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(Note: This is a work in progress! It will be updated periodically.)

7. THE ANCIENT INDIAN PHONOLOGICAL CLASSIFICATION

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7.1 Reasons for Devoting an Entire Chapter to the Indian Classification

The original Indian phonological classification gave rise to **all** the scripts that are in use in India today [1-7], excepting the Arabic and Roman, and many others in Southeast Asia, East Asia, and elsewhere, as discussed below.

The reader may wonder at the outset why we have devoted an entire Chapter to the Indian phonological classification in the first place.

The answer is relatively simple: This ancient classification provides an extremely scientific, systematic, remarkably well-organized, and elegant ***basis from which to further develop a more complex phonological classification***. It is thus an elementary, yet firm and wonderful jumping off point for us. Furthermore, a detailed discussion of this Indian "alphabet" (classification), as done in the next section, yields *a fundamental understanding of the bases of phonological classification themselves,* as adopted in the present work, but at a very basic level. It is thus an essential "primer" for the more advanced developments in the sequel.

This Indian phonological classification is also, incidentally, the *world's **first*** phonological classification and was, until about 1820 A.D. the world's ***only***, scientific and systematic classification. Even today it is, in this author's humble opinion, still pretty much the best.

7.2 The Original Indian Classification in Summary

7.2.1 Tabular Summary

Table 1 summarizes the simplest form of the classification, that which was originally applied to the Sanskrit language from *time immemorial*. (What we list is the contemporary *Devanaagari* version, plus the original *Braahmi* (in square brackets) for reference.)

Our phrase *time immemorial* is italicized above because it has a particular significance: The earliest known Sanskrit writings, in the *RgVeda*, included exegesis, i.e. analysis, as an integral part. That exegesis in turn discussed phonology in some detail, and pre-assumed a knowledge of the already well-established Sanskrit grammatical rules. And the *first* chapter in the teaching of any Sanskrit grammar was phonology.

> **Table 1**: The Indian phonological classification, as represented by the modern *Devanaagari* ("refined urban") script. Vowels (*svara*) and the non-vowels (*vyanjana*), including semivowels and fricatives, are listed in summary tabular form, in the exact "alphabetical" order they are taught to children even today. Thus, memorization of the Indian "alphabets" comprises a thorough lesson in phonological classification. The non-vowel Table includes a column for the corresponding vowels, inserted in highlight before the semivowels, to show their relation with the nonvowels in terms of articulation position. This column is of course not in the "alphabet" as taught. The Table also lists the original *Braahmi* letters, for reference. Finally, we give examples of the formation of ligatures, and a summary of modern adaptations of Devanaagari.

DEVANAAGARI SCRIPT ("ALPHABET")

(USED TODAY FOR SANSKRIT, HINDI, MARAATHI AND NEPAALI)

JUXTAPOSED WITH BRAAHMI
(LATE ASHOKAN VERSION, IN SQUARE BRACKETS)

(NOTE: A bar ("hanging post") is put above the Braahmi to better facilitate the reader in appreciating its relation to modern Devanaagari)
(The reader can see that many Devanaagari letters appear to be attempts at "cursivazation" of the original Braahmi)

VOWELS, FUNDAMENTAL

TYPE OF ARTICULATION (Class, *Varga*)	FUNDAMENTAL: SHORT	FUNDAMENTAL: LONG
Velar (*kanthya*)	a (*but*) अ, ॲ [ग्र]	aa (*father*) आ, ग्रा [ग्र]
Palatal (*taalavya*)	i (*bit*) इ [⠶]	ii (*beat*) ई [⠶⠶]
Bilabial (*oshthya*)	u (~ *put*) उ [⌐]	uu (~*boot*) ऊ [⌐]
Retroflex (*muurdhanya*)	vocalic-r (American *doer*) ऋ [ ]	vocalic-rr ॠ [ ]
Dental (*dantya*)	vocalic-l (American *able*) ऌ [ ]	*(defunct)* ॡ [ ]

VOWELS, DERIVATIVE

COMPONENT 1	COMPONENT 2	RESULTING DERIVATIVE VOWEL
a	i	e (~*bait*) ए [ठ]
aa	i	aai (originally *Jack*, now diphthong, *my*) ऐ [ठ]
a	u	o (~*boat*) ओ, श्रो [ठ]
aa	u	aau (originally ~*bought*, now diphthong, *out*) औ, श्रो [ ]
a	*nasalization*	~ (*anusvaara*) (अं, अँ e.g. कं, कँ) ॱ, ॱ [ॱ, e.g. कँ]
a	*glottalization*	originally glottal stop (:), now unvoiced aspirate (~ whispered <u>h</u>*at*) (अः e.g. कः) : [:, e.g. कः]

NON-VOWELS

POINT OF ARTICULATION (Class, *Varga*)	PLOSIVES					SEMI-VOWELS *Anta:shta*	FRICATIVES *Uushman*	CORRES-PONDING VOWELS
	Unvoiced (*karkasha*) Unaspirated (*alpa-praana*)	Unvoiced (*karkasha*), Aspirated (*mahaa-praana*)	Voiced (*mrdu*), Unaspirated (*alpa-praana*)	Voiced (*mrdu*), Aspirated (*alpapraana*)	Nasal (*Anu-naasika*)			
Velar (*kanthya*)	ka	kha	ga	gha	nga (ki*ng*)		ha**	a
Palatal (*taalavya*)	cha	chha	ja	jha	jna	ya	sha	i
Retroflex (*muurdhanya*)	~ta	~tha	~da	~dha	~na	ra	~sha	vocalic-r
Dental (*dantya*)	ta	tha	da	dha	na	la	sa	vocalic-l
Bilabial (*oshthya*)	pa	pha	ba	bha	ma	wa (va)		u

**(This is actually of course a glottal fricative, but is placed in the Velar row for convenience only).

(In ancient times, it probably represented both the glottal and velar fricatives, as IE cognacy shows).

ONE EXAMPLE OF USE OF *MAATRAS* (NON-INITIAL-VOWEL MARKERS)

ILLUSTRATED WITH VELAR PLOSIVE [ka]

[ka]	[kaa]	[ki]	[kii]	[ku]	[kuu]
क [+]	का [+]	कि [+]	की [+]	कु [+]	कू [+]

[ke]	[ko]	[ka~] *(nasalization)*	[ka:] *(glottalization)*		
के [+]	को [+]	कँ [+]	कः [+:]		

ONE EXAMPLE OF USE OF LIGATURES

ILLUSTRATED WITH VELAR AND DENTAL PLOSIVES, [ka], [ta]

[ka] + [ya] = [kya]

क + य = क्य

[+ + =]

[ta] + [yaa] = [tyaa]

त + या = त्या

[+ + =]

MODERN ADAPTATIONS OF THE DEVANAAGARI SCRIPT
(AS USED TODAY IN HINDI AND MARAATHI)

VOWELS

Pure Vowel	Maatra (Vowel Sign), Illustrated with [ka]
(Jack) अॅ, एॅ	कॅ
(bought) ऑ	कॉ

NONVOWELS

Articulation Position	Plosive, Unvoiced	Plosive, Voiced	Fricative, Unvoiced	Fricative, Voiced	Flap, Voiced *(Unaspirated)*	Flap, Voiced *(Aspirated)*	Central or Lateral
Uvular	[k.] क़	[g.] ग़					
Velar			[x] ख़				
Retroflex					[d..] ड़	[dh..] ढ़	[l..], [r..] ळ
Dental				[z] ज़	[r] र		
Infralabio-Supradental			[f] फ़	[v] व			

7.2.2 The Vowels

The *vowels* follow a highly scientific definition, which we gave (and discussed at some length) in an earlier Chapter (cite *as;dlfasdlfj*), namely: ***Phones for which the breath is not impeded at all during articulation***.

All phones which do not comply with this definition are then automatically classified as *nonvowels*. It is also important to remember that the "alphabetical" order listed in the Tables is the exact order in which this "alphabet" is taught to children even today. Thus, memorization of the Indian "alphabets" comprises a thorough lesson in phonological classification.

The vowels in **Table 1** start with the ***fundamental*** vowels:

1.   [a] (velar or flat).
2.   [i] (palatal).
3.   [u] (bilabial).
4.   vocalic-[r] (central).
5.   and vocalic-[l] (lateral).

These in turn are said to lead to the ***derivative*** vowels through the application of very simple, mathematical, vowel equations, which also form part of the ***Sandhi*** rules used in Sanskrit grammar:

6.   [a] + [a] = [aa].
7.   [i] + [i] = [ii] (i.e. long [i]).
8.   [u] + [u] = [uu] (i.e. long [u]).
9.   vocalic-[r] + vocalic-[r] = [rr] (i.e., long vocalic-[r])
10.   [a] + [i] = [e].
11.   [a] + [u] = [o]

Finally, two other parameters relating to vowels, though not vowels themselves, are taught as part of the regular "alphabetical" order of the vowels. They are the final two elements in the vowel series:

12.   [a~] (nasalization, *anusvaara*)
13.   [a:] (glottalization, *visarga*)

Combination of the vowel [aa], itself a derivative of [a], yields two further derivative vowels as follows:

14.   [aa] + [i] = [aai].
15.   [aa] + [u] = [aau].

