in the Sukhothai region, in Thailand's upland northwest, the inscription and several other artifacts came to royal attention and they were transported to Bangkok.

The traditional account continues: the inscription's text was found to be written in an unfamiliar form of Thai script, so in 1836 a commission of local scholars was set up to decipher it. Decoding was gradual. The inscriptional text was not comprehensively understood until many decades later (Terwiel 1991). However, some progress had been made by the time that the monk-prince assumed the throne as King Rama IV (also known as King Mongkut; r. 1851–1868). Enough was known by 1855 for an annotated facsimile to be presented to Sir John Bowring, a visiting British diplomat, who subsequently published it (Bowring 1857). A year later a similar facsimile copy was presented to the French.

On the other hand, according to the provocative challenge (Krairiksh 1991a,b; 2004; see also Vickery 1991a,b), the British and French were duped by a hoax created by King Rama IV. "The Ram Khamhaeng Inscription was written for the consumption of the European powers..." (Krairiksh 1991b: 561). The king secretly composed it presumably "between 1851 when he ascended the throne and 1855..." (ibid 553). A parallel objective might have been domestic. The new king was eager to cite precedents for intended social and legal reforms through passages in the inscription's text. With validation of this sort, the king's conservatively-minded critics would be disarmed and become more accepting of the planned changes (ibid: 558). As for the deciphering commission, documentation is unclear: they must have been concerned with different inscriptions (or possibly were in on the ruse).

The inscription's critics call attention to the anomalous physical condition of the stone's carving: they find the lettering to be suspiciously crisp and high-quality. (See Newmandala 2017 for an online view of one face of the inscription, along with philological discussion.) However explanation is needed as for why the 1855 transcript presented to the foreign powers contained what later study has shown to be obvious errors. Also, vexing intertextual questions have been raised: would an author of the 1850s have had available information sufficient to fake material in common with other inscriptions discovered only decades later? These philological matters are still debated but are beyond the present scope.

What of the inscription's orthographic system? What objectives for its fakery could be proposed? One aim, say disparagers, was to display to foreigners a centuries-long heritage of written Thai – indeed a form of writing with impressive alphabet-like features. Foreigners would *attribute* such features to a highly civilized culture – an assumption again recalling proposals of Sebba (2015). The form of writing was thus intended to be indexical. Along with inscriptional content emphasizing a progressive and essentially humanistic early Thai polity, the orthography would go toward convincing the threatening European powers that Thais were not a “savage and barbarous nation” (as King Rama IV expressed it in a letter) needing civilizing benefits of colonialization (Krairiksh 1991b: 560).

3. The Ram Khamhaeng orthography as an integrated plan

Discussion of the Ram Khamhaeng orthographic system, henceforth RK, needs first to take account of relationships with nearby thirteenth-century scripts presumed to be prototypes. In the decades preceding 1283 date mentioned in the inscription, historians are in agreement that the Sukhothai area mentioned in the text had shifted from Khmer to Thai control. Whatever the inscription's actual provenance, Old Khmer orthography must be considered formative. In addition, Old Mon (Bauer 1991) and scripts of South India and Sri Lanka may have been consulted.

The proposal advocated here is that the inscription's writing system coheres together as a *planned set of interrelated features*. These incorporate, alter and sometimes reinterpret elements from preexisting prototype scripts. Planning was based on a notable degree of phonemic awareness. A summary list of ten salient features follows. With respect to presumed prototype scripts, some features represent retentions; others innovations. For convenience in later discussion, RK numbering is arbitrarily assigned in the following list. Further developments are taken up in later sections as indicated.

RETENTIONS

- (RK1) The majority of grapheme shapes closely resemble Old Khmer and similar prototypes, but with simplifications. See 4.2.
- (RK2) Indic (Pali-Sanskrit) inventories are well-preserved along with many etymological spellings. These include orthographic distinctions that were probably not pronounced. See 4.3.
- (RK3) An Old Khmer convention is retained for representing medial short vowel [a]. This is through inherent-vowel interpretation indicated by doubling of

syllable-closing consonant. In this way the phonemic sequence $[C_1 \text{ a } C_2]$ is shown orthographically through symbols representing C_1 - C_2 - C_2 . See 4.7.

- (RK4) As in some other Indic-derived scripts, semivowel graphemes <y> and <w> have contextually-determined alternative interpretations: both consonantal and vocalic-diphthongal (cf. Share & Daniels 2016: 21). Other Old Khmer conventions regarding inherent vowel interpretation are probably maintained, but details of pronunciation remain uncertain.

