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IRAVATHAM MAHADEVAN'S READING OF INDUS SCRIPT: A CRITICAL REVIEW

C. Jyothibabu
Independent researcher

This paper comprehensively summarizes, analyses, and reviews Iravatham Mahadevan's attempts to decipher the Indus script. Spanning a period of over thirty five years, Iravatham Mahadevan made continuous attempts to interpret and decipher the Indus script. Mahadevan claimed to have adapted the method of parallels between the symbolic representation and the text, between the written object and its designation, between the written symbol itself and its meaning, and the similarity throughout the ancient East of certain portions of the inscriptions, with the assumption that the underlying language of the script is Dravidian. Mahadevan was very flexible in changing his views and finding new interpretations, and gradually he shifted his interpretation of Indus signs from being phonetic/logographic/word to ideographic, leaving unshaken his core personal hypothesis and belief in the Veḷier clan and Tamil cultural settings. While Mahadevan did not succeed in making a self-consistent system of readings applicable to a large number of discovered pieces of writings, he did make a determined, persistent effort to develop a Dravidian framework for deciphering of the Indus script. This study seeks to find weaknesses in the methodology and assumptions of Mahadevan and searches for possible alternatives within that framework.

1. INTRODUCTION

Sir Alexander Cunningham reported the first-known Indus seal from Harappa in 1875 (Parpola 2005: 32). Since then, numerous attempts have been made to decipher the writings on the Indus seals. Iravatham Mahadevan started his decipherment on paper in 1970. One can find very few reviews of attempted decipherments (see, for example, Aalto 1984; Elst 2000; Mahadevan 2002) but none on Iravatham Mahadevan. Here, Mahadevan's attempts are comprehensively summarized, analysed, and reviewed.

Despite so many attempts over the years, scholars have not reached any agreement on (1) the language of the script, (2) the type of the signs, or (3) the structure of the script. Therefore, individual decipherers have to work with their own convictions on the language, type, structure, and methodology, until one of them eventually proves to be right. Mahadevan (1970) had used the assumption of an underlying Dravidian language. Mahadevan (2015) gave a detailed justification for this assumption. In spite of the arguments by Mahadevan (2015), Asko Parpola (1994), Stephan Levitt (2009), and others, there is no conclusive evidence to support the argument that the language in the Harappan script is Dravidian. Still, there is a definite possibility that the language is Dravidian.

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If one assumes that the language is not Dravidian, then the only possible criticism regarding Mahadevan is that he chose the wrong language. Therefore, this review is not going to discuss the correctness of this assumption. Instead it tries to find weaknesses within the methodology and assumptions of Mahadevan and searches for possible alternatives within that framework.

2. IRAVATHAM MAHADEVAN'S METHOD

According to Mahadevan (1970), almost all scholars in the field agree that the script is logographic, such that each symbol represents a word and not merely a sound, as the script is not purely phonetic. Parpola (1976: 127) used the term "morphemographic" for this:

> The term morphemographic implies a writing system making use of signs with inherent semantic and phonetic values and usable in either function, in contrast to logographic/ideographic systems with semantic content only, and syllabic systems with phonetic value only. All early writing systems were morphemographic, and the […] system fits well the Sumerian language because most of its roots were monosyllabic. […] The morphemographic system operating with bare roots is perhaps even more natural and easy in the case of Dravidian, since in Dravidian the bare root as such usually has both a verbal meaning […] and a nominal meaning. […] It may hence be considered a legitimate procedure to operate with the roots only while attempting a decipherment of the Indus script. It is clear that we must try to reconstruct the proto-(North-) Dravidian forms of the roots and that in doing so we must try to stick very strictly to the rules established by comparative Dravidian linguistics.

Furthermore, according to Parpola (2010: 13):

> 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. (The method demands strictness with homophony; in the case of Porto-Dravidian, variation in the length of vowels and consonants is allowed, but not much else.)

This has to be kept in mind while evaluating Mahadevan's decipherment.

Mahadevan (1970) claimed to have adapted the method of parallels described by Emil Forrer. In this method, parallelism can be found (1) between the symbolic representation and the text (e.g. attitude, costumes, and attributes obviously predict a being as a deity), (2) between the written object and its designation (e.g. when something is engraved on a sacrificial axe, such as the axe of the high priest), (3) between the written symbol itself and its meaning (e.g. when the ideogram is comparatively close to its original form, as in the case of the Sumerian character for 'star'), (4) similarity throughout the ancient East of certain portions of the inscriptions (e.g. the opening of royal inscriptions: "king", "king of kings", "king of this and that"), the formula for curses (e.g. "whoever destroys", "may the god destroy"), and the introduction to letters (e.g. "from A to B"). Thus, Mahadevan used the votive texts of Tamil Brahmi cave inscriptions, megalithic pottery in south India, the earliest seal and coin legends in Dravidian languages, Tamil Sangam works, and Sanskrit literature to guide his decipherment.

Mahadevan (2008) also claimed to have used the "method of bilingual parallel". He opined that:

> due to extended bilingualism and the gradual replacement of Dravidian with Indo-Aryan languages in North India, some at least of the more important names and titles passed into the latter as loanwords and loan translations. […] It is also possible that when the Indus Script disintegrated as a writing system, at least some of the more important ideograms survived and evolved into traditional symbols of various kinds […] recognized by […] the telltale presence of myth and folk etymology invoked to explain the symbolism and the loanwords and translations. (Mahadevan 2008: 81–82)

Following this method, Mahadevan (1970) argued that the 'twinkling fish' (sign 67) + 'roofed fish' (sign 65) combination identified by the Finnish team (Mahadevan 1970: 7) as Saturn and Venus occurs in either order and that they represent the words *vēḷ mā*. While *vēḷ* means a priest who performs a sacrifice, as well as a chieftain, *mā* means great (Mahadevan 1970). Then Mahadevan connected the word *vēḷ* to the legends of the Vēḷirs and to Yādavas and Dwāraka. In this manner, a grid of parallels is to be progressively built up to make the identifications of symbols adhere together better to demonstrate the validity of the decipherment.

Regarding the content of the writing, Mahadevan (1975: 262) argued: "The Harappan seals, in accordance with universal usage, give the names of their owners. The longer texts probably also contain titles, honorifics, references to occupations, place names and other ancillary information." Some others (e.g. S.R. Rao 1982; Parpola 1994) also concluded that the inscriptions contain personal names and titles.

According to Mahadevan (1970), there are too many available choices to interpret the symbols; however, positional characteristics can limit these choices. We will find in due course that still many more choices do exist. This paper uses Mahadevan's (1977) sign list wherever Indus sign numbers are mentioned (Figure 4) and the DEDR (Dravidian Etymological Dictionary).

3. STRUCTURAL STUDIES

Regarding the possibility of structural studies of an unknown script, Mahadevan (1986d: 15), quoted Ernst Doblhofer (1961: 183), who summarized Emil Forrer's (1932) work, "a simple comparison of these texts will reveal the signs employed for case-endings, pronouns, personal suffixes, demonstrative pronouns, relative and interrogative pronouns; also the adverbs, prepositions, conjunctions, particle and verb forms – in short, the basic features of a grammar, intelligible to the eye, if not to the ears" (Mahadevan 1986d: 15).

The Indus script runs generally from right to left but sometimes from left to right, in which case the "direction markers" are also reversed. Iravatham Mahadevan's structural studies of the Indus script are summarized below (Mahadevan 1985; 1989):

(1) The Indus Script consists mainly of word-signs which appear to be of the following types:

   (a) Ideograms: These are the clear, "transparent" signs whose ideographic significance is apparent. These signs can be understood but not "read": (sign 1: 'man').

   (b) Phonograms: The "improbable" pictograms like fish, birds, insects, animals, etc. that appear in the seal-texts are most likely names and titles and can be explained only on the basis of their being phonograms formed by rebus writing. These signs cannot be understood or read without making an assumption about the underlying language.

   (c) Conventional signs: These include the superscript signs, "bracket" signs, and other "stroke" signs. While it is possible to determine their function by structural analysis, there is presently no method to discover their phonetic values.

   (d) Numeral signs: Numerals have been identified by their logical sequence and their use on pottery and bronze implements, obviously for enumeration. Numbers precede the objects enumerated. The system appears to be decimal. The units are represented by short strokes and the tens by inverted semi-circles, both as in Egyptian. The numerals from 4 to 10 are also found written with two-tiered strokes. The long strokes do not seem to represent ordinary numbers (except probably on the miniature tablet from Harappa). The short superscript suffixes are certainly not numbers.

   (e) Phonetic syllables: They probably do exist, as a developed writing system cannot manage without them, but so far structural studies have not helped in their identification.

(2) Ligatures and modifications: Compounding and modification of signs appear to be ideographic and not phonetic in character. This inference is based on the observation that in most cases the ligatured or modified signs have the same distributional pattern as the basic or unmodified signs in question. For example, any modified 'fish' sign can be substituted for any other sign in the group in almost all contexts. Such a pattern is wholly inconsistent with phonetic combinations or modifications.

(3) Words: Word-signs appear to represent basically only two types of words (or morphs), viz. roots/stems and suffixes.

  (a) The root sign functions either as a substantive or an attribute. The same sign can serve in either function. The vast majority of the signs belong to this category of vocabulary items in the language. Attributes precede the substantive they qualify.

  (b) Suffixes fall into two main groups:

    (i) Terminal Suffixes: Five very frequent terminal signs (and their ligatures and combinations) appear to function as nominal suffixes.

    (ii) Grammatical Suffixes: Another set of six suffixes comprising three superscripts, two middle-register stroke signs, and a four-stroke bracket sign appear to be grammatical morphs.

      (A) The superscript suffixes function like case markers, most probably for the locative, possessive, or oblique cases.

      (B) The middle-register suffixes appear to function like conjunctions, as they generally serve to join two parts of a text appearing as separate texts elsewhere. These stroke signs also appear to denote the numerals 1 and 2.

      (C) Plural marker: The four-stroke bracket sign functions like a grammatical suffix replacing the terminal suffixes. This is probably a plural marker, as originally suggested by Heras.

(4) Syntactic order in the texts:

  (a) Substantive Phrase: The core of a text is the root/stem morpheme. It may be preceded optionally by one or more root/stem morphemes functioning as attributes qualifying the substantive. The substantive may be followed by one to three nominal suffixes. The whole sequence constitutes the main or substantive phrase of the text.

  (b) Introductory phrase: The substantive phrase may be preceded (optionally) by one (or more) "introductory" phrases qualifying the substantive phrase. The introductory phrase consists of a root/stem as the substantive, preceded (optionally) by one or more attributes qualifying the substantive, and followed by a superscript case-marker suffix.

Earlier, Mahadevan (1986d) also observed that:

(1) There are signs where the modifications result in a change in the distributional pattern (e.g. sign 1 'man' versus sign 3 'man with a stroke between the legs'). In such cases, there is no prima facie evidence to determine whether the modifications are ideographic or phonetic – or whether the two signs are related at all. So far, the existence of phonetic modifiers has not been proved by structural analysis.

(2) Ligatures of word-signs modify the meanings in those cases where both the basic and the ligatured signs have the same pattern of distribution. This again is good evidence for the substantial ideographic content of the Indus script. Such a pattern is also inconsistent with that of combinations of phonetic syllables. Examples are sign 347 and sign 348.

(3) It can be shown in many cases that the ligatured compound signs have to be read from right to left (e.g. sign 25 'man with staff'). Thus, 'staff-man' is different from 'man-staff', assuming that Harappans were not left-handed.

(4) Where signs are ligatured one below the other, the natural sequence appears to be from top to bottom.

(5) In those cases in which two signs are ligatured one within the other, it is not possible at present to split up the ligatures with certainty, or even to say whether such signs are ligatures or modified signs or integral basic signs which cannot be split up further.

(6) A word-sign in the Indus texts stands for a morpheme or a word or a compound word. It is likely that each sign represents one or more morphemes.

(7) Root morphemes comprise the bulk of the signary (406 signs) but have a much lower average frequency (25 times) than the suffixes, which are fewer in number (10 basic signs, 3 ligatures, and one modifying element) but have a much higher average frequency (250 times).

(8) In the Indus texts there seems to be only one class of root morphemes which function either as substantives (nouns) or as attributes (adjectives) depending on their position. However, it is possible to classify the root morphemes into those which occur more often as substantives and those which occur more often as attributes. For example, the sign 59 'fish' occurs more often as attributive but sign 48 'sitting man' occurs more often as substantive.

(9) Attributes precede the substantives they qualify.

(10) A set of five frequent terminal signs (and their ligatures and combinations) – namely, 'jar', 'arrow', 'bearer', 'man', and 'harrow' – are not grammatical morphs (indicating number, gender, person, or case) but nominal suffixes.

(11) These signs are substantive with ideographic signification.

(12) These five nominal suffixes, being elements in name formation, are added only to personal nouns and not to other types of nouns.

(13) The ligatured four-stroke circumgraph element is a plural marker and to be read after the included sign. A basic sign which is mostly initial or medial becomes mostly final when ligatured with the four-stroke circumgraph.

(14) The core of a text is the root morpheme or substantive. It may be preceded (optionally) by an introductory phrase consisting of one or more root morphemes functioning as attribute(s) qualifying the substantive. The substantive may be followed by one to three nominal suffixes. The whole sequence – namely, the attribute(s) (if any), the substantive, and the nominal suffix(es) (if any) – constitutes the substantive phrase of the text.

(15) The introductory phrase has at its core a root morpheme as the substantive, preceded (rarely) by one (or more) root morpheme(s) acting as attribute(s) qualifying the substantive. The substantive is followed by a case marker in the introductory phrase(s).

Ideograms have to be read as a whole; if the ligatured sign is to read from left to right, then it is probably an indication of phonetic reading, which contradicts Mahadevan's (1986d) own opinions. Also, Mahadevan (1986d) agrees that the five terminal signs are occasionally doubled, behaving in this respect as some other substantive word-signs, thus casting doubt on their ideographic character.

Mahadevan's structural analysis is comprehensive. The results of Mahadevan's structural analysis is similar to those of the Soviet team (e.g. Knorozov 1976), the Finnish team (e.g. Parpola 1994), those at the Tata Institute of Fundamental Research (e.g. Yadav & Vahia 2011), Gift Siromoney and Abdul Huq (1988), Walter A. Fairservis, Jr (1992), and so forth, but they are different from those of S.R. Rao, who identifies only about 60 or less basic signs (Mahadevan 1986d), and others who assume a largely semantic alphabetic structure.

4. NUMERALS

There are three types of strokes/lines which could be represented as numerals, viz. short strokes, long strokes, and short superscripts. Mahadevan (1977) treated straight strokes and slanting strokes as variations; they are depicted as slanting to differentiate them from the other long strokes. Mahadevan also treated long slanting strokes and short superscripts as variations (e.g. sign 94). Looking at the variations of sign 123 as listed by Mahadevan (1977), it appears that the sign represents two single-stroke superscripts. Mahadevan (1989) observed that long strokes are not ordinary numbers. The difference between the short strokes (in the middle) and the long strokes is not clear. It is possible that one is substantive and the other is attributive. Mahadevan (1986d) considered that the single and double short strokes of the middle register (signs 98 and 100) placed in the initial positions appear to be numerals (l and 2) or alternate forms for single and double long strokes (signs 86 and 87).

5. SIGN 342 'JAR'

About one tenth of the total material is accounted for by this symbol (Mahadevan 1970). The most marked characteristic of this symbol is its terminal position (even when in the middle of writing); according to the Finnish team (Parpola et al. 1969a: 19), 627 final occurrences (32.25% of the number of inscriptions) include this sign (Mahadevan 1970: 9). The sign occurs 971 times at the end of texts, three times more than the next most frequent final sign (Mahadevan 2009b). In Soviet terminology, the symbol belongs to the class of variable signs "which can replace each other, join in pairs or disappear" (Mahadevan 1970: 9). According to the Finnish team (Parpola et al. 1969a: 19), the symbol occurs 12 times at the beginning of inscriptions (Mahadevan 1970: 10).

According to Soviet scholars, the symbol is a stylized picture of a pipal tree; according to the Finnish team (Parpola et. al. 1969a: 21), it is the picture of a ship. However, Mahadevan (1970) claimed that the pictogram of the 'jar' sign suggests some kind of vessel with handles with a protruding rim or lip at the mouth and a tapering bottom. Parpola (1994) opined that the sign represented the head of a cow.

The Soviet and Finnish scholars, as well as Heras (1953), considered the 'jar' sign to be an inflexional ending of the genitive case (Mahadevan 1970). Langdon (1931) concluded that it is an inflexional case ending or determinative, but citing its great frequency Hunter (1934) ruled out it as a determinative (Mahadevan 1970). Hunter argued that it is not a grammatical suffix but a suffixed element, as 'servant' is used in the formation of proper names (Mahadevan 1970).

According to Mahadevan (1970), the observed frequency and distribution pattern of the earliest Dravidian material in a similar context does not substantiate a Dravidian genitive in this position because in ancient Tamil a symbol in a similar context should almost always occur in the nominative. Mahadevan (1970; 2009b) connected this symbol with:

DEDR 130 Tamil *aṇṭai* 'squirt'
DEDR 127 Kannaḍa *aṇḍige* 'one pannier, pack'
DEDR 7 Kui *anḍra* 'male animal or bird', 'male
DEDR 3067 Tamil *tantai* 'father'

Mahadevan (1970) reasoned that the 'jar' sign should represent the masculine singular pronominal suffix in the third person **-anṟ*, meaning 'he, that man', corresponding to old Tamil *aṉ*, *antai*. Mahadevan (1970) opined that the main purpose of the suffix was honorific and that the number and gender were only incidental. Mahadevan (1970) claimed that this recognition can help to identify personal names and titles from the inscriptions.

However, Mahadevan (1980: 209) further clarified that his "earlier attempt to treat the sign as a grammatical suffix and to establish its phonetic value through homophones of 'vessel' words has not been successful". He concluded: "It can be established from purely formal analysis that the 'jar' sign occurs as a post-fix, suffix or determinative at the end of what are most probably names and titles", and that it "is most probably used in an ideographic sense to indicate the class of persons to whose names it is found suffixed" (Mahadevan 1980: 209).

Mahadevan (1986d) observed that the 'jar' sign has substantive character because (1) there are a number of instances where the sign is immediately preceded not by substantives but by superscript stroke suffixes and thus stand initially or by themselves separated from the preceding texts, (2) there are instances where the sign is immediately followed by superscript stroke suffixes confirming their substantive character, and (3) the 'jar' sign also occurs in a

modified manner with one to four short strokes placed on the top. The modified signs share to some extent the environment of the basic sign, and the pattern of distribution of the modified signs indicates their ideographic relationship with one another (Mahadevan 1986d).

Mahadevan (1980; 1982a; 1986b) considered that since the 'jar' sign was used ideographically to represent a priest, it is not necessary that the words for 'priest' and 'jar' be homophones. Mahadevan (1986b) observed that the most ancient word for 'priest' in Dravidian was probably **vēḷ*, derived from the root *vēḷ* 'to pray, to beseech' (DED 4548) or 'to perform a sacrifice' (DED 4561); later on, it came to mean 'a petty ruler, chief' (DED 4562), evidently as a result of the semantic shift from 'priest-ruler' to 'ruler'. According to Mahadevan (1986b), the 'jar' sign stands for **vē* 'priest' and it is connected to the Agastya legend.

While determining the phonetic value of the sign 'arrow' (which occurs under similar circumstances as the sign 'jar') as a non-masculine singular suffix, Mahadevan (1998a: 72) again modified his view to state that "the 'jar' sign must be the masculine singular suffix with the phonetic value **(*a*)*nṟu*, a result which is virtually independent of the pictorial value of this sign". Mahadevan (2009a; 2009b) further opined that the 'jar' sign as well as the 'arrow' sign has a double function, namely, as a pictogram and also as a gender suffix.

Mahadevan (2009a) also discussed the 'jar-born' myths. He found that the poet Kapilar recorded that the Vēḷir arose in the *taṭavu* of a "northern sage". He interpreted the meaning of *taṭavu* (*taṭā*) as 'jar'. In fact:

> DEDR 3027 Tamil *taṭā* 'pot, big pot'
>
> DEDR 2946 Parji *ṭanḍi* 'small pot, cup'; Gondi (G.) *ṭanḍi* 'earthen pot of medium size'
>
> DEDR 3031 Tamil *taṭu* (*-pp-, -tt-*) 'to hinder, stop, forbid, dam, block up, partition off, restrain, control'; *taṭavu* 'prison'

Here one more question arises: cannot *taṭavu* or *taṭ-akam* mean a walled city, probably Dwaraka, going by the connection that Mahadevan made between that city and the sage Agastya? Mahadevan did not probe this possibility.

Figure 1 Amulet 3305

Parpola (1994) pointed out that on each of the three sides of amulet 3305 from Harappa (Figure 1), the sign 344 'two strokes in a jar' occurs alone. Each side of the amulet also shows a deity with bovine legs and a staff. Parpola argued that here at least this sign cannot be a bound morphological marker but a distinct word, probably the name of the depicted deity or a title applied to gods, such as 'Lord'. The total frequency of sign 344 is 35. Parpola further argued that this might also be the case for the plain 'jar' sign in what he called position II in a sentence (where it appears as the terminal sign). According to Knorozov (1976), this sign is equivalent to a double-stroke superscript to be read after the 'jar' sign (written thus to save space). If we treat it as a compound sign and follow Mahadevan's suggestion, then two strokes are to be read first. The 'jar' sign occurs three times solus (Sundar et al. 2009), and hence it represents a word or phrase. Mahadevan (1986d) observed that the suffix follows anthropomorphic signs (most probably representing personal names, titles, professions, etc.) and in such cases the superscript suffix seems to have genitive, possessive, or oblique case significations. Thus, the 'jar' sign could be a title.

Levitt (2016) made the following observations on the assignment of the phonetic value **nṟu* for the 'jar' sign by Mahadevan: the masculine singular suffix is *-ṉ* in Tamil and *-nṟu ~ -ṇḍu*, *-ndu* in Old Telugu, and all are derived from PD **-nṯ* via *-nṟ* (**-nṯ > -nṟ > -ṉ, -nṟu; -nṟu > -ṇḍu, -ndu*). According to Levitt (2016), the forms Mahadevan cited as signifying 'jar' in DEDR 127 and DEDR 130 reconstruct to PD **-ṇṭ-* (with a retroflex nasal and a retroflex dental), not to PD **-nṯ*, in which we have an alveolar nasal and alveolar plosive. Levitt (2016) was of the opinion that Mahadevan was not careful with phonology. However **nṯ* and **ṇṭ* could be homophones if both **nṯ* and **ṇṭ* in the target language had resulted in *ṇḍ* (Levitt 2016). This has not occurred in North Dravidian languages but is found in Telugu and possibly in some loan words to Vedic Sanskrit (Levitt 2016). Therefore, there is a possibility that **nṯ* and **ṇṭ* could be homophones. According to Levitt (2016), Mahadevan (1970) quoted *aṇṭar* (Akanāṉūṟu 59) as a "clan name of chieftains of cow-herds" to exemplify *-nṟ*/*-ṇṭ* as a masculine singular suffix (*-ṇṭar* being the plural form).

Considering all these facts, one may conclude that the 'jar' sign need not have the function of a pictogram. The reading proposed by Mahadevan for the 'jar' sign is a plausible one. However, according to Parpola (1994), archaeological evidence does not corroborate the existence of such a vessel. Even if one considers the sign as representing a vessel, alternative readings (as suggested above) are possible.

6. SIGN 1 'MAN'

This simple pictogram is almost universally interpreted as representing a human figure (Mahadevan 1982a). Contrasting the 'plain man' sign (sign 1) with 'horned personage' (sign 8), Mahadevan (1982a) opined that while the latter depicted a chieftain or divine personage, the former depicted a servant or attendant, so that the pair 'jar-man' occurring in terminal positions is an ideogram for a lower order of priestly functionaries.

It is interesting to note that elsewhere Mahadevan (1970; 2010b) assigned the sign a phonetic value of *āṉ* 'male' and took 'jar' + 'man' as a compound word *anṟ- āṉ*, citing Old Tamil words such as *ant-aṉ*, *ant-aṉ-aṉ*, and *ant-aṉ- āḷ* to support his reading.

Mahadevan (1970) also proposed the development of *āṉ > āḷ*. However, it could be the other way round, because:

DEDR 400 Tamil *āṭṭi* 'woman, wife', *āṭavaḷ* 'woman'; Telugu *ālu*, *āḷu* 'woman, wife', *ā̆ṭadi*, *ā̆ḍadi*, *ā̆ḍudi* 'woman'; Gondi (Tr.) *ār* 'woman'; Kui *āsa* 'woman, female'; (Letchmajee) *āli* 'woman, wife'; Kurux *ālī* 'woman, wife'; Sanskrit *ālī̆-* 'a woman's female friend'

DEDR 399 Tamil *āḷ* 'man, husband, servant, labourer, adult', *āḷaṉ* 'husband', *āḷiyan* 'husband', *āṇ* 'male, manliness, courage, superiority, warrior', *āṇaṉ* 'manly person', *āṇmai* 'manliness, virility, courage', *āṭavaṉ* 'man, youth'; *Kurux āl* 'adult male, husband, servant, mankind'

Therefore, *āḷ* = person, so that:

**āḷ-cc -v* = 'woman', **āḷ-tt -v* > *āṭṭ-v* = 'woman', **āḷ-v* = 'woman'

**āḷ-ṉ* > *āṇ* = 'man'

One may even consider *āḷ* as a feminine suffix and *āḷ-cc-i*, *āḷ-tt-i*, etc. as later developments; for example, *aḷ*/*-āḷ* is a feminine suffix in Old Tamil.

Therefore, *āḷ*/*aḷ*/*al* has more possibility to represent the 'man' (= person) sign than *āṇ*. We know that *al*/*aḷ* is an important suffix in Dravidian. The 'man' sign thrice occurs solus (Sundar et al. 2009), and hence it represents a word or phrase. According to Parpola (1994), 'man' + 'comb' – or at least 'man' – is either a separate word(s) or inflectional suffix(es).

Mahadevan sometimes claims that both 'jar' and 'man' are ideograms. The observation of Mahadevan (1982a) that as a final sign 'man' forms a frequent pair with the 'jar' sign but never with the 'lance/arrow' sign (sign 211) is very important. If the 'jar' sign acts as a gender suffix, then this difference need not be there despite the examples quoted (above) by Mahadevan (1970; 2010b). One possibility is that both 'man' and 'arrow' represent both feminine and neutral gender suffixes. One should remember in this connection that Krishnamurti (2003) postulated only two gender suffixes for Proto-Dravidian (PD), masculine and feminine cum neutral.

