Aryan or Dravidian or Neither?
A Study of Recent Attempts to Decipher the Indus Script (1995-2000)

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Esteemed colleagues, Ladies and Gentlemen

0.1 I am grateful to the Executive Committee for electing me as the General President for the current session of the Indian History Congress, the first to be held in the new Millennium. You would have been taken by surprise at the choice. I can assure you that none could have been more surprised than myself. I am not a historian; I belong to one of the more obscure historical disciplines, Epigraphy, where again I have confined myself to two rather marginal areas namely the Indus script and the Tamil-Brahmi inscriptions. However, here I am and let me do my best to live up to the traditions of this high office.

0.2 I understand from informal consultations with some of my colleagues that I am expected to talk on the state of research on the Indus script. I face a problem here. At the Forty-ninth Session of the Indian History Congress held at Dharwar in 1988, I presided over Section V on Archaeology, Epigraphy and Numismatics and read a paper with the title : What do we know about the Indus Script? Neti neti 'not this nor that'. I must confess that there is little to add to what I said on that occasion thirteen years ago. Further progress - if it can be so described - up to 1995 has been included by Greogry Possehl in his objective and readable book ***Indus Age: the Writing System*** (1996). I do not propose to cover the same ground again except to mention an outstanding publication which deserves special notice. That will also help me to start this talk on a positive note, as much of what follows will be, I am afraid, distressingly negative.

0.3 There is no doubt that the most important publication in this field in recent years is the magnificent ***Corpus of Indus Seals and Inscriptions*** (Vol. I : 1987, Vol. II : 1991) by Asko Parpola and others. These superbly printed volumes (with generous funding from the UNESCO) illustrate the Indus seals and other inscribed objects in the collections in India and Pakistan. A noteworthy feature is that

each seal is reproduced in the original as well as from the impression. The non-availability of the original publications and the inherent limitations of the hand-drawn or computer-made concordances need no longer stand in the way of would-be decipherers from looking at the inscriptions as they are. The world of Indus scholarship is deeply indebted to Asko Parpola and his co-editors for this landmark publication.

0.4 As the compiler of one of the concordances of the Indus texts, it has been my privilege to receive from the authors copies of their books and Papers relating to the decipherment of the Indus script. During the last five years after the publication of Possehl's book, there have been more attempts at decipherment by Indian scholars. Confining our attention to book-length publications only, two of the proposed decipherments are based on Sanskrit, two on Tamil and one rather unusually on neither. I shall devote this talk to a study of these attempted solutions. It is of course not possible in the course of this brief talk to review the publications in depth. I shall be concentrating more on the methods than on the results which, if I may anticipate, are all negative. Finally, I shall discuss the question whether there are objective and generally accepted criteria to assess the validity of the ever-growing number of claims to have deciphered the Indus script.

Section I : DECIPHERMENTS BASED ON SANSKRIT

1. 'Grandmother of the Vedic language'

1.0 *Dr. Madhusudan Mishra was a lecturer in Sanskrit in Germany and India before joining the Rashtriya Sanskrit Sansthan which he served until his retirement. He has written a number of books on various aspects of the Sanskrit language. His work on the Indus Script* ***From Indus to Sanskrit*** *is in three parts (1996-98). The following summary is based on Part III of the book, which presents a revised model of his decipherment of the Indus Script.*

1.1 According to Mishra, the language of the Indus inscriptions is Pre-Vedic Sanskrit described by him as the 'grandmother of the Vedic language'. The special characteristic of the Indus-Sanskrit is that it belongs to the 'isolating' type consisting of monosyllabic

words. Sanskrit is then supposed to have passed through the agglutinative stage (which is not attested) before reaching the final inflectional stage known from the Vedic language.

1.2 Mishra also believes that the Indus Script too evolved through three successive stages, written at first with animal figures, then with geometric forms and finally with numeral signs, even though all the three phases are present simultaneously in the extant Indus texts. Mishra's study of the concordance of the Indus texts leads to the conclusion that each Indus sign represents a complete word and that stable pairs and triplets of signs build up phrases or clauses. The ligatured signs represent compound words. The word- signs are strung together loosely in short sentences with very little or no grammar. Mishra accepts the generally held view that the Indus inscriptions are normally written from right to left.

1.3 Mishra then proceeds to match the features of the Indus inscriptions as determined by structural analysis with those of the 'isolating' type of Sanskrit. Each Indus sign is regarded as an open syllable of the consonant-vowel (CV) type. It is important to note that Mishra does not determine the phonetic values but the meanings of the monosyllabic word-signs. The procedure followed by him is to pick out monosyllabic words (of CV type) referring to animals or objects from the Sanskrit lexicons and apply those values to the Indus signs identified by him as representing the animals or objects. For example, the sign looking like an ant is identified with *ka* 'ant', the sign depicting a circle is *ca* 'moon', the 'hill' sign is *da* etc. Mishra follows a different procedure when dealing with the numerical signs. The transparent sequence of the numerals determined by the number of strokes enables him to identify them (after some re-shuffling) with the Mahesvara-sutras in Panini's grammar.

1.4 Mishra's readings yield a list of monosyllabic words in the Indus-Sanskrit language. A remarkable feature of the list is that each monosyllabic word is provided with a large number of meanings. For example, *ca* has 12 meanings, *ta* has 12, *sha* has 21 and *ha* has 26. In this way, the monosyllables are made to yield hundreds of words in Sanskrit. The choice of any particular meaning depends wholly on the context.

1.5 A unique feature of Mishra's decipherment is that he does not combine the syllables to form words – at least not straightaway. The complex procedure followed by him may be illustrated with the following example. A text of three signs is read *ta-na-sha* and equated with the Vedic *tanas* 'offspring', not by combining the syllables but by combining the monosyllabic words *ta* (the womb of a woman), *na* (gem) and *sha* (produces) = 'a gem produced from the womb of a woman' = 'offspring'.