INNOVATIONS

- (RK5) New digraph symbols are created to represent a distinctive set of inherited (Tai) aspirated continuants, written as though <hn>, <hm>, <hl>, <hw>. Digraphs are written with components slightly touching. See 4.5.
- (RK6) New consonant graphemes are created to represent distinctions needed for inherited Tai vocabulary, e.g. for fricative sounds [x], [ɣ], [f], [v], [z], and to distinguish [d] / [t] and [b] / [p]. See 4.6.
- (RK7) New vowel graphemes are created to distinguish phonemes [ae:], [u:] and several additional vocalic sequences not consistently shown in prototypes. See 4.7.
- (RK8) Consonant clusters are shown by *horizontal* conjuncts, written with components slightly touching, rather than by vertical conjuncts as in Old Khmer and Old Mon. (Note however that in Devanagari most compound conjuncts are essentially horizontal.) See 4.4.
- (RK9) Syllable-initial forms for vowels in prototype scripts are *reanalyzed* to function as vowel-medial forms, in effect representing all vowels on the same line as consonants. See 4.7.
- (RK10) Thai tones – three tonal distinctions as reconstructed for this period – are represented by introducing two superscript diacritic markers; the third tonal category remains unmarked. See 4.8.

The contention here is these characteristics taken together point to an integrated plan (whether of an original thirteenth-century creator or of a later faker). RK10, the representing of distinctive (phonemic) tone by superscript diacritics, was clearly the organizational principle at work. It must have been behind two other key modifications: RK8–9. These two radical innovations taken together brought all segmental graphemes onto the same line. The overall strategy then was to *free up space between lines of script in order to introduce superscript diacritics indicating tone*.

By contrast, Old Khmer orthography of the thirteenth century utilized inter-linear space through:

- i. decorative crown-like motifs, the so-called ‘pandanus thorns’ (*nam bai-toei*)
- ii. vertical subscript consonant conjuncts
- iii. vertical subscript signs for vowels [u], [u:]
- iv. vertical superscript signs for syllable-medial and final [i], [i:], which probably doubled to represent back unrounded vowels [u], [u:]. Vertical space was also required for representations of [o:], [ao], [ai]. All of this interlinear material was readjusted in the Ram Khamhaeng orthography to make room for superscript tonal marking.

Phonemic awareness of Thai as tonally distinctive with certain noticeable segmental contrasts as well seems basic to the innovations above. In the traditional account, such awareness refers to earlier stages of Thai as reconstructed on the basis of firm comparative evidence (Pittayaporn 2009; Li 1977, 1989). A later faker would need an equivalent understanding. Important distinctions considered in following sections include segmental phonemic oppositions (RK5–7) and phonemic tones (RK10).

Linguistic interaction would have facilitated the high degree of phonemic awareness evident in the RK orthography’s design. Authorities on the authenticity side of the debate have established a background of intensive language contact. Wyatt (2001) and others have argued that Sukhothai had a multiethnic constituency that included many Austroasiatic and Chinese speakers. Thai social practice encouraged exogenous marriage arrangements, promoting substantial bilingualism (Khanittanan 2001). Multilingual language contact would have instigated tonal linguistic awareness as speakers of non-tonal (Mon and Khmer) languages began to acquire (tonal) Thai. Mixups of tones and segments would have been inevitable as non-Thai-speaking populations attempted communication with the newly dominant ethnic group, bringing language to conscious attention.

Trade communication would have provided a natural setting for inter-language contact. The inscription specifically refers to Sukhothai’s *bazaar*, using a Persian loanword, also confirmed by archaeological remains. The region’s ceramics were widely traded. Another significant multilingual context was Buddhist study and scholarship. Records refer to Bay of Bengal voyages by monks travelling from Sukhothai to sites in Sri Lanka and India for extended study and pilgrimage. This would have provided not only expertise in the Buddhist Pali textual tradition but also practical familiarity with oral and written vernacular languages used in the region. On return to Sukhothai, senior monks would undoubtedly have been consulted on orthographic matters.

4. Thai orthography in the fourteenth century and beyond

This section provides further discussion of the RK features listed above and relates them to less controversial fourteenth century orthographic evidence and to later sources. In what follows, comparative Tai data is cited where relevant, with ‘Tai’ referring to the wider language family of which Thai, Lao, etc. are members.

4.1 Orthographic practice of King Lithai (r. 1347–1370?)

Early orthographic testimony comes from some fifty stone inscriptions known from the Sukhothai region beginning in the period just following 13th-century dates stated in the Ram Khamhaeng inscription (Fine Arts Department 1983). See Fontpad (2017) for some examples online. An inscription of uncertain year, but perhaps 1339, is currently under study as among the earliest (Na Nakhon and Griswold 1992:768; cf. also Penth 1996, who considers prior dating). If the fakery charge introduced above were substantiated, then this corpus of texts would count as the first extant examples of Thai orthography. The faker would need to have consulted these sources to perpetrate the hoax. As mentioned above, an issue arising here is the post-1850 period in which most such sources were discovered and deciphered.

Within two generations of the traditional origin of Ram Khamhaeng script, a royal grandson, King Lithai, was issuing texts with a number of distinctive orthographic features. (Following the usage of Suphanwanit (1984) and others, ‘Lithai’ is used as a general label for writing of this 14th-century era.) His practice can be traced over several decades and shows both development and experimentation. To assume temporarily the traditional perspective for convenience in discussion, comparison with RK features shows that Lithai’s approach to writing Thai is a combination of significant retentions along with a partial *reversion back to several Old Khmer norms* as discussed below. These reversions are often overlooked in traditional treatments.