The 'man' sign occurs after the 'jar' sign 87 times (Sundar et al. 2009). Gurov (1976) suggested that inscriptions ending with 'jar' + 'man' are names of persons and mythological figures. Zvelebil (1976) pointed out that such forms could also be "read" in different ways: for example, as names of professions (e.g. *koll-aṉ* 'blacksmith'), as finite verb forms, or as participial nouns, so that 'jar' + 'man' could easily be read as *-tt-āṉ*/*-tt-ōṉ*. We find another possibility: this combination could represent *-ṇṭ-āḷa* (see Section 5 for *ṇṭ*) in words such as *ca-ṇṭ-āḷa*. Probably *ca-mp-āḷa* types of constructions were not current in Proto-Dravidian (the 'man' sign never occurs after the 'arrow' sign).

7. SIGN 211 'ARROW'

Mahadevan described the 'arrow' sign as one of the very few in the Indus script which are pictorially transparent, being the simplest and least complicated with hardly any variant forms but having strongly marked functional characteristics which can be identified by frequency-distribution analysis. Mahadevan (1998a: 69) noted: "It is easily identified as an arrow or spear (more precisely, an arrowhead or spearhead)." He continued: "The main characteristics of the Arrow sign are its final position in the texts and its functional similarity with the Jar sign. Both function as terminal signs not only at the end of texts but also in medial positions. The preceding signs or sequences can be shown to be complete words, probably names or titles, especially in the seal-texts" (Mahadevan 1998a: 69). According to Parpola (1994), the 'jar' and 'arrow' signs are mutually exclusive (the sequence 'jar' + 'arrow' or 'arrow' + 'jar' never occur).

However, the frequency of the 'arrow' sign is only about one sixth of the 'jar' sign. One may note that the 'arrow' sign occurs once solus (Sundar et al. 2009), and hence it is a word or

phrase. The combination of the 'fish' and 'arrow' signs (55 times) and the 'fish' and 'jar' signs (44 times) occurs at relatively similar frequencies (Sundar et al. 2009).

Knorozov (1976) suggested that the symbol represents the Tamil *-kaṇ*, the ancient suffix of the locative, while the Finnish team (Parpola et al. 1969a: 22) identified the symbol as an arrow and interpreted it as a dative case ending corresponding to the Tamil *-ku* (Mahadevan 1970). According to Parpola (1976), the 'arrow' sign stands for the substantive *koṭai* 'giving away as a gift'. Based on a statistical analysis of old Tamil names and titles, Mahadevan (1970) reasoned that the sign should represent a functional analogue of the 'jar' sign and therefore is the nominal suffix **-ey*, corresponding to old Tamil *-i* or *-ay*. He connected the symbol with an arrow and DED 691 Tamil *ey*, *ē* 'arrow'.

Mahadevan (1982a) suggested that the 'lance/arrow' sign was employed as an ideogram denoting the meaning of 'warrior' when suffixed at the end of names and titles. Mahadevan (1998a) again revised his view to opine that the 'arrow' sign (and the 'jar' sign) represents a person-number-gender marker, as a single suffix can play this role in Dravidian. Mahadevan (1998a; 2009b; 2011) further argued that the 'arrow' sign has a phonetic value of **ampu* (DEDR 178), meaning 'arrow', and represents a non-masculine singular suffix. He suggested the development (*a*)*mpu* > (*a*)*mbu* > (*a*)*mmu* > (*a*)*mu* (Telugu) > (*a*) *m* (Tamil), as well as (*a mbu* > *abu* in Telugu (Mahadevan 1998a). Mahadevan (1998a) observed that many Telugu titles of kings in the Pallava stone inscriptions of the sixth century CE end in (*a*)*mpu*/(*a*)*mbu*.

Levitt (2011) suggested that Sanskrit could have borrowed not only from Dravidian languages that no longer exist but also from earlier forms of contemporary Dravidian languages, even if the Dravidian content of their lexicon is in a decimated state due to contact with Indo-Aryan and Indo-Iranian languages and their grammar has most certainly changed radically.

The most common word for an arrow in Dravidian is *amp-*, and possibly *amp*a > *amba* > *amma*. Therefore, *an̲r* could be masculine and *ampa* feminine. Mahadevan (2011) espouses such a view, such that the earlier non-masculine suffix -(*a*)*mp*(*u*) has been replaced with the feminine gender suffixes in Old Tamil, namely, *-ay*, *-i*, or *-aḷ*/*-āḷ*/*ōḷ*: thus, Indus-Dravidian *mū*-(*a*)*mp*(*u*) > Old Tamil *mū*(*-tt-*)*-āḷ*, *mū*(*-tt-*) *ōḷ*, etc. This is an important observation because the sign combination of three long strokes + 'arrow' (with a frequency of 44) is an appropriate sign combination for the reading *mū*-(*a*)*mp*(*u*) or, more appropriately, *muH*-(*a*)*mpa*. Krishnamurti (2003) reconstructed a Proto-Dravidian laryngeal **H* and the Proto-Dravidian numeral three as **muH*). Kosambi (1962: 71) pointed out that all goddesses whose names end in *-mā* in Sanskrit (like Umā, etc.) are "mother goddesses" (Mahadevan 2011). According to Mahadevan, this combination represents the senior priestess. Mahadevan (2011) also points out that this goddess (Mū-tēvi) was worshipped even during the tenth century CE. We have:

> DEDR 5052 Tamil *mu-*, *mū-*, *mūn̲r*(*u*) 'three, third, triple'
>
> DEDR 4954 Tamil *mū-*, *mut*(*u*), *mū*(*tt*)-, *mū*(*pp*)- 'old, ancient, elder, senior, great, superior, head, leader'

According to Mahadevan (2011), the Ṟg Vedic word Tryambaka (RV 7.59.12) refers to the sign combination of three long strokes + 'arrow'. Kosambi (1962: 61) pointed out that the word is connected with the waters (*ambu*) as well (Mahadevan 2011). According to Mahadevan (2011), in a parallel development the 'arrow' sign appears to have evolved into a religious symbol in later times and been identified as the 'lance', which is closely associated with the mother goddess (Śakti).

Mahadevan (2011) also argued that the mythic origin of Tripura is related to the sign combination of three long strokes + 'arrow'. According to him, the word for lance *ayil* has been mistaken for 'eyil', 'fortress, wall, city' (DEDR 808) and for *eri* 'to burn' (DEDR 811), so that the story of the burning of three cities with a single arrow arose. One major problem with this interpretation is that the word 'eyil' could only be of recent origin because **ēḻil* > *eyil*.

However, due to the revised opinion of Mahadevan (1980; 1982a) that the 'jar' and 'arrow' signs are not to be read phonetically, he contrasted the priestly 'jar' sign with the military 'arrow' sign instead of masculine versus feminine. This is despite his observation that a final sign 'man' forms a frequent pair with the 'jar' sign but never with the 'arrow' sign. There is no reason other than gender for such a difference.

Interestingly, Mahadevan (2011: 10) argued: "A study of ideographic word signs in the Indus texts reveals the presence of appellative nouns which are formed from nominal or adjectival stems by the addition of pronominal suffixes." Thus, Mahadevan read 'hill + arrow' as 'hill-she' or 'woman from the hills' and 'hill' + 'jar' as 'hill-he' or 'man from the hills'. If we suppose a phonetic reading and assume that 'hill' is *kō*(*n*)-, these become *kō*(*n*)- *anṟ* and *kō*(*n*)-*ampa*. There are many Dravidian tribes and languages whose names can be traced to *ku/ko/kō*. Mahadevan (2011) also observed that in these examples, the suffix marks the gender of the appellative noun and not the stem from which it is formed. It is important to note that there is not even a single solus 'hill' + 'jar' occurrence, and 12 out of 13 occurrences are word-final (Sundar et al. 2009). Finally, in his latest interpretation Mahadevan (2015) reiterates that the 'jar' sign and 'arrow' sign can be read phonetically and they represent (*a*)*nṟu* and -(*a*)*mpu*, respectively.

The opinions of Mahadevan on Tryambaka or Tripura cannot be taken seriously. If one accepts that the language is Dravidian, the reading -(*a*)*mp*(*u/a*) for the 'arrow' sign is unavoidable.

8. SIGN 12 'PERSON CARRYING LOADS', 'BEARER'

This is a frequent terminal sign alone or ligatured with the 'jar' or 'arrow' sign (Mahadevan 1970). The frequency of the sign ligatured with the 'arrow' sign is only one tenth of that ligatured with the 'jar' sign (Mahadevan 1986c). Even in the medial position, the 'bearer' signs are mostly quasi-final, meaning that they are followed by a terminal sign – generally the so-called 'harrow/comb' sign (sign 176) – that is a separable suffix (Mahadevan 1986c). In this respect, the 'bearer' signs behave exactly like the 'jar' and the 'lance/arrow' signs, showing that they all belong functionally to the same class or category of signs. Mahadevan (1986c: 134) explains:

> The bearer' signs can replace the 'lance' or 'jar' signs from otherwise identical texts. There are rare instances when the 'jar' sign is placed before the 'bearer' sign in a sequence instead of being ligatured. It is however possible that the two arrangements have different functions as the preceding sequences in either case are different. Another significant point is that even though the 'bearer' signs are mostly final, the 'jar bearer' sign can sometimes occur alone comprising the whole text and also in quasi-initial positions, that is, where the preceding signs are clearly separable.

According to Aalto (1987: 69), the five signs – namely, 'jar', 'arrow', 'bearer', 'jar-bearer', and 'arrow-bearer' – are grammatical suffixes, and the most usual case forms (besides the nominative) are the genitive and dative *-ōtu*, *-kku*, *-kaḷ*, *-kaḷ-ōṭu*, *kaḷ-kku*. Mahadevan (1986d) argues that they are nominal suffixes. According to Mahadevan (1970), the 'bearer' sign is an honorific for a male person, through homophones:

DED 3729 Tamil *poṟu* 'to bear a burden, load, weight'
DED 3729 Tamil *poṟu* 'to take responsibility', 'to undertake, to undertake an office', 'to carry out'
DED 3728 Tamil *poṟu* 'seal (of office)'

According to Mahadevan (1970), the priest-king himself was a Cēra because Old Tamil Poṟayi and *poṟaiyan* are Cēra names. Medieval copper coins of Cēras of Kerala portray the 'bearer' motif, which is practically identical with the ideogram of the Indus script (Mahadevan 1980; 1982a). According to Mahadevan (2009a), *irumai* means 'greatness' (DEDR 481) as well as 'twofold state' (DEDR 474). Therefore, the Cēra title Irumpoṟai may also be interpreted literally as 'bearer of twin loads'. Mahadevan (1975) advanced the idea that the Bharatas (literally, the 'bearers') were priests and rulers known to have occupied the Indus region during the Vedic period, and it is possible that they were the descendants of the priest-rulers of the Harappan civilization. It is interesting to note that Irumpoṟai may be translated as Yugandhara.

Mahadevan (1980: 210) modified his opinion to state: "The positional and functional characteristics of this sign are very similar to those of the 'jar' sign. Thus the 'bearer' sign also appears to be an ideogram occurring as suffixed element in name formations […] with approximate meaning of 'officer' or 'functionary'." Mahadevan (1986c) reiterated the ideographic interpretation. According to Mahadevan (1980), the 'jar' + 'bearer and arrow' + 'bearer' compound signs stand for concepts similar to Sātavāhana and Śālivāhana; both are names of famous Andhra dynasties. Mahadevan (2009a) opined that *cātam* is 'cooked rice' and *cata* is 'food or beverage in a sacrificial vessel (offered to the deity)'. Mahadevan (2009a) related Cātaṉ/Sātaṉ with Satiya- (inscriptional) and Ātaṉ (inscriptional), such that Old Tamil Ātaṉ and Atiyaṉ are derived from Cātaṉ and Satyaṉ by loss of the initial *c*. Thus, Mahadevan correlated Satya- > Sāta- and further related Śalya > Śāli (he did not explain the *a* > *i* transition). This explanation is not tenable, because the word *śāli* exists independently with the meaning 'rice' (Monier-Williams 1872), which is the same as what Mahadevan attributed to *sāta*. Hence, the whole argument of 'jar-bearer' versus 'arrow-bearer' collapses and thereby the Indus connection becomes untenable. According to Parpola (1994), the words are synonymous variants shown to be derived from 'horse' and 'son', respectively, with the horse being the emblem of the dynasty. Also, according to Parpola (1994) there is no Proto-Dravidian word **cātan*.

Mahadevan (1980) observed that in the ancient Tamil tradition, ministers and senior officers of the king were given the title Kāviti (literally 'yoke bearer'), probably from *kā* 'yoke' (DED 1193). Mahadevan (1986b) revised his opinion to assume that Kāviti is derived from Sanskrit Gṛhapati. Mahadevan (2009a) opined that the Sanskrit word *bhartṛ*, meaning 'lord, master, husband', has connotations of the word 'bearer'. One cannot rule out the argument for Poṟayi.

Later, Mahadevan (2009b) interpreted 'jar-bearer' (sign 15) as 'one who carries ceremonially a sacrificial vessel with offerings' and the 'arrow-bearer' (sign 14) as 'one who carries the arrow' (meaning a 'warrior'). Gurov (1976) suggested an apt pair of homophones and opined that the symbol could stand for a deity, representing a word for protection (*kāval*, *kāppu*) in an amulet, or for a weight (Mahadevan 1970; 1986c). We have:

DED 1193 Tamil *kā* 'pole with ropes hung on each end to carry load on the shoulder'
DED 1192 Tamil *kā* 'to protect, guard'

One of the suggestions by the Finnish team (Parpola et al. 1969a: 23) was that the bearer sign is a plural suffix and the pictogram represents "DED 1155 * kaḷai '(bamboo) pole; pole fastened to a load by which it is carried on the shoulders'".

DEDR 1370 Tamil *kaḻai* 'pole used for propelling boats', 'elephant goad', 'stem of sugar cane', 'shaft of a bamboo'; *kaḻi* 'rod, staff, stick,' 'handle of tool', 'peg to keep a yoke in place', 'lath'; *kāḻ* 'post, pillar', 'oar', 'iron rod', 'elephant goad', 'bolt', 'handle', 'rafter', 'firewood'

It is possible that *kāḻ* > *kā* because *ḻ* > zero happened in many languages (Krishnamurti 2003).

Another suggestion by the Finnish team (Mahadevan 1986c: 136) s was that the sign is the plural suffix based on DED 1144 *Tamil *kaḻi* 'much', which, according to the Finnish teams, was an originally independent word suffixed to denote the plural concept and in the course of time became shortened, resulting in the modern plural suffix *kaḷ*. There is no evidence for this and it is doubtful whether *kaḷ* as a single plural suffix can be reconstructed for Proto-Dravidian (Mahadevan 1986c). The word meaning 'much, in excess' does not have the plural signification of 'more than one', and it is doubtful whether *kaḻ* and *kaḷ* can be considered homophones at all (Mahadevan 1986c).

According to Krishnamurti (2003), Proto-Dravidian plural suffixes include -*Vr*, -*nk*(*k*), -*Vḷ*, and -*nk*(*k*)*Vḷ*. Both -*Vḷ* and -*Vr* could be a result of a split in -*Vḻ*, which, as we have already seen, does happen. In that case, the 'bearer' sign could represent the plural suffix *āḻ*/*aḻ*.

Sign 12 appears in votive texts as a quasi-final sign before the 'comb' sign (Knorozov 1976); hence, it could be the final part of the name of a ruling deity. One may speculate that 'jar-bearer' means *anr- āḻi* and 'arrow-bearer' means *amp- āḻi*, male ruler and female ruler, or that they are *anr- āḻ/aḻ* and *amp- āḻ/aḻ*, respectively, representing plurals. Despite Mahadevan's (1986c) criticism of Gurov and the Finnish teams, it is quite possible that the 'bearer' sign is the plural suffix *ka*, *kaḻ*, or *kaḷ*.

9. SIGN 176 'COMB/HARROW'

This sign never occurs initially, but once appears solitary, 38 times in middle position, and 316 times finally in writings (Mahadevan 1977). It closely resembles the Sumerian sign for hand, is a nominal suffix or an independent epithet analogous to 'jar' + 'man', is often final after *muruku* (sign 48) + 'jar', and is not a grammatical suffix, as indicated by its plural (double sign) (Mahadevan 1970). According to Mahadevan (1970), this sign represents the "posture" of the lower portion of a hand (it stands for lower-rank helpers); he read it as *iḻ-*, from *iḻi* 'to fall, drop down', 'low, inferior' (DED 426) and connected it to *ēḻai* 'poor people' and *eḻavar* 'a lower caste'.

Mahadevan (1982a; 2006) revised his view and interpreted the sign as depicting a harrow and ideographically representing a farmer or tiller of the land. According to Mahadevan (1982a), the characteristic position of the sign is terminal, frequently occurring in conjunction with the 'jar', 'lance/arrow', or 'bearer' signs, so that such terminal clusters can be provisionally interpreted to indicate that the persons named in the inscriptions were perhaps farmers or tenants, serving under either priests, warriors, or officers (as the case may be) or, alternatively, themselves belonging to these categories. Mahadevan (2010b) read the combination 'jar' + 'harrow' as *anr-kuṭi* 'one who is a tenant or tiller under another person'.

The 'harrow' sign once occurs solus, meaning that it is a word or a phrase. However, no two-sign combination involving the 'harrow' sign occurs solus. That means such a combination does not represent a word or phrase. For example, both the 'jar' and 'harrow' signs occur solus, but their combination never occurs solus. That could mean that in Indus script the sound representing a symbol was modified in combination with another symbol. The 'harrow' sign occurs in combination with the 'jar' sign 184 times, which is the second largest combination of two signs in Indus script (Sundar et al. 2009); of these, they appear 179 times as the terminal sign

(the largest terminal sign combination). The 'harrow' sign occurs 25 times as a terminal sign in combination with sign 15 ('jar-bearer') and 11 times with the 'arrow' sign (Sundar et al. 2009).

According to Mahadevan (1970), the *muruku* symbol (sign 48) appears frequently in votive texts. Yadav (2013) observed that the *muruku* + 'jar' + 'comb' combination occurs mostly solus, and almost all occurrences of these signs are in sealing and miniature tablets from Harappa. This combination occurs a total of 46 times, of which 39 times the other side of the tablet consists of the combination 'cup' (sign 328) + two to four long strokes (Yadav 2013). The sign combination three long strokes + 'cup' occurs 120 times in Harappa (out of 124 total occurrences), 63 times on miniature tablets, and 57 times in sealing (Sundar et al. 2009). The pair and the triplet show much greater affinity to Harappa (site), miniature tablets (type), and dot in circle (field symbol) (Sundar et al. 2009).

Knorozov (1976) observed that there are more than sixty basic blocks in such inscriptions (which he called "sacrificial" inscriptions). He observed that such blocks generally contain the 'comb' sign in the post position, alone or preceded by the 'jar' or 'arrow' sign. However, in many cases the final comb sign is dropped altogether (Knorozov 1976). One corollary to this finding is that all such inscriptions could involve names of deities (as also indicated by Knorozov 1976).

Parpola (1994) opined that four long strokes + 'cup' may indicate an offering of four pots to a deity. We may generalize that in all such cases one may assume that the combination involving the 'cup' sign indicates some specific quantities in some specific religious context (see Section 10). It may involve standard quantities of offerings to the deity named on the other side. Therefore, Mahadevan's (1982a; 2006) ideographic interpretation of the 'harrow' sign as representing a farmer or tiller is not tenable.

Let us examine some Dravidian words for 'comb' and 'harrow':

> DEDR 688 Tamil *uḻu* (*-v-*, *-t-*) 'to plough, dig up', 'scratch', 'incise' (like bees in a flower), *uḻakku* (*uḻakki-*) 'to plough'; Kolami *ur-* (*urt-*) 'to harrow', 'to plough'
>
> DEDR 689 Tamil *uḻu* (*-v-*, *-t-*) 'to arrange or adjust' (like hair with the fingers); Tulu *dūbina* 'a comb, urvaṇe' (an instrument for destroying nits); Parji *uṛ-*, *uṛv-* 'to comb'; Kuwi *rūca* 'a comb'
>
> DEDR 2719 Kurux *cūgnā* 'to harrow'
>
> DEDR 1610 Tamil *cīppu* 'a comb'
>
> DEDR 2497 Tamil *cikkam* 'comb'

The positional analysis (Mahadevan 1977; Rao et al. 2009) shows that the 'harrow' sign (as well as the 'man' sign) is most likely to end a text. From the statistics on the *muruku* + 'jar' + 'comb' combination and its relation to the number + 'cup' combination discussed above, one may suggest that the 'harrow' sign could be a dative suffix. The Russians have already made such a suggestion (see, for example, Gurov 1976). Krishnamurti (2003) reconstructed the Proto-Dravidian dative suffix as **-nk*/**-nkk*. One would expect that, being a terminal suffix, the last syllable of a Proto-Dravidian word would represent the sign. As is evident from the possible Proto-Dravidian words listed above, possible Dravidian suffixes which could represent 'comb/harrow' are *-pp* and *-kk*.

Probably this led to **cuḻu-kk-nā* > *cuḻu-gnā* > *cūgnā* (DEDR 2719) and also **cuḻu* > *uḻu* (DEDR 688). Thus, a Proto-Dravidian word for a harrow or a comb could be **cuḻu-pp-a*/**cuḻu-kk-a*. In that case, the most suitable phonetic value for the 'harrow' sign is -(*n*)*kk*, possibly from a Proto-Dravidian word for 'harrow/comb', which could be **cuḻu-*(*n*)*kk-a*. Therefore, the 'jar' + 'harrow' combination could be *anṛ/aṇṭ-kk*. Now, we can understand the tablet containing *muruku* (sign 48)

+ 'jar' + 'comb' combination as an offering of two/three/four pots to the *muruka* deity. However, Zvelebil (1976: 136) asked a relevant question: "How to account for the 'reduplication' of this very frequent sign, if it is a dative suffix (reconstructed by Dravidianists as **-k/u*)?"

10. SIGN 328 'CUP'

The 'cup' symbol occurs mostly on votive plates and prisms and is generally preceded by one to four long vertical signs, and therefore represents a clan divided into four phratries (Mahadevan 1970). He identified the 'cup' symbol as *kō* (DED 1811) 'mountain' and the name of many Dravidian hill tribes.

Both the 'cup' sign and the 'jar' sign are considered to represent vessels. However, the contexts of their occurrences are very different. From the statistical analysis carried out by Sundar et al. (2009), one may find that one long stroke + 'jar' occurs only a total of two times, the two long strokes + 'jar' pair never occurs solus out of 42 total occurrences, the three long strokes + 'jar' pair occurs only three times total, the four long strokes + 'jar' pair never occurs, and the five long strokes + 'jar' sign occurs only five times in total. In comparison, one long stroke + 'cup' occurs only seven times total, the two long strokes + 'cup' pair occurs 74 times solus out of 78 total occurrences, the three long strokes + 'cup' pair occurs solus 111 times out of 124 total occurrences, the four long strokes + 'cup' pair occurs solus 50 times out of 58 total occurrences, and the five long strokes + 'cup' sign never occurs (Sundar et al. 2009). As discussed in Section 9, in all such cases one may assume that the pair involving the 'cup' sign indicates some specific offerings in some specific religious context, but the 'jar' sign's context is different. The context indicates that the 'cup' sign may stand for a vessel, a measure, or an offering. Therefore, let us examine two Dravidian words which could be suitable to represent a vessel in such contexts:

> DEDR 297 Gondi *lākāna*, *lākānj* 'the sacrifice after a successful hunt'; Kuwi *lāk-* 'to sacrifice', *lākinai* 'to praise', *lākwinai* 'to invoke', *lāgu* 'offering to a deity'
>
> DEDR 303 Kannada *aḷige*, *aḷage* 'a capacious earthen vessel to hold water or grain'; Telugu *alaki* 'an earthen pot'
>
> DEDR 295 Tamil *aḷa* (*-pp-*, *-nt-*) 'to measure, limit, define', *aḷapu*, *aḷappam* 'measurement', *aḷappu* 'measurement, bounds, limit', *aḷavu* 'measure, extent, size, number'; Telugu *alavi* 'measure, extent'; *lāvu* 'dimensions, magnitude'; Kuwi *lācali* 'to measure'

Thus, we have the word **aḷa-*, which could represent an offering, a measure, or a vessel.

Another word is:

> DEDR 3027 Tamil *taṭā* 'pot, big pot'
>
> DEDR 2946 Parji *ṭanḍi* 'small pot, cup'; Kuwi *tānḍi* 'pot'
>
> DEDR 3031 Tamil *taṭu* (*-pp-, -tt-*) 'to hinder, stop, obstruct, forbid, prohibit, resist, dam, block up, partition off, curb, check, restrain, control, ward off, avert'
>
> DEDR 2312 Parji *caṭṭ-* 'to roast, set fire'; Gadaba *saṭ-* (Ollari) 'to roast, burn'
>
> DEDR 2308 Kannaḍa *caṭṭu*, *caṭṭa*, *caṭṭe* 'flatness, levelness'
>
> DEDR 2306 Tamil *caṭṭi* 'earthen vessel, pan'; Telugu *caṭṭi* 'earthen pot with a wide mouth'
>
> DEDR 1127 Tamil *kaṭi* 'protection, safeguard, defence', *kaṭikai* 'shield'

According to legend, the Veḷir chieftains of the Tamil country arose from the *taṭavu* water pot of a "northern sage" (Mahadevan 1975). We know that in many Dravidian languages the *c* > *t* transition occurred in an irregular manner (Krishnamurti 2003). The basic idea conveyed by

the root *caṭ-* (> *taṭ-*) is "some type of arrangement which 'contains' something or protects something" and came to be related to protection, vessel and cooking food. Suppose we consider the 'cup' symbol as the homophone of 'vessel/container'. Then we get one of the possible phonetic values as *caṭa*. If we assume loss of an initial *c* for the word **aḷa-*, we have **caḷa-* for vessel. Possibly **caḷ-t* > *caṭ-*. Ligatured signs (such as 44, 45, and 46) prompt us to think that the 'cup' sign is a sacrificial vessel. Therefore, (*c*)*aḷ-*/*caṭ-* is a better suited alternative to represent the 'cup' sign.

Mahadevan (1970) connected the 'cup' sign with a clan divided into four phratries and gave it a phonetic value *kō* from Tamil *kōy* 'vessel' and identified it as one of the many clans starting with *kō-*. If the argument is correct, then there should be other phratries represented by other symbols occurring under a similar environment. So far no such claims have been made by Mahadevan or anybody else. Hence, Mahadevan's (1970) identification is not a likely one. To sum up, the identification of the 'cup' symbol as *kō* (Mahadevan 1970) is not tenable.

11. SIGN 59 'FISH'

According to Mahadevan (1998b), it was the brilliant idea of Father Heras that the 'fish' sign in the Indus script represented the word *mīṉ*, which means 'fish' as well as 'star' or 'planet' in all the Dravidian languages. According to Parpola (2010: 16), "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". 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 (Parpola 2010).

Mahadevan (1970) used the transliteration *mīṉ* as well as *mīn* for the 'fish' word. According to Krishnamurti (2003), Proto-Dravidian **n* had two allophones: a dental *n* word initially and before dental stops, and alveolar *ṉ* elsewhere. This distribution is preserved in Classical Tamil and Old and Modern Malayalam, but in Old and Modern Tamil evidence for their contrast is insignificant (Krishnamurti 2003). The word is always written as *mīṉ* in Tamil and we have followed that convention here.

According to Mahadevan (1970), the 'fish' symbol comprises about ten percent of the texts and generally occupies middle positions, appearing to indicate personal names derived from planetary deities. According to him, the five 'fish' symbols have similar positional and functional characteristics, hence similar meanings. The Finnish team (Parpola et al. 1969a: 40–44; Parpola et al. 1969b: 18–20, 28–29; Parpola et al. 1969c: 9–10, 18–20) made the following suggestions regarding the 'fish' sign (Mahadevan 1970): (1) they are divine names of planetary deities, (2) they also served as personal names, and (3) clusters of two or three 'fish' signs are planetary conjunctions. Mahadevan (1970) argued that clusters of two or three 'fish' signs are not planetary conjunctions but are composite personal names very commonly found in Old Tamil literature.

However, Mahadevan (1970) also observed that *mīṉ* does not occur as an element in ancient Dravidian personal or clan names or titles. He therefore argued that the form is not *mīṉ*/*mīn* but *mīṇ* and there was alteration between *mīṇ* and *mīn* parallel to *viṇ* versus *vin-u* in DED 4422. Mahadevan (1970) gave the approximate phonetic value for the 'fish' sign as **mīḷ/ṇ/ṭ-*(*v*) and stated that this alteration is similar to that of *vēḷ*, *vēṇ*, *vēṇṭ*, *vēṭṭ* (DED 4548; DED 4561). According to him, the Old Tamil *mīḷi* (DED 3990) means 'lord, chieftain, hero, great man' and is derived from *miḷ-ir* 'to shine'; *miḷ-ai/mīḷi* occurs in the personal names of the Vēḷīr clan. He

argued that the 'fish' + 'arrow' sign shall be read as *miḻ-ay* (Old Tamil) 'chief, great man' and is the source of *mleccha* in Sanskrit.

Mahadevan (1970) argued that the 'fish' sign prefixed with numerals does not represent stars or planets but names or clans. He gave examples such as Aimperu Vēḷīr (five great Vēḷīr), Eḻuvēḷīr (seven Vēḷīr), Patineṇkuṭi Vēḷīr (eighteen septs of Vēḷīr), Nalven Sāgā (the number four phratry) (of Gonds of Adilabad), Iruṅkō Vēḷīr, and Tonmutu Vēḷīr. He considered 'fish' prefixed by two long strokes and also 'fish' prefixed by three strokes in the upper portion as special cases.

While trying to make specific readings, Mahadevan (2011) argued that two long strokes (sign 87) + 'fish' + 'jar' is to be read *as iṇay/iraṇ* (*mīṉ*)- *ṉṟ*(*u*) and is the equivalent of 'Yama' and two long strokes + 'fish' + 'arrow' is to be read as *iṇay*/*iraṇ* (*mīṉ*)- *amp*(*u*), is the equivalent of Yamī. The expression 'Yama' literally means 'a twin, one of a pair or couple' (Monier-Williams 1972: 809; Mahadevan 2011: 50). Two long strokes precede the 'fish' sign 67 times; two long strokes precede many other signs and precede the 'jar' sign directly 42 times. Thus, we have examples of two long strokes (sign 87) + 'jar' with and without the 'fish' sign in between. When Mahadevan (2011) argued that the 'fish' sign in between is not to be read, then what difference does the 'fish' sign make in the reading? Mahadevan does not delve into this question.

Furthermore, we have the possibility that the deity with bovine legs and a staff on amulet 3305 of Harappa (Figure 1) with the sign 'two strokes in a jar' (sign 344) could be Yama (see Section 5). Therefore, two long strokes (sign 87) + 'fish' + 'jar' may not be Yama. We have another problem here: we do not know how two long strokes differ from two short strokes.

However, regarding the 'fish' = *mīṉ* = 'star' theory, Mahadevan (2011: 5) realized: "Several distinguishing features of the 'fish' signs remain without convincing explanation"; hence, the "theory had run out of steam and needed reappraisal". Mahadevan argued that: (1) space was a consideration for Indus writers and it seems most unlikely that a 'star' would be represented by the bulky 'fish' signs, (2) the number + 'fish' signs appear to be part of a larger system of number + sign sequences in the Indus texts and hence did not represent constellations in the sky, and (3) there are features such as the special affinity of the 'fish' signs with the four-stroke modifier, the 'arrow' and the 'mortar and pestle' signs. Wells (1998) argued that there is possibly another sign for 'star'.

Mahadevan (2011) did not suggest any alternative reading for the 'fish' sign. However, there are terms other than *mīṉ* for 'fish' in Dravidian which may have been more prevalent in the past. For example:

> DEDR 2348 Tamil *campai* 'fish'; Malayalam *campa* 'fish'
>
> DEDR 1252 Tamil *kayal*, *cēl* 'carp'; Malayalam *kayal* 'fish'; Telugu *kakka* 'fish', *cēpa* 'fish'; Kolami *kaye* 'fish'; Naiki *kayy*e 'fish'; Sanskrit *kaivarta*-, *kevarta*- 'fisherman'
>
> DEDR 1947 Tamil *keṇṭai* 'a freshwater fish, Barbus'; Malayalam *keṇṭa* 'a carp'; Kurux *kiṇḍō* 'a species of fish'

The name for various species of carp in Tamil is *keṇṭai* (Tamil Lexicon: 753, 762, 819, 1097). The carp is known as *rohita* (means 'red') in Sanskrit. In all Dravidian languages, *ce* or *ke* means 'red':

> DEDR 1931 Tamil *ce*-, *cem*-, *cevv*-, *ceyya*, *cētakam*, *cēttu* 'red'; Kurux *xẽ̃so* 'red', 'blood'

Wells (1998) opined that fish comprised a major mercantile item for Harappans. Probably red carp was abundant in Indus. Gurov (1976) considered all the above words for 'fish' (and for 'red')

and evaluated the possibility that these words could have represented fish in general but finally concluded that *kay* (*key*) represented the 'twinkling fish' (sign 67) (carp, according to him).

Thus one basic Dravidian word for 'fish' could have been *kay-* (Krishnamurti 2003). The words *kay- > key- > ke-*, and *ke-ṇṭ-ai*, *cē-l*, *cē-pa*, *ca-m-pai* are all derived from *kay-* by variation or by addition of suffixes. Thus the 'fish' sign could be read as *kay*. Can *kay* mean 'star'? It is possible:

DEDR 1090 Koṇḍa *kas-* (*-t-*) 'to be lit (as fire), burn', *kasis-* (*-t-*) 'to light (lamp, fire)'; Pengo *kacay ki-* 'to light (lamp)'

DEDR 1458 Tamil *kāy* (*-v-, -nt-*) 'to grow hot, burn', 'be warm (as body)', 'wither, parch, be dried up', 'begin to heal (sore, wound, boil)', 'shine', 'be indignant, angry', 'be prejudiced', 'hate', 'burn', 'consume', 'kill'; Naiki (Chanda) *kāp-* 'to heat, boil'; *kāy-* 'to be hot'

DEDR 2646 Tamil *cukkai* 'star' (< Telugu); Telugu *cukka* 'star', 'spot, dot, drop'

In many languages there is a development of *l̲>y* (Krishnamurti 2003): for example, DEDR 1353 Malayalam *kayal* 'shoot or branch growing from the root'; Kannada *kaḷale*, *kaḷile* 'bamboo shoot'; Tulu *kaṇile* 'tender bamboo shoot'; Parji *karri* 'bamboo shoot'. Therefore, one of the developments of the word could be *kaḷ-al > kay-al*. Therefore, in the Indus script the 'fish' sign could have represented *kaḷ* (*–al*). See DEDR 1358 Tamil *kaḷi* 'much, great, excessive' (attested only in South Dravidian).

Levitt (2011) implied that the Proto-Dravidian form of DEDR 276 Tamil *aḷal* (*aḷalv-, aḷaṉṟ-*) 'to burn, glow, shine', 'be acrid', 'become angry', 'envy'; n. 'fire, flame, heat', 'pungency', 'rage' could be **caḷ-al*. According to rule 14 of Krishnamurti (2003) (palatalization of velars), *k > c* occurs under different environments in different Dravidian languages. However, Krishnamurti (2003) does not envisage such change when *k* is before the vowel *a*. But three examples of instances of change *ka > cV* are shown below:

DEDR 1265 Tamil *karaṭu* 'roughness, unevenness'; Malayalam *karu* 'rough';

Telugu *gari* 'hardness, stiffness', 'sharpness'; Kurux *karcnā* 'to be tough'; Sanskrit *khara* 'hard, harsh, rough', 'sharp-edged'

DEDR 1260 Kannaḍa *garasu*, *garusu* 'gravel'; Telugu *garusu* 'gravel'

DEDR 1298 Tamil *kal* (*kaR-*, *kaN-*) 'stone'

DEDR 2354 Tamil *caral*, *caraḷ*, *caraḷai* 'gravel, laterite'

The forms *garasu* and *caral* indicates the original initial consonant to be *ka* (*ka > ca* and *ka > ga*).

DEDR 1272 Tamil *karappaṉ* 'eruption in children'

DEDR 1560 Tamil *ciraṅku* 'eruption, pimple, itch'

Here the change is *kara > cira*:

DEDR 2011 Tamil *cērai*, *cārai* 'rat snake'; Koḍagu *ke·re pa·mbï* sp. 'non-poisonous snake'; *kariŋ ge·re pa·mbï* 'rat snake'

DEDR 2816 Gondi *sargōḍā*, *sargoḍal*

Compare the Gondi forms with the Vedic words Sarkōḍa- and Kārkoṭa-ka. Obviously the Proto-Dravidian form could have been **kar-* (*> car- > sar-*). Therefore, we may conclude that there was irregular palatalization of *k* in Dravidian.

Therefore, the Proto-Dravidian form of DEDR 276 Tamil *aḷal* could have been **kaḷ-al/*kaḷ-a* (**kaḷ-al > *caḷ-al > aḷ-al*). Levitt (2011) indicates that the word for Durga in Indus could be

*caḻaṉṟ, from which, according to him, the word Caṇḍī can be derived. Again, considering that *k* > *c* and *ṭ* > *ḍ*, the word could have been *Kaṇṭī. According to Mahadevan (2008), there is at least one reference in the Sangam literature (Cilappatikāram 12.57) for the usage of Kaṇṭi for the goddess Durga.

Levitt (2011) also gives examples of syllabic loss in Dravidian. Krishnamurti (2003) showed examples of the loss of *ḻ* in some languages. It is interesting to note that the alternative form **kaḻ-ali* (for Durga), as suggested above, may yield Kāḷi by consonant reduction. Also, *-al* and *-aḷ* are both used as suffixes in Dravidian and sometimes they merge.

Therefore, it is suggested that in the Indus script the 'fish' sign could have represented **kaḻ* (**-al*), which could have represented 'fish', 'fire', 'star', 'great', etc.

One has to look further for other alternative readings for the 'fish' sign. Mahadevan (1970) observed the possibility of alterations between *v* and *m*. Parpola (1988) opined that the alternations **v-* / **m-* can be reconstructed for Proto-Dravidian. Levitt (2011) added that *m-* ~ *v-* within Dravidian. Among many others, one may find the example DEDR 5490 Malayalam *veruku*, *viruku*, *meruku* 'civet cat'. We have already seen that Mahadevan (1970) gives the approximate phonetic value for the 'fish' sign as **mīḷ/ṇ/ṭ* (*-v*) (*m* = *v* and *ī* = *ē*) and stated that this alteration is similar to that of *vēḷ*, *vēṇ*, *vēṇṭ*, *vēṭṭ* (DED 4548, DED 4561). This implies that *mīḷ* = *vēḷ*; *i* = *e* follows Krishnamurti's (2003) rule 4. This reading is a distinct possibility. Thus, the Indus word for the 'fish' sign according to this reading is **m*(/*v*)*īḷ* > *vēḷ*.

There are 18 occurrences of the 'fish' sign solus, the maximum for any sign; the 'jar' sign occurs thrice solus, Three strokes occurs seven times solus and the 'arrow' sign occurs once solus (Sundar et al. 2009); occurring solus means that 'fish', 'jar', three short strokes, and 'arrow' are words capable of conveying meaning, and thus could represent a title, name, or action.

The 'fish' + 'arrow' combination occurs 55 times, the 'fish' + 'jar' combination occurs 44 times, and the three strokes + 'arrow' sign occurs 44 times; there is not even a single solus 'fish' + 'arrow' or 'fish' + 'jar' or three strokes + 'arrow' combination (Sundar et al. 2009); if these combinations form phrases or words or represent titles or names or actions, then one would expect them to be present solus. In comparison, six short strokes + 'fish' occurs three times solus, three short strokes + 'fish' + 'jar' occurs five times solus, and there are 11 solus 'trident' + 'fish' + 'arrow' signs (Sundar et al. 2009); hence, they represent a word or phrase.

An explanation was not found why 'fish' + 'arrow' or 'fish' + 'jar' does not occur solus. Probably when the 'fish' sign is written solus it conveys the meaning as if the 'jar' or 'arrow' sign is present along with it. In that case, these signs could be suffixes such as -(*a*)*nṭ*(*a*), -(*a*)*mp*(*a*), -(*a*)*al*, which, even if not written, are understood to be present when the 'fish' sign is solus, forming the Harappan words for 'fish', which later on gave rise to such words as *kenṭa*, *campa*, *kayal*. The case of three strokes should be similar.

Mahadevan (2011) found that among the 'fish' signs, only the basic one forms pairs with the preceding numerals three to seven (with the exception of five, an omission which remains inexplicable). There are other signs preceded by such numbers. According to him, number + 'fish' + 'arrow' are formations (*gaṇās*) of *apsara*s and number + 'fish' + 'jar' are formations of *gandharvā*s. The expression *gaṇa* appears to be the source of the later appellation *gaṇikā* 'courtesan'. According to him, two 'fish' signs = two long strokes + 'fish' = twin fish.

We have seen that one possible reading for the 'fish' sign is *kay*. Krishnamurti (2003) reconstructed 'five' in Proto-Dravidian as **cay-m-* adjective, **cay-m-tu* noun (non-human). Balzek (2009) pointed out that Andronov (1994) connected the numeral 'five' with Dravidian **kay-*/**key-*

'hand'. If *kay*- really represented the adjective for 'five', then in the double 'fish' sign, the first 'fish' sign may stand for the adjective 'five'. One may speculate that this is the reason for the absence (or rareness) of the numeral 'five' (represented by five strokes) in Indus script.

We will examine one more possible candidate to represent the 'fish' sign:

> DEDR 4974 Tamil *mural* 'needle-fish'
>
> DEDR 5023 Kurux *mūxā* 'frog'; Malto *múqe* 'frog'; Sanskrit *mūkaka* 'frog'
>
> DEDR 4887 Tamil *muka* (*-pp-*, *-nt-*) 'to draw (as water), bail', 'measure (as grain or liquid), obtain in full measure', 'lift, take up'; Tulu *mugè*, *mugayi* 'small earthen vessel', *mogēre* 'fisherman', *muggerů* 'a Malayalam fisherman'

See also Malayalam *mākri* 'frog' (not in DEDR).

The presence of the same word (*mūk*/*māk*-) for 'frog' in different branches of Dravidian indicates that it is a Proto-Dravidian word:

> DEDR 4952 Tamil *mutalai*, *mutaḷai*, *mucali* 'crocodile'; Kannaḍa *mosaḷe*, *masaḷe* 'crocodile'; Parji *mōca* 'crocodile'; Sanskrit *mācala*- 'crocodile'

Also consider Sanskrit *makara* for 'crocodile' and Sanskrit *matsya* for 'fish' and Hindi *machhli* for 'fish'.

All these words are related and refer to water-dwelling species. Interestingly, in Indian mythology Manmadha (Cupid) is said to be *makara kētu* as well as *mīna kētu* (Cupid's flag is described sometimes as having the symbol of the crocodile and sometimes as having the 'fish' symbol). This indicates that *makara* and *mīna* can be used interchangeably.

Therefore, the word *mūk*-/*māk*- represented water-dwelling species such as the fish, frog, and crocodile. The famous terracotta tablet from Mohenjo-daro (Figure 2) of a crocodile eating a fish may actually be a crocodile represented by a 'fish' sign having a value of *mūk*-/*māk*-/*muka*/*maka*.

Figure 2 Moulded terracotta tablet from Mohenjodaro

To sum up, Mahadevan proposed the approximate phonetic value for the 'fish' sign as **mīḻ/ṇ/ṭ* (*-v*). However, *mīṉ*, *mīṇ*, *mīḻ*, *vēḻ*, *kay*, and *kaḻa* can represent 'fish' roots, and each of these roots reflects the meaning 'to shine'. However, we have the Tamil god *cēy* ('the red one', 'the child god') and DEDR 2813 Tamil *cēy* 'son, child'; 'juvenility, youth'; Parji *cēpal* 'boy, lad', as well as DEDR 1252 Tamil *kayal*, *cēl* 'carp'; Malayalam *kayal* 'fish'; Telugu *cēpa* 'fish'. Thus, *cēy* has the meanings of 'red', 'child', 'name of a god', and 'fish', all probably derived from Proto-Dravidian **kay* (< **kaḻa*). Overall, *kay* is one of the most probable Proto-Dravidian words to represent the 'fish' sign. Alternatively, *mūk*-/*māk*-/*muka*/*maka* is an apt word that could have represented the 'fish' sign.

12. MODIFIED 'FISH' SIGNS

Mahadevan (1970) opined that the different 'fish' symbols do not constitute different varieties of fish, since the modifications are artificial. Mahadevan (1989; 2011) observed that in most cases the ligatured or modified 'fish' signs have the same distributional pattern as the basic or unmodified signs in question. For example, any modified 'fish' sign can be substituted for another sign in the group in almost all contexts. According to Mahadevan (1989), such a pattern is wholly inconsistent with phonetic combinations or modifications. Therefore, he concluded that the compounding and modification of signs appear to be ideographic in character. In contrast to the plain 'fish' sign, the ligatured 'fish' signs are never doubled or preceded by numbers (Parpola 1994).

The almost identical positional distribution of the 'fish' signs makes it reasonably certain that they must have similar correlated meanings (Mahadevan 2011). Thus, the suggestion by Hunter that the 'fish' signs are syllables sharing the same consonant but with varying vowels is not tenable (Mahadevan 2011). The prominence and high frequency of the 'fish' signs on the seals indicate that the signs represent some important aspect of the Indus polity (Mahadevan 2011).

Mahadevan (2011) further found that the fish-women ('fish' signs followed by an 'arrow' sign) outnumbers fish-men ('fish' signs followed by a 'jar' sign). Mahadevan noted that there are only seven 'fish' signs, and each of them occurs also with four strokes around the sign. According to Mahadevan (2011), the affinity for the surrounding four strokes (which he interpreted as the human plural suffix *-ar*) indicates that the 'fish' words are not proper names but appear to be common nouns indicating titles (attributes) or categories, like classes or groups. Such conclusions are untenable because there is no proof that 'jar', 'arrow', and four strokes around a sign are gender/plural markers. It is not clear why the human plural should have an affinity towards the 'fish' sign.

According to Parpola (1994), sign 289 with three double strokes and a single stroke around a 'wave' is a ligature of seven single strokes (sign 112) + 'wave' (sign 287), with one component being placed inside another. If we extend the same argument for sign 60 ('fish within four strokes') (frequency 29, one solus), it should be equivalent to four strokes + 'fish' (that is, sign 105 + sign 59) (frequency 1). This interpretation also rejects the 'four strokes around fish' sign as a plural marker.

Mahadevan observed that in theory the five 'fish' signs can form 20 non-repeating pairs, and 16 of the 20 possible pairs are actually attested in the Indus texts. The 'arrow' sign, interpreted as the feminine singular suffix when attached to the 'fish' signs, is found after single, double, or triple 'fish' sequences (Mahadevan 2011). He further concluded that the 'fish' signs are ideograms representing water nymphs, whose activities centred around the Great Bath. One may suspect that the ideographic interpretation is only due to the frustration arising from the inability to read the 'fish' signs. Mahadevan interpreted the modified 'fish' signs as composite titles or names of water nymphs. One cannot call a set of symbols which needs separate pictograms to represent each name/title to be a writing system.

13. SIGN NO. 67 'TWINKLING FISH'

Seeking to overcome the problem in phonetically reading the repetitive 'fish' signs, Mahadevan (2011) further suggested that in the modified 'fish' signs, the 'fish' sign is not actually pronounced and only the modification is significant. To understand the modified 'fish' symbols,

Mahadevan (1970) considered Tamil Sangam names such as Māvēḷāy (Puṟanāṉūṟu 135), Māvēḷevvi (Puṟanāṉūṟu 24), Māvēḷavaṉ (Paṭṭiṉappālai 299), Iruṅkōvēḷmāṉ (Akanāṉūṟu 36), Naṉṉaṉvēḷmāṉ (Akanāṉūṟu 97), and Veḷimāṉ (Puṟanāṉūṟu 162). Mahadevan (1970) equated *bali* (Sanskrit) = *vēḷ* (Tamil) = 'sacrifice' and Mahābali = Māvēḷ. According to Mahadevan (1970), the 'twinkling fish' (sign 67) should be read as *mā* (an animal in Tamil, because of the horn). Also, according to him, *māy* = 'sharp, to grow sharp' (DED 3779). Mahadevan (1970) argued that even though *māṉ* can be grammatically derived from *makaṉ* (= 'son'), it is not the case, because the word is almost always associated with Vēḷīr; thus, he proposes that the chieftain probably wore a headgear of horns.

Discarding his earlier interpretation, Mahadevan (2011) derived the 'twinkling fish' (sign 67) from the root *cim-ay* 'to glitter, shine, twinkle' and read the 'twinkling fish' as *cimay*(*mīṉ*) 'celestial (water nymph)'. Mahadevan (2011) also gave examples such as (*c*)*imayavar* 'celestial beings', arguing that it is a Cēra title. Therefore, according to Mahadevan (2011), if a word such as (*c*)*imayavar* existed in Harappa, then a combination involving the 'twinkling fish' sign + 'four strokes' should occur. As the combination actually does occur, Mahadevan takes it as proof for the correctness of his reading. However, if 'fish' itself means 'to shine', then the horn is not required to derive that reading. As such, the interpretation is not very convincing. We may not accept the argument that in the modified 'fish' sign only the modifications are important, as we find that the same modifier is used for many other signs.

14. SIGN NO. 65, THE 'ROOFED FISH'

Mahadevan (1970) read the 'roofed fish' as *vaḻ-/veḻ-* from

DED 4346 Tamil *vaḻavi* 'sloping roof'
DED 4349 Tamil *vaḻavu* 'arch'
DED4463 Tamil *veḻumpu* 'edge'

All these words are derived from *vaḻ-ay* 'to bend' and are homophones of:

DED 4422 Tamil *viṇ* 'sky'
DED 4524 Tamil *veṇ-, viḻ- veḻ* 'bright'

Mahadevan (1970) also argued that the double meaning of *vēḷ* 'chieftain' (DED 4562) and 'to sacrifice' (DED 4561) indicates the presence of priest rulers in the Indus Valley.

Later on, Mahadevan (2011) interpreted the 'roof' symbol as *vāṉ* 'sky' and the 'roofed fish' as *vāṉ* (*mīṉ*) 'celestial (water nymph)'. Mahadevan also gave examples such as Vāṉavar (Cilappatikāram 10.158) 'celestial beings', '*dēvās*'. If we extend the argument put forward by Mahadevan (2011) for the correctness of the reading for 'twinkling fish', then words such as Vāṉavar or Vāṉavṉ (Vāṉavṉ = 'Cēra king', according to Mahadevan 2011) existed in Harappa and corresponding sign combinations involving the 'roof' sign + four strokes or 'roof sign' + 'jar' should occur. We do not find such combinations. Therefore, by Mahadevan's own criterion, such readings are not correct.

Interestingly, Parpola (1988) read this sign as **mey-mīṉ* in the sense of **may-mīṉ* 'black star' from the Dravidian word for 'roof **vay-/*vey-/*mey-* 'to cover a house with a thatched roof', in which etymon the alternations **v-/*m-* and **-ay-/*-ey-* can be reconstructed for Proto-

Dravidian and was partially homophonous with the root **may-* 'black'. One may note that Zvelebil (1970, in Levitt 2011) also observed the frequent Dravidian development of *m* > *v*.

15. SIGN NO. 72, 'FISH WITH A SLANTING STROKE', SIGN NO. 70, 'FISH WITH A VERTICAL STROKE INSIDE'

Mahadevan (1970) gave the phonetic value of *cāy* to the 'fish with a slanting stroke' (sign 72), based on *cāy* (DED 2026) 'to incline, decline, slope, slant' and (DED 2028) 'to release, to cause to leave'. But we also have:

> DEDR 2360 Tamil *cari* (*-v-, -nt-*) 'to slip away, slide down, roll, tumble, stumble down, give way, yield, lean, incline, be aslant, slope'; Malto *jarqe* 'to be dropped, fall'

Therefore, a more appropriate word may be *car-a/i*. It is possible that *caray* > *cāy*. According to Mahadevan (1970), *cāy* > *āy* represents the Āy kings. Mahadevan (1970) argued that the Āy kings belonged to the Vēḷīr clan, which was part of the Nāga ('Serpent') race. The most common title of a Vēḷīr chieftain was Ara(i)yaṉ (Mahadevan 1970). According to Mahadevan (1970), the form Tara(i)yaṉ survives as an alternate to Ara(i)yaṉ. He also notes that there was an original **cara-y* with the meaning 'serpent'. Mahadevan (1970) presumed **cara-y* > *ara-y/ tara-y*, and we have:

> DEDR 2359 Tamil *ara* 'serpent'; Gondi *taras* 'serpent'; Koṇḍa *saras*(*u*) 'snake'
>
> DEDR 2011 Tamil *cērai*, *cārai* 'rat snake'; Kannaḍa *kēre* 'rat snake, whip snake'

Therefore, if the slanting sign stands for *car-a*, the 'fish' sign with a slanting line can be read as *cara-mīḻ/ṉ* (= *cara-vēḻ*), which can better fit Mahadevan's (1970) argument. However, another view is that the Āy kings derive their name from *ā* 'cow', and we have:

> DEDR 334 Tamil *ā, āṉ* 'female of ox, sambur, and buffalo', *āy* 'the cowherd caste', *āyaṉ* 'herdsman'

Mahadevan (1970) assigned the phonetic value *cō-* to the 'fish' with a vertical stroke (sign 70) based on:

> DED 870 Tamil *ō* (*-ṇku*) to ascend'
>
> DED 2344 Tamil *ō* 'to come out, emerge'
>
> DED 2346 Tamil *cō* (*ṅ*)*ku* 'devil, demon, evil spirit'

According to tradition, eclipses are caused by the sun and moon being swallowed by Rāhu and Kētu, the serpentine demons (shadow planets) (Mahadevan 1970). Mahadevan treated the two 'fish' signs (sign 70 and sign 72) as Rāhu and Kētu based on meanings such as 'to incline', 'to cause to leave' for *cāy* and 'to come out', 'demon' for *cō-*. According to Mahadevan (1970), through their priestly rituals the Vēḷīr appeared to liberate the sun and moon from the evil influence of the serpent planets. According to Mahadevan (1970), due to such priestly functions releasing from the influence of serpents, the Vēḷīr themselves adopted the name for serpent Ara(i)yaṉ. In any case, we cannot find sufficient grounds for the whole series of arguments relating the signs 70 and 72 with the shadow planets, further relating them with Vēḷīr kings, Vēḷīr chiefs, and Vēḷīr priests, and finally connecting them with serpents.

Mahadevan (2011) later interpreted the 'fish' sign with a vertical stroke as *cō-*(*mīṉ*) 'water nymph of the rising sun' and the 'fish with slanting stroke' as *cāy-*(*mīṉ*) 'water nymph of the

setting sun'. He pointed out that *cō* formed part of proper names even during the Sangam Period, as Cōkīraṉār (Naṟṟiṇai 319) and Cōkuttaṉār (Naṟṟiṇai 329) are names of Sangam poets. The Ōy chiefs have names such as Ōymāṉ Villiyātan (Puṟanāṉūṟu 379) and Ōymāṉ Nāṭṭu Nallikkōṭaṉ (Ciṟupāṇāṟṟuppaṭai). According to Mahadevan (2011), *uḻai* (Cilappatikāram 6.62) as the princess of the city of Cō is the same as the Sanskrit Uṣas. But possibly *uḻai* could be *cuḻai* (hence not Uṣas) in Proto-Dravidian, because loss of the initial *c* is common in Dravidian.

Mahadevan (2011) gave many more interpretations for the 'fish with a vertical stroke'. He related it with Apsaras Rambhā, as *rambha* means 'staff' or 'bamboo'. He connected the symbol with Apsaras Tilōttamā, as the symbol is a fish with a *tilaka*. Mahadevan (2011) further argued that Rambhā, the Apsaras, is sometimes regarded as a form of Lakṣmī because *lakṣa* means 'a mark, symbol' and *lakṣmi* means 'a mark, sign, token'. Therefore, according to him, the 'fish' sign marked with a short vertical stroke or dot represents Lakṣmī, the consort of Viṣṇu.

While 'trident' + 'fish' occurs 76 times and 'trident + horned man' occurs 40 times, 'trident' in combination with six other signs has a frequency of only ten. Mahadevan (2011) read the 'trident' + 'fish' symbol as *nīḻ*(*mīṉ*) 'great water nymph', with the ordinary water nymph being represented by a plain 'fish' sign (see Section 20 for a discussion of the 'trident' sign). According to Mahadevan (2011), Urvaśī 'widely extending' is a loan translation of *nīḻ* (*mīṉ*). According to Zvelebil (1970: 132–133), the *n*-/zero alternation may have been present in the parent Dravidian speech itself (Mahadevan 2011). Therefore, Mahadevan argued that Nīḷā-dēvī is identical with Ṛg Vedic Iḷā (RV 5.41.19 mentions Iḷā along with Urvaśī).

When we have the same sign with a straight line and another with a slanting line, then one may reasonably think that the straight line represents the word for 'straight', which in Tamil is DEDR 2757 *ce/ce-m*. It also means 'red' (DEDR 1931) and possibly *cem* < **kem* (<**kam?*). In any case, none of Mahadevan's interpretations for sign 70 and sign 72 can be substantiated.

16. SIGN NO. 403 'TWO INTERSECTING CIRCLES'

Mahadevan (1970) interpreted 'intersecting circles' as representing a collective entity and deduced its value from DEDR 1562 Tamil *kūṭu* 'to come together, join, meet, combine' and *kūṭṭam, kūṭṭar* 'clan' or 'tribe' or their members. Mahadevan (1970) argued that the rings with a slanting stroke and horizontal stroke are parallel to 'fish' with a slanting and horizontal stroke and hence have a similar function.

Mahadevan (1995) agreed with Parpola that the 'intersecting circles' sign can depict a pair of bangles or earrings. Many of the stoneware bangles unearthed from Mohenjo-daro are inscribed and, according to Parpola (1994), the 'intersecting circles' sign occurs with disproportionately high frequency on the bangle inscriptions (Mahadevan 1995). But according to Mahadevan (1995: 12), the word *muruku* 'to twist' suggested by Parpola can be applied only to twisted metal bangles and not to stoneware bangles, because in the Proto-Dravidian stage it could not have represented bangles in general: "the earring or nose ring known as 'muruku' is made from twisted silver wire". There is no evidence that this sign represented a divinity ('Murugu', namely, 'Skanda') (Mahadevan 1995).

Parpola (2010) opined that the pictogram represented earrings which occur in pairs and that it is represented by the Tamil word *muruku*, which means 'ring, earring, bangle' and also 'young man' in Old Tamil, being derived from the Dravidian verbal root **murV* 'to bend or to be bent'. Similarly, the Proto-Dravidian **vaḻay* 'ring, circle, bracelet' comes from the root **vaḻay* 'to bend or to be bent, be curved, turn around, surround, enclose' (Parpola 2010).

For earring, we have:

DEDR 4979 Tamil *muruku* 'ornament worn in the helix of the ear'; Telugu *murugu, muruvu* 'bracelet, bangle'; Kuwi *murmur, mūrmū* 'nose ring'

DEDR 5002 Gondi *muṛhuttānā* 'to cover up'; *muṛutānā* 'to conceal, to cover'; *Kurux mulga'anā* 'to cover, protect'

DEDR 1127 Tamil *kaṭi* 'protection, safeguard, defence'

DEDR 1138 Tamil *kaṭukkaṉ* 'man's earring'

DEDR 1245 Tamil *kammal* 'earring worn by women in ear-lobe'; Kuwi *aḍi-kommu* 'nose ring'; *karsakāmi* 'earring (worn by males only)'

DEDR 1823 Tamil *kuḻai* 'earring, ear'; Kolami *kuḍka* 'earring'

DEDR 968 Tamil *oṭṭu-kkaṭukkaṉ* 'small earring'; Malayalam *oṇṭya* 'a kind of earring'; Telugu *oṇṭu* 'a sort of earring worn by men'

DEDR 3545 Tamil *tōṭu* 'ear jewel'; Malayalam *tōṭa* 'earring of women'

DEDR 969 Tamil *oṇtu* (*oṇṭi-*) 'to take shelter, conceal oneself (as a person to shoot game), lurk (as an animal for prey)', *oṭṭu* (*oṭṭi-*) 'to play the eavesdropper, lurk, lie in ambush'; Malto *oḍe* 'shelter, refuge'; Kurux (Tiga) *ordrnā* 'to take shelter'

It appears that the words for 'earring' are related to protection. The word *muruku* as well as *kaṭ-/kar-/kam-* can be reconstructed in Proto-Dravidian to represent earrings (as they are present in different branches of Dravidian). Therefore *vaḻay*, *murukku*, and *kaṭ-* are available alternatives to represent sign 403.

17. SIGN NO. 364 'FIG TREE + CRAB'

Parpola regards this composite sign, which occurs in three forms, as simple variants of a single sign (Mahadevan 1995). However, the outer U-like form has two sharply differentiated additions, either the 'fig leaf' (sign 326) or the 'man' (sign 1) (Mahadevan 1995). Similarly, the 'crab' sign has two clearly differentiated forms, either with 'feet' (sign 54) or without (sign 53) (Mahadevan 1995). The two 'crab' forms occur in wholly different contexts in the seal texts (Mahadevan 1995). Parpola treated each modified 'fish' sign as having a distinct phonetic value (Mahadevan 1995). Likewise, the 'fig tree' + 'crab' forms have to be treated as independent signs with distinct though possibly related meanings, according to Mahadevan (1995). However, Mahadevan did not attempt to read this sign.

18. SIGN NO. 8 'HORNED GOD OR PERSONAGE'

Mahadevan (1970) found that the fish and horned man occur in similar circumstances and hence share a similar function. According to Mahadevan (2008: 84–85), "many scholars have interpreted the sign as a title meaning broadly a 'divinity, personage, hero or warrior'. […] This interpretation is corroborated by variants of the sign […] clearly showing the 'horns' and by the pictorial motif of the 'buffalo-horned god or personage' depicted on the Indus seals." Mahadevan (2008) interpreted the symbol as phonetically related to:

DEDR 1173 Tamil *kaṇṭaṉ* 'warrior, husband'; Kannaḍa *gaṇḍu* 'strength, manliness, bravery', 'the male sex, a male, man', *gaṇḍa* 'a strong, manly male person'; Malto *geṇḍa* 'male'

DEDR 1173 Tamil *kaṇṭi* 'buffalo bull'

DEDR 1114 Tamil *kaṭamā, kaṭamāṉ* 'bison'; Kurux *kā̃ṛsā, kāṛsā* 'male of the *bādō* deer'

DEDR 1123 Tamil *kaṭavu, kaṭā, kaṭāy* 'male of sheep or goat', 'he-buffalo'; Brahui *xarās* 'bull, bullock', *xaṛ* 'ram'

Mahadevan (2008) observed that the stem *ka*(*ṇ*)*ṭ* occurs in Dravidian etyma for 'horned beasts or creatures' and the word *Kaṇṭaṉ* stands for 'warrior, hero' and also as personal names in Tamil literature and inscriptions. On the basis of the evidence summarized above, Mahadevan (2008) provisionally determined the phonetic value of the Indus sign 8 as *kaṇṭ*(*a*) 'eminent personage'.

As there is a sign (sign 1) for simple 'personage' in Indus script, why cannot one consider the 'horned personage' as a modification using a qualifier syllable? The word *kaṇṭa* does not look like such a word. In any case, let us examine a few more words for horn:

DEDR 2146 Tamil *koḻu* 'fat, flourishing, prosperous'; Kui *krōga* 'fat, tallow, suet'

DEDR 2149 Tamil *koḻuntu* 'tender twig, tendril, tender leaf, shoot, anything young, tenderness'; *koḻuntaṉ* 'husband, husband's younger brother'; *kuḻakaṉ* 'youth, beautiful person', 'Skanda'; Naiki *kovve* 'young of bird or animal'; Kui *koṛgi* 'newly sprouted, green, immature, unripe'

DEDR 2200 Tamil *kōṭu* 'horn, tusk', 'branch of tree', 'cluster, bunch', 'coil of hair', 'line, diagram', 'bank of stream or pool'; Kui *kōju* (pl. *kōska*) 'horn, antler'

DEDR 2115 Tamil *kompu* 'branch', 'horn of an animal, musical horn, tusk'; Kuwi *komma* 'branch', *kommu* 'horn'

There are many examples of syllabic loss in Dravidian (Levitt 2011). Therefore, it is possible to derive **koḻu-nṭ-u* > *kōṭu* and **koḻu-mp-u* > *kompu*. A crowned person can be called Kompan, as the Harappan crown has buffalo horns (Mahadevan 1970). One important word for 'horn' in Proto-Dravidian could be **koḻ-u-*, with the other word being DEDR 4720 Tamil *maruppu* 'horn of a beast', 'elephant's husk', 'part of a lute', 'branch of a tree', 'horns of crescent moon', 'ginger'. By consonant reduction, the following is possible: *mar-aṉ* > *māṉ* > *mā*.

Therefore, the 'horn' sign may be phonetically *koḻ*(*u*) (or *mar-u*) and hence the horned personage can here represent the child god Murukan/Skanda/Kumara, because both *koḻ-* and *mar-* have connotations of 'child'. However, one may remember that the 'bird/cock' sign also can be read as *koḻ-* in Dravidian. Thus, *koḻunṭ, koḻunta, koḻumpa, koḻ-āḷ, or mar-āḷ* (>*mā-ḷ*) are equally suitable alternate readings for the 'horned personage'.

The 'trident' + 'horned personage' + 'jar' sign occurs 36 times, twice solus, and could represent an important deity. Mahadevan observed that in this position/combination, the 'fish' sign alternates with the horned personage. Mahadevan's (2008) reading *kaṇṭ*(*a*) is a plausible one.

19. SIGN NO. 9 'HORNED MAN WITH CURVED LINES ON BOTH SIDES'

Mahadevan (1970) read the 'horned man with curved lines on both sides' as *cara-y-kaṇṭa-*, interpreting the curved lines as snakes. Yet, there is no reason to believe that the curved lines are snakes. Sign 9 is probably a ligature of sign 8 inside sign 294.

20. SIGN NO. 171 'TOOTHED HEAD MOUNTED ON A SHAFT' OR 'TRIDENT'

Mahadevan (1970; 2008) is of the opinion that this symbol represents a weapon like the later trident. This symbol works as a prefixed attribute mostly before the 'fish sign and the 'horned personage' sign and resembles the Sumerian pictogram *lugal* ('great man') (Mahadevan 1970; 2008). Mahadevan (1970) argued that as the symbol does not stand alone, it should be a true adjective. Heras (1953: 76) and Gurov (1976: 131–132) were of the opinion that it stands for

per(*u*) 'great', but the Finnish team (Parpola et al. 1969b: 15–16) identified the pictogram as a flower, being of the opinion that it stands for *cem* 'straight, just, red'. According to Jeganathan (1997), the sign represents the numeral 'five'; he read it as *kay* 'hand'. A numeral need not stand alone. Mahadevan (1970) cited Old Tamil names such as Neṭuṅkaṉṉaṉ, Neṭumiṭal, Neṭumāl, Neṭuvēḷ, Neṭiyōṉ, Neṭuñcēralātaṉ, Neṭuṅkiḷḷi, Neṭuñceḷiyaṉ, and Neṭumāṉ to argue that the sign stands for *neṭu*, which is an attribute for kings and deities, in relation to DED 3099 (Tamil) *neṭu* 'tall, great' and (Tamil Lexicon) *neṭṭai* 'a kind of weapon'.

Mahadevan (2008) argued that the most characteristic verbal attribute of Śiva is the epithet 'great', as in Mahādēva, Mahēśa, and Mahēśvara, while the most characteristic symbolic attribute of Śiva is the 'trident' (*śūla* in Sanskrit). Names like Śūlin, Śūladhara, Śūlapāṇi, and other equivalents arose due to the symbolism of the sign pair and hence *śūla* = *mahā*. Earlier, Mahadevan (1986a) opined that the combination 'trident' + 'horned person' may indicate Śūla (= Mahā)dēva, but it need not presuppose Śiva because it could have been a title in general used by the Harappan ruling classes (priests, nobles, etc.). Subsequently, however, Mahadevan (2008) claimed that the words later converged to represent Śiva.

Mahadevan (2008: 88) concluded that the 'trident' sign means 'great' "by its positional and functional characteristics in the Indus texts as well as by its close graphic similarity with the corresponding Sumerian ideogram with the same meaning". He then argued that the phonetic value of the 'trident' sign is *nīḷ*. For *nīḷ* we have DEDR 3692 Tamil *nīḷ* (*nīḻv-, nīṇṭ-*) 'to be long, be great'.

With the phonetic value of the 'horned personage' being *kaṇṭa*, the sign pair 'trident' + 'horned personage' represented a 'great personage', in other words Nīḷ Kaṇṭa in Tamil, which has been adopted into Sanskrit as Nīlakaṇṭha and later understood as 'blue neck' (Mahadevan 2008). Mahadevan (2008) observed that his previous reading of the pair of signs in Mahadevan (1970) as *neṭ*(*u*)*kaṇṭ*(*a*) did not prove to be productive, as the title could not be satisfactorily related to any of the traditional names or titles in Dravidian or borrowings by Indo-Aryan. This method of decipherment is what Mahadevan called "bilingual parallels". Mahadevan's argument that such confusions, loans, and translations are possible has merit. However, the arguments put forward by him are not conclusive to prove that such a translation took place in the specific case of Nīlakaṇṭha.

The symbol called 'trident' by Mahadevan cannot be given the phonetic value *nīḷ* unless one can associate a word close to *nīḷ* with some object that physically looks like what is called a trident. As Mahadevan has not made any such claim, his reading is unacceptable. The symbol Mahadevan called 'trident' looks like a harrow or a comb (especially one used to remove nits). Hence, there can be alternative readings for the symbol 'trident'. Let us look at some possible words:

> DEDR 2624 Tamil *cīr* (*-pp-, -tt-*) 'to be excellent, be superior, be suitable, fitting (as an opportunity)', 'fall into rhythmic movement'; n. 'prosperity, wealth, beauty, gracefulness, goodness, greatness, excellence, superiority, paramount importance, esteem, regard, reputation, fame, nature, good normal condition', literal meaning, 'equilibrium, evenness, balance, measure, quantity, heaviness', as a time measurement, 'song, metrical foot, sound of musical instruments'; *cīrmai* 'greatness, excellence, eminence, reputation, renown, weight, moderateness, decorum, smoothness, evenness, polish'; *cīrppu* 'excellence'
>
> DEDR 481 Tamil *iru* 'great, spacious, vast'; *irumai* 'greatness, largeness, hugeness, eminence'
>
> DEDR 1610 Tamil *cīppu* 'a comb'; Malayalam *cīppi* 'a comb, a cluster or comb of a plantain bunch'; *cīrppu* 'a comb'; Tulu *kīpu* 'a bunch [of plantains]'; Parji *kīpid* 'a comb'
>
> DEDR 2625 Tamil *īr, īrppi* 'nit'; Malayalam *īr* 'nit', *īruka* 'to comb hair'; Kannaḍa *īr, īpi, sīr* 'to comb hair'; *īr* 'to comb out nits'; Kui *sīreni, sīreṛi* 'comb'; Kurux *cīr* 'nit'

Here, *irV-* may be a form derived from *cirV-* with the loss of *c*. Such losses of initial *c* are described by Krishamurti (2003). Also, *cir-* (or the form with loss of initial *c*, *ir-*) indicates a comb or nit.

But does **cir-v* have anything to do with 'blue', so that one can still justify Mahadevan's argument about 'blue neck'? Let us note that one basic problem with some languages, including Sanskrit, is that there is no clear cut distinction between the words for the colours blue and black; thus, *nīl* can be either blue or black. Let us look at the following words:

> DEDR 2552 Tamil *iravu, ira, irā, rā* 'night', *iru* 'black', *iruṭci, iruṭṭu, iruṇmai, irumai* 'darkness', *iruḷ* 'darkness, dark colour', 'ignorance'; Kolami *cirum* 'very dark', *sindi* 'soot'; Parji *ciruŋ* 'charcoal'; Gadaba *siriŋg* 'black', *sirŋaṭ* 'black, rusty'

From the above, we can reconstruct a Proto-Dravidian **cir-* for 'night' or 'black'.

Thus, the symbol 'trident' can have the phonetic value *cir* (or *kir*) where *cir* stands for 'comb', 'great', or 'black'. Some languages show initial *k* (but only for 'comb'); *kir* > *cir* is possible due to palatalization of velars, even though palatalization has been blocked in many cases where the second consonant is a retroflex (or alveolars in some cases) consonant (Krishnamurti 2003). This argument is valid only if the words for 'comb', 'great', and 'black can all be reconstructed as *cir-* or *kir-*.

Krishnamurti (2003) showed that in many Dravidian languages, *c* > *s* by affricate weakening. It is quite possible that this Proto-Dravidian **kir-V-/ *cir-V-* was transformed into *siri* by affricate weakening and adopted into Indo-Aryan as *śri*.

Tamil *tiru* could also have originated from the same **cir-V-* by *c* > *t*. Emeneau (1994) has noticed many examples for the irregular change of *c-* > *t-* in many Dravidian languages, which according to him cannot be generalized.

Thus, *ciru* is an equally valid alternative to *nīḷ*. All these arguments presented above are valid only if 'trident' has something to do with 'great', as Mahadevan (2008) argued, and the language was Dravidian. Jeganathan's (1997) argument that the sign represents *kay* with the meaning 'five' is also a possible one.

21. SIGN NO. 17 'PERSONAGE CARRYING A CLUB'

The Finnish team (Parpola et al. 1969c: 26) described the symbol on an ivory plaque as the portrayal of a man wearing a crown and carrying a club on his shoulder, and Volcok (1976: 114) argued that Vedic Yama is called Daṇḍin and Daṇḍadhara (Mahadevan 1970). In this connection, Mahadevan examined the words:

> DED 4559 Tamil *vēy* 'bamboo, bamboo rod'
>
> DED 4514 Tamil *vetir* 'bamboo'; Tamil Lexicon *mētar, mētaravaar, mētavar* 'a class of people who do bamboo work'
>
> DED 4549 *vēṇṭaṉ* 'king'; Tamil Lexicon *vēṭṭiya* 'of the king'; Tamil Lexicon *vēyar* 'a class of Brahmin priests', *vēṭiyar* 'Brahmans, priests'
>
> DED 4552 Tamil *vēy* 'to cover or thatch'

Mahadevan (1970) argued that the word *vēṇṭaṉ* 'king' is derived from the meaning 'to cover' because of the crown the king wears, such that the pictogram represents both meanings: 'one with a crown' and 'one with a bamboo staff'. Here again he linguistically connects the king and the priest. According to him, this word for king could also be derived from *vēḷ*.

Mahadevan (1970) considered the following words in the Tamil Lexicon: *mēti*, 'buffalo', 'a buffalo-faced demon, slain by Durgā'; *mētiyaṉ, mētiyāṉ* Yama (as riding on a buffalo). He argued that Yama is Mahiṣāsura (slain by Durgā) and can be interpreted as the Harappan Priest-King. Hence, the sign represented him and the phonetic value is *vēy-*(*n*)*t*. Mahadevan (1970) further proposed 'personage carrying a club' + three strokes as *mū- vēy-*(*n*)*t*, per the parallel of Old Tamil Mū-vēṇṭar.

If we try to translate Daṇḍin or Daṇḍadhara into Dravidian, another possible word is **kaḻa-v-āḷ*. Therefore, this word is a possible alternative for representing the symbol. We have:

> DEDR 1370 Tamil *kaḻai* 'pole used for propelling boats', 'elephant-goad', 'stem of sugar-cane', 'shaft of a bamboo', *kaḻi* 'rod, staff, stick, handle of tool, peg to keep a yoke in place, lath'
> DEDR 852 Tamil *eḻu* 'a kind of weapon'; Malayalam *eḻu, eḻuku* 'a club'

Another possible translation for *daṇḍin* or *daṇḍadhara* is Kōlaṉ: DEDR 2237 Tamil *kōl* 'stick, staff, branch, arrow'; Telugu *kōla* 'stick, staff, arrow', 'long, oblong'; Pengo *kōl* 'pestle'.

A fourth word for club is DEDR 1166 Tamil *kaṇai* 'arrow'; Malayalam *kaṇa* 'small stick, shaft, hilt, handle, arrow, bamboo'; *kaṇayam* 'spear, club'; Koṇḍa *kaṇsi* 'spade'; Sanskrit *kaṇaya-* 'a kind of spear or lance'.

Earlier we have opined that the deity on amulet 3305 could be Yama (see Sections 5 and 11). The deity is compared directly with sign 17, as Parpola (1994) argued that the sign 'two strokes in a jar' (sign 344) on the amulet could represent the deity. Therefore, sign 344 and sign 17 should be connected in some way. An attractive proposition by Mahadevan (1970) is that Yama represents the Harappan king. Bamboo would have never been used as a club; hence, the possibility for the word for bamboo representing Yama is remote. The other three alternatives suggested above are equally possible.

22. SIGN NO. 99 'TWO SUPERSCRIPT SHORT STROKES', SIGN NO. 97 'SINGLE SUPERSCRIPT SHORT STROKE', SIGN NO. 123 'SUPERSCRIPT SINGLE STROKE AND CURVED STROKE'

Mahadevan (1986d) considered these signs as case endings based on the following characteristics: (1) they are suffixes occurring only in final or quasi-final positions in texts or phrases, (2) they occur more often medially (generally at the end of the "introductory" phrase) than finally in a text, as their function is to relate the preceding substantive to the remainder of the text, and (3) their superscript position means that their physical placement is much closer to the preceding than the succeeding sign and the rare instances where they are ligatured with the preceding sign confirm that a suffix of this class and the preceding sign constitute one word. Mahadevan (1986d) argued that based on these suffixes, the preceding substantives can be classified into three groups: (1) substantives which are followed by anyone of the three suffixes, (2) substantives which are followed by either of the two suffixes 'single stroke' or 'single stroke and curved stroke' only, and (3) substantives which are followed invariably by the suffix 'two strokes' only.

Mahadevan (1970) argued that as the 'double stroke' (sign 99) follows the symbols which he identified as place names, it may represent **ir-* 'two' (DED 401) and **ir-* 'to be in place, to reside' (DED 407), which is used as a locative and possessive suffix. According to Mahadevan (1970), the other two types of strokes (sign 97 and sign 123), which also must be locative or possessive, are conventional and their phonetic value cannot be determined by homonymy. He

add that there are only three suffixes in Old Tamil in this environment; the other two are *-a* (attributive-possessive ending), which he identified with the single stroke, and *-t-* (locative-possessive oblique case ending), which he identified with 'single stroke and curved stroke'. According to Mahadevan (1989), the short superscript suffixes are certainly not numbers. Mahadevan (1986d) argued that they do not represent (1) dative or ablative cases because introductory phrases consisting of a place name and a superscript suffix are often followed by anthropomorphic signs representing personal names and titles, or (2) accusative or instrumental cases, because, according to him, the seal texts contain only place names and personal names.

Mahadevan (1986d) observed that these suffixes also follow anthropomorphic signs (most probably representing personal names, titles, professions, etc.) in similar contexts as place signs, and in such cases the superscript suffixes seem to have genitive, possessive, or oblique case significations. Mahadevan (1986d) also observed that at present it is not possible to find the precise distinction in the meanings of the three suffixes, which are functionally very similar but not identical. Tentatively speaking, all the three suffixes may be interpreted to mean broadly 'of, in, among, belonging to' (or as the oblique case markers). Thus, Mahadevan (1986d) read sign 267 + sign 99 as 'of' the palace/temple, sign 284 + sign 99 as 'in' the city, and sign 28 + sign 99 as 'among' the archers. In this way, these signs have the following functions: (1) as locative/possessive/genitive/oblique case endings, and (2) as conjunctions. Mahadevan identified sign 99 'two strokes' as 'in the' or 'of the' and 'among', and sign 123 also as 'in the'/ 'of the', in addition to 'of/among others'.

According to Krishnamurti (2003), *-a*, *-ā*, and *-in* as genitive suffixes can be reconstructed to Proto-Dravidian. According to him there are no exclusive, non-overlapping locative case markers in Dravidian. While *-ttV* and *-ul-* can be reconstructed to Proto-Southern Dravidian and *-Vn* and *-il* can be reconstructed to Proto-Dravidian with locative meaning, the locatives *-in/-an/-un* can be understood as derived from Proto-Dravidian *-Vn* (Krishanmurti 2003: 238–239) Since *kaṇ* existed in Old Tamil (belonging to Southern Dravidian I) and *kan* exists in Parji (belonging to Central Dravidian) as post-position (with locative meaning), it may be reconstructed to Proto-Dravidian. According to Krishnamurti (2003: 238), Southern Dravidian I *-in*, Parji *-t-i*, and Kurux–Malto *t- ī* used for ablative seem to be basically Proto-Dravidian locative suffixes. Krishnamurti (2003: 188) opined that *-t-* is derived from *-nt*, which was a non-past marker in Proto-Dravidian. Krishnamurti also discussed a form *uṇṭu* (< *uḷ-ntu*) with a meaning 'there is, exists'. In the locative case, there is an abundance of post-positions used by all the languages (Krishnamurti 2003). Many post-positions were used in Old Tamil in the locative case: *kaṇ*, *kāl*, *akam* 'inside', *uḷ/oḷ* 'inside', *pāl*, *kaṭai* 'place', *vaḻi*, *mutal* 'beginning', *talai* 'space', *mēl* 'above', *varai* 'up to (place)', *vayin* 'with', etc. (Krishnamurti 2003).

Which among the above represent these three signs (97, 99, and 123) is anybody's guess. Parpola (1994) opined that these signs are special markers required by the structure of the inscriptions in position I.

23. SIGN NO. 98 'THE SINGLE SHORT STROKE OF THE MIDDLE REGISTER' AND SIGN NO. 100 'THE DOUBLE SHORT STROKE OF THE MIDDLE REGISTER'

When they occur in non-initial positions, they do not appear to function as case endings but rather as conjunctions joining two independent linguistic formations (phrases or whole texts) (Mahadevan 1986d). According to Parpola (1994: 232), signs 97 and 98 are allotropes.

24. THE SINGLE STROKE

Mahadevan (1970) argued that the double stroke superscript represents the number two, but he took a different stand on the single stroke superscript (sign 97) and argued that it is a conventional sign and its phonetic value cannot be determined by homonymy. This is not logical. Let us look for the possible Proto-Dravidian word for the numeral 'one'.

Andronov (1994) reconstructed *ol-tu* for 'one' on the basis of Tamil *ol-* and Malayalam *ollu-* 'to unite' (Blazek 2009: 70). There are many examples of the loss of the initial consonant in Dravidian. Therefore, it is prudent to look for the possible initial consonant, if it existed:

> DEDR 3516 Tamil *tol* 'old'; ancient Kota *tol viːr* 'first pregnancy'; Telugu *toli* 'beginning, commencement', 'first, former, previous, old, ancient; formerly, previously'; Gondi *tolle* 'first', *tottāy* 'old', *tottūr* 'ancestors', *toṇṭi* 'former, earlier, previous', 'ancient, old'
>
> DEDR 697 Tamil *uḷ* 'to be, have', *uṇṭu* 'is, are' (existence); Telugu *uṇḍu* 'to be, exist, live, dwell', *uniki* 'existence, being, remaining, stay, dwelling, home, place, residence, state, condition'; Kui *lohpa* (*loht-*) 'to abide, remain, reside'; Brahui *anning* 'to be'
>
> DEDR 698 Tamil *uḷ* 'inside, interior of a place, mind, heart', a locative ending; Parji *ole*(*k*) 'house'; Malto *ule* 'inside, within'
>
> DEDR 3518 Pengo *dol* 'ground, floor'; Kuwi *dojjo* 'floor', *tojjo* 'ground', *tojo*, *chōjjō* 'floor' (the Kuwi forms are originally locatives of **tol*)

It is suggested here that the single stroke represents the Proto-Dravidian number one **tol/*toḷ* as well as 'house/inside/in', which on loss of initial consonant became **ol/*oḷ*. The word *samvatsarambuḷ* with the meaning 'in the year' quoted by Mahadevan (1998a) from Cikilla Plates of about the sixth century CE lends credence to this argument.

Konḍa, Pengo, and Kuvi use *to* as a locative marker (Krishnamurti 2003). One of the words for temple attendants in old Tamil was *akattoṇṭar* (Mahadevan 2009a), probably derived from **aka-t-tol-ṇṭar*. Thus, with the phonetic value *tol* the sign 97 'single stroke superscript' can act as the locative case ending, meaning 'belonging to' or 'in'. The sign 98 'single short stroke of the middle register' with a phonetic value *tol*, having a meaning 'lead by' or 'the first among', can join two words where the first one is a personal name.

According to Parpola (1994), the long single line (sign 86) could signify the number 'one', which in the cuneiform script of the first millennium BCE was prefixed to proper names as their determinative. Despite our arguments above, we may conclude that we have not made any progress in understanding anything about the 'single stroke' sign.

25. TWO STROKES

According to Mahadevan (1970), two superscript strokes represent the number 'two'. According to Krishnamurti (2003), Proto-Dravidian **Ir-/*ir-V* means 'two'. Let us examine:

> DEDR 474 Tamil *iraṇṭu*; Brahui *iraṭ* 'two (entities)'
>
> DEDR 479 Tamil *irical* 'break, crack'; Kui *īra* 'a splinter'
>
> DEDR 520 Tamil *i̲ṟu* (*i̲ṟuv-, i̲ṟṟ-*) 'to break, snap (as a stick)', 'become severed (as a limb)'; Kurux *esnā* (*essas*) 'to break, divide by force (a stick, a tooth, etc.)'
>
> DEDR 542 Tamil *īr* (*-pp-, -tt-*) 'to drag along, pull, attract', (*-v-, -nt-*) 'to be drawn out', 'saw'; Malayalam *īr* 'splitting, sawing'; Gondi *ric-* 'to cut with a saw'
>
> DEDR 824 Tamil *erukku* (*erukki-*) 'to cut, hew, strike (as a bush), beat (as a drum), kill, destroy'; Kuwi *erg-* (*-it-*) 'to cut, slash'

DEDR 1612 Tamil *cīy* (*-pp-, -tt-*) 'to cut with an adze, cut down'; Koṇḍa *kīs-* (*-t-*) 'to scrape, scratch'

DEDR 1564 Tamil *cirai* (*-pp-, -tt-*) 'to shave, cut with a sickle'; Malto *qerce* 'to scrape'; *qére* 'to shave'

DEDR 2491 Malayalam *cīntuka* 'to tear (as paper, leaves)'; *cīttu* 'a shred, strip', *īruka* 'to saw, split'; Parji *cīk-, cīkip-* (*cīkit-*) 'to tear', *cīŋg-* 'to be torn'

DEDR 1624 Tamil *kīṟu* (*kīṟi-*) 'to slit, tear, rend, cut, gash, slice'; Gondi *kirr, kīr* 'a wound', *keerkè* 'a bit or piece'

DEDR 1623 Tamil *kīṟu* (*kīṟi-*) 'to scratch, draw lines, scribble, write'; Gadaba *gīri* 'line'; Gondi *kirwānj* 'scratch', *gīt* 'line'

Examining the above forms, it is obvious that Krishnamurti's (2003) rule 14 of palatalization of velars (before non-back vowels) followed by rule 13 of affricate weakening and loss (*c* > *nil*) is occurring here. It is quite possible that the word for 'two' is derived from the word for 'cut, tear, split, scratch' or vice versa. We have forms like DEDR 1624 and DEDR 1623 with initial *k*, the palatalized forms DEDR 1612, DEDR 1564, and DEDR 2491, and the forms without initial consonant DEDR 479, DEDR 520, and DEDR 542. Therefore, one may assume that the Harappan word for 'two' was **kīr-*. It is also interesting to note that according to Blazek (2009: 70), loss of the expected initial **k* is not unprecedented in Dravidian, especially before back vowels (*ī* is not a back vowel). One is tempted to assume that loss of the initial *k* via *c* could be valid for the following forms also (however, such an assumption can be accepted only if at least one of the languages preserves the remnant of initial *k/c*):

DEDR 480 Tamil *iru* (*-pp-, -nt-*) 'to exist, remain, sit down, live, belong to' (dative of person); Kui *rīnda* (*rīndi-*) 'to be stable, steady, stand firm, stand still'

DEDR 481 Tamil *iru* 'great, spacious, vast', *irumai* 'greatness, largeness, hugeness, eminence'

DEDR 823 Kolamil *er-* (*e-, a-; edd-*) 'to become, happen, (story) is finished'; Brahui *ar-ē-* "emphatic present" stem of *anning* 'to be'

Therefore, we are tempted to phonetically read all the variations of 'two strokes' as *kir-* with the possible meanings as above. Mahadevan (1970) argued that as 'two strokes' (sign 99) follows the symbols which he identified as place names, it may represent **ir-* 'two' (DED 401) and **ir-* 'to be in place, to reside' (DED 407), which are used as locative and possessive suffixes. Mahadevan (2009b: 95) considered these strokes as conventional markers which cannot be "read". Mahadevan argued that when the sign is suffixed to a place name, it has the value of *iṉ/il*, which means 'of/in the'. Thus, sign 267 + sign 99 may be read as *mēl-aka-*(*tt*)*-iṉ/il* meaning 'of/in the High House' (Mahadevan 2009b).

According to Parpola (1976), 'two tall lines' stands for *veḷ*(*ḷi*) 'whiteness' and also 'star'. Mahadevan (2011) argued that 'two tall lines' (sign 87) has to be understood not as 'two' or 'second', but as 'pair' or 'twin'. The expression Yama means literally 'twin-born, twin or forming a pair' (Witzel, in Mahadevan 2011). Mahadevan (2011) pointed out that Cōkīraṉār, Cōkuttaṉār, and Cōkōvaṉār are names of Sangam poets. That means that Kīraṉ is a proper name attested in Old Tamil. It is quite possible that the sign 'two strokes in a jar' (sign 344) on each of the three sides of amulet 3305 (Parpola 1994) may be read as Kīraṉ, which could mean Yama or 'Lord' (according to Mahadevan, the top sign is to be read first in a compound sign).

What is the difference between superscript, 'stroke of the middle register', and tall line? Are they conventional markers? We do not have answers yet.

26. THREE PLACE NAMES: SIGN NO. 391 'SUN/WHEEL', SIGN NO. 267 'CITADEL/INNER HOUSE', SIGN NO. 284 'CITY'

Out of 98 composite personal names in Tamil Brahmi inscriptions, 25 begin with place names; out of the 473 names of the Sangam poets, 184 commence with place names. Hence, these symbols may represent place names, especially because of the presence of sign 99 'two strokes superscript' following these symbols (Mahadevan 1970), as explained earlier. They occur at the starting of the text, commence about 15% of inscriptions, and constitute independent blocks along with one of the three strokes (signs 97, 99, and 123); furthermore, the sequence following them can be shown to be separate words (Mahadevan 1970). Mahadevan (1986d) identified sign 267 as 'palace/temple', sign 284 as 'city', and sign 150 as 'closed crossroads'. They occur as "introductory" phrases which are optional and serve as an attribute of the succeeding substantive phrase in the text (Mahadevan 1986d).

27. SIGN NO. 391 'SUN/WHEEL'

The spoked wheel was not known in Indus. However, later on the wheel was associated with Kṛṣṇa, the Dharma, and Cakravartin and Vedic imagery of a solar wheel (Mahadevan 1975). Hence, sign 391 could represent something divine in Indus culture (Mahadevan 1975). In its round form, sign 391 is strikingly similar to some prominent symbols of kingship in Near Eastern as well as later Indian iconography and religion (Parpola 1994). Mahadevan (1970) identified the wheel symbol as 'sun' and its phonetic value as **vē-*(*- ṅk-/nt*) meaning 'in the temple, of the temple, among the persons in the temple, or belonging to the deity' when followed by a suffix. He explored Dravidian words of places/rivers starting with **vē-* to establish the possibility of it being a place name. Mahadevan (1970) pointed out:

> DEDR 5529 Tamil *vēntaṉ* 'king, Indra, sun, moon, Bṛhaspati', *vēntu* 'kingly position, kingdom, royalty, king, Indra', *vēttiyal* 'kingly nature'
>
> DEDR 5530 Parji *vẽdiḍ* 'god'; Gadaba *vēndiṭ* 'God'
>
> DEDR 4438 Tamil *pēy* 'devil, goblin, fiend', 'madness'; Malayalam *pē, pēyi* 'demon'; Gondi *pēn, pen, ven, pēnu* 'god', *peṇ* 'idol, god'; *pēnvor* 'priest'; Kui *pēnu, vēnu* 'a god, a spirit'

However, let us examine another word for 'sun':

> DEDR 4559 Tamil *poḻutu, pōḻtu, pōtu* 'time, opportunity', 'sun'; Gondi *poṛd* 'sun'
>
> DEDR 4558 Tamil *poḻil* 'park, forest, flower-garden', 'earth, world', 'country, district'
>
> DEDR 4555 Kannaḍa *poḻal* 'town, city'; Telugu *prōlu*, (inscriptional) *pḻōl*(*u*) 'city'

It gives us, among others, another important word for 'sun', which is *poḻutu* or **poḻil* and is associated with place names and therefore represents an alternative to Mahadevan's (1970) suggestion. However, it is only an assumption that the sign indicates 'wheel, sun' and a place name.

28. SIGN NO. 267 'CITADEL'

This ideogram is by far the most frequent opening sign in the initial position in the texts, suggesting that it represents the most important institution in the Harappan polity (Mahadevan 1981). It is the fourth most frequent sign in the Indus script and occurs 376 times (Mahadevan 1986b). The sign occurs 298 times at the commencement of texts, more than double the number of times for the next most frequent initial sign (Mahadevan 2009b).

The 'citadel' symbol was identified by the Finnish team (Mahadevan 1970: 47) as a conch by the collection of variants. Mahadevan (1970) identified the symbol as *cur/l̲/r̲-* because:

> DEDR 2684 Tamil *curi* (*-v-, -nt-*) 'to be spiral as a conch', 'whirl round, eddy (as water)'; Parji *cirḍ-* 'to turn'; Brahui *kūring* 'to roll up, make a clean sweep of'
>
> DEDR 2698 Tamil *cuḻi* (*-v-, -nt-*) 'to become curved, curled, involved', 'form eddies as on the surface of water'; Kui *ḍuṛi* 'rolling, writhing, tossing'
>
> DEDR 2715 Tamil *cuṟṟu* (*cuṟṟi-*) 'to revolve, circulate, turn around, spin', 'encircle, entwine, embrace'; Kuwi *sūtū* 'around', *hūcali* 'to put on clothes'
>
> Tamil Lexicon *cūl̲-al* 'place locality', *cūl̲-aka* 'fortified capital', *cūl̲-v-*ōr 'councillors, ministers'
>
> DEDR 684 Tamil *uḻi* 'place, site, side', *uḻai* 'place'; Malayalam *uḻa* 'place, especially about a king'
>
> DEDR 1821 Tamil *kuḻu* 'assembly, flock, herd, heap'; Parji *kuṛayp-* (*kuṛayt-*) 'to heap up'

Mahadevan (1970) argued that the word represents 'citadel' or 'acropolis', being the centre of religious and secular authority in Harappa. According to him, in Tamil there are terms like Akanagar (Maṇimēkalai 1.72) and Akanilay (Cilappatikāram 5.161) to represent the inner city, and terms like Puṟakkuṭy (Maṇimēkalai 28.4) and Puṟanilay (Cilappatikāram 5.180) to represent the outer city. Mahadevan (1970: 49) interpreted the symbol 'citadel' + 'two strokes' as 'in the citadel' or 'of the attendants'.

Mahadevan (2009b) reiterated that *cūl̲-* is a word related to 'temple/palace and attendants' but the word now no longer represented sign 267. Mahadevan (1981) rejected the 'conch' interpretation for sign 267, based on an exact match in an Egyptian ideogram which means 'castle, mansion, palace, temple, tomb'. Mahadevan (1981; 1986b) considered that the sign may represent either 'palace' or 'citadel complex' (within whose area the palace and the temple must have been situated), being the seat of authority or the power centre in the Harappan polity. Since the title 'Pharaoh' of the ancient Egyptian rulers literally meant 'Great House' (from *pr* 'house') and the Indus seals also refer to 'palace', the following entries are to be considered to identify the phonetic value of the sign (Mahadevan 1981: 10; 1986b):

> DED 8 Tamil *aka-m* 'house, place, inside', *aka-tt* 'within, in the house', *aka-tt-ān̲* 'master of the house, householder'

Accordingly, Mahadevan (1981) read sign 267 followed by 'two strokes' as *aka-tt* with the meaning 'of the (Great) House or Palace', used attributively with the names of persons or institutions connected with the palace. Mahadevan (1986b) is of the opinion that the sign and its phonetic value are related to the sage Agastya because, according to him, *aka-tt*-i means 'he of the house, master of the house, householder' in Dravidian. Further evidence that he offers includes the use of another name for Agastya, namely, Māna or Mānya, in the Ṛg Veda (here Mahadevan possibly refers to RV 1.184.4–5), which also means 'house' and 'related to house', according to Mahadevan (1986b; 2010a), based on Monier-Williams (1872).

Mahadevan (2009b; 2010a) also states that Aka-tt-i = 'Agastya, the sage' = Uḷḷirukkiṟavaṉ ('one who is in'). Mahadevan (2010a) opined that the ultimate source of the Sanskrit title Gṛhapati is the Harappan title Aka-tt-i. Mahadevan (1981; 1986b; 2009b; 2015) argued that Harappan *aka-tt-i* 'he of the (High) House' was the prototype of Indo-Aryan Agasti (Agastya) as well as Dravidian Akatti (Akattiya) of the Old Tamil legends. Mahadevan (2015) adds that Agastya is a title of an office rather than the name of an individual. Mahadevan (2009b) also points out that the *akatti* tree (*Agasti grandiflora*) is also called *agasti*. For Mahadevan, Agastya is a hyper-corrected form of Akatti. Let us examine this:

DEDR 5 Tamil *akatti, accam, acci* 'West Indian pea-tree, Sesbania grandiflora'; Kannaḍa *akace, agace, agase, agise* 'tree with large scarlet flowers, S. (or Aeschynomene) grandiflora'

The development shall be from **aka-cc-* > **aka-ct-* > **akast-* > *agas-* > *aga-* and not the other way round when we use rule 13b of Krishanamurti (2003), according to which the *c* > *t* change occurs irregularly in Dravidian languages; see also **aka-cc* > *aka-tt-*. If this is true for the name Agastya also, then Mahadevan's derivation of *aka-tt-* for Harappan 'palace/temple' or its connection with the sage needs correction and modification.

Mahadevan (2009b) argued, "The opening signs must then refer to important places or institutions present in every major Harappan settlement, like for example, 'temple, palace, citadel, walled city' etc. Some of the frequent opening signs may also represent important titles or offices, which would be much fewer in number than personal names, like for example, 'ruler, chief, priest, lord' etc. Judging from the extreme brevity of the Indus texts, it is much more likely that place names and common titles would be represented by single ideograms rather than by phonetic syllabic writing."

Mahadevan (1995: 10) further opined: "I am not however convinced by his [Parpola's] attempt to derive Meluhha [the name of the land of the Indus in the cuneiform texts] from Dravidian Mēl-akam, 'High country', not actually attested, as Parpola himself points out, in any of the Dravidian languages." Later, Mahadevan (2009b) observed that sign 267 appears to depict the ground plan of a building with a forecourt inside a fortified place, in other words, what is popularly known as 'citadel'. He interpreted sign 267 as Dravidian Mēl-akam literary 'the high (or great) place (or house) inside (the citadel)'. Here one may also note that Parpola (1976: 145) argued that *mēl* and *mēru* are the same because all original Indo-European *l* are *r* in the chief Ṛg Vedic dialect. In any case, sign 267 represents a fortified house (Mahadevan 2010; 2015). Later, Mahadevan (2009b: 92–93) notes: "Through constant use, the expression Mēl-akam [Melahha of the cuneiform records] came to represent the people and the land of the Indus Civilisation." One should also recollect that Mahadevan (2006) has already identified another sign (the upper part of sign 138, similar to sign 134) as a modifier and given it a meaning similar to Tamil *mēl* 'upper'. There is another problem here: when sign 261 and sign 284 are monosyllabic, why is sign 267 not also monosyllabic?

According to Mahadevan (2010a), the ancient name of Madurai was Matiray, as recorded in the earliest Tamil-Brahmi cave inscriptions from the second century BCE. The expression *matir*(*-ay*) can be interpreted in Dravidian as 'walled city'; according to Mahadevan (2010a):

DEDR 4692 Tamil *matil* 'wall around a fort, a fortification'; Telugu *maduru* 'coping of a wall'

DEDR 4689 Tamil *matalai* 'cornices on sides or front of a house'; Kota *madil* 'lintel of a doorway'

According to Mahadevan (2010a), when the Vēḷīr (Yādavās) migrated from Mathurā to the coastal regions of Sauraṣtra, Dravidian *matir*-(*ay*) was translated as Indo-Aryan Dwārakā, 'the walled city with (imposing) doorways'. Cuvaraṉ is used as (part of) a personal name in the Sangam Age (Mahadevan 1970). According to Mahadevan (1986b), Tuvarai is the ancient Tamil name for Dwārakā. Emeneau (1994) has noticed many irregular changes of *c-* > *t-* in many Dravidian languages. Also, according to rule 13b of Krishnamurti (2003), the *c* > *t* change occurs irregularly in Dravidian languages. Thus, it is possible that Cuvarai > Tuvarai 'walled city' and Cuvaraka > Dvārakā. That means *cuvarai* can be another possible reading for sign 267. We have:

DEDR 1975 Tamil *cuvar, cevar, cevr* 'wall'; Malayalam *cuvar, cumar* 'wall'

Let us examine one more possible alternative to read sign 267:

DEDR 2058 Tamil *koṭṭakai* 'shed with sloping roofs, cow-stall', 'marriage pandal'; Gondi *koṭa, koṭam* 'cow shed', *koṭka* 'shed'

DEDR 2203 Tamil *kōṭai* 'west wind', 'summer, intense heat of summer'; Malayalam *kōṭa* 'west wind, cool wind, west'

DEDR 2207 Tamil *kōṭṭai* 'fort, castle', *kōṭu* 'stronghold'; Malayalam *kōṭṭa* 'fort, residence'; Kuwi *kōṭa* 'palace, fort'

DEDR 2049 Tamil *koṭi* 'banner, flag, streamer', *kōṭu* 'summit of a hill, peak, mountain'; Gondi *koḍḍī* 'tender tip or shoot of a plant or tree', *koḍḍi* 'end, tip', *koḍi* 'point'

Thus, the sign may represent *kōṭ-*. There are many place names ending in *kōṭ/kōṭa/kōṭay*. Balakrishnan (2012: 46) equated 'high' with 'west' in Dravidian and opined that the citadel is westwards on the upper part of the geography, which fits the word meaning of *kōṭ-*. It is therefore possible to speculate that the city (or probably the entrance of the city) destroyed by Śiva Tripura could be *mū/mu-kōṭṭai*.

Mahadevan (2015) considered two words for representing the sign: *aka-* and *cūḻ-*. We have here examined other possible words. So far we do not have any clue to narrow our reading of the sign to one or two possible words.

29. SIGN NO. 261 AND SIGN NO. 373 'ENCLOSURE'

Mahadevan (1970) interpreted sign 373 'circle' as DED 8 Tamil *aka-m* 'inside, house'. He interpreted sign 169 inside sign 373 'circle' (sign 387) as *vēḻ-aka*, associated with *vēḻam, vēḷakam, viḷākam* in Old Tamil inscriptions (the quarters of the *vēḷir* regiments) and sign 162 inside 'circle' (sign 373) as *kōḻ-aka*.

Again, Mahadevan (2010a) argued that Vailasthānaka and Mahāvailastha in the Ṛg Veda (RV 1.133.3) seem to be hybrid loan translations from Dravidian *vēḻ-akam* 'the place of the *vēḷir*' vide *vēḻ* 'to sacrifice, a sacrifice' (DEDR 5544) > *vēḻ* 'a priest', *vēḷir* 'a class of ancient chiefs in the Tamil country' (DEDR 5545), *akam* 'house, place, inside' (DEDR 7). But this need not be true because one may interpret Vailasthānaka as Dravidian Vayal:

DEDR 5258 Tamil *vayal, vayakkal* 'paddy field, agricultural tract, open space, plain'; *vayalai* 'open space, plain'; Kuwi 'bayalu field'

Mahadevan (1981) interpreted the sign 'citadel' as *aka-* and considered sign 373 as a variation of sign 261. Mahadevan (1981) found that Old Tamil literature has several words for palace servants or attendants (derived from *akattu* or *akampu*) meaning 'inside (fort, palace or house)', such as Akattōṉ (DEDR 8), Akattaṭimai, Akattaṭiyāl, Akattoṇṭu, Akampaṭi, etc. (Tamil Lexicon). From this evidence he assumed that while 'palace' (sign 267) was associated with the ruling classes, 'enclosure' (signs 261/373) was related to minor functionaries like palace servants and attendants.

Sign 373 is similar to the sign for 'house' in the Proto-Sinaitic Semitic script and shows the usual variations of rectangular, rhomboid, and oval shapes (Mahadevan 1981). It also appears as a pair of brackets as a ligatured element in compound signs (Mahadevan 1981). Mahadevan did not give a phonetic value for this sign.

Mahadevan (2009a; 2009b) gave sign 373 a phonetic value of *akam* 'house, place, inside' (DEDR 7). Some more words in addition to what we have seen in Section 28 for 'house/enclosure' (and can represent sign 373) are:

DEDR 1655 Tamil *kuṭi* 'house, abode'; Gondi *kuṛma* 'hut, outhouse'

DEDR 4776 Tamil *maṉai* 'house, dwelling'; Koṇḍa *poṇḍeŋ* 'mane cowshed'

DEDR 494 Tamil *il* 'house, home, place'; Koṇḍa *ilu* 'house'

DEDR 4294 Tamil *purai* 'house, dwelling'

DEDR 5313 Tamil *vaḷai* (*-v-, -nt-*) 'to surround, angle, bracelet', *vaḷaical, vaḷaippu* 'enclosure, courtyard'; Telugu *balayu* 'to surround'

It is also possible for the word *cuvar* (DEDR 1975) meaning 'wall' to represent sign 373. The root *cūl̲-* 'to surround' (discussed in Section 28) can also represent sign 373. If we consider sign 373 as 'including bracket' or the 'oval form' as 'internal to' or 'inside of', then the word for it is *akam* or *akatt*. In fact, Mahadevan identified sign 267 as well as sign 373 as *akam*.

30. SIGN NO. 319 'ENCLOSED COURTYARD'

The Indus sign no. 319 appears to represent an 'enclosure' with a narrow, restricted entry or passage formed by the overlapping of the surrounding walls; as such, it is similar to Egyptian determinatives or ideograms representing walled enclosures (Mahadevan 1981). This motif is probably very ancient, deriving from Neolithic wooden palisades or reed shelters around human settlements or cattle pens (Mahadevan 1981). According to Mahadevan (1981), the whorl-like shape of the Indus ideogram suggests that the appropriate Dravidian root for such a type of enclosure is *cūl̲* 'to surround, encompass' (DED 2223), and words like Cūl̲akal̲irukkai 'a fortified capital' (Tamil Lexican), *cūl̲* 'to counsel' (DED 2257), etc. justify such a phonetic reading for sign 319.

It is worth noting that the Canān script of BCE 1300–900 has exactly the same symbol representing 'house'. We have already discussed the Dravidian words for 'house', one of which in principle could represent sign 319.

31. SIGN NO. 284 'CITY'

According to (Mahadevan 1970), the walls of the city and the streets intersecting at right angles unmistakably identify the symbol as that of a planned 'city'. He identified the word for 'city' as *pāl̲/ṇ/ṭ*(*-v*).

Let us examine:

DEDR 4112 Tamil *pāmi* 'temple', 'town, city, town of an agricultural tract, hermitage', *pāwn* 'town, village, district', *pa,wn,* 'paddy field, agricultural land, tank'

DEDR 4113 Kanna41 *pānn* 'row, line, regularity, regular order or way, method, rules'; Telugu *pālu* 'justice, propriety', 'nature, quality'; Sanskrit *pāli-* 'row, line, range'

DEDR 4110 Tamil *pāmilline, range* 'to go to ruin, be laid waste, become useless, be accursed (as a place or house)', *pā g* 'desolation', *pasola* 'unprofitableness', 'damage, ruin'; Gondi *pān* 'desert', *pār* 'a deserted village site', *pāre, pāg̲ village s* 'a village site'

DEDR 4114 Tamil *pāmil* 'metal cast in moulds'; Telugu *pālugucast i* 'ingot'

DEDR 4117 Tamil *pāḷaiyam* 'army, war-camp, village surrounded by hillocks'; Telugu *pāḷemu* 'guard, camp, army'

According to Mahadevan (1970), sign 284 stands specifically for the lower city in opposition to 'citadel' in the upper city. According to Parpola (1994), Mahadevan's assumptions have been criticized, as the find spots of the texts containing these signs do not correspond to the assumed meanings, there are no such parallels in old Tamil proper names, and they are not useful as addresses. According to Mahadevan (2010a), the identification of sign 284 as *pāḻi* is based not merely on etymology but also supported by frequent references in the Tamil Sangam poems to *pāḻi*, an ancient and prosperous city of the Tamil Vēḷīr clan.

Further, according to Mahadevan (2014), it is possible to also derive *pāṇṭi-* from *pāḻi* on the basis of the known development of *-ḻ- > -ṇṭ-* in Dravidian. See also:

> DEDR 3999 Tamil *paḻa* 'old', *paṇṭu* 'antiquity'
> DEDR 4004 Tamil *paḻu* 'ripen'; Telugu *paṇṭu* 'ripen'

Thus, *pāḻi > pāṇṭi-> pāṇṭi-aṉ* (the Pāṇṭiya dynastic name as nasalization of *-ṭ- > -ṇṭ-*) is common in Dravidian.

Mahadevan (2010a) argued that the Harappan cities must have been in ruin in the early Vedic times. The association of the word *armaka* with *vaila-* (< Dravidian Vēḷ) does raise another intriguing possibility. It is possible that Dravidian *pāḻi* 'city' (DEDR 4112) was in later times understood (not without reason) as *pāḻi* 'ruin' (DEDR 4110), resulting in the translation into Indo-Aryan *arma*(*ka*) 'ruined city' in the Ṛg Veda and early Sanskrit literature. This would explain how so many of the ruined cities had the suffix *-arma*(*ka*) tagged onto their individual names (also rendered into Sanskrit). The cities were identified earlier with their generic Dravidian name *pāḻi* '(planned) city', later understood as Indo-Aryan *-arma*(*ka*) when the 'city' turned into a 'ruin'.

According to Mahadevan (2010a), one of the *-arma*(*ka*) names compiled by Burrow from Pāṇini and the Kāśika commentary is Kukkuṭārma-, literally 'the ruined city of the cock'. Mahadevan (2010a) drew attention to an Indus seal from Mohenjo-daro (Marshall Seal No. 338) (Figure 3), which has an inscription featuring a pair of cocks followed by the ideogram for 'city' (sign 284).

For 'cock' we have:

> DEDR 2248 Tamil *kōḻi* 'gallinaceous fowl'; Naiki (Chanda) *gogoḍi, gogoṛi* 'cock'; Gondi *gōgōṛi, gugoṛī, ghogṛi, gogoṛ* 'cock'

The Naiki and Gondi forms may presuppose a proto form of the type **kōkōḻi > kōḻi* and **kōkōḻi > kukkuṭa*. Uṟaiyūr, the ancient Cōḻa capital in the Sangam Age, was also known as Kōḻi, literally, 'cock' (Mahadevan 2010a). The name is explained by the myth of a cock boldly confronting an elephant (Mahadevan 2010a).

Another observation of Mahadevan (2009a) is that there were many places in Tamil country called Kūṭal, which according to him were towns located at crossroads. Thus, Kūṭal can very well represent sign 284. Other than the 'cock' hypothesis, there is nothing which can connect *pāḻi* with *armaka*. Mahadevan (1981) hypothesized that *pāli dhvaja*, the flag of the Cālukyas, originally featured a motif based on the 'City of Four Quarters'. Accordingly, *pāḻi* is a plausible reading for sign 284.

Figure 3 Mohenjodaro bull seal 338

32. SIGN NO. 150 'CLOSED BROAD CROSS'

The 'closed crossroads' (sign 150) followed by a superscript suffix appears most often as an opening sign (Mahadevan 1981). Mahadevan (1970) interpreted this symbol as **aka-t-* meaning 'inside', that is, inside the citadel or temple palace. According to Mahadevan (1981), the 'closed crossroads' ideogram represents streets or quarters which were guarded, had restricted access, and were perhaps the quarters of the elite of the city (nobles or priests).

According to Mahadevan (1981; 2015), the word *cēri* denotes an exclusive part of a village either for the Brahmanas (as medieval temple inscriptions mention) or for the Pariahs (as in later usage) and hence should represent sign 150; DED 1669 Tamil *cēri* 'town, village, hamlet, street, passage, quarters'. Also according to Mahadevan (1981), *cēri* < **kēri*. We also have DEDR 2814 Tamil *cēr* (*-v-, -nt-*) 'to become united, incorporated, joined together'; Telugu *cērika* 'union, junction'; Koṇḍa *sērpu* 'neighbourhood'. Hence, it is possible that the 'closed crossroads' represents *cēri*.

33. SIGN NO 149 'OPEN CROSSROADS'

The **'**open crossroads' (sign 149) is rarely seen at the beginning of an inscription (Mahadevan 1981). Mahadevan (1970) interpreted this symbol as *puṟa* (outer city). According to Mahadevan (1981), sign 149 has no such exclusive connotation as that of sign 150, and it represents areas occupied by common people (agriculturists, herdsmen and other middle castes). According to Mahadevan (1981), the suitable word in Tamil for such areas is *pāṭiand*:

DED 3347 Tamil *pāṭi* 'town, city, village, hamlet, street, section or part of a village'

But according to DEDR, Tamil *pāṭakam* 'street, section of a village' is derived from Sanskrit *pāṭaka* 'a kind of village, half a village'. The following meanings for *pāṭi* are given: DEDR 4064 Tamil *pāṭi* 'town, city, hamlet, pastoral village'; *pāṭam* 'street, street of herdsmen'.

Mahadevan (1981) connected Akattiyan, Cēra, Cōḻa, and Pāṇṭiya to signs for 'palace' (sign 267), 'court' (sign 319), 'exclusive quarters' (sign 150), and 'ordinary quarters' (sign 149), and indicated that these names are related to place names. According to Mahadevan (1981), the ideographic identifications proposed by him, while still tentative, rest on more firm grounds than the linguistic parallels which require further study before they can be confirmed.

Mahadevan (2006) read sign 149 as 'street' and indirectly indicated that this could have the connotations of the word *pāṭi*. Mahadevan (2015) gave sign 149 a phonetic value of *pāṭi*. And Mahadevan (2014) gave the reading *pāṭi* as well as *vāḻi* for sign 149:

> DEDR 5297 Tamil *vaḻi* 'way, path, road'
>
> DEDR 5292 Tamil *vaḻaṅku* 'to move, proceed'; *vaḻakku* 'moving, passing (to and fro)'
>
> DEDR 5372 Tamil *vāḻ* 'to live, flourish'; *vāḻkkai* 'living, wealth, prosperity'; *vāḻvu* 'living, residence, prosperity, wealth'
>
> DEDR 5296 Tamil *vaḻi* (*-v-, -nt-*) 'to overflow, flow'; Koṇḍa *vaṛ-* (*-t-*) 'to drip down (as through a filter)'

We have already seen (in Section 31) that there were many places in Tamil country called *kūṭal* meaning 'junction'. Thus, *kūṭal* can also represent sign 149.

34. SIGN NO. 293 'CRESCENT MOON'

Mahadevan (2010a) juxtaposed *akam* 'inside (the fort) or the inner city' against *puṟam* 'outside (the city walls) or the outer city' and argued that sign 293 stood to represent the outer city. We have:

> DEDR 4205 Tamil *piṉ* 'back, rear part, end (as in place or time)', 'afterwards, subsequently', *puṟam, puṟaṉ* 'back'; Kurux *pisā* 'afterwards', *pistā* 'subsequent, later, subordinate'
>
> DEDR 4333 Tamil *puṟam, puṟaṉ* 'outside, exterior, that which is foreign', 'aspersion, calumny', adjective *puṟa-, puṟam-, puṟakku* 'outside', *piṟa* 'other things'
>
> DEDR 4422 Tamil *peṟu* (*peṟuv-, peṟṟ-*) 'to get, obtain, beget, generate, bear', *piṟa* (*-pp-, -nt-*) 'to be born, be produced'; *piṟai* 'crescent moon'; Gondi *pirr-* 'to sprout from the ground'

Mahadevan (2010a) derived the word for 'crescent moon' in Tamil *piṟa* from *peṟu* 'to beget'. He further argued that DEDR 4333 *puṟ-* 'out, outside, exterior' is interchangeable with *peṟ-* 'other, others, other things' and associated it with sign 293. While *piṟa* is an appropriate word for 'crescent moon', we do not know whether this word really represented sign 293.

35. SIGN NO. 216 'CRAB'

Heras (1953: 69) identified the symbol as a crab (and interpreted it as the name of a city), while the Finnish team (Parpola et al. 1969a: 30–31) regarded it as a drum (and interpreted it as a priest). Jeganathan (1997) identified the sign as a ligature of sign 373 and sign 216. According to Mahadevan (1970), the symbol is lying on its side and once it is turned right side up it tells us that it is the trunk of a body representing **iṟ*(*-ay*) 'lord' from DED 380 Tamil *iṭay* 'waist', DED 683 Kannaḍa *ede, erde*, and DED 448 Tamil *iṟai* 'lord, master chief'; he opined that it also represents the clan name *iṭai*, which is equivalent to Yādavas. The sign has the shape of forceps or tongs. DEDR 444 Tamil *iṭukki* 'pincers, tongs, forceps' is a word which is represented in

many languages of two branches of Dravidian and can match with Mahadevan's reading. Other words for tongs are DEDR 1843 *kuṟaṭu* and DEDR 2052 *koṭiṟu*.

36. SIGN NO. 254 'PLOUGH'

This symbol is similar to the Sumerian pictogram for a plough and is a frequent terminal symbol Mahadevan (1970). Heras (1953: 260) gave it a phonetic value of *uḻavar* and the Finnish team (Parpola et al. 1969: 31) a value of *mēṭi* (from *mēḻi* 'plough'). Mahadevan (1970) identified the symbol as *cēr* based on:

DED 2313 Tamil *cēr* 'plough'
DED 2312 Tamil *cēr* 'to be united'; Tamil Lexican *cēr* 'granary'

Mahadevan (1970) connected the Old Tamil names Cēra, Cē(r)ntan, Cērppan, and Cērvai to keepers of a granary. According to him, Cēdi kings and Halāyudha are related to this symbol.

We have DEDR 1979 Tamil *keḻuvu* (*keḻuvi-*) 'to unite, embrace', n. 'friendship', *keḻumu* (*keḻumi-*) 'to attain, join, unite', which could be related to DEDR 1505 Tamil *kāṟu* 'ploughshare'; Kuwi *karu* 'ploughshare', *kārru* 'plough', and DEDR 2815 Tamil *ēr, cēr* 'plough'; Kuwi *hērū* 'plough'. Therefore, one Proto-Dravidian word representing 'plough' could be *kāṟu/ *kāḻu*, from which *cēr* is derived.

37. SIGN NO. 336 'MORTAR AND PESTLE'

The 'mortar and pestle' sign comprises one of the dozen most frequent signs in the Indus script, occurring 236 times (Mahadevan 1984). The Finnish team (Parpola et al. 1969a: 37) identified the symbol as 'mortar and pestle' and interpreted it as representing a deity (Parpola et al. 1969c: 8–9). One of the frequent combinations involving the symbol is 'mortar and pestle' + 'three straight lines' + 'arrow' (Mahadevan 1970). Mahadevan (1970) connected the symbol to a wooden mortar sunk into the ground surrounded by wooden platforms. He related the symbol to the following words:

DED1391 Tamil *kuṭṭu* 'to pound'
DED 1539 Tamil *kuṟu, kuṟṟu, kuttu*
DED1383 Tamil *kuḍy* 'pit mortar'
DED 1389 Tamil *kuṭṭam, kuṭṭai* 'small pond, pool pit', *kuṇḍam, kuṇḍu* 'pond, pit'; Sanskrit *kuṇḍa* 'round hole for water or sacred fire'

According to Mahadevan (1970), the symbol stands for 'sacred pool', that is the great bath in Mohenjo-daro. Mahadevan further interpreted that the combination 'mortar and pestle' + 'three straight lines' + 'arrow' stands for *kuṟ-muṉṟ-ay*, representing the Old Tamil words *kuṭa-muni* or *kuṟu-muni*. According to him, this is the chief priest of the sacred pool, being none other than Agastya, who is said have been born in a water pitcher.

The sign is found engraved singly on the boss at the back of a unicorn seal (MIC 18), indicating its character as a meaningful word sign by itself (Mahadevan 1984). The identification of the cult object symbol on the unicorn seals as a sacred filter makes it likely that the 'mortar' sign is connected with the ritual pressing and extraction of the juice, as in the Soma sacrifice of the Ṛg Veda **(**Mahadevan 1984**)**. The sign may stand for 'mortar and pestle' or 'pressing' or even 'presser' **(**Mahadevan 1984). Let us examine some related words:

DEDR 1660 Tamil *kuṭai* (*-v-, -nt-*) 'hollow out, bore, perforate, penetrate', *kuṭā* 'cavity, cavern'; Toda *kuḏy* 'pit, mortar'

DEDR 1669 Tamil *kuṭṭam* 'depth, pond', *kuṇṭam* 'deep cavity, pit, pool'; Kui *kuṭṭ* 'a large pit'; Sanskrit *kuṇḍa-* 'round hole in the ground (for water or sacred fire), pit, well, spring'

DEDR 1671 Tamil *kuṭṭu* 'to cuff'; Malayalam *kuṭṭuka* 'to pound, cuff'; Kolami *kuḍk-* 'to pound (grain)'

DEDR 1726 Tamil *kuntāṇi* 'large mortar'

DEDR 1818 Tamil *kuḻi* 'pit, hole, hollow, cavity, depression, excavation, pond, well'; Pengo *kṛoy* 'pit, hole, ditch'

DEDR 1819 Tamil *kuḻavi* 'grinding pestle'

DEDR 1850 Tamil *kuṟu* 'to pound in a mortar, husk', *kuttu* 'to strike with the fist, cuff, pound (as in a mortar)'; Gondi *kurumānā* (*kurmsī*) 'to grind or pound grain in a mortar'

To read sign 336, one relevant Proto-Dravidian word appears to be * *kuḻ-*, from which we can get **kuḻ-t* > *kutt, kuṭ* and also **kuḻ-nt* > *kuṇṭ-*. Moreover, **kuḻ-* > *kur-* is also possible (Krishnamurti 2003). We also have:

DEDR 1844 Ta. *kuṟam* 'Kuṟava tribe', kuṟumpu 'petty chieftains', 'a class of savages supposed to form a part of the aborigines of south India', 'village'; Malayalam *kuṟuppu* 'a chief'; Gondi *kurmal* 'shepherd'

DEDR 1857 Tamil *kuṟumpu* 'stronghold, fort'; Kannada *kuṟumba* 'a man belonging to a fort'

DEDR 1897 Tamil *kūr* (*-v-,-nt-*) 'to covet, hanker after'; Malayalam *kūṟuka* 'to love, mind', *kūṟ, kūṟu* 'love', *kūṟṟān* 'friend, lover, protector'

Therefore, Mahadevan's (1970) reading of the sign as *kuṭ-/kuṟ-* is a reasonable one. Mahadevan (2011) revised his opinion regarding Agastya to read the sign combination 'mortar and pestle' + 'three long strokes' + 'arrow' as *kuṇṭa-mū-amp*(*u*) 'Senior Priestess of the (Sacred) Pool', who according to him later evolved as the 'elder mother goddess'. Earlier the Finnish team (Parpola et al. 1969a: 37) had identified the first two symbols as *kuṟ-muṉ* (Mahadevan 1970). Thus, a possible reading is *kuṟ-mū-mp* 'chief of kuṟ(u) tribe' or 'the leader of chiefs'. Mahadevan (1970) speculated on the possible combinations: 'mortar and pestle' + 'jar' and 'mortar and pestle' + 'arrow'. The former occurs four times but the later combination is not found (Mahadevan 1977) in Harappan script. There is no explanation for the non-occurrence of the latter.

38. SIGN NO. 393 'SKY' + 'SUN' + 'SHADOW'

Mahadevan (1970) identified the sign as 'moon'. It is not clear whether it has a shadow or two strokes; 'sky' and 'sun' occur as independent signs. Therefore, this sign could be a ligature.

39. SIGN NO. 249 'PILLAR WITH A BASE'

This is one of the commonest symbols, normally preceded by sign 169 or sign 162. The Finnish team (Parpola et al. 1969a: 36) identified it as a garden and interpreted it to represent 'great person' (Mahadevan 1970). The sign combination of sign 249 + sign 162 + 'jar' occurs 37 times and sign 249 + sign 169 + 'jar' occurs 44 times. One may look for a masculine proper name ending in these combinations. Mahadevan (1970) interpreted the symbol as **poti-k*(*-v*) based on:

DED 3746 Tamil *pōtikai* 'capital of a pillar, stake'; Old Tamil *potikai, potiyil* 'residence of Agastya, a *vēḷir* city, a hall of justice, assembly hall, platform under a tree in village commons'

40. SIGN NO. 244 'SCRIBE'

According to Mahadevan (1970), the symbol represents a row or series of lines within an enclosed space, and the only widely prevalent word for writing in Dravidian languages is **var-(v)*.

However, Parpola (1976) opined that sign 244 may stand for a house with rooms and hence *uḷ* (*oḷ, oḷi*), as it looks similar to Pakistani village houses; Hittite has a related figure for 'house'.

41. SIGN NO. 124 'SLANTING STROKE' + 'SHORT STROKE'

According to Langdon (1931), this symbol is similar to the Sumerian pictogram read as *bad* 'open' (Mahadevan 1970). Following this thread, Mahadevan connected this symbol with DED 2667 Tamil *tiṟa* 'to open' and assumed that *tiṟa* > *tēṟ* means 'faithful', 'trustworthy'.

Mahadevan (1970) read 'slanting stroke' + 'short stroke' + 'fish' as *tiṟa-miḷ* and derived *Tiṟa-miḷa* > *Dramiḷa* > *Dramiḍa* > *Drāviḍa*. The suggested phonetic change is plausible but that need not make this sign represent this word.

42. SIGN NO. 173 'TWO TOOTHED HEADS MOUNTED ON A SHAFT'

According to Mahadevan (1970), this sign is not the plural of Neṭu (sign 171) but should be read as DED 3195 Tamil *paṭai* 'weapons, arms, armed formations'. He cites Old Tamil inscriptions such as *paḍe-vaḷḷa* 'a general' to justify his reading.

43. SIGN NO. 230 'HILL'

This sign clearly represents 'hill' or 'mountain' (Mahadevan 1970). Mahadevan (1970) read this sign also as *kō*, corresponding to the Old Tamil *kōcar* and working class originally from the mountains: see DEDR 2178 Tamil *kō* 'mountain'; Kuwi *kui* 'up, above, west', *kūita* 'in the west'. As opposed to this, the *vēḷir* are from *veḷi* 'plains, open country' (DED 4526) and some of their names include *veḷi-* as a part (Mahadevan 1970).

There are other Proto-Dravidian words for 'mountain' but Mahadevan has selected *ko-*. However, the connection he attributed between *ko-* and the working class is doubtful because:

> DEDR 2177 Tamil *kō, kōṉ, kōmāṉ* 'emperor, king, great man, leadership', *kōyil* 'palace, temple', *kōyiṉmai, kōviṉmai, kōṉmai* 'royal dignity, arrogance'

44. SIGN NO. 253 'AXE OR KNIFE FIXED THROUGH A WOODEN HANDLE'

Mahadevan (1970) read this sign as **maḻ-* from DED 3889 Tamil *maḻu* 'axe, hatchet, axe with blade fastened through a wooden handle' and associated it with *maḻavar* or *maṟavar* 'a martial tribe of Tamil country'.

45. SIGN NO. 175 'WEED'

Mahadevan (1970) read this sign as *kaḷ-* from DED 1157 Tamil *kaḷ-* 'weed' and associated it with *kaḷḷar, kaḷavar* 'a martial tribe of Tamil country'.

46. SIGN NO. 264 'FOUR ROADS OUTSIDE A WALL'

Mahadevan (1970) read this sign as *puṟa-c-cēri* (outer suburbs) (an Old Tamil parallel) and contrasted it with sign 149 'open crossroads', which represents *puṟa*, and sign 150 'closed crossroads', which represents *aka*. He suggested that Tamil *puṟ*a (outer city) may be the basis of Sanskrit *pura* 'city'.

Mahadevan (1981) found that similar Sumerian signs represent a 'walled city' or 'sanctuary' and accordingly he modified his reading of the sign as representing some important place in the city at the crossroads, probably a common place for a meeting or assembly. According to Mahadevan (1981), Old Tamil works have preserved three expressions for a meeting place or assembly: *ampalam* (DED 145), *potiyil* (from DED 3684 *potu* 'common'), and *maṇṭu* (DED 3913). He opined that *potiyi*l (from *potu-il* 'common house') comes closest to the ideographic motif because of the association of Akattiyan with Potiyil.

47. SIGN NO. 47 AND SIGN NO. 48 'SEATED PERSONAGES'

According to Mahadevan (1999), "There are two near identical signs in this group, no. 47 and no. 48 depicting seated personages reminiscent of very similar representations of deities in the Egyptian hieroglyphic script, in which a seated figure functions as the determinative for 'God'." This symbol occurs frequently on votive texts. The Finnish team (Parpola et al. 1996c: 25–26) suggested this to be a human in sitting posture (indicating dignity) and identified it as the mother goddess Ammā (Mahadevan 1970). However, Mahadevan (1970) considered it as representing an infant and gave the phonetic value of **eḷa-* (DED 436) 'young, tender'.

Mahadevan (1999) observed that two defining characteristics of Harappan sign 48 are: (1) a skeletal body with a prominent row of ribs; and (2) the figure being seated on his haunches, body bent and contracted, with lower limbs folded and knees drawn up. Mahadevan (1999) considered sign 47 to represent 'deity' and the modification of it in sign 48 to represent a particular deity. According to him, the skeletal figure appears to be a symbolic representation of the dead (or rather the spirit of the dead) or the manes (souls of the 'Fathers') or a demonic deity, suggesting some form of ancestor worship. According to him, it may represent Sanskrit *prēta* or Tamil *pēy* 'devil, goblin, fiend' (DEDR 4438).

Mahadevan (1999) observed that some scholars interpreted the figure as a horse and therefore connected sign 48 with the myth of Dadhyanca (who is said to have a horse head). According to him, the term is derived from *dadhi* 'curd' and is a loan translation. The related words in Dravidian are:

DEDR 4902 Tamil *mucar* 'buttermilk, curds'
DEDR 4903 Tamil *muci* 'to grow thin, to be emaciated'
DEDR 4972 Kannada *muruṭu, muraṭu, muruṇṭu* 'to shrink, shrivel'
DEDR 4977 Tamil *muri* (*-v-,-nt-*) 'to bend; murivu contracting, fold'
DEDR 4971 Tamil *muraṭu* 'ill-temper, wildness, rudeness', *muraṇ* 'fight, battle, strength'
DEDR 4975 Tamil *murukku* (*murukki-*) 'to destroy, crush, ruin, kill'
DEDR 4969 Tamil *murañcu* (*murañci-*) 'to mature, be old, ancient', *mūri* 'antiquity, old age'

From the above, Mahadevan (1999) deduced that the original word was **mūr-/mur-V*, which represented a fierce god, destroyer, or hunter. According to Mahadevan (1999), he is Muruku

(Murukan), the primitive god of the Tamils. But *muc-* and *mur-* are phonetically different and hence any connection between 'curd' and *muruku* is ruled out.