Some discussion of the above presentation of the fundamental vowels and their derivatives is now pertinent.
Firstly, the scientific thoroughness, yet simplicity, of the classification is evident. The three fundamental vowels, [a], [i], [u], which we know from modern analyses of formant frequencies *are in fact truly fundamental*, are used to derive almost all the other vowels.

Secondly, the scientific accuracy of the Sandhi equations that lead to derivative vowels is astounding: For example, taking Eq. 5, we see that when we try to articulate the tongue-flat, lips-flat, close-mid [a] with the characteristics of [i], i.e. tongue-forward, lips-stretched, we immediately arrive at [e], i.e. [a] + [i] = [e]. Similarly, when we try to articulate [a] with the characteristics of [u], i.e. tongue-back, lips-rounded, we immediately get [o], i.e. [a] + [u] = [o]. We can do this more rigorously with formant frequency analysis, but do not need to. In a similar fashion, if we "add" two close-mid jaw positions, [a] and [a], we figuratively get an open-mid or open jaw position, i.e. [a] + [a] = [aa].

7.2.3 Jaw, Lip and Tongue Position as Independent Variables in the Indian Vowel Classification

Another important feature of the Indian vowel classification that should now be apparent from the above is that it clearly gives us three ***independent variables*** upon which to base a classification:

1)   **Jaw position**: Only *three* being recognized, *close ("viraama"), mid ("guna"), open ("vrddhi")*. As is well know, of course, the IPA splits *mid* further into *open-mid* and *close-mid*.
2)   **Tongue position:** *Five* recognized, of which two correspond to vocalic-r (*retroflex, "muurdhanya"*) and vocalic-l (*dental, "dantya"*). The other three positions are *velar, palatal* and *bilabial*, corresponding respectively to the Indian terms *kanthya, taalawya, oshthya.*
3)   **Lip position**: Three are recognized: *stretched ("taalawya")*, *flat* (*"kanthya"*) and *rounded ("oshthya")*.   The Indian terms are the same ones used for tongue contact position, as in 2).

We can thus already start to see the utility of presenting the Indian classification as a sort of "primer" phonological classification, upon which to build a more complex one.

7.2.4 Probable Original Significance of Some Elements of the Indian Vowel Classification (Eqs. 12-15 Above)

Some specific discussion of Eqs. 12-15, in reference to their probable original significance, is pertinent.

7.2.4.1 Glottalization vs. aspiration:

Today, the glottalization, [a:], is pronounced, in Sanskrit and all other Indian languages, as a type of light *aspiration*. Some phonologists even call this a "voiceless" aspiration, in contradistinction to the voiced aspiration of the standard [1,2].

However, there is strong evidence that it was in fact originally a *glottal stop*; some of which we cite here briefly:
  (i)   It occurs whenever a terminal *-s* is elided in Sanskrit. This, and cognacy with the terminal-s of other old Indo-European languages, most especially Classical Greek and Latin, very strongly indicates that it was a glottal stop. This is corroborated by a quick analysis of the way in which glottal stops develop in modern accents such as the Cockney of English. The terminal-s relation is too large a subject to discuss here, but should be apparent to anyone with even a passing knowledge of Sanskrit, Classical Greek and Latin. The Cockney aspect is more easily discussed here: Cockney has a frequent desire to elide terminal surd (de-voiced) stops, including plosives such as [t] and fricatives such as [s]. Whenever such elision occurs, the elided stop is invariably substituted by a glottal stop. Thus the standard English *lot of fun* becomes Cockney *lo: o fun*, where the *(:)* is the glottal stop.

(ii)   With such a thorough phonological treatment as their "alphabet" obviously represents, it is extremely unlikely that the ancient Indian phonologists would have omitted such an important phone as the glottal stop.

7.2.4.2 Diphthongs vs. pure derivative vowels:

In a similar vein, the products shown on the right hand side in Eqs. 14, 15 are, today, denoted and pronounced as *diphthongs*, [aai], [aau].

However, there are strong indications that *they were originally pure vowels*, respectively the *a* and *ou* of English *Jack* and *bought*: Once again, we cite here briefly some of the evidence for this:

(i)   The ancient Indian classification puts them in the same class as the derivative vowels of Eqs. 10, 11, i.e. [e], [o]. It is very unlikely that the ancient phonologists, who came up with such an accurate classification, would mistake diphthongs for vowels.

(ii)   In the same way as done for [a], if we apply the characteristics of [i] (lips-stretched, tongue-forward) and [u] (lips-rounded, tongue-back) to [aa], i.e. we immediately get the pure vowels of English *Jack* and *bought*.

7.2.5 The Non-Vowels

The beauty and simplicity of the Indian phonological classification of non-vowels is apparent in the Non-Vowel table in **Table 1** above.

It can be noted firstly that the classification is basically a *two-dimensional matrix*, incorporating *just **two** independent variables*: (i) *Articulation position* (***artition***) along the x-dimension (the rows) and (ii) ***phonochromaticity*** along the y-dimension (the columns). (Both these terms were defined in an earlier Chapter (***asldj***).) These two independent variables are sufficient to describe the entire classification.

The *artitions*, starting from the back of the speech apparatus and going towards the front, are:

> *(Back of speech apparatus)*
- ▸   *Velar (Kanthya)*
- ▸   *Palatal (Taalavya)*
- ▸   *Retroflex (Muurdhanya)*
- ▸   *Dental (Dantya)*
- ▸   *Bilabial (Oshthya)*
> *(Front of speech apparatus)*

The artitions are of course highly incomplete by modern standards, For example, they omit uvular, and intermediate positions such as alveolar. A more complete rendition was provided in an earlier Chapter (***asdlj***). However, they were remarkably complete for the languages they addressed, those of India at the time.

Similarly, the elegant simplicity yet thoroughness of the phonochromatic classification is also apparent: We start with the simplest of the plosives, the unaspirated, unvoiced ones (*ka, cha, ta,* etc.). We then add aspiration, voicing and nasalization in order. Finally, we have the semivowels and the fricatives, each

with their own column:

- ▸ *Unvoiced, Unaspirated (Karkasha, Alpapraana)*
- ▸ *Unvoiced, Aspirated (Karkasha, Mahaapraana)*
- ▸ *Voiced, Unaspirated (Mrdu, Alpapraana)*
- ▸ *Voiced, Aspirated (Mrdu, Mahaapraana)*
- ▸ *Nasal (Anunaasika)*
- ▸ *Semivowel (Anta:stha)*
- ▸ *Fricative (Uushman)*

What is more, *all* phones, including nonvowels, and, through the intermediacy of the semivowels, the corresponding vowels as well, are tied into a **single matrix**, a *single* phonological presentation, as in the Non-
vowel table in **Table 1**. For this purpose, the artition is used as the linking mechanism. The semivowels are derived from the parent vowels through the simple addition of [a], which again forms part of the rules of *Sandhi* thus:

- ▸ [i] + [a] = [ja]
- ▸ [u] + [a] = [wa]
- ▸ [vocalic-r] + [a] = [ra]
- ▸ [vocalic-l] + [a] = [la]

7.2.6 Accuracy of the Ancient Classification, Despite Lack of Modern Scientific Instrumentation

It is important to take the high accuracy and extremely scientific, systematic methodology of classification that is apparent from the above into perspective. *The ancient Indian phoneticians did not have the instrumentation we have at our disposal today*, such as the audio instrumentation that generates "spectrograms" (sound frequency vs. amplitude graphs) and the soft-X-ray photography of tongue contact positions and pharynx movement used by modern linguists. Yet they had no problem in figuring out the articulation positions, the voicing/devoicing, the aspiration, fricatization, etc..

Indeed, we might ponder today that, emboldened with the presence of the latest scientific instrumentation around us, we have a somewhat patronizing attitude towards ancient scientists. If we removed these prejudicial glasses, we might not be so surprised to appreciate that a little quiet analysis, sitting under a Banyaan tree with all the time in the world, a balmy climate, plus a heavy dose of intelligence, can sometimes do wonders! (We should also perhaps not be surprised then that an ancient scientist, sitting under that same tree and simply observing all the animal species floating about him or her, might be able to figure out the concept of evolution through natural selection; but that is now going off on a tangent!)

7.2.7 Gross Inadequacies of the Ancient Classification Even for Indian Languages Today

Wonderful as it was for its time and the languages it applied to then, the ancient Indian classification of course had gross inadequacies. Let us itemize some of the deficiencies for Indian languages of today:

- ▸ For vowels, it *no longer* addresses the *derivative vowels* of English *Jack* and *bought*. We say *no longer* because our contention, elaborated on above, is that the "vowels" [aai] and [aau], which

are pronounced as diphthongs today, were once exactly these pure derivative vowels.

- It does not address even *common fricatives* such as the infralabio-supradental *[f]* and *[v]*. These are found, e.g., in many words borrowed in Hindi, Maraathi and other Indian languages from Faarsi.
- It does not address the voiced form of the sibilant *[s],* i.e. *[z].*
- It does not consider the alveolar plosives, e.g. the [t] of English *t*oday.
- It does not consider the so-called "Dravidian" laterals and centrals (which we temporarily denote as [l~], [r~]), as in Maraathi *kar~la* ("understood"), Tamil *pal~am* ("fruit").
- It does not consider later additions to Indian languages from Arabic and Faarsi, such as the uvular *[k..]* and the unvoiced velar fricative *[x]*, and their voiced counterparts.
- It of course does not consider more truly "foreign" sounds widely prevalent in non-Indian languages, such as the interdental fricatives (of English *th*ought, *th*ough). Indeed, for this reason, many Indians will pronounce the initial phones in these English words as the aspirated plosive [th] rather than as true fricatives!