This Lithai reaction fits in with other evidence: local inscriptions written in the Old Khmer language and script also occur, in a few cases with matching Thai versions. In a type of digraphia extending over centuries, Khmer-style (*khom*) script is used for religious texts (Panarut & Grabowsky 2015: 202). Lexical borrowing from Khmer into Thai is on the increase. Lithai’s texts include special Khmero-Indic ‘royal language’ forms (*rachasap*) not found in RK (Diller 2006). The impression is of a more pervasive pro-Khmer influence than in the Ram Khamhaeng Inscription’s orthography or text. Is King Lithai’s own educational upbringing along with a Khmer-background court intelligentsia to be discerned in the orthographic evidence here? On the other hand, for the fakery perspective, a rationale

for *reduction* of Khmer characteristics in the hoaxed inscription would need to be argued. If European colonial-office officials had been the target audience, would they have cared about these matters?

4.2 Consonant shapes

With respect to consonant grapheme shapes (RK1), Lithai mainly uses the same akshara-type forms as RK, but with more refined execution. The Ram Khamhaeng inscriptional text explicitly states that the king himself created the letters, but clearly most shapes in the RK-Lithai inventory constitute simplifications of Old Khmer prototypes. Most of these also closely resemble Old Mon. However there are unexpected changes: graphemes representing palatals [c], [c^h] and velar nasal [ŋ] are reversed horizontally. This inverse relationship continues into Modern Khmer and Thai. The flipped forms resemble shapes in some South Indian scripts (Bright 1996: 415). A possible motive lies in aesthetic consistency: the changes serve to align the Thai graphemes in a general design whereby right-hand vertical sides of letters are unbroken.

Compare: <𑀓> Modern Khmer [c^h]; Old Khmer and Old Mon similar.

<𑀛> Standard Thai [c^h]; RK and Lithai scripts similar.

4.3 Indic etymological retentions

Lithai and RK are similar in preserving extensive Pali-Sanskrit inventories. (Grapheme counts of Table 1 include Indic extras even though they probably were never phonemically distinctive for Thai speakers.) Etymological spellings are retained (RK2) but they are not always ‘correct’ by classical standards. Further complexity arises from poetic spelling alternations (Hudak 1980: 105). Morphophonemic complexity also results from borrowed forms with residues of Pali and Sanskrit derivational morphology.

Although RK innovations are generally shallow in orthographic depth with rather direct phoneme-grapheme correspondence, etymological treatment of Indic vocabulary moves the writing system in the opposite typological direction. Syllable-final consonant aksharas often appear in Indic loans that would not be pronounced following Thai syllable-coda phonological rules. (Later texts mark many of these with a special superscript.) As in precursor Old Khmer, graphemes for Indic retroflex consonants are retained but spelling variation shows that they do not represent distinctions articulated in most speech. In RK and Lithai texts, these forms are occasionally treated as alternates (or allographs) for representing

inherited Tai dental-alveolar stops. (So ‘grapheme’ would need some qualification when applied to these aksharas.)

Similarly, graphemes for Pali-Sanskrit voiced aspirates ([bh], [dh], etc.) and for the three Sanskrit sibilants ([s], [ʃ] [ʒ]) are retained. All three sibilant graphemes appear as allographic variants available to represent inherited Tai forms reconstructed in dental-alveolar [s]. This inflates the inventory. Standardization for Indic-provenance items is not apparent: in the Ram Khamhaeng Inscription, even the king’s father’s Indic name and the town name ‘Sukhothai’ are subject to variant sibilant spellings. Pro-fakery sceptics would need to consider why a faker would have displayed such flagrant allographic variation and disregard for norms of Indic spelling.

4.4 Consonant cluster representation

The innovation (RK8) of representing consonant clusters by horizontal conjuncts is also characteristic of all Lithai and later Thai sources. (In a few Lithai-era inscriptions conjuncts appear for [r] clusters while others are written horizontally.) Unlike RK, cluster components are not written touching. This orientation for consonant clusters differs sharply from vertical conjuncts in the presumed prototype Old Khmer, but Tamil shows similar placements (Steever 1996: 426); see also 4.7.

4.5 Aspirated continuant digraphs such as หม <hm>, หน <hn>, หล <hl>

One of the most astonishing early Thai orthographic innovations, characteristic of Lithai script as well as RK, is recognition of a distinctive class of earlier aspirated continuants (RK5). As far as can be determined, such aspirated continuant sounds were absent in Old Khmer but phonemic in earlier Thai stages. (Old Khmer shows occasional conjunct combinations like <h> + <y> but the consensus is that <y> in such cases represents a vocalic diphthong.)

Remarkable corroboration of the phonology motivating this orthographic innovation can be found in languages of China, distantly related to Thai, where this class of sounds is currently distinguished. For example, items like ‘pig’, ‘flea’ and ‘new’ in the Tai-Kadai language Mulao are articulated with a distinctive initial labial aspirate nasal [ɱ] (Wang & Zheng 1993: 117). Based on standard comparative methodology, Proto-Tai reconstructions for items of this type coincide with the Mulao pronunciation. The Proto-Tai reconstruction is usually written *hm (Li 1977: 74; Pittayaporn 2009). *Regular Thai spelling of cognate items is also with a digraph corresponding to <hm>.* Items meaning ‘pig’, ‘flea’, ‘new’, etc., are written with the <hm> initial digraph in modern Standard Thai, however they are now

pronounced with plain nasal [m] and are assigned rising or low tone, as taken into account below (4.8–9).

