

MOHENJO-DARO AND THE INDUS CIVILIZATION

Being an official account of Archæological Excavations at
Mohenjo-daro carried out by the Government of India
between the years 1922 and 1927

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Volume II Text Chapters XX—XXXII
Appendices and Index



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CHAPTER XXII

SIGN-LIST OF EARLY INDUS SCRIPT

I SOME EXTERNAL FEATURES OF THE WRITING

[From p 406 to p 411 this chapter expresses the joint views of Messrs Smith and Gadd From the bottom of p 411 to p 414 it expresses the views of Mr Gadd only, and from p 415 to p 422 those of Mr Smith]

THE accompanying list of signs used in the inscriptions upon seals found at Harappā and Mohenjo-daro is offered for the use of those who may in the future devote themselves to the study of this writing It is published as a contribution, indeed, to that study, but rather as a tool ready to the hand of scholars when time may have brought the possibility of further achievement, than as a finished production in itself For the aim of such study must naturally be the decipherment of this script, and it is proper, therefore, to state at the outset that we have not succeeded in reading anything of it, there was, in fact, very little hope, in the complete absence of any kind of clues which might lead to some trustworthy inference Hope for the future most probably rests in Mesopotamia It is known for certain that seals and sealings of this class were carried thither by trade from the Indus valley in ancient times,¹ and one such seal has already been found (at Ur) with a *cuneiform* in place of an "Indus" inscription² There is consequently reason to hope that some day a bilingual record may be discovered, and very few data of this kind would probably suffice to reveal the secret Meanwhile, all that can be done is to prepare the material to which the solvent may ultimately be applied

Script not deciphered

Indus seals found in Mesopotamia

Difficulty in classifying signs

Even for the modest purpose indicated we are sensible that the list we have compiled is far from perfect Its faults arise partly from the inherent difficulty of classifying signs simply by their outward appearance, but partly, too, from the nature of the copies which we have used These have been photographs, showing sometimes the original seals, sometimes the impressions, and hence the order of the signs may now and then have been unintentionally reversed, if this has occurred, however, the attentive student, once familiar with the writing, will probably detect and allow for it A more serious defect will doubtless be found in the making of distinctions between signs which are differently drawn in certain instances but are actually identical, or, conversely, in the neglecting of actual distinctions between signs which are very similar in appearance As an example of the first, CCXLII and CCXLIV may be quoted (these two are probably not different), and of the second, the number of "barbs" on signs of the class CCLXIV may sometimes have been incorrectly given, and here a real distinction may have been observed—though it is perhaps not very likely Faults of this

¹ They have been recovered from at least four sites, the ancient cities of Kish, Lagash, Umma, and Susa, see the article by Mr E Mackay in *Journal of the Royal Asiatic Society*, 1925, pp 697 f and pl x, and also that of M Thureau-Dangin in *Revue d'Assyriologie*, xii, 99 for another specimen and further references

² Mr C L Woolley in *Antiquaries' Journal*, 1928, p 26 and pl xi, 2

kind arise, of course, from the first-mentioned difficulty, that of dealing with a script purely from outward appearance, without knowledge wherewith to control eye and hand

The form and material of the seals, their archæological character and context, will be found fully described in the preceding chapter, preliminary accounts of them have already been given in periodicals. All that need be said here is that there seems to be no direct connection between the device engraved upon the seal (usually an animal) and the inscription, the same animal being found in company with completely different inscriptions. The devices may be presumed to have religious significance, and perhaps some amuletic value.

As concerning the signs themselves, the number listed here is 396, which must be considered only a very approximate measure of the signary of this writing, both because the material is still, no doubt, far from complete, and because of the slight uncertainty of distinction mentioned above, but also because of the great resources of modification and combination of signs which this writing possessed, the extent and ingenuity of which is perhaps its most striking feature. The signs are pictographs, as in all other early scripts. They are carefully drawn as faithful representations of their originals in all cases where the original can be identified, and the same may therefore be presumed of the much more numerous cases where the original is doubtful. That is to say, the writing remains in what may be called, on Egyptian analogy, the hieroglyphic state, it has not degenerated nor been worn down by use, to conventional summaries like the Egyptian hieratic, the Babylonian cuneiform, or the Chinese writing. This is certainly due in great part to the material upon which these inscriptions are found, since pictographs always preserve their form best when they have to be sculptured on stone, but tend to lose it when they are employed cursively on soft substances like clay, papyrus, or parchment. Whether the Indus people wrote upon more perishable materials, and what form the signs then assumed, there is nothing to show, but the scratched characters found upon potsherds and copper utensils suggest a more extended usage.

Clearly as the signs are drawn it is a remarkable fact that few can be identified. This difficulty is familiar in other early scripts also, but it is generally due rather to imperfect representation than to actual uncertainty of the object intended, this applies particularly to the archaic Sumerian signs, which, while often suggesting the original, very seldom portray it unmistakably, and often seem very doubtful representations of the objects which their known meanings presumably indicate. Among the Egyptian hieroglyphs only a few still resist identification. No doubt further study of this "Indus" writing will reveal more of the objects represented, but at present the list is surprisingly short. The following are some additions or alternations to the very tentative proposals made by us in the *Illustrated London News* of 4th October, 1924, p. 614.

