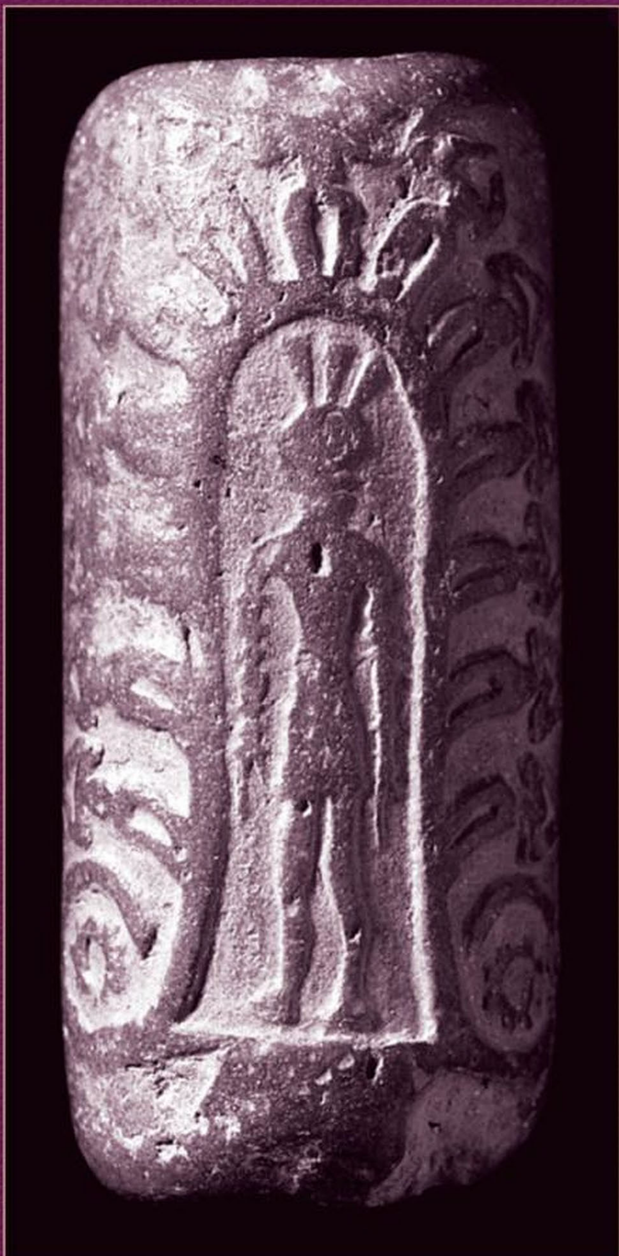
Kalaignar M. Karunanidhi Classical Tamil Research Endowment Lecture

World Classical Tamil Conference 25-6-2010 Coimbatore



A Dravidian solution to the Indus script problem

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Central Institute of Classical Tamil, Chennai

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सत्यमेव जयते

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aṟuvar payanta ... perum peyar muruka

niṉṉ aṭi y-uḷḷi vantaṉeṉ

(Tirumurukâṟṟuppaṭai 255, 269, 279)

The Indus Civilization and its forgotten script

Stone seals inscribed with an unknown script were obtained from Harappa in the upper Indus Valley in the 1870s and 1880s. In the early 1920s, curiosity about their origin initiated excavations at Harappa and 750 km away at

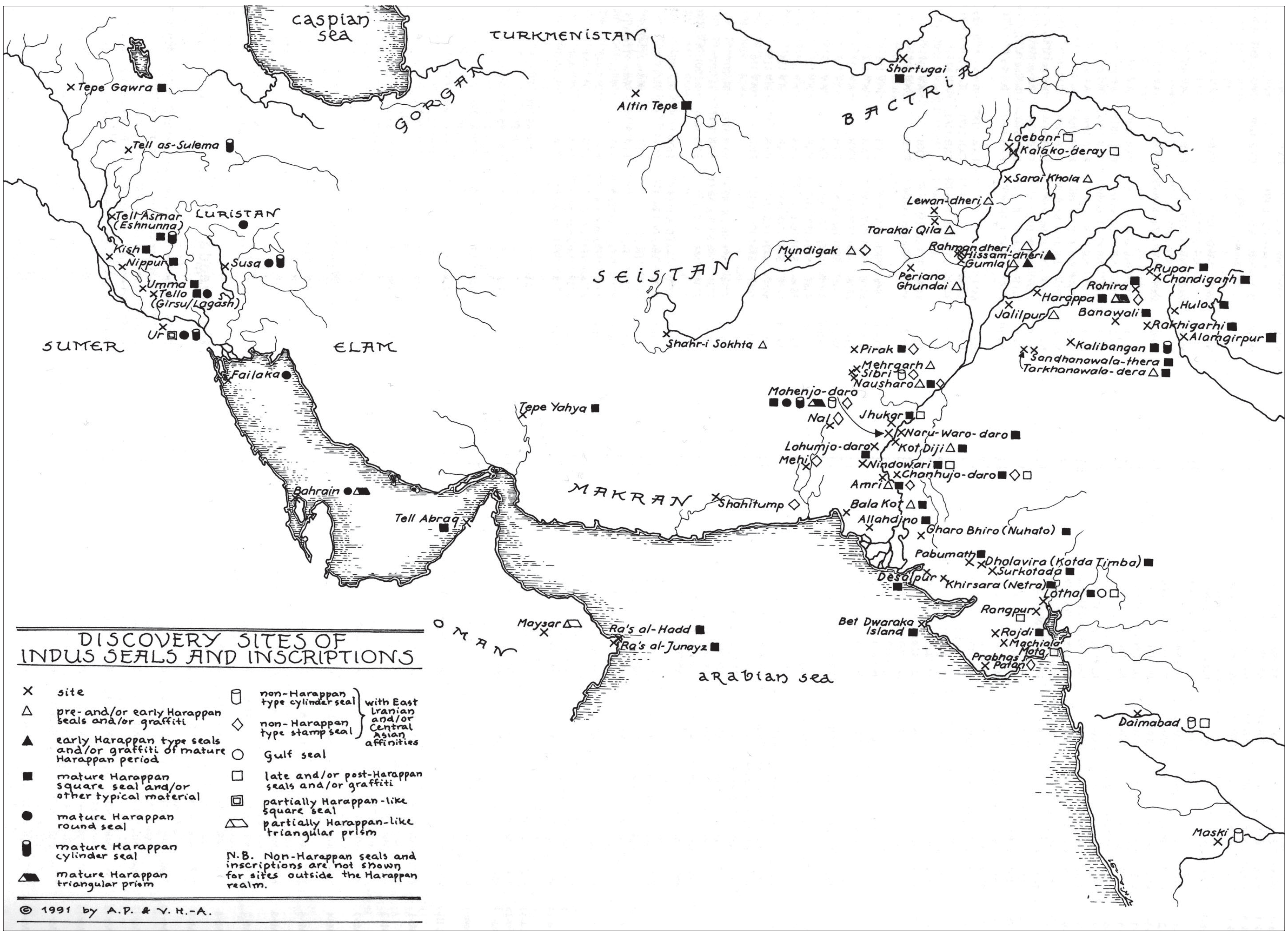


Figure 1. Discovery sites of Indus seals and inscriptions. (After CISI 2: 448.)

Mohenjo-daro in Sindh. Immediately more seals of the same kind were found. The publication of these discoveries turned attention to a few seals of the Harappan type that had come to light in Mesopotamia. They dated the newly found Harappan or Indus Civilization to the third millennium BCE. Radiocarbon dating has fixed the duration of the Mature Harappan phase, during which the Indus script was used, to 2600-1900 BCE. About 30 Harappan seals come from the Gulf and Mesopotamia, left there by sea-faring Indus merchants.

Since the 1920s, ceaseless archaeological research has revealed some 1500 Harappan sites in Pakistan and western India. The Harappan realm in the Greater Indus Valley is one of the earliest cradles of civilization. Its urban culture is among the first four in the world to possess a script of its own. Some 5000 short Indus texts from more than 50 sites are known today, and much other data as well has accumulated. But the decipherment of the Indus script has remained the most intriguing problem pertaining to this impressive city culture that initiates Indian civilization. The Indus script vanished together with the Indus Civilization, which collapsed many centuries before hymns composed in Vedic Sanskrit begin the historical period in South Asia around 1000 BCE.