𑄓𑄣 <hm u> ‘pig’ spelling attested c. 1360 (Na Nagara & Griswold 1992: 370)
 ” ” ‘pig’ modern Standard Thai [mu:], no marker = rising tone

In effect, RK, Lithai and Standard Thai agree in the consistent use of this set of innovative digraphs, written with two components as though <hm>, <hn>, <hl>, etc., These are distinguished from plain-nasal forms, written as though <m>, <n> and <l>, etc. This innovation warrants the hypothesis that Thai speakers in an early period retained a Mulao-like aspirate nasal articulation for lexical items in the ‘pig’ class, and correspondingly for other similarly-spelled items. Otherwise, why invent the striking digraphs? These sounds were presumably heard as having [h]-like features, motivating the orthographic <h-> forms. The further significance of these digraphs for the fakery debate is considered in 4.9.

4.6 Creation of new graphemes from old

Additional consonant distinctions not in prototype scripts were indicated by modifying prior graphemes to invent new ones. Phonological similarity was coded in iconic manner through matching orthographic resemblance. One RK strategy expanded the graphemic inventory for labials by crafting new letter shapes through extending the right vertical side of a preexisting form upwards. At first there was looping as well. Compare modern forms:

<𑄓> Standard Thai [b]; <𑄣> Standard Thai [p].

Following a similar method, earlier graphemes were modified through nicks or notches. For example, an Old Khmer prototype letter had apparently represented preglottalized or ingressive sound [d̚]; the letter type was borrowed to code an analogous early Thai sound also reconstructed as *d̚ (Pittayaporn 2009: 70). Such sounds are still distinctive in Tai-Zhuang varieties in southern China (Holm & Meng 2015: 39). In RK and Lithai scripts, to distinguish the phonemically similar [t] sound, a notch was made on the prior [d̚] grapheme’s top. The Standard Thai contrast is now pronounced [d̚] / [t̚], with slightly modified graphic forms:

<𑄣> Standard Thai [d̚]; <𑄣̚> Standard Thai [t̚].

Similarly, graphemes like those in Old Khmer for the velar stops [k^h] and [g] were taken directly into the RK inventory. However early Thai also distinguished corresponding velar fricatives [x], [ɣ], absent in Old Khmer. To represent these sounds, two new graphemes were invented by notching prior stop graphemes. In the Ram

Khamhaeng Inscription, all four graphemes <kh>, <g>, <x>, <y>, are used consistently to mark lexical distinctions reconstructed for earlier stages of Thai.

This particular four-grapheme set has played a role in the fakery debate (Gedney 1991: 203). The phonemic distinctions that the set codes, while still made in White Tai and some other Tai varieties, are no longer made in modern Standard Thai (cf. Li 1989; Pittayaporn 2009: 73). Vickery (1991a: 25ff.), on the fakery side of the argument, presented a detailed examination of spelling *inconsistency* in the Lithai corpus. Through these results, in accordance with well-established philological/orthographic methodology, it can be deduced that merging sound changes [x] > [k^h] and [ɣ] > [g] must have been underway during the 14th-century Lithai period. The fact that the RK system, on the other hand, marks these distinctions *consistently* and in accordance with Proto-Tai reconstructions would seem to be a strong indicator that RK orthography must precede that of Lithai. If not, the faker must have been a very competent comparative Tai linguist indeed, familiar with remote data not generally documented until the 20th century. The irony here is that inscriptional analysis intended to establish the inscription's fakery (Vickery 1992a) can rather be interpreted to advocate its authenticity.

4.7 Vowel developments

How unmarked (inherent) vowels were pronounced in earlier periods of Thai must remain speculative. As noted above (RK3), the Old Khmer convention for representing what was probably medial short vowel [a] through coda grapheme doubling was maintained in RK. Significantly, a shift is observed during the Lithai period (Suphanwanit 1984: 445; Na Nagara & Griswold 1992: 467). Texts before about 1360 continue with phonemic [C₁a C₂] = orthographic <C₁C₂ C₂>. For later inscriptions, an innovation is gradually introduced: a curved superscript diacritic replaces the final <C₂> graph of the syllabic coda (perhaps originally intended as a repeat sign?). This diacritic steadily gained acceptance and is still in use but has shifted a little leftwards. A word meaning 'day', Standard Thai [wan], is illustrated in (i) in accordance with RK and early Lithai; in (ii) as the item appears in later Lithai sources and in Standard Thai (slightly different contemporary letter forms are shown):

- Compare: i. <๖๓๓> RK and early Lithai
 ii. <๖๓̂> later Lithai and Standard Thai

An innovation (RK7) to distinguish phonemes [ae:] / [e:] through a doubling of the <e:> form is also characteristic of Lithai script. On the other hand, the RK distinction [u:] / [i:] is evident only in a few texts. Others indicate a conservative reversion to Old Khmer non-distinctive practice. On comparative evidence, Old

Khmer too probably distinguished high back unrounded vowels [u] and [u:], but these were represented orthographically by the same front-vowel superscripts and initial alternates as for [i], [i:] (Jenner 1981: 3).

