Claims of Decipherment of the Indus Script : Some Objective Methods to test their Validity*

By

Iravatham Mahadevan

Introduction

There are over forty claims of decipherment of the Indus
script and the number seems to be growing. According to these
claims, the Indus script is either alphabetic or syllabic or logo-
graphic; the language of the inscriptions is either Dravidian or
Indo-Aryan or 'Indo-Sumarian'. None of the claims has received
general acceptance. It would however be a counsel of despair
to ignore all the attempts or be content with mere negative
criticism. Some at least of the claims are based on serious
study and years of devoted research and may provide valuable
clues or insights, though none is so far wholly successful.
It is therefore useful to evolve some objective criteria to
assess the various claims of decipherment. Some methods based
on statistical and structural analyses of the Indus texts to
test the validity of proposed decipherments are described
in this paper.

The methods described here are of general applicability.
In other words, any proposed decipherment will have to satisfy
these criteria, irrespective of the methods adopted or the
results achieved. However these tests are largely negative in
character. They can invalidate a claim as not being consistent
with the criteria, but they cannot prove that a proposed deci-
pherment which passes all the tests must necessarily be correct.
It can only be said that such a decipherment appears to be
theoretically sound and deserves serious consideration.

Methods to test the validity of proposed decipherments:

. Direction of writing :

One of the few well-established facts about the Indus
script is that it is generally written from the right, though
there are exceptional cases of lines running from the left.
The general direction of writing has been established on the

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basis of many simple observations like the overflow of the
last sign at the left end to a lower line, cramping of signs
for want of space towards the left end, writing of a text
along the top, left and bottom edges of a square seal leaving
the right edge blank (as seen in impression) showing that
the writing is in an anti-clockwise (that is right to left)
direction etc. B. B. Lal (1960) has demonstrated from a study
of overlapping incisions on pottery graffiti that the inscrip-
tions must have been incised from the right. I. Mahadevan (1977)
has drawn attention to pairs of identical texts occuring in
single lines and also in two lines one below the other thus
indicating the real sequence of signs and the direction of
writing.

It is therefore surprising that some scholars still
attempt to decipher the Indus script on the assumption that
the writing is from the left as in the later Brāhmī script.
Applying the test of direction of writing we can safely
ignore all such attempts as not deserving serious consideration.

We also come across attempts to read all the lines
mechanically from the right. It is a matter of simple obser-
vation that there are cases of bi-directional writing of
identical texts. It is possible to recognize reversed
writing by observing the 'direction-markers', viz.

(a) the asymmetric signs (with respect to the
vertical axis) will appear reversed (as in the
case of the Egyptian Script);
(b) the most frequent right-end and left-end signs
will exchange positions;
(c) the most frequent sign-groups (pairs and triplets)
will appear in the reversed order.

A question may however arise whether there are not
genuine cases of reversed spellings forming different words
or phrases (as for example, GOD and DOG in English). It
is true that there are such exceptional cases of reversed
spellings in the Indus texts. There is a simple test by
which we can detect such cases. Thus XY and YX are genuinely
reversed spellings forming different words only if it can
be shown that both spellings occur within a longer text
(e.g. ABCXY and ABCYX). But a complete text, say XYZ, cannot
be read as ZYX (even when the latter is in the right-to-left
order) if the reversal is not found within a longer text.
Uncontrolled readings of such texts by some scholars from

. the right or in both directions have to be disregarded as
arbitrary.

II. Methods based on the structural characteristics of
the Script :

We know the frequency and positional distribution of
signs in the Indus inscriptions through simple statistical
analysis. We also know that each type of script has its own
structural characteristics, which are independent of the
language of the inscriptions. We can therefore use these
two sets of data as controls to check the validity of proposed
decipherments. Here are a few examples :

v 1. Number of signs in the script :

All systems of writing employ one or more of only three
types of signs, viz., word-signs (logograms), syllabic or alpha-
betic signs, standing respectively for words, syllables or
single sounds (consonants or vowels). It is also known that
the total number of signs in a script falls rapidly as the
system evolves from word-signs through the syllabic to the
final alphabetic stages.Actual sign-counts of various ancient
and modern scripts have shown that the total number of signs
is specific to each type of writing within a range, as may
be seen from the following chart :

