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Dangla historical tonology

Abstract

East Dangla and West Dangla, two dialects of the Dangla language which belongs to the Chadic language family, differ substantially in their tone systems. In numerous lexical items, entire or partial tonal inversions are observable. Earlier research has not succeeded in boiling this down to regular sound correspondences. In the meantime, data from Central Dangla as a third dialect have become available, which provide important insights into the matter. Based on all available materials, a new attempt to establish the tonal correspondences is undertaken here. This results in a reconstruction of the tone system of Proto-Dangla, the hypothetical ancestor of the modern varieties, together with a chronological elaboration of the tonal changes that occurred in the individual dialects.

Keywords

East Dangla, West Dangla, tone system, tonal inversions, tone system of Proto-Dangla.

1. Introduction

Together with some of their neighbours (in particular the Bidiya, Kenga, Migama, and Mokilko), the Dangla people, also known as Dangaléat¹, constitute a grouping known as “Hajaray” (in French spelling “Hadjeraï”), Arabic for “mountaineers”, who are reputed to have preserved a particularly traditional way of living and to have come under Arabic and Islamic influence only rather lately (Le Rouvreur 1962: 121–123). The Dangla language (*dàŋlā* in East and Central Dangla, *dāŋlā* in West Dangla)² belongs to the Eastern branch of the Chadic

¹ A French adaptation of the Chadian Arabic term *dangaliyyāt* “Dangla people”.

² East and West Dangla terms from Fédry (1977: 87). The Central Dangla name of the language occurs in the Audio Bible (see §2) in phraseologisms such as *ŋà dèlī-cō dāŋlā ámán* “he beat (to) them Dangla saying” = “he said to them in parables” (Mk3:23).

stock; its total number of speakers was estimated by Ethnologue (<https://www.ethnologue.com/language/daa>) to be 60,000 as of 2005. Dangla forms a dialect continuum from which we have substantial documentation of three different varieties that have been called East, Central, and West Dangla.

Like all other Chadic languages, Dangla is a tone language. Jacques Fédry, the eminent researcher of West Dangla, noticed that the differences between West and East Dangla are most pronounced in the tone system. In many words, even a tonal inversion seems to have been at work. Among the numerous striking tonal divergences, I just mention the two major tone classes of Dangla verbs, one of which has a high tone in the east but a low tone in the west (E[ast] *máké* = W[est] *màkè* “piler”, Fédry 1974: 6), while the other one has a low–mid contour in the east but a high–low contour in the west (E *àlē* = W *álè* “pleurer”, Fédry 1974: 6), or the subject proclitics, whose tones are diametrically opposed (e.g. E *kí* = W *kì* “tu (masc.)”, E *ɲà* = W *ɲá* “il”, Fédry 1974: 11), or finally the singular and plural forms of the noun for “foot”, which are sg. *ásín*, pl. *àsín* in East Dangla (de Montgolfier *et al.* 1976: 22) as against sg. *àsè*, pl. *àsè* in West Dangla (Fédry 1971a: 21).

Fédry considered the tonal differences an enigma which he investigated in two papers (Fédry 1974 and 1977)³ without having been able to bring it to a convincing solution. Fédry did not succeed much better in his 1977 publication despite incorporating external evidence from two other East-Chadic languages, because these in turn may have experienced various tonal developments which add yet more to the uncertainties. Finding himself unable to establish regular tonal correspondences between the two Dangla dialects using the methods of historical linguistics,⁴ he finally resorted to an entirely different track. He proposed that either the common ancestor of both dialects might still have been non-tonal and both groups introduced tone independently, or, as an alternative explanation “suggérée par la très forte opposition des deux groupes dans l’histoire”⁵, that there might have been “une recreation arbitraire par l’un des deux groupes, celui de l’ouest éventuellement, recomposant délibérément un système tonal

³ In the programmatic title of his 1974 paper: “*pátó* à l’est, *pàtò* à l’ouest, ou l’énigme tonale des parlers dangaléat”, the Dangla noun for “sun” features as an example of the tonal inversion.

⁴ “[...] nous nous trouvons en face d’une très grande diversité de schèmes tonals, et d’une extrême complexité dans la correspondance tonale entre les deux parlers” (Fédry 1974: 15); “très grande variété de schémas tonals dans les deux parlers, sans qu’on puisse établir, semble-t-il, de correspondance entre les deux parlers” (Fédry 1974: 22); “une divergence tonale trop systématique pour être le fait du hasard, mais qu’on n’arrive pas pour le moment au moins à expliquer complètement” (Fédry 1974: 23); “une divergence systématique du schème tonal (ordinairement inversé) dont on peut repérer les constantes mais dont on ne possède pas encore le clef” (Fédry 1974: 26); “vous croyez saisir une règle et vous trouvez aussitôt une foule d’exemples qui la détruisent, ces exemples eux-mêmes divergeant entre eux...” (Fédry 1977: 104).

⁵ As opposed to the Danglas of the west, those of the east collaborated with the Wadai empire which played a role in the introduction of Islam (Fédry 1974: 2).

«à contrepied» de l'autre" (Fédry 1974: 23f.). Both ideas seem utterly unrealistic to me, in particular the sociolinguistic approach presuming that a group of speakers should deliberately have alienated the tones of their language for political reasons.

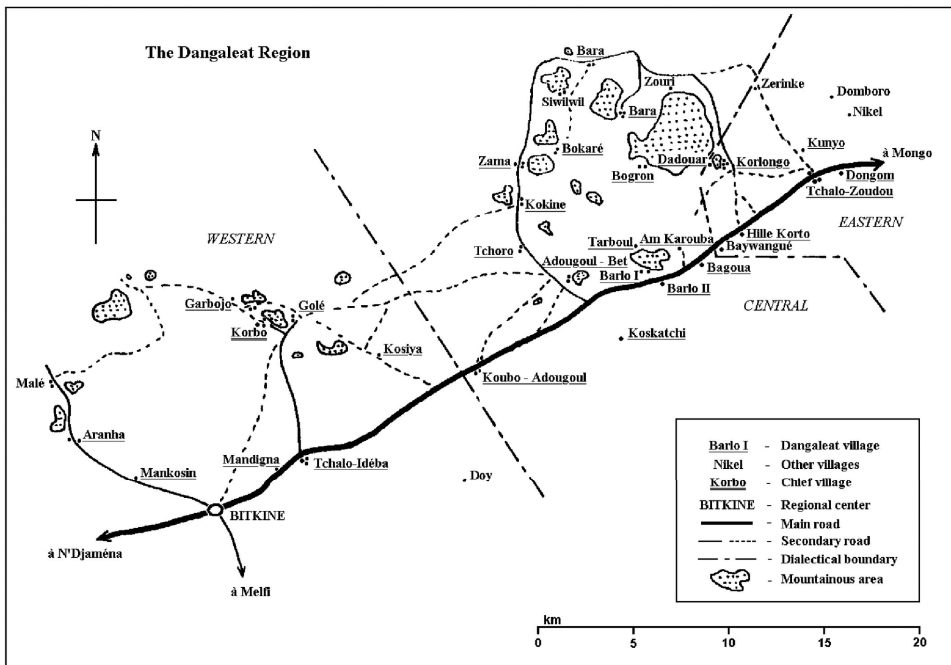
Fédry left no doubt that further research on Dangla tone was desirable.⁶ It was Wolff (1986: 568–580) who took up the challenge of explaining the tonal differences between East and West Dangla, focussing on verbs, with the commendable goal in mind to avoid a flip-flop tone reversal rule. He ended up proposing a rather complex set of rules, but one major component of Wolff's system is the ad-hoc assumption of a "pitch accent" feature: "Each verb had the potential to occur both in a stressed and unstressed form, i.e. a /+H/ «tone» would be added to the first syllable in the stressed form" (Wolff 1986: 571). According to Wolff's theory, the "pitch accent" happened to be usually distributed inversely in East and West Dangla, so that the tonal inversion is not really explained but essentially derived from an antipodal distribution of his presumed pitch accent. I find this approach too circular and will not discuss it further here.

I will now take a fresh look at the topic, integrating also data of the Central Dangla dialect as a missing link, located half-way between the two others, of which no information at all was available to Fédry nor to Wolff. Besides Dangla, there are several more pairs of closely related languages or dialects for which fundamental tonal differences up to a "tonal inversion" have been reported. Within the Chadic stock, this includes Geji dialects (Caron 2013), Kotoko languages (Tourneux 2007)⁷, Kwang dialects (Lenssen 1984: 29–33), Lamang vs. Hdi (Wolff 2013), Ngamo dialects (Schuh 2009), and Zime dialects (Jungraithmayr 1978: 10f.). It is hoped that the present study may contribute to finding natural explanations of tonal inversions also in these and other language groups.

I wish to express my deep gratitude to a number of scholars who shared vital unpublished materials with me: First of all to Lawrence Burke, who gave me access to his documentation of Central Dangla, which was of crucial importance to the present study, but also to Pascal Boyeldieu, Joseph Lovstrand and Erin Shay, who supplied me with various important unpublished materials.

⁶ "[...] cette communication voudrait inciter linguistes et étudiants à poursuivre l'analyse des deux lexiques" (Fédry 1974: 3). Somewhat more sceptically: "Une analyse de la structure profonde permettra-t-elle un jour de rendre compte de la diversité de surface des schèmes tonals [...] ? Ceci ne nous semble pas certain." (Fédry 1974: 23).

⁷ Tourneux even adopts Fédry's sociolinguistic explanation also for his own case.



The Dangla region (from Burke 1995)

2. The dialects of Dangla

The best-known variety of Dangla is East Dangla, for which we have a dictionary (de Montgolfier *et al.* 1976), a grammar (Shay 1999) and various other studies e.g. by Judallah Abbakar *et al.*, Djimet Adalta, Carl Ebobissé and André Sopoyé. Most of the East Dangla documentation represents the idiom of the village Tyalo-Zoudou, but Sopoyé, who was also Erin Shay's main informant, came from nearby Dongom. The linguistic diversity between these sources seems to be minimal. Already the earliest record of Dangla, a few words recorded by Lukas (1937: 17) from an idiom that he called "Karbo", evidently represents East Dangla, with the high (and mid) tone misinterpreted as a word-accent.

At the opposite end of the area, West Dangla was researched in depth by Jacques Fédry, who published several studies including a dictionary (Fédry 1971a). I utilized his materials to extract some elements of the grammar (Peust 2014, 2016). All of Fédry's West Dangla data were recorded in the village Tyalo-Idéba, though the real centre of West Dangla is presumably the neighbouring village of Korbo, the chief village of the Dangla country and the traditional seat of their sultan.

A third variety, Central Dangla, was researched by Lawrence Burke, who authored two unpublished works on it (Burke 1995, 2003), which he generously made accessible to me. These data were recorded in the village Koubo-Adougoul. They can now be complemented by a translation of the entire New Testament into Dangla produced by Wycliffe Bible Translators in 2012, for which purpose the central dialect was chosen. While there is no official statement as to which particular village was selected to be the linguistic reference point, I assume that the New Testament was in fact written in the idiom of Koubo-Adougoul. This is, first, because Burke himself was a member of the translation committee (Burke 1995, preface) and, second, because YouTube hosts a film of a “dedication ceremony for the New Testament translation into the Dangaleat language” recorded in Koubo-Adougoul. The practical Dangla orthography employed for the Bible translation omits the tones and is therefore not of any use for the purposes of the present paper. But high-quality audio recordings of the whole New Testament were created by the organisation Faith Comes By Hearing. They are available on the internet alongside the written text (<http://www.bible.is/DAAWYI/Matt/1> etc.). Although the text is spoken by various speakers and there is no proof that they all originate from Koubo-Adougoul or even from any single village, I became convinced that at least the bulk of the audio recordings are, as concerns their tones, very close to Burke’s notations and can thus be regarded as testimonies of Central Dangla. When citing Central Dangla forms in the present paper, I will rely on Burke’s materials wherever available, but I will supply my interpretations of the Audio Bible for a number of words missing from Burke’s documentation (cited as “AudBib” followed by book and verse number).⁸

A variety of Central Dangla is also spoken in Barlo. A short story in that dialect is contained in Adalta (1978: 18f.), a text collection that otherwise focusses on East Dangla. A comparative word list of three Dangla dialects termed East, Central and West, obviously based on independent research, is to be found in Mbernodji & Johnson (2006), though without tone marks. Finally, Alio (2009: 12) provides a short list of eleven words including tones for three Dangla dialects, again based on independent research.

For citing my three most important sources, I will use the following shorthand notations: B = Burke (2003), F = Fédry (1971a), M = de Montgolfier *et al.* (1976). As in my former papers, the transcriptions taken from the various sources will be slightly normalized; note in particular that I represent the palatal series of consonants by the symbols *c*, *j*, *f* and *ɲ*, where Fédry and others write *ty*, *dy*, *dy* and *ny*.

⁸ I did not employ any particular technical device for pitch analysis apart from slowing down the tempo of the recordings, a manipulation that I found most helpful. Though giving only a single reference for each form, I usually checked more than one instances wherever possible.

3. The tones of Dangla

Agreement in the tone system is generally closest between East and Central Dangla, whereas West Dangla is more divergent. This applies to the number of contrastive tone levels in the first place. West Dangla has two of them (High, Low), while East and Central Dangla have three (High, Mid, Low) according to almost all investigators so far. The tones will be marked by diacritics (following Fédry, de Montgolfier, Burke, and others) as follows: *á* high, *ā* mid, *à* low, *ǎ* low-high rising, *â* high-low falling. Also in the substance of the tone melody, Central Dangla more frequently agrees with East than with West Dangla, as will be amply demonstrated below. Inspecting the Central Dangla Audio Bible, it is also my impression that there are three acoustical tone levels, even though I cannot claim to be always sure about the proper identification. At any rate, there is certainly some truth in this analysis of East and Central Dangla, which I will call the “ternary tone analysis”.

But there also seems to be some value to what I call a “binary tone analysis”. Already Wolff (1982: 201), in a review of Ebobissé’s (1979) study of East Dangla verbs, had the idea of reducing the three surface tones to two phonemic tones, but his suggested rules were based on limited evidence and would be hard to apply beyond the domain of verbs. Nevertheless, in particular one of his rules seems promising to me, namely “Hi[gh] → M[id] when following [or] before a Lo[w] tone”.