The numerous unsuccessful attempts to understand the Indus script include a recent claim that it is not a writing system based on language, but consists of non-linguistic symbols. Similar misconceptions prevailed about the Mesopotamian cuneiform script and the Egyptian hieroglyphs before their decipherments. Extreme shortness of texts and their restriction to seals, small tablets and pottery graffiti have been adduced as proofs for this thesis, but all these features characterize also the Egyptian hieroglyphic script during the first 600 years of its existence. Yet this early form of Egyptian script was real writing, and can be partially read on the basis of later texts. The high degree of sign standardization, the arrangement

Figure 2. Two-sign hieroglyphic inscription of c 3100 BCE, rendering the name of the Proto-Dynastic king Narmer with the images of ‘catfish’ (Egyptian *n’r*) and ‘awl’ (Egyptian *mr*). Detail of Narmer’s palette. (After Flinders Petrie 1953: K26.)

of texts into regular rows, and the presence of hundreds of recurring sign sequences from different sites all indicate that the Indus script is real writing.

Most attempts to read the Indus script apply the unsuited method of comparing the Indus signs with similar-looking signs of other scripts and transferring their phonetic values to the Indus signs. This general error is often coupled with the mistake of deriving Brahmi from the Indus script, though it is based on the Semitic consonant alphabet.

Preparatory work

How then can the Indus script be deciphered? We may turn to successful decipherments and to the history of writing for guidance. Most ancient scripts have been deciphered with the help of translations into known scripts and languages. But here no such help is available. Historical information of the kind that opened up the cuneiform script is virtually missing. Later Indian texts tell us nothing about the Indus Civilization. Contemporary cuneiform sources speak of the most distant land called Meluhha, widely understood to denote Greater Indus Valley, but they offer little further information. There is no related writing system to help with the phonetic values of the signs. Nor is there any fair certainty of the underlying language, which was a great advantage in unraveling the Ugaritic and Mayan scripts. All surviving texts are very short and probably not complete sentences but just noun phrases. This naturally hampers grammatical analysis, as does the absence of word dividers.

In spite of all the difficulties, there are some positive circumstances. One is the relatively high number of preserved inscriptions. Collecting and publishing all available evidence reliably and legibly belongs to the fundamental preparatory tasks that have proved useful in all decipherments. This aim is being realized partly in the photographic *Corpus of Indus Seals and Inscriptions;* its third volume has just come out.

Several versions of a standardized text edition in machine-readable form have been completed, and a thorough revision is again being done. Computerization has enabled the compilation of concordances that systematically record all occurrences of individual signs and their sequences, and various other indexes and statistics. Among the things to be standardized is the direction of writing, normally from right to left and in seal stamps carved in mirror image from left to right. Other routine tasks are location of word boundaries and search for possible grammatical markers. One way to segment longer texts is to see if their component parts occur elsewhere as complete texts.

A crucial but difficult task is the compilation of a reliable sign list, which distinguishes between graphemes and allographs. The allographic variation constitutes one important basis for interpreting the pictorial meaning of the Indus signs. Signs may represent the same grapheme if their shapes are reasonably similar and they in addition occur in very similar contexts. Based on these criteria, my sign list has very nearly 400 graphemes.

It is difficult to construct even parts of the Indus grammar on the basis of textual analysis. The positional sequences of signs can be exploited to analyse the Indus texts syntactically, to define textual junctures, and to classify the signs into phonetically or semantically similar groups. Such analyses have been carried out with automated methods. Data accumulated in this way will certainly be useful in decipherment once a decisive breakthrough has been achieved — in other words when the language has been identified and some signs have been read phonetically in a convincing manner. But such analyses alone are unlikely to provide that breakthrough.

The language underlying the Indus script

In the decipherment of any ancient script, there are two principal unknowns to be clarified, namely the underlying language or languages and the type of the script.

The language problem is most crucial. If the language of the Indus script belonged to a language family not known from other sources, the Indus script can never be deciphered. This is clear from the case of Etruscan, an isolated language written in an easily read alphabetic script. Etruscan can be read phonetically, but in spite of this is not much understood beyond the texts covered by copious translations. But as the Harappan population numbered around one million, there is a fair chance that linguistic relatives have survived and that traces of the Harappan language can be found in the extensive Vedic texts composed in the Indus Valley less than a thousand years after the collapse of the Indus Civilization.

While it is likely that various minority languages were spoken in the Greater Indus Valley, only one language was written. The sign sequences are namely uniform throughout South Asia. This argument is reinforced by the Indus seals found in the Near East. Some of them have native Harappan and some non-Harappan sign sequences.

One would expect that the most frequently attested Indus sign would very often occur next to itself, but this is never the case in the Indus Valley. The combination is however attested on a round Gulf-type seal coming from the Near East. The seal contains five frequently occurring Indus signs but in unique sequences. This suggests that Harappan trade agents who resided in the Gulf and in Mesopotamia became bilingual and adopted local names, but wrote their foreign names in the Indus script for the Harappans to read. The cuneiform texts in fact speak not only of a distant country called Meluhha, but also of a village in southern Mesopotamia called Meluhha whose inhabitants had purely Sumerian names.

According to its inscription, one Old Akkadian cylinder seal belonged to “Su-ilishu, interpreter of the Meluhhan language". This implies that the Meluhhan language differed from the languages commonly spoken and understood in ancient Near East, above all Sumerian, Akkadian and Elamite. Near Eastern languages appear historically much less likely to have been spoken in the Indus Valley than languages known to have existed in South Asia.

Because the origin of the Aryan languages is such a controversial issue, especially in India, it is necessary to trace these languages back to their source, the Proto-Indo-European. The location and dating of Proto-Indo-European too have been long debated, but a fair consensus concerning this problem is in sight. When the Proto-Indo-European-speaking community dispersed, its language had a dozen terms related to wheeled vehicles. Wheeled vehicles were invented shortly before 3500 BCE in south-eastern Europe, from where they quickly spread to areas where the principal Indo-European languages were later spoken.

Greek and Armenian are the closest linguistic relatives of Indo-Iranian, and the protoforms of these languages are likely to have been spoken in the Pit Grave or Yamnaya cultures which between 3300 and 3000 BCE spread with ox carts from North Pontic steppes eastwards to the Ural mountains. The Eurasian steppes are the native