Many of the phones in the above bulleted list have been adapted into modern Indian scripts in a completely ad-hoc manner (memories of the IPA!), primarily by the addition of various diacritics such as dots-underneath. The adaptations are summarized in the last table of **Table 1.**

Another great deficiency of the Indian scripts has been their poor adaptability to *cursive writing*. The speed of writing is extremely slow, and the writing instrument has to be lifted from the tablet or paper much too much. There have, from time to time, been innovations, such as the **Modi** (literally, "curved") script, a variation of Devanaagari used for Maraathi in medieval times. Overall, however, these innovations have failed to address deficiencies in cursive writing.

7.3 Origins and History of the Indian Phonological Classification and Indian Scripts

7.3.1 Braahmi and Earlier Scripts

It is universally accepted that all scripts in use in India today, excepting the Arabic and the Roman, are derived from a script called **Braahmi**, a prominent script of ancient India.

The most well-known Braahmi writings still surviving today date from a comparatively late period. These are the inscriptions of the Emperor Ashoka of the Mauryan dynasty, from about the 4th century B.C. (the variant of the script therein is denoted Ashokan Braahmi). From the manner of description of phonology, phonetics and similar subjects in pre-Mauryan writings, however, it is apparent that *the script was unchanged for many hundreds, if not thousands of years preceding the Mauryan inscriptions*. However, in unfortunate consonance with the completely anti-historic sense of the ancient Indians (cf. below), and the fact that most writings were preserved on perishable materials such as palm-leaf manuscripts (as discussed further below), no record of pre-Mauryan Braahmi survives.

We deal with the antecedents of Braahmi further below. Let us first address the provenance of the present-day Indian scripts and their relation to Braahmi.

Table 3 further below lists the present-day **Indian** scripts, and the languages they are used for today. All of these are descended from Braahmi. Many of these scripts (e.g. Gujaraati and Gurmukhi with Hindi, Kannadaa with Telaguu) are partially mutually intelligible, even more than Cyrillic and Roman scripts are today. Of these scripts, the most widely used today is *Naagari* (literally "urban"), also called *Devanaagari* ("refined urban). It is used for Sanskrit, Hindi, Maraathi and Nepaali, with a few letters adapted in a minor way, with diacritics, in Hindi (for words of Arabic and Persian borrowing) and Maraathi (for "Dravidian" phones such as retroflex laterals and centrals).

7.3.2 Supposed Resemblance to Semitic Alphabets

The *general* issue of the possible provenance of Indian scripts from Semitic or other foreign scripts is dealt with at some length in a later section in this Chapter (vide infra). In this Section, we discuss the specific issue of the Semitic-Braahmi resemblance only.

The supposed resemblances of some letters of the *Braahmi* script to Semitic letters would be classed in any other setting as "creative imagination" or, at best, "circumstantial evidence". They would certainly not hold up in a court of law!

For example, some Western scholars claim that the Semitic *'alif* (alpha) "resembles" the vowel [a] of *Braahmi*. With the amount of creative imagination required to see this resemblance (this author certainly does not see any), one could conceivably imagine that *'alif* resembled *Braahmi* [gha], [chha] and [ma] as well (see **Table 1**)!

And the supposed resemblance of Semitic/Greek [*l*] with *Braahmi* [*la*] requires even more creative imagination. Once again, the *Braahmi* [tha] is said to resemble the corresponding Semitic/Greek letter

(*theta*). Now in this case, it does to some extent. But an inspection of the tabulation in *Braahmi* (see Table below) shows that it could just as well have been derived from its neighbor in the row above ([retroflex-tha]), through addition of a diacritic dot, or its neighbor to the right ([d]). And why would the aspirated nonvowels, which do not even exist in Semitic, be borrowed, and not the unaspirated ones? Similarly, why would just *five* letters be borrowed from the Semitic, and not the rest (Western scholars attribute only five resemblances between Semitic and Braahmi, [a], [la], [ra], [dha] and [tha]). In this author's humble opinion, supposed Semitic/Braahmi resemblances are not just creative imagination, but really not credible at all.

Far more plausible than the Semitic-provenance view is **the view provided by Indian phoneticians and grammarians themselves: That specific letters in the Braahmi script were selected to resemble the appellations of specific objects starting with those letters**.

For example, the [va] resembles the shape of the common stringed instrument, the *viina* (the predecessor of the *vihuela* and, thence, the guitar). Similarly, both the dental [dha] and the retroflex-[~dha] resemble the striking area of drums, with Sanskrit words such as *dhumru*, still found in Hindi today. And the [t] resembles the *tala vrksha* (the tala tree), or, according to some, *any* tree (*taru*).

This view is more in accord with the plausible contention, elucidated earlier in this Chapter, that the Indian scripts and phonological classification appear to have been *deliberately devised by a group or groups of scholars*: Once their phonological classification was complete, they would then likely look for suitable letters to represent each phone, and would probably think of common objects which started with the phones, e.g. the *viina* for [v] and *dhumru* for [dh].

Aggarwal has discussed elegantly and in detail the supposed derivation of Braahmi letters from Semitic or other sources [3]. Characteristically, however, this eminent Indologist and Sanskritist of Indian origin has simply been ignored in the West. Among others, Aggarwal makes the following key points:

(i)   Much like the arbitrary assignment of Indian historical dates by Max Müller which was subsequently taken as gospel by all Western Indologists (discussed elsewhere in this Chapter), the source of this theory of a Semitic origin of Indian scripts is an **arbitrary conjecture by Bühler**, [**asdkjf**] which was then given the status of gospel by all subsequent Western scholars without any analysis. Bühler's analysis first assumed a Phoenician origin, then set about to prove it, by all sorts of incredible arbitrary techniques, such as turning letters upside down, right-to-left, removing top-heaviness in certain letters, etc.. As Aggarwal notes [3].

      a)   *"As a learned writer in the Encyclopaedia Brittanica has remarked, according to his principles, it is possible to derive any alphabet from any other alphabet"*

(ii)   Much was made by, first, Bühler, and, subsequently, other Western scholars, of the fact that some early Braahmi inscriptions found on one or two coins indicated writing right-to-left, as in the Semitic. However, subsequent discoveries of coins, copper-plaques, etc., of as recent provenance as the 19th century, e.g. the Holkar inscription and inscriptions in Andhra Pradesh, indicate that even Devanagaari was written right-to-left for decorative or ceremonial purposes. Furthermore, subsequent finding of the Bhattiprolu and other inscriptions, which predate the Braahmi inscriptions cited by Bühler, were left to right. What is more, the Western scholars do not explain why the initial right-to-left Braahmi would suddenly be made left-to-right. Scripts are

seldom changed radically in this fashion. As an example, the decimal system adopted from India by the Semitic countries continues to be written left-to-right in Arabic.

(iii)   Some of the derivations of the Western scholars, e.g. Braahmi [*ka*] from Semitic [*ta*] (*tau*), are truly off the wall, as Aggarwal notes.

Some scholars have also attributed the provenance of Braahmi to the Tamil script *Vatteluttu*, which is dated to at least 1000 B.C. by most scholars of Dravidian studies [5]. In this respect, the archaeological evidence, cited further below, is corroborative, and accords an even greater antiquity than 1000 B.C.

7.3.3 Archaeological Evidence for Indian Origins of Braahmi

Perhaps some of the strongest evidence for Indian origins of Braahmi, once again simply ignored by Western scholars, sits in the Madras Museum (in Chennai, India), as we speak [3]. Specifically, this is in the form of earthen pots from excavations of pre-historic mounds near Hyderabad. These were dated, when they were found in the 1930's, at not later than 3000 B.C. (Modern radiological and other dating methods have never been applied to them subsequently; it is possible that even earlier dates may be arrived at with new dating methods.)

Quite surprisingly, ***these pots and shards show writing which has five signs for maatra's*** (non-initial, inter-consonantal vowel signs) ***which are identical to those of Braahmi***, e.g. those for [e] and short-[i]. Furthermore, there are two stone pieces from the same period (now found in the Indian National Museum in New Delhi, India) which have many letters engraved on them. ***In one of these, three letters, [ma], [aa], [ta], are virtually identical to those of Ashokan Braahmi***.

7.3.4 Not Credible Western Theses on Lack of Writing in Ancient India

Before further discussing the origins of the Indian phonological classification and scripts, we must unfortunately make a digression to further address this somewhat unpleasant issue.

This issue probably arose from a consequence of the colonial legacy in India: that nearly all Indologists of the 19th and 20th centuries were persons of non-Indian, and, especially, of British origin. One need only look at the supposedly eminent names in the field: A.A. Macdonnell; H.H. Wilson; W.D. Whitney; C. Wilkins, etc. The few Indian names who dared to challenge some of the hypotheses propounded by these eminent names, such as Misra [1-2] and Aggarwal [3] were disposed of in the best way possible: They were simply ignored.

The basic, and absolutely incredible Western thesis is that, ***until the sudden appearance of Braahmi, a highly scientific system of phonological classification, around the 5th century B.C., seemingly out of nowhere, India did not possess a post-Harappan system of writing***.