This rule can be corroborated by taking a look at the statistical distribution of tones. Under the ternary analysis, bisyllabic words should appear in nine possible tone patterns. I counted all bisyllabic entries in de Montgolfier’s (1976) East Dangla dictionary excepting those that he himself marked as Arabic loans (“ar.”), since these have a particular preference for the tonal patterns high–low and low–high, where high matches the Arabic stress syllable. Among these altogether 1219 entries, the nine possible combinations, sorted by frequency, are represented as follows: low–mid 34.6%, high–high 27.6%, mid–low 11.0%, low–low 8.3%, high–low 6.7%, mid–mid 6.6%, low–high 4.0%, high–mid 1.1%, mid–high 0.0%.

The four most frequent patterns turn out to be high–high, low–mid, mid–low, and low–low. I therefore suggest a binary tone analysis as an alternative. Under this analysis, there is an abstract high tone (H) which is realized as mid when adjacent to a low tone in the same word, and as high elsewhere: HH = high–high, LH = low–mid, HL = mid–low, LL = low–low. This analysis allows for a simplification of various morphological rules. For example, the infinitive of East Dangla verbs comes in two tone classes: high–high and low–mid, as in *káté* “to go” and *àsē* “to come” (Ebobissé 1979: 26). Under the ternary analysis, it remains unexplained why just two, and exactly these, combinations occur. Under the binary analysis, we can give the straightforward explanation that

the verb stem may be either H or L, while the final *-e*, which is the infinitive suffix, is inherently H, realized as high after H and as mid after L.

The imperative sg. of the East Dangla verb *íyé* “to bring” is *íyú*, but together with the low-toned 1st person sg. indirect object clitic *-òr* it becomes *īy-òr* “bring me!” (Shay 1999: 182).⁹ However, with other clitics such as *-gà* we get *íy-gà* “bring it!” (Shay *ibid.*). My tentative explanation is that the latter form probably derives from an earlier **íyú-gà*, where the succession of two high tones may have helped to preserve the tone level even before the following L clitic. The East Dangla term for “morning, tomorrow” comes in two free variants: *āāndīrā* ~ *áándīrā* (Shay 1999: 253). While all tones seem to differ on the surface, the only essential difference under the binary analysis would lie in the tone of the last vowel. Finally, there are morphemes whose abstract high tone is realized as high when neighbouring another abstract high tone but as mid otherwise: East Dangla “four” is *pōōdī*, but “eight” – an obvious reduplication thereof – is *pópópód* (Shay 1999: 115).

Under the binary analysis, neither the sequence low–high nor high–low should be expected to occur in lexical items. The words with these melodies are therefore in need of an explanation. One explanation has already been given above, namely that these melodies are typical of Arabic loans. While items marked as being of Arabic origin have already been excluded from my statistics, there are definitely more borrowings not marked as such by de Montgolfier, which so went into my count, e.g. *màtá* “quand?” (M198) < Arab. *matā*, or *mīrī* “impot” (M206) < Chadian Arabic *mīrī* “impôt” (Jullien de Pommerol 1999: 861) < Arab. *amīr-ī* “belonging to the emir”. But not all cases can be dismissed in this way, so a certain number of low–high and high–low items have to be acknowledged also for the native vocabulary. I can indeed suggest an explanation at least for the native high–low items. For several of these, variants are reported within East Dangla that display a low–high contour tone in the first syllable, which I consider as more original: “fish (pl.)” *bóósi* (M52; Shay 1999: 258) ~ *bōósi* (Adalta 1978: 26) • “fox” *gándà* (M112) ~ *gāndà* (Adalta 1978: 4) • “good” *gálà* (M109)¹⁰ ~ *gállà* (Shay 1999: 110; Sopoyé 1982: 2) ~ *gàllà* (Adalta 1978: 12) • “seven” *péesírá* (M243) ~ *pèésírá* (Ebobissé 1978: 5; Shay 1999: 115) • “stone” *dám̄bì* (M63) ~ *dāmbì* (Adalta 1978: 66) • “toad” *kóricā* (M172) ~ *kòrricā* (Adalta 1978: 14; Shay 1999: 33). It seems that when low–high contour tones were simplified, they survived as high, rather than mid, even before a following low tone. I conjecture that a distinction of low–mid and low–high contour tones in a single syllable is too subtle to be perceived reliably, so that any rising contour tones may have been uniformly

⁹ This form is confirmed by both Ebobissé (1979: 67) and Sopoyé (1982: 36), but M144 has *íyòr* “apporte-moi”.

¹⁰ As *gálà* also in Central Dangla (AudBib Mk9:5).

interpreted as low–high and therefore ended up as high after simplification.¹¹ My guess is therefore that most native East Dangla high–low sequences were originally LHL with a contour tone at the beginning. Evidence is less illuminative concerning native East Dangla low–high items, but the word “here” *èèdā* (M101) ~ *èèdā* (Ebobissé 1979: 115; Shay 1999: 242) may suggest that at least some of them can again be explained as formerly having had a contour tone, which was simplified to L in this case. An alternation of the same kind can be demonstrated also for the Arabic item “come on!” *yállà* (M341) ~ *yállà* (Sopoyé 1982: 42) ~ *yállà* (Adalta 1978: 66). This seems to indicate that the Arabic word accent was not initially rendered as a high tone, at least not in all cases, but rather as a contour tone, which was simplified to high only as a later development.

The sequence mid–high is not tolerated within a word. If a mid tone stem combines with a high tone suffix, the mid tone will change to high, as in East Dangla *sīŋ* “brother” + *-tí* “her” > *sín-tí* “her brother” (Shay 1999: 38) • *nōō áné* “I will say” + *-tí* > *nóó-tí áné* “I will tell her” (Ebobissé 1979: 62) • *sūgīnē* “market” + locative *-irá* > *súgín-irá* “to/at the market” (Shay 1999: 36). The inverse sequence high–mid is rare as well but appears to be marginally possible, most clearly so in the East Dangla word for “hyena”, which is recorded with a high–mid melody in no less than six independent sources: *bóórī* (M51; Abbakar *et al.* 1975: 34; Ebobissé 1978: 4; Fédry 1977: 99; Shay 1999: 218) ~ *bòórī* (Adalta 1978: 14). Here again, the last variant with a contour tone may provide a clue to the origin of this atypical tone sequence. Other candidates are more doubtful, such as the term for “louse”, which Fédry (1977: 94) quotes as *ittā*, whereas M143 has *ittā*.

There are in general quite a number of oscillations between high and mid tones in the documentation of East Dangla, e.g.: *áándò* (M16) ~ *āāndò* (Fédry 1977: 94) “night” • *àgindā* (M7) ~ *āgindā* (Shay 1999: 110) “big (pl.)” • *āwgì* (M27) ~ *āwgì* (M105) “goats” • *báákó* (M34) ~ *bākō* (Shay 1999: 84) “neighbour” • *bārkày* (Shay 1999: 202) ~ *bārkày* (M43) “cattle” • *bútú* (Fédry 1977: 104) ~ *būtū* (M56) “ashes” • *cārgò* (Abbakar *et al.* 1975: 39) ~ *cārgò* (M317) “doum-palm” • *gāmó* (M111) ~ *gāmō* (M112) “thing” • *gártà* (Abbakar *et al.* 1975: 32) ~ *gārtà* (M115) “sour” • *kárà* (M154) ~ *kārā* (Fédry 1974: 16) “open territory” • *kèdēr* (M160) ~ *kèdēr* (Ebobissé 1979: 37) “in the field” • *mīfī* (M203) ~ *mīfī* (Sopoyé 1982: 24) “children”. This suggests that the distinction tends to be unstable and/or difficult to perceive. Nevertheless, numerous other words are recorded in a consistent manner, and there are also a few minimal

¹¹ The available descriptions are not absolutely clear in this respect. Shay (1999: 33) does claim that a low–high and a low–mid contour tone can be distinguished, but in the most relevant practical case, namely the perfect tense of low–mid verbs that become monosyllabic by contextual elision of the final vowel, whenever there is a contour tone at all, the sources present it as low–high as in *gāsē* ~ *gās* “found” (Ebobissé 1979: 55; Shay 1999: 55), not as low–mid.

pairs, which prove that the distinction has to be taken seriously, such as *nééŋ* “être enceinte” ≠ *nēēŋ* “être mûr” (M216) • *tálé* “to see” ≠ *tālē* “to see (perf.)” (Ebobissé 1979: 51) • *sámàà̀nē* “bon” ≠ *sāmàà̀nē* “ciel” (Abbakar *et al.* 1975: 32).

The major remaining problem is the existence of a not insignificant number of “all mid” words with all syllables having a mid tone. This is not expected under the binary analysis, which predicts that polysyllabic words with all syllables carrying abstract H tones should be realized as “all high” (which is indeed very frequently the case, to be sure). Notwithstanding some oscillations between high and mid tones, East and Central Dangla normally agree in this respect (see my correspondence set no. 1 below), suggesting that the distinction between “all high” and “all mid” reflects something that already existed at the Proto-Dangla stage. On the other hand, the West Dangla cognates do not show any trace of this distinction. An explanation of the origin of the “all mid” words will be suggested below in §10.

I conclude from all this that there are evident traces of an underlying binary tonal system in East (and likewise Central) Dangla, which has turned into a ternary system only at a relatively recent stage, with the former binary system still showing through. In order to account for the intimate connection between the mid and the high tones, I will modify the terminology from this point on. When speaking of a H tone without further qualification, this will designate the abstract high tone, whose surface realization is either “high” or “mid”. It contrasts with the L tone which is clearly just a single phonemic level. But it should be mentioned that, at least in the Central Dangla dialect as I hear it from the Audio Bible, a L tone often undergoes an extra lowering in the last syllable of an utterance, which could be represented with a double grave diacritic (ä). This is best noticeable when an utterance terminates in more than one L syllables, in which case the last of them becomes extra-low. For example, the noun *kàà̀wò* “word” (including combinations with a possessive suffix like *kàà̀wò-y* “his word”) may be realized as *kàà̀wò* at the end of a sentence: (...) *gìn-nō gēm kàà̀k īcī-t kàà̀wò-y. Dàà̀r kàà̀k īcī-t kàà̀wò-y gāy* (...) “(...) there is no man who accepted his word. He who accepted his word though (...)” (AudBib Jn3:32f.). This extra-low tone is entirely phonetic and will be ignored in the transcriptions below.

For East Dangla, some authors report a predictable and therefore non-phonemic low tone at the end of a phrase whose last word terminates in a sonorant. This low tone may even be spelled out as a distinct segment -ì. For example, items such as *téŋ* “to eat”, *bótól* “way” and *wēr* “place” may then be realized as *téŋ̃*, *bótól̃* ~ *bótólì* and *wēr̃* ~ *wērì* (Abbakar 1975: 33; Shay 1999: 34f.). It appears that this terminal -ì is not only non-phonemic but also non-etymological: When the 1st pers. sg. possessive suffix -dù occurs in its sonorant allomorph -r, which I consider as etymologically related (Peust

2014: §10), and this one comes at the end of a phrase, we get $-ṛ \sim -r_i$ (Shay 1999: 96; an example is *kàà-rì* “my head” in Shay 1999: 165) rather than $*-r_ù$. This prepausal low tone also does not seem to play any role in the sound correspondences to be discussed below and will be ignored in the following.

4. The relationship of the Dangla dialects

Unlike what is suggested by the tone systems, West and Central Dangla are much closer to each other in most linguistic aspects than any of them is to East Dangla: “In regard to tone distinctions, Central and Eastern Dangaleat stand in contrast to Western Dangaleat. In other ways, however, Central Dangaleat is much closer to Western Dangaleat. (...) Morphologically, disregarding the tonal anomalies, the verbal systems of Western and Central Dangaleat are almost identical” (Burke 1995: §1.4.2). Clear confirmation for this comes from the lexicon where East Dangla often has a term on its own whereas West and Central Dangla share a different term, e.g.: “below, down” E[ast] *kèrá* (Shay 1999: 159) $\neq$ C[entral] *bààtà* (AudBib Lk6:48) = W[est] *báátà* (F72) • “branch” E *līfā* (M188) $\neq$ C *lèègè* (B) = W *lèègè* (F355) • “to bury” E *tíné* (M305) $\neq$ C *tísé* (B) = W *tìsè* (F164) • “children” E *mīfī* (M203) $\neq$ C *kòògìnā* (B) = W *kòògìnā* (Fédry 1971c: 38) • “friend” E *dīlō* (M72) $\neq$ C *róyá* (B) = W *ròyà* (F349) • “to go” E *káté* (M157) $\neq$ C *bààwē* (B) = W *báàwē* (F104) • “grass” E *ṇààlō* (M221) $\neq$ C *gāṇō* (B) = W *gāṇó* (F312) • “heavy” E *péeri* (M242) $\neq$ C *òòmā* (B) = W *óòmā* (F41) • “lion” E *mīcīlè* (M207) $\neq$ C *bōōrī* (AudBib Rev10:3) = W *bùùrī* (F100) • “a lot, much” E *ànáṇ* (M15) $\neq$ C *dàkìnā* (B) = W *dákinā* (F179) • “orphan” E *nēēgò* (M216) $\neq$ C *gòllā* (B) = W *góllā* (F332) • “outside” E *pèrindā* (M243) $\neq$ C *kàrá* (AudBib Mt5:13) = W *kàrà* (F272) • “to put” E *dùùwē* (M79) $\neq$ C *dīyē* (B) = W *dīyè* (F190) • “red” E *wāṇ* (M333) $\neq$ C *dīndīkō* (B) = W *dīndīkò* (F190) • “to say” E *áné* (M16) $\neq$ C *dīyē* (B) = W *dīyè* (F208) • “to send” E *tóósé* (M312) $\neq$ C *tábíré* (B) = W *tàbíré* (F151) • “short” E *kàsábí* (M156) $\neq$ C *gèèrām* (B) = W *gèérām* (F320) • “tomorrow” E *āāndīrā* (Shay 1999: 253) $\neq$ C *káwtán* (AudBib Mt6:30) = W *kàwtà* (F266) • “to want” E *éllé* (M102) $\neq$ C *ráké* (B) = W *ròkè* (F350) • “yesterday” E *dīirā* (Shay 1999: 201) $\neq$ C *dūūdī* (B) = W *dūúdī* (F195). Only much more rarely do we find the opposite situation that Central Dangla goes together with East Dangla: “all” E *òkín-* (M228) = C *òkīn-* (AudBib Mt9:26) $\neq$ W *kāw-* (Peust 2016: §86) • “cloud” E *ùcā* (M328) = C *úcè* (B) $\neq$ W *gócì* (F327) • “left side” E *ṇògòlō* (M224) = C *ṇògīlā* (B) $\neq$ W *géélè* (F322) • “nail of finger” E *kīrlō* (M166) = C *kīrlō* (B) $\neq$ W *kòrmó* (F291) • “one” E *rákkí* (Shay 1999: 115) = C *rákkí* (B) $\neq$ W *kīdā* (F283).