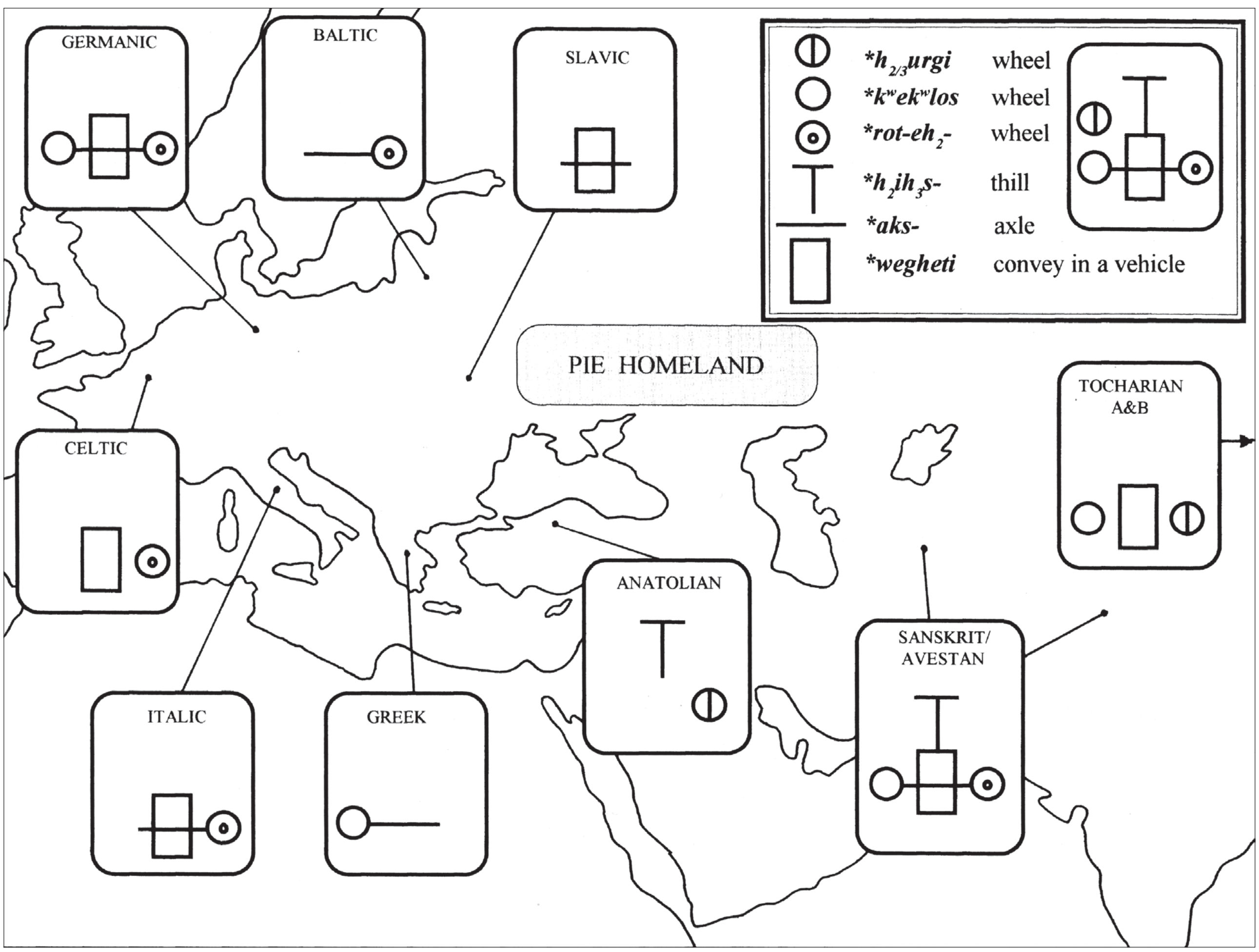


Figure 3. Distribution of some Proto-Indo-European terms referring to wheeled vehicles. (After Anthony 1995: 557, fig. 1.)

habitat of the horse. It was there that the horse was first yoked to pull a light-wheeled chariot, at the end of the third millennium BCE. Early Aryan loanwords in Finno-Ugric languages spoken in north-eastern Europe locates Proto-Aryan to the Volga-Ural steppes.

From the Volga-Ural steppes the horse-drawn chariot spread southwards to the Bronze Age culture in southern Central Asia, the “Bactria and Margiana Archaeological Complex” or BMAC, which flourished about 2300-1500 BCE. BMAC people started moving to Iran and to the Indus Valley in the Late Harappan period, around 1900-1600 BCE. At the same time, the BMAC sites were surrounded by nomadic peoples from the Eurasian steppes, who probably spoke early forms of Indo-Iranian. On their way to Iran and India, these migrants took over the rule and culture of the BMAC. Alexander Lubotsky (2001) has listed all words shared by Iranian and Indo-Aryan which do not have an acceptable Indo-European origin. In structure, these words largely agree with the 383 foreign loanwords in the language of the Rigveda listed by Frans Kuiper (1991). Lubotsky has suggested that most words in both lists come from the language of the BMAC. This justified conclusion implies that these foreign words of an unknown language were borrowed by Rigvedic Aryans before they entered the Indus Valley, or from the language of the Daasas, an earlier come wave of Indo-Iranian speakers with a BMAC substratum. Hence these words do not represent the Harappan language. Their use for the decipherment of the Indus script would in any case not be feasible for the simple reason that the exact meaning of so many of them is unclear.

Although Indo-Iranian languages have been spoken in the Indus Valley since the second millennium BCE, they were hardly spoken by Harappan people in the third millennium. The domesticated horse played an important role in the culture of the Indo-Iranian speakers, but according to faunal remains the horse came to South Asia only after 2000 BCE and it is not depicted in Harappan art. The first appearance of the horse is in Swat, in the BMAC-derived Gandhara Grave culture; its characteristic “face urns” seem to be connected with the cult of Aœvins, the Vedic gods of chariotry.

Burushaski spoken in northernmost Pakistan is a linguistic isolate, but possibly related with the Ketic languages of Siberia. There is little trace of Burushaski further south. Burushaski’s arrival from the north was probably preceded by the Himalayan group of Tibeto-Burman languages, which may be connected with the Northern Neolithic of the Swat Valley and Kashmir. The Northern Neolithic had some contact with the Early Harappans but only in its own northern area.

In general the Sino-Tibetan languages always restricted to the Himalayan regions in South Asia are unlikely candidates for a genetic relationship with the Harappan language.

The Austro-Asiatic languages known from Central and Eastern India, with linguistic relatives in South-East Asia and minor participation in the linguistic convergence in South Asia, are also unlikely to have descended from the Harappan language.

The only remaining alternative among the well-known potential linguistic relatives of the Harappan language is the Dravidian language family. The 26 Dravidian languages are now mainly spoken in Central and South India.

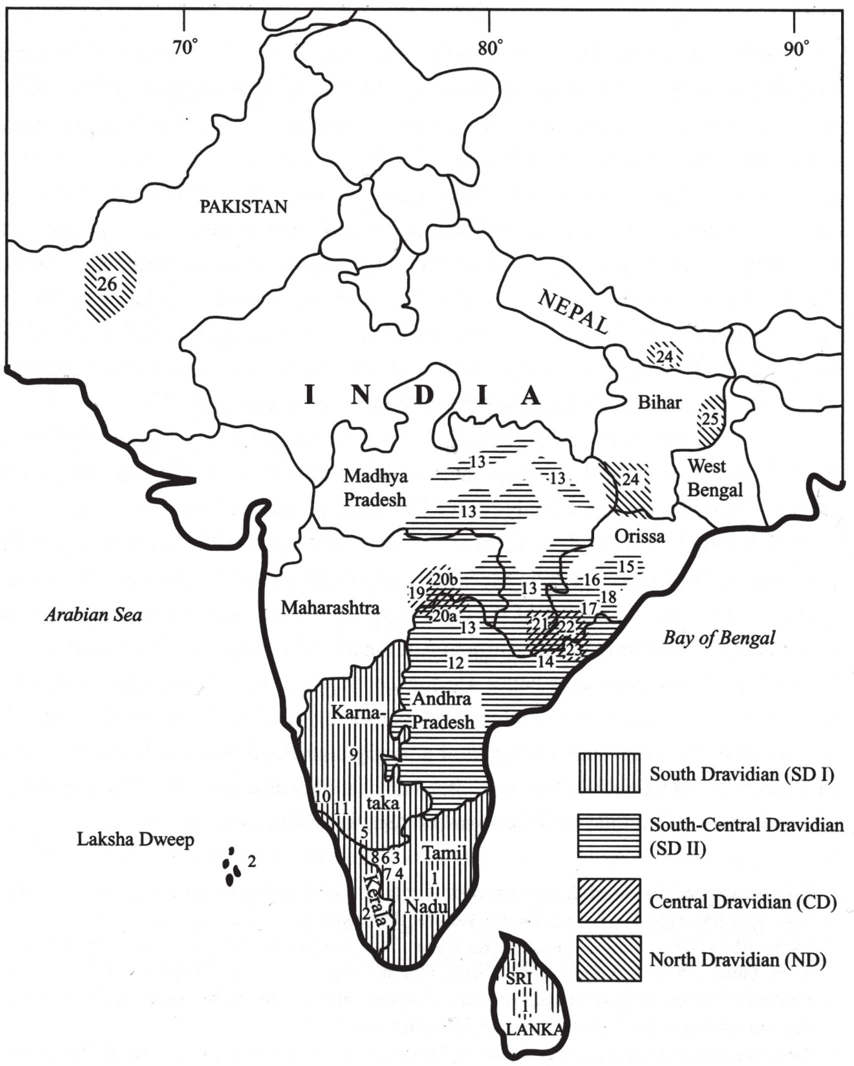


Figure 4. The Dravidian languages and their subgroups. (After Krishnamurti 2003: 18.)