Sl. No.	Type of scripts	Type of signs	Total no. of signs	Examples
I.	LOGOGRAPHIC	word-signs	in thousands	Chinese
II.	LOGO-SYLLABIC	word-signs and syllabic signs	900-400	Egyptian, Akkadian, Hittite.
III.	SYLLABIC (A)	with closed and open syllables	200-100	Elamite cuneiform.
	(B)	with open syllables only	100-50	Cypriote, Cretan Linear-B, Old Persian cuneiform.
IV.	ALPHABETIC	Single-sound signs (consonants and vowels)	Below 50	Ugaritic cunei- form, Semitic alphabet,Greek, Latin, etc.

The simplest and one of the most decisive tests for the
typology of a script can be made just by counting the total
number of signs in it. This is how Champollion concluded
that the Egyptian script with about 700 signs could not be

purely logographic like the Chinese; and Michael Ventris proceeded on the assumption that the Cretan Linear-B script with about 90 signs could only be an open syllabary. The decipherments proved both of them right.

The Indus script has about 400 signs. This number is too small for a purely logographic script like the Chinese, and too large for a purely alphabetic script like the Greek or Latin scripts. Applying this test we may leave such proposed solutions out of serious consideration.

The only other possibilities are that the Indus script is logo-syllabic like the Egyptian and the Akkadian scripts or mainly syllabic like the Elamite cuneiform with both closed and open syllables (of the types CVC, VC and CV). The evidence is against a purely open syllabary (of the V/CV type); however considering the relatively larger number of phonemes in Indo-Aryan (33 consonants, 10 vowels and 2 semi-vowels) we cannot rule out this possibility merely on the basis of a sign-count. But we shall see presently that there are other lines of evidence strongly suggesting that the Indus script is more likely to be logo-syllabic than purely syllabic.

2. Number of signs in a Text :

It is a matter of common observation that a word will require more signs to write as scripts evolve from word-signs through syllabic to alphabetic stages. The Indus inscriptions are very brief, their average length being hardly five signs. There are a large number of texts each with just one or two signs only. It is difficult to conceive of complete texts written with one or two letters each in an alphabetic script. Even syllabic writing, especially with open syllables, seems unlikely with such extreme brevity. If we look at comparable material from the later Historical period in India, like coins, seals, brief votive labels (as at Sanchi etc.) we find that the average number of open syllables required to compose these very short legends is more than the number of signs in an average Indus text. Here is another test indicating that the Indus script cannot be alphabetic or even an open syllabary, but is likely to have a more complex structure involving word-signs and compound or closed syllables (of the CVC/VC type

3. Frequency-distribution of signs matched with typology
   of the script.

(i) In an alphabetic script, consonants and vowels will generally occur in an alternating pattern (C-V-C-V etc.). This will be so whether the vowels are written separately

(as in the Greek script) or indicated by uniform diacritics in non-initial positions (as in the Indian scripts). Such patterns of alternating vowels or uniform diacritics are not discernible in the Indus script. This is one more argument against the possibility of an alphabetic or quasi-alphabetic solution.

(ii) In an alphabetic script the vowels will be fewer in number than consonants, but with a much higher relative frequency. The pattern of distribution of the high-frequency signs in the Indus script does not resemble that of vowels in an alphabetic script. The possibility that the Indus script is a vowel-less consonantal script (like the Semitic) is ruled out by sign-count.

(iii) In a syllabic script with open syllables (of the V/CV type) the vowel signs will tend to occur mostly initially (and hence known as 'initial' vowels). Michael Ventris relied on this feature to identify the vowel signs in the Cretan Linear-B script. The proposed identification of the most frequent sign in the Indus script (the JAR sign) which occurs mostly in final positions and never in text-initial positions as a 'vowel' in an open syllabic script is therefore quite unlikely.

(iv) In a syllabic script (of either type), text-final signs which are found to be few in numbers but with very high frequencies are likely to represent grammatical forms like number, gender or case-markers, or auxiliary signs like determinatives etc. Therefore any solution assigning phonetic values to such signs (which do not simultaneously represent grammatical forms or auxiliary indicators in the language) will be suspect.