For many notions, all three dialects share a single lexeme, but the phonetic segments show some minor differences which again group West and Central

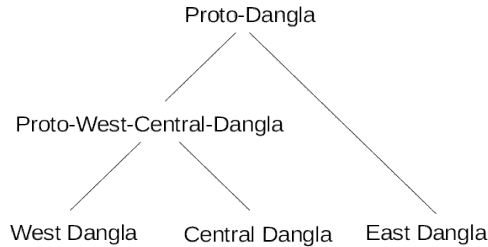
Dangla closer together, if we disregard tone for the moment. Examples: “calabash gourd” E *dāwgā* (M90) ≠ C *dōkā* (B) = W *dōḡkā* (F210) • “eye” E *ūdā* (M325) ≠ C *òdò* (B) = W *ódò* (F41) • “hand” E *pósíj* (M248) ≠ C *písé* (B) = W *pìsè* (F64) • “to laugh” E *sètē* (M277) ≠ C *sītē* (B) = W *sítē* (F373) • “leaves” E *tòòpòr* (M311) ≠ C *tàpàr* (B) = W *tápàr* (F151) • “liver” E *àdāki* (M6) ≠ C *àdikā* (B) = W *ádikā* (F8) • “to refuse” E *póócé* (M248) ≠ C *péécé* (B) = W *pèécé* (F60) • “sesame” E *kintí* (M165) ≠ C *cintí* (B) = W *cintì* (F227) • “she (indep. pron.)” E *cààrà* (Shay 1999: 89) ≠ C *tààrà* (AudBib Mt5:28) = W *táàrà* (F150) • “tooth” E *sēējō* (Fédry 1977: 95) ≠ C *sāājō* (B) = W *sàājō* (F364) • “tree” E *étí* (M104) ≠ C *ētò* (B) = W *ètò* (F29).

But in order to effectively prove that West and Central Dangla form a genetic subgroup, we need to adduce a common innovation. The terms for “man” and “woman” are a good case in point. East Dangla translates them as *mètā* “homme, personne de sexe masculin, mâle, mari” (M203) and *dāādī* “femme, épouse, femelle” (M61). These terms exist in Central and West Dangla as well, but with their meanings cut down to “husband” and “wife”: C *mītā* (B) = W *mítā* (F129) “mari”, C *dààtù(-r)* (AudBib Lk1:18) = W *dáàti* “femme (épouse)” (F176). The more general meanings are, however, rendered by extensions of the basic terms: C *mìtikō* (B) “mâle” = W *mítikō* “mâle, homme (vir)” (F129), C *dààtkó* (AudBib Mt22:24) = W *dáàtikō* “femme (en général)” (F177). These are most likely secondary creations and thus provide a common innovation. An exact parallel can be found in Russian where the original terms for “man” and “woman”, *муж* and *жена*, today stand for “husband” and “wife”, whereas the general meaning came to be expressed by the derivatives *мужчина* and *женщина*. In a similar way, the East Dangla adjective for “big, large”, *tátá* (masc.) – *yààrà* (fem.) (Shay 1990: 110), was expanded by a suffix in both Central Dangla: *tátikó* (m., B) – *yààrkó* (f., AudBib Rom2:5), and West Dangla: *tàtikò* (m.) – *yáàrkò* (f.) (F153).

Innovations common to West and Central Dangla can also be adduced from the field of grammar in at least three instances: (1) The original suffix conjugation, still well alive in East Dangla, lost its personal agreement and turned into an invariable “subjunctive” tense in both West and Central Dangla (Peust 2016: §75a). (2) The ordinary near-demonstratives of East Dangla are *èkā* m. / *ètā* f. / *àkū* pl. (Shay 1999: 243 and 262). In West Dangla, these basic demonstratives are still employed in an article-like function, but the proper value of a near demonstrative has been taken over by *ājka* m. / *ántā* f. / *ājku* pl. (Peust 2014 and 2016: §§51f.). The same is true of Central Dangla, whose ordinary near demonstratives are *ājka* m. (AudBib Mt18:4) / *ántā* f. (AudBib Mt11:14) / *ājku* pl. (AudBib Mt3:7). It is evident that an element *an-* was prefixed to the original demonstrative in West and Central Dangla, again a common innovation. (3) The Dangla subject proclitics of the 1st person plural make an exclusive-inclusive-distinction:

	East Dangla	Central Dangla	West Dangla
1st pl. exclusive	<i>ní</i> (Shay 1999: 123)	<i>ní</i> (B)	<i>nì</i> (Fédry 1974: 11)
1st pl. inclusive	<i>nì</i> (Shay 1999: 123)	<i>gí</i> (AudBib Mt 20:18)	<i>gè</i> (Fédry 1974: 11)

While both proclitics differ just in tone in E, the 1st pl. inclusive proclitic has an entirely different form in C and W. This one is a transparent grammaticalization of the noun for “persons, people” (comparable to the popular use of “on” for “nous” in French), which goes E *gēēmì* (M118) = C *gēē* (AudBib Jn3:21) = W *gēē* (F319) (see also Peust 2014: 220 note 14). All this leaves no doubt that West and Central Dangla belong closely together and derive from a common intermediate stage that I call Proto-West-Central Dangla. The historical relationship of the three dialects can thus be outlined as follows:



5. Tonal correspondence sets

Before delving into the historical development of tone in the three dialects, I start with a synchronic overview of the most common tonal correspondence sets. I focus on those sets which recur most frequently in the basic vocabulary, ignoring for the moment various other, more isolated correspondences. There are 13 such sets, some of which I subdivide into subsets. Each (sub-)set will be exemplified by at most six examples, though many more would often be available. Some of these sets, dubbed “constantes”, were already mentioned by Fédry (1977: 100), still without records from Central Dangla. I attempt to provide evidence from all three dialects, E[ast], C[entral] and W[est], though sometimes one dialect is missing for lack of an attestation. “L” means low tone, while “H” stands for the abstract high tone that may be realized as either high or mid in East and Central Dangla.

Set 1: E H = C H = W L

Subset 1a, H realized as high: “âne” E *dūr̀kùl* (M97) = C *dūr̀kùl* (AudBib 2Pet2:16) = W *dūr̀kùl* (F213) • “chameau” E *lókù́mó* (M189) = C *lókù́mó* (B)

= “dromadaire” W *lòkùmò* (F357) • “chemin” E *bótól* (M52) = C *bótól* (B) = W *bòtòl* (F93) • “jambe, pied” E *ásíŋ* (M22) = C *ásé* (B) = W *àsè* (F21) • “soleil” E *pátó* (M239) = C *pátó* (AudBib Mt13:43) = W *pàtò* (F52) • “voir” E *tálé* (M296) = C *tálé* (B) = W *tàlè* (F157).

Subset 1b, H realized as mid: “bouche” E *bī* (M44) = C *bī* (B) = “lèvre, bouche” W *bīì* (F87) • “chenille” E *gūrō* (M129) = “ver” C *gūrō* (B) = W *gūrō* (F337) • “fils” E *rōŋ* (M256) = C *rōŋō* (B) = W *rōŋò* (F350) • “grandeur” E *āgīndāw* (M8) = C *āgīndāw* (B) = W *āgīndāw* (F15) • “os” E *kāāsō* (M156) = C *kāāsō* (B) = W *kāàsò* (F278) • “ruisseau” E *cōrkīrō* (M324) = C *cōrkīlō* (B) = W *cōrkīlō* (F232).

Here and elsewhere, East and Central Dangla show a distinction of my abstract H tone into high and mid, which does not play any role on the side of West Dangla: The West Dangla representatives of this cognate set have a L tone throughout.

Set 2: E L = C L = W HL (HHL)

Subset 2a, long words: “charbon (de bois)” E *kilmò* (M165) = C *kùlmò* (B) = W *kùlmò* (F306) • “parents” E *àgìnày* (M7) = C *àgìnày* (B) = W *ágìnày* (F15) • “parole” E *kààwò* (M158) = C *kààwò* (B) = W *káàwò* (F266) • “plante qui sert à faire des gris-gris” E *òròymè* (M232) = “plante magique” C *òrìimè* (B) = W *òrìimè* (F39) • “poitrine” E *kòrkidò* (M172) = C *kòrkidò* (B) = W *kórkidò* (F301) • “sombre” E *gòndikò* (M124) = “obscurité” C *gòndikò* (B) = “nuit sans lune” W *gòndikò* (F326).

Subset 2b, short words: “beau-père” E *mìgò* (M204) = C *mìgò* (B) = “parent par alliance” W *mìgò* (F131) • “children” E *ròŋ* (Shay 1999: 88) = “fils (pl.)” C *ròòŋ* (B) = W *ròŋ* (Fédry 1971c: 38) • “lune” E *kòyè* (M177) = C *kòyè* (B) = W *kòyè* (F289) • “nom” E *sìŋ* (M282) = C *sìŋ* (B) = W *sìŋ* (F374) • “sel” E *màràl* (M195) = C *màràl* (AudBib Mk9:49) = W *màràl* (F116) • “terre, sol” E *kìdā* (M164) = “terre” C *kìdā* (B) = W *kìdā* (F283).

Subset 2c, very short words: “fondement, pied, anus” E *bàà* (M30) = “fesse” C *bà* (B) = “fondement, but, raison” W *báá* (F71) • “où?” E *mòŋ* (M208) = C *mòò* (AudBib Mt2:2) = W *mó ~ móò* (Fédry 1971b: 129) • “poser [imperative]” E *làà* (Shay 1999: 65) = C *làà* (AudBib Rev5:5) = W *lá* (Fédry 1974: 7) • “sœur” E *bòò* (M47) = C *bòò-* (AudBib Act25:13) = W *bóó- ~ bóó-* (Peust 2016: §40) • “tête” E *kàà* (M145) = C *kà* (B) = W *káá* (F262, noting that this is pronounced [káà]).

The long words of set 2 reveal that the final L tone of West Dangla is located only on the last mora or syllable, all preceding segments being H. So

they belong to what I have called the HHL pattern (Peust 2014: §2) as opposed to the HLL pattern. The short words are less indicative in this respect since they cannot overtly distinguish between HHL and HLL. The very short words are probably to be regarded as underlyingly monomoraic, so that the phonemic distinction between HL and H cannot be made in West Dangla (Peust 2014: §4), which explains the notations with only a H tone.

Set 3: E LH = C LH = W HL (HLL)

Subset 3a, long words with late rise (E LLH = C LLH = W HLL): “cil” E *còlmō* (M322) = C *còlmō* (B) = W *còlmō* (F230) • “excrément” E *dòòyó* (M76) = C *dòòyō* (B) = W *dòòyō* (F194) • “marmite” E *kòngilā* (M171) = C *kòngilā* (B) = W *kòngilā* (F299) • “œuf” E *dīisā* (M94) = C *dīisā* (AudBib Lk11:12) = W *dīisā* (F209) • “poule” E *kòkīrā* (M169) = C *kòkīrā* (B) = W *kòkīrā* ~ *kòkrā* (F298) • “rêver” E *sòònē* (M287) = C *sòònē* (B) = W *sòònē* (F379).

Subset 3b, long words with early rise (E LHH = C LHH = W HLL): “brasero” E *bājāngē* (M32) = W *bājāngā* (F75) • “figuier” E *bùgúwá* (M53) = “arbre (Ficus)” W *bágùwà* (F79) • “gazelle mâle” E *bāncilē* (M37) = W *bāncilē* (F75) • “petite graine” C *ārīncilō* (B) = W *ārīncilō* (F17) • “poussière” E *bùrintál* (M55) = C *bùrintál* (AudBib Lk10:11) = W *bùrintál* (F101) • “prière” E *sālāānē* (M264) = C *sālāānē* (B) = “prière musulmane” W *sālāānē* (F366).

Subset 3c, short words (E LH = C LH = W HL): “colostrum” E *jākā* (M80) = C *jākā* (B) = “fromage, fait avec du lait de chèvre, une seule fois, après que la chèvre ait mis bas” W *jākā* (F237) • “(petite) fille” E *mīcā* (M207) = C *mīcā* (B) = W *mīcā* (F130) • “mouche” E *dūwō* (M79) = C *dūwō* (B) = W *dūwō* (F189) • “travail” E *rīyó* (M254) = C *rīyó* (AudBib Mt20:28) = W *rīyó* (F348) • [demonstrative pronoun masc. sg.] E *ēkā* (Shay 1999: 243) = C *ēkā* (AudBib Mt26:46) = W *íkā* (Peust 2016: §51) • “in the field” E *kēdēr* (Ebobissé 1979: 37) = “par terre” C *kēdēr* (B) = W *kēdēr* (F280).

Subset 3d, monosyllabics (E H = C variable = W HL): “accoucher” E *wēēŋ* (M339) = C *wēē* (B) = W *wēē* (F147) • “boire” E *sēēŋ* (M275) = C *sēē* (Burke 1995: §2.1.2) ~ *sēē* (AudBib Mt25:35) ~ *sēē* (AudBib Mt6:31) = W *sēē* (F367) • “chanter” E *rēēŋ* (M253) = C *rīyē* (B) = W *rīyē* (F347) • “mettre (plusieurs choses)” E *lēēŋ* (M187) = C *lēē* (B) = W *lēē* (F354) • “être mûr” E *nēēŋ* (M216) = C *nēē* (B) = W *nēē* (F216) • “tuer” E *dēēŋ* (M69) = C *dēē* (B) = W *dēē* (F196).