However, one Dravidian language, Brahui, has been spoken in Baluchistan in the northwest for at least a thousand years, as far as the historical sources go. In contrast to Burushaski, Tibeto-Burman and Austro-Asiatic languages, which are very small minority languages in South Asia, the Dravidian speakers until recently constituted one fourth of India's population.

Loanwords from Dravidian have been identified from Indo-Aryan texts composed in northwestern India around 1100-600 BCE. These six examples are from the earliest text, the Rigveda (the capital letters are retroflex consonants, which did not exist in Proto-Indo-Iranian):

mukham ‘face, front, mouth’ < PD **mukam* ‘id.’

khalam ‘threshing floor’ < PD **kaLam* ‘id.’

phalam ‘fruit’ < PD **paZam* ‘ripe fruit’

kuNDam ‘pit’ < PD **kuNTam* ‘pit’

kaaNa- ‘blind in one eye’ < PD **kaaNa* ‘not seeing’

kiyaambu- ‘watery plant’ < PD **kiyampu* ‘taro, aroid, *Colocasia*’.

The retroflex consonants, a diagnostic feature of the South Asian linguistic area, can be divided into two main groups. One of them is distributed over the Indus Valley and the Dravidian-speaking areas.

In addition to the retroflex consonants, Indo-Aryan has several other structural features that have long been interpreted as borrowings from Dravidian. Some of them exist at the earliest level. Historical linguistics thus suggests that the Harappans probably spoke a Dravidian language. With this conclusion we turn to the problem of script type.

The type of writing system represented by the Indus script

Recent American-Pakistani excavations at Harappa with meticulous stratigraphy have produced new evidence on the evolution of the Indus script. Pottery has scratched symbols since 3300 BCE. Some of these pot-marks became signs of the Indus script, which was created during the final phase of the Early Harappan period, between 2800-2500 BCE. It is possible and indeed even probable that the Early Harappans got the idea of writing through stimulus diffusion from the Proto-Elamites of the Iranian Plateau, but they did not copy the signs of the Proto-Elamite script. Only few specimens from this formative period are presently available. During the Mature Harappan period, the fully developed script was used without much change at all major sites. The script disappeared fairly soon after the collapse of the Indus Civilization.

Archaic Sumerian, the oldest logo-syllabic writing, mainly consists of iconic word signs or logograms occasionally complemented with rebus-based syllabic signs which also initially expressed “words”. Grammatical markers were at first ignored in writing, but were gradually introduced with the growing familiarity with phonetic signs and better ability to analyze language.

The logo-syllabic system demanded hundreds of signs. Devising the first syllabic scripts became possible around 2300 BCE, when many syllabograms were already in use in the cuneiform script. Logograms could now largely be eliminated. The Egyptian variant of logo-syllabic writing, whose rebus puns ignore vowels altogether, enabled an even more drastic reduction of graphemes. Around 1600 BCE, Semitic scribes in Egyptian-occupied Levant started writing their own language with just those phonograms of the Egyptian script that comprised a single consonant.

Logo-syllabic scripts have hundreds of graphemes, syllabic scripts manage with less than 100 and most alphabetic scripts with less than 40.

The number of known Indus signs is around 400, which agrees well with the logo-syllabic type but is too high for the script to be syllabic or alphabetic. Word divisions are not marked, but many inscriptions comprise only one, two or three signs, and longer texts can be segmented into comparable units. This is a typical word length in Sumerian-type logo-syllabic script, while in syllabic and alphabetic scripts many words require more signs. The Indus script was created before any syllabic or alphabetic script existed, so all main criteria agree in suggesting that the Indus script is a logo-syllabic writing system.

Methodology: the basic decipherment formula and initial clues

The prospects and methods of deciphering a logo-syllabic script without translations differ in some essential respects from those of syllabic and alphabetic scripts. The syllabaries and alphabets form closed systems that cover the entire phonology of the language, and can be decoded as a systemic whole. In logo-syllabic scripts, there are many more signs, and the phonetic bond between the signs is weaker. There is no chance of building such phonetic grids as in the decipherment of Linear B, and a complete decipherment of the Indus script is certainly not possible with presently available materials.

Most signs of early logo-syllabic scripts were originally pictures denoting the objects or ideas they represented. But abstract concepts such as ‘life’ would be difficult to express pictorially. Therefore the meaning of a pictogram was extended from the word for the depicted object to comprise all its homophones. In the Sumerian script the drawing of an arrow meant ‘arrow’, but in addition ‘life’ and ‘rib’, because all three words were pronounced alike in the Sumerian language, namely *ti*. Homophony is usually language-specific, and rebuses thus enable language identification and phonetic decipherment.

Individual signs of logo-syllabic scripts may be deciphered if four conditions can simultaneously be fulfilled: (1) the object depicted in a given pictogram can be recognized; (2) the said pictogram has been used as a rebus; (3) the intended rebus meaning can be deduced from the context(s); and (4) acceptably homophonous words corresponding to the pictorial and rebus meanings exist in a historically likely known language. (Method demands strictness with homophony; in the case of Proto-Dravidian, variation in the length of vowels and consonants is allowed, but not much else.)

The iconic shape of the Indus signs thus constitutes one of the chief keys to their interpretation. Unfortunately the pictorial meaning of most Indus signs is not clear. In some rare cases an iconographic motif added to an Indus inscription can suggest the intended meaning of a sign. The scene at the right end of one tablet from Mohenjo-daro (M-478) shows a human being who kneels in front of a tree and extends a V-shaped object towards it. The person apparently presents offerings to a sacred tree in what may be a pot shown in cross-section. If so, the intended and

Figure 5. Pot of offerings in the text and iconography of the tablet M-478 from Mohenjo-daro. (After CISI 1: 115.)

iconic meanings of the V-shaped sign in the text coincide, and it can be understood directly from the pictogram. We need not know what the Harappan word for the depicted object was.

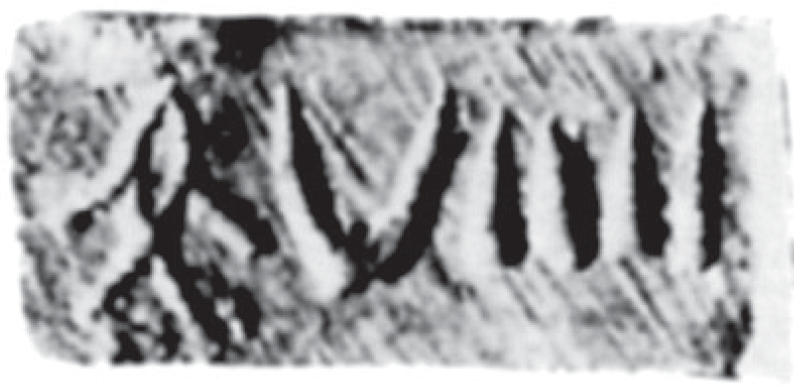


Figure 6. (Offering of) "four pots of fish" on the tablet H-902 from Harappa. (After CISI 2: 339.)

The plain 'fish' sign probably has the intended meaning 'fish' on Indus tablets such as H-902 B which seems to mention offering of four pots of fish. In Mesopotamia fish offerings were made in temples, in India fish and meat and strong drinks were offered to godlings inhabiting sacred trees. That the signs looking like a 'fish' really have this pictorial meaning is certified by the Indus iconography, in which it is placed in the mouth of a fish-eating crocodile.

But if phonetic decipherment is possible only in cases where the rebus principle has been employed, how can we locate such cases, and how can we deduce the intended rebus meanings? These are certainly among the most difficult tasks. Contextual clues include the function of inscribed artifacts. The vast majority of Indus texts are seal stamps and seal impressions. As with iconographic clues, we can use for their interpretation parallels from elsewhere, Western Asia and historical South Asia being most relevant.