(v) In a logo-syllabic script the word-signs representing the vocabulary items will be more in number but will occur with low frequencies. On the other hand signs representing phonetic syllables, grammatical elements or auxiliaries will be much fewer in number, but occur with much higher relative frequencies. This is the pattern observed in the Indus inscriptions. Thus out of the total of 417 signs, no less than 264 signs occur less than 10 times each. At the other end of the scale, just 2 signs occur 2044 times out of 13, 372 sign-occurrences in the corpus (Mahadevn 1977). 67 signs account for over 80 per cent of the total sign-occurrences. A small group of five or six signs occurring mostly in final positions are found to have very high relative frequencies. This pattern is consistent with that of a logo-syllabic script

having a larger word-sign inventory, supplemented by a smaller number of phonetic, grammatical or auxiliary signs with higher frequencies.

III. Methods based on Linguistic Characteristics :

Since we know the frequency-distribution pattern of the signs in the Indus inscriptions, as well as that of the sounds in the proposed language, matching of the two sets of data provides another set of controls over the proposed readings. Here are some of the applications of the method as examples :

1. Frequency-distribution test :

(a) The ARROW sign has the following frequency-distribution pattern in the Indus inscriptions :

Solus	Initial	Medial	Final	Total	Percent(total occurrences)
1	0	42	184	227	1.70

Three Indian scholars have proposed the phonetic values ka, da or ra in Indo-Aryan to this sign. None of them is likely to be correct because the proposed sounds do not occur mainly in the final position or avoid the initial position in Indo-Aryan.

(b) The JAR sign has the following frequency-distribution characteristics :

Solus	Initial	Medial	Final	Total	Percent
3	1*	420	971	1395	9.65

(* In a second line; no text-initial occurrences.)

Two scholars have proposed the phonetic values ā or na in Indo-Aryan to this sign. This is the most frequent sign in the Indus script. It is mostly final and never initial. The frequency of ā in Indo-Aryan is not as high as 10%, nor is it mostly confined to final positions. Similar arguments rule out na also as a probable phonetic value for the sign.

2. Syntactic vs Syllabic order of signs :

In a syllabic script the signs will have a generally free distribution subject only to some phonological constraints in the language. But in a logo-syllabic script the signs tend to occur in a relatively more fixed order reflecting the syntactical pattern of the language. The Indus text

clearly exhibit the latter pattern thus indicating a substantial word-sign content in the script. Therefore any solution based on mere phonetic values assigned to most of the signs will be inconsistent with the relative fixed order and positional distribution of the signs.

3. Word boundaries determined by segmentation of texts :

Several analytical studies have established that it is possible to segment the Indus texts into constituent phrases or words through simple techniques like identification of recurrent sign-groups, comparison of near-identical inscriptions, finding shorter texts which are part of longer ones, comparing the frequencies of successive adjacent pairs of signs (e.g. of AB, BC, and CD in the text ABCD) etc. As a result of these studies we can now demarcate the word boundaries in Indus texts with some confidence. This procedure yields another valuable test for proposed decipherments. A proposed reading is suspect if it does not match the word boundaries determined by segmentation analysis. For example, let us consider a text ABCD which is segmented as A/BC/D by structural analysis, while a proposed reading leads to a different segmentation AB/CD on linguistic considerations. Such a reading is unlikely to be correct.

Conclusion:

As a result of testing most of the recently announced 'decipherments' by these methods, an irresistible conclusion which emerges is that the Indus script cannot be alphabetic and is most unlikely to be purely syllabic of either type. It is most probably a logo-syllabic script with a substantial number of word-signs augmented by syllabic and auxiliary signs. A second conclusion is that a logo-syllabic script cannot be deciphered successfully ~~from the phonetic content~~ in the absence of bi-linguals or clues from personal or place names. That leaves only the possibilities of (a) trying to extract the utmost information from structural and formal analyses, and (b) studying the likely ideographic signs for pictorial clues and parallels to the general contents of the inscriptions. As things stand a complete decipherment is still beyond the horizon.

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