For Standard Thai readers, the tendentious inscription’s on-line representation of all vowels (RK9) would be the most striking orthographic novelty. It needs to be emphasized that in most Brahmi-derived Indic scripts, including Old Khmer, vowels [i], [i:]; [u], [u:] and [e:] had *two* differing graphic representations depending on the vowel’s syllabic position. When occurring word-medially or finally, [i], [i:] and [u], [u:] were represented by superscript and subscript forms respectively. However for these vowels occurring word-initially (or even syllable-initially), fuller distinctive initial graphemes were written on the akshara line. *The RK innovation consisted in reanalyzing the on-line word-initial forms as also applicable to word-medial and -final high vowels.* This new interpretation came with a minor potential ambiguity, since sequences [i: C] and [C i:] would fall together, as illustrated in Table 2.

It is worth noting that Old Tamil script made a similar on-line innovation (Fedorova 2012: 7; Steever 1996: 426). Recall also Tamil consonant cluster similarities (4.4). Furthermore, Tamil inscriptions are known from Nakhon Srithammarat, a Southern Thai Buddhist site mentioned in the Ram Khamhaeng inscription as the homeland of the head of the Sukhothai Buddhist order (Hudak 1990: 45–46). A monk of this stature is sure to have been involved in orthographic matters. However without further evidence a direct link with Old Tamil remains speculative.

In any case, this high-vowel initial grapheme reanalysis is *not* characteristic of Lithai or of later Thai orthography. As Table 2 shows, written Thai of the 14th–21st centuries aligns (realigns?) with the traditional vowel representations of Old Khmer: diacritic marking of high vowels. An interesting difference from Old Khmer lies in post-RK representing of initial-position vowels as diacritics on the glottal-stop sign <ʔ> ; cp. (1) Table 2 (1), ‘Indra’ in later varieties of Thai.

Table 2. Treatment of high-vowel graphs in Thai script varieties

	RK (13th c.?)	Lithai (14th c.)	Standard Thai (21st c.)
1. ‘Indra-’ formative in proper names	𑄢𑄣𑄤𑄥 <i: n d r>	𑄢𑄣𑄤𑄥, 𑄢𑄣 𑄢𑄥	อิ น ท ร
2. ‘good’ PT *dʰi: (class A);	𑄢𑄣 <i:> <dʰ>	𑄢𑄣	ดี [di:] mid tone
3. ‘elder sibling’ PT *bi: (class B);	𑄢𑄣 <i:> tone marker: class B	บิ, ฬิ	ฬิ [pʰi:] falling tone

If the inscription is authentic, then the RK change must have seemed too revolutionary or uncouth for readers and writers of the following century. As noted

above, Lithai's corpus reveals strong pro-Indic literary interests and sentiments, along with substantial Khmer influence. On the other hand, if instead the inscription is a hoax, presumably the motivation for displaying this odd innovation would have followed from a different attributed indexicality: the innovation was set to fool nineteenth century Europeans into thinking that early Thai orthography was alphabetic.

4.8 Tone-marking developments

We are now in a position to trace the novel inclusion of tone markers as elements in the Ram Khamhaeng orthographic system (RK10). With interlinear space vacated through integrated strategies outlined above, room becomes available over consonants for two tone-marking superscript diacritics. In the RK text, one marker is a single stroke <'>, illustrated in Table 2 (3) for the item 'elder sibling'. The other tone marker resembles the sign <+>; see Table 3. By the 15th century, the shape of this latter marker shifts to resemble a small figure <2>, its current form.

As for possible conceptual precursors for Ram Khamhaeng tone marks, in Vedic Sanskrit a system for indicating intonation (*anudatta* and *svarita* pitches) in chanting makes use of various symbols, including both + and ' (Diller 1996b: 247). However the antiquity of this system is undetermined. Furthermore, is it not clear how such marks might have diffused into the upland Thai milieu. For the time being influence must remain speculative.

These two diacritics, along with a class of unmarked items, make possible the representation of three tonal distinctions. These three coincide with early-stage tonal phonemes reconstructed through the Comparative Method (Li 1977; Gedney 1991; Pittayaporn 2009). It must be emphasized that *independent* strands of orthographic and comparative evidence (i.e. inscriptional marking and dialect comparison) converge here isomorphically. They match orthographically marked RK words with correspondence patterns in inherited Tai vocabulary. Most such words are monosyllabic and assigned to one of four specific tone classes. For syllables ending in vowels or nasals (open), available classes are labeled by comparativists as A, B and C; for syllables ending in stops (closed), assignment is to class D. The consistent Ram Khamhaeng orthographic practice (RK10) is to mark B with <'>, C with <+>, and to leave A and D forms unmarked.