A clay tag stamped with cloth impression on the reverse and with a square Indus seal on the obverse comes from Umma in Mesopotamia. The Harappans' contact with the Near East makes it highly probable that the Indus seal

Figure 7. The fish-eating crocodilian ghariyal with the 'fish' sign of the Indus script on the seal M-410 from Mohenjo-daro. (After CISI 1: 98.)

inscriptions chiefly contain proper names of persons with or without their occupational or official titles and descent, as do the contemporaneous Mesopotamian seal inscriptions.

Starting point: the 'fish' signs of the Indus script

In Mesopotamian and later Indian onomastics, names of gods are used to form personal names. We can expect to have theophoric components of proper names and of priestly titles in some fairly large and uniformly distributed group of signs in the Indus seals.

Although Mesopotamian ECONOMIC texts often record rations of fish, fish is NEVER mentioned in Mesopotamian SEAL inscriptions. Yet the 'fish' sign, both plain and modified with various diacritic additions, occurs so frequently on Indus seals that almost every tenth sign belongs to this group. This suggests that at least in the Indus SEAL inscriptions, the 'fish' signs denote something else than 'fish' and are used as rebuses.

The most commonly used word for 'fish' in Dravidian languages is *miin*, and has the homophone *miin* meaning 'star'. Both words may be derivatives of the root *min* 'to glitter'.

Of course, one must check that the words in assumed readings are represented in more than one subgroup and can be reconstructed for Proto-Dravidian. In addition, the hypotheses must be checked against script-external evidence. Do the proposed interpretations make sense in the Harappan context, and with regard to the later South Asian tradition, and the Mesopotamian contacts?

There is some external evidence supporting the proposed Dravidian rebus reading of the 'fish' sign. The motifs fish and star co-occur on Mature Harappan painted pottery. Tamil speakers, who call these two things with the same word, have imagined the stars to be fish swimming in the ocean of night sky.

Additional support for reading the 'fish' sign as a rebus for 'star' is the absence of a sign depicting 'star' from the Indus script, although the 'star' symbol is painted and incised on Early Harappan pottery. The omission of a 'star' pictogram from the script is understandable as an economic measure, as the 'fish' sign covers the meaning 'star' as well.

The rebus meaning 'star' suits the expected meaning 'god' as a component of proper names in seal inscriptions. Whenever a god or goddess is mentioned in cuneiform texts, the pictogram of 'star' is prefixed to the name as its determinative, to indicate that what follows is divine. In the Sumerian script, the 'star' pictogram means not only 'god' but also 'sky'. 'Star' is thought to have originally been an attribute of the sky-god An. With An as the leading divinity of the Sumerian pantheon, his symbol would then have started to mean 'god' in general. Astronomy, including the use of a star calendar, played an important role in ancient Mesopotamia, and deeply influenced the religion: all the main gods were symbolized by particular stars or planets.

In the Near East, the 'star' symbol distinguished divinities even in pictorial representations. Significantly, a seal from Mohenjo-daro depicts an Indus deity with a star on either side of his head in this Near Eastern fashion.

The 'fish' signs could well have been parts of Harappan proper names, for ever since Vedic times people in India have had astral names derived from their birth stars. There are indications that this kind of name-giving is of non-Aryan origin.

Figure 8. A seated deity with stars on either side of the head on the seal M-305 from Mohenjo-daro. (After CISI 1: 383.)

Methodology: Checking and verifying

The hypotheses can and must be subjected to script-internal checking in the manner of cross-word puzzles. One cannot overemphasize the importance of this operation. If we apply exactly the same assumptions and methods of interpretation to signs associated with an interpreted sign in a compound sign or in a recurring sign sequence, do we get sensible results? If yes, these provisional results must be subjected to further external checking: Are the posited compound words actually attested in Dravidian languages and not mere imagination? Particularly important is Old Tamil literature, the only ancient Dravidian source not much contaminated by Indo-Aryan languages and traditions. Interlocking of consistent readings with each other and with external linguistic data and clues constitutes the essence of all decipherments.

Compounds formed with 'fish' signs and Indian mythology

The numerals belong to those few Indus signs whose function and meaning can be deduced with fair certainty, partly from the fact that they consist of groups of vertical strokes, which is the way numerals are represented in many ancient scripts, partly from their mutual interchangeability before specific signs, including the plain 'fish'. Reading the sequence '6' + 'fish' in Dravidian yields the Old Tamil name of the Pleiades, *aṟu-miin*, literally '6 stars'. Note that the numeral attribute precedes its headword in the Indus script as it did in Proto-Dravidian, but by no means in every language of the world.

'7' + 'fish' corresponds to the Old Tamil name of Ursa Major, *eẕu-miin*. This sequence forms the entire inscription on one big seal from Harappa (H-9).

In Mesopotamia big dedicatory seals were sometimes presented to divinities. The stars of Ursa Major have since Vedic times been identified with the ancient "Seven Sages". These mythical ancestors of priestly clans play an important role in early Indian mythology.

Because the Pleiades constitute the first constellation of the Vedic star calendar, its heliacal rise at the vernal equinox is thought to have marked the beginning of the New Year. This and the position of the marking stars in the sky dates the calendar to the twenty-third century BCE and suggests its Harappan origin. The Vedic people did not inherit the calendar from the Indo-Iranian tradition but adopted it in India.

Figure 9. The sequence of signs depicting 'seven' and 'fish'; these two signs form the whole inscription of the large seal H-9 from Harappa. (After CISI 1: 166.)

Vedic texts prescribe the kindling of sacred fires under the Pleiades, because the Pleiades now have the Fire-God Agni as their mate. We are told that the Pleiades were the wives of the Seven Sages, but are now precluded from intercourse with their husbands, who divorced them. Therefore the Pleiades now rise in the east, while the Seven Sages (that is, the stars of Ursa Major) are in the north. The Fire God Agni mentioned as the mate of the Pleiades apparently represents the young vernal sun, whose conjunction with the Pleiades started the New Year.

Later Sanskrit texts tell the myth in more detail and in several variant forms. According to them, the Fire God Agni (or the great ascetic god Œiva) seduced the Pleiades in the absence of their husbands, the Seven Sages. They were divorced. Only Arundhatii, the faithful wife of Sage VasiSTha, could not be seduced. She could remain as the star Alcor with her husband, the star Mizar of Ursa Major (see fig. 13).

This is really one of the central myths of the Hindu religion. In a Puranic version, God Œiva seduced six of the wives of the absent Seven Sages in their Himalayan hermitage. The Sages cursed Œiva's phallus to fall down. The phallus started to burn the world and stopped only when the Sages placed it on a vulva-shaped platform and worshipped it with cooling water-libations. This is how the cult of Œiva's linga or phallus originated. Œiva, one of the greatest gods of Hinduism, has mostly the phallus as his cult icon since the earliest historical times. Œiva's Vedic predecessor Rudra is thought to be of non-Aryan origin. In Vedic texts, Rudra is euphemistically called *œiva* 'benign', and equated with the Fire god Agni as is Œiva in the Pleiades myth.

Banyan fig and the pole star

One recurring sign sequence with the plain 'fish' sign as its latter member begins with a sign whose iconic meaning seems to be 'fig tree'. Can we here too have a Dravidian astral term?

Figure 10. The seal M-414 from Mohenjo-Daro. The normal direction of writing, from right to left, is that of the impression; in this original seal stamp, the text has been carved in mirror image. (After CISI 3.1: 409.)