The reflexes in West Dangla are always the same regardless of where precisely the rise in East and Central Dangla is located: The tonal drop always comes early in the word. This creates – for longer words at least – a contrast with set 2, which is likewise HL but with the tonal drop coming late. The monosyllabic verbs cited here structurally belong to set 3 (one of the two major

tone classes of Dangla verbs besides set 1), but they were subject to a tone levelling in the Eastern and sometimes in the Central dialect.

Set 4: E HL = C HL = W H

“eau” E *āmày* (M12) = C *āmày* (B) = W *ámáy* (F2) • “langue” E *lēēsè* (M187) = C *lēēsè* (B) = W *léésé* (F356) • “nuit” E *āāndò* (Fédry 1977: 94) = C *āāndò* (B) = W *áándó* (F11) • “oreille” E *dēngè* (M91) = C *dēngè* (AudBib 1Cor12:17) = W *dēngé* (F207) • “ventre” E *ādì* (M3) = C *ādì* (B) = W *ádí* (F8) • “viande, chair” E *kūmà* (M179) = C *kūmà* (AudBib Lk24:39) = “animal, viande” W *kúamá* (F303).

Set 5: E HL = C HL = W LH(L)

Subset 5a, E HL = C HL = W LH: “bon” E *mээрàm* (M202) = C *mээрàm* (B) = W *mèèrám* (F124) • “cuisse” E *tùmke* (M313) = C *tùmke* (B) = W *tùmké* (F170) • “doigt” E *kōrmò* (M173) = C *kōrmò* (B) = “ongle” W *kòrmó* (F291) • “feuille de cramcram pour la sauce” E *gūdḡūdū* (M127) = “chardon” C *gùrkùdū* (AudBib Mt7:16) = “plante rampante, rassemblant à l’arachide, dont on mange les feuilles (Amaranthacée)” W *gùrkùdū* (F338) • “jour (opp. nuit)” E *fìrìyò* (Sopoyé 1982: 22) = C *fìrìyò* (AudBib Mt27:45) = W *èrìyó* (F30) • “talon” E *dūūdò* (M77) = C *dūūdū* (B) = W *dùùdú* (F195).

Subset 5b, E HL = C HL = W LHL: “aile” E *gēēzīngirè* (M119) = C *gēsḡirè* (B) = W *gēsḡirè* (F320) • “coude” E *kócīngilò* (M176) = C *kōcīngilò* (B) = W *kòcīngilò* (F297) • “demi-clef, nœud sur le fuseau en filant” E *bóbbòdòm* (M47) = “petit nœud de fil en haut de l’axe du fuseau” W *bìbòdòm* (F88) • “hyène” C *dùùyù* (B) = W *dùùyù* (F196).

It appears to me that the proper correspondence of East/Central Dangla HL is West Dangla LHL, even though this is only visible when the L segment of East/Central Dangla is sufficiently long (bisyllabic) (subset 5b). When the L segment of East/Central Dangla is monosyllabic, which occurs more frequently (subset 5a), W displays a simplified LH melody.

Set 6: E H = C HL = W H

“chaud” E *tóngó* (M310) = C *tōngò* (B) = W *tóngó* (F169) • “difficile” E *rādā* (M251) = C *rādā* (AudBib Mt19:23) = W *rádā* (F343) • “jouer” E *kāñfé* (M152) = C *kāñjè* (B) = “s’amuser, jouer” W *kāñjé* (F268) • “prendre” E *óbé* (M227) = C *ōbè* (B) = W *óbé* (F41) • “transvaser” E *bóóbé* (M47) = “verser jarre d’en haut” C *bōōbè* (B) = “verser” W *bóóbé* (F93) • “urine” E *pífí* (M244) = C *pífí* (B) = W *pífí* (F63).

Set 7: E H = C HL = W LH

“concombre” E *kóringó* (M172) = C *kōringó* (B) = W *kòringó* (F291) • “cueillir” E *àkìdē* (M9) = C *ākīdē* (B) = W *àkīdē* (F14) • “deux” E *sééro* (M276) = C *sēērà* (AudBib Mt2:16, but B has *sēērà*) = W *sēēr(ó)* (F369) • “mouton” E *támga* (M297) = C *tāmgà* (B) = “ovidé, béliér” W *tāmgá* (F152) • “petit” E *kápákí* (M153) = C *kápági* (AudBib Mk15:40) = W *kàpák* (F263) • “bois épineux dont l’écorce est rouge” E *tíkīdī* (M305) = “épineux (Acacia Seyal) à tronc rouge” W *tikīdī* (F163).

Set 8: E LH = C HL = W H

“courir” E *gādē* (M108) = C *gādē* (Burke 1995: §3.1) = W *gádē* (F311) • “demander” E *īndē* (M140) = C *īndē* (B) = W *īndé* (F34) • “mouton [pl.]” E *tāmági* (M297) = C *tāmgì* (AudBib Mt18:12) = W *tāmgí* (F152) • “nœud (d’une tige), l’articulation (du doigt)” E *dillē* (M72) = “espace entre les articulations” C *dēlē* (B) = “espace compris entre les articulations, ‘phalanges’ d’une tige de mil” W *délé* (F186) • “savoir [present/habitual tense]” E *ibān* (M138) = C *ībān* (AudBib Mt12:5) = W *ibán* (Peust 2016: §69) • “some (more)” (or similarly) E *bīdā* (M44)¹² = C *būdā* (AudBib Rev13:1)¹³ = W *bīdā* (F87)¹⁴.

Set 9: E LH = C HL = W LH

“grignoter” E *kōkīfē* (M169) = C *kōkīfē* (B) = W *kōkīfē* (F298) • “marteler” E *kōkīdē* (M168) = C *kōkīdē* (Burke 1995: §3.1) = W *kōkīdē* (F298) • “piétiner” E *jīpīdē* (M223) = C *jēpīdē* (B) = W *jēpīdē* (F255) • “se disputer” C *tārpīdē* (B) = “se disputer une proie” W *tārpīdē* (F156) • “se rincer la bouche” E *kōrkīfē* (M172) = C *kōrkīfē* (B) = W *kōrkīfē* (F301) • “écorce” E *pārdā* (M237) = W *pārdé* (F57).

Set 10: E HL = C H = W L

“chien” E *kānà* (M152) = C *kánà* (B) = W *kànà* (F269) • “huile, beurre” E *sēwēn* (M277) = “huile” C *séwé* (B) = “corps gras” W *sèwè* (F369) • “joue” E *gōrgūmò* (M125) = C *gárgúmó* (B) = W *gàrgùmò* (F316) • “lait” E *būwà* (M56) = C *búwà* (AudBib 1Cor9:7) = W *bùwà* (F98) • “peau” E *zāāmà* (M344) = C *záámà* (B) = W *zààmà* (F387) • “sauce” E *tíwù* (M307) = C *tíwú* (B) = W *tìw* (Peust 2016: §28).

¹² Translated by de Montgolfier as “d’abord”, but he gives the expression *nīgīndā bīdā* “plus tard”, whose literal meaning seems to be “some (more) future”.

¹³ Here and elsewhere always in the expression *māán būdā* “something”.

¹⁴ Fédry translates “qui est à côté, en plus”, giving the expression *māābīn bīdā* “quelque chose d’à côté (autre chose encore)”.

Set 11: E HL = C LH = W HL (HLL)

“dos” E *āārà* (M18) = C *ààrō* (B) = W *áàrò* (F17) • “mil que l’on fait germer pour la boisson” E *dēymà* (M93) = “mil germé” C *dēēmā* (B) = W *dēēmà* (F204) • “ongle” E *kīrlò* (M166) = C *kīrlō* (B) = “derme” W *kīrlò* (F286) • “paille (du toit du case)” E *jārīṇò* (M83) = “auvent to toit” C *jārmō* (B) = “brin de paille de l’auvent” W *jārmò* (F239) • “salive” E *ūḷṇà* (M326) = C *ùḷṇā* (B) = W *ūḷṇà* (F49) • “testicule (pl.)” E *gūllà* (M128) = C *gūllā* (B) = W *gūllà* (F339).

The West Dangla representatives of this set have an early tone drop as in set 3 rather than the late tone drop of set 2. This implies that, even though East and West Dangla both have a HL melody here, the precise location of the downstep is not the same in both dialects.

Set 12: E LHL = C LHL = W HLH

“big (pl.)” E *àgīndà* (Shay 1999: 110) = C *àgīndà* (AudBib Mt23:5) = “grands” W *ágìndá* (F15) • “bâton” C *dīṅkīlò* (B) = W *dēṅkíló* (F187) • “malade” C *àríwrà* (B) = W *árìwrà* (F18) • “plus tard” E *nīgīndà* (M30) = “future” C *nēgīndà* (AudBib Mt6:34) = “après-demain” W *négìndá* (F217) • “sept” E *pēésirà* (Shay 1999: 115) = C *pēésirà* (B) = W *péésirá* (F60) • “touffe de cheveux non coupés” E *bòtíyò* (M52) = “rangées fines de cheveux laissées de chaque côte d’un crâne rasé” W *bóótíyò* (F91).

Set 13: E LHL = C LH = W HL (HLL)

“Dangla man” E *dāṇīlè* (Shay 1999: 269) = “dangaléat (m.)” W *dāṇīlè* ~ *dāṇlè* (F180) • “jeune homme” E *dūbīlè* (M96) = C *dūbīlē* (B) = W *dūbīlè* (F211) • “maladie” E *rādūwà* (M251) = C *rādūwā* (AudBib Mt10:1) = W *rādūwà* (F344) • “paludisme” E *pàriyà* (M237) = “fièvre” C *pàriyā* (B) = W *pàriyà* (F56) • “soif” E *ibīnò* (M138) = C *ibīnō* (B) = W *ibìnò* (F32) • “veuf” E *mùrgīlè* (M212) = “célibataire” C *mùrgīlē* (B) = W *mùrgīlè* (F139).

Here again, West Dangla has the same early tone drop as in sets 3 and 11.

6. Historical tonology: Determining the direction of change

As is illustrated by the above correspondence sets, pervasive tonal differences characterize the three Dangla dialects. Not infrequently, East and Central Dangla agree as against West Dangla (sets 1–5 and 12). In none of the sets, however, does Central Dangla accord with West Dangla. This contrasts with the other fields of language and with the genetic tree established above. The easiest explanation is to assume that, whenever East and Central Dangla agree, they

preserve a common retention from Proto-Dangla, with West Dangla having innovated. If, on the contrary, the West Dangla tones were considered original, we would have to posit a massive areal spread of tonal innovations across the Central and Eastern areas, which is not the option to prefer. I therefore assume that, at least in general terms, East and Central Dangla have often preserved the original tones, whereas West Dangla was innovative.

Additional support for this claim comes from loan words adopted from neighbouring languages. One of them is Daju, a language genetically unrelated to Dangla, which encompasses a large cluster of dialects that adjoin the Dangla territory to the east and extend far into the Sudan. This has been an important contact language in the past from which Dangla adopted a tremendous number of loan words. It is, of course, hard to determine from which precise Daju dialect the bulk of loanwords were taken, but I will draw here from the dialect of Eref (*èréf*, 70 km air-line distance east of the Dangla area), which is one of the westernmost varieties of Daju and whose tones have been well documented, namely by Palayer's grammar (Palayer 2011). The late Pierre Palayer also left behind a manuscript of a "Dictionnaire du dadjo d'Eref (Tchad)", which is currently being prepared for publication by Pascal Boyeldieu. I am very grateful to Pascal Boyeldieu, who has provided me with numerous forms from this dictionary manuscript prior to its publication. When referring to Daju forms, I will draw them from Palayer's published grammar whenever possible, otherwise I give "Boy." as the source which refers to our personal communication.

Daju has the fortunate property that most of its nouns terminate in *-e*, most commonly *-né*, which makes it usually clear that they were in fact borrowed from Daju into Dangla rather than vice versa. Furthermore, a large part of these words ultimately originate from Arabic and passed through Daju, where they acquired the termination *-né*, before finally entering Dangla (cf. Baldi 2007: 9). It will be seen that Dangla occasionally preserves the termination *-ne* more faithfully than Daju itself, where it tends to be obscured by recent assimilations.

Daju, too, is a tone language with two levels, high and low. The following list features some Daju loans in Dangla that show the typical tonal perturbations also known from the native vocabulary, which indicates that they belong to an early layer of borrowings. Though with some inaccuracies, the examples reveal that the Daju tones essentially agree with those of East and Central Dangla (with the Daju high tone often realized as Dangla "mid"), but disagree with West Dangla, thus confirming that West Dangla is on the innovative side. Furthermore, in the case of the Arabic words, Daju regularly transformed the Arabic word stress into a high tone, which is a natural substitution and ensures that Daju itself has not been subject to major tonal perturbations at least between the time of adopting the Arabic words and today.