1.6 Based on his readings, Mishra identifies the contents of the Indus inscriptions with a 'rudimentary form' of what is elaborated in the Vedic and later samhitas. The Indus inscriptions are also identified as written in metrical form, mostly in the Gayatri and Anushtubh meters. One example will suffice; the longest Indus text with 26 signs, read in monosyllabic Sanskrit, yields the following meaning:

> (when the universe was to come into being) the unsteady star (sun) was bright (or produced light). (Firstly) the sky was born. It was (rather) conceived through meditation (that the sky has been born). Then the river flowed. The sun shone brightly. This is the truth to know. (Then the earthly) fire burnt(=came into being). Now, indeed, the hot sun is shining.

According to Mishra, some of the ideas in this text are reflected in the 'hymn to creation' in the Rigveda (RV.10.12). Mishra's own comment on his readings is worth quoting: "These sentences often appear ridiculous ... but the absence of the real context makes them unbelievable".

1.7 Of all the Sanskrit-based decipherments known to me, Mishra's comes closest to the structure of the Indus texts as determined by objective formal analysis. He accepts that the direction of writing is from the right, that the script consists mostly of word-signs and not mere phonetic syllables, that the signs form stable combinations of pairs and triplets to build phrases, that ligatured signs are compounds of words and not sounds, and that there is hardly any overt grammar in the inscriptions. In spite of these initial advantages, his decipherment appears to be unsuccessful mainly on account of two reasons, one related to the procedure for decipherment followed

by him, and the other to his views on the historical and linguistic context of the Indus Civilisation.

1.8 As regards the procedure, Mishra falters when faced with the problem which has baffled all the would-be decipherers irrespective of the linguistic models chosen by them namely, the inherent uncertainty in identifying the pictorial and geometric signs and in finding the unique phonetic or semantic values. For example, the most frequent JAR sign of the Indus script, generally identified as some kind of a vessel, looks to Mishra like a 'nipple' for which the monosyllabic word in Sanskrit is said to be *sha*. Again *sha* is given no less than 21 semantic values to choose from in reading a text. There is also no apparent reason why monosyllabic words should only be in open syllables of the CV type and not VC or CVC types. The identification of the numerical signs with the Mahesvara-sutras in Panini's grammar is arbitrary. To an independent observer the whole procedure would appear to be highly subjective and the model of decipherment based on such speculations, suspect.

1.9 It is ironic that Mishra's correct understanding of the structure of the Indus texts should lead him to choose a linguistic model which no expert in Sanskrit is willing to accept. In order to fit in with his readings, he has to convert Sanskrit into a monosyllabic language without inflection. This he does by positing an 'isolating' type of Sanskrit which preceded the inflectional Vedic. However, reconstruction of Sanskrit to the earlier proto-languages or to the earliest stage of Proto-Indo-European does not support his theory of an isolating stage or an intermediate agglutinative stage preceding the inflectional Vedic language. In his review of the first part of Mishra's book, Michael Witzel, Professor of Sanskrit at the Harvard University, dismisses Mishra's evolutionary model of progression from a primitive form of language to more complex ones as 'linguistic Darwinism'.

1.10 Another question which arises is: when Mishra's own analysis of the Indus texts indicated the presence of a monosyllabic language, why did he have to invent a non- existent 'isolating' Sanskrit and not choose an ancient Indian language known to have been monosyllabic, like for example, Dravidian ? The answer to this question lies in Mishra's strongly held views on the historical and

linguistic context of the Indus Civilization. His book opens with a quotation from a Hindi poem by Jayshankar Prasad:

> We had not come from anywhere else;
> Our home is here itself.

In his Foreword, Mishra describes the Aryan immigration theory as a 'mischievous conception, the result of an ill-conceived history and ill-designed reconstruction of the Indo-European language'. According to him, the reconstruction of the Proto-Indo-European language 'has played havoc in distorting the origin of the parent Aryan speech'. The 'hasty generalisations and presumptuous inferences' in the textbooks of the comparative philologists of the 18th and 19th centuries have led to the elaborate division of the civilised humanity into Aryan, Dravidian and Semitic races and established an 'incongruous relation between language and race'. The whole history of ancient India has been 'distorted by the modern historical research speculations'. Mishra believes that some natural catastrophe led to the disintegration of the Indus community into Aryan, Dravidian and Santhal groups. Some of the Aryans marched through Iran and Central Asia towards Europe. Mishra muses, "Perhaps Manu was right when he mentioned the emigration of the Aryan".

1.11 It is also relevant to take note of Mishra's views on the Dravidian languages. According to him 'the rustic dialects of the Dravidian languages' belong to the Indo-Aryan family. He cites *amba* in the Rigveda and *amma* in Tamil ('mother') as 'cognates' and not borrowing from one language to another. He deplores the reconstruction of Proto-Dravidian on the lines of the reconstruction of Proto-Indo-European. He thinks that utilising the *Dravidian Etymological Dictionary* to read the Indus texts is 'abortive' and nothing can come out of it. And finally, "the Tamil merchants should never have found a place in (the Indus) inscriptions of ethical and philosophical nature". Mishra's unbounded love for the Aryan and reverence for the Sanskrit language are matched only by his contempt for the 'rustic dialects' of the Dravidian languages and the 'Tamil merchants'.

1.12 Madhusudan Mishra had taken the first step in the right direction towards the decipherment of the Indus script and might have made further progress, had he not been prevented by nationalistic bias.

2. Sulbasutras and the 'Horse Seal'

2.0 Dr. N. Jha, a scholar in Sanskrit, retired as Principal, Kendriya Vidyalaya, at Farakka in West Bengal. He is the author of several books on the Indus script including ***Vedic Glossary on Indus Seals*** *(1996). Dr. N.S. Rajaram is an Engineer who has carried out research in Artificial Intelligence and Robotics. Since 1992 he has been an independent researcher working on the history and science of Ancient India. He is the co-author along with David Frawley of* ***Vedic Aryans and the Origin of Civilization*** *(1997). Jha and Rajaram are the authors of the publication considered in this survey,* ***The deciphered Indus Script: Methodology, readings and interpretations*** *(2000). The decipherment is by Jha. The final version of the book has been written by Rajaram who also acknowledges providing most of the historical background.*

Historical and Linguistic Context of the Indus Civilisation according to Rajaram.