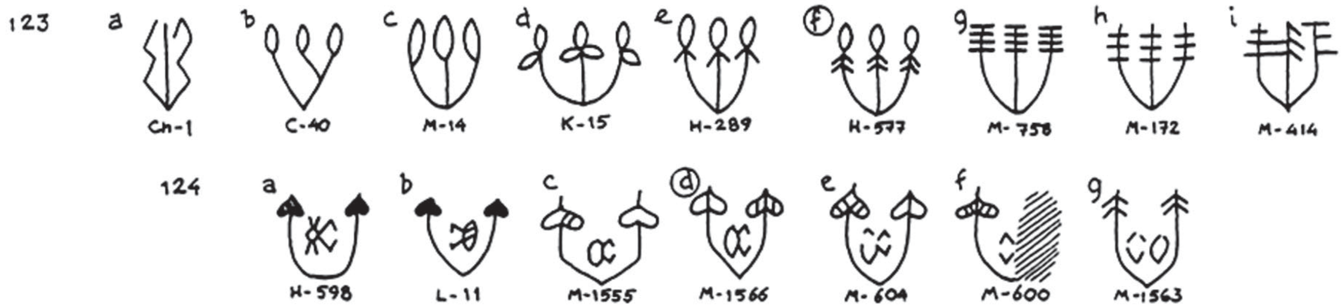


Figure 11. Allographs of the Indus sign (no. 123) representing a three-branched 'fig tree' and of its ligature with the 'crab' sign (no. 124), where the middlemost branch has been omitted to accommodate the inserted 'crab' sign. (After Parpola 1994: 235.)

The iconic interpretation as 'fig' is based on a comparison with Harappan painted pottery. In the script, the fig tree is shown as three-branched, just as on the painted pottery, except when another sign is placed inside it; then the central 'branch' is omitted. In the combined sign, the branches end in fig leaves as they do on the painted pottery, but in the basic sign with less space the fig leaves are simplified, and one or two down-going lines are sometimes added beneath the leaves on either side; in some variants three or four such lines replace the leaves altogether.

The 'three-branched fig tree' motif occurs on Harappan pottery from the Early through the Mature to the Late phase. In one variant from the time when the Indus script was created, four strokes are attached to either side of the middle stem. They are similar to the strokes of the Indus sign, except for their upward direction, which may be due to the direction of the two lower stems. The strokes seem to represent the air-roots of the banyan fig.

Figure 12. A painted goblet with the 'three-branched fig tree' motif from Nausharo ID, transitional phase between the Early and Mature Harappan periods (c. 2600-2550 BCE). (After Samzun 1992: 250, fig. 29.4 no. 2.)

The rope-like air-roots are characteristic of the banyan fig, *Ficus bengalensis* or *Ficus indica*. This mighty tree is native to South Asia and does not grow in the parts where the Indo-Aryan speakers came from. A post-Vedic Sanskrit name for the banyan fig is *vaTa*. This is a Dravidian loanword, ultimately derived from

Proto-Dravidian *vaTam* meaning 'rope or cord'. As a name of the banyan fig, *vaTam* is short for the compound *vaTa-maram*, 'rope-tree', which is attested in Tamil. *VaTam* 'banyan' has a Proto-Dravidian homophone *vaTa* 'north or northern'. This yields the expected astral meaning to the sign sequence 'fig' + 'fish'. *VaTa-miin* 'north star' is attested in Old Tamil as the name of the star Alcor in Ursa Major.

In Old Tamil texts, *vaTa-miin* is a symbol of marital fidelity and this star is pointed out to the bride as an object of emulation during the wedding. Originally *vaTa-miin* probably denoted the pole star, which in the third millennium was the nearby star Thuban. The pole star is the 'immobile' centre of the rotating heavens, and called in Sanskrit *dhruva*, 'fixed, firm, immovable, constant'. It is a fitting symbol of firm fidelity, and indeed in Vedic marriage ritual the pole star is pointed out to the bride as a model in addition to Arundhatii.

This interpretation explains in a new way some peculiar cosmological conceptions. In the first place, the Sanskrit texts mention the banyan fig as the tree of the northern direction. Homonymy connects the banyan with north in Dravidian, but there is no such linguistic association in Indo-Aryan languages. Secondly, in reply to the question, why do the stars and planets not fall down from the sky, the texts say that the heavenly bodies are bound to the pole star with invisible 'ropes of wind'. In Dravidian *vaTa-miin* as the name of the pole star also means 'rope-star' and 'banyan-star'.

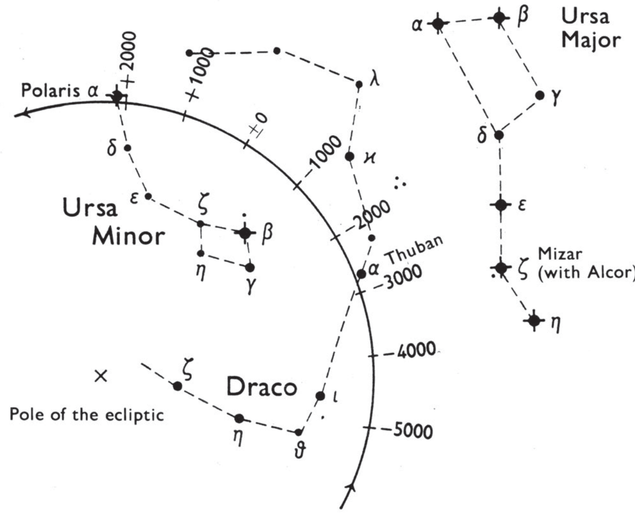


Figure 13. Circumpolar stars and the celestial pole between 5000 BCE and 2000 CE. The semicircle marks the path of the gradually shifting celestial pole. (After Liebert 1969: 168.)

Figure 14. A deity inside a fig tree and a star on either side of the tree on the tablet H-179 from Harappa. (After CISI 3.1: 403.)

Around 1000 BCE, a late hymn of the Rigveda (1,24,7) speaks of the roots of a cosmic banyan tree being held up in the sky by God VaruNa.

The Vedic and Hindu texts repeatedly refer to heavenly fig tree. This conception seems to be reflected on an Indus tablet, which depicts an anthropomorphic deity inside a fig tree. At bottom the fig tree is flanked on either side by a star. They suggest a heavenly connection for the tree.

Identifying Murukan's name in the Indus texts

If the Harappan language was Dravidian, the Old Tamil literature assumes great importance in the study of the Indus religion. It is the only source granting us glimpses into the culture that prevailed among Dravidian speakers before their language and traditions became much contaminated with Indo-Aryan languages and traditions.

The principal native deity of the Old Tamil pantheon is a youthful god of war and love, in many respects resembling the North Indian war-god Skanda and early on explicitly identified with him. This god has various native Dravidian names, but the most important is *Muruku* or *Murukan*, which means 'youth, young man'. Skanda's Vedic predecessor Rudra is represented as a newborn baby and called in Sanskrit *Kumaara*, 'young boy, young man', an exact synonym of Murukan.

Both Vedic and epic myths of Rudra's or Skanda's birth mention the Pleiades, in Sanskrit *krttikaah*, as the mothers or nurses of Rudra or Skanda, whose metronym therefore is *Kaarttikeya;* in late Old Tamil and Medieval Tamil texts Murukan is called *aru-miin kaatalan* 'son or beloved of the Pleiades'. Both Murukan and Rudra-Skanda are connected with the colour red and the rising sun. One reality behind the myth of Rudra's birth seems to be the sun's heliacal rise in the Pleiades, which marked the beginning of the New Year.

It seems possible that Murukan and Rudra-Skanda are both descended from a Proto-Dravidian deity and that this god is mentioned in the Indus inscriptions. But how to locate his name or names in the texts if we cannot read the script? The most reliable clue seems to be his association with the Pleiades, because the Pleiades can be identified in the Indus texts: their Old Tamil name *aru-miin* 'six-star' corresponds to the sign sequence '6' + 'fish'.

One particular context where '6' + 'fish' occurs is a seal from Mohenjo-daro (M-112). The first three signs of this seal possibly denote an epithet. They recur in this same order in one other text only, another seal from Mohenjo-daro (M-241). The first sign has here a variant shape. In passing I would like to introduce here an interpretation of this sign not included in my 1994 book. It seems to depict the traditional Indian spinner's spindle, i.e. the instrument used to spin threads from cotton. The cotton-cultivating Harappans must have had the spindle. In Proto-Dravidian spindle was called **katir*, which is homophonous with the root **katir* 'to shine, be radiant', often occurring in Old

Figure 15. The seal M-112 from Mohenjo-daro and its modern impression. (After CISI 1: 40.)