Device and legend unconnected

Signs are pictographs

Objects imperfectly represented

Numbers

Possible Identification

I to XVIII

CCCLXIX to CCCXCVI

CCCLXX

CCCLXIX

CCCLXXVII

CCCLXXVIII

CCCXCVI

CCCLXXIX f

CCCLXXXV

Strokes, representing numbers

Men in various attitudes

Man standing

Man raising arms

Man with staff

Man with bow and arrow (or, more probably, defending himself with a shield), in any case, a warrior

Man with staff raised

Man holding up three or five fingers

Man holding yoke (possibly abbreviation of the following picture)

<i>Numbers</i>	<i>Possible Identifier</i>
CCCLXXXVI	Man carrying on a yoke two water skins (ligature of above and No CLIX)
CCCLXXXVII	Man carrying on a yoke two water skins (ligature of above and No CCXXXVIII)
CCCXXXI to CCCL	Fish, with various additions and insertions
CCLV ff	Hand, with different numbers of fingers outstretched
CCLXI	Hands (?), indicating the number 13 (?)
CCCLI ff	Birds and animals, among which CCCLXIV seems to be a drake, and CCCIX a bat
CCLI f, CCCLXVI f, and perhaps CCXXXVIII	Plants
CXXXV ff	Mountains (?)
LXV	Heart (?)
CLIX	Spear
CCCXIX	Chair
CCCXXII	Table
CCCXXIX	Piraol (cf CCCIXVIII)
CCLXXXIII	Road
CCXLVII ff	Foot
LII ff	Insects

Parts of human body

Apart from the apparent numbers, which will be considered later, there are a few remarks to be made on the foregoing list. It is rather noticeable that, whereas men in various attitudes are well represented, there are few parts of the body among the signs, seemingly the only exceptions are the hand and foot, if, indeed, Nos CCLV, CCXLVII are correctly so interpreted. Among the "man" signs No CCCXCVI gains certainty from the object published in *Times of India*, 22nd January, 1928,¹ which shows on a larger scale a man standing in exactly the position which the sign depicts in miniature. That Nos CCCLXXIX f really indicate a number of fingers held up is suggested by the circumstance that they follow, in the inscriptions, three and five strokes respectively. The pictures of the man carrying the yoke, and the two water-skins or sacks hanging from it look quite unmistakable, and equally clear seems the nature of the composite signs CCCLXXXVI f, particularly as these occur in positions where CLIX and CCXXXVIII are expected. The suggested "fish" signs are more puzzling, since the modifications to which the original (?) CCCXXXI is subjected are not particularly natural as indicating different kinds of fish, and it is by no means certain that a fish is intended at all, but the comparison suggests itself at once, and it is hard to find a better.

"Fish" signs doubtful

That CCLV and the like represent the hand with different numbers of fingers extended must be considered a very doubtful possibility, since there are instances in which more than five digits are shown, although, on the contrary, there is the very suggestive case of the man (No CCCLXXX) who seems to hold up five fingers while he stands next to five strokes, and these "fingers" with his forearm, have much the appearance of the "hand" signs. In the *Illustrated London News* (loc cit) we formerly proposed a comparison between these "hands" and the archaic Sumerian form of *gal*, outwardly, this is still striking, but if the "Indus" sign really represents a hand this comparison would have to be abandoned, since, although the original of the Sumerian sign is uncertain, there is no reason to connect it with the hand. The elaborate character No CCLXI is perhaps to be explained as the fingers of one hand twice outspread, and three of the other hand held up, the whole indicating the idea of "thirteen". Instructive comparisons with this sign are Nos CCLX and CCXXXII, but

Indus signs compared with Sumerian

¹ Cf Pl CXXXII, 10

whether favourable to the "hand" supposition or not it is not easy to decide. The birds and animals are more obvious, but it is impossible to be more precise as to their kinds save in the cases of the drake and the bat. Nearly all of the plants must be pronounced doubtful, though No CCLII seems a clear instance, it would be something if No CCXXXVIII, by far the commonest sign of all, could be identified as a plant, but actually it is very questionable. "Mountains" are simply an analogy from the Sumerian sign *kur*, the analogy is perhaps quite illusory. The same remark applies to No CCLXXXIII "(cross) road", and to No LXV "heart", especially to the latter, which has further modifications tending to show that the "heart" form is merely an oval with one segment (instead of four) cut out from it. Finally, the "table", "spear", and "parasol" have to rely only upon their outward form, though the last is seen over the head of a man in No CCCLXXIII. Doubtless several more suggestions will occur to any user of this list, we have confined ourselves to such as seemed most obvious to a purely outward view.