2.1 The Jha-Rajaram model of decipherment of the Indus script is based on what is described as the 'changed' historical and linguistic context resulting from the discovery of the Indus civilisation. Even though Rajaram claims repeatedly that the context emerged from the decipherment, his own presentation in the first part of the book shows the opposite to be the case. In brief, Rajaram's position is that the earlier theory of the Aryan invasion implying that civilisation was first brought to India by bands of nomadic invaders from the Central Asian steppes around 1500 B.C. has been negatived by the discovery of the Harappan civilisation which flourished between 3100-1900 B.C. with its antecedents dating back to about 7000 B.C. The entire period is identified by Rajaram with the Vedic culture. The Indus civilisation is equated with the late Vedic period of the sutra literature. The Indus inscriptions are in Sanskrit and consist of sutras

with words traceable to the *Nighantu*, the ancient Vedic glossary compiled by Yaska.

2.2 The problem faced by Rajaram at the outset is that his views on the historical and linguistic context of the Indus-Vedic civilisation are not found in the textbooks in use today. He recognises that he has to demolish the current theories if the model of decipherment presented by him is to be accepted. And he goes about the job of demolition with gusto in his inimitable polemical style. He identifies several 'powerful' obstacles which stand in the way of progress towards a correct understanding of the historical and linguistic context as visualised by him. As it is necessary to understand his viewpoint before assessing the decipherment based on it, I have made a compilation of his comments on the various 'barriers to progress', reproduced as far as possible in his own words. I have avoided quotation marks for the citations except for key words or phrases in them.

(1) *Colonial interests and Christian missionaries*: Since the principal activity of the European countries in the nineteenth century was colonialism, it is natural that their views should reflect colonial interests and biases. A closely associated movement that rode on the bandwagon of Euro-colonial expansion was that of the Christian missionaries. The colonial British authorities presented themselves as the latest wave of conquerors related to the ancient Aryans. The Christian missionaries presented the Bible as the 'Yesurveda' turning 'Jesus the Jew' into an Aryan sage. Aryan invasion and non-Indian origin of the Vedas are interpretations based on European colonial and Christian missionary interests. Max Muller edited the Vedas to help uprooting Hinduism from Indian soil to make way for the spread of Christianity. He was paid by the British Government to produce a negative interpretation of the Vedas to undermine Hindu respect for their scripture and to better prepare Indians to accept foreign rule by a 'Christian' power. Max Mueller was no Vedic scholar at all. There were political and other considerations behind Marshall's 'vehement' denial of any connection between the Vedic and the Harappan civilisations.

(2) *Marxist school of historians*: Marx held the view that the history of India was the history of the invading peoples. It was natural that this should have become the official position of the Indian Marxist historians who came to dominate the scene after Independence. Marxism took the place of colonial missionary interests. The 'Marxist scholar' Malati Shengde's theory that the Akkadian was the language of the Harappans is part of the Marxist theology that seeks to make Harappans non-Vedic, and the Vedas and the Aryans non-Indian. The Marxist contribution to Indian historical scholarship is 'negligible and crumbling'.

(3) *Aryan-Dravidian divide*: The claim of the linguists that the South Indian languages descended from an ancestral Proto-Dravidian is only a theory. Proto-Dravidian is purely a theoretical construct which in all probability never existed in history. People called Proto-Dravidians never existed. British colonial interests were uppermost in the mind of 'Bishop' Caldwell when he propounded his Dravidian language family as a sub-family of the Scythian. The Aryan-Dravidian division is based on racial theories which are supported to show the languages of South and North India to be fundamentally different. The differences between Sanskrit and the 'so-called' Dravidian languages are greatly exaggerated. Dravidian languages are also'inflectional' like Sanskrit. The 'new fad' about an Elamo-Dravidian family for the Harappans is probably another attempt to ascribe a foreign origin to the Harappans and their language.

(4) *Linguistics:* Linguistics is a 'petty conjectural pseudo-science'. (Rajaram is so fond of this phrase that he repeats it at least thrice in the book.) While old masters like Panini made linguistics a science, modern linguists seem to be practising something closer to theology. Most of the linguists working on Indo-European studies tend to be ignorant of the languages of India. Archaeologists have subordinated their own interpretations to the historical, cultural, chronological 'impositions' of the linguists.

(5) *Indology*: The academic subject called Indology is less a scientific discipline than a product of 'Euro-centric' vision of history and civilisation. Indology has contributed little to our understanding of Ancient India. Indological scholarship of the last two centuries has been a 'barrier to progress'. Its creations have mainly been 'misinterpretations' driven by 'preconceptions and political needs'. Indology is built on a foundation of beliefs and practices that have no basis in reality. It has given us a picture of ancient India as it never existed. Europe's Indologists often display an 'unsettling smugness' and 'absence of critical spirit'. Indology is incapable of providing the tools and thought necessary for decipherment.

In short , the 'powerful barriers to progress' identified by Rajaram are colonial interests and Christian missionaries, historians (especially Marxist), linguists (especially Dravidian), Indologists and archaeologists (especially foreign). When these barriers are removed, progress towards recognizing the identity of Vedic and Indus civilisations would be unimpeded.

2.3 Rajaram's outbursts speak for themselves and need no annotation. The first part of the book is not about academic research on the technical problem of deciphering an unknown script. It is crude communal propaganda with obvious political overtones, betraying deep mistrust of foreigners and alien ideologies and intolerance towards religious and linguistic minorities. I find it a relief to turn to the second part of the book containing Jha's decipherment to examine the claim on its merits.

Jha's decipherment as interpreted by Rajaram

2.4 The clue to the decipherment is obtained from the similarity of Brahmi to the Indus script. As Rajaram explains, this is the 'palaeographic basis for Jha's decipherment'. From the comparative chart of the Indus and Brahmi scripts published in the book, one can make out the actual procedure followed. The 'plausible transition path' of Each Indus sign to the Brahmi stage is traced by progressively 'simplifying' the Indus sign by cutting and chipping until the desired linear Brahmi form is reached, and its phonetic

value is presumed to be that of the corresponding Indus sign. Thus an 'alphabetic subset' is created, which forms the basis for Jha's readings and Rajaram's interpretations.