Let us examine another set of words connected to 'curd' (to see if sign 48 has any relation to the story of Dadhyanca at all):

DEDR 4411 Tamil *peru, perum, pēr* 'great', *periya* 'large, great, elder, important'
DEDR 4418 Gondi *peṛeka, peṛka, peṛeŋka, penˀka* 'bone', *peṛekā* 'backbone, rib'
DEDR 4005 Ta. *paḻu* 'rib, side of the body'; Koṇḍa *paṛka* 'side', *paṛka ḍumu* 'rib'
DEDR 4421 Tamil *peruku* 'curdled milk'; Naiki *perag, perg* 'curds'
DEDR 4438 Tamil *pēy* 'devil, goblin, fiend'; Gondi *pēn pēn, pen, ven, pēnu* 'god', *peṇ* 'idol, god', *pēnvor* priest; Kuwi *pēnū, pēnu* 'god', *pēnu* 'devil', *pēne'esi, pēneˀesi* 'deceased person'

Here *per-* is related to 'curd', 'bone/rib', and 'lord'. It is possible that **Per-* > *prē-* (by metathesis) (rule 6 of Krishnamurti 2003) > *pē-*. If one believes in Mahadevan's (1999) argument, then **per-* is a better word for sign 48, as it means 'curd, great, god, rib' and also is related to *pēy*.

The sign 48 + 'jar' combination occurs 114 times; sign 48 is not found paired with 'arrow' and sign 47 is not followed by 'jar'. This is not expected if the 'jar' and 'arrow' signs are gender suffixes; otherwise some gender bias is there for the other two signs. This point supports Mahadevan's (1999) argument that sign 48 represents a specific deity, possibly Muruku, so that sign 48 + 'jar' is *murukaṉ̲r̲*.

48. SIGN NO. 44 'MAN HOLDING A CUP'

Keeping in mind the discussions in Sections 9 and 10, we have three more cases of votive/sacrificial inscriptions. Knorozov (1976) observed that sometimes the cup sign is replaced by a 'kneeling adorant with a cup' (sign 45) or a 'dancing adorant with a cup' (sign 44). There is also a case in which 'man with bow and arrow' (sign 28) is preceded by the 'cup' sign.

But Mahadevan (1970) read sign 44 as *iḷa-ku* 'to lift one's body slightly from the ground '(DED 432), connecting it to *iḷa*, the old Tamil epithet for the *kōcar* tribe. Mahadevan (1970) connected *iḷamkōcar* with the rulers of Kauśāmbī, which can only be proved by further historical research. Mahadevan's (1970) reading of sign 44 is highly improbable, as it does not take into consideration the actual environment of the inscriptions in which the sign appears.

49. SIGN NO. 78 'BIRD'

Mahadevan (1982b) hinted that sign 78 could represent a bird.

50. SIGN NO. 121 'TWELVE STROKES'

The sign with twelve strokes arranged in three tiers does not function as a numeral, as the number of strokes is found to be variable and the occasional zigzag arrangement of the tiers and doubling of the sign are features not shared by the numeral signs (Mahadevan 1989). According to Mahadevan, elsewhere actual numerals are used in ideographic (non-numeral) function especially when they appear as fixed numbers in set combinations, as in 'VII-CITY' or 'III-FENCE'. Mahadevan (1970) earlier commented that a fixed numeral sign in a block generally indicates a homophone and not a number. The largest numbers identified so far are 35 and 76, occurring on two bronze axes (6306, 2925) (Mahadevan 1989).

51. SIGN NO. 112 + SIGN NO. 194 'SEVEN CITIES'

According to Mahadevan (1989), (1) L.A. Waddel identified this pair of signs with the Sumerian equivalents Imina Bara and suggested the meaning 'Heavenly House', (2) F.W. Thomas pointed out that the Indus sign 194 is "too similar" to the Sumerian sign for 'city wall', (3) Kinnier Wilson equated the Indus sign pair with Sumerian Imin Bad meaning 'Seven (walled) Cities', and (4) H.W. Bailey pointed out the apparent equivalence of Sumerian Bad Imin with Sapta Sindhava in the Ṛg Veda and Hapta Hindu in the Avesta.

Mahadevan (1989) found an exact equivalent in Tamil *ēḻ-eyil* meaning 'Seven (walled) City' occurring in Puṟanāṉūṟu (33:8), a compilation of bardic poetry dating from about the beginning of the Common Era but probably incorporating much earlier traditions. Mahadevan (1989) also found another variant *ēḻ-il* meaning 'Seven House', a name which appears to be equally ancient and occurs seven times in five anthologies of old Tamil Sangam poetry belonging to the same age. However *ēḻil* (<*eḻil*) could be 'high house'; thus, sign 194 could simply mean *il* 'house'. Accordingly, *eḻil* is a possible reading for 'seven strokes' + sign 194/197.

Probably *keḻu* > *eḻu* = 'high', 'seven' (we have earlier discussed the loss of initial *k*). We have DEDR 1979 Tamil *keḻuvu* (*keḻuvi-*) 'to unite, embrace', *kiḻamai* 'friendship, alliance, relationship', 'day of the week (as related to each of the seven planets)', *kiḻavaṉ, kiḻavōṉ* 'owner, master, husband'; Kannada *kēḻi* 'line, series, group, flock, troop, heap'.

Sign 194 occurs 58 times, never solus. 'Seven short strokes' + sign 194 + 'jar' occurs 14 times, twice solus. 'Seven short strokes' + sign 194 occurs 27 times. Sign 194 + 'jar' also occurs 27 times. Sign 197 occurs 60 times, once solus. 'Seven short strokes' + sign 197 + 'jar' occurs 12 times, never solus. 'Seven short strokes' + sign 197 also occurs 14 times.

According to Parpola (1994: 223), the word *liṅga* can be derived from the Proto-Dravidian root **niṅg/nig* 'to rise, become erect, stand up right, be extended'. It is possible for **nil-nk* to mean 'standing' and could represent a building. Sign 197 could be a building but Parpola (1994) interprets it as 'phallus'. It is possible that **Nil-nk* > *Ilnka* > *Iringa* (Avestan).

In old Tamil country, *aṉ* along with place name was used to denote the king. For example, the king of Koṅk was Koṅk-aṉ. Sign 194/197 as well as other signs which Mahdevan identifies as place names are followed by the 'jar' sign. Therefore, sign 194/197 + 'jar' could denote the ruler.

52. AGRICULTURAL TERMS

Mahadevan (2006) interpreted all signs that he called "agriculture signs" as belonging to a single class. This class includes signs 38, 137, 138, 139, 140, 141, 142, 143, 144, 145, 162, 163, 164, 165, and 166. He further classified sign 137, 141, and 162 as basic signs and the other signs as modified signs using modifying elements such as: (1) 'sky' modifying signs 139 and 142, (2) 'one eighth' modifying signs 140, 143, and 164, (3) 'upper' modifying signs 138 and 163, (4) 'streets' (sign 149) modifying sign 144, and (5) 'harrow' (sign 176) modifying signs 38, 145, 165, and 166.

Mahadevan (2006) brought together the "agriculture signs" with an underlying assumption that they indicated words related to the sharing of agricultural products. This assumption may not necessarily be correct, as the combined syllables need not have anything to do with agricultural products or their sharing. However, Mahadevan (2006) argued that the modifying elements modify the sense and not the sound of the basic signs. That means the additions are semantic and not phonetic. Mahadevan (2006) also argued that it is not necessary that a

compound sign have two phonetic elements, as it may be a single word. This led Mahadevan (2006: 74) to conclude that "one is left with the impression that the Indus script, even in its mature stage, appears to be a limited type of writing, comprising almost wholly of word-signs which represent matters of interest to the ruling classes. Such redundancy, as seen even in this limited set of signs, is not expected to be present if the script had reached a more advanced stage as Sumerian or Egyptian."

There is one basic problem in treating these signs as a class of signs representing some type of sharing of agricultural products: they appear in a wide variety of contexts. To overcome this problem, Mahadevan (2006) suggested that the signs can also be interpreted, when warranted by the context, as the corresponding personal nouns.

53. SIGN NO. 137 'DIVIDE'

The X-like sign 137 is one of the simplest in the Indus script and is near identical to the ideogram in the Egyptian hieroglyphic script which means 'to divide' (Mahadevan 2006). He interpreted sign 137 of X as 'to divide, share (as grain)'. He indicated (but did not explicitly state) a phonetic value of *vāram* for the sign.

54. SIGN NO. 141 'SHARE OF A CROP'

According to Mahadevan (2006), sign 141 (which he interpreted as 'share of a crop') indicates a combination of the X-like element 'to share' with a pair of tall vertical lines representing 'grain stalks'. He assumed that the graphic variants of the sign indicate that the sign represented 'bundles of grain stalks tied in the middle'. If so, then it could not be a compound sign of X and two parallel lines.

Mahadevan did not give a phonetic value for the double-line sign. According to Parpola (1994), the sign X is redundant in the compound sign in some examples and is added to ensure a correct reading. Mahadevan (2006) indicated (but did not explicitly state) a phonetic value of *vāram* for the sign.

55. SIGN NO. 162 *VIḶAI*

Mahadevan (1970) interpreted Sign 162 as 'closed hand' and sign 169 as 'open hand'. These symbols occupy about three percent of the textual matter, their most marked characteristics being prefixed numerals. According to Mahadevan (1970), just like the 'fish' sign these symbols represent the phratry number of the person mentioned in the seal. He found that Valaṅkai Vēḷaikkārar and Kaikkōḷar are elite forces of the Cōḷa army. Mahadevan (1970) connected *viḷ* (*veḷ*) 'to open, expand, spread out' (DED 4459, 3446) and *kōḷ* 'seize, hold, grasp' (DED 1788) to sign 169 and sign 162, respectively, based on the assumption that the symbols represent 'open hand' and 'closed hand'. Knorozov (1976) opined that the sign represented 'palm of hand'. The *canān*/Phoenician script of BCE 1300–900 has exactly the same symbol representing 'palm of hand' (LeBlanc 2013).

Mahadevan (2006) modified his opinion to explain sign 162 as a self-evident ideogram for 'crop' and stated that *viḷai* is the most common expression for 'crop' in Dravidian languages. If that is so, why would he read and interpret the sign combinations such as 'three strokes' + sign 162? Part of one inscription (M-494 and M-495, both identical) (Parpola 1994) ends with a sequence 'three cups' + sign 162. If we consider three repeated cups as 'three' + 'cup' and

assume that it indicates some quantity, then we may assume sign 162 to be some agricultural product measurable in pots. We have many occurrences of sign 162 preceded by short strokes solus. All these cases may be of the same agricultural product measurable in numbers. If the identification is correct, we have:

> DEDR 5437 Tamil *viḷai* (*-v-, -nt-*) 'to be produced, be productive, result, mature, ripen (as grain), occur'; Telugu *velayu* 'to thrive, prevail'

The Proto-Dravidian form could be **veḷa* or **vēḷ* (rule 4b of Krishnamurthi 2003). Mahadevan (2009b) quoted Raghavaiyangar as pointing out that *vēḷ* means 'one who performs a sacrifice' (namely a 'priest'). Whether the sign is identified as 'palm of the hand' or 'crop', the phonetic value assigned by Mahadevan is almost the same. Therefore, if we read sign 162 syllabically it could be *veḷa* or *vēḷ* and 'three strokes' + sign 162 could be *mū-vēḷ*, a proper name, position, or title. Thus, number + sign 162 could indicate phratry or title. Parpola (1994) considered signs 162 and 169 as variants of the same sign.

56. SIGN NO. 139 'SKY' + 'DIVIDE'

Mahadevan (2006) called the upper part of sign 139 a modifying element. He interpreted it as representing 'sky' and indicated that it is represented by the word *mītu* in Tamil: see Tamil Lexicon *mītu* 'top, outer or upper surface', 'elevated place'. Other words in Tamil for the symbol could be *mēl* or *vān*. Mahadevan (2006) read the compound sign 139 as something like *mītu-vāram* 'god's share of grain'. It is unlikely that *mītu* is a Proto-Dravidian word.

Parpola (1994) observed that sign 139 occurs in contexts parallel to those of the 'man' sign. If one assumes that the language is Dravidian, a possible word for the 'man' sign is *āḷ* (discussed in Section 6). Can the 'sky' sign represent *āḷ* with a meaning of 'upper'? Let us examine:

> DEDR 93 Tamil *aṭṭam* 'terraced roof, upper story'
>
> DEDR 295 Tamil *aḷa* (*-pp-, -nt-*) 'to measure, limit, define'
>
> DEDR 307 Kannada *aḷur* 'to enclose, cover'; Telugu *alamu* 'to spread, extend, overspread (of smoke over the sky)'
>
> DEDR 300 Tamil *āmpi, ampi* 'common mushroom'; Malayalam *aḷāmbu* 'a variety of mushroom'

The word *aḷāmbu* for mushroom is probably derived from its umbrella-like structure. Possibly *aḷ-tt-* > *aṭṭ-*, which means *aḷ*, could signify 'roof', 'limit', 'cover', 'something that extends or spreads', etc. Otherwise it means that *aḷ* could have connotations of 'sky'. Hence, Parpola (1994) could be right.

57. SIGN NO. 142 'SKY' + SIGN 141

Mahadevan (2006) read the compound sign as 'god's share of the crop' without assigning a phonetic value to sign 141.

58. SIGN NO. 140 'ONE EIGHTH OF X'

Mahadevan (2006) read sign 140 as one eighth of a share of an item/grain. He argued that there is evidence that one eighth was the state's share of produce. The Tamil word for one eighth of a measure is DEDR 397 Tamil *āḻākku, aḻakku, aḻākku* 'ollock, one eighth of a measure'.

If we try to give it a phonetic reading, it may be something like *āḷ-vāram*. In Dravidian, *vāḷ* or *āḷ* means 'to rule'. Therefore, it looks to justify Mahadevan's (2006) claim that one eighth is the state's share. But there is another possibility: it could be a ligature of an item placed inside eight strokes (in two rows). Parpola (1994) gave such an interpretation for sign 289 of three double strokes and a single stroke around a wave, which according to him is a ligature of 'seven single strokes' (sign 112) + 'wave' (sign 287).

59. SIGN NO. 143 AND SIGN NO. 164

Mahadevan (2006) read both signs 143 and 164 as one eighth of a share of a crop.

60. 'SLANTING ROOF'

Mahadevan (2006) called the 'slanting roof' (upper part of sign 138) a modifier and opined that it could be similar to Tamil *mēl* meaning 'upper'. Proto-Dravidian **mēl* means 'upper', according to Krishnamurti (2003). The same sign was read by Parpola (1988) as **mey-* 'to roof' with the intended meaning **may-* 'black'. Another possible Dravidian word for the sign could be:

DEDR 2054 Tamil *koṭu* 'curved, bent, crooked'
DEDR 2058 Tamil *koṭṭakai* 'shed with sloping roofs, cow-stall', 'marriage pandal'

Also, the modifier appears to be similar to sign 134. Mahadevan (2006) read compound sign 138 as 'upper share of the grain', which could mean something similar to *mēl vāram* of Tamil country. However, Mahadevan (2011) interpreted the roof symbol as *vāṉ* 'sky' and the 'roofed fish' as *vāṉ* (*mīṉ*) 'celestial (water nymph)'. The 'slanting roof' symbol could be represented by the following words in Dravidian: *mēl*, *vān*, *pura*, *aḷ*, *koṭu*, and *mey*.

61. SIGN NO. 163

Mahadevan (2006) read compound sign 163 as 'upper share of crop'.

62. SIGN NO. 144

This is a solitary sign with a single frequency (Mahadevan 1977). Mahadevan (2006) considered sign 144 as a compound sign and read it as 'streets' share of crop' consisting of sign 149 'street' and sign 141 'share of crop'. He observed that there is a term known as *pāṭi kāval* in Tamil inscriptions, which was used for a levy for guarding the streets.

It is doubtful whether the sign 'excluding bracket' in sign 144 is the 'street' sign. If we consider the brackets as 'external to' or 'outside of', then the word is *pur-* (see Section 34).

63. SIGN NO. 38

Mahadevan (2006) identified sign 38 as a compound sign consisting of sign 176 'harrow' and sign 1 'the man', representing 'plough man' or 'farmer'. He found that there is a word in Tamil Kuṭiyāḷ 'tenant', where *āḷ* means 'man, tenant, labour' (DEDR 399). There is a word related to *kuṭi* having the meaning 'harrow': DEDR 1689 Kannada *kuṇṭe* 'a harrow, the web-beam in a loom'; Telugu *guṇṭaka* 'a harrow'.

If we take this phonetic value for the 'harrow' sign here (treating sign 38 as a compound sign), then it is difficult to explain the position of the 'harrow' sign as a terminal sign. The 'harrow' sign otherwise never occurs initially. Sign 38 occurs once in combination with the 'harrow' sign, twice with the 'jar' sign, and once with sign 375 (in all these cases, the other sign is the terminal sign). It occurs once as a terminal sign and once solus.

64. SIGN NO. 145, SIGN NO. 165, AND SIGN NO. 166

Mahadevan (2006) interpreted all these three compound signs as 'tenant's share of the crop'. According to Mahadevan, sign 145 is interpreted as a compound of 'share' (X-like element), 'grain stalks' (pair of tall vertical lines), and the 'harrow'. The compound sign means 'share of the crop due to the tenant farmer'. Mahadevan (2006) found that the word in Tamil *kuṭi-vāram* 'share of the produce to which a farmer is entitled', which he claimed to represent sign 38, could also represent a similar idea as these signs.

65. SIGN NO. 358 'TWO OPEN HANDS' AND SIGN NO. 347 'TWO CLOSED HANDS'

Sign 347 is preceded by six short strokes ten times, out of which six times are solus; sign 358 follows six short strokes only twice. Sign 347 occurs 212 times, thrice solus and 90 times final. Sign 358 occurs 240 times, once solus and 30 times final. Mahadevan (1970) gave the same value as 169 and 162 for these two symbols and opined that they represent masculine singular personal names as they are followed by the 'jar' sign.

66. SIGN NO. 78 'PARTRIDGE'

Mahadevan (2011) identified the Tamil name for 'partridge' as *pūḻ*. Cēra kings were known as *pūḻiyar* and their land *pūḻi-nāṭu* is identified as *koṇkāṇam* in South Konkan (Mahadevan 2011). Mahadevan opined that *puru* people are identical with the *pūḻ* clan. Mahadevan's (2011) interpretation of 'partridge' + 'fish in brackets' (sign 64) as 'he of the partridge clan (*pūru-*) calling (*-ravas*) the fish (Apsaras)' appears to be far-fetched.

67. SIGN NO. 130 'HOOK'

The elongated Z-shaped sign depicts a 'hook'; the S-shaped copper fish hook excavated at Khirsara, a Harappan site in Gujarat, offers a close parallel (Mahadevan 2014). Mahadevan (2014) adds:

> DEDR 2151 Tamil *koḷuttu* 'to cause to hold, a clasp', *kōḷ* 'holding'
>
> DEDR 2151 Tamil *koḷ* 'to receive, buy, acquire', *koḷvōṉ* 'buyer'
>
> DEDR 2761 Tamil *ceṭil* 'hook machine' (a post with a long sweep from which a person under a vow is suspended by a hook fastened into the integuments of their back)
>
> DEDR 2759 Tamil *ceṭi* 'light, splendour'; Tamil *-koḷḷi* as in *kāppu-k-koḷḷi* 'one who receives protection' (Tēvāram 5.95.3), *nīr koḷḷi* 'reservoir holding water' (Glossary of Tamil Inscriptions)

According to Mahadevan (2014), an alternative linguistic interpretation can be given to the 'hook' sign: *ceṭ*(*i*) with the intended meaning 'lightning, thunderbolt' from which the Pāṇṭiya dynastic name Ceḻiyaṉ can be derived, as there was a tendency in Old Tamil for *-ṭ-* (phonetically *-ḍ-*) to alternate with *-ḻ-*. This argument is not acceptable because *ceḻi* means something different:

DEDR 2789 Tamil *ceḻi* (*-pp-, -tt-*) 'to thrive, flourish, grow well as vegetation, prosper (as kingdom, family, country), be fertile, be superabundant, be cheerful as countenance', *ceḻumai* 'flourishing condition, greatness, excellence, splendour, beauty, gracefulness, verdure'

According to Mahadevan (2014), the Tamil tradition has preserved the memory of a hook-like legendary weapon known as the *ceṇṭu*, which was mostly associated with the Pāṇṭiya dynasty. We may note that DEDR 2158 Tamil *koḷḷi* 'firebrand, fire' is similar in meaning to *ceṭ*(*i*). Gurov (1976) assigned a phonetic value of *koṭ-* to this sign, with a meaning of 'to give'. Furthermore, *koḷ-* is an appropriate word for 'hook' in Dravidian.

68. SIGN NO. 51 'WOLF'

According to Hunter (1934: 81), the sign shows 'the tail, back, two ears and hind legs of an animal', which he identified as the jackal "from the shape of its ears" (Mahadevan 2014: 2–3). According to Mahadevan (2014: 3), the animal is more likely to be a wolf as it looks larger and its tail is curled up: "The fact that only the back of the animal is shown is made clear by the closely hatched lines drawn over it, and the absence of the face which seems averted. The unusual portrayal indicates that the sign is an ideogram conveying some meaning connected with the posture rather than with the animal as such." Thus, according to Mahadevan, the sign actually depicts the 'back of the wolf', labelled 'wolf' for brevity. Mahadevan (2014) adds that the critical features of the ideogram are: (a) a change in the normal position; an exchange of front and back (of the animal); and (b) the face (of the animal) being averted or hidden. According to Mahadevan (2014), the literal meaning of the sign is 'turn back (showing one's back)', 'exchange, hide, conceal' because:

DEDR 4761 Tamil *maṟi* 'to turn back, turn about'

DEDR 4834 Tamil *māṟu* 'to become changed, exchanged, retreat (as showing one's back)'

DEDR 4760 Tamil *maṟai* 'to hide, conceal, concealment, secret'

DEDR 4834 Tamil *māṟu* 'exchange of goods, barter, sell'

The Tamil Lexicon has *māṟi* 'one who barters goods' and Kannada has *māṟ-āḷ-i* 'barterer' (DEDR 4834) (Mahadevan 2014). The corresponding personal noun *māṟ-aṉ* does not mean 'barterer' in Tamil but is used as 'a dynastic name of the Pāṇṭiya kings' most probably because in very remote times the Pāṇṭiyar were traders (Mahadevan 2014). If Mahadevan's reading is correct, *māṟ-aṉ* should be represented by 'wolf' + 'jar'; this sign combination has a frequency of 13 in the Indus script. However, *maṟ-* has gained other meanings. For example:

DEDR 4763 Tamil *maṟam* 'valour, bravery, anger, wrath, enmity, hatred, strength, power, victory, war, killing, murder, Yama'

DEDR 4767 Tamil *maṟu* 'stigma, blemish, fault, stain, blot, spot, sign, symbol, mole, freckle'

Therefore, *māṟ-aṉ* could be 'brave one' or 'one with a mole/sign' (Viṣṇu).

According to Mahadevan (2014), the 'protuberance' covering generally only one of the ears as 'braided and knotted hair' worn in a slanting manner indicates the anthropomorphic character of the sign. He adds that this feature seems to have survived in the Old Tamil tradition as *kuṭumi* 'knotted hair' worn in different styles. According to him, the *kuṭumi* was associated with Lord Śiva as well as the Pāṇṭiya dynasty.

DEDR 2049 Tamil *kuṭumi* 'tuft of hair (especially of men)'

According to Mahadevan (2014), the epithet *kuṭumi* applied to Lord Śiva and the Pāṇṭiya rulers seems to have been largely replaced in the medieval period by the synonym Caṭaiyaṉ derived from Sanskrit *jaṭā* 'braided or knotted hair'. In the Tamil country, Śiva seems to have acquired the epithet Caṭaiyaṉ, most probably only from the medieval period, as the epithet is not found in Sangam literature.

Despite this interpretation, there is a serious issue with the identification of sign no 51. Parpola (1994; 2010) identified a sign which, according to him, represents a squirrel with its tail up, head down, and four feet clinging to a tree. Mahadevan (1995) endorsed this reading. Earlier, Mahadevan (1977) identified this sign (listed as no. 1400 in his concordance) as a variation of sign no. 51. Considering his description, it is quite possible that Parpola's (1994; 2010) identification is correct. This casts a big question mark on the whole effort by Mahadevan (2014) in interpreting sign no. 51.

69. INDUS PHRASE

During his earlier stage of decipherment, Mahadevan used the rebus principle to decipher the pictograms, but later on he started adopting a more pictographic interpretation. Again, however, Mahadevan (2014) returned to rebus/phonetic readings.

He read 'wolf' + 'hook' + 'open crossroads' + 'jar' as *māṟ-koḷ-pāṭ-*(*a*)*ṉṟ* 'barter-receiving-settlement-he of the', or in short 'merchant of the city'. He also gave an alternate reading to the same set of signs as *māṟa-ceḻi-a vaḻuti/pāṇṭi-*aṉ meaning 'barterer-he of lightning/thunderbolt-the prosperous one-he of the city'.

This four-sign phrase is found in a Unicorn seal text from Mohenjo-daro (CISI II: M-857) (Mahadevan 2014). This could be the name of a merchant. It could also be the name of a god. And both could be complementary. Thus, Mahadevan's reading is a possible one, but there is no real evidence to confirm it and there is serious doubt regarding the identification of sign no. 51 as 'wolf'.

It is worth noting that Mahadevan (2014: 11) made a significant statement: "As a result of the migration, the Indus-Dravidian language influenced Proto-South Dravidian and through it, the earliest South Dravidian literary languages, especially Old Tamil." This makes it clear that according to Mahadevan, Indus Dravidian is different from Proto-South Dravidian.

70. PŪṢAN

The name of Pūṣan, if remembered at all, became a synonym for the sun as a post-Vedic development (Mahadevan 2014). However, the oft-recurring basic feature of Pūṣan's activity is that "he knows the paths, shows the paths, (and) leads the paths" (Mahadevan 2014). Mahadevan (2014), quoting Macdonell (1897) on etymology and meaning, opined that Pūṣan means 'prosperer', which is derived from the Sanskrit root *puṣ* 'to cause to thrive'. Interestingly, Monier-Williams (1872) gave the meanings 'to share, divide', 'to cause to thrive or prosper', and 'to nourish, nurture' (among others) for the root *puṣ* and 'to nourish, to increase' for *pūṣ*. Influenced by such derivations, Mahadevan (2014) equated Pūṣan with the Dravidian word *vaḻuti*. He further connected the sign 'open crossroads' with the word *vaḻuti*, which has connotations of 'prosperous' as well as 'road'.

The Ṛg Vedic verses (6.58.3a,b) *yāstē Pūṣannāvō antaḥ samudrē | hiraṇyayīrantarikhē caranti*, which was translated by Griffith (1896) as "O Pusan, with thy golden ships that travel across the ocean, in the air's mid-region", was taken by Mahadevan (2014) as a valuable record of Pūṣan's prehistory as a merchant of the Indus civilization engaged in maritime trade of valuable merchandise. According to Mahadevan (2014), this enables one to identify Pūṣan as the deification of *māṟ-* 'barterer, trader, merchant' depicted by Indus sign 51 '(back of the) wolf' and also as 'prosperous resident of the city' of the Indus civilization as depicted by Indus sign 149 'crossroads'. Connecting Pūṣan with *vaḻuti* and further connecting both with the sign 'open crossroads' is highly speculative.

Mahadevan (2014) also quoted from the Ṛg Veda describing Pūṣan, the 'Hero of the Assembly' (RV 7.36.8). According to Mahadevan (2014), Pūṣan, a 'member of the assembly' in the Indus Age, became an 'eater of gruel' in the early Vedic society because:

> DEDR 173 Tamil *ampalam* 'village assembly for transacting village affairs'
> DEDR 174 Tamil *ampali* 'porridge, especially of ragi'

According to Mahadevan (2014), *karambha* 'gruel' in the Ṛg Veda (RV 6.56.1) is a loan translation of *ampali*. However, Kar-a-mp-a as well as **kar-a-ñcc-i* (>*kañci*) could be Dravidian, which makes a loan translation unnecessary, hence untenable, because we have:

> DEDR 1292 Tamil *karai* (*-v-, -nt-*) 'to dissolve in water, be reduced from solid to liquid form, wear away (as soil by the action of water), become emaciated, become gradually attenuated'

According to Mahadevan (2014), it appears that *koḷ-* (*koḷuttu, kōḷi*) 'hook, receive' was misunderstood as *koḷ-*(*koḷuttu, koḷḷi*) 'set on fire, firebrand', which is the source for the loan translation Āghṛṇi 'the glowing one' as an epithet for Pūṣan in the Ṛg Veda (RV 3.62.7). According to Mahadevan (2014), *ceṭ-* (*ceṭil, seḍi, siḍi*) 'hook, goad' is Pūṣan's characteristic weapon of *aṣṭrā* 'goad'. *Koḷḷi* 'lightning/firebrand' (the 'hook' symbol, as interpreted by Mahadevan) can show the path in the night. But *ceṭ-* does not appear to be a Proto-Dravidian form, not even Proto-South Dravidian, because:

> DEDR 1528 Toda *kiṛy* 'a spark'; Kannada *kiḍi, keḍi* 'a spark'; Koḍaku *kĕḍi, ceḍi* 'a spark'; Tulu *kiḍi, keḍi* 'a spark'

One of the peculiar traits of Pūṣan is that his chariot is drawn by goats instead of horses. According to Mahadevan (2014), the reason for this myth is an incorrect loan translation based on a misunderstood meaning of Indus sign 51 '(back of the) wolf' because:

> DEDR 4761 Tamil *maṟi* 'to turn back, turn about'
> DEDR 4764 Tamil *maṟi* 'sheep, young of sheep, female of sheep'

One of the peculiar traits of Pūṣan is his ability to make hidden things manifest: hence, his characteristic epithet in Ṛg Veda Agōhya (RV 10.64.3) 'one from whom nothing is concealed' (Mahadevan 2014). Pūṣan's unique ability credits him with discovering 'King' (Sōma), who was 'concealed and hidden' in a cave (Mahadevan 2014). The word *gupta* 'hidden, concealed' was employed as the equivalent of the earlier *guhya* in the same sense and occurs in Classical Sanskrit as the name of men belonging to the Vaiśya caste (Mahadevan 2014). According to Mahadevan (2014), this is due to confusion arising from a loan translation of *maṟ-/māṟ-*. But

māṟ-aṉ should ideally mean 'somebody who hides' and not 'somebody who reveals'; hence, he cannot represent Pūṣan.

Pūṣan is described as Kapardin 'one with braided and knotted hair' in the Ṛg Veda (RV 6.55.2), an epithet he shares only with Rudra (Mahadevan 2014). According to Mahadevan (2014), priests and women (priestesses?) wore their hair as long, plaited tresses while 'braided and knotted hair' worn in a slanting fashion, as shown in sign 51 ('wolf') was probably a mark of identity of the trading classes in the Indus civilization.

Thus, Mahadevan (2014) gave a Ṛg Vedic explanation to the phrase 'wolf' + 'hook' + 'open crossroads' + 'jar' as Ajāśva/agōhya/kapardin-āghṛṇi/aṣṭrā/ārā-pathaspati/pūṣan/karambhād-, where the 'open crossroads' sign is the main root and the other two signs are attributes.

According to Mahadevan (2014), all this cannot be mere coincidence. The quality and quantity of interlocked findings at the three levels described in the paper have transcended the level of mere evidence and attained the level of proof, namely, the Dravidian proof of the Indus script via the Ṛg Veda!

Pūṣan is preeminently a pastoral god in the Ṛg Veda, because of which he has the following characteristic epithets (Mahadevan 2014):

(a) Gōpā 'protector of cattle' (RV 10.17.3)
(b) Paśupā 'protector of cattle' (RV 6.58.2)
(b) Anaṣṭapaśu 'one who loses no cattle' (RV 10.17.3)
(d) Aṣṭrā (or) Ārā 'the goad of Pūṣan to drive the cattle' (RV 6.53.8–9).

Agricultural implements, identified as the plough and the ploughshare (*suna and sīrā*), which were regarded as divine, are associated with Pūṣan (Mahadevan 2014). However, Mahadevan tried to prove that Pūṣan was not originally a pastoral or agricultural god but was verily a Vaiśya god. As sign 51 is unlikely to represent '(back of a) wolf' as claimed by Mahadevan, his identification of Pūṣan as *māṟ-aṉ* is not possible. But if Mahadevan's arguments are correct, one may ask the question: why cannot the Indus Pśupati be Pūṣan?

71. 'THE PRIEST IN THE WATER PITCHER'

Mahadevan (1970) interpreted the 'fig deity seal' (M-1186) as that of the sage Agastya, who is said to have been born in a water pitcher. According to him, the water pitcher shown in the seal is a pun of DED 1376 *kuṭa* 'water pot' and DED 1389 *kuṭṭa* 'pool'. Another popular myth is about the origin of *vēḷir* from *kuṇṭa*, later interpreted as 'sacrificial pit' (Mahadevan 1970). The seven robed figures are seven *vēḷir* phratries (Mahadevan 1970). According to Mahadevan (2009a), the Dravidian name Akatti, literally 'one inside (the fort)', was constantly associated with the 'jar' sign (in its ideographic sense), resulting in the creation of the myths of 'jar-born' sages. Such assumptions have no basis.

72. GHARIAL

According to Mahadevan (2011), the combined evidence from the sealing leads to the following broad interpretations:

(1) The gharial is a symbolic representation of the horned, seated male personage frequently depicted in Indus art.

(2) Taking the overall archaeological and textual context into account, the horned seated male personage may be identified as a priest-ruler.

(3) The close association of the gharial with the main animals depicted on the seals indicates priestly authority over the clans represented by the totemic animals.

(4) The close association of the gharial with the fish indicates the special rights exercised by the priest-ruler over the water nymphs (dancing girls) attached to the Sacred Pool.

(5) The Chanhudaro sealing shows that there was more than one priest-ruler, probably of equal status, controlling different clans represented by the totemic animals.

The observation that the gharial is identical to the horned male personage in the Paśupati seal is significant. The crocodile continues to be worshipped as a god by the tribal people of Gujarat (Parpola 1994). A corollary to this observation is that Paśupati and the gharial should have the same name or title. But we do not know what that name or title is. Let us examine a Dravidian word for crocodile:

> DEDR 4952 Tamil *mutalai, mutaḷai, mucali* 'crocodile'; Telugu *mosali*; Parji *mōca*; Konḍa *mōdi, mūdi*; Kurux *bōca*; Sanskrit *mācala-* 'crocodile'; *musali-* 'house-lizard', 'alligator'
>
> DEDR 5031 Tamil *mūñci* 'face', *mūñcai* 'pouting, sullen countenance', 'longish face, longish nose'; Kannada 'face, mouth, snout', *musuḍu, musaḍi, musuḷi* 'face, mouth, snout'; Pengo *mutla* 'snout of pig'; Kurux *moccā* 'mouth'

Also:

> DEDR 4950 Tamil *mutal* 'beginning, first as in rank, place, etc.', 'cause, God as the first cause, one who is first or oldest, best, that which is superior', 'principal, fund, capital, money yielding interest', 'place', *mutalvar* 'persons beginning with, celestials', *mutalvaṉ* 'one who is first, chief, head, god, king, father'; Telegu *modalu* 'beginning, commencement, origin, source, principal, capital, the chief or principal thing or person, base, basis, foundation'
>
> DEDR 4954 Tamil *mutu* 'old', *mutuvar* 'elders, old persons, persons of ripe wisdom, men of experience, counsellors', *mūppāṉ* 'elder, Śiva'; Brahui *mutkun* 'old'

It is also possible that *muc-* > *mut-* (rule 13b of Krishnamurthi 2003) and *muc-/moc-* stand for 'beginning', 'old', 'crocodile' and a deity represented by a crocodile. It is obvious that the word for crocodile in Dravidian is derived from that of an animal with a longish face or snout. Krishnamurti (2003) hypothesized that the Proto-Dravidian form of the numeral three is **muH-*. Three strokes occur seven times solus, thus representing a word or phrase. One may speculate that the 'three strokes' sign could be representing a deity and could be read as **muH-nṭ* to represent the crocodile. Harappan painted pots show fish and alligators (Parpola 1994: 180). The pictures and amulets interpreted as a fish-eating crocodile by Parpola (1994) could be a script representing *muH-kaya* or *muH-maka* (see Section 11 for *kay/maka*). Harappan plates and pots show 'crocodile' and 'fish' as well as three strokes and 'fish', and both could be representing *muH-kaya/maka*.

73. ORGANIZATION OF THE SOCIETY

Mahadevan's interpretation of the symbols and the script is inseparably linked to his analysis of Indus society. We have already seen that Mahadevan (1970) argued that the double meaning of *vēḷ* 'chieftain' (DED 4562) and 'to sacrifice' (DED 4561) indicates the presence of priest rulers in the Indus Valley. Mahadevan (1970) also argued that the city was organized as the upper city, inner city, or citadel where the nobles lived and the lower city or outer city where others lived. Mahadevan (1970) argued that at least some sections of society were organized in phratries to

explain the symbols preceded by numbers. He explained many ligatures as representing individuals performing specific functions in the palace/temple. Mahadevan (1981: 95) also opined: "It is remarkable that authority in the Harappan polity is indicated by an impersonal ideogram referring to the 'palace' rather than to a 'King'. Perhaps Harappan rulership was oligarchic."

Thus, Mahadevan tries to make his reading internally consistent by quoting numerous parallels from Old Tamil literature. In this process he makes many assumptions based on Old Tamil parallels. The observations such as Vēṇṭar 'crowned kings', Vēḷīr 'nobles, chieftains, and generals', and Vēḷāḷar 'peasantry', which are true for Tamil country, need not be true for the Indus. One or many of these assumptions may be wrong, which can making the whole line of argument and hence the decipherment wrong.

74. THE PALLAVAS

The term *palava* in Sanskrit means 'basket of wicker-work' (as for catching fish), and it is also attested as a personal name (Mahadevan 1971). The Pallavas claimed that their family issued out of a vessel (*pātraskhalitavrittīnām*). They also claimed descent from Drōṇa, who according to legend was generated by Bharadvāja in a 'bucket'; the Sanskrit word *drōṇa* means 'wooden vessel, bucket or trough' (Mahadevan 1971). In the Ṛg Veda (RV 7.33), it is said that Vasiṣṭa and Agastya were generated by Mitra and Varuṇa from a jar (Mahadevan 1971). Consequently, these sages, especially Agastya, were known as Kumbhayōni, Kumbhasambhava, and Kuṇḍina (Mahadevan 1980). Similarly, the Cālukyas, the Hoysaḷas, the Viṣṇukuṇḍinas, and other southern royal dynasties all claimed to have originated from various kinds of vessels (Mahadevan 1980).

In this connection, let us examine:

> DEDR 3898 Tamil *paṇti, paṇṭam* 'belly, paunch, body'; Malayalam *paṇṭi* 'stomach', *paṇṭam* 'crop of birds, craw'; Kuwi *banḍi* 'belly', *baṇḍi* 'stomach', *baṇḍita ā-* 'to be pregnant'

Malayalam *paḷḷa* 'stomach' (not in DEDR); therefore, *paḷ-nt-i* > *paṇṭi*

> DEDR 4017 Tamil *paḷḷayam, paḷḷaiyam* 'dish'; Malayalam *paḷḷayam* 'basin, dish'
>
> DEDR 4016 Tamil *paḷḷam* 'lowness, low land, valley, ditch, dimple'; Malayalam *paḷḷam* 'pit, hole, low ground, low shore', *paḷḷa* 'cavity, pit, hole'

Thus, the Pallavas could originally be from a low-lying area and the association with 'dish' could be a later interpretation emanating from the meanings of the word *paḷḷa*, which became Sanskritized to *palla*. This word could be the origin of other 'jar-born' myths also.

75. THE CULT OBJECT

According to Mahadevan (1984), the most characteristic artefact of the Indus civilization is the square stamp seal made of stone, featuring a one-horned bull (the so-called 'unicorn') with a cult object placed in front of the animal and a brief inscription above. The cult object is depicted as a device essentially consisting of two parts, namely, a generally cylindrical upper vessel and a hemispherical lower vessel with a long stem at the base. It has been variously identified as an incense burner or a bird-cage, or a crib and stable rack, or as a calendar system to indicate the Jovian cycle of sixty years (Mahadevan 1984). According to Mahadevan (1984), the cult object is a 'sacred filter' on the basis of pictorial representations of the object on Harappan artefacts as well as parallels from the Soma ritual in the Ṛg Veda.

One of the special characteristics of Soma very frequently mentioned in the ninth *maṇḍala* of the Ṛg Veda is that it is "held in hand by men" (RV 9.24.3) (Mahadevan 1993). Griffith (1896) translated this verse (RV 9.24.3) as "the men have seized and lead thee forth". It is possible that these are references to a procession of priests bearing portable standards with symbolic a representation of the Soma bowl as the crowning motif, reminiscent of the Harappan processional scenes already referred to (Mahadevan 1993). According to Mahadevan, it is quite natural that Indra, the greatest patron of Soma, should have the Soma bowl as the insignia (*ketu*) of his standard (*dhwaja*).

76. PULIKAṬIMĀL

The Sangam poet Kapilar addressed King Iruṅkō Vēḷ as Pulikaṭimāl (Puṟanāṉūṟu 201–202), which literally means 'tiger-killing hero' (Mahadevan 2009a). Mahadevan argued that the Pulikaṭimāl legend is of Harappan origin because one of the Indus seals shows a personage grappling with two tigers pouncing on him from either side. However, Mahadevan (2009a) also observed that when Bharata was living in the forest as a child, he tied up lions, tigers, etc. That means such a story can be created at any age independently to glorify a king; hence, it needs not have any connection with Harappa.

77. ARA-MAKAḶIR

Mahadevan (2011) observed that the Ara-makaḷir mostly occurred in the plural; they hailed from the sky (*vāṉ*), dwelt on the mountains (*varai*), sported in the mountain streams (*aruvi*), were connected with the fearsome deity Cūr, were regarded as mythical, semi-divine beings, and were most probably associated with serpent worship, as indicated by the constant reference to *ara* 'serpent'. It is quite possible that the name is derived from *vara* (>*ara*) and could mean 'damsels from the mountains'. We have DEDR 5274 Tamil *varai* 'mountain, peak, slope of hill'; Kannada 'bare steep slope'.

78. GANDHARVA

According to Mahadevan (2011), the confusion in the meaning ('smell' as well as 'marriage/ bridegroom') of the word *maṇa* led to the loan translation of *gandharva* into Indo-Aryan:

> DEDR 4667 Tamil *maṇa* 'wed, live in company with', *maṇam* 'marriage', *maṇavāḷaṉ* 'bridegroom, husband', *maṇappu* 'possession of extensive properties'
>
> DEDR 4668 Tamil *maṇa* 'to emit fragrance', *maṇappu* 'scent, odour', *maṇam* 'fragrance'

The only *gandharva* mentioned in the Ṛg Veda (RV 10.85.21, 22) is Viśvāvasu, whose name is said to mean 'possessing all goods', which has an identical meaning with *maṇappu* (Mahadevan 2011). Mahadevan opined that the 'fish' + 'arrow' pair (frequency 55) represents Apsaras and the 'fish' + 'jar' pair (frequency 44) represents *gandharvas*. Mahadevan (2011) did not make it clear how *maṇa* relates to 'fish'. We have another important word related to 'smell':

> DEDR 4886 Tamil *muka* (*-pp-, -nt-*), *mukar* (*-v-, -nt-*), *mō* (*-pp-, -nt-*) 'to smell', *mōppam* 'smell', 'nose', *mūcu* (*mūci-*) 'to sniff', *mūccu* 'respiration, breath'; Koṇḍa *mūnz-* 'to sniff, smell'

The word *muka-* is related to 'smell' as well as 'nose'. We have earlier (Section 72) opined that the Proto-Dravidian name of 'crocodile' could be related to the numeral three and 'snout'.

The argument can be extended to include 'crocodile' in the meaning 'one who is fragrant' (*gandharva*). Therefore, the three strokes + 'arrow' pair occurring 44 times and three strokes + 'jar' pair occurring three times could be related to 'crocodile'.

79. PARPOLA'S DECIPHERMENT

According to Mahadevan (1995: 12):

> One can try to assess Parpola's decipherment at two levels. First, one can analyse his interpretations and readings of individual signs, some of which I have attempted above. To sum up, problems arise at this level due to implausible identification of pictorial signs, arbitrary assignment of values to non-pictoria1 signs and diacritic-like marks, doubtful classification of basic, composite and variant signs, uncertainty in fixing the context of occurrence to provide clues to likely meanings, and linguistic problems in the handling of Proto-Dravidian reconstructions and choice of homophones. These specific problems are important and may have to be sorted out in the light of constructive criticisms from experts in the related disciplines.
>
> Secondly, and even more importantly, one may look at Parpola's model of decipherment holistically to assess its overall plausibility and the likelihood of its being the generally correct solution. At this level the two major problems as I see them are Parpola's excessive, almost obsessive, preoccupation with the "Harappan religion", and the inexplicable absence of matters relating to the social life and administration of the Harappan polity, which one may reasonably expect to be recorded in the Indus inscriptions.
>
> Parpola's interpretations rely more on mythology than on textual or linguistic analysis. […] Archaeological evidence point to the presence of a centralized administrative structure in the Harappan cities employing a large bureaucracy. Since almost every household has yielded at least one seal, it is only reasonable to expect that the seal inscriptions would mention, besides names, the professions or callings of the seal-holders like those of scribes, city officials, tax collectors, merchants, sailors or armed guards. Judging from the short votive inscriptions of later times, one may expect at· least some kinship terms like father, son, wife or daughter to occur in the Indus inscriptions too. Granting that the seal-texts are probably only strings of names and titles, and assuming that the writing is mostly logo-graphic, it would still be necessary to employ minimally parts of speech like pronouns, conjunctions and verbal participles and also grammatical morphs to indicate person, number, gender and case.

What has been quoted above is equally applicable to Mahadevan's decipherment, as exemplified below:

(1) Implausible identification of pictorial signs: examples are sign 244 'scribe', which could be a village or house; sign 358 'two open hands' and sign no. 347 'two closed hands', which could only be a wild guess; sign 51 'wolf', which possibly represents a squirrel.

(2) Arbitrary assignment of values to non-pictorial signs and diacritic-like marks: examples are sign 60, where four strokes are considered as a plural marker; sign 164, where eight strokes are considered as one eighth of a share.

(3) Doubtful classification of basic, composite, and variant signs: examples are sign 143 and sign 164. They are possibly composite signs but are considered as basic signs.

(4) Uncertainty in fixing the context of occurrence to provide clues to likely meanings: examples are interpreting sign 12 'bearer' in the context of Andhra dynasties; interpreting sign 78 'partridge' *pūḻ* in the context of the *puru* people; interpreting the 'fish' sign (sign 59) in the context of the great bath.

(5) Linguistic problems in the handling of Proto-Dravidian reconstructions and choice of homophones: examples are the reconstruction of **ṉṟu* to Proto-Dravidian and whether **ṉṯ* and **ṇṯ* could be homophones; reconstruction of sign 59 'fish' as *mīṉ* as well as *mīn*; representing Dravidian Vayal as *vēḻ*.

(6) The overall plausibility and the likelihood of Mahadevan's decipherment being the generally correct solution; from our discussion in this review, it is evident that the possibility of Mahadevan's decipherment being a correct solution is remote.

(7) Mahadevan's excessive, almost obsessive, preoccupation with the *velir* clan and Tamil culture as reflected in Sangam literature. Mahadevan's dependence on Vedic and Sangam mythology without sufficiently convincing substantiation.

80. MAHADEVAN'S DECIPHERMENT

When most decipherers failed to consider the cultural setting of the Indus civilization (Aalto 1984: 416), Mahadevan tried to interpret some of the signs in the settings of the Tamil Sangam literature, which he believed reflects the Indus culture in some way. The Sangam Period is almost two millennia away from the Indus civilization; hence, any conclusions or guesses based on the Sangam texts are highly unreliable. Mahadevan as well as Parpola also used Vedic texts and Hindu mythology to interpret Indus signs. It is extremely difficult to isolate the exact Vedic/Sangam context and match it with the Indus situation, and there are no methods to verify the correctness of such a matching. Thus, readings based on such matching are highly unreliable.

Mahadevan's model of decipherment involves: (1) the assumption that the language is Dravidian, (2) the assumption that there was an extended period of bilingualism involving borrowings and loan translations between Dravidian and Indo-Aryan, (3) analysis of the Ṛg Veda, Mahābhārata, and other Sanskrit literature for clues, an (4) extensive survey of old Tamil literature for myths, proper names, and words, (5) the identification of individual signs and interpreting them, (6) classifying some of the signs as pictograms, and (7) giving a phonetic value for some of the signs.

The Dravidian assumption has no clear-cut proof; it remains just an educated guess. An extended period of bilingualism is accepted by many linguists (see, e.g., Emeneau 1956: 7; Krishnamurti 2003; Parpola 1988). Many elements of Indus culture and myths might have been absorbed by Ṛg Vedic and other cultures that flourished in that area afterwards; hence, they could be a source for understanding some aspects of Harappan culture. Old Tamil literature is very distant from the Indus in time and space; hence, their utility in deciphering Indus script is anybody's guess. Mahadevan himself at least at one place (2014) admits that the Indus language is different from Southern Dravidian, despite his direct use of Tamil words to find the phonetic value of Indus symbols.

Mahadevan (1995: 12) himself pointed out that at the level of interpretation and reading of individual signs "problems arise […] due to implausible identification of pictorial signs, arbitrary assignment of values to non-pictorial signs and diacritic-like marks, doubtful classification of basic, composite and variant signs, uncertainty in fixing the context of occurrence to provide clues to likely meanings, and linguistic problems in the handling of Proto-Dravidian reconstructions and choice of homophones".

Again, Mahadevan (1995: 12) criticized Parpola's excessive, almost obsessive, preoccupation with the "Harappan religion", but he himself is obsessive about the *velir* clan and Tamil culture as reflected in Sangam literature. The observation made by Koskenniemi (1981: 126) that "readings for the signs are assigned in order to support some personal hypotheses on the culture rather than vice versa" about many decipherments is applicable for Mahadevan's decipherment as well. According to Parpola (1994), the zebu bull on seals suggests that the owner of the seal had majestic status. Mahadevan does not make any attempt to interpret or correlate the motif with the writing (Parpola 1994).

While going through his writings spread over thirty-five years, one can find that Mahadevan is very flexible in changing his views and finding new interpretations, which is a very welcome

attitude. But his core belief in the *velir* clan, etc. remains unshaken. Mahadevan gradually shifts his interpretation of Indus signs from phonetic/logographic/word to ideographic. If practically every sign is an ideogram, the system is hardly a script. It leads to accepting the views of Farmer, Sproat and Witzel (2004) that the system is not a script.

The most prominent decipherers do not agree on what object the most frequent sign (the 'jar' sign) represents or what type of language it is. Many structural analyses claim that it is an agglutinative language, but Sanskrit-based decipherers do not accept that. Thus, despite numerous attempts to decipher and numerous structural studies and studies on cultural surroundings, nothing (not even the basic concepts) is settled in the case of the Indus script.

Given these circumstances, Mahadevan attempted to decipher the script in a particular cultural and linguistic setting. Mahadevan did not succeed or he could not make efforts in developing a self-consistent system of readings applicable to a large number of discovered pieces of writings. Probably the condition to create such a consistent and compatible set of reading does not exist even now, despite numerous efforts. However, one has to appreciate that Mahadevan made a determined, persistent effort to develop a Dravidian framework for the decipherment of the Indus script.

This paper tried to review Mahadevan's attempts in that given setting. This paper did not review the merit of Mahadevan's linguistic assumption or identification of pictorial signs. According to this reviewer, decipherers following Dravidian, Sanskrit, or Munda or other linguistic settings should continue to peruse their efforts in their own way. The basic idea is to create a framework in which decipherments gradually converge and become consistent in larger and larger contexts and a self-consistent matrix arises, so that the script is ultimately deciphered in a satisfactory manner.

Sign No	1	3	8	9	12	14	15	17	25	28	38	44	45	46	47
Sign															
Sign No	48	51	53	54	59	60	64	65	67	70	72	78	86	87	94
Sign															
Sign No	97	98	99	100	105	112	121	123	124	130	134	137	138	139	140
Sign															
Sign No	141	142	143	144	145	149	150	162	163	164	165	166	169	171	173
Sign															
Sign No	175	176	194	197	211	216	230	244	249	253	254	261	264	267	284
Sign															
Sign No	287	289	293	294	319	326	328	336	342	344	347	348	358	364	373
Sign															
Sign No	375	391	393	403	406	407									
Sign															

Figure 4 List of signs used in this paper

ABBREVIATIONS

DED *Dravidian Etymological Dictionary*. 1961 by Thomas Burrow & Murray Barnson Emeneau.

DEDR *Dravidian Etymological Dictionary*. Rev. 2nd edn. 1984 by Thomas Burrow & Murray Barnson Emeneau.

PD Proto-Dravidian.

RV Ṛg Veda.

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