Birds and animals identified
Representations of plants doubtful

Other objects

The extensive use which this writing makes of modification and combination of signs has already been mentioned and it is, indeed, one of its most striking peculiarities. While it is difficult to give any conspectus of the modifications, a rough principle at least may be observed by dividing them into "additions" and "enclosures". By the first we mean the small strokes, generally vertical, and standing beside the top of the sign modified, but some times also oblique, in which case they are contained within the sign (as indeed are the vertical strokes in a few cases). "Enclosures" are signs which stand in the midst of a varying number, usually of vertical strokes, but occasionally within a kind of parenthesis. Groups of this latter kind are, naturally, of rather similar composition to the *combined* signs, and the distinction between the two is based principally on the use of simple strokes (nearly always) in the "enclosures", whereas the combined signs are coalitions of two entirely different individuals. The "additions" are —

Modifications of signs

, " , " , / , / , ^

"Enclosures" are constituted by the following —

| |, || ||, |, |, " |, () ,)

The principal combinations are given in the following table —

<i>Combined Sign</i>	<i>Elements</i>
CXLIX	LXXIII and CCXXXII
CL	LXXIII and CLII
XLVIII in a number of combinations	—
LXXVIII f	XLVIII and CCLXXXIII
CXXIV f	CXII and CCXXXII
CCCLXXIX f	CCCLXX and CCLV f
CCCLXXXVI f	CCCLXXXVI with CLIX and CCXXXVIII
CCCLXX in a number of combinations	—
CCLXI	CCXXXII and CCLX

Next to the signs themselves the direction in which the writing runs is to be considered. First, however, it must be repeated, as M. Thureau-Dangin has already observed,¹ that the *impression* produced by the seal, not the seal itself, gives the true order of the inscription. This may be shown best by turning from the seals (upon which, of course, most of the inscriptions occur) to the other objects, pottery or metal, upon which signs have been scratched, for there the legend is naturally to be read as it is written. A pottery fragment from Harappā,

Direction of Writing

¹ *Revue d'Assyriologie*, xxii, p. 100

Position
of Signs

No 2779, is inscribed with two completely preserved signs, the one on the spectator's left being No XCIX of our list, in the pot-inscription, the opening of this sign faces to the right. As an example of the same sign upon a seal we may quote the inscription given as No LXXIV, H 40, in the list. Here it is found in the second place from the right, and with the opening again facing to the right. But the inscription as there copied is from an *impression* of the seal, a photograph now before us of the seal itself naturally shows this sign with its opening towards the left. But since the pot-inscription gives the signs in the position in which they were meant to be read, it follows that the sign in question is properly placed with its opening facing to the right, that is, the impression, not the seal, presents the inscription in its true form. An exactly similar experiment can be made with the copper dagger-blade from Harappi, No 277^{1,2}. Here also the inscription is obviously meant to be read directly, and the sign furthest to the spectator's right is No XXXI, with its "loop" on the left. Now this sign is found also upon the seals, of which No XXXI (H 31) may be taken as an example. A photograph of this seal (not its impression) shows, as before, the sign reversed, i.e. with its "loop" on the right, hence again the impression gives the correct form, not the seal. There is no need to multiply examples, since these two suffice for proof, and indeed the proposition that seals are made for the purpose of reproducing a device, not to be looked at themselves, flows so directly from the nature of seals, and is so supported by all analogies that it might seem almost self-evident. However, it can be formally established in the present case, as shown above. Perhaps also it may be well to mention that at least one ancient impression of an Indus seal has already been published,¹ showing that these marks were affixed to clay labels upon bales of goods, in precisely the same way as the Babylonian seals were rolled over the clay "dockets", or the Egyptian seals impressed upon the clay stoppers of wine-jars.


Clay labels on
bales

Signs face to
the right and
left

The correct way of looking at the inscriptions having been settled it remains to take up the original question—in which direction does the writing run? An answer which we believe to be right, though based on quite insufficient evidence, has already been given by M. Thureau-Dangin: "les inscriptions sont à lire de droite à gauche, comme le montre l'un des signes du no XV, représentant un oiseau de profil à droite." The number referred to is No CCCLXIV of our list, and it is true that in the impression of this seal the bird enclosed in a ring (it seems to be somewhat carefully marked as a draft) faces to the right. It is, of course, a well-known rule of the Egyptian hieroglyphs that the inscription is read from the side to which the figures face. But it is easy to show that this is no safe indication for the "Indus" writing, for while most of the "men" signs face to the right (cf Nos CCCLXXIV to CCCLXXX in the list), there are several birds and animals (cf Nos CCCLIV to CCCLVIII) which face to the left! Some other criterion must therefore be sought, but is not altogether easy to find. First it will be noticed that in nearly all cases the bull or other animal which forms the main subject of the seal faces to the right, and there is consequently a presumption that the inscription begins from its head. There is, nevertheless, at least one exception to this stance of the animal, for in the impression of the Seal No 341 a rhinoceros faces to the left. This may be an inadvertence, but it succeeds to warn us against relying too much on the usual position of the animal as indicating the beginning of the inscription. Another small indication may be found in the usual manner of writing the sign composed of seven strokes (𑀓𑀔) in which the lower three are nearly always placed level with the right end of the upper four. A very significant example, too, is a seal