Arabic source (if relevant)	Daju	East Dangla	Central Dangla	West Dangla
–	<i>bèrré</i> “esclave” (Palayer 2011: 50) (< * <i>bèrné</i>)	<i>bèrrē</i> “esclave” (Fédry 1974: 22)	<i>bèrnē-y</i> “son esclave” (B)	<i>bèrnē</i> “esclave” (F106)
Chadian Arabic <i>durdur</i> “mur” (Jullien de Pommerol 1999: 403)	<i>dùrdùrré</i> “mur de maison” (Boy.)	<i>dùrdùrrē</i> “mur, maison en dur” (M78)	<i>dùrdùrrē</i> “wall” (AudBib Lk13:4)	<i>dùrdùrnē</i> “mur monté avec gros colombins” (F198)
<i>faqīh</i> “faki, expert in Islamic law”	<i>fàkīnīcè</i> “marabout” (Boy.)	<i>pàkīnnīcè</i> “musulman” (M235)	<i>pàkīncé</i> “marabout” (B)	<i>pàkīncé</i> “faki” (F55)
<i>qirāʔah</i> “lecture”	<i>gīrāyīnè</i> “lecture, étude, classe, école” (Boy.; I expect * <i>gīrāyīnè</i>)	<i>gārāānē</i> “école, classe” (M113)	<i>gārāānē</i> “discours” (AudBib Mt19:1)	<i>gārāànè</i> “lecture” (F314)
<i>ḡadīd</i> “new”	<i>jādīnné</i> “nouveau” (Palayer 2011: 153) (< * <i>jādīdné</i>)	<i>jādīnnē</i> “neuf, nouveau” (M80)	–	<i>jādīddè</i> “neuf” (F237)
<i>kitāb</i> “book”	<i>kitāābīnè</i> “écriture” (Boy.)	<i>kitāāmnē</i> “livre, Coran” (M167)	<i>kitāmnē</i> “livre” (AudBib Mt11:10)	<i>kitāābīnè</i> “Coran” (F283)
<i>maktūb</i> “letter”	<i>màktūbnè</i> “lettre, écrit” (Boy.)	<i>màktūmnē</i> “lettre” (M193)	<i>màktūmnè</i> “lettre” (AudBib Mt19:7)	<i>màktūūbīnè</i> “lettre” (F115, said to be specific to Korbo)
–	<i>jīrīyè</i> “coton, cotonnier” (Boy.)	<i>jīrīyē</i> “coton” (M223)	<i>jīrīnē</i> “coton” (AudBib Rev1:14)	<i>jīrīnè</i> “coton” (F255)
<i>ṣalāt</i> “prayer”	<i>sālānè</i> “prière” (Boy.)	<i>sālāānē</i> “prière” (M264)	<i>sālāāné</i> “prière” (B)	<i>sālāànè</i> “prière musulmane” (F366)
–	<i>úrdé</i> “grenier” (Palayer 2011: 45)	<i>ūrdē</i> “grenier à mil” (M326)	<i>ūrdē</i> “grenier” (B)	<i>ùrdè</i> “grenier à mil” (F49)

Another important, again genetically unrelated contact language is Kenga, which borders the Dangla territory to the West and South (dictionary by Palayer 2004, grammar by Neukom 2010). Unlike Daju, Kenga nouns have no characteristic morphological mark, which makes it more difficult to decide on the direction of borrowing. We probably deal with borrowings in both directions and from diverse periods, which leads to a somewhat blurry picture. Furthermore, Kenga itself might have had a history of tonal changes which is hard to assess. I will therefore not try to exploit Kenga evidence exhaustively, but will restrict myself to some illustrative examples of Kenga–Dangla contact. Kenga has three tones: low, mid and high.

Kenga	East Dangla	Central Dangla	West Dangla
<i>ààyē</i> “serrer, sécher” (Palayer 2004: 16)	<i>ààfē</i> “sécher, faire sécher” (M7)	<i>ààfē</i> “faire sécher” (B)	<i>ááfē</i> “faire sécher, être sec” (F13)
<i>báádā</i> “tas” (P. 2004: 29)	–	–	<i>bàádā</i> “gros tas d’épis” (F104)
<i>cēṇē</i> “kenga” (P. 2004: 34)	–	–	<i>kèèṇà</i> “Kenga” (F281)
<i>cētē</i> “piment” (P. 2004: 34) ¹⁾	<i>cētā</i> “piment rouge” (M319)	–	<i>cētē</i> “piment (Capicum)” (F224)
<i>dāṇlīj</i> “long tambour” (P. 2004: 39)	<i>dāṅgūlūf</i> “petit tam-tam” (M65)	<i>dāṅgūlūc</i> “petit tambour” (B)	<i>dāṅgūlūc</i> “petit tambour” (F181)
<i>gèrtē</i> “van” (P. 2004: 63)	<i>gàrrtā</i> “grand van” (M115)	<i>gàrtā</i> “van” (B)	<i>gàrtā</i> “van de grande taille” (F316)
<i>gòópò</i> “pouce” (P. 2004: 64)	–	<i>gòòpō</i> “pouce” (B)	<i>gòópò</i> “pouce” (F329)
<i>górñ</i> “panier à pied” (P. 2004: 65)	–	<i>górñ</i> “panier” (B)	<i>gòrn</i> “type sp. de pannier vanné (l’objet, comme le mot, sont d’origine kenga)” (F328)
<i>jègèṇē</i> “hache” (P. 2004: 73) ²⁾	<i>jègìnē</i> “houe” (M84)	<i>jēkīnē</i> “hache” (B)	<i>jékínē</i> “hache” (F240)

¹⁾ The ultimate source of this word is Arabic šaṭṭah “red pepper”.

²⁾ The ultimate source seems to be the Daju noun tiginé “hache” (Boy.), but the forms of Dangla and Kenga are phonetically closer and probably more directly related.

Kenga	East Dangla	Central Dangla	West Dangla
<i>ká-cíkili</i> ~ <i>cíkili</i> “coude” (P. 2004: 88) ³⁾	<i>kócingilò</i> “coude” (M176)	<i>kōcīngilò</i> “coude” (B)	<i>kòcingilò</i> “coude” (F297)
<i>kòrdō</i> “bière de mil” (P. 2004: 99)	<i>kòrrē</i> “beer” (Shay 1999: 97)	<i>kòrdē</i> “bière” (B)	<i>kòrdē</i> “bière de mil” (F291)
<i>māgārā</i> “oncle maternel” (P. 2004: 109)	—	—	<i>màgìrà</i> “«ami» (appellation parfois employée par les anciens)” (F115)
<i>mértē</i> “hôte, étranger” (P. 2004: 116)	<i>màrtē</i> “visiteur, hôte, étranger” (M197)	<i>màrtē</i> “étranger” (B)	<i>máartē</i> “hôte, étranger” (F117)
<i>jēmēṛī</i> “nigérian” (P. 2004: 129)	<i>jāmūrūwē</i> “anthropophage” (M222)	—	<i>jàmìrì</i> “anthropophage” (F253)
<i>rìibī</i> “se chauffer” (P. 2004: 145)	<i>ribbā</i> “début de la saison sèche” (M253)	<i>rībbī</i> “automne” (AudBib Jud1:12)	<i>ribbī</i> “période qui suit les quatre mois de saison pluvieuse” (F347)
<i>siléérē</i> “flûte” (P. 2004: 153)	<i>sūrāārē</i> “petite flute en bambou” (M293)	<i>sūrāárē</i> “flûte” (AudBib 1Cor14:7) ⁴⁾	<i>sūrààrē</i> “petite flûte en bambou” (F384)
<i>tāntúúrù</i> “petite fourmi noire” (P. 2004: 159)	<i>tòntilò</i> “petite fourmi noire” (M310)	<i>tōntilò</i> “fourmi (sp)” (B)	<i>tōntilò</i> “petite fourmi” (F164)

³⁾ *ká-* is a nominal prefix of Kenga, which ascertains the Kenga origin certain of this item.

⁴⁾ B has *sūrāárē* which seems to be wrong.

The overall impression is that while Kenga seems to share the highest number of items with West Dangla, the tone of Kenga usually agrees better with that of East Dangla.¹⁵ Most of the cited words show in Dangla (more or less) the regular correspondences discussed above, with Kenga joining the pattern that is regular for East Dangla, even in the event that the term is attested only in the west. The equivalence of the Kenga and the East Dangla tones is best demonstrable for items of sets 1 (e.g. *māgārā*, *jēmēṛī*), 2 (*gèrtē*, *jègènnè*), 3 (*cètē*,

¹⁵ Cf. Fédry’s (1977: 93 note 5) slightly overgeneralized statement: “(...) sur la vingtaine de mots communs entre le dangaléat de l’ouest et le kenga, le ton est symétriquement opposé (sauf une seule exception)”.

kòrdā), 5 (*báádā*, *ká-cíkìlì*), 8 (*ààyē*, *rìibī*), and 13 (*gòópò*, *tāntúúrù*). Some items of set 1 (*céṇṇè*, *górṇò*) and set 3 (*dāṇlǐjì*, *siléérè*) have, instead of H and LH as would be regular for East Dangla, HL and LHL respectively in Kenga. These contours, while not identical to those of East Dangla, are still close and might owe their existence to some tonal development internal to Kenga.

Finally, there are very rare items whose Kenga tone agrees with West Dangla (*mértè*), which were presumably borrowed from West Dangla into Kenga, as well as recent areal words without any tonal difference.¹⁶ But the overall conclusion is again that the tone of West Dangla is innovative and probably used to be more “eastern-like” in the past.

From this follow two important principles that help us sort out the tonal developments chronologically. (1) Words whose tones agree in East and Central Dangla as against West Dangla experienced tonal innovations specific to West Dangla. These words testify to a late layer of tone shifts restricted to this individual dialect. (2) Words whose tones disagree between East and Central Dangla must already have differed at the period of earlier East Dangla and Proto-West-Central Dangla. These words testify to an early layer of tone shifts. Since they were obviously affected by the subsequent West Dangla tone shifts as well, their tones usually differ in all three dialects.

I will begin with the correspondence sets of the second kind in order to recover the tone rules in their chronological sequence, starting with the earliest one.

7. The earlier tone shifts of Proto-West-Central Dangla

Consider the following two sets that have different tones in each of the three dialects and which, according to the principle just stated, must testify to early tone shifts:¹⁷

Set 10: E HL = C H = W L

Set 11: E HL = C LH = W HL

Compare them with the following sets that attest late, specifically West Dangla developments that will be discussed further below:

Set 1: E H = C H = W L

Set 3: E LH = C LH = W HL

Set 4: E HL = C HL = W H

Set 5: E HL = C HL = W LH

¹⁶ E.g. E *bàngàw* (M36) = C *bàngàw* (B) = W *bàngàw* (F79) = Kenga *bàngàw* (Palayer 2004: 19) = Chadian Arabic *bangaw* (Jullien de Pommerol 1999: 244), all “patate douce”.

¹⁷ I assume that the agreement of E and W in set 11 is accidental rather than inherited; this is also suggested by the fact that even though they are both HL, the location of the downstep is not the same.

Sets 10 and 11 comprise words that behave like sets 4 and 5 in East Dangla, but like sets 1 and 3 in Central and West Dangla. Assuming that East Dangla has preserved the original state of affairs, we conclude that they were originally identical to set 4 / set 5 but merged with set 1 and set 3 respectively in Proto-West-Central Dangla. This change can be described as a movement of the H tone by one syllable to the right. Some words underwent this right-shift (sets 10, 11) and some did not (sets 4, 5). The trigger appears to have been the consonant between the H syllable and the following syllable. If this consonant was “permeable”, essentially a sonorant, the H tone usually moved across, as in the noun for “dog” (set 10): *kāṇà* (thus still E) > Proto-West-Central **kāṇá* (> C *káṇá*, W *kàṇà*). If it was “impermeable”, essentially an obstruent or a consonant cluster, the melody did not change, as in the noun for “ear” (set 4): *dēṅgè* (thus still E and C) > W *dēṅgé*. This resembles the concept of “tonimpermeable Konsonanten” described by Lukas (1969) in his classic study on tone in Bole, a West-Chadic language. There are a few terms (“water”, “meat”) that belong to set 4 and escape the H rightward movement, even though the following consonant looks like a permeable one; this remains an open question for the moment.¹⁸ The right-shift never seems to have applied across word-boundaries.

The distinction between sets 10 and 11 appears to be tied to the nature of the segment that formerly carried the H tone. When this was a “heavy” segment, in particular CVC-, the H tone carried over to the next syllable while being replaced by L in its original location, as in “spittle” (set 11): *ūlṇà* (thus still E) > Proto-West-Central *ūlṇā* (thus still C) > W *ūlṇà*. When it was a “light” segment, essentially CV-, the H tone was copied to the right and also remained in its original place, as in the noun for “dog” (set 10, see above). From all this, our first (also in chronological terms) tone rule emerges:

Rule 1: In Proto-West-Central Dangla, a H tone moved to the right unless an impermeable consonant (obstruent or cluster) intervened. After the move, the former place of the H tone was occupied by a L tone when the segment was heavy and by a H tone when it was light.

There is a second group of words whose tones differ between East and Central-(West-)Dangla, and which testify to yet another early tone shift. The effect of this rule is still synchronically visible in the verbal systems of Central and West Dangla. Consider the following six infinitive forms:

¹⁸ One explanation could be that there was a geminate at an earlier stage of the language, cf. *àmmi* “water” in closely related Migama (Jungraithmayr & Adams 1992: 65).

	original H root	original L root
no depressor consonant	E <i>tálé</i> = C <i>tálé</i> = W <i>tàlè</i> “to see” (set 1)	E <i>àsē</i> (M21) = C <i>àsē</i> (B) = W <i>àsè</i> (F21) “to come” (set 3)
depressor consonant, short stem	E <i>óbé</i> = C <i>ōbè</i> = W <i>óbé</i> “to take” (set 6)	E <i>gàdē</i> = C <i>gādē</i> = W <i>gádē</i> “to run” (set 8)
depressor consonant, long stem	E <i>ákidē</i> = C <i>ākīdē</i> = W <i>àkidē</i> “to pick” (set 7)	E <i>kòkidē</i> = C <i>kōkīdē</i> = W <i>kòkidē</i> “to hammer” (set 9)

There are only two verbal tone classes in East Dangla, H stems and L stems (forming their infinitives as H and LH respectively), with no obvious correlation of tone class and root consonants. By contrast, in Central and West Dangla verbs are assigned to specific tone classes if their final consonant is a voiced or glottalized obstruent. One of the best known cross-linguistic facts about tonogenesis is the tendency of voiced obstruents to act as “depressor consonants”, i.e. to lower the pitch of the following vowel (see e.g. Yip 2002: 35–38, Wolff 1986). This is exactly what can be observed in Central Dangla where, evidently, *óbé* changed to *ōbè* on account of the voiced /b/, thus giving rise to a new verbal tone class. This fact was first described by Burke (1995: §8.1), who stated it by two rules framed in generativistic terminology as follows: “(a) If the final consonant of the Underlying Form of a verb base is a depressor consonant, insert a low tone [+LOW, +low]. (b) Associate the two features [+LOW] and [+low] from right to left to the first available tone bearing unit (vowel).” Somewhat untypically, also glottalized obstruents act as depressor consonants in Dangla. While West Dangla shares with Central Dangla the special treatment of verbs containing these consonants, the subsequent tonal changes of this dialect obscured and nearly inverted their depressing effect. Since East Dangla shows no trace of this at all, we can be sure that this change took place only after the Proto-Dangla period, that is in Proto-West-Central Dangla. This process created the correspondence sets 6 through 9. In Proto-West-Central Dangla, the words affected coincided with sets 4 and 5:

Set 6: E H = C HL = W H

Set 7: E H = C HL = W LH

Set 8: E LH = C HL = W H

Set 9: E LH = C HL = W LH

Set 4: E HL = C HL = W H

Set 5: E HL = C HL = W LH

As for West Dangla, Fédry already noticed that a final voiced or glottal obstruent caused a specific tone shape of (infinitives of) verbs: “Nous pensons pour notre part qu’il s’agit d’un conditionnement du ton par la consonne: c’est la sonore ou la glottalisée qui entraîne le ton haut” (Fédry 1974: 8). He assumed a raising rather than depressing effect of these consonants since he was not yet aware of the Central Dangla evidence. But he (as also Burke) mistakenly believed that the lowering rule could not be extended to other word classes: “il importe cependant de signaler immédiatement que ce conditionnement phonématique du ton n’existe que pour les verbaux, et non pour les nominaux” (Fédry 1974: 8, similarly Fédry 1977: 103). He failed to recognize this because the effect of depressor consonants could only operate on items that had a final H tone in Proto-Dangla, which happens to be true of all (infinitives of) verbs, but not so on items with an original final L tone, typical of many non-verbs. I imagine that Fédry’s impression of the word class playing an essential role may have been one of the factors that fatally discouraged him from searching for regular sound laws. In fact, the depressing effect of voiced and glottalized obstruents is not at all restricted to verbs, since sets 6–9 are also well attested for non-verbs, and is therefore a purely phonological rule. We so arrive at tone rule number two:

Rule 2: In Proto-West-Central Dangla, a H tone was lowered to L in a word-final syllable beginning with a depressor consonant (a voiced or glottal obstruent). The preceding segment became H whatever it had been before.

It is interesting to notice that the depressor consonant lowered the tone only in the final syllable of a word, where it is likely that there already was a phonetic lowering due to the universal intonational phenomenon of downdrift. Only the combined effects of the depressor consonant and the natural downdrift were strong enough to actually change the phonological representation of the word.

There are occasional examples in which a lowering applied to the last syllable even though its onset does not appear to be a depressor consonant, such as E *sééro* = C *sēērà* = W *sèèr(ó)* “two” (set 7). One possible explanation could be that they did have a depressor consonant at an earlier period.¹⁹

Finally, some complications have to be noted concerning original LH verbs whose final radical was a depressor consonant. I have assumed above that the regular outcome of these verbs in Proto-West-Central Dangla was HL (correspondence sets 8 and 9), which would make them coincide entirely with original H verbs containing a depressor consonant (sets 6 and 7). There is, however, one prominent exception, namely the verb “entrer” E *ònjē* (M230) = C *ūnjè* (B) = W *ūnjé* ~ *ūnjé* (Peust 2016: §56), whose West Dangla representation

¹⁹ Cf. *sīdī* “deux” in closely related Bidiya (Alio & Jungrathmayr 1989: 114).

appears as if it were the result of a former **ɨŋjè* with a LHL melody (cf. my set 12). I would not exclude the possibility that this verb in fact represents the regular development, in which case all the other verbs such as *kòkìdè* > *kōkīdè* “to hammer” would have received their tonal pattern (instead of **kòkīdè*) irregularly through confusion with the original H verbs.

Another complication is posed by a group of verbs including the following: “avalér” E *sìdè* (M279) = C *sìdè* (B) ~ *sìdè* (Burke 1995: §3.1) = W *sìdè* (F373) • “faire rembourser une dette” E *bòòdè* (M47) = “exiger le remboursement d’une dette” C *bòòdè* (B, AudBib Rom11:35) ~ *bòòdè* (Burke 1995: §3.5) = “réclamer une dette” W *bóódé* (F93) • “suivre” E *ààdè* (M7) = C *ààdè* (B, AudBib Lk9:57) ~ *ààdè* (Burke 1995: §3.1) = W *áádè* (F9) • “grandir” E *mààdè* (M191) = C *mààdè* (B, AudBib Eph4:16) = W *máádè* (F111). These verbs should have experienced the lowering, and West Dangla indeed shows they did since they produce the regular outcomes of set 8. But the documentation of Central Dangla suggests that the lowering was suppressed: They are presented like ordinary unlowered LH verbs in Burke (2003), which I find confirmed by the Audio Bible, whereas Burke (1995) described them as a distinct tone class L which is entirely unexpected and may have been misanalyzed in some way. I have to assume that there is some kind of irregularity with these verbs in Central Dangla, whereas West Dangla derives from a variety of Proto-West-Central Dangla in which the lowering took place in a regular manner and brought about the forms **sìdè*, **bòòdè*, **āādè*, **māādè*.

There is no way of determining the relative chronological order of rules 1 and 2; they might have applied contemporarily.

8. The later tone shifts of West Dangla

These have been the two tone rules that I can reconstruct for the period between Proto-Dangla and Proto-West-Central Dangla. I will now proceed to a number of later tone rules that applied exclusively to West Dangla. These changes are probably of a fairly recent date and so must have occurred within a rather short period of time, but they altered the appearance of West Dangla considerably. It is mainly by virtue of these tone changes that West Dangla emerged as a dialect on its own.

As was stated above, the distinction between the high and the mid tone is entirely invisible in the West Dangla correspondences. One might assume that both tones happened to be treated alike in each of the various sound-laws that I am going to describe below, but it is more economical to posit a merger of both tones as the first tone rule specific to West Dangla. This is what I propose here:

Rule 3: In West Dangla, both realizations of H, the high and the mid tone, became indistinguishable and merged into a uniform H tone. This turned West Dangla again into a two-level tone language.

I will now focus on set 2, one of the best attested correspondence sets. These are words with an original L melody, which stayed intact in East and Central Dangla but changed into HL in West Dangla. In longer words, HL is realized in a way that only the last syllable or mora remains L, as in “chest” E *kòrkidò* = C *kòrkidò* = W *kórkidò*. The member words of set 2 demonstrate an important principle of the language: The overall shape of the tonal melody is more important than the precise mapping to the segmental tier. If a set 2 word is sufficiently long, its last syllable will be L. If there is not enough space, only the last mora will be L.

I propose the rule that a L section of any length was transformed into a falling melody that drops at the end: *CàCà* > *CáCà*, *CàCàCà* > *CáCáCà*, which is best visible in longer stretches of original L. I assume by analogy that the same happened also to short L segments so that *Cà* turned into **Cá*, even though contemporary West Dangla no longer retains **Cá* because single moras do not support complex contours; for this see rule 7 below.

One reason for considering this change as a recent one is the fact that East and Central Dangla, where they agree, must preserve a common retention since they are remote from each other in the genetic tree. Confirmation comes again from loanwords from Kenga. In §6, I already cited some examples where a Kenga word with L tone corresponds to a West Dangla HL item. There are in fact many more instances of this kind in words likely of Kenga origin. Here are some additional examples that are restricted to the West (and Centre) while missing from East Dangla: Kenga *dàgàrà* “beaucoup” (F179)²⁰ = C *dàkìnà* “beaucoup” (B) = W *dákinà* “beaucoup” (F179) • Kenga *dèntòdò* “ratel” (Palayer 2004: 42) = W *dótídò* “ratel (Mellivora Capensis)” (F193)²¹ • Kenga *dòògò* “buffle” (P. 2004: 47) = W *dóògò* “fou, sot” (F192) • Kenga *gàràrà* “divination” (P. 2004: 60) = W *gáàrà* “divination” (F314) • Kenga *jààrà* “nom d’un village: Djaya” (P. 2004: 71) = C *jààrà* “nom de village” (B) = W *jááyà* “village au Nord-Ouest de Sara-Kenga” (F237) • Kenga *jèlèlè* “gauche” (P. 2004: 72) = W *géélè* “gauche” (F322) • Kenga *mùrkùkù* “petit hibou” (P. 2004: 120) = W *mùrkùkù* “chouette” (F139) • Kenga *zèèrè* “vert, couleur verte, couleur claire (robe d’animal)” (P. 2004: 181) = C *zèèrè* “cheval blanc” (B) = W *zéérè* “cheval blanc” (F389). It is likely that (at least most of) these are originally Kenga words that were borrowed into an earlier form of West Dangla, or into Proto-

²⁰ Palayer (2004: 42) has this as *dènà*, which is from a different dialect.

²¹ Also in Daju as *dòttidò* “ratel” (Palayer 2011: 47), where the noun lacks the typical nominal ending and so must be an unassimilated foreignism, possibly taken from Dangla.

West-Central Dangla, prior to the tone shift $L > HL$. The time of borrowing is probably not very far back because the words apparently did not enter Proto-Dangla, being unattested in the East.

Rule 4: In West Dangla, a L melody of any length turned into a falling melody HL. When the segment was long, most of it became H and only the very end remained L.

Coming to the inverse case, what happened in West Dangla to words that formerly were all H? They became all L, forming my set 1: $E\ H = C\ H = W\ L$ as in “camel” $E\ lókúmó = C\ lókúmó = W\ lòkùmò$. We could take this change as being entirely unrelated to the one of rule 4. But it will be shown in the next section that there are independent reasons for assuming a final lowering rule. With that in mind, we can also posit a development $H > *LH > L$, so that the “camel”-word would have passed through an intermediate stage $*lòkùmó$. I prefer this latter reconstruction, first because it so neatly makes up an inverted form of rule 4, and also because there might be an isolated attestation of a preserved LH melody from a little-known subdialect: The verb “brûler” $E\ éré$ (M104) = $C\ éré$ (B) = $W\ èrè$ (F30) is cited by Alio (2009: 12) as $èré$ from a dialect that he describes as “dangaléat du Centre” without stating its provenance more precisely. If this form is authentic, it would be a direct attestation of a preserved LH melody in a set 1 item. This leads us to the next rule:

Rule 5: In West Dangla, a H melody of any length turned into a rising melody LH. When the segment was long, most of it became L and only the very end remained H.

Rules 4 and 5 can be motivated by a universal tendency for tones to be articulated most clearly towards the end of the segments to which they are associated, with the melody starting from a somewhat neutral position and then progressively approaching its goal. This is a key hypothesis of Kingston (2003: 85f.), who considers it a characteristic property of the pronunciation of tones that “the F0 targets that phonetically realize tones typically occur very late in the syllable that is phonologically specified for that tone, often even after that syllable is over”, and who explains instances of apparent tone reversals, as also of tone right-shifts, in some non-Chadic languages from this principle.

I now move on to the final lowering rule that is needed to explain why set 1 words have a L melody in contemporary West Dangla rather than the $*LH$ outcome predicted by rule 5. Consider the following Daju loan words, which are only a selection out of many similar ones:

Arabic source	Daju	East Dangla	Central Dangla	West Dangla
<i>ṣādah</i> “habit, tradition”	* <i>áádíné</i> (not attested)	<i>āādinē</i> “coutume, tradition” (M4)	<i>āādinē</i> “coutume” (B)	<i>áádinē</i> “coutume, tradition” (F8)
Chadian Arabic <i>dangay</i> “maison en terre, chambre, prison” (Jullien de Pommerol 1999: 365)	<i>dàṇ(g)áyiné</i> “maison en dur, prison” (Boy.)	<i>dàṇāyiné</i> “bâtiment en dur, prison” (M64)	–	<i>dàṇááyiné</i> “maison en terre à terrasse, prison” (F180)
<i>dunyā</i> “world, life”	<i>dúnùyné</i> “vie” (Palayer 2011: 155)	<i>dūnìnē</i> “malheur” (M78)	<i>dūnìnē</i> “monstre” (Adalta 1978: 18)	<i>dúniñé</i> “existence, vie, malheur” (F197)
<i>xabar</i> “news”	* <i>kábàrré</i> “nouvelle” ¹⁾	<i>kābàrrē</i> “news” (Shay 1999: 209)	<i>kábàrē</i> “nouvelle” (B)	<i>kábìrnē</i> “nouvelle” (F264)
<i>xalā?</i> “open field”	<i>kálàné</i> “brousse, hors du village” (Boy.)	<i>kālàànē</i> “brousse, campagne” (M149)	–	<i>kālàànē</i> “brousse” (F276)
<i>ṣadaqah</i> “alms”	<i>sátkiné</i> “sacrifice, rites divers” (Boy.)	<i>sātkinē</i> “sacrifice” (M270)	–	<i>sátkiné</i> “sacrifice” (Fédry 1971b: 139)
<i>waḡh</i> “face”	<i>wījíné</i> “visage, figure” (Boy.)	<i>wījèènē</i> “figure, visage” (M340)	<i>wījèènē</i> “visage” (B)	<i>wījàànē</i> “visage” (F148)
<i>waqt</i> “time”	<i>wikinné</i> “temps” (Palayer 2011: 172)	<i>wikkinē</i> “moment, temps” (M340)	<i>wiktinē</i> “temps” (AudBib Act1:7)	<i>wittinē</i> “temps” (F148)

¹⁾ This is what I assume as underlying according to the Daju tone rules outlined by Palayer (2011: 20–22). Palayer (2011: 47) gives *kábàrrē* as the free form and *kábárré* as the context form.

Unlike the Daju loans discussed in §6, these words do not participate in the fundamental tonal perturbations between East and West Dangla. Their tones are almost identical, save for a final L in West Dangla where we have LH in the East. Again, Daju shows that East Dangla is original. I conclude that these are recent borrowings from a time when most of the tonal perturbations had already taken place, so that they were subjected only to the final lowering rule, my rule no. 6:

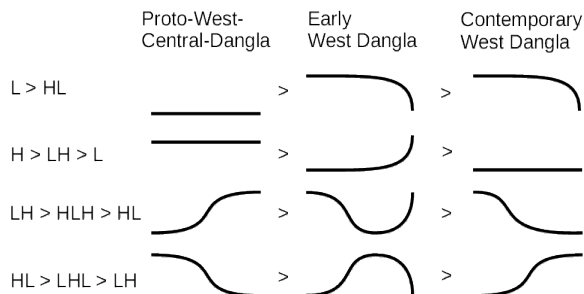
Rule 6: In West Dangla, LH became L at the end of a word.

I see a synchronic trace of this rule in the progressive tense of West Dangla L verbs. This tense has a L tone, which changes to LH when followed by certain clitics: either 3rd person direct object clitics (*tàlāw* “see” – *tàlīi-gà* “see him”, Peust 2014: §46) or most indirect object clitics (Peust 2014: §47). I assume that *tàlāw* has an underlying LH tone, which is normally realized as L by the effect of rule 6 but resurfaces before the clitic. The corresponding forms of Proto-West-Central Dangla must have been as they still are in Central Dangla: *tálāw* (AudBib Mt13:16) – *tālīgà* (AudBib Rom3:31).²²

Despite rule 6, there is a number, though limited, of LH words in West Dangla. My explanation is that these words still had a LHL melody at the time of rule 6, which therefore did not apply to them. Only by another rule, my rule 7 below, did these words turn into LH so that this melody became again possible in West Dangla. Nonetheless, rule 6 explains why LH is still a relatively rare melody in this dialect.²³

It might be the case that rule 6 did not apply, or in a more restricted manner, in the West Dangla variety of Korbo, which is unfortunately largely undocumented. My only reason for considering this possibility is the noun for “couteau”, which is E *gòdolé* (M123) = C *gòdōlē* (B) = W *góòlè* (F332) (my set 3), and for which a fourth variant *góólé* is cited by Fédry (1974: 3) as being characteristic of the idiom of Korbo.

Let us move a step back at this point. As a consequence of rules 4 and 5 combined, we can infer that original (= Proto-West-Central Dangla) HL must have turned into LHL, and original LH into HLH in (early) West Dangla. The following graphics summarizes what I assume to have happened in West Dangla to original L, H, LH and HL contours:



The principal tone shifts from Proto-West-Central Dangla to contemporary West Dangla

²² Burke (1995: §3.4) cites *bīrāw* – *bīrīgà* as progressive forms of *bīré* “to pass”, a verb of the same tone class.

²³ In Fédry’s (1971b: 119) count of West Dangla CVCV words, he found a percentage of 60% LL, 32% HH, 7% HL and 0.4% LH.

With the additional effect of rule 6, we arrive at the chain sequence LH > HLH > HL. So, former L words turned into HL (set 2), and former LH words did, too (set 3). Both sets did not, however, coincide, at least not for longer words, since the location of the downstep differs. While the downstep comes late in set 2 words, it comes early, usually on the second mora, in set 3 words. The downstep came early in set 3 in order to leave room for the following rise in my reconstructed *HLH, even though this rise no longer exists today. This subtle distinction still plays an important role in grammar. For example, the noun for “serpent” is E *ààlò* = C *ààlò* = W *áálò* (set 2), but in the genitive case it goes E *ààlól* = C *ààlól* = W (**áálól* >) *áàlól* (set 3) with a slight tonal difference still present in W.²⁴

On shorter words, the West Dangla tonal changes as described up to now would result in numerous contour tones and overly complex word tone patterns. Such a state might have existed for a little while, but contemporary West Dangla usually does not admit contour tones on single syllables apart from a falling tone on a long initial syllable of a word. Where it was necessary to simplify the overly crowded tone contours, the melody was shifted by ½ syllable to the right. This is most evident in items of set 2c (“fondement” C *bà* > **bā* > W /*bá*/ [*báá*]), set 5a (“bon” C *mээрà*m > **mээрà*m > W *mээрà*m), set 7 (“concombre” C *kōrīngò* > **kōrīngó* > W *kòrīngó*), set 9 (“marteler” C *kōkīdē* > **kōkīdē* > W *kòkīdē*) and set 12 (“grands” C *àgīndà* > **àgīndā* > W *àgīndá*). This shift did not occur in words that were long enough for each tone to fall on a separate syllable, such as those of set 5b.

Rule 7: West Dangla did not preserve any contour tones apart from a falling tone on heavy word-initial syllables. The others were simplified by shifting the melody by ½ syllable to the right, that is by transforming LH into L and HL into H.

As an exception to this, light word-initial former H syllables were not transformed into L, as they should have by rule 7, but into H when also the following segment was H. This concerns items of set 4 (“eau” C *āmà*y > **āmā*y > W *ámáy* rather than **àmáy*), set 6 (“chaud” C *tōngò* > **tōngó* > W *tóngó* rather than **tòngó*) and set 8 (“courir” C *gādē* > **gādē* > W *gádé* rather than **gàdē*), whereas sets 5, 7 and 9 are the corresponding sets that were not affected by this exception since the condition of the light first syllable was not met. I cannot provide an exhaustive definition of the term “light” but can only say that initial CV- always counts as light, initial CVV- or CVC sometimes, whereas initial CVCV- usually counts as heavy.

²⁴ E and W forms cited from Fédry (1974: 20), C forms from Burke (2003).

This rule has still left some synchronic traces in West Dangla. A H possessive suffix assimilates the tone of a L noun if the noun is very short (Peust 2014: §37), so we get *àsè* “foot” > *àsìn-dú* “my foot” (F21), but *sìḡò* “brother” > *sìn-dú* (F374, rather than **sìn-dú*) “my brother”. Second, verbs like *gádě* “to run” and *kòkidě* “to hammer” can be considered as belonging to the same tone class, which is H for short and LH for long verbs (Peust 2014: §57). This leads us to our eighth tone rule, the last one that can be reconstructed for West Dangla:

Rule 8: As an exception to rule 7, LH of a light word-initial syllable was assimilated to a following H tone rather than becoming L in West Dangla.

9. Tone simplification in East and Central Dangla

As we have seen, the tones of East Dangla are still close to the tones reconstructible for Proto-Dangla. Central Dangla participated in a few tone shifts from Proto-Dangla to Proto-West-Central Dangla, but remained stable after that, while a further series of substantial changes occurred in West Dangla. But a few tone changes, more specifically contour simplifications, are nevertheless demonstrable for East Dangla and to a lesser degree for Central Dangla. There is a general tendency in these dialects for contour tones within a syllable to be eliminated by levelling. The clearest case concerns monosyllabic verbs that should belong to the LH class structurally (cognate set 3d). This was already recognized by Fédry (1974: 7): “La lecture de ce tableau nous conduit à une hypothèse au sujet des verbes moyen de l’est, type *lěēḡ* «poser plusieurs choses». Cette forme résulte vraisemblablement de /*lā-ēḡ*/, [...] quand on sait que ce parler ne connaît pas le ton modulé (**lěēḡ* impossible).”

When 3rd person subject proclitics such as “he” E *ḡà* = W *ḡá* merge with the future auxiliary E *āā* = W *yàà*, we get the expected contour tone in West Dangla: *ḡáà* (Peust 2016: §82), whereas East Dangla does not have the expected **ḡāā*, but rather *ḡāā* (Ebobissé 1979: 31, Shay 1999: 212), again an obvious result of levelling.²⁵ There are some more instances in which a recent tone levelling can be assumed, sometimes only in certain subdialects. In §3 above, some cases were already mentioned in which a LH contour tone alternates with a H tone, most likely the product of levelling, in one and the same East Dangla word.

²⁵ I skip Central Dangla evidence here since the forms of this dialect, at least as I hear them in the Audio Bible, appear to be very variable.

10. The origin of the all-mid melody in East and Central Dangla

When the method of comparative linguistics has been pushed to its limit in the reconstruction of a proto-language, as here Proto-Dangla, one can try to explore still earlier periods either by internal reconstruction departing from the reconstructed proto-language or by incorporating evidence from more distantly related languages that are external to the proto-language. I will attempt this here for one problem that concerns a very early period preceding the time at which the Proto-Dangla language broke up into dialects, namely the origin of the all-mid words in East and Central Dangla.

I have operated with a binary tone analysis, which treats the surface mid-tone of East and Central Dangla as a realization of an abstract H tone in the neighbourhood of L. As was explained in §3, the existence of all-mid words in these dialects poses the major remaining problem to this analysis. Besides various isolated items, there are two large morphological groups of words that are generally all-mid: The perfect tense of (Proto-Dangla) H tone verbs (see the example below) as well as abstract nominalizations in *-aw* such as E *āgīndāw* = C *āgīndāw* = W *āgīndāw* “grandeur” (see cognate set 1b above)²⁶. Since roots with any kinds of consonants participate in both groups, we can rule out the possibility that the all-mid melody might in any way be conditioned by specific consonantal environments. Instead, we have to look for a strictly tonetic explanation of the mid tone. It seems reasonable to assume that all-mid words derive from words that were essentially H but used to include a L segment which lowered the H tone and got lost afterwards, so that the trigger of the mid tone is no longer apparent. This is in fact what happened much later to certain monosyllabic verbs in East Dangla, where a mid tone originated from an earlier LH-contour tone (see §9). But where in the all-mid words of Proto-Dangla might a L segment originally have been located?

It turns out that while LHL words are well attested for Proto-Dangla (my sets 12 and 13), even more so LH and HL words, it is hard to find any native terms that can plausibly be reconstructed as HLH, which leaves a conspicuous distributional gap. Had there been such words, they ought to survive as HLH in East Dangla. Looking through such candidates, I find that by far most East Dangla HLH items are evident borrowings from Daju (with the suffix *-né*), a number of which were cited above in §8. A few more HLH terms are either unattested in the other dialects or potential borrowings from Kenga, such as “hibou” E *gúúgùmā* (M128) = C *gúúgùmò* (B) = W *gúùgùmò* (F336) = Kenga

²⁶ Noticed already by Fédry (1974: 19): “Le dangaléat a un nombre important de noms abstraits en *-aw*, désignant une qualité, toujours de genre féminin, dotés d’un schéma tonal isotone caractéristique (moyen à l’est, bas à l’ouest)”.

giũgũm (Palayer 2004: 66).²⁷ I have found just one single word that plausibly looks like a native Proto-Dangla HLH item, namely “guêpe-maçonne” E *firingō* (M99) = C *firimó* (B) = W *firimò* (F250). If we emend the C form to **firimó*, this could be the result of the high-tone right shift (my rule 1), from which W would derive regularly (cf. set 3b). But the rarity of this type indicates that HLH was, at the very least, unusual in Proto-Dangla and might therefore have regularly transmuted into something else not very long before, as I suggest into all-mid.

While this argument is still weak as it stands, supporting evidence comes from a related Chadic language. I have hesitated so far to draw from other Chadic languages for comparison, because they would require a thorough historical analysis in their turn before being safely usable as evidence, particularly since the time span to consider (from the last common genetic subnode until today) is very long. Now, already Fédry (1977: 104) observed that an East Dangla mid tone may correspond to a HLH melody in the closely related Migama language (which he calls “dyongor”). Also Wolff (1982: 208) derived the East Dangla perfect tense *rũgũmē* “have cooked” from an underlying **rũgũmé*, possibly inspired by Fédry’s article or by his knowledge of Migama, though this is not stated. I will give five examples for this correlation:²⁸ “dent” E *sēñjō* (Fédry 1977: 95) = C *sāñjō* (B) = W *sàñjò* (F364) = Migama *sàñnú* (Jungraithmayr & Adams 1992: 121) • “poil” E *lāwō* (M186) = Migama *lāwú* (J. & A. 1992: 103) • “poisson” E *bōōsō* (M52) = C *bōōsā* (B) = W *bòòsà* (F97) = Migama *búúsú* (J. & A. 1992: 72) • “tige (de mil)” E *āārō* (Abbakar *et al.* 1975: 31) = C *āārō* (B) = W *ààrò* (F17) = Migama *ààrú* (J. & A. 1992: 63) • “oublier [perfect]” E *rāwītē* (Ebobissé 1979: 50) = C *rāwītē* (Burke 1995: §3.0) = W *rāwtē* (F343) = Migama *rāwté* (J. & A. 1992: 118).²⁹

Both arguments taken together provide firm support of the HLH origin of Proto-Dangla all-mid words. After having triggered a phonetic lowering of the neighbouring H tones, the L valley was eliminated by a levelling of the overall word melody. With the loss of the L element, the phonetic lowering of H became phonemic, so that the original binary tone system of the language turned into a ternary one. This leads us to another tone rule, the earliest one that I am able to reconstruct:

²⁷ The high tone before L in (East and Central) Dangla seems to be a reflex of a former contour tone, as explained above in §3, so this word is better classified as LHLH rather than HLH.

²⁸ Evidently, too short words cannot show HLH in Migama since contour tones are restricted to long syllables in this language (Abdoulaye & Kelly 1985: 2). I nevertheless consider it probable that words such as “lieu, temps” E *wēr* (M339) = C *wēr* (AudBib Mt8:19) = W *wèr* (F147) = “lieu, espace” Migama *wéré* (Jungraithmayr & Adams 1992: 134) originally did have HLH, in this case **wéré*.

²⁹ This verb represents many others that, in East and Central Dangla, oppose a high tone in the infinitive to a mid tone in the perfect tense (while West Dangla has L both of the times). In Migama, this verb is *rāwtó* (HH) in the infinitive and *rāwté* (HLH) in the perfect tense.

Rule 0: At some period preceding the break-up of Proto-Dangla into dialects, HLH was levelled to an all-mid melody, so that “mid” emerged as a third phonemic tone of the language.

A precise chronology is, of course, hard to provide, but it seems that Proto-Dangla, the common ancestor of the three modern dialects, can be situated at a time not long after the emergence of mid as a third phonemic tone. While it was then strictly speaking already a ternary tone language, most of its morphological processes would still be more economical to describe within a binary framework. Since HLH items had just been levelled to all-mid, only few new HLH words, if any, had the opportunity to develop by the Proto-Dangla stage.