The basis cited for this incredible thesis is the (supposed) absence of archaeological evidence of writing between the supposedly sudden demise of the Harappan (Indus Valley) civilization, which Western historians date at around 2000 B.C., and the sudden appearance of Braahmi, most famously in the inscriptions of the Mauryan Emperor Ashoka widely seen around 270 B.C. The Western contention has been that Indians then evolved an alphabet based on one of the borrowed Semitic alphabets!

This incredible thesis then predicates the assumption that ***all the pre-Mauryan Indian scientific works, on such subjects as astronomy, engineering, mathematics, etc., were executed without the knowledge of writing***!

This thesis is all the more incredible in consideration of an overwhelming number of factors, only some of which we cite here:

7.3.4.1 The Completely Different Method of Working and Classification Methodology of the Indian Scripts vs. All Other World Scripts

Perhaps the most important evidence that stares one in the face in refuting supposed Semitic or any other non-Indian origins for the Indian phonological system is that the Indian system *is so utterly different* from the Semitic or any other system in the world, even today. Just a few of the differences can be enumerated here:

(i)   The entire classification, and its "alphabetical" order, is a highly scientific and systematic *phonological* classification, with an understanding of such phonetic terms as *voicing/de-voicing, aspiration, fricatization, semivowels, fundamental vs. derivative vowels*, etc. No other world scripts show anything even resembling this, and no other world scripts even remotely show an understanding of these scientific bases of phonetics. Indeed, the Semitic systems are completely ad-hoc.

(ii)   The method of using ***ligatures***, and of *vowel markers* (***maatra's***) added to nonvowel symbols to construct syllables, is completely different *from anything else in the world*, and is so totally alien to Semitic, or for that matter any other scripts in the world. These latter, like the Roman script in which this book is written, use separate symbols for vowels, which are then interposed with non-vowels ("consonants") for construction of syllables. Furthermore, as noted above, there is ***archaeological evidence for the use of maatras in South India from around 3000 B.C.***, as discussed earlier in this Chapter.

(iii)   The supposed resemblances of some letters of the *Braahmi* script to Semitic letters has been discussed in more detail above. As that discussion indicates, such resemblance is not just creative imagination, but really not credible. To paraphrase the learned scholar writing in the *Encyclopedia Brittanica* cited by Aggarwal [3] utilizing the methodology and license used by Western scholars to derive Braahmi from Semitic scripts, one can derive *any* script from *any* other.

7.3.4.2 Archaeological evidence for the existence of Braahmi in South India from about 3000 B.C.

Cited in the discussion of Braahmi above, q.v..

7.3.4.3 The earliest scientific, literary, grammatical and other works of ancient India:

The oldest Sanskrit writings, the *RgVeda* and the other *Vedas*, included, as an integral part of them, accompanying works on six subsidiary sciences (called *Vedaanga*, the "limbs of the *Veda*"). The learning of these was an integral part of the learning of the *Vedas*, and was required for a recitation of the

Vedic hymns. These sciences included among them [11, 12, 14]:

▸   *Shiiksha* (phonetics), The *Shiiksha* (phonetics) *already included the **full phonological classification**, exactly as it appears in* **Table 1** above.
▸   *Chhanda:* (prosody),
▸   *Niruukta* (etymology and etymological classification),
▸   *Vyaakarana* (grammar)
▸   and *Jyotisha*: (astronomy)

Furthermore, there is a vast vocabulary indicating the existence of writing in the *RgVeda* and the Vedaantic works. For example:

▸   Words such as *akshara* (letters of the script) and *grantha* (books) are freely dispersed in even the oldest hymns of the *RgVeda*.
▸   R. Roth has himself observed [3] that the *RgVeda-Pratishaakhya*, exegeses of the *RgVeda*, could not have been prepared without a written manuscript of the *RgVeda* being available for reference.
▸   Detailed discussion of grammatical and phonological terms specifically applicable to writing, e.g. *i-kaara*, *u-kaara* and how to write internal Sandhi, are given in such Vedaantic works as the *Chhaandogya-Upanishad* and *Aitareya-Aaranyaka*.

As Panconcelli-Calzia acknowledges in his chapter in the phonetics tome of Kaiser [24]:

> "An eminent position, even within the ancient Indian civilization, is held by Saunaka, who probably lived in the 8th century B.C. In his *RgVeda-Pratishaakhya*, he uses the rules, *already known before him*, of Sanskrit phonetics and gives them the form which, in essentials, has been preserved till today (Bischof, Vox, 1917). The 25 consonants have been arranged in an admirable system. There are 5 groups: guttural, palatal, cerebral, dental and labial consonants. With some surprise we read: 'The breeath is wind, the pressure derives from the abdomen. The *glottis* opens and closes and thereby the wind is transformed into (sound) or tone.' The Indian scientists, therefore, knew the abdominal respiration as well as the fact that the voice (and voicing) is produced in the larynx and by the vocal chords." *(Emphases added).*

Are we then to believe, as the Western Indologists of the last 200 years would have us believe, that all these sciences, and, more importantly, ***all these references to a script, to books, to phonetics, and to sciences of etymological classification, were developed without a knowledge of writing*?!**

7.3.4.4 Other Phonetic and Grammatical Traditions:

Paanini, the great Sanskrit grammarian, has been dated fairly reliably (one of the few dates Indian and non-Indian historians appear to agree on) at around 800 B.C.. (Some Western scholars still give a precise and later date of 520 B.C., almost as if a birth certificate were extant [23]! He was most likely born in a village near present-day Attock in Sindh province, and worked in Gandhaara (present day Kandahar in Afghaanistaan).

In his work, Paanini reverently cites ***64*** predecessor grammarians and phoneticians, on which he says he builds his work. The works of only a few of these have survived, but even crudely dating the back-

references and cross-references in these surviving works yields a span of about 1000 years preceding Paanini. And let no one come forth with the thesis that Paanini composed his "monumental work of human intelligence" (quoting a Western linguist, Bloomfield [23]) without the benefit of a system of writing. That would not even be one for late-night talk show comedy! We have thus no option but to presume that a system of writing, and more importantly, *a complete phonological classification almost exactly like the present Indian classification, existed <u>at least </u>about 1000 years preceding Paanini, i.e. about 1800 B.C.*.

7.3.4.5 Other Writings in the Sciences During the Harappan-Mauryan Interregnum:

In a similar vein, there were great ancient Indian works on engineering (including construction of buildings), astronomy, music, theater, dance, mathematics and surgery that long pre-date the Mauryan era [3, 17]. We also have, from approximately the same time, the entire *Vedaanta* ("end of the *Vedas*) philosophical works, i.e. the *Upanidhad*, the *Aaranyaka*: etc. Again, we are to believe that all these were composed without the benefit of a system of writing!

7.3.4.6 Old Persian Cuneiform:

Cuneiform, a form of writing first thought to have been developed by the ancient Sumerians, was adapted by numerous other peoples to write their languages, including the Akkadians and, later, the Elamites, Hurrians and their neighbors, the ancient Persians. All of these adaptations were of the *ideo-phonetic* variety, i.e. they were ideograms intermixed with a few phonetic markers to make the number of letters manageable (see **Chapter alskdjas**). The cuneiform system initially adapted by the Old Persians also fell into this category.

Then, all of a sudden, following Persian forays into northwestern India and conquest of some territories west of the Indus [25, 26], the Persian cuneiform system suddenly adopted a syllabic organization and phonological classification patterned exactly on the Indian, i.e. *ka, kha, ga, ...pa, pha, ba...* etc. This is of course the syllabic cuneiform of the famous trilingual Behistun inscriptions of the Persian Achaemenid dynasty kings, first deciphered by Niebuhr [25, 26]. This very strongly suggests that the system of phonological classification was borrowed (and evidently in only partial form) from the Indians, who then obviously had a refined system already in place, much like so many other scientific borrowings.

7.3.4.7 Cultural Misunderstandings Regarding "Oral Tradition" and Misconceptions Relating to the "Anti-Historical Sense" of Ancient Indians

Many of the misconceptions of non-Indians regarding Indian writing stem from deep *cultural* misunderstandings and miscomprehensions, especially those having to do with the so-called **oral tradition**.

These have to do with such factors as the complete ***"anti-historic"*** ("who cares?") *sense* of the ancient (and modern) Indians, and the Hindu tradition, and later, prejudice, against writing down of important religious and non-religious works. These are   reflected in the ***shruti/smrti*** dichotomy which is very difficult for non-Indians to understand: Religious works are considered *shruti* ("to be heard (only)") rather than *smrti* ("to be remembered", i.e. to be written down). Even non-religious works are sometimes made to fall in the *shruti* category by their authors by the invocation of all manner of gods in their introductions, and other such devices, originally meant to make sure they got disseminated well.

The play of such minor factors is seen, e.g., in Jain vs. Hindu temples: The former are full of writings and inscriptions, the latter have absolutely none. Indeed, there are some [12] who believe that the hymns of the *Veda* were saved only because Jain scholars wrote many of them down, whereas Hindus refused to write them down.