In the Ram Khamhaeng Inscription, tone marking follows this pattern and is regular and uniform. However, a problem for the traditional account is that in inscriptions of the 14th century and beyond, the system succumbs to competition: tone marking becomes optional and sporadic. Instead, diacritics often come to mark vowels taken as inherent in the Ram Khamhaeng system (RK4). For example, in later texts, the superscript diacritic <'> is found not as a tone mark but used

to indicate formerly-inherent vowels (Vickery 1991a; Suphanwanit 1984: 448). So a competing principle becomes apparent: mark vowels explicitly but leave tones unmarked or demote tone-marking to optional status.

Inherited Tai lexical items in classes B and C continued to be tone-marked as in the RK system in some sources but not in others. Well after Lithai's reign, an inscription of 1399 follows the RK superscript marking of tones for about half of the relevant items (Inscription 93: Fine Arts Department 1983: 319; Na Nagara & Griswold 1992: 49), although by this time the superficial shape of the + marker has shifted as noted above. Yet other contemporary texts show no tone marking at all.

What was motivating this inconsistency in scribal practice? One plausible account based on phonological change is developed in the following subsection. For some readers and writers of the period, it appears that the traditional tone marking system had become an unnecessary extra. Genre was clearly significant. For example, traditional Thai poetry conservatively maintained fixed patterns based on tonal regulation. In particular, the *khlong* form specified syllables where inherited vocabulary with B and C tones could occur. Evidence is clear that earlier tone-marking practices were maintained for centuries in poetic texts written by court poets (Pittayaporn 2016; Gedney 1991).

Medium, available writing space and aesthetics may have been concerns as well. Orthographic reversion to Old Khmer norms for marking high vowels by diacritics would have meant reduced room for superscript tone marking. Writing both tone marks and vowel diacritics in the same interlinear zone might have seemed to some scribes cluttered and unappealing, especially on stone. Comparison of 14th-15th century sources indicates a high degree of experimentation and lack of standardization. Could superscript <'> be allowed different functions? Should two tiers of superscripts be allowed, placing tone marks over superscript vowel diacritics, as currently characteristic of Standard Thai? Scribal answers differed.

4.9 Sound changes or clever fakery?

This subsection returns to factors introduced in Table 1. The conventional view is first considered, in which increase in orthographic depth is seen as the result of a combined set of sound changes. In this perspective, several laryngeal articulatory processes are regarded as interacting. Rate and mode of glottal approximation were shifting – hence tones were changing. Along with suprasegmental shifts went concomitant modifications in voice-onset timing – hence in parameters of voicing, aspiration and preglottalization. These features were undergoing redistributed roles in consonant distinction. Five interlinked phonological changes discerned during the critical period between the 15th and 18th centuries are enumerated

below. They include three cases of consonantal merger (1)–(3) along with two further diachronic laryngeal processes (4)–(5):

- (1) Earlier aspirated nasals and similar continuants became voiced unaspirated (e.g. *hm > m).
- (2) Earlier voiced stops became voiceless and aspirated (e.g. *b > ph); e.g. Table 2 (3).
- (3) Earlier voiced fricatives became voiceless (e.g. *v > f).
- (4) Earlier preglottalized or imploded stops became plain voiced stops (e.g. *ḃ > b).
- (5) Phonemic tonal distinctions doubled from three to six, then coalesced ultimately to five.

As for tones, the diachronic reconstruction supported by most historical linguists is that the original open-syllable tones A, B, C split (Gedney 1991). What had been allophonic tonal variants conditioned by initial consonant type were upgraded to phonemic contrasts (Brunelle & Kirby 2016). The result was six tones. Subsequently, as illustrated in Table 3, two of the resulting six tonal phonemes recombined, yielding the present-day five-tone system of modern Standard Thai. Change (2) must have preceded change (4) so the sequence was ordered but precise articulatory mechanics must remain outside our present scope.

Evidence for these changes is discussed by Gedney (1991). Ross (1996) and L-Tongkum (1997) point to conservative Tai varieties that have not undergone all of these changes and thus better reflect some aspects of RK phonology; recall also the Mulao example above (4.5). These sources also consider how tone-class D items with closed-coda syllables were conditioned by a vowel length parameter, further increasing non-linear and hierarchical aspects of current Thai orthographic structure. Hudak (1980: 6–7) and Pittayaporn (2016) summarize how these changes are reflected in traditional Thai poetic meters, including the *khlong* form mentioned in 4.8.

For purposes here, the significant aspect of these sound changes taken together is that except for a few homonym respellings, *Thai orthography remained largely conservative*. What was required was a new mode of interpretation. Graphemic oppositions originally coding *consonantal* phonemic distinctions now instead came to code *tonal* contrasts. For example, lexical minimal pairs such as (i) ‘dog’ spelled with initial digraph <hm> and (ii) ‘to come’ spelled with single-grapheme <m> had earlier differed as to consonantal [+/- aspirated] manner of articulation. After the changes, both were articulated with [– aspirated] initials, but occurring with different syllabic tones: (i) [rising] and (ii) [mid] respectively. Syllable-scope

tonal phonemes had now taken on functional load, making the lexical distinction. Nevertheless, spelling remained as before. This implies a decided increase in hierarchically-organized orthographic depth.