Direction of writing of the Indus script

2.5 The crucial question of the direction of the Indus script is brushed aside by Rajaram who claims that "nothing definite can be said about the direction of writing". The procedure followed is to determine the direction of writing in each case without assuming it in advance. In actual practice however, almost all the inscriptions are read from left to right. As Rajaram has no argument either to rebut the generally held view that the direction is from the right or in support of his theory that it is from the left, the question arises as to how the choice of the direction was made. Though Rajaram does not answer this question, one can infer that he thinks that the Indus script must be read from the left because that is how Brahmi and all other Indian scripts are read. Unfortunately, the choice of the wrong direction for the script renders the Jha-Rajaram model of decipherment *ab initio* invalid. Further discussion of the merits of the decipherment is unprofitable. However, the assessment would be incomplete without reference to the two sensational claims made in the book relating to the discovery of the Sulbasutras in the Indus inscriptions and the horse among the animal moifs on the seals.

Sulbasutras in the Indus Texts

2.6 It is claimed that some of the mathematical formulas of the Sulbasutras are found in the Indus inscriptions. Here is one example; a text of three signs is read *pa-ka-ma* and interpreted as follows: *pa* stands for *paridhi vyasa anupathi* 'perimeter to diameter ratio', *ka* for *karani* 'square root' and *ma* for 10. The text, rewritten in modern notation, yields the mathametical formula

$$\pi = \sqrt{10} = 3.16 \text{ (approximately)}$$

The method is so flexible and easy to follow that one can, without much effort, read into the Indus texts almost any mathematical formula including the most famous one $E = mc^2$.

The 'Horse seal'

2.7 It has often been pointed out that the complete absence of the horse among the animals featured on the seals is good evidence for the non-Aryan character of the Indus Civilisation. Against this background, Rajaram's discovery of a 'horse seal' from Mohenjodaro became sensational news. Seal No. 453 in Mackay's ***Further Excavations at Mohenjodaro*** is broken off right in the middle and the front portion of the animal is lost. However, judging from the hind part of the animal and comparing the motif with hundreds of complete specimens, the animal on the fragmentary seal can be recognised as a bull, most probably the 'unicorn', but certainly not the 'horse'. Rajaram has published in the book a computer-created picture, so manipulated as to convert the image of half a bull into a full horse. Lest the readers miss the point, an artist's rendering of the horse is also added. The text above the animal is said to contain the word *asva* 'horse'. Significantly, Rajaram has refrained from publishing the original illustration from Mackay, which would have clearly shown what the animal really is. Rajaram could not of course get away with it. An expose has been published by Michael Witzel, Professor of Sanskrit, Harvard University and Steve Farmer, a comparative historian. It was a sad day for Indian scholarship.

Section II : DECIPHERMENTS BASED ON TAMIL

3. 'Indus Script in Tamilnadu': Pottery Graffiti

3.0 *Dr. S. Gurumurthy retired as Professor of Ancient History and Archaeology, University of Madras. His earlier publications include* ***Ceramic Traditions in South India upto 300 A.D.*** *He has made a special study of the graffiti on ancient Indian pottery. His book* ***Deciphering the Indus Script*** *was published in 1999.*

3.1 Gurumurthy begins by calling for a re-examination of the wide gap in the archaeological record between the Neolithic and Iron Age cultures in Tamilnadu. He seeks to bridge the gap between the two periods, partly by pushing back the commencement of the Iron Age in South India and partly by positing the existence of a 'Pre-Iron Age culture' in Tamilnadu, claimed to be coeval with the last phase of the Chalcolithic cultures of Central India towards the close of the

second millennium B.C. The occurrence of iron at an earlier date (ca.1000 B.C.) in South India and the recent discoveries of rock paintings and engravings from caves in Tamilnadu are cited as new evidence in this regard.

3.2 According to Gurumurthy, the Iron Age population of Tamilnadu was 'mixed', with a large proportion of the descendants of the Neolithic people who are described by him as the 'carriers of the Indus culture and script'. The Iron Age which originated in South India was Dravidian and, in its last phase, coincided with the Sangam Age, characterised by literary activity, the use of currency and foreign trading contacts.

3.3 Gurumurthy has made an extensive collection of over three thousand pottery graffiti from more than a hundred sites in India. He traces the evolution of pottery from the Neolithic to the Harappan and from the latter to the Chalcolithic and Iron Age cultures. His study of the pottery graffiti from Tamilnadu has revealed that many of them have been incised on specially selected potsherds, cut and ground to the required size. He believes that these are records of 'economic transactions' kept by the owners 'for posterity or remembrance'. They show that in this period, pottery served as the principal medium for writing.

3.4 Gurumurthy employs the term 'ligatured graffiti' in an unusual sense to refer to groups of graffiti comprising 'more than one symbol'. He also describes the 'ligatured' graffiti found in Tamilnadu as 'inscribed sherds in the Indus script'. However, he clarifies that they are not contemporaneous with the Indus inscriptions but are survivals in a later period. He claims that their presence in Tamilnadu has extended the southern boundary of the Indus script from Daimabad (in the Godavari basin) to the 'lower Kaveri basin'.

3.5 Gurumurthy accepts the view that the Indus script is normally written from right to left. Following B.B. Lal's famous demonstration of the direction of the script from overlapping incisions on pottery, Gurumurthy has discovered two instances of similar overlapping among the pottery graffiti found in Tamilnadu. The photographs included in his book clearly show that the direction of the overlapping incisions is from the right. This is a valuable

contribution establishing for the first time that the pottery graffiti were also incised in the same direction as followed in the Indus script. Gurumurthy has also stated that there are exceptional cases running in the opposite direction as judged from the context.

3.6 Gurumuthy's decipherment of the graffiti proceeds in three stages. In the first stage, he identifies selected graffiti as 'signs of the Indus script' based on similarity with the shapes of the signs. Next, he assigns phonetic values in Tamil to the graffiti based on the perceived pictorial forms. Finally he reads the graffiti with more than one symbol as texts written in the Indus script. Based on his readings, Gurumurthy identifies the language of the 'inscribed sherds in the Indus script' found in Tamilnadu as 'the Dravidian language of the bygone days or the language of the Non-Aryan Proto-Dravidian India'.

3.7 Gurumurthy's procedures for decipherment are generally the same as those of most other would-be decipherers, and it is not surprising that he faces similar problems with the identification of pictorial forms and assignment of phonetic values. Here are a few examples of his identification of the graffiti. A graffito looking like K is identified as 'calling while walking'; a zigzag line denotes 'running'; variously shaped linear curves are identified as 'eye, nose, forehead or lips'; the most frequent JAR sign is identified as the 'head of a human body', and so on. Except for a few transparent pictorial forms like MAN or FISH, the identifications are subjective or even arbitrary. The whole exercise reminds one of seeing figures in cloud formations.

3.8 Gurumurthy's 'Proto-Dravidian' readings include, as he himself candidly admits, Tamil words from the 'Pre-Sangam', Sangam and medieval periods. For example, Tamil *aintu* for PDr **cay-ntu* 'five'. What he does not admit, and is probably not aware of, is the inexplicable presence of loanwords from Sanskrit in the 'Non-Aryan Proto-Dravidian' readings. For example, *tuti* 'to pray', *tula* 'weighing scales', *nasi* 'nose' and *padam* 'foot'.

3.9 Gurumurthy identifies some of the graffiti symbols with Brahmi letters. In practice, he compares pottery graffiti from the earlier levels with the Indus script and from the later levels with the

Brahmi script. According to him, the Brahmi script is not directly derived from the Indus, but through the pottery graffiti of later times. He posits a hypothetical 'Proto-Brahmi' script based on Dravidian from which the Brahmi and Tamil-Brahmi scripts are derived. However, linking the Indus and Brahmi scripts on the basis of mere external resemblance is methodologically unsound. The results may be as illusory as comparing the form of zero(0) with the letter O, or the numeral (I) with the letter I. There are no attested intermediate forms to bridge the vast gap in time between the end of the Indus script before the middle of the second millennium B.C. and the earliest Brahmi inscriptions in the 3rd century B.C. There are more weighty reasons for not deriving the Brahmi script from the Indus, but the scope of the present talk does not permit me to go into them.

3.10 Gurumurthy's documentation of the pottery graffiti from South India and especially Tamilnadu is the most exhaustive published so far and would no doubt provide important source material for further studies in the field. While Gurumuthy's attempt to decipher the Indus script from the pottery graffiti is not successful for the reasons I have summarised above, his study raises important questions on the nature of the pottery graffiti and their possible links with the Indus script. As B.B. Lal demonstrated in his seminal paper (1960) with the suggestive title 'From the Megalithic to the Harappa: tracing back the graffiti on pottery', there does seem to be a genetic relationship at a deeper level between the signs of the Indus script and the megalithic graffiti. According to Lal, "eighty-nine percent of the megalithic symbols go back to the chalcolithic-Harappan times. Conversely, eighty-five percent of the Harappan-chalcolithic symbols continue down to the megalithic times". Recent excavations at Kodumanal have revealed a remarkable association of specific symbols with particular megalithic grave complexes. There can hardly be any doubt that the graffiti are meaningful, though no clue has yet been found to understand their function or significance.

3.11 Pottery graffiti are found from Late Neolithic and Pre-Harappan times up to the end of the Megalithic Period. They are also spread across the subcontinent from the North-west to the Peninsula and beyond to SriLanka. It is most unlikely that throughout this vast expanse of time and space, the graffiti were tied up with one language, though they may well have the same significance. An

important theoretical consideration is that writing is always an adjunct of urban civilisation and is born out of economic necessities of account-keeping and trading. There is no evidence in the Post-Harappan Pre-Iron Age period for the existence of large states or developed urban civilisation in South India necessitating the use of writing. In the present state of our knowledge, it seems best to assume that the pottery graffiti do not constitute a writing system with phonetic values, but may be regarded as mnemonic or representational devices derived from pictorial art and belonging to the category of forerunners of writing (I.J. Gelb 1963).

4. From 'Kumari Kandam' to the Indus script

4.0 *Dr. R. Mathivanan has specialised in Tamil etymological studies and is currently the Chief Editor of the Tamil Etymological Dictionary Project of the Government of Tamilnadu. He has published four books on the decipherment of the Indus script, of which the latest is* ***Indus Script among Dravidian speakers*** *(1995).*

4.1 To understand Mathivanan's decipherment of the Indus script, it is necessary to refer briefly to two major influences which have shaped his ideas on the antiquity of the Tamil culture and language. His mentor, the late Devaneya Pavanar, a renowned Tamil scholar, taught that Tamil is the most natural (*iyal-mozhi*) and oldest (*tol-mozhi*) language from which all other languages of the world are derived. He was a staunch protagonist of the Pure Tamil movement and conceived the Etymological Dictionary Project for restoring Tamil to its original status of pristine purity. Acknowledging his indebtedness to Pavanar, Mathivanan writes:

> Tamil is a language whose script and grammar were standardised millennia ago. My mentor, the eminent etymologist G. Devaneya Pavanar, advised me to attempt the decipherment of the Indus script applying the rules of the ancient Tamil grammar *Tolkappiyam.* My decipherment work, informed by his methodology, produced desired results.

4.2 The second influence permeating Mathivanan's work is the equally extreme view on the great antiquity of the Tamil civilisation propagated by the adherents of what may be called the 'Lemuria-Kumari Kandam' school of thought. Lemuria, like Atlantis of Western mythology, is the name given to a large land mass said to have been submerged under the sea in geological times. Kumari Kandam is believed to be a large tract of land south of Cape Comorin submerged under the sea, according to the legendary tradition referred to in Old Tamil works. In a modern re-interpretation, Lemuria and Kumari Kandam are linked together as the most ancient homeland of the Tamil civilisation.