7.3.4.8 Other Cultural and Anti-Historical Factors

Other uniquely Hindu cultural factors, which have a strong anti-historic and anti-documentation role, include the copious interweaving of mythology and tales with a religious bent, and the like, right into otherwise highly scientific and scholarly works. Examples abound:

For example, the Hindu theories of Creation, appear so eerily, even hauntingly to anticipate the Bing Bang, with their stories of recurring creation and destruction over billions of years, their postulation of the state of *Nothingness* (*Naasti*, "non-existence"), their correct contentions that time is a distinct entity that needs to be created separately, that the Laws of Nature (*Rta*, read Laws of Physics) are of a particular type (read inverse-square etc. etc.), that there may be other universes with different Laws of Nature, etc. etc. [***xxx.].*** Yet these theories are intimately interwoven with tales of the gods, with a golden embryo (*Hiranyagarbha*), a serpent (*Aadishesha*) who sleeps on the ocean of Space, the Creator god *Brahma*, etc. etc., which give them an unscientific, "magical" quality!

Indian historical accounts are even more frustrating, leaving the reader to figure out for himself/herself when history ends and mythology begins! For example, chronological records of lines of kings seem to be going along fine in the many *Puraana* (ancient histories), but then suddenly get interspersed with tales of various gods and the tales of their interactions with the very earthly persons the histories are discussing. The concept of a *historian* or diarist, one who wrote histories or even daily logs, was completely alien to the ancient Hindus. Why bother, who cares? Herodotus was an anomaly to them. The initially-foreign Moghuls attempted to introduce diarists and historians who kept the emperor's *Namaa* (diary or historical record, e.g. the *Baabar-Namaa*), but, late as this was, it still did not catch on with other Indians.

7.3.4.9 Perishable Methods of Writing

Another important factor in the lack of archaeological evidence for writing during the Harappan-Mauryan interregnum is the *physical mechanism of writing*, which was primarily on highly perishable materials such as wood bark or palm leaf. Indeed, the most common equivalent of the word processor used by the typical ancient Indian author was to first write rough drafts on black slate using river chalk, and then to make them fair on palm leaf manuscripts. The latter had a shelf life, *if properly kept* (away from excessive moisture and insects), of about 200 years [14]. For reasons of tradition, palm leaf kept on being used even after the advent of paper in India more than a millennium ago. Older Indians can still relate stories of heaps of obscure or unknown palm leaf manuscripts lying in some house in their village, eventually to be used for kindling.

This factor is probably most responsible for the fact that ***more than 50% of Sanskrit literature is simply lost,*** gone forever.

We know of lost works only through cross-references, in surviving works of eminent authors, to "such-and-such a great author, in whose eminent work such-and-such I humbly cite Section so-and-so, stanza

so-and-so...."

7.3.4.10 Additional Factors: Lack of Money for Archaeology, and Indian Laws Prohibiting Excavation:

Two additional factors which may have an even stronger import on the archaeological record of writing in India are even more frustrating.

The first is a simple question of finances and the fact that India is still a very poor country (as of this writing, 2005). The second is some archaic Indian laws still on the books from British times.

The first, financial aspect affects the *Archaeological Survey of India* (ASI), the only body legally authorized to perform excavations in India. The ASI simply doesn't have the money to dig up even 1% of the archaeological sites it has on its books. As an example, there are more than 7 000 Harappan sites on the ASI's books. It hasn't initiated steps to excavate even 1% of them. As another example, the field near the town of Kurukshetra (Paanipat) in the state of Haryaana near Delhi is the acknowledged location of at least four epic battles: The great battle of the *Mahaabhaarata*, the battle of remnants of Alexander's army's with a regional satrap hostile to King Porus of Panjaab, one of the great Moghul battles, and the battle of the last Sikh king against the British around 1830. In any other country, this field would have been excavated to death. But in India, it has nary been touched. Yet another illustration of the financial aspect can be experienced by a visit to the Indian National Museum in New Delhi. Here, some of the world-famous artifacts, such as the famous Indus Valley dancing girl, lie in cabinets with their lighting and glass broken, and a well-off-looking visitor is discretely yet forcefully followed around by museum employees, asking if he might like to take one of the museum exhibits with him to his residence abroad, for a decent price.

The second factor prevents any other private party (for example those wonderfully well-funded American universities) from legally performing [*refs.]* any excavations on sites on the ASI's books. So if there were indeed a record of writing from the Harappan-Mauryan interregnum, it is very unlikely that it will, quite literally, see the light of day.

7.3.4.11 In Summary

In summary, we need to forcefully conclude that **the Western thesis that Indians did not possess writing during the Harappan-Mauryan interregnum is Nonsensical**.

One must sadly add that these nonsensical theses about the absence of writing in India in the Harappan-Mauryan interregnum are parroted by some authors of Indian origin as well. Educated in the Western educational matrix, they unfortunately know no better. An example, cited earlier in this book, is Deshpande [27].

The above discussion does not even take into consideration such other India-hating authors as Farmer and Wintzel, who propagate such wild theories as a non-literate Harappan civilization. In one paper Farmer and Wintzel [16], contend that those Harappan writings were just animistic and religious scribblings by the elite to keep the masses in check! If that were true, one has to wonder, how did they communicate the equations they used in design and engineering of all those marvelous Harappan buildings?! This author

must express his bafflement and lack of understanding at what makes the intense India-hatred of these authors tick! Nevertheless, serious scholarship needs lighter moments like these to keep its sanity and alleviate its boredom!

In the face of this torrent of ignorance or apparently purposeful misinformation about Indian scripts and phonology, one must nevertheless give due credit to several Western authors or others schooled in the Western linguistic tradition who *have* acknowledged the originality and comparative completeness of the ancient Indian phonetic classification. These include Panconcelli-Calzia, whose was quoted above, and Austrian and German authors such as Friedrich von Schlegel. [18, 24].

7.3.5 Dating of Indian Historical Events

Another unfortunate deficiency of Western and Eurocentric scholarship relating to Indian writing in particular lies in the ***dating*** of Indian literary works, and Indian history in general.

7.3.5.1 Dating of the RgVeda and the "Aaryan Invasion", and the "magical" 1500 B.C. date

Since archaeological evidence is so scant, Western scholarship arbitrarily assigns a date of **1500 B.C**. to the so-called "**Aaryan invasion**" (if there was such a thing - little archaeological evidence of such an invasion has been found in any Harappan site to date) of Sanskrit-speaking peoples that is supposed to have "destroyed" the Harappan civilization in one fell swoop. *This date then sticks everywhere*, and is parroted even by Indian authors educated in Western tradition, who know no better.

Yet, it is worth taking a pause to see exactly where this date of 1500 B.C. has come from. The answer is all the more incredible when we learn that it can be summarized in just four words:

> ---> *arbitrarily by Max Müller*!

F. Max Müller [22] arrived at this date in the following completely whimsical, lackadaisical, unscientific and careless manner:

- ▸ He first assigned the date of Buddha's enlightenment to approximately 483 B.C., which is reasonably accurate.
- ▸ Then, in completely arbitrary fashion and without citing any evidence whatsoever, he first assigned a date of about 200 years before this to the last of the *Vedaanta* writings.
- ▸ He then did a rough back-calculation, allowing for 200 years for each of the four Vedic stages, viz. *Suutra, Braahmana, Mantra, Chanda:*, thus magically arriving at the approximate date of 1483 B.C., i.e. 1500 B.C!

Yet, to his credit, Müller admitted that his assignment was totally arbitrary and approximate, due to the total lack of archaeological evidence to base anything on. He indicated that he was merely trying to arrive at a *minimum* date, to say that the *RgVeda* must be dated to *at least* 1500 B.C..

Yet all subsequent Western scholars **took this date as gospel**, and accorded it great respect. And then, without further questioning, all subsequent scholars have stuck by this date. Thus, this arbitrary date of Max Müller, completely ***unsupported by a single shred of archaeological evidence***, has since become

ingrained in the Western, and by extension, world Indological literature.

7.3.5.2 Astronomical Evidence:

Much more accurate than this totally arbitrary dating of the *RgVeda* and other Aaryan writings by Müller would be ***astronomical evidence***. There is ample astronomical evidence in the *RgVeda* and other Vedic writings - specific events such as confluence of planets, etc. - that can be very accurately dated. For example, Jacobi [1-2] cites several clearly spelled out astronomical events cited in the *RgVeda* that can be dated from before 4000 B.C. [1-2]. And S.B. Dikshit [3] has cited a specific passage in the *Satapatha Braahmana* (a *Vedaantic* work) which clearly gives the positions of certain *Nakshatra:* (stars and constellations) and *Krttikaa:* (the third asterism) which can be precisely dated to before 3000 B.C.

Even the completely uninformed layman will appreciate that astronomical evidence, especially with the level of development of modern astronomy, has pinpoint accuracy, to the second. It is thus far more weighty than linguistic and even archaelogical evidence. Yet Western authors have simply ignored the above-cited astronomical evidence, not even bothering to refute them, e.g. with other astronomical evidence to the contrary. (And once again, the layman will appreciate that astronomical evidence can be refuted only with astronomical evidence.) This lends some credence to the hints of severe anti-Indian bias by Western Indologists which is at first glance inexplicable and contradictory.

Some Indian authors, such as the Indian Indologist, linguist and Sanskrit and Indo-European languages scholar Satya Swarup Misra [1-2], have brought up the misdating of Vedic writings, citing the above astronomical evidence and archaeological and other evidence but have, characteristically, been simply ignored in the West.