Figure 16. The seal M-241 from Mohenjo-daro and its modern impression. (After CISI 1: 60.)

Tamil poems in connection with Murukan, who is associated with the rising sun. The sun is called in Old Tamil *katir-k-kaTavuL*, 'radiant deity'.

In any case, the two first signs both occur very infrequently, which makes their co-occurrence in these two texts significant. Therefore, the immediately following sequence in the second seal, the signs 'two intersecting circles' + ' two long vertical strokes', may be a name of Murukan, because it corresponds to a sequence in the first seal that includes '6' + 'fish', i.e. the name of the Pleiades. The identified sequence occurs very frequently in Indus inscriptions, and some contexts strongly suggest that it refers to a deity. For example, it occurs on the obverse side of amulets whose reverse sides show an anthropomorphic deity sitting on a throne, surrounded by a kneeling worshipper and a snake on either side. In South India, Murukan is associated with snake cult.

If the sign of 'two intersecting circles' expresses an ancient Dravidian name of Murukan, or a part of his name, the most obvious choice is Old Tamil *muruku*, 'young man', which has cognates in many South and Central Dravidian

Figure 17ab. The obverse (a) and reverse (b) of the faience tablet M-453 from Mohenjo-daro. (After CISI 1: 111.)

languages. This word has an exact and ancient homophone, whose meaning strikingly fits the form of the pictogram involved, namely *muruku*, 'ring, ear-ring, bangle' derived from the Dravidian verbal root **murV* 'to bend or to be bent'. (Similarly, Proto-Dravidian **vaLay* 'ring, circle, bracelet' comes from the root **vaLay* 'to bend or to be bent, be curved, turn around, surround, enclose'.) The idea of 'ring', of course, could be expressed by means of a single circle, but this could be interpreted in various other ways as well. But ear-rings are usually worn in pairs, one in each ear. This pictorial interpretation of the sign of 'intersecting circles' is supported by its formal identity with a symbol that in the traditional Tibetan Buddhist art represents royal ear-rings (fig. 18). The sign could also depict the ear with its ear-ring.

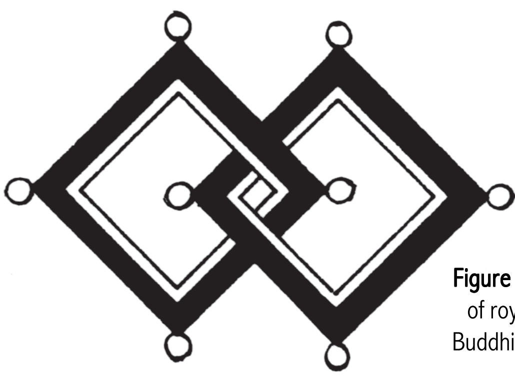
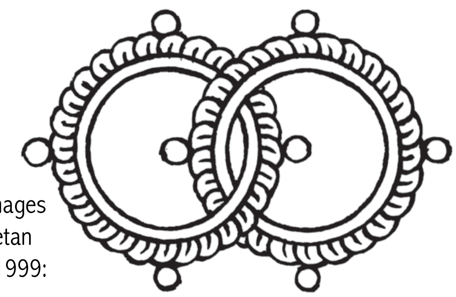


Figure 18. Traditional images of royal ear-rings in Tibetan Buddhist art. (After Beer 1999: 230, pl. 107.)



Muruku and the bangle cult

Besides 'ear-ring', the word *muruku* in Dravidian languages denotes 'arm-ring, bangle'. The meaning 'bangle' is endorsed by the disproportionally high frequency of the pictogram on the 40 or more inscribed Harappan 'stoneware' bangles. Several of these bangle inscriptions in fact contain nothing but the sign of 'intersecting circles'. It is not unusual for ancient inscriptions carved on various objects to mention the name of the object concerned, especially when given as votive offerings. These stoneware bangles were manufactured with a very difficult and expensive process, and they must have been prohibitively expensive. This is suggested by the fact that the saggars in which these bangles were heated were carefully sealed and stamped to prevent stealing. On a votive bangle, this pictogram could denote the Dravidian word *muruku* not only in the sense of 'bangle' but also in the sense of a 'boy child' wished for by the donor of the votive bangle. The homophony alone could make a bangle an appropriate gift in sympathetic fertility magic. But is there any factual evidence for such a usage?

The bangle has a strong association with pregnancy in many parts of India. During pregnancy and childbirth, the mother and baby are both in great danger of being attacked by demons. In Tamil Nadu, in the fifth or seventh month after the conception of the first pregnancy, the expectant mother is ritually adorned with bangles and blessed by older women. The bangles symbolize an enclosed circle of protection.

Bangles and rings are connected with pregnancy not only as protective amulets but also as charms effecting reproduction. Such a practice is attested as early as around 1000 BCE, in Atharvaveda 6,81, a three-versed hymn addressed to *pari-hasta,* 'bracelet', literally 'what is around the arm'. The bracelet is fastened upon a woman 'intending that she shall beget a son', as a charm that drives off the demons, opens up the womb and brings an embryo into it. In Indian folk religion, pregnancy bangles are offered to tree spirits or hung on sacred trees. William Crooke reports that at Allahabad, near the tomb of a Muslim saint, is

Figure 19. The 'fig deity' seal M-1186 from Mohenjo-daro. (After CISI 2: 425.)

''a very old, large Champa tree *(Michelia champaka)*, the branches of which are hung with glass bangles. 'Those anxious to have children come and offer the saint bangles, 7, 11, 13, 21, 29, or 126, according to their means and importunity. If the saint favours their wish, the Champa tree snatches up the bangles and wears them on its arms.'' (William Crooke, *Religion and Folklore of northern India*, 1926, p. 417)

In Karnataka, bangles are similarly offered to the Hindu goddess Ellamma (a form of Durgaa) by women wishing to become pregnant. This widespread folk custom is likely to go back to Harappan traditions. The deity standing inside the fig tree in a famous seal from Mohenjo-daro wears bangles on both arms. The seven anthropomorphic figures at the bottom of this seal, wearing their hair in the traditional fashion of Indian women, are likely to be female and to represent the 'Seven Mothers', the Pleiades, famous as child-granting and child-killing goddesses like their son Skanda.

Several Harappan tablets illustrate worshippers kneeling in front of sacred trees and presenting offerings to them. The Buddhist Jaataka texts show that such worship of trees, especially to obtain children, was an important part of early historical folk religion, and tree spirits continue to be among the principal divinities that the Indians approach for getting children. In Bengal, the goddess SaSThii who presides over childbirth is worshipped under the banyan tree in the form of a cat made of rice paste, and bangles made of rice paste are presented to her. Thus it does not seem farfetched to read the sign of 'intersecting circles' on Harappan bangles as Dravidian *muruku* and to understand it to denote 'bangle' as well as 'boy child' and the proper name of the child-granting divinity, himself the divine child par excellence. Even today in Tamil Nadu, many couples desiring a male child make a pilgrimage to a famous shrine of Murukan and, after the birth, name their son after the god.




Figure 20abc. The sequence of signs depicting 'intersecting circles' and 'squirrel' in three Indus texts. **(a)** Part of a seal from Nausharo. (After CISI 3.2.) **(b)** The seal M-1202 from Mohenjo-daro and its modern impression. (After CISI 2: 143.) **(c)** Obverse of the moulded tablet H-771 from Harappa. (After CISI 2: 324.)

PiLLai 'young' as an attribute of the squirrel and of Muruku

The sign of 'intersecting circles' is three times (on a seal from Nausharo, M-1202 and H-771) followed by a complex sign, whose pictorial shape can be understood on the basis of a seal from Nindowari. It depicts the five-striped palm squirrel, which is found everywhere in the Indus Valley and is represented among the Harappan animal figurines. In the Indus sign the animal is represented with its tail up and head down, and its four feet cling to a long vertical stroke that can hardly represent anything else

Figure 21. The 'squirrel' sign of the Indus script engraved on the seal Nd-1 from Nindowari. (After CISI 2: 419.)

than a tree. The creators of the Indus script have tried to secure the identification by depicting the animal in its typical pose, for "in cool weather, the squirrels ... hang head down in the sun on the vertical trunk of a tree for considerable periods" (T. J. Roberts, *The mammals of Pakistan*, 1977, p. 228).