¹ By Father Scheil in *Revue d'Assyriologie*, xxii, p 56

² *Ibid*, p 100

from Harappā (No 5629) which makes it evident that the engraver has been cramped for space, and that in consequence not only were his signs closely bunched together, but the space remaining on the left side was not sufficient to take another sign, which has therefore been dropped below the line. The inference that the inscription began from the right is almost irresistible. But there is a final instance which puts this conclusion beyond doubt. The seal H 173 found in the excavations of 1926-7, is peculiar in having no animal device, but a long inscription which occupies two whole sides of the square and most of the third side. Now (in the impression, of course), this inscription occupies all the top side, all the left side, and most of the bottom, thus , the signs being turned 90 degrees at each corner in such a way that their tops always follow the edges. It is manifest, therefore, that the inscription was read turning the sealing round in the hand, and the position of the second and third sections shows that it was turned over towards the right, in other words, that the reader began from the right of the first and longest section, turned the sealing through 90 degrees, read the second section again from right to left, and similarly the third. Proof that these inscriptions are to be read from right to left seems herewith complete.¹

**Reading from
right to left**

Up to this point it has been possible to write with some assurance upon certain outward characteristics of the "Indus" script, but whatever is now added must concern its actual mechanism and reading, and must therefore, in the absence of any advance towards decipherment, be largely speculative. Perhaps, indeed, it would be prudent to stop entirely here, but there are a few observations that may still be advanced, and cannot, at least, do any harm provided the reader be amply cautioned that they are no more than tentative suggestions, which time may well prove completely erroneous.

First, then, something ought to be said about the possible affinities of this script. Being at that time in possession of very little evidence we once ventured to comment on a few resemblances between certain "Indus" signs and certain archaic signs of the Sumerian syllabary. This hint was on the one hand taken up with exorbitant enthusiasm and regrettable results, on the other rejected with an emphasis which mistook a suggestion for an affirmation. We need not dwell upon this longer than to remind the over-rigid that conjecture has its most legitimate place where other resources are lacking, and has played a brilliant part in former decipherments of unknown scripts, nor is it likely to be otherwise here. But, for the question in hand, we shall admit without hesitation that further experience has not tended to confirm our faith in any direct connection between the writing of Sumer and the Indus. The list which we gave could not now be much extended, some of the comparisons are doubtless fortuitous or occasionally far-fetched, and it is not improbable that a similar list could be constructed with the aid of other early scripts, such as the Minoan, which indeed affords some striking analogies. When it is reflected how many totally different scripts are known to have been employed within areas smaller than that which divides the Tigris from the Indus, no surprise will be felt that connection in this case cannot be established. Contact between the two peoples certainly existed, we think even that they shared certain cultural influences, but the presence of common elements in their mode of writing cannot be proved.





**Few resemblances
between Indus
and Sumerian
signs**

**Analogies of
Indus and
Minoan script**

What is likely to be the nature of this script? That it is not an *alphabet* must be obvious from the number of its signs, such a notion cannot seriously be taken into account. On the other extreme, it can hardly be a pure picture-writing in which every sign represents a word, since a very short search will reveal groups of signs which frequently appear in the inscriptions in different contexts and often with the insertion of one or more varying signs. While no great certainty can be felt about this matter, it remains true that the general impression derived

**Script not an
alphabet**

¹ On this subject, see pp 40 (with footnote) and 427-8

possibility of others not identified, it is hard to believe that a complete numerical-system exists in these inscriptions. Again, very little inspection of the text will reveal examples in which the apparent number occurs near to the beginning, or in the middle of a longish inscription, followed by several signs which have no obvious numerical value. Even if it be assumed that preceding signs are in some way higher "powers" of numbers, there is no such explanation for what follows, and the mere presence of a seemingly numerical sign in a long inscription is insufficient ground for assuming that the inscription conveys a note of quantities. Furthermore, not a few examples are found in which two numerical signs stand side by side, as ||| |||, or |||| |||, or |||| |||, and it is very hard to understand why so peculiar a form is adopted, if they are really numbers. Finally, to conclude the examination of this question, it will be interesting to take two or three individual cases. The first two inscriptions in the list are not uninteresting, the second might be interpreted "two men, one water-bearer", but the first has only the second part of the inscription, with a qualifying sign added. Even so it would still be possible to interpret this as "water-bearer", but it is then to be noted that the added sign CCXXXVIII can itself follow "numbers", so that it can hardly have been a mere qualification. Even more difficult is No H 149, where if both | and || are numbers, the whole must be a plain number, and that incomprehensibly expressed. Also, what should be the difference between U  and U  or  and , all of which are found? Lastly, if the sign XV be consulted, it will be found that this "number" occurs almost exclusively before one or two special signs, there should be no reason for this if the group really denotes the number seven. The general conclusion is that these collections of strokes, though obviously containing a certain number of units, are not here used in a numerical sense, but most probably with a phonetic value, which is perhaps derived from the native words expressing the respective numbers.

Strokes probably not numerical

The peculiar and at present (it seems) hopeless difficulty in the way of decipherment is the complete lack of exterior evidence. The finds in the Indus valley have been the first revealers of an Indian civilization of high antiquity, which appears to have left no traditions of itself. What may have been the race and language of this people is a question of pure conjecture. We must end where we began, with the hope that Mesopotamia, which has already revealed so infinitely much of ancient history, here also will not fail. The appearance at Ur of an "Indus" seal with a cuneiform inscription is full of hope, its three signs are all, unluckily, indistinct, but the reading is perhaps *Sak-ku-shu* or *ka-lu-shu*,¹ probably a name indeed, but whether characteristic of the Indus population we do not know. One other interesting reminiscence of these seals may be mentioned, there are certain devices and punch-marks on coins from N W India which have a strong apparent likeness to these ancient pictures. We may refer to the new British Museum "Catalogue of the Coins of Ancient India", where the feeding rhinoceros on No 70 (p 16), the bull with the "symbol of Taurus" before him, No 16 (p 18), and some of the devices described on pp 120 ff seem not very far removed, if not direct descendants, from the pictures engraved on the seals of Harappā and Mohenjo-daro.

Indus seal found at Ur

Devices on coins from N W India similar to ancient Indus pictures

The following note may be completely neglected by those who object to licence in speculation, as it may also be decisively exploded even by those willing to try heroic measures.

First, then, a series of assumptions will be made, for which there is no proof, and next

¹ *Ka-Ku-wa*, equally possible, might be compared to such names *Kakia*, already, known as used east of Tigris and in Asia Minor.

A Conjectural Reading

to no evidence, the third will be rejected at the outset by the best-informed opinion. Nevertheless let them be made —

- (a) That the writing is, at least in part, syllabic
- (b) That the seal-inscriptions are, in general, names
- (c) That these names belong to an ancient Indo-Āryan language¹

These are the general assumptions, what likelihood the first two may have is considered above. The third, as already observed, would be denied by most Indologists on the ground that Āryans were not present in India at the period (before 2600 B.C.) to which these seals presumably belong—the date itself is, of course, not satisfactorily ascertained. Since, however, we are admittedly guessing, we shall not even pause to make any attempt (which must be unsuccessful) to meet these objections.

Next, can anything be found to which a conjectural *meaning* may be attached? Once more, as in settling the direction of the writing, let us appeal to Harappā H 173. Here the first (top) line may be supposed to represent a name, ending with the very common CCXXXVIII, which indeed, wherever it occurs, seems nearly always to end a word. The second (side) line is the fairly common group $\hat{\uparrow}|||U$, the third (bottom) line may be another name, it is not dissimilar in fact, to I, 218, which elsewhere stands alone. The next conjecture, then, will be that this whole inscription signifies “M son of N”, and consequently that $\hat{\uparrow}|||U = \text{“son”}$. If now we boldly act upon the general assumption (c) *supra*, we shall substitute for “son” the Sanskrit word *putra*². Of the three signs in this group we can treat the first and last as doubtful, but the middle consists of three strokes, and presumably represents simply the number three. If we take again the Sanskrit word for that number, *tri*, an interesting result is obtained —

$$\begin{array}{c|c} \hat{\uparrow}|||U & \begin{array}{l} x - tr(i) - y \\ pu - tr - a \end{array} \\ \text{son} & \end{array}$$

From which these values would be ascertained —

$$U = p(u), \quad ||| = tr(i), \quad \hat{\uparrow} = a$$

Could these be established it would follow that the principle of akrophony had some application in this writing, and further that the not uncommon examples of inscriptions ending with the above group would be patronymics. Unhappily there seems to be nothing whatever by which the above pleasing speculation can be tested. The reader who has persevered so far may take it that I am fully conscious of many objections which it would not even be worth while to formulate here, since they could not possibly be answered out of a simple conjecture.

¹ On the subject of the Vedic Āryans see pp. 109–111.

² For the present purpose it makes no difference that in Sanskrit the form used is “N’s son M”, not “M son of N”.

II THE MECHANICAL NATURE OF THE EARLY INDUS WRITING

The writing found on seals and other objects from Mohenjo-daro and Harappā was intended to be read from right to left, it cannot be purely alphabetic in character, and it is probable from the seals found at Susa and Kish, and from the analogy of a seal found at Ur, that it was in use in the first half of the third millennium B C

**Script used
in third
millennium
B C**

No help is to be derived, so far as an understanding of the inscriptions is concerned, from the intaglios on the seals, just as the same device may occur with different inscriptions, so the same inscription can occur with different devices

It is believed that the inscriptions on the small, stone rectangles from Harappā belong to an earlier period than the inscriptions on the large seals. Early inscriptions frequently present more complications than later ones, so far as questions of phonetic reading and interpretation are concerned, the "mechanical" nature of early writing is generally more simple

By the "mechanical" nature of writing is meant the manner in which the signs are used. Of those writings which are not purely alphabetic it may be said that signs fall into one of three classes, syllables, ideograms, determinatives. In any one inscription a sign can only belong to one of these classes, but it may in different inscriptions belong to all three. If a sign is used with a syllabic value, it may in different inscriptions have different syllabic values. If a sign belongs to the last class, it may determine meaning, in which case it has no bearing upon the sound of the word, or sound, in which case it generally marks the first or last sound in a syllable, or the first or last syllable in a polysyllable. A determinative of sound is usually called a complement, and is particularly useful when ideograms permit of variant readings

**Mechanical
nature of
writing**

In this sense the "mechanical" nature of the writing does not include the "material" nature. The complications of the "material" nature of the signs arise from two main features of the script, modifications, whether internal or external, and combinations. The modifications, when simple, consist of a stroke or strokes in various positions, sometimes placed inside, sometimes adjoined, sometimes separate. In rare cases the constant addition of modifications transforms the appearance of a sign, see Nos CCCIV to CCCIX. Combinations may be effected by interior adjustments or by simple ligature. It seems probable that at any rate in certain cases the ligature has the same sense as the two signs in juxtaposition, see Nos CVIII and CII. In Sumerian and Egyptian, parallels could be cited for such modifications and combinations, the Indus writing differs from them in its frequent use of these compound signs, and by its use of the two together, to judge from the series Nos CXL-CXLIV. The "material" nature of these signs suggests an extremely ingenious invention, dependent upon the use of certain fixed principles, but it does not throw any light on the 'mechanical' use of the signs. Whether combined or modified signs retain their separate significance or acquire new phonetic values and meanings depends upon an examination of the "mechanical" use of the script

**Material nature
of writing**

The object of such an examination must be to divide the signs into classes, of the three kinds mentioned. Such a division of these signs presents insuperable difficulties. This examination must commence by a recognition of three fairly obvious classes of signs, (a) the "end" signs, (b) the "beginning" signs, (c) the "numeral" signs. Of the "end" signs, the commonest has not been separately entered in the present list, for obvious reasons. The sign occurs nearly always at the end of inscriptions. When it occurs in the middle it can generally be proved that it there marks the end of a word or group. A favourable instance

**Division of
signs**

of this kind may be found under sign No CCLXXXIII. The form of the inscription (No 12) in which the two first signs are repeated after the first occurrence of the "end" sign, and the first line of the inscription closes with the "end" sign, is sufficient to illustrate this point. But there are some peculiar cases. Sign No CLIX appears so constantly at the end of inscriptions, or at the end of groups in inscriptions, that it clearly belongs to the class of "end" signs, yet it can appear at the beginning of such inscriptions as H 208 and 329, which consist entirely, it should be noted, of signs which belong to the "end" class. These instances are sufficient to prove that this sign No CLIX is not a peculiar form of a phonetic sign used only at the end of words. There must be some peculiarity in the sign which demands that it should ordinarily stand at the end, and which allows only of other "end" signs appearing after it. It is improbable that the sign denotes a syllable, for it should appear then in more varied positions, or, on the other hand, if it represents a syllable of such a peculiar kind that it can only appear at the end of a word, the instances in which it appears at the beginning cannot be accounted for. There is a general probability that sign No CLIX is an independent and self-contained unit, that it possesses a meaning in and by itself. In the inscription H 266, it occurs with a single stroke before it, and the similar inscriptions listed under sign No 1 hardly permit any doubt that here this sign must have a meaning complete in itself.

Granted that sign CLIX does not form a syllable of a word, but is a separable element, and that it has upon occasion a meaning in itself, it is still impossible to be sure whether this "end" sign is an ideogram or a determinative in most inscriptions. The obvious comparison suggested by inscription No 287 which has the other "end" sign, No CCCLXXXVII, does not assist, but it is interesting to note that sign No CXXVII, with which a comparison is suggested by inscription H 52 can certainly stand alone, as it does in inscription 292. On the whole, it seems possible that sign CLIX is some separate word, at least in most cases.

Inside this group of "end" signs it seems possible to distinguish grades of strength, as it were, and yet no very firm rules can be distinguished. Thus sign CLIX is occasionally followed by other signs, thus by No CCXCII in inscriptions 554, 387, and 534,¹ by No CCLXIX in H 250 and 173. An examination of sign No CCXCII in the list favours the view that this sign represents a word, or at any rate a meaning, in itself, for the form of inscriptions Nos 550, 386, 355, and 341 points to that conclusion. Similarly, a reference to No CCLXIX proves that this is another "end" sign, which appears not only after No CLIX, but after the commonest "end" sign. According to this line of argument inscriptions often end in one or more signs which have separate meanings and do not form part of the preceding words. But it is still possible for these signs to be ideograms, determinatives, or separate elements of personal names, and no aid is obtained for the classification of signs.

An examination of the "beginning" signs results in the same observation. A remarkable group of "beginning" signs consists of signs modified by two short perpendicular strokes. The signs without the modification can generally vary their position in inscriptions, as in the case of Nos LXV and LXXIII, but when modified, in the forms LXVI and LXXV, they occur only at the beginning of inscriptions. But it is necessary to note that sign LXXIII is able to stand by itself, it therefore means something. Similarly, a comparison of inscription No 133 (under sign IX) with inscription 76, and a consideration of the form of the inscription No 126 leads to the opinion that the modified sign LXXV has a meaning by itself. Of the modified sign No LXVI it may be affirmed with confidence from H 255 that it has a meaning by itself, but the question whether LXXV has such a meaning does

¹ Erroneously listed under CCXC—[Ed.]

"End" signs

"Beginning" signs

not at present allow of a certain answer. Now the modified signs LXVI and LXXV are almost always in the initial position. The cases in which they are not in that position allow of a special explanation. If they were ordinary syllables, it is difficult to see why these signs must always be in the initial position, the simplest explanation seems to be that these signs retained in the long inscriptions the separate sense we know they would have. But it remains as difficult to assign these "beginning" signs to one of the three classes as proved to be the case with the "end" signs.

There is a peculiar characteristic of the mechanical use of some of the modified signs which must be associated with the nature of the "numeral" signs that have yet to be considered. The commonest, unlisted, "end" sign, when modified in the forms shown by Nos CCXXXIX to CCXLVI becomes capable of occupying a medial or initial position, while e.g. the modified "beginning" sign CXV can only occupy an initial position as against the medial, initial, or end position of the simple sign CXIV. This mechanical characteristic of the modified signs, which throws them into a forward position as compared with the simple signs, must probably be explained in the same way in both cases. Otherwise it would be plausible to believe that the modification which enables the "end" sign to occupy a medial or initial position represents a vowel, though this would involve the abandonment of the reasoning which has led to the view that the "end" signs represent words in themselves. But this explanation of the modification as a vowel does not serve to explain why a sign which can occupy any position must occupy the initial position when modified.

It is fairly clear that the modification is in itself an entity. That seems the only reasonable explanation of inscriptions Nos 65 and H 54, listed under sign No CCCLXXVIII. In these cases the inscription begins with two strokes, in H 54 in the small form that is common is a modification, in No 65 in the large form which naturally leads to an association with the "numeral" sign, the consecution of signs leaves hardly any doubt that the two forms are identical. The same inscriptions prove that the modifications consisting of one and two strokes are similar in their "mechanical" effect, though not identical. Since one, two, or three small strokes are used as modifications, it is natural to inquire whether their use in this manner is not immediately derived from the sense of the "numeral" signs.

The "beginning" signs modified by two small strokes are often followed by one of the "numeral" signs, it does not seem to matter which of the "numeral" signs is used in this connection. There is a parallel between this collocation of modified "beginning" signs and numeral signs, and the collocation of "numeral" signs, either in repetition or with one another. When the "numeral" signs are in such collocation, it is often, but not always, found that one of the "numeral" signs is written smaller than the other, but no rule has been distinguished in the collocation of "numeral" signs that governs the orders large, small, or small, large, that seem to be used alternatively. It is possible that the "mechanical" nature of the modification, e.g. by two small strokes, is the same as that of "numeral" signs when written small, and this view is rather favoured by inscription No 113 under sign XV. The question then arises, what is the difference between the small and large writing? It has already been seen that inscriptions Nos 65 and H 54 show that the difference can only be, if one may use the phrase, in intensity, they can hardly differ considerably in "mechanical" nature. If the "numeral" sign consisting of two strokes is a syllable, then the small two strokes are also a (similar) syllable, if the "numeral" sign is not read, but has some determining function, so has the other, and so forth.

The question of the "mechanical" character of certain "beginning" signs may, then, depend upon a consideration of the "mechanical" nature of the "numerical" signs. The signs composed of strokes are here called "numerical" as a convenient description of their

"material" nature, not because they denote numbers. These "numerical" signs consist of strokes of different lengths, at different angles, arranged in different ways. It would be conceivable that these differences are due to differences of meaning, were it not that an examination of the inscriptions leads to the opinion that this is probably not so. Thus in the case of the arrangement of the strokes, the single example in which the sign with five strokes is not written with the strokes side by side, listed as sign XII, is surely to be compared with inscriptions 301 and 441 under sign XI, the additional element is the "beginning" sign, a separable and distinct part of the inscription that we know can have a meaning by itself. Similarly, the four strokes arranged in two sets of two occur in a connection in λ No. 130, which clearly offers a comparison with the four strokes side by side in IX No. 133 and No. 395. These instances do not amount to a logical proof that there is no difference between signs XI and XII, or between signs IX and λ , but it must be admitted that, if there was a difference, then that difference must frequently have led to confusion in view of the similarities pointed out, and that it cannot be due to any "mechanical" difference in the nature of the sign. Or again, in the case of the difference between perpendicular and sloping strokes, an inspection of the last inscription listed under VII should show that it must be the same as the last three signs of VI No. 3. Similarly, we may compare VII No. 170 and VI No. 65. It is not easy to believe that there is any difference at all between signs VI and VII of meaning or nature.

Perpendicular
and sloping
strokes

It is difficult to explain why these "numerical" signs can change, as is probable, their angle, or, as is possible, their internal arrangement, unless they are numbers. In those scripts where numeral signs can have syllabic, or even word, values, for instance Sumerian, the forms of the signs are not variable, but as fixed and unchangeable as all other signs with syllabic values. Numerals, however, which have no phonetic value, like the Egyptian, can and do change their position in very much the way that these "numerical" signs from the Indus valley do. Analogies of this kind may be extremely misleading. But the changing form of the Indus valley "numerical" signs is a feature which favours the interpretation of these signs as numbers.

Signs for
numbers

Certain of the inscriptions seem most easily explained by the interpretation of these signs as numbers, more especially the shorter inscriptions from Harappā. Under sign No. CCXIX may be found an instance in which the same sign can combine with "numerical" signs containing 2, 3, or 4 strokes and the position of the "numerical" sign varies, being sometimes before, sometimes after sign No. CCXIX. Let it be granted, for argument's sake, that these inscriptions contain words, and that the two signs in these inscriptions form, in the six different cases, one word. The assumption leads to a strange coincidence. It is peculiar that, if the syllable represented by two strokes can be combined with the syllable represented by sign CCXIX in two ways to form two intelligible words, the syllable represented by three strokes should have the same power, it is almost incredible that the syllable represented by four strokes should have the same power. The easiest explanation, the explanation which immediately presents itself, is that in this particular series we have a formula v_2, v_3, v_4 , or $2x, 3x, 4x$. It is true that even so the indifference shown to the position of the numeral is peculiar. But it may well be that the alternation is a purely graphical one, of the kind sometimes found in our own conventional writings, e.g. £3 or 3£.

Small Harappā
signs are older

The small Harappā inscriptions may well be in a different class from those on the larger seals. They belong to an earlier stratum than the large inscribed seals. Granted that it is possible or probable that in certain cases in the Harappā inscriptions the "numerical" signs may represent numbers, it is not necessary to assume that they always do so. Some arguments against considering them numerals have already been stated. The most important seem to be that the most natural interpretation of inscriptions on seals is that they are names, and that

the regular occurrence of the signs containing 3 and 7 strokes with certain other signs points to a natural sequence of sounds. It must be remembered, however, that these arguments themselves contain assumptions, and need testing before it is admitted that we have any ground for attempting an interpretation of these inscriptions as personal names.

The final result of the examination of the "mechanical" nature of the "numeral" signs is then as inconclusive as that of "beginning" or that of the "end" signs, there is only the probability that in certain cases the "numeral" signs denote numbers, and that the significance of the stroke modifications of some "beginning" signs is closely connected with the corresponding "numeral" signs. There is a further parallel between the modifications and the "numeral" signs that may be of importance. A comparison of the signs CCXLIV and CCXLV with CCXLII and CCXLIII seems to show that there is no important difference in the meaning of these signs, or in other words that the modifications can in certain cases be perpendicular or slant, as is true also of the "numeral" signs.

It is impossible to be certain of the character of these inscriptions until we know whether they consist of one or more words, and of that there is no indication. But a "mechanical" analysis tends to point to certain conclusions, the typical series of instances listed under sign No CCCXXXI will provide an example of the kind of analysis meant. H 3570 seems to show that the sign can in itself mean something. It can combine with the "numeral" signs with six or seven strokes to mean something. With two strokes in front and the separable "end" sign after, it forms a significant group in H 152. When sign No XXVIII intrudes before the "end" sign into this group, it is permissible to infer that another separable element is present in inscription No 120, an inference much favoured by considering the inscription No 5 listed under sign XXVIII, since the intrusive sign and the "end" sign make a significant group. The most natural, though not demonstrable, conclusion is that in inscription No 120 there is a series of signs which retain their separate characters, in other words, the inscription consists of a series of intelligible expressions. If the whole is a personal name, then on this reasoning it contains four separate ideas. Similarly, in inscription No 19 we have "beginning" sign + 4 strokes + fish + "end" sign, again conveying four separate ideas. But in those inscriptions where "numeral" signs occur before the fish, 2, 3, 4, 6, and 7 strokes are to be found. So far as we know at present, the non-appearance of the other "numeral" signs may be accidental, in any case the "numeral" signs appear to be significant in themselves.

If we now consider inscription No 314 we shall find that it consists of at least five elements that seem to have a separate significance, possibly six. There is the "end" sign, preceded by the fish, with six strokes in front of it, before these, as the second sign, comes sign No CCLX, with the "modifying" element of two short strokes already discussed. Of sign No CCLX it may fairly be assumed, from a comparison of inscriptions Nos 268, H 21, and 372 that it has a separate value in itself. The first sign in inscription 314 is sign No CXXXIX, and about this sign there is a curious observation to be made. It occurs upon a broken pot, and it is therefore not absolutely certain that it stood above, it may have done so. The sign also occurs on pots from the Aegean region, of the kind called "Urfinis" ware, see e.g. Hall, *Civilization of Greece in Bronze Age*, fig 68, dating from about the middle of the second millennium, but is to be seen on much earlier ware, *ibid*, fig 31. It also appears commonly on the "Dipylon" ware from Attