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THE HYBRID ORIGIN OF BRĀHMĪ SCRIPT FROM ARAMAIC, PHOENICIAN AND GREEK LETTERS

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ABSTRACT

The origins of Brāhmī script have been mired in controversy for over a century since the Semitic model was first proposed by Albrecht Weber in 1856. Although Aramaic has remained the leading candidate for the source of Brāhmī, no scholar has adequately explained a letter by letter derivation, nor accounted for the marked differences between Aramaic, Kharoṣṭhī and Brāhmī scripts. As a result, the debate is far from settled. In this article I attempt to finally answer the vexed questions that have plagued scholars for over a century, regarding the exact origins of Brāhmī, through a comparative letter by letter analysis with other Semitic origin scripts. I argue that Brāhmī was not derived from a single script, but instead was a hybrid invention by Indian scholars from Aramaic, Phoenician and Greek letters provided in part by a western Semitic trader.

KEYWORDS: Aramaic, Brāhmī, epigraphy, Greek, Sanskrit, Phoenician

RESUMEN *El origen híbrido de la escritura brāhmī de las letras arameas, fenicias y griegas*

Los orígenes de la escritura brāhmī se han visto envueltos en controversia durante más de un siglo desde que Albrecht Weber propuso por primera vez el modelo semítico en 1856. Aunque el arameo sigue siendo el principal candidato para la fuente de brāhmī, ningún erudito ha explicado adecuadamente una derivación letra por letra, ni tuvo en cuenta las marcadas diferencias entre las escrituras aramea, kharoṣṭhī y brāhmī. Como resultado, el debate está lejos de resolverse. En este artículo, intento responder finalmente a las inquietantes preguntas que han atormentado a los eruditos durante más de un siglo, con respecto a los orígenes exactos de brāhmī, a través de un análisis comparativo letra por letra con otras escrituras de origen semítico. Argumento que brāhmī no se derivó de una sola escritura, sino que fue una invención híbrida de eruditos indios a partir de letras arameas, fenicias y griegas proporcionadas en parte por un comerciante semítico occidental.

PALABRAS CLAVE: arameo, brāhmī, epigrafía, griego, sánscrito, fenicio

1. Introduction

Brāhmī was the main ancient script of the Indian subcontinent used to write both Indo-Aryan and Dravidian languages, including Prakrit and Tamil. The earliest securely dated Brāhmī epigraphs are the edicts of Aśoka which date to the third century BC. Another ancient Indic script that likely predates Brāhmī is Kharoṣṭhī. This was used in

the northwest of the subcontinent and is widely accepted to be derived from the Aramaic script of the Persian empire, sometime in the third or fourth century BC. Currently, there is no consensus on the exact origins of Brāhmī. A theory of independent and indigenous origin has been proposed mainly by Indian scholars, but as the late epigraphist Iravatham Mahadevan states this is almost certainly impossible:

> …the connection between Brahmi and some form of Semitic script is too strong. Bühler pointed out the relation between Alif and A, B and Bay, Gameen and Ga, and so on. At least I can see about 10 of the 22 Semitic characters very closely resemble Brahmi both in form and sound. Statistically, such a resemblance is impossible except when there is genetic relationship. (Mahadevan, 1998)

Mainstream scholarship in the field of epigraphy is therefore united on the Semitic origin hypothesis, with Aramaic being the prime candidate. However, the exact model of creation has never been satisfactorily explained and considerable doubt remains. Contributing to this confusion is the fact that Brāhmī is paleographically too dissimilar from Kharoṣṭhī, which makes a shared development from a common Aramaic prototype incredibly unlikely (Salomon, 1998, p.23). Despite this it is clear that the older Kharoṣṭhī script had influenced Brāhmī at least on a structural level, with the introduction of its vowel stroke system (Falk, 2018, p.55).

Salomon states that no one since Bühler in 1898 has "undertaken a comprehensive and careful paleographic reexamination of the Semitic hypothesis" (Salomon, 1998, p.29). In this article, I finally attempt this with a non-insular approach surveying the latest data from Semitic scripts.[1]

2. Scholarly influence on Brāhmī

The creators of Brāhmī were undoubtedly scholars well versed in linguistics. This can be seen clearly by the systematic and scientific arrangement of letters based on the

[1] Dani (1986) for example does not adequately explain every letter derivation convincingly. He has missed the clear Greek influence, and does not provide satisfactory prototype source letters for each and every Brāhmī character. He derives *gha* from *ga*, and *jha* from *ja*, but the base forms look significantly different, and are not convincing. He also incorrectly derives *ḍa* from *ṭa*, when *ḍa* is clearly cognate with an Aramaic *d* variant. Finally, he derives two nasals from *ja* and *jha*, which just does not seem logical at all, especially when we have Aramaic *n* variants of very similar forms to the Brāhmī letters.

established Vedic system of phonetics (Lockwood, 2019, p.40), (Staal, 2005, p.193). Furthermore, certain vowel letters appear to be derived from other letters following the principles of vowel gradation enunciated in Sanskrit grammars such as Pāṇini's grammar, the *Aṣṭādhyāyī*. In Pāṇini's defined rules, *guṇa* vowels *e* and *o* substitute the base vowels *i* and *u* respectively, whilst *vṛddhi* vowels *ai* and *au* substitute the *guṇa* vowels *e* and *o*. This is mirrored perfectly by the corresponding Brāhmī letter derivations (Lockwood & Bhat, 1991, pp. 1-3).

Table 1: Vowel substitutions and their matching Brāhmī derivations.

Vowel substitutions	Matching Brāhmī derivations
i > e	𑀇 > 𑀏
u > o	𑀉 > 𑀑
e > ai	𑀏 > 𑀐
o > au	𑀑 > 𑀒

The *Aṣṭādhyāyī* is dated by most scholars to after 350 BC, since it mentions the *rūpya* coin which emerged in the fourth century BC (Falk, 1993, pp. 302-304). It is likely that the creation of Brāhmī post-dates this period.

3. Brāhmī letters

Standard Aramaic[2] with its limited 22 letter alphabet could not provide all the letters for the 43 Prakrit phonemes[3] and the Brāhmī creators were compelled to look

[2] Standard Aramaic refers to the standard scripts of the Persian empire, both cursive and lapidary (monumental). Aramaic was the lingua franca of the empire, and this persisted even after its fall in 330 BC, remaining the dominant trade language.

[3] The 43 Prakrit letters are: *a, ā, i, ī, u, ū, e, ai, o, au, ka, kha, ga, gha, ṅa, ca, cha, ja, jha, ña, ṭa, ṭha, ḍa,*

elsewhere. They did this by borrowing additional letters from other scripts and by modifying existing Brāhmī letters. For example, both the Aramaic and Greek forms of *d* were borrowed, but used for two different, but closely related phonemes in Brāhmī, [ḍ] and [dh] (𑀥 and 𑀡).

4. Letter by letter analysis

1. a  𑀅

A reversed form of the Brāhmī letter *a* 𑀅 is attested in an Ashokan era Aramaic inscription from Lampāka, Afghanistan dating to the third century BC (Henning, 1949, Plate 1):

 Aramaic *aleph*

A similar form is also attested in lapidary Aramaic dating to the early fifth century BC from Tayma, northwestern Saudi Arabia (Al-Theeb, 1989, p.77):

The lapidary Aramaic script persisted till at least the third century BC (Naveh, 1995, pp. 1-4), and this archaic K like form likely reached India close to this time period. Although the Semitic *aleph* represents a glottal stop [ʔ], Greek and other scripts derived from Semitic alphabets take the *aleph* for [a]. The reversal of this letter in the Brāhmī script may have been influenced by the reversal of the overall script direction in Brāhmī in relation to Aramaic.

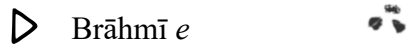
2. ā 𑀆

ḍha, ṇa, ta, tha, da, dha, na, pa, pha, ba, bha, ma, ya, ra, la, va, śa, ṣa, sa, ha.

The long vowel *ā* 𐤀 is a clear adaptation of the short vowel *a* 𐤀 by the addition of a horizontal midline extension to the right.

3. i ∴

As mentioned before the short vowel *i* is substituted by the *guṇa* vowel *e* in vowel gradation. The Indian scholars were aware of this and thus derived the triangle of three dots *i* ∴ from the closed triangle of *e* 𐤄.

 Brāhmī *e* Brāhmī *i* (rotated variants)

4. ī ⁘

The long vowel *ī* ⁘ is a clear adaptation of the short vowel *i* ∴ by the addition of a fourth dot.

5. u 𐤅

In Aramaic, the standard letter for *w* 𐡅 has a double function, and is also used to represent the vowel *u*. This is the same as the Brāhmī *u* 𐤅, but turned upside down. A similar form is attested in a Nabataean Aramaic inscription of the second century BC (Del Río Sánchez, 2015, p.69).

6. ū 𐤥

The long vowel *ū* 𐤥 is a clear adaptation of the short vowel *u* 𐤅 by the addition of another horizontal line to the right above the baseline.

7. e 𐤄

The Semitic-origin *'ayin* 𐤏 is used to represent the *ʿē* in Phoenician [ʕ]. A triangular variant of this letter is found in Phoenician 𐤄 (usually engraved on hard surfaces due to the difficulty in engraving the circular form), dating to the fourth century BC, and is

the likely source of the Brāhmī *e* 𑀏 [eː] (De Vogüé, 1881). This is supported by the use of the *'ayin* letter 𐤏 to represent a vowel in ancient Greek [o], and by the use of *'ayin* by modern Jews to represent [e] in foreign loan words (Bühler, 1898, p.67).

8. ai 𑀐

The *vṛddhi* vowel *ai* 𑀐 is a clear adaptation of the long vowel *e* 𑀏 by the addition of a horizontal extension to the left. This reflects vowel gradation where *ai* substitutes *e*.

9. o 𑀑

As mentioned before the short vowel *u* is substituted by the *guṇa* vowel *o* in vowel gradation. The Indian scholars were aware of this and thus derived the *o* 𑀑 from *u* 𑀉 by adding a top horizontal line to the left.

10. au 𑀒

The *vṛddhi* vowel *au* 𑀒 is a clear adaptation of the vowel *o* 𑀑 by the addition of a horizontal line to the right. This reflects vowel gradation where *au* substitutes *o*.

11. ka 𑀓

A variant of the Greek letter chi 𐌟, which represents the sound [kʰ] has the exact same form as Brāhmī *ka* 𑀓 [k]. It is attested in the fifth century BC (Jeffery, 2004). Alternatively, the more common 𐌗 form of chi could have been rotated to create Brāhmī *ka* 𐌟.

12. kh 𑀔

The deep guttural Arabic *qāf* [q] is often rendered as the harsh sounding [kʰ] in Arabic loan words in Indo-Aryan (Bühler, 1898, p.70). A variant of Brāhmī *kha* 𑀔 [kʰ] with a circle base has the same form as a *qop* unique to Nabataean Aramaic (Naveh, 1975, pp. 83-85), but turned upside down and reversed:

 Nabataean Aramaic [q]

Nabataean Aramaic refers to the specific Aramaic script variants found in the Nabataean kingdom, which was established in the third century BC.

13. ga 𑌗

Brāhmī *ga* 𑌗 [g] is likely derived from the Aramaic *g* 𐡂. A similar form also exists in Phoenician 𐤂.

14. gha 

The Arabic *ghayn* غ which shares the same base letter as *'ayin* ع is used to represent the voiced velar fricative *gh* [ɣ]. A similar letter form exists in its parent script Nabataean, but rotated:

 Nabataean Aramaic *'ayin*

The Brāhmī *gha* 𑌘 [gʰ] is likely derived from a cursive variant of the Nabataean Aramaic form. The use of this shared letter for *ghayn* meant that an alternative *'ayin* outside of Aramaic had to be sought to represent the *e* sound in Brāhmī (the Phoenician *'ayin* 𐤏). Biblical Hebrew also used a similar letter ע to represent both *'ayin* and *ghayn*.

15. ṅa 𑌙

Brāhmī *ṅa* 𑌙 [ŋ] is likely derived from a variant of Aramaic *n* found in the Levant, which was then reversed. This variant later evolved into the modern Hebrew and the Maalouli Aramaic forms, both derived from square Aramaic script:

 Modern Hebrew and Maalouli Aramaic *n* forms

16. ca 𑌚

The Brāhmī *ca* 𑌚 [tɕ] is perhaps derived from the Nabataean Aramaic form of *ṣade* [sˁ], but turned upside down:

 Nabataean Aramaic [sˤ]

A similar form also exists in Kharoṣṭhī.

17. cha 𑀘

The aspirate *cha* 𑀘 [tɕʰ] is a clear adaptation of the Brāhmī *ca* 𑀕 by the addition of a loop to the right to represent the aspirate.

18. ja 𑀚

The *ja* 𑀚 [dʑ] is frequently used in Indo-Aryan to replace the sound [z], particularly when borrowing Arabic, Persian and Greek words (Bühler, 1898, p.61). A variant of the Phoenician *z* dated to the third-second century BC is the closest letter form to the Brāhmī *ja* 𑀚, but rotated (Lidzbarski, 1898, Table XLV):

 Phoenician *z*

19. jha 𑀙

The aspirate *jha* 𑀙 [dʑʰ] is likely an adaptation of the Aramaic *z* 𐡆 by the addition of an upper hook to the right to represent the aspirate. This form of *z* is also present in Nabataean Aramaic (Naveh, 1975, pp. 83-85).

20. ña 𑀜

Brāhmī *ña* 𑀜 [ɲ] is likely derived from a variant of Aramaic *n* with the addition of a hook. The letter was then reversed and rotated (Al-Theeb, 1989, p.223):

 Aramaic *n*

A similar form is attested in standard cursive Aramaic dating to the fourth century BC (Dusek, 2007) as well as in Nabataean Aramaic (Al-Theeb, 1989, p.223).

21. ṭa 𑀝

The retroflex *ṭa* 𑀝 [ʈ] is a clear adaptation of the Brāhmī *ṭha* 𑀞, by halving the circle.

22. ṭha 𐤈

The Brāhmī *ṭha* 𐤈 [ʈʰ] is likely derived from a circular form of Aramaic *ṭēth* 𐤈. This is attested in the Ashoka era Aramaic inscription from Lampāka, Afghanistan dating to the third century BC (Henning, 1944, Plate 1).

23. ḍa 𐤄

The Brāhmī *ḍa* 𐤄 [ɖ] is likely derived from a reversed form of the Aramaic letter *d*:

This form is attested in both the Lampāka Aramaic inscription (Henning, 1944, Plate 1) and in Nabataean Aramaic (Al-Theeb, 1989, p.237)

24. ḍha 𐤉

The aspirate *ḍha* 𐤉 [ɖʱ] is an adaptation of *ḍa* 𐤄 by looping the lower half to represent the aspirate.

25. ṇa 𐤊

The Brāhmī *ṇa* 𐤊 [ɳ] is a clear derivation from the Brāhmī *na* 𐤋 but with the addition of a top horizontal line to represent retroflexion.

26. ta 

The Brāhmī *ta* 𐤀 [t] is a clear derivation from the Aramaic *t* (Al-Theeb, 1989, p.76):

 Aramaic *t*

A similar form is attested in a Nabataean inscription of the second century BC (Del Río Sánchez, 2015, p.69).

27. tha 𐤈

The Greek letter *theta* 𐤈 has the exact same form and sound as the Brāhmī letter *tha* 𐤈

[t^h], both being aspirates. The letter is found in Greek inscriptions dating to the fourth century BC (Walbank, 1982, pp. 41-56).

28. da 𑀤

Brāhmī *da* 𑀤 [d] is likely an adaptation of Brāhmī *dha* 𑀥 by removing its back stroke and adding vertical extensions to the top and bottom.

29. dha 𑀥

Brāhmī *dha* 𑀥 [$d^ɦ$] is likely derived from a semicircular variant of the Greek *d* 𐌃, which has been found in epigraphs dating to the fourth century BC (Jeffery, 2004).

30. na 𑀦

Brāhmī *na* 𑀦 [n] is likely derived from a variant of Nabataean Aramaic *n* (Al-Theeb, 1989, p.223):

 Nabataean Aramaic *n*

31. pa 𑀧

Brāhmī *pa* 𑀧 [p] is likely derived from the Aramaic *p* 𐡐, but rotated and turned upside down. The exact same letter is also found in Phoenician.

32. pha 𑀨

The aspirate *pha* 𑀨 [p^h] is a clear adaptation of Brāhmī *pa* 𑀧 by looping the tail of the letter to represent the aspirate form.

33. ba 𑀩

A squarish *b* exists in Nabataean Aramaic, and is perhaps the source of Brāhmī *ba* 𑀩 [b], by the addition of a closing back stroke (Klugkist, 1982, p.223):

 Nabataean Aramaic *b*

34. bha 𐨦

The Brāhmī aspirate *bha* 𐨦 [bʱ] is perhaps derived from a rotated form of the squarish Nabataean Aramaic *b*, but with the addition of a hook to represent the aspirate:

 Nabataean Aramaic b

35. ma 𐨨

Brāhmī *ma* 𐨨 [m] is likely derived from the Aramaic *m* 𐡌. This is attested in the Ashoka era Aramaic inscription from Lampāka, Afghanistan dating to the third century BC (Henning, 1944, Plate 1):

 Aramaic *m*

The top evidently closed in a loop, and the letter turned upside down by the time of Ashoka's Brāhmī edicts. A similar form is attested in a Nabataean inscription of the second century BC (Del Río Sánchez, 2015, p.69).

36. ya

Brāhmī *ya* 𐨪 [j] is likely derived from the Phoenician *yodh* turned upside down, with an extension of the middle projection (the Aramaic *y* was foregone due to its similarity with *ga* 𐡂). Phoenician forms like this exist in both the fourth and third centuries BC (Lidzbarski, 1898, Table XLV):

 Phoenician *y*

37. ra 𐨫

Brāhmī *ra* 𐨫 [r] is likely derived from the Nabataean Aramaic *r* 𐡓, which is a single vertical stroke that evolved from the cursive standard Aramaic *r* 𐡗. This vertical stroke assimilated with the Nabataean *zayn* 𐡆, and it became necessary in the later Arabic forms to add a diacritic to differentiate the two letters (Naveh, 1975, pp. 83-85). The ambiguity between Nabataean Aramaic *z* and *r* is perhaps the reason why the Phoenician *z* was

loaned for Brāhmī *ja*.

38. la 𑀮

Brāhmī *la* 𑀮 [l] is likely derived from a reversed form of Aramaic *l* 𐡋. Similar forms exist in Nabataean Aramaic (Al-Theeb, 1989, p.226).

39. va 𑀯

Brāhmī *va* 𑀯 [ʊ] is likely derived from a variant of Nabataean Aramaic *w*, but turned upside down (Al-Theeb, 1989, p.239). The standard Aramaic form of *w* 𐡅 does not have the unique circular head of the Nabataean form:

 Nabataean Aramaic *w*

40. śa 𑀰

Brāhmī *śa* 𑀰 [ɕ] is clearly derived from the standard Aramaic *s* 𐡎, but turned upside down with slight adjustment of the middle extension. A similar form is attested in a Nabataean inscription of the first century BC (Del Río Sánchez, 2015, p.75).

41. ṣa 

Brāhmī *ṣa* 𑀱 [ʂ] and *sa* 𑀲 [s] are both likely derived from variants of standard Aramaic *ṣade* [sˁ]. This reflects the influence of Sanskrit phonetics where both letters are closely related, and *sa* becomes *ṣa* due to "the influence of a preceding i, u, ṛ, e, ai, o, au, k, r or l" (Bühler, 1898, p.67).

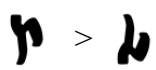
For *ṣa* 𑀱**,** an Aramaic *ṣade* was turned upside down and reversed, with the addition of a horizontal midline extension to the right:

 (Aramaic s > Brāhmī ṣa)

A similar *ṣade* is attested in Nabataean Aramaic (Al-Theeb, 1989, p.77).

42. sa 

Brāhmī *sa* 𑀲 [s] is likely derived from the standard cursive Aramaic *ṣade* [sˁ], but turned upside down and reversed, with elongation of a hook to the left:



43. ha 

Brāhmī *ha* 𑀳 [ɦ] is likely derived from a form of Aramaic *h*, reversed and turned upside down (Lidzbarski, 1898, Table XLV):

5. Western Semitic model

There are 23 Brāhmī letters cognate with Aramaic letters in both sound and form. This leaves no doubt that Brāhmī is primarily derived from a form of Aramaic script. Such phonetic and visual correspondence cannot be due to coincidence. Considering that Aramaic remained the lingua franca and dominant trade language of the Near East well into the third century BC, this is hardly surprising.

It is plausible that a form of Aramaic script intermediate to standard Aramaic and its daughter Nabataean was the primary source. This is supported by the presence of standard Aramaic letters in Nabataean, as well as variants unique to Nabataean found in Brāhmī (see Table 2). This would partly explain the divergence of Brāhmī from Kharoṣṭhī, as Kharoṣṭhī was sourced directly from standard Aramaic at an earlier date (see Table 3). Even the Aramaic epigraphs found in the northwest of the subcontinent (the birthplace of Kharoṣṭhī) from the Aśokan era and after are noted for their conservative adherence to standard Aramaic (Zellmann-Rohrer, 2019, p.206), (Dupont-Sommer, 1970, pp. 158-173).

Excluding the 15 letters derived from standard Aramaic, we get a total of 3 Greek letters, 3 Phoenician letters, 7 specific Nabataean letters and 1 Square Aramaic letter in Brāhmī. The latter three groups comprising 11 letters are all derived from the Levant and Nabatea (western Semitic). This correspondence with specific western Semitic letters in both sound and form, strongly suggests a partly western Semitic origin of

Brāhmī.

Fig 1: Map of Nabataean Kingdom (Zifan, 2019)

The most plausible explanation for this is that a trader from this region introduced these western Semitic letters to India via the sea route. The preponderance of Nabataean specific forms suggests that the trader was based in the Nabataean Kingdom, or at least disembarked from a Nabataean port in the third century BC. These specific variants could only have arisen after the fall of the Persian empire at the hands of Alexander the Great in 330 BC, and the subsequent diversification of standard Aramaic, which uniformity could no longer be preserved by the empire's scribes (Naveh, 1997, pp. 82-84). Already from the third century BC, a process of regional differentiation of Aramaic scripts can be observed (Klugkist, 1982, p.5).

There are no surviving Nabataean inscriptions from the third century BC, and the earliest from the lapidary tradition are dated to the 1st century BC (Jones, 1988, pp. 47-

57).[4] It is this branch of Nabataean where unique lapidary variants are first attested similar to Brāhmī forms such as the circular ended *q* and *w* (corresponding to Brāhmī *kha* 𑖏 and *va* 𑖯). These variants are absent in standard Aramaic.

Whereas the trader was perhaps a Nabataean seaman, a more likely scenario is the trader being of Phoenician origin. The Phoenicians were the premier long-distance sea traders of the ancient world and were renowned for their maritime expertise. King Solomon is said to have recruited a Phoenician fleet with 'knowledge of the sea', in order to trade with India in the tenth century BC. Indian commodities such as peacocks, monkeys, gold and sandalwood are said to have been procured on these voyages via the Red Sea (Bar-Ilan, 2015, pp. 127-137). It is possible that the Phoenicians repeated this journey in the third century BC via a trade relationship with the later Nabataean kingdom. This would have given the Phoenicians renewed access to the Red Sea (see Fig 1), repeating the precedent set 700 years prior by King Solomon. This is plausible given the Phoenicians' record of forming symbiotic relationships with the various empires and powers that arose over the centuries. In the fifth century BC, they provided a large naval fleet to the ruling Persian empire (Katzenstein, 1979, pp. 23-34). In the second century BC, they transported the Seleucid ruler Demetrius I to the Phoenician city of Tyre to aid his escape from Rome (Millar, 1983, pp. 55-71).

While we have no direct evidence that the Phoenicians were still sailing to India in the third century BC, it was well within their capabilities. The Greek writer Scylax of Caryanda made the opposite journey in the sixth century BC from the Indus to the Gulf of Suez, whilst the Phoenicians had circumnavigated Africa almost a century before (Rawlinson, 1889, p.819).[5]

[4] Regarding use of the word 'lapidary' as opposed to epigraphic, this is the term most frequent in the literature as it has come to mean the variants found exclusively on stone, not necessarily all the letter forms found on stone. Also, some of the cursive script forms were also inscribed epigraphically at times, which makes the term 'epigraphic' more ambiguous. See Naveh: https://www.journals.uchicago.edu/doi/10.2307/1357384

[5] the circumnavigation around Africa refers to Pharaoh Necho II of Egypt's sponsored Phoenician

The Phoenicians also maintained trade networks throughout the Mediterranean and Levant in the third century BC, and would have been fluent in Greek, Aramaic and Phoenician. A Phoenician trader with knowledge of all the above scripts would have been the perfect person to provide the prototype letters for Brāhmī.

Some may argue that a hybrid script is a stretch of the imagination and unlikely. However, it is much more unlikely for the 6 Brāhmī letters cognate to Phoenician and Greek in both sound and form to be mere coincidences. These 6 letters (𐤏, 𐤃, 𐤕, 𐤄, 𐤋, 𐤃) are also absent in every Aramaic derived script, further corroborating the hybrid origin of Brāhmī.

As mentioned before, there is a clear and logical reason why the Brāhmī creators would have turned to other scripts outside of Aramaic. The 43 Prakrit phonemes simply could not be covered by Aramaic's 22 letter register, even when variants are taken into account.

Both Aramaic and Greek scripts were known in India as early as the fourth century BC, both *lipi* (derived from the Persian *dipi* for writing) and *yavanānī* (Greek script derived from the Sanskrit rendering of Ionian, *yavana*) are mentioned in Pāṇini's grammar the *Aṣṭādhyāyī*.

The Greek influence on ancient India would have increased following Alexander's conquest of the Punjab in 326 BC, and the subsequent matrimonial alliance between the Seleucid Empire and the Maurya Empire in 303 BC. A lady from the Greek emperor Seleucus' family was said to have been given to the Maurya emperor, Chandragupta, in marriage following a peace treaty (Falk, 2018, p.57). Therefore, even if we discount the proposed western Semitic trader's fluency in Greek (a reasonable assertion considering the Seleucid Empire ruled the Levant), alternative sources for Greek script abound elsewhere in India.

expedition (as recorded by Herodotos). It does not refer to the later Hanno expedition

The ability of scripts to borrow letters from other script traditions is also well attested in Middle Aramaic scripts (dated to between 300 BC – 200 AD):

> The Middle Aramaic script-traditions did not develop out of each other. They can all be traced back to cursive Imperial Aramaic script-forms, but they were not independent of each other. They influenced each other mutually and borrowed various forms from each other. (Klugkist, 1982, p.320)

There is no reason to exclude this phenomenon from Brāhmī, especially when western Semitic traders were known to juggle several languages and scripts. This is made more plausible by the presence of hybrid scripts elsewhere in the world. The Cyrillic script for example, is derived from Greek uncial script supplemented with letters and ligatures of the Glagolitic alphabet. These additional Glagolitic letters were used to represent Slavic sounds not found in Greek (Cubberley, 1996, pp. 346-352).

6. Aśokan era creation

Megasthenes, a Greek ambassador in the court of Chandragupta (321-297 BC), stated that Indians were ignorant of writing and recorded everything by memory:

> Megasthenes, who was in the camp of Sandrocottus, which consisted of 400,000 men, did not witness on any day thefts reported, which exceeded the sum of two hundred drachmae, and this among a people who have no written laws, who are ignorant even of writing, and regulate everything by memory. (Strabo, 1903, 15.1.53)

It was Chandragupta's own grandson Aśoka (268-232 BC) who likely commissioned the creation of Brāhmī, which clear, well-defined letters were perfectly suited for his monumental rock edicts. It is possible that many of the Semitic letters adopted in Brāhmī were made more geometric in appearance due to this function, and is another reason why Brāhmī diverges from Kharoṣṭhī (which is closer to manuscript Aramaic) (Daniels, 2020, pp. 3-13). It is from this period that we first get firm evidence of writing in ancient India.

Most telling of all is the fact that Aśoka employed scribes from the northwest to engrave his Brāhmī edicts elsewhere, including in the south. For example, a scribe

called Chapada who engraved several Brāhmī edicts in Karnataka signed off his work in Kharoṣṭhī, with the meaning 'written by the scribe' (Goyal, 2006, p.49). Another scribe engraved parts of the Yerragudi edict in the boustrophedon style associated with Kharoṣṭhī. Inversion of certain letters in the Aśokan edicts also hark back to an older Kharoṣṭhī habit of engraving letters from right to left (Goyal, 2006, p.50). If writing was already a long-established tradition throughout India in this period, there would be no need for Aśoka to recruit northwestern scribes to other provinces, as trained scribes skilled in engraving letters would have already been present there. As S.R. Goyal summarizes:

> Such a necessity should not have arisen, but if Brahmi had been created in the reign of Ashoka himself, he had no option but to depend mainly upon the artisans from the North West just as the Gupta emperors had to depend upon the Kushana mint-masters when they issued gold coins for the first time in the history of indigenous Hindu dynasties. (Goyal, 2006, p.50)

All the above evidence firmly places Brāhmī as a creation of the 3rd century BC.

Table 2: Brāhmī letters and their sources. (Aramaic refers to standard Aramaic).

Brāhmī sound	Brāhmī letter	Source letter	Source sound	Attested source
a	𑀅	𐡀	a	Aramaic
ā	𑀆	𑀅	a	Brāhmī
i	𑀇	𑀏	e	Brāhmī
ī	𑀈	𑀇	i	Brāhmī
u	𑀉	𐡅	u	Aramaic

				Nabataean Aramaic
ū	𐡥	𐡤	u	Brāhmī
e	𐤃	𐤄	ʿē	Phoenician
ai	𑀏	𑀍	e	Brāhmī
o	𑀒	𑀌	u	Brāhmī
au	𑀓	𑀒	o	Brāhmī
ka	+	+	kh	Greek
kha	𐢘	𐢙	q	Nabataean Aramaic
ga	𐡀	𐡁	g	Aramaic Phoenician
gha	𐢦	ع ﻉ	gh	Nabataean Aramaic Arabic
ṅa	𐡅	𐡍	n	Square Aramaic
ca	𐡇	𐡑	sʕ	Nabataean Aramaic

cha	𐤆	𐤃	c	Brāhmī
ja	𐤇		z	Phoenician
jha	𐡆	𐡉	z	Aramaic Nabataean Aramaic
ña	𐡇	𐡍	n	Aramaic Nabataean Aramaic
ṭa	𐤈	𐤏	t	Brāhmī
ṭha	𐡈	𐡏	tˁ	Aramaic
ḍa	𐡄	𐡋	d	Aramaic Nabataean Aramaic
ḍha	𐤄	𐤃	ḍ	Brāhmī
ṇa	𐤉	𐤋	n	Brāhmī
ta	𐡅	𐡊	t	Aramaic Nabataean Aramaic
tha	𐤅	𐤅	th	Greek
da	𐤊	𐤃	dh	Brāhmī

dha	𐤃	𐤃	d	Greek
na	𐤍	𐤍	n	Nabataean Aramaic
pa	𐤐	𐡐	p	Aramaic Phoenician
pha	𑀦	𐤐	p	Brāhmī
ba	𐤁		b	Nabataean Aramaic
bha	𐤁		b	Nabataean Aramaic
ma	𐤌		m	Aramaic Nabataean Aramaic
ya			y	Phoenician
ra	𐤓	𐤓	r	Nabataean Aramaic
la	𐤋	𐡋	l	Aramaic Nabataean Aramaic
va	𐤅		w	Nabataean Aramaic
śa	𐤔	𐡔	s	Aramaic

				Nabataean Aramaic
ṣa	𐡑		sˤ	Aramaic Nabataean Aramaic
sa	𐡎		sˤ	Aramaic Nabataean Aramaic
ha	𐡄		h	Aramaic

Table 3: Correspondence between Aramaic, Kharoṣṭhī and Brāhmī letters.

Standard Aramaic	Kharoṣṭhī	Brāhmī	Brāhmī source
𐡉 y	𐨌 y	𑀬 y	𐤉 y Phoenician
𐡄 e	𐨆 m	𑀏 e	𐤄 ʿē Phoenician
𐡍 n	𐨍 n	𑀦 n	𐡍 n Nabataean
𐡅 w	𐨅 v	𑀯 v	𐡅 w Nabataean
𐡐 p	𐨐 a	𑀧 p	𐡐 p Aramaic
𐡓 r	𐨕 r	𑀭 r	𐡓 r Nabataean

𐤃 d 𐡃	𐤃 ḍ 𐡃	𐤃 ḍ	𐡃 d Aramaic
𐤁 b 𐡁	𐤁 b 𐡁	□ / 𐤁 b/bh	𐡁 b Nabataean
𐤕 t 𐡕	𐤐 p 𐡐	𐤕 t	𐡕 t Aramaic

Several of the Kharoṣṭhī letters are only cognate in form, not sound. As Harry Falk has rightfully suggested, several Aramaic letters were borrowed but allotted different sounds by the Gandhāran creator of Kharoṣṭhī who likely had forgotten their original sound values given to him by an Aramaic clerk (Falk, 2018, p.53).

Examples of Brāhmī letter evolution

Fig 2: Evolution of *da* and *dha*

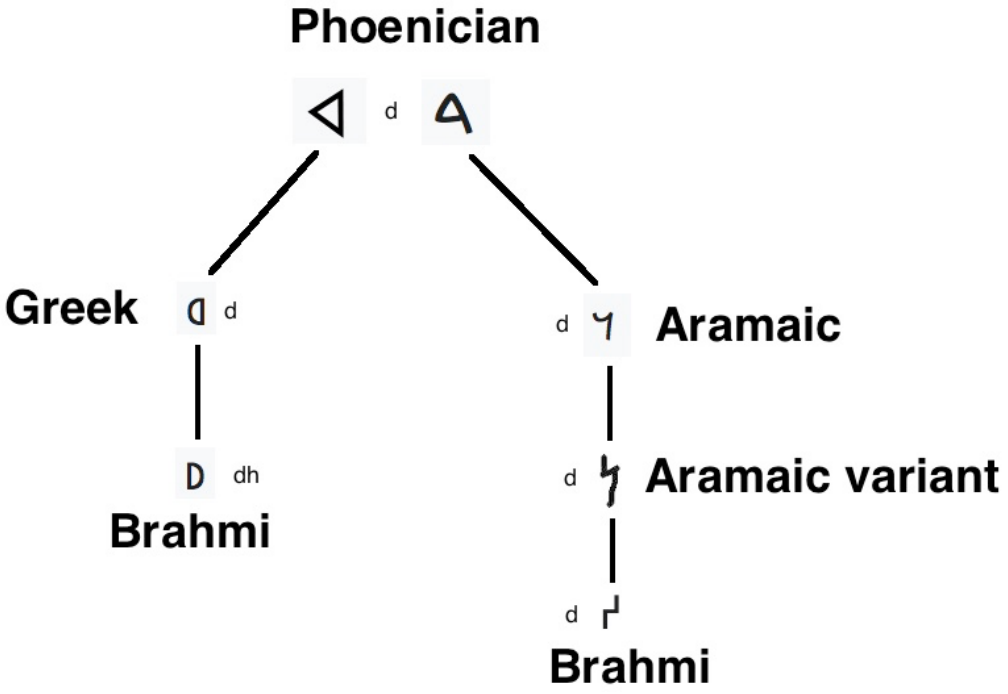


Fig 3: Evolution of *tha* and *ṭha*

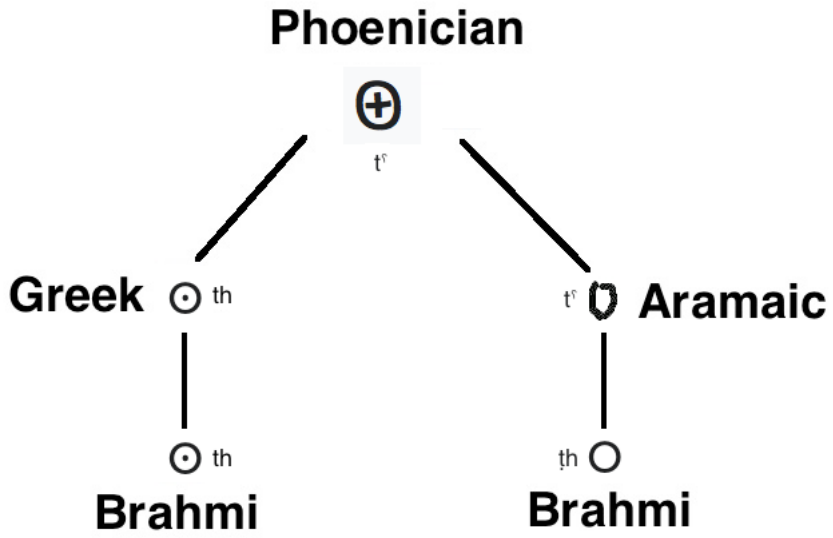


Fig 4: Evolution of *ja* and *jha*

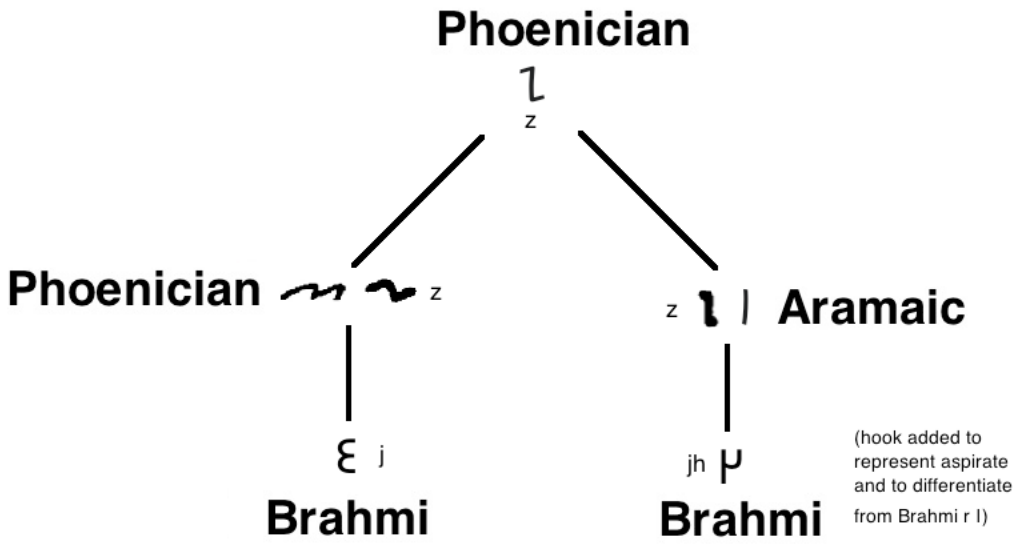


Fig 5: Evolution of *ra*

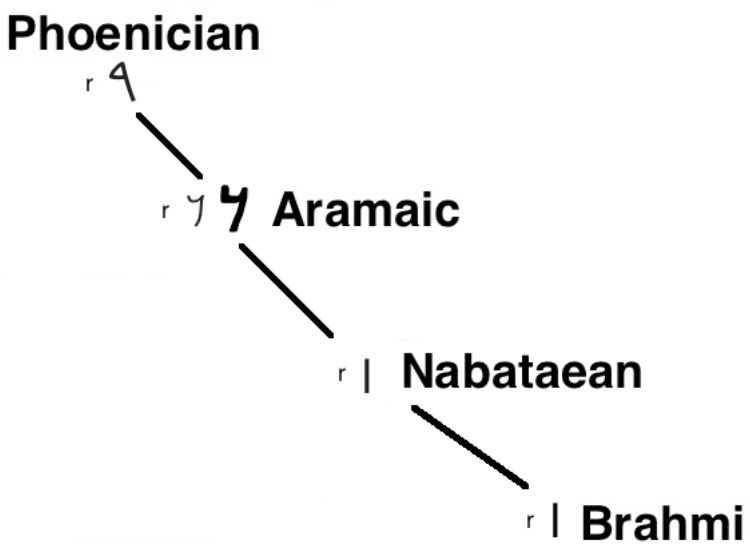


Fig 6: Evolution of *va*

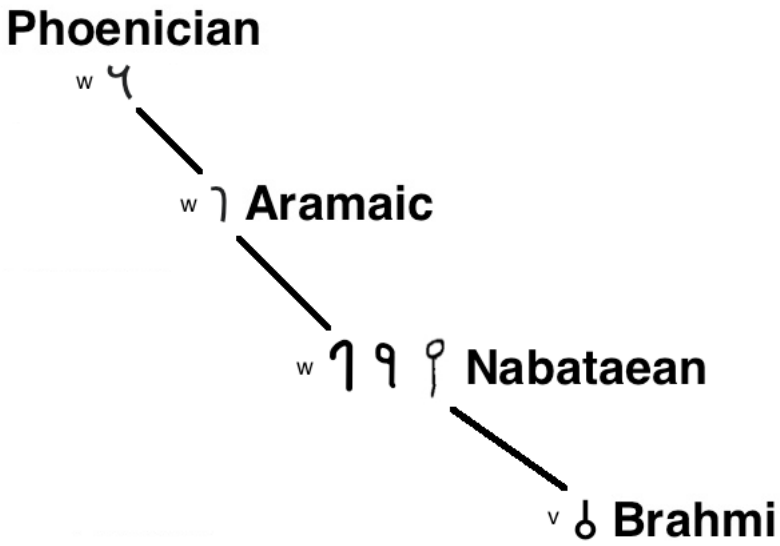


Fig 7: Evolution of *kha*

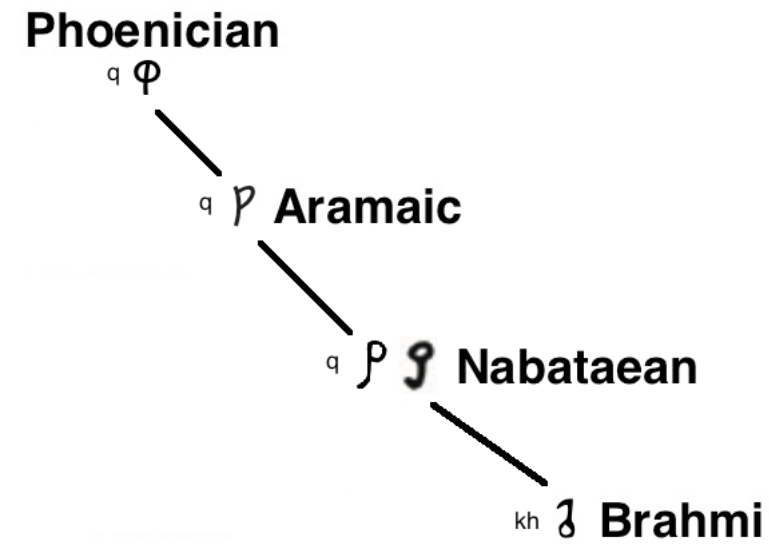


Fig 8: Evolution of *ya*

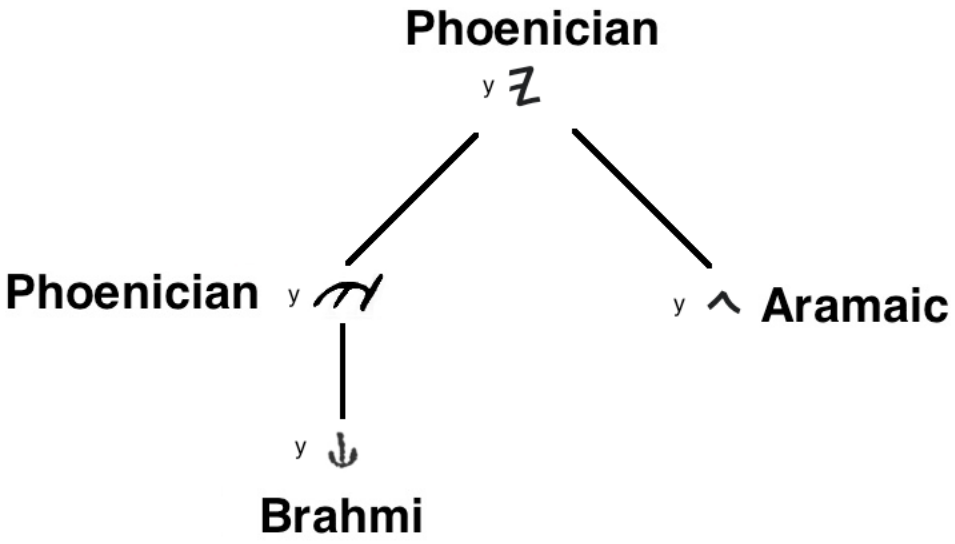
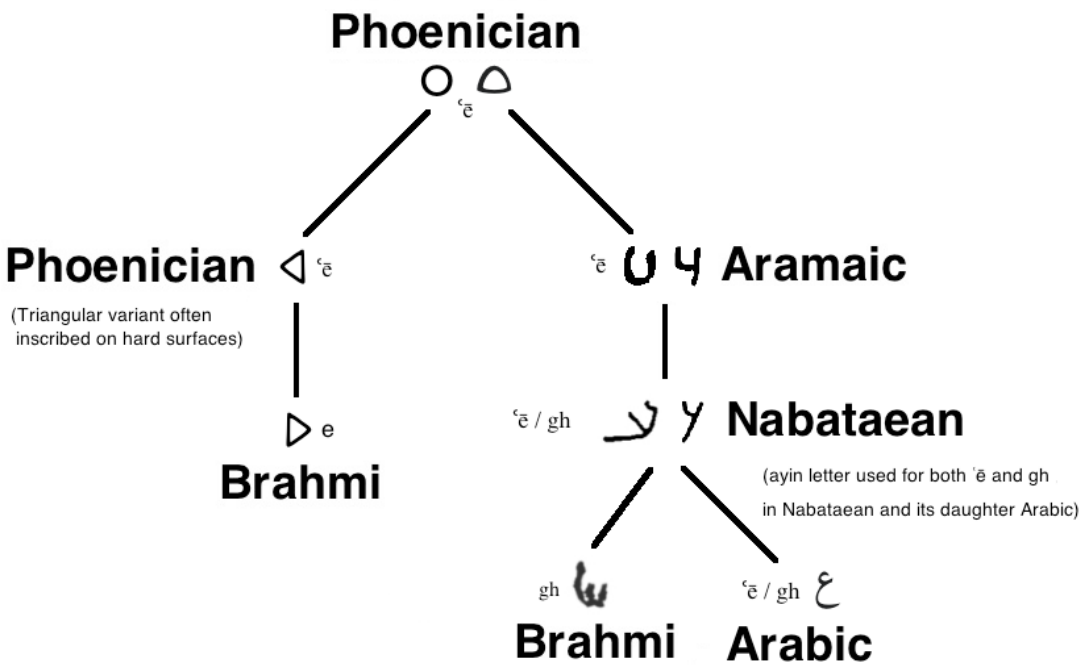


Fig 9: Evolution of *e* and *gha*



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