4.3 In the first book (1991) announcing the decipherment, authored jointly by Mathivanan and M. Ramachandran (a retired Chief Engineer of the Indian Railways), a historical calendar of the Tamil civilisation is given in the form of a long Table commencing with the formation of the solar system 4500 million years ago and ending with the start of the Christian Era. The following is a brief extract of important events, some of them precisely dated:

Years before	**Events**
50000	Kumari Kandam civilisation
20000	A lost Tamil culture of the Easter Island which had an advanced civilisation
16000	Lemuria submerged
6087	Second Tamil Sangam established by a Pandya king
B.C.	
3031	A Chera prince in his wanderings in the Solomon Island saw wild sugarcane and started cultivation in Tamilnadu.
1780	The Third Tamil Sangam established by a Pandya king
700-600	*Tolkappiyam* (the earliest extant Tamil grammar)

4.4 Mathivanan rests his decipherment on the following general principles:

(1) The Indus civilisation had its origin in Kumari Kandam of the ancient Tamils.
(2) The people of the Indus valley were Tamils.
(3) The Indus language was Tamil.
(4) The Indus script is syllabic and written from left to right like the Tamil script.
(5) The grammatical rules of *Tolkappiyam* are applicable to the Indus language.

4.5 Mathivanan is aware that his theory of an advanced civilisation in Tamilnadu from very ancient times is not supported by archaeological evidence. He gives three reasons to explain the apparent discrepancy:

(1) Proper excavations have not been carried out in any important site of antiquity.
(2) The great ancient cities of the Proto-Dravidians are believed to have been submerged during successive deluges caused by the rise in sea-level.
(3) "After imbibing the mania of the Aryan culture of destroying the enemy and their habitats, the Dravidians developed a new avenging and destructive war approach. This induced them to ruin the forts and cities of their own brethren out of enmity". (Here Mathivanan apparently alludes to destruction of forts by Indra, the *Puramdara*, referred to in the Rigveda, juxtaposing it with the destruction of the Chola cities by the invading Pandyan army in the 13th century A.D.).

4.6 Mathivanan's methodology of decipherment is to treat each Indus sign as a pictogram, find the appropriate Tamil word for it, and derive a phonetic syllable from the initial or even non-initial sounds of the word. However, as the Indus script has more than four hundred signs and the Tamil script has only thirty characters, Mathivanan is forced to assign the same phonetic value to a large number of signs. For example, more than forty Indus signs are allotted the same

phonetic value *-(a)n*. This enables him to read most of the Indus inscriptions as personal names in Tamil ending with *–(a)n*.

4.7 I shall not discuss the linguistic features of Mathivanan's decipherment of the Indus inscriptions in Tamil on the present occasion. However, a remarkable feature of the decipherment is, given his ideological leanings and etymological expertise, the number of words of Sanskrit origin in his readings.

Some examples:

tivu : 'island' (<Skt. *dvipa*)
tevan : 'a personal name' (<Skt. *deva*)
nandan : 'a personal name' (<Skt. *nanda*)
nandi : 'a personal name' (<Skt. *nandi*)
naavaay : 'boat' (< Skt. *nau*)

It is possible however that Mathivanan believes that these are Dravidian words borrowed into Sanskrit.

The Jaffna Seal:

4.8 Mathivanan claims to have discovered some clinching evidence validating his decipherment. The most important among them is the metal seal from jaffna described by him as the 'Rosetta Stone' for his decipherment. An archaeological team led by K.Indrapala of the University of Jaffna excavated a megalithic burial complex at Anaikoddai in Jaffna District, SriLanka. In one of the burials, a metal seal was found assigned by the excavators to ca.3rd century B.C. There are two lines of writing on the seal; the upper line depicts three megalithic symbols (one of them repeated twice) resembling the signs of the Indus script; the lower line has three characters in the Brahmi script read as *ko ve ta*. Indrapala (1981) has raised the question whether this could be a bilingual inscription in the Indus and Brahmi scripts. Scholars have debated the question, but the results are inconclusive.

4.9 Disregarding the archaeological evidence, Mathivanan assigns the seal to ca.1600 B.C. and reads the 'biscript' inscription as *tivu ko* 'king of the island'. According to him, the writing on the seal

belongs to a period of transition when both Indus and 'Proto-Tamil' scripts existed side by side, until the Third Tamil Sangam (ca. 1800-1700 B.C.) reformed the Indus script reducing the number of characters to thirty as recorded in *Tolkappiyam*. Mathivanan explains: "just to enable those who were accustomed to read the old Indus script, the metal seal of Jaffna was allowed to be in biscript".

Coin of the Nandas in the Indus Script

4.10 Another piece of evidence relied upon by Mathivanan is a coin found near Alur in Kurnool District of Andhra Pradesh. The circular thick coin (probably in lead) features a horse on the obverse and some illegible symbols on the reverse. S.K. Pandian (1987) who first published a photograph of the coin describes it as 'Pre-Buddhist'. However, judging from its fabric and motif on the obverse, the coin appears to belong to the Satavahana period in ca. 2nd century A.D. Mathivanan reproduces a drawing of the coin in his book and claims that the 'legend' on the reverse (inaccurately drawn) is in the Indus script. He reads the legend as *nanda* and assigns the coin to 'one of the kings of the Nanda dynasty of Pataliputra, much earlier than the Navanandas and probably related to the Sisunagas". According to Mathivanan, the legend on the reverse of this coin proves that the Indus script was in use in North India till the time of 'earlier Nanda dynasty'.