- (i) **หม** <hm a:> modern Standard Thai 'dog': [ma:], no marker = rising tone
- (ii) **มา** <m a:> modern Standard Thai 'to come': [ma:], no marker = mid tone

Furthermore, in written texts tone markers now had acquired *differing* tonal interpretations depending on which *orthographic* groups of consonants were being marked. (In fact, two extra tone markers were later added.) This is because earlier phonological information obliterated by sound changes was maintained in conservative spelling.

The sociolinguistic background for the changes was significant: it was one of bilingualism and dialect interaction involving confrontation of tonally-different Tai phonological systems. This was happening as the Thai realm of Ayudhya, to the south of Sukhothai, was expanding and consolidating political control. Although scribes in Ayudhya could appreciate the basic utility of the inventory of Sukhothai symbols, what the orthography had been signifying in the earlier period was shifting. By the 15th century, what had been earlier planned as a *directly phonemic* marking system with high grapheme/phoneme isomorphism was breaking down. Tone markers and what had been consonant distinctions were thus shifting in interpretation toward a *more abstract or morphophonemic status*.

An interesting consequence of the shift toward abstract interpretation was that a wider set of dialects could be accommodated by the RK-Lithai orthography. Because of this flexibility, during the 15th-17th centuries the writing system was taken up locally to represent phonologically divergent Northern Thai and Lao through different interpretive rules; similarly, the seven-tone system of Southern Thai. Tonal systems of these varieties were phonemically dissimilar but could be indicated through the same orthographic representations, with local interpretations adopted.

The preceding scenario can be considered the conventional account, taking RK orthography as foundational. For the fakery challenge, some critics have rejected the Ayudhya-era sound-changes entirely, arguing in particular that the proposed devoicing change had occurred far earlier, in fact prior to the inception of Thai writing (Vickery (1991b: 374ff.)). The speculation is greatly strengthened by a parallel devoicing history in Khmer, where consonant devoicing is accompanied not by tonal change but by differentiation of vowel quality (separation into two vocalic registers). However, dating for Khmer devoicing has remained elusive.

Orthographic treatment of Thai aspirated continuant digraphs provides more for critics to consider. Recall that the initial consonant sound in 'pig' for Tai-Kadai

languages like Mulao occurs with aspirated labial-nasal articulation. In Sukhothai texts words like ‘pig’ and ‘dog’ are written with digraph <hm> and are tonally unmarked (Fine Arts Department 1983: 73). The well-established practice of tracing diachronic phonology through spelling variation poses a hurdle for those denying sound change in the 15th–17th centuries. It is just during this period that one occasionally finds orthographic digraph vs single-grapheme confusion among initials, such as <hm> vs plain <m> or <hl> vs plain <l> (e.g. National Library 1986: 135, 155, 184). The straight-forward inference is that mergers were in progress along with orthographic reinterpretation. Instability led to scribal variation.

Even stronger orthographic evidence comes from a complex sound change that resulted in total homophony, occurring as six distinctive tones reduced to five. As tones merged, earlier voiced items marked B with <'> merged with voiceless ones marked C with <+>. At the same time, in line with the changes mentioned above, former initial aspirated continuants lost aspiration and became voiced. Concurrently, former voiced stops became unvoiced and aspirated. This complex homophony is another case of what Share & Daniels (2016: 24) consider a dimension of orthographic depth in their scheme, whereby originally distinct sounds once spelled differently merge while the spelling is retained, as in the case of English *peak/peek/pique*. Standard Thai orthographically distinguishes a number of homonyms of this type.

In Thai, this type of merger has also led to certain respellings that came to be incorporated into Standard Thai. Table 3 shows a characteristic example. The table’s panels indicate a phonological tonal and consonantal merger, followed by orthographic respelling. A telling example, a verb ‘to play’, appears in the Ram Khamhaeng Inscription with tone marker <+> indicating tone class C (Fine Arts Department 1983: 13). The lexical item occurs in the inscription with aspirated lateral initial represented through digraph <hl>.

Subsequently in the critical period the same lexical item is respelled as in the right panel, now occurring with single-graph initial: voiced unaspirated lateral <l> and B tone marker. The inference is that between the 14th and 17th centuries, the period of the respelling, sound change with a combination of tonal and consonantal mergers has been in progress: items earlier written <hl> with reflex of proto-tone C have lost their phonemically-distinctive aspirated continuant articulation and have merged with items in <l> with tonal reflex of proto-tone B.

It is worth emphasizing that the RK orthography presents what the comparative method reconstructs for the early period accurately and without any known exceptions (Gedney 1991). On the face of it, it seems highly unlikely that a 19th-century faker would have understood diachronic phonological processes such as in Tables 1–3 well enough to undo them orthographically in order to create a hoax text. But more basically, why would a faker have bothered with such

epigraphic minutiae, especially if the inscription were produced for the consumption of European officials?