11. The date of Proto-Dangla

The localization of Proto-Dangla in time is a thorny issue. The Arabic borrowings that entered the language through Daju, of which a number have been discussed above, ought to provide some clues. While the majority of these loans seem to be very late since they did not participate in most of the tonal changes, some belong to an earlier layer. One of the earliest might be the term for “enemy”, which seems to have passed through my sound rule no. 1, the rightward tone shift, and so behaves entirely like a native word of set 13. Unfortunately, I have no attestation of the Daju form of this noun: Arabic *ṣadūw* > Daju **ādīnè??* > E *ādīnè* (M4) = C *ādīné* (B) = W *ādīné* (F8) “ennemi”. If we can rely on this word, it must have been borrowed at or before the time of Proto-Dangla. Even though HLH is a particularly frequent melody in Daju nouns, there are hardly any examples that went through my rule 0, by which a Daju HLH melody would have resulted in a Proto-Dangla all-mid word. The only such candidate is Arabic *ṣawā* “to howl” > Chadian Arabic *awwa* “vacarme, tumulte, cri, bruit fait par un grand nombre” (Jullien de Pommerol 1999: 206) > Daju *āwwīné* “bruit” (Boy.) > E *āwīnē* (M26) = W *āwnè* (F6) “bruit”. I hesitate, though, to take this term as really so ancient but rather suspect that the word might have been heard as **āwīné* at the time of borrowing, with the Daju high tone being adapted as a Dangla mid tone.

My guess is therefore that Proto-Dangla might have been spoken at about the time when the very first Arabic-Daju words began to enter the language. Unfortunately, the history of the whole region is not well known but largely relies on oral tradition. The Dangla area is located between the three historical kingdoms of Wadai (Ouaddaï) to the North-East, Bagirmi (Baguirmi) to the West and Kanem to the North-West. The origins of the Wadai kingdom, one of whose ethnical components were the Daju, lie in the dark, but Islam is assumed

to have spread more widely only under Abd el-Karim in the early 17th century (Insoll 2003: 310), even though the Daju of Darfur seem to have been exposed to Islam already around 1200, the assumed date of the oldest remains of a mosque in that area (Insoll 2003: 128). Bagirmi, one of whose components were the Kenga, became a Muslim state under Abdullah in the late 16th century (Insoll 2003: 286). The ruler of Kanem is said to have converted to Islam already in the 11th century (Insoll 2003: 273). Such dates have, however, little to say about the beginning of the Islamic or Arabic influence, which may have been long before time was ripe for the large-scale conversion of nations.

I will therefore rely here on linguistic evidence alone, which is probably more suitable for elucidating history than vice versa, by using Morris Swadesh's rule of thumb in order to get a rough idea of the diachronic depth of Dangla. Considering that East and West Dangla still share 89 items out of the Swadesh 100-item list (Peust 2014: 201 note 1), Swadesh's estimated preservation rate of 86% per millennium leads me to a guess of $1000 * \log(0.89) / \log(0.86) \approx 770$ years before the publication date of my sources, that is to say to a localization of Proto-Dangla at around 1200 CE. This will be my starting hypothesis until better evidence comes up.

12. Context forms and contour tones

All Dangla dialects are characterized by the feature that the final vowel of a word is dropped in context, that is whenever another word follows within the same phrase. This is a rule of high practical importance since most words terminate in vowels, and most instances of words occur in context. When the tone of the final vowel to be dropped differs from the preceding tone, it is often rescued by being copied to the preceding syllable where it creates a contour tone, e.g. (East Dangla) *kàà-tí* 'her head' > *kàát* (Shay 1999: 37), *gàsē* 'to find (perf.)' > *gās* (Shay 1999: 55). It is mostly in this situation that contour tones occur in East and Central Dangla, dialects that disprefer contour tones in citation forms of elementary lexemes.

The fact that the feature of context forms is shared by all Dangla dialects would suggest that it was inherited from Proto-Dangla. But in this case, I consider the phenomenon as more recent for four reasons: (1) It was shown in §9 that original contour tones were subject to levelling in East (and partly Central) Dangla after the Proto-Dangla period. The contour tones caused by the vowel elision, and hence the vowel elision itself, must therefore have come into existence after that. (2) Not only Dangla but also some unrelated neighbouring languages, including Daju (Palayer 2011: 24f.) and Kenga (Neukom 2010: 40–43), share the feature of dropping final vowels in context. This can only

have an areal rather than a genetic explanation at any rate. (3) Admittedly a weak argument, I believe that the existence of a context form and a final form side by side in a language is unlikely to be a very stable phenomenon, since speakers must become increasingly uncertain of the correct vowel to be used in the (relatively rare) phrase-final positions. I imagine that this is only a transitory stage, which will probably end up with the general loss of final vowels after a few generations.³⁰ (4) Related to the last argument, we observe that the vowel elision creates consonant clusters that fail to undergo commonplace assimilations, at least in East Dangla of which we have the most precise description. Whereas the combination of *rōŋ* “son” + *jì* “his” yields *rōŋjì* “his son” with an assimilation of the nasal, *mìnē* “to fill (perf.)” + *jī* “he” yields *mìnjī* “he filled” rather than **mìnjī*, as explicitly stated by Shay (1999: 29). I explain this by a difference in diachrony: The first syntagm is likely to be very old, while the second one came into existence only more recently along with the elision of final vowels, so that an assimilation of the consonants has not yet taken place.

13. Special and irregular correspondences

There are numerous instances of irregular tonal correspondences between East Dangla on the one hand and Central+West Dangla on the other. Verbs of Arabic origin are a striking case in point. Already Fédry (1974: 9) noticed: “On remarque que tous les verbes empruntés à l’arabe véhiculaire du Tchad (ils sont très nombreux) sont intégrés dans chaque parler dans une catégorie tonale déterminée : ´´ à l’est, ´´´ à l’ouest.” Thus, Arabic verbs are generally LH in East but L in West Dangla, to which I can add the information that they belong to the H class in Central Dangla. While the correspondence Central H = West L is regular (my set 1), this is at variance with the LH tone in the east. I assume that, as is also true for the nouns, (at least the older layer of) Arabic verbs usually passed through Daju. Some examples: Arab. *ḍabaḥa* “to slaughter” > Daju *dápsàygé* “égorger” (Palayer 2011: 23)³¹ > E *dàpsiyē* (M65) = C *dápsiyé* (B) = W *dàpsiyè* (F173) “égorger” • Arab. *ḥaḡaba* “to cover, to guard” > Daju *hátpàygé* “protéger” (Boy.) > E *hìcbiyē* (M136) = C *hìcbiyé* (B) = W *ìcbiyè* (F34) “protéger (par un talisman)” • Arab. *kāfaʔa* “to recompense” > Daju *káffàygé* “rembourser, compenser pour un dommage” (Boy.) > E *kàppiyē* (M153) = C *kápiyé* (B) = W *kàpiyè* (F263) “payer” • Arab. *qadara* “to be able” > Daju

³⁰ Cf. the Classical Arabic contrast between *al-kitābu* (context form) and *al-kitāb* (final form) “the book”, of which only the latter survives in all modern dialects.

³¹ I cite all Daju verbs in their infinitive form, which terminates in *-gé* or *-ké*. The Dangla stems must have been based on a form without that suffix, such as possibly the 3rd person present tense, which in this case is *dápsiyé* (attested in Palayer 2011: 173).

gédèrgé “pouvoir, avoir de la force” (Boy.) > E *gèdirē* (M117) = C *gédéré* (B) = W *gèdèrè* (F321) “pouvoir” • Arab. *qaraʾa* “to read” > Daju *gàrkàygé* “lire, fréquenter l’école” (Boy.) > E *gàrkìyē* (M114) = C *gàrkíyé* (AudBib Mt21:23) = W *gàrkìyè* (F316) “lire”.

Why weren’t all these verbs assigned to one of the regular tonal correspondence classes? My explanation is that the bulk of the Arabic-Daju verbs were borrowed after the Proto-Dangla period, but before the break-up of Proto-West-Central Dangla into West and Central Dangla. While Arabic naturally lacks tone, Arabic verbs had to adopt some tone pattern in Daju. Tone of Daju verbs depends on various factors, but all infinitives as well as many present tense forms have either of the tone patterns LH or HLH. More specifically, Palayer’s (2011: 140-145) verbal class 3, to which most or all Arabic verbs, as generally most longer roots, seem to belong, has HLH in the infinitive and the 3rd persons of the present tense, and LH in the 1st/2nd person sg. of the present tense. These melodies had to be integrated into the preexisting tone classes of Dangla verbs. It appears that this took place independently in (earlier) East Dangla on the one hand, where (H)LH was approximated by LH, and in Proto-West-Central Dangla on the other, where (H)LH was approximated by H. The subsequent development into West Dangla L followed the regular path. There are a couple of verbs which, on first sight, would appear to be native but share the same irregular tonal correspondence, such as “passer” E *bìrē* (M46) = C *bíré* (B) = W *bìrè* (F90) • “passer la nuit” E *wàlē* (M332) = C *wálé* (B) = W *wàlè* (F146) • “savoir” E *ibìnē* (M138) = C *ibíné* (B) = W *ibìnè* (F32) • “travailler la terre, cultiver” E *gáwnē* (M116) = C *gáwné* (B) = W *gàwnè* (F310). I suspect some kind of non-genetic transmission or interdialectal borrowing for these as well.

Besides this, there are quite a number of diverse individual irregularities for which only more or less tentative explanations can be suggested. Just two examples for that: The adverb “above” is E *kùwán* (Fédry 1977: 92) = C *kúwá* (B) = W *kùwà* (F303). The correspondence is irregular, but we can explain all forms departing from the assumption that there was a tone levelling **kùwá* > *kúwá* in Proto-West-Central Dangla. This would have been an easy change because words of this kind tend to sound almost monosyllabic despite their conventional CVCV spelling.³² Another example is the noun for “evening”: E *mààkò* (M192) = C *mààkò* (B) = W *mààkó* (F114). The correspondence between E and C is regular, but not so the match with W, for which an outcome **máàkò* would rather be expected. There being no genetic subnode common to E and C, I assume that an irregular development must have occurred on the side of W. Since a spontaneous

³² This is my acoustical impression from the Central Dangla Audio Bible. Fédry (1971b: 62-71), discussing West Dangla, argued at length that such words contain a structural glide rather than being just **kùà*. Abbakar *et al.* (1975: 9) remarked the same with regard to East Dangla. The mere fact that this needs to be argued for reveals that the presence of the glide is not so very evident on the phonetic surface.

change **máákò* > *mààkò* seems little motivated, one might better imagine that the Proto-West-Central Dangla form **mààkò* was misinterpreted as **māākò* by some speakers, possibly because the last syllable of **mààkò* may have had an extra-lowering due to the utterance-final sentence intonation (see my remark at the end of §3 above). Such an intermediate form **māākò* would be a suitable input for creating the actual W term *mààkò* (my set 5).

Some apparent instances of irregular correspondences may arise from mistakes in one of the sources. At the current state of documentation, we cannot expect all Dangla records to be absolutely correct. Even though this takes us on somewhat shaky ground, the knowledge of the sound correspondences may be helpful to identify at least some of the errors. For example, the East Dangla term for “tooth” is given as both *sèèṅò* (M275) and *sēēṅò* (Fédry 1977: 95). Since the forms of the other dialects, to wit C *sāāṅò* (B) and W *sààṅò* (F364), predict a mid tone for E (my set 1b), I presume that Fédry’s variant is the better one. In the word for “flour”, we encounter the forms E *kùrgàl* (M181) = C *kùrgàl* (B) = W *kùrgàl* (F305). The correspondence looks irregular but would become perfect after a slight correction of the W form into **kùrgàl* (my set 2). I cannot decide whether Fédry’s dictionary is imprecise here, or whether there was an irregular sound development in this word; the doubts could only be removed through new fieldwork. Various other examples of this kind could be adduced.

Recent borrowings obviously do not obey the regular sound correspondence rules, such as “argent” E *gúrùs* (M129) = C *gúrùs* (AudBib Mt10:9) = W *gúrùs* (F337) < Chadian Arabic *gurus* “argent, monnaie” (Jullien de Pommerol 1999: 518) < Arab. *qirš* (a currency unit), to cite just one example. The same applies to certain onomatopoeic or nursery terms, in which regular sound shifts may have been suppressed: “papa! (terme d’appellation)” E *bààbá* (M31) = C *bààbá* (AudBib Mt21:30) = W *bààbá* (F72).

Finally, as in any language, we have to reckon with analogy disturbing the regular sound developments. One probable example of that can be found in a cluster of feminine nominal derivations, many of which designate animals. These nouns consistently belong to set 3(a),³³ such as “cow” E *bèrkā* (M43) = C *bèrkā* (AudBib Heb9:13) = W *bèrkā* (F86) or “hen” E *kòkìrā* (M169) = C *kòkìrā* (B) = W *kòkìrā* ~ *kòkrā* (F298). When the last consonant is a depressor consonant, a tone lowering should have taken place moving the noun into set 8 (E LH = C HL = W H). But this did not happen, by analogical pressure as I assume, so that nouns such as “sheep (fem.)” E *tàmḡā* (M297) = C *tàmḡā* (B) = W *tàmḡā* (F152) or “bird (fem.)” E *dīdā* (M93) = W *dīdā* (F208) still belong to set 3.

³³ Cf.: “le féminin [sc. in derived female animate terms] est toujours caractérisé par une modalité nominale /-a/ conjointement à un schème tonal /‘‘/” (Fédry 1971c: 37 on West Dangla); “Tous les noms féminins terminés par -ā ont une suite de ton bas-moyen” (Sopoyé 1982: 30 on East Dangla); see also Peust (2014: 207).

14. Outlook

It was my intention to show that tonal correspondences between related languages are as regular as are any sound correspondences and can likewise be described in terms of regular sound change. But we can also observe that the rate of change is very high in certain languages, as here in West Dangla, which gives rise to substantial tonal differences even between idioms that are otherwise closely related. For this reason, I consider attempts at reconstructing tone for the levels of Proto-Chadic or even Proto-Afroasiatic (as was envisaged e.g. by Ehret 1995) as premature. We should focus first on reconstructing tone for a sizeable number of low-level units within the Chadic family before we can think of pushing the reconstruction further back into the past.

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