Indus Script found in a Santhal village in Bihar

4.11 Mathivanan has also read the symbols painted on the walls in a Santhal village in Bihar as written in the Tamil language in the Indus script. Here I have to make a brief digression to explain the background to this discovery. N.K. Verma, an officer of the Bihar Administrative Service who has made a special study of the language and culture of the Santhal tribe in Bihar, published a Paper in 1993 claiming to have found symbols in Santhal wall paintings looking like the signs of the Indus script. He also claims to have learnt the phonetic values of the symbols from the village priest. His study has revealed the occurrence of 22 out of 26 letters of the Roman alphabet in the Indus inscriptions from Mohenjodaro published by Marshall. This discovery enabled him decipher the Indus script. He found in the Indus inscriptions not only Santhali words but also words in

Sanskrit, Hebrew, Persian-Arabic and English. He knew he was on the right track when he was able to decipher an Indus inscription which reads *hai pig* 'this is pig' on a copper tablet which has also the figure of a pig (earlier identified by others as a rhinoceros). He reads another inscription as *eft* 'elephant' on a sealing which has the figure of an elephant on it. When Verma sent me a copy of his Paper, I noticed the extraordinarily close resemblance of Verma's drawings of the Santhali symbols to the Indus signs published by me in the ASI Concordance (1977). At that time I did not think much about it; but now Mathivanan's book throws fresh light on this curious affair.

4.12 In the course of his fieldwork, Mathivanan visited the Santhal village in Bihar accompanied by Verma and met the village priest. He reports seeing the priest writing the symbols on the walls. He also records that the priest 'was taught every detail about the Indus civilisation by Verma'. The colour photographs of the 'Santhali-Indus' paintings published by Mathivanan in his book are revealing. The symbols are painted in black in large size on freshly white-washed blank walls. One of the photographs shows the village priest writing a long inscription of 14 symbols in two lines on a blank wall. The painted symbols do not look like tribal art at all. After closely studying the photographs, I suspect that the ultimate source of the freshly painted symbols on the walls of the Santhal village is the Sign List published in the ASI Concordance. In any case, unless the existence of the 'Santhali-Indus' symbols is confirmed by independent evidence of drawings or photographs published before 1920, the date of the discovery of the Indus civilisation, it would be prudent on the part of the would-be decipherers not to rely on the Santhali wall paintings reported by Verma.

A Comparative Study of Sanskrit and Tamil Solutions

4.13 It is instructive to compare the Sanskrit solution as presented by Rajaram and the Tamil solution of Mathivanan. *Prima facie,* they are poles apart; in reality, like the climate of the poles, they are chillingly alike. Each argument based on Aryan and Sanskrit on the one side can be matched by that of Dravidian and Tamil on the other. For Rajaram, the Harappans are Aryan and the language is Sanskrit; For Mathivanan, the Harappans are Dravidian and the language is Tamil. Rajaram believes that the Harappan-Vedic culture dates back

to 7000 B.C. ; Mathivanan goes much farther and traces the Tamil civilisation of Lemuria-Kumari Kandam to 50000 years ago. Rajaram believes that all Indian languages including the South Indian are Aryan; Mathivanan believes that all languages of the world are derived from Tamil which was spoken all over the subcontinent before the advent of the Aryans. Rajaram's Sanskrit reached West Asia and marched into Europe; Mathivanan's Tamil spread from the Himalayas to the South Pole. Rajaram reads the Indus texts with the help of Yaska's *Nighantu;* Mathivanan achieves the same feat with the help of *Tolkappiyam.* Both read the Indus script from the left, Rajaram's choice being guided by the Brahmi script and Mathivanan's by the Tamil script. The choice of the wrong direction makes both solutions *ab initio* invalid. Above all, each sees the decipherment as the means to achieve a wider objective which is, judging by their earlier publications, the glorification of the Aryan culture and Sanskrit for Rajaram and the Dravidian culture and Tamil language for Mathivanan. Their works are the outcome of deep nationalistic and linguistic bias respectively.

Section III: NEITHER ARYAN NOR DRAVIDIAN

5. 'Number Mysticism'

5.0 *Dr. B.V. Subbarayappa is the honorary Director of the Centre for History and Philosophy of Science at the Indian Institute of World Culture, Bangalore. He has published several books on the history of science in India. His book* ***Indus Script: its Nature and Structure*** *was published in 1996.*

5.1 This remarkable and interesting book on the Indus script will come as a relief to those tired of the unending Aryan-Dravidian controversy and to those who would like to hear less about gods and goddesses and more about the economy of the Indus civilisation. The disappointment is all the more as the solution turns out to be as implausible as the 'linguistic' decipherments surveyed earlier in this talk.

5.2 Subbarayappa examines the reasons why the proposed decipherments based on language have failed. According to him, it is unlikely that there was a single language spoken over the vast area

covered by the Harappan civilisation. In any case, he doubts whether the Harappan vocabulary could be so limited as to possess only about 450 words represented by the signs of the Indus script. He also points out that early societies with oral tradition like the Vedic had highly developed number systems; the Harappan society could have been one such. This is the basis for Subbarayappa's radically different solution that the Indus signs are all numbers 'expressed in an ingenious manner' and that the Indus texts are a 'ciphered system involving additive-multiplicative approach to arrive at and express the desired numbers'.

5.3 The proposed numeral system is decimal with base 10. There are different symbols for the numbers 1 to 9, for 10, 100 and 1000, and for their multiples. Subbarayappa identifies two types of numerical representation in the texts. The symbols with the orderly sequence of one to twelve strokes represent the numbers 1 to 12. The number 10 is represented by a circle. The other type is much more complex in which pictorial symbols or geometric forms represent various numbers. For example, any sign with four lines, whether it is a square, or oblong or diamond or a cross, represents the number 4. Higher numbers are represented by additional strokes attached to the basic signs. Many of the numbers are identified from their supposed resemblance to numbers in various other numerical systems including Babylonian, Chinese, Attic Greek, Kharoshthi and Asokan Brahmi. There are also many imaginative derivations; for example, U stands for 20 because it looks like a 'nail' and we have twenty nails. The complexity of the system is increased further as many of the numeral signs are 'condensed in an artistic way' or 'embellished' to look like pictorial depictions.