7.3.5.3 Dating of Harappan-era Ruins.

The Harappan ruins of Mohenjo-Daro and Harappa were originally dated in the 1920's, the time of their discovery, by scientific techniques extant then, which, e.g., did not include ^{14}C and other radio-dating techniques.

One fact little known to the layman however is that there has, subsequent to this intense work in the 1920's, been little work on dating Harappan ruins. The Indian and Pakistani archaeological community simply does not have the funds, and there has been little interest by well-funded Western universities or non-profit organizations such as the National Geographic Society, which prefer to focus their attention on Middle Eastern and American digs, of which there are plenty. In the case of Pakistan, the political climate and the government have discouraged such work. Thus, due to these factors, a simple thing such as radio-dating of the new findings at Lothal in Gujaraat state in India, of horse bones and fire-altars, has simply not been carried out. It is possible that with dating revisited, much older dates for the Harappan civilization than the currently accepted ca. 2300 B.C. may be arrived at, closer to the dates of the first settlements of Sumer, where Harappan commercial seals have been found in abundance.

7.3.5.4 Linguistic and Archaeologico-Linguistic Evidence

The ***strongest*** evidence by far, one that stares one in the face everywhere, but which Western scholarship (excepting for a few respected German authors) has completely ignored, is the linguistic evidence: To wit and simply put, the archaicness and primordial nature of the Sanskrit language in relation to ***all*** other

ancient Indo-European languages.

This is clearly evident in even a cursory comparison of Sanskrit with Homeric Greek, Classical Greek, Old Latin, or Hittite [8, 9, 13, 20, 21]: Just juxtapose a few paradigms of declension, conjugation and the like from Sanskrit and from each one of these languages. Take even the most elementary of words, such as the personal pronouns or the demonstrative pronouns. And then, ask yourself, which is clearly the older, parent-like language, which is the language that has the most completeness? Which is the language that has all eight declensional cases, that has the dual number in full force, that has all 10 conjugation classes of verbs?..... the list is too long to discuss here, and is properly the subject of a full book elsewhere. [There are even stronger bits of evidence, primordial parent-words (such as the verb *suu*, "to give birth") found in Sanskrit and no other Indo-European language, but with their remnants, scattered like bits from a shredder, in all other Indo-European languages (*son, sin,* etc., "son"), but *not once* the reverse, i.e. a parent word found in another Indo-European language with a descendant cognate in Sanskrit. But once again, that is a subject for another book.]

Exactly such a juxtaposition is given, for just one word (the third person masculine pronoun, "he"), in **Table 2** in Sanskrit, Greek, Hittite and the so-called, reconstructed "Proto-Indo-European".

   Table 2 Juxtaposition, for just one word (the third person masculine pronoun, "he"), in **Table 2** in Sanskrit, Greek, Hittite and the so-called, reconstructed "Proto-Indo-European"

   (Click this link to go to "Completeness vs. Other I-E Tongues Button)
   http://www.samskrta.com/moresoon/moresoon.html

If we then definitively assign a date of about 1200 B.C. to the form of Homeric Greek, which was then preserved in poems Homer wrote down 500 years later, or to the Mycenaean inscriptions, then by its older form alone, Sanskrit must be dated to at least 1000 years earlier.

To take another, better, example, Hittite, which all modern Western Indo-European scholarship inexplicably trumpets now as the most ancient of Indo-European languages (but **Table 2** above clearly shows not to be so), is dated very definitively to about 1300 to 1700 B.C., due to the good fortune of archaelogical evidence having been found (the famous treaties and epistles of the Mittani kings, written in cuneiform script, unearthed at **Boghaz-Koy**, near Ankara in Anatolia). One of the treaties, between the Mittani king Matiwaza and the Hittite king Suppiluliuma [2], mentions some Vedic gods, using their very Indian names (*Indra, Mitra(sil), Naashatya(nna), etc.*).

Another Mitanni document, a treatise on horse-care composed by Kikkulis, uses technical terms that are clearly Sanskrit terms, e.g. *eka-vartana* ("one turn of the course"). Yet even here, there are other borrowed Indian terms indicating borrowing from an Indian language already well on its way from Sanskrit to Praakrits, Apabhramsas, etc. [4, 7, 11]: E.g., instead of Sanskrit *sapta-vartana*, "seven-turns-of-the-course", we find the term *satta-vartana* used, i.e. with the [p] elided, as in the later Praakrits and Apabhramsas. The word *eka* (*aika* in some transcriptions) is the clincher in particular. For no other Indo-European language uses this or a cognate for "one".

Now that Hittite of 1700 B.C., when juxtaposed with Sanskrit, is so "modern", so "new" and so "changed" from the Sanskrit. The Sanskrit so clearly appears to be the original document. Only four

declensional cases are preserved in Hittite from the original eight of Sanskrit, and many of these are confused with each other (e.g. the locative with the instrumental). The dual number has practically vanished in Hittite. Many tenses and many, many moods, are absent.

The most obvious explanation for these Vedic god and horsemanship terms in the Mittani kingdom is that they are borrowings from a friendly, neighboring country (India), perhaps one with greater expertise in such things as horsemanship.

And, more importantly, the most obvious take from these findings is that ***the Hittite of that time, i.e. about 1300 to 1700 B.C., recorded in these treaties and epistles, is so much more modern, so far degenerated from the Sanskrit***. Even the most unprejudiced linguist will deduce, upon juxtaposing Hittite and Sanskrit declensional and conjugational paradigms (see **Table 2**), that it would take at least 1000 years to get to that Hittite from the structural completeness of the Sanskrit. Coupled with another fact, ***that the Sanskrit quoted therein, i.e. in the 1700 B.C. documents, already shows strong signs of having, in 1700 B.C., degenerated into the later Praakrits*** [4, 7, 11], we can come to only one conclusion, that Paaninian Sanskrit dates from at least 2300 to 2700 B.C. Vedic Sanskrit would then date from 3000 to 4000 B.C., in complete agreement with the *astronomical evidence*.

Rather than concluding the obvious, that these words were borrowings from natural cultural intercourse with an already well-established Sanskrit-speaking civilization in India, further supported by the fact that the Hittite unearthed in these excavations was so "modern", so "late" as compared to the Sanskrit, Western scholars instead concluded that these Sanskrit words were remnants of a "Proto-Sanskrit", and that this proved that the "Proto-Sanskrit" speakers were in the vicinity of Anatolia prior to their still-to-be-made journey into India! An incredible convolution of thinking, in this author's humble opinion.

Indeed, using the method described above, i.e. juxtaposing declensions, conjugations, manner of formation of tenses (e.g. the perfect, the imperfect and aorist), the language that unquestionably comes out to be the closest to Sanskrit is *Classical Greek*, and, by extension even closer, *Homeric Greek*. Just juxtapose together, in all the ancient Indo-European languages, the declensions of the three personal pronouns, or the manner of formation of the perfect tense (reduplication), imperfect (pre-augment), optative, aorist, pluperfect-aorist (augment + reduplication), etc., etc., and Greek and Sanskrit alone stand out among these as close as brothers; yet it is clear which is the older brother by far. The so-called ***"shredder effect"*** with respect to Sanskrit vs. the other Indo-European languages has been discussed elsewhere *[xx]*: (The other languages appear to be what would happen if Sanskrit were put through a shredder as an original document, i.e. a remnant here in this language, another in that, but to find the relation of the remnants to each other, and their origin, one must go to the original document; and never a remnant in one of the languages that is not also in the original document).

Yet other linguistic evidence is embodied in the hyper-structure, complexity and "mathematical order" of the Sanskrit language itself [13]. As discussed elsewhere in this book, assuming the monosyllabic-agglutinative-inflectional theory of linguistic evolution to be accurate, this hyper-structure of the Sanskrit language pre-supposes linguistic isolation for 5,000 to 10,000 years [15]. Being aware as we are of developments in the Neolithic age and their relation to the end of the last Ice Age, it may then be reasonable to assume that this presumed 5 to 10 millennia isolation of Sanskrit speakers was caused by their being trapped in some geographical region by the Ice Age, evolving there, and first venturing out to contact other linguistic groups around 6,000 to 5,000 B.C., which would tally very well with the astronomical dates cited above.

7.4 The Progeny of the Ancient Indian Scripts Today in India, Southeast Asia, East Asia and Elsewhere

7.4.1 Progeny in India

Table 3: Modern Indian scripts descended from Braahmi.

Script name or designation	Language used for	Remarks
Devanaagari (Naagari)	Hindi/Urdu, Sanskrit, Maraathi, Nepaali	
Kashmiri	Kashmiri	Nearly defunct, replaced by Arabic script
Gurmukhi	Panjaabi	
Gujaraati	Gujaraati	
Kannadaa	Kannadaa	V. similar to Telaguu
Malayaalam	Malayaalam	
Tamil	Tamil	
Telaguu	Telaguu	V. similar to Kannadaa
Odiyaa	Odiyaa (Oriya)	
Bengali	Baanglaa (Bengali)	
Assamese	Aasomi (Assamese)	V. similar to Bengali
Sinhala (Sinhalese)	Sinhalese	

7.4.2 Progeny in Other Parts of Asia and Elsewhere

7.4.2.1 Summary

In addition to the above, Braahmi is also the origin of many ***non-Indian*** scripts. These are listed in **Table 4** below. Most of these are descended from the script used for Paali between the 1st and 9th centuries A.D., along the southeastern coast of India. The Thai National Museum in Bangkok even traces the origin of the Thai script (which came along with Buddhism) precisely from Amaraavati on the southeastern coast of India, close to the modern-day port of Vishaakapatnam; however, such precise, single-source tracings do not rest on firm archaeological evidence.