Table 3. Orthographic shifting of tonal markers and classes

	RK and 14th century	17th century and Standard Thai
‘to play’	ເລີນ	เล่น
contrastive components	<e> <hl> <n> tone marker = class C	<e> <l> <n> tone marker = class B = [len] with falling tone
merger status	C marked with <+> distinct from B marked with < ’ >	C <+> merges with B < ’ > ho- mophony and respelling

The timing of devoicing can also be studied through loanwords. Austronesian loans into Thai with voiced-stop consonants in Malay include cultural loans like *durian*, *sagu*. These appear to have been borrowed into Thai during an early period when Proto-Tai consonants *d, *g were still voiced, matching the sounds in donor-language Malay. In agreement with the preceding section, the initial sounds of these items would then have been swept up in the global changes, causing devoicing with aspiration: [d] > [t^h]; g > [k^h]. In post-seventeenth century Thai, including in modern Standard Thai, these items are indeed pronounced [t^hurian]; [sa:k^hu:], with predictable tones. The items are written with the graphemes consistent with Proto-Tai *d, *g that would have still been voiced in the earlier contact period. A sceptic arguing that Proto-Tai devoicing had occurred prior to the inception of Thai writing would need to account for loans such as these, as well as for the spelling variation noted above.

5. Concluding remarks

The preceding sections have shown examples of how general proposals in orthographic analysis are of relevance in clarifying the contested origins and early history of Thai writing. Focus has been on attribution, orthographic depth and on assumptions regarding unidirectional development.

An indicative example of the relevance of these notions can be seen in the assumptions of participants in the Thai inscriptional debate. A leading pro-fake protagonist contends that “...signs are gradually devised as they are perceived necessary to lend clarity to confusing contexts, and only at the end of such gradual development are they codified into complete systems” (Vickery 1991: 16). This is presented as a common-sense maxim that agrees in discursive emphasis with the one-dimensional evolutionary vector for orthographies advocated by I. J. Gelb

(1952). But this view is now far from conclusive. Daniels (1996: 7) and Share & Daniels (2015:21) show that unidirectional and single-dimensional modeling is inadequate.

Presuppositions of the type cited may retain heuristic value as hypotheses to investigate but in concrete cases, such as the Thai one here, orthographic history surely needs to involve more than a cybernetic template of symbol clarity and confusion. Simple functional signals are but one orthographic dimension. As Primus (2004: 240) observes: “orthographies have been criticized for mapping spoken language imperfectly. But functional imperfection is a natural trait of language.” In particular, the orthographic marking of Thai tone demonstrates how indexical attribution and similar sociolinguistic factors, along with increasing orthographic depth due to phonological change, can overtake the earlier functional ‘clarity’ of direct phoneme-grapheme correspondence.

An instructive comparison is provided by another suprasegmental marking practice: Ancient Greek accentuation. Of course, Greek accents were not marking lexically phonemic tone so the parallel is far from exact, but there is still a lesson to be learned for debate participants. Probert (2006: 49) describes how the classical three-accent system of Ancient Greek was essentially codified and promulgated by Alexandrian grammarians hundreds of years before it was accepted as general scribal practice. Specifically, earlier uncial manuscripts left little interlinear space for accents. As calligraphic styles changed, the Alexandrian accents were included. Genre too was critical. In the early period, accents were mainly confined to poetic texts. By the time marking had become more widespread, phonological change (Byzantine shift to stress accentuation) was already affecting how the accent marks were to be interpreted (Tsantsanoglou 2010). Again, an account restricted to a simple arrow-like evolutionary model misses key aspects of the denser multi-dimensional diachronic process. General similarities with the Thai situation can be noted: tone-marking as especially salient in poetry (4.8); constraints in relation to orthographic space (3); and the critical role of diachronic phonological change, requiring reinterpretation of diacritic symbols (4.9).

For Thai, the historical course of orthographic development seems more intricate than for Greek. Attaining working literacy in Thai implies mastering an orthographic system that has accumulated a daunting hierarchical structure. This requires protracted pedagogical effort on the part of Thai educators over early years of schooling (Winskel & Iemwanthong 2010; McBride-Chang, et al. 2012; Burnham, et al. 2013). To teachers’ and students’ credit, Thailand maintains a high rate of literacy (93.98%, UNESCO 2015).

Modification continues. Although highly standardized with official dictionary and manuals, normative spelling has often been overridden in popular culture to represent more speech-like articulations. In current texting and blogging,

emotional emphasis is routinely shown through new (mis)spellings. Examples abound: vowel signs are repeated for drawn-out emphasis, tone markers are placed to mark special expressive intonation, etc. Online social identity of bloggers is constructed and enhanced through the attributed indexicality of such misspellings (Tagg & Seargeant 2012). So the orthography's complexity is a trove of accessible resources for further innovation.

This review of the contentious inscription's status and of later Thai orthographic history leaves debate agenda open, but the orthography's accumulated multi-dimensional orthographic depth seems indisputable. If most of the diachronic account proposed above is upheld, the strong indication is that the first stages of written Thai were based on close phoneme-grapheme isomorphism. This includes perhaps the earliest attested case of phonemic tone marking in a general-use orthography.

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