5.4 The Indus texts are all strings of numbers. They are generally written from right to left. Subbarayappa cites the ancient Indian practice of writing the numeral digits from right to left. The 'mechanism' proposed by him to derive higher numbers comprises (1) repetition, (2) addition of strokes, (3) ligaturing of signs and (4) use of some special additive devices. For example, a square with a cross inside is 4 x 4 = 16; A lozenge enclosing four smaller squares and a circle is: 4 x 4 x 4 x 4 x 4 x 10 = 10, 240. Some of the number strings have very large values; for example, a 5-sign text (No. 9832 in

the ASI Concordance) is read as:

$$11000 + (700 \times 13 \times 7) + (10 \times 10 \times 5) + 16 + (6 + 2)$$

Subbarayappa claims that the advantage of this numerical system lies in the 'ease with which a purposeful and realistic recording can be accomplished'. One may however dispute his claim as he himself describes the system as a cipher which, by definition, has to be deciphered before it can be understood.

5.5 The Indus texts are regarded as 'exclusively quantitative records with no words or ideograms interposed in between'. Subbarayappa has an interesting answer to the question as to what the quantitative records represent as they are not mentioned in the texts. He believes that the animal motifs depicted on the seals represent various agricultural commodities, the quantities of which are specified in the numbers indicated in the texts which accompany them. For example, the 'unicorn' represents symbolically the three important field crops of barley, wheat and cotton, each crop being specified by the variations in the standard-like object placed in front of the animal. Some of the other important identifications include-

short-horned bull	:	six-rowed barley;
ox-antelope	:	two-rowed barley;
elephant	:	wheat;
rhinoceros	:	peas;
buffalo	:	sesamum;
gharial	:	rape-seed,
tiger	:	date fruit;
humped bull	:	cotton threads;
hare	:	boll of cotton.

5.6 Subbarayappa identifies the agricultural commodities from the clues present in the animal motifs. For example, the short-horned bull represents an edible variety of barley as there is a feeding trough before the animal; the elephant represents wheat as the trunk of the animal is, like the axis of the wheat grain, not straight; the rhinoceros represents peas which are depicted by the `dots' seen on the hide of this animal; the white colour and the posture of the hare are suggestive of a boll of cotton; and so on.

5.7 The purpose of the inscriptions is to maintain an account of the grains and cotton made available to the people under a centralised dispensation. Duplicates of the inscriptions like those on the sealings indicated that so many bundles or packages were sent from one place to another. What about the texts without any animal or other pictorial motifs? Subbarayappa points to the perforations, a feature present on most of the seals, and explains that the text-seals were tied to other seals having pictorial motifs, the latter identifying the commodity.

5.8 A serious objection to Subbarayappa's solution is that it is highly unlikely that the large and beautifully carved stone seals, apparently very expensive to make, would be used to record quantities of commodities varying with each transaction. It would have been much more simple to make use of cheaper and readily available material like cloth, palm leaves or clay for daily accounts not required to be preserved for posterity. Another equally serious objection is that notwithstanding his claim to the contrary, the great complexity of the system would render it quite unsuitable for unambiguous recording of transactions for handing out daily rations or despatch of goods. Subbarayppa's solution may be described, borrowing a phrase from his book, as 'number mysticism'.

Section IV : TESTS FOR VALIDITY OF DECIPHERMENTS

6.1 No bilingual or biscriptal inscription has been found to provide the breakthrough to unravel the mystery of the Indus script. It is however a counsel of despair to dismiss all attempts to decipher the script as futile in the absence of such evidence. After all, the decipherments of the Linear-B and Maya scripts were achieved without the aid of bilinguals. However, in the absence of such clinching evidence, we do need some objective criteria to test the validity of competing claims and to guide the would-be decipherers. I worked on this problem as a Visiting Fellow in the Department of Linguistics, Osmania University, Hyderabad, under the guidance of Prof. Bh. Krishnamurti in 1985. Later that year, I presented the results of the work at the SAARC Workshop on Epigraphy held at Mysore. As the proceedings of the workshop were not published, I incorporated a brief summary of the methods in my Paper presented at the Indian History Congress in 1988. In the context of the newer

attempts at decipherment, I feel it is useful to make a brief recapitulation of the tests.

6.2 There are three simple but decisive tests for a preliminary screening of the claims :

(1) Test of Direction

The general direction of reading the Indus inscriptions from the right is now so well established that we can safely leave out of serious consideration any attempt to read the script generally from the left. A claim for decipherment will also be suspect if the decipherer mechanically reads all the lines from the right and is unable to identify the occasional reversal of direction in the inscriptions, which can be done quite easily in most cases with the help of the sign sequences.

(2) Test of word segmentation

As a result of analytical and structural studies, we can now confidently demarcate word boundaries in the Indus inscriptions. A proposed reading is suspect if it does not match word boundaries indicated by segmentation analysis. For example, if a text ABCDEF is segmented as AB/CD/EF by structural analysis, a lingustic reading ABC/DEF will be unacceptable. If several such cases of mismatch occur in a decipherment model, the whole claim is suspect.

(3) Test based on Frequency-Distribution Analysis

Since we know the frequency-distribution pattern of the signs in the Indus inscriptions, we can match the data with those for the sounds in the language proposed by a would-be decipherer. The readings are suspect if there is no reasonable match. For example, vowel values proposed for the JAR sign do not seem to be possible since the vowel signs are expected to occur initially in a syllabic script of open syllables, while the JAR sign avoids the initial position altogether. Another value proposed viz. *sa* has a better fit, especially because, as a grammatical morph, it is both final

and a separable suffix like the JAR sign. But since the JAR sign never occurs initially, a different sign for *sa* has to be postulated for this position, which is unlikely in the phonetic script assumed by the model.

6.3 The tests mentioned above are of general applicability. In other words, any proposed decipherment will have to satisfy these criteria irrespective of the methods followed or the language proposed. However, the tests are negative in character. They can invalidate a claim as not being consistent with the criteria, but they cannot prove that a proposed decipherment which passes the tests must necessarily be correct. It can only be said that such a decipherment appears to be *prima facie* sound and deserves serious study. However, the tests do serve to warn the would-be decipherers of the pitfalls ahead and to point towards the likely direction of fruitful research.