Table 4: Modern *non*-Indian scripts descended from Braahmi.

Script name or designation	Language used for	Remarks
Thai	Thai	
Khmer	Khmer (Cambodian)	
Vietnamese	Vietnamese	Now defunct, replaced by French colonialists with Roman-based script
Indonesian	Malay (Bahasa Indonesia)	
		Replaced at Indonesian independence by Roman script
Tibetan	Tibetan	
Burmese (Myanmari)	Burmese (Myanmari)	
Haangul	Korean	*** See further discussion below.*
Japanese	Japanese	*## Vowel order only.*
Armenian	Armenian	*^^ Origin from Indian scripts is disputed and may not be correct.*

7.4.2.2 Haangul

Of the non-Indian scripts listed in **Table 4** above, the Korean Haangul deserves some further discussion.

Its provenance, as ascribed by Koreans, is from King Sejong of the Choson dynasty, who is said to have devised it himself with the assistance of Buddhist scholars in the year 1446 A.D [10]. It is, however, highly likely that, like *all* the Southeast Asian scripts listed in **Table 4**, the basis of the classification system that it used may have been brought to Korea along with Buddhist teachings.

There are several reasons for this contention. Firstly, the Southeast Asian scripts, such as Thai or Khmer or Indonesian or Burmese or Vietnamese, were brought by either Hindu or Buddhist cultural streams entering these areas. The Buddhist influence is of particular significance. All the Buddhist *suutraa:* (scriptures) were in Sanskrit, and, for an understanding of the Sanskrit language one needed, of course, to know the Sanskrit "alphabet" (script). And to know the Sanskrit script was of course to know and understand phonological classification.

Table 5 (*overleaf*)**:** The Haangul phonological classification and script in summary.

KOREAN HANGUL, AS TYPICALLY RENDERED IN KOREAN TEXTS FOR WESTERN READERS

Note That the Terms Used, e.g. "Compound Vowels" are Taken Directly From Korean Texts, But Are Grossly Incorrect in a Phonological Context (e.g. Many Compound Vowels are Denoted as Basic Vowels, Semivowels are Referred to as Compound Vowels, and Geminates as "Compound Consonants").

It may also be noted that the script displays little phonological classification or order.
(The Order Shown is Also the "Alphabetical" Order in Which the Script is Taught)

Basic Vowels

[a]	ㅏ	[eo], [yeo]	ㅓ , ㅕ
[o]	ㅗ	[yo]	ㅛ
[u]	ㅜ	[yu]	ㅠ
[eu]	ㅡ	[i]	ㅣ

Compound Vowels

[ya]	ㅑ	[ae]	ㅐ
[yae]	ㅒ	[e]	ㅔ
[ye]	ㅖ	[oe]	ㅚ
[wi]	ㅟ	[ui]	ㅢ
[wa]	ㅘ	[wo]	ㅝ
[wae]	ㅙ	[we]	ㅞ

Basic Consonants

[g], [k] *(same phoneme)*	ㄱ	[n]	ㄴ
[d], [t] *(same phoneme)*	ㄷ		
[r], [l] *(same phoneme)*	ㄹ	[m]	ㅁ
[b], [p] *((same phoneme)*	ㅂ	[s]	ㅅ
[ng]	ㅇ		
[j]	ㅈ	[ch]	ㅊ
[k]	ㅋ	[t]	ㅌ
[p]	ㅍ	[h]	ㅎ

Compound Consonants

[kk]	ㄲ	[tt]	ㄸ
[pp]	ㅃ	[ss]	ㅆ
[jj]	ㅉ		

Hints that Haangul was indeed based on the Indian phonological classification are transparently evident in the order of the phones listed. For example, the "consonants" are ordered thus: [g]/[k], [n], [d]/[t], [r]/[l], [m], [b]/[p]..., [ch]/[j], [chh]/[jhh], etc. The resemblance to the Indian *varga* (articulation positions, velar ([k]...), dental [t]..., bilabial..) *is too strong to be co-incidental*. And the Haangul displays tell-tale use of *maatra's* (non-initial-vowel markers) for some of its vowel modifications (e.g. lengthening), and we know that *maatra's* originated thousands of years earlier than Haangul, in India.

The Haangul script is adequate for Korean, but, when compared to the Indian scripts, remains less scientifically and less systematically organized (Chapter **asdlk**, in this book gives a more detailed discussion of Haangul). For example, the full listing order of the "consonants", cited above, is incomplete: E.g., Aspirated/Unaspirated, Voiced/Unvoiced pairs are missing, since, of course, they were not required in Korean. (With the "creative imagination" syndrome, discussed earlier in this Chapter, and displayed so well by Western scholars when it comes to Semitic vs. Indian scripts, one could well imagine *all* the Haangul letters coming from Braahmi letters! Nevertheless, we contend that the Haangul letters are probably of an original creation, devised by King Sejong and his scholarly assistants. More than anything else, they somewhat resemble the Chinese characters that were their predecessors in Korean). But the phonological classification that they use is not.

Moreover, the Japanese acknowledge that the vowel order of the syllabary portion of their script is taken from Buddhist teachings [10, 28]; thus Buddhist provenance for neighboring Korea's script is plausible.

Thus, the overall contention that this book makes with respect to Haangul is that, yes, it was indeed devised by King Sejong in 1446, specifically for Korean. But the phonological basis it used was borrowed from the Indian. The "alphabetical" order of the "consonants" and "vowels" of Haangul, and the use of *maatra's*, is too close to the Indian classification to be coincidental. The most likely Indian influence is through Buddhist cultural influences, which required a learning of Sanskrit, hence of the Sanskrit script, hence of the Indian phonological classification.

It may also be noted that, if one were to apply the same methods applied by Western scholars such as Bühler for the derivation of Braahmi from Semitic alphabets to the derivation of Haangul from Braahmi, one would have a much stronger case than Bühler did for his derivation. For example, the bilabial non-vowels of Haangul, e.g. [ba], [ma], are nearly identical to the corresponding Braahmi letters. Nevertheless, this author will not stoop to that level to derive Haangul directly from Braahmi, and will be satisfied with the contention that the Indian script was used as a phonological basis for Haangul, but the Haangul letters themselves are probably distinct and original.

This author feels compelled to add one parting shot in the discussion on Haangul above. We have seen above that, from a phonological rigor point of view, it is grossly deficient, unsystematic and much poorer than the Indian classification. Yet one cannot but disappointingly note the Ooh's and Aah's among Western authors studying Korean, and writings in some respected Encyclopediae, such as the Grolier Encyclopedia [29]. The latter pronounces unequivocally that *"...Haangul is the world's best and most phonetic script..."* (sic!). The author of that line has obviously not bothered to study the Indian scripts.

7.5 Salient Features of the Ancient Indian Phonological Classification, in Summary

7.5.1 Summary

Let us then briefly summarize the characteristics of the ancient Indian phonological classification that can be gleaned from the above discussion, which our relevant as a take-off point for further classifications:

♦   It was the ***world's first scientific, systematic***, organized phonological classification. Until approximately the mid-1800's, it was also the world's ***only*** scientific and systematic phonological classification. Beginning in the mid-1800's, most prominently with the Pittman classification that led to Pittman's shorthand, Western phonological classification studies took off [***refs. a;sldf***]. [These in turn emanated from the "comparative philology" studies of the late 1700's, themselves initiated by the "discovery" of Sanskrit in the mid-1700's). The Western studies culminated in the classification of the International Phonetic Association (IPA) based in London. This classification is a rather disorganized and unsystematic presentation with ad-hoc, "add-as-you-go-along" origins based on the Roman alphabet. It is very difficult to render in cursive, and difficult to keyboard. It suffers from lack of recognizability and distinguishability, with its myriad of diacritics, many letters seeming to come straight from outer space, and confusing use of existing letters, e.g. similar-looking inverted-turned-rotated *e*'s, *a*'s etc..]

♦   It used a relatively simple method of classification of nonvowels, constructing a ***2-dimensional matrix*** (a Table), with two ***independent variables***:

o   (i) ***Articulation position*** along one axis, starting logically from the *back* of the speech apparatus (uvula and velum) and progressing towards the *front* (ending with the bilabial). The positions it identified, which were comprehensive for the time and language that they were applied to, were:

- *velar;*
- *palatal;*
- *retroflex;*
- *dental;*
- *bilabial*

o   (ii) The "color" of the phone, for which we have elsewhere coined the term ***phonochromaticity***, (*uchchaaravarna*) along the other axis. This progressed in the following logical sequence:

- *unvoiced/unaspirated;*
- *unvoiced/aspirated;*
- *voiced/unaspirated;*
- *voiced/aspirated;*
- *nasal;*
- *semivowel;*
- *unvoiced fricative.*

♦   It used a very precise definition of *vowels*: *phones in which the breath is completely unimpeded.* This thus included the *r*-vowels and the *l*-vowels.

♦   It further classified vowels into **fundamental** comprising just the three [a] (velar), [i] (palatal), [u] (bilabial), and the **derivative**, which are recognized even today from their formant frequencies as truly "fundamental".

♦   The *derivative* vowels could be derived from the fundamental vowels through simple mathematical equations, e.g. [a] + [i] = [e], which are a part of the rules of **Sandhi**. The vowels were further classified according to articulation position, so that they could be inserted into the overall nonvowel matrix. Thus, in addition to the [a] (velar), [i] (palatal), [u] (bilabial), the [vocalic-r] and [vocalic-l] were classified as retroflex and dental respectively. In a similar fashion, the *semivowels* could be derived from the vowels through the simple addition of [a], e.g. [i] + [a] = [ja]; [u] + [a] = [wa]; etc., as cited in an earlier Section.

♦   Learning the Indian scripts in the "alphabetical" order that they are still taught today to children comprises in itself a lesson in phonetics and phonological classification. Phonetic terms such as voiced/unvoiced, aspiration/unaspiration, fricatization, semivowel/vowel relationships, etc., become immediately apparent.

♦   It appears to have been *deliberately designed*, by a person or group of persons who sat down and carefully considered the phones (sounds) to be classified, and how best to classify them. This is, e.g., in contrast to the "alphabet" of the International Phonetic Association (IPA), which developed in a purely ad-hoc, add-as-you-go-along, fashion from the Roman script. (The IPA still remains today a presentation lacking any meaningful organization or systematicity.) Although the person(s) who designed the Indian scripts did not have the benefit of modern instrumentation, e.g. for X-ray images of articulation positions or comparative frequency audiograms of voiced vs. unvoiced sounds, their classification nevertheless appears to have been extremely accurate.

♦   For the language that it was applied to, Classical Sanskrit, the Indian classification and script had the unique property of **one phoneme = one phone = one symbol (letter)**. That is to say, each letter of the script represented one phone (sound), and also one phoneme.

♦   From the treatment in the earliest Sanskrit writings (the *Veda*, *Vedaanga* and *Vedaanta)* of the sciences of *Shiiksha* (phonetics, which already included the **full phonological classification, exactly as it appears today**), *Chhanda:* (prosody), *Niruukta* (etymology and etymological classification), and *Vyaakarana* (grammar) [14], the use in the *RgVeda* itself of words such as *akshara* (letters of the script) and *grantha* (books), and backdating from the phonetics and grammar works available to us today (e.g. backdating the 64 predecessor phoneticians and grammarians that Paanini cites), the original Indian scripts can be dated fairly well, to at least 1700 B.C. at the *latest*. Although first applied to the Sanskrit language, the Indian phonological classification was most likely independently arrived at through a fusion of the Harappan culture and whatever knowledge it possessed on language and phonetics, and a Sanskrit-speaking Aaryan culture.

♦   The first script based on the Indian phonological classification which has a written record that

has survived is **Braahmi**, whose most prominent surviving records are the inscriptions of the Mauryan Emperor Ashoka, from about 300 B.C. Braahmi is in turn the antecedent of the following Indian scripts: Devanaagari; Kashmiri; Gurmukhi; Gujaraati; Kannada, Malayaalam; Tamil; Telaguu; Odiyaa; Bengali; Assamese; Sinhalese. It is also the antecedent of the following non-Indian scripts: Thai; Khmer; Vietnamese (now defunct); Indonesian (now in disuse); Tibetan; Burmese (Myanmari); Haangul (partial only); Japanese (vowel order only).

♦   The Western contention, sometimes parroted by Indian authors, that, until the sudden appearance of the highly scientific phonological classification of Braahmi having no resemblance to any other phonological classification in the world, in the 1st millennium B.C., writing had vanished from India during the Harappan-Mauryan interregnum, is utter *nonsense*.

7.5.2 Lack of Recognition for the Indian Phonological Classification Even Today

In spite of being the world's *first*, and until recently, the *only* and arguably the *best*, phonological classification, the ancient Indian system has received scant acknowledgment or even attention outside India.

Persons of non-European origin, such as this author, are quite used to textbooks on myriad subjects starting, in their introductions, with the acknowledgment of such-and-such a Greek or Roman, or, very occasionally, an Egyptian, as the parent of the science. There is unfortunately nary (or, usually, never) an acknowledgment of Chinese, Indian or other contributions, as elucidated by Teresi [28]. In this, linguistics, phonology and phonetics are no exception: Just pick any introductory English-language book on the subject, and see if there is a single reference to Indian phonology.

Where the Indian scripts are studied, always in a cursory fashion [23], we find quaint, patronizing references to a "syllabic-phonetic" script (whatever that means), or a mention in passing only. This is in stark contrast to the treatment of, e.g., Haangul (cf. discussion above).

(ENGLISH LANGUAGE) LITERATURE CITED

1) Misra, Satya Swarup, *A Comparative Grammar of Sanskrit, Greek and Hittite*, World Press, Calcutta, India (1968).
2) Misra, Satya Swarup, *The Aryan Problem: A Linguistic Approach*, Munshiram Manoharlal Publishers Pvt Ltd, New Delhi, India (1992).
3) Aggarwal, Hans Raj, *A Short History of Sanskrit Literature*, (Revised Second Edition) Munshiram Manoharlal Publishers Pvt Ltd, New Delhi, India, (1966). See esp. pp. 224-225; 258-263.
4) Tagare, Ganesh Vasudev, *Historical Grammar of Apabhramsa*, Motilal Banarsidass Publishers Pvt Ltd, Delhi, India (1987).
5) Sastri, K.A. Nilakanta, *A History of South India*, Oxford University Press, New Delhi, India (2002).
6) Law, Bimala Churn, *A History of Pali Literature*, Indica Books, New Delhi, India (2000).
7) Jain, B.D., *Ardha Magadhi Reader*, Sri Satguru Publications, Delhi, India (1982).
8) Held, Warren H.; Schmalstieg, William R.; Gertz, Janet E., *Beginning Hittite*, Slavica Publishers, Inc. (Indiana University Press), Bloomington, IN, USA (1988).
9) Morwood, James, *Oxford Grammar of Classical Greek*, Oxford University Press, New York, NY, USA (2001).
10) Lee, Iksop; Ramsey, S. Robert, *The Korean Language*, State University of New York Press, Albany, NY, USA (2000).
11) Doshi, Bechardaas J., *Praakrtamaargopadeshikaa*, Motilal Banarsidass Publishers Pvt Ltd, Delhi, India (1968).
12) Jha, V.N., *Pre-Paninian Grammatical Traditions (Part-I): A Linguistic Analysis of the Rgveda Padapatha*, Sri Satguru Publications, Indian Books Centre, Delhi, India (1992).
13) Goldman, Robert P.; Goldman, Sally J.S., *Devavanipravesika: An Introduction to the Sanskrit Language*, University of California at Berkeley Press, Berkeley, CA, USA, (2002).
14) Sivapriyananda, "Brahmi, Kharoshthi, Telugu, Oriya, Kannada, Gurmukhi, Devanagari", pp. 36-45 in *the India Magazine*, August (1982).
15) Cavalli-Sforza, L.L.; Menozzi, P.; Piazza, A., *The History and Geography of Human Genes*, Princeton University Press, Princeton, NJ, USA (1994).
16) Farmer, Steve; Sproat, Richard; Witzel, Michael, "The Collapse of the Indus-Script Thesis: The Myth of a Literate Harappan Civilization", *Electronic J. Vedic Studies*, **11-2**, 19-57 (2004).
17) See Introduction and discussion of predecessor works in: *Natyasastra of Bharatamuni, with the Commentary Abhinavabharati by Abhinavaguptacarya*, Parimal Publications, Delhi, India (1988).
18) Vasu, S.C. (Ed., Transl.), *The Ashtadhyayi of Panini*, Motilal Banarsidass Publishers Pvt Ltd, Delhi, India (2003).
19) Varma, K.C., *Annals of the Bhandarkar Oriental Research Institute*, **LXI**, Pune, India (1980).
20) Szemerenyi, Oswald J.L., *Introduction to Indo-European Linguistics* (English Translation of *Einführung in die vergleichende Sprachwissenschaft*, Oxford University Press, Oxford, England (1999).
21) Lehmann, Winfred P., *Theoretical Bases of Indo-European Linguistics*, Routledge Press, London, England (1999).
22) Müller, Friedrich M., *A History of Ancient Sanskrit Literature: So Far As It Illustrates the Primitive Religion of the Brahmans*, Bhuvaneshwari Ashrama (Allahabad), Asian Educational Services, New Delhi, India (1993).
23) See, e.g., some of the postings on http://www.ancientscripts.com/.

24) Panconcelli-Calzia, G., in Kaiser, L. (Ed.), *Manual of Phonetics*, North-Holland Publishing Co., Amsterdam (1957).
25) Friedrich, J., *Extinct Languages*, Dorset Press, New York (1989).
26) Gordon, C.H., *Forgotten Scripts: Their Ongoing Discovery and Decipherment*, Dorset Press, New York (1982).
27) see Preface (p. xiii) in Deshpande, Madhav M., *Samskrtasubodhini: A Sanskrit Primer*, University of Michigan Press, Ann Arbor, MI, USA (2001).
28) Teresi, D., *Lost Discoveries: The Ancient Roots of Modern Science - from the Babylonians to the Maya*, Simon & Schuster, New York, NY, USA (2002).
29) *Grolier Encyclopedia* (1998), under topic "Hangul".