In Tamil, the striped palm squirrel is called *aNil* or *aNil piLLai*. In the latter expression, the word *piLLai* means 'child, infant, son, boy' as well as 'young of animals and trees'. In the case of the squirrel, parrot and mongoose, the word *piLLai* is added to the basic word in order to form an affectionate deminutive, and the word *piLLai* can also alone refer to the animal concerned. This Tamil usage of *piLLai* in the meaning of 'squirrel' goes back to Proto-Dravidian, for Central Dravidian preserves cognates of *piLLai* meaning 'squirrel'. This word is similarly added to the various names of the god Muruku to form affectionate variants that are popular as male proper names in Jaffna Tamil, and these names include *Muruka-p-piLLa*. Thus the compound sequence we are considering, 'intersecting circles' and 'palm squirrel', is matched by an actually attested Tamil compound.

Murukan's name and the planet Venus: a case for cross-checking

Another possibility for verifying the reading *muruku* is to try and interpret the sign of 'two long vertical strokes' which is frequently postfixed to the sign of 'intersecting circles'. Actually this sign makes a double cross-check possible, for it also often precedes the 'plain fish' sign.

Figure 22. Obverse of the moulded tablet H-723 from Harappa. (After CISI 2: 319.)

Figure 23. The seal H-669 from Harappa, flipped to show the signs as they would appear in an impression. (After CISI 2: 310.)

How can we read the pictogram of 'two long vertical strokes'? Such a simplified symbol lends itself to various pictorial interpretations, and it would be difficult to decide which of them, if any, is correct. But the tentative readings for 'two intersecting circles' and 'fish' enable a different approach. We can collect, first, all actually attested composite names of the god Murukan that start with the word *muruku*, and, secondly, all actually attested compounds denoting either stars or fish which end in the word *miin*. We are looking for two Dravidian compounds in which the missing component *X (muruku-X* and *X-miin)* is the same. If such a shared member should be found in these two very limited groups of actual compounds, the solution can be further tested by asking whether its meaning(s) will adequately explain the pictorial shape 'two long vertical strokes'.

To start with the names of the Old Tamil war-god, the best match for the sequence is the compound *Muruka-veeL*. The component *veeL* occurs in the same position in several other names of Murukan as well: besides *Kanta-*

veeL and *Kumara-veeL*, in which the first members *Kanta* and *Kumara* are derived from Sanskrit *Skanda* and *Kumaara*, Murukan is often called in Old Tamil *Ce-v-veeL*, with Dravidian **ke-* 'red'. *VeeL* 'desire' even occurs alone as the name of Murukan, who is not only the god of war but the god of love and sex as well.

From Murukan's name we now turn to astronomical terms. The word for 'white' with the widest distribution in Dravidian languages is *veL*, a close homophone of Murukan's name *VeeL*. The compound *veN-miin* (< *veL* + *miin*) 'white (or bright) star' is known from Old Tamil as the name of the planet Venus, the brightest star of the morning and evening sky. The noun *veLLi*, derived from the root *veL* 'to be white or bright', denotes 'Venus' in several Dravidian languages, and the compound *veLLi-miin* occurs in Tamil.

The phonetic shape *veL / veeL* has thus emerged as the shared component *X* in the compounds *Muruku-X* and *X-miin*. This intended meaning of the sign 'two long vertical strokes' is homophonous with Proto-Dravidian *veLi* 'open or public space, space (in general)' and 'intervening space', i.e. the atmosphere between heaven and earth (Sanskrit *antarikSa*). 'Intervening space, atmosphere' could be the pictorial meaning of the sign, for on the basis of various other evidence it seems likely that the sign consisting of three long vertical strokes denotes 'the three worlds'. Another attested meaning for *veLi* is 'space between two furrows' in ploughing, which also fits well the 'two long vertical strokes'.

Additional cross-checking

The sign 'two long vertical strokes' is used in the Indus script not only as an *ATTRIBUTE* of the 'fish' pictogram, namely in the compound 'two long vertical strokes' + 'fish' = *veL / veLLi* + *miin* 'white star' = 'Venus', but also as a *SYNONYM* of the 'fish' sign. The synonymous usage can be observed by comparing two inscriptions, M-172 and H-6. The two signs, the plain 'fish' and the 'two long vertical strokes', both occur as the second member of a

Figure 24. Impressions of the seal M-172 from Mohenjo-daro. (After CISI 1: 50.)

Figure 25. Impression of the seal H-6 from Harappa. (After CISI 1: 162.)

compound after one and the same first member. Identity of meaning is suggested by the fact that both compounds are embedded in the same context, which includes the preceding as well as the following sign. The matter is complicated by the fact that three graphemes in this sequence of four signs have variant forms (allographs) in the two inscriptions.

It is striking that this double usage of the 'two long vertical strokes' happens to agree with the semantics of the word *veLLi*, which offer yet another support to this interpretation of the sign 'two long vertical strokes'. In Tamil, at least, *veLLi* means not only 'Venus', but also 'star' in general. Two renderings for English 'star' in Chettiar's *English-Tamil dictionary* are *viN-miin* and *vaan-veLLi*. Here the words *viN* and *vaan*, both meaning 'sky', have been prefixed to *miin* and *veLLi* 'star', in order to avoid confusion with homonyms, such as *miin* 'fish'. The word *veLLi* meaning 'star' also occurs in other compounds as a synonym of *miin*. Thus both *viTi-veLLi* and *viTi-miin* are used in Tamil for 'the star of the dawn, Venus' (the first member *veTi / viTi* means 'to dawn, break as the day').

Future prospects

Thus there is a fair number of consistent rebus interpretations which interlock with each other and with external linguistic and cultural data to an extent that excludes chance coincidences. These readings have been achieved with strictly adhered methodology which is in full agreement with the history of writing, methods of decipherment, and historical linguistics, including the comparative study of Dravidian languages. The readings are based on reasonable identifications of the signs' pictorial shapes. Moreover, the results make good sense in the framework of ancient Indian cultural history and the Harappan context, and they keep within narrow limits: fertility cult connected with fig trees, a central Hindu myth associated with astronomy and time-reckoning, and chief deities of Hindu and Old Tamil religion.

For all these reasons, I am confident than an opening to the secrets of the Indus script has been achieved: we know that the underlying language was Proto-Dravidian and we know how the script functions. The confirmed interpretations and their wider contexts provide a lot of clues for progress, but there are some serious difficulties on the way. One is the schematic shape of many signs, which makes it difficult to recognize their pictorial meaning with certainty. Possibilities of proposing likely readings and their effective checking are severely limited by our defective knowledge of Proto-Dravidian vocabulary, compounds and phraseology.

I hope that at this stage scholars who speak Tamil and other Dravidian languages as their mother tongue will actively participate in this exercise and develop it further. The problem of the Indus script resembles to some extent that of the logo-syllabic Maya script, where advance was phenomenal once native Mayan speakers were trained in the methods of decipherment. Laymen, too, can make useful contributions in suggesting possible pictorial meanings for the Indus signs, and here there is no need to be a Dravidian speaker - but good acquaintance with the realities of Indian culture and South Asian nature is definitely an advantage. All such suggestions that hopefully will be forthcoming from Tamil people could perhaps be coordinated by the Indus Research Centre established by Dr Iravatham Mahadevan at the Roja Muthiah Research Library at Chennai. Perhaps the Centre might make them available in the internet.

What I have presented here, and many other aspects of the Indus script not mentioned here, including further interpretations based on the same premisses and supporting the above results, are available with full documentation, references and illustrations in my book *Deciphering the Indus Script* (1994) and in other publications by myself and my colleagues, detailed in the following bibliography. The paper which I present later in this conference deals with some very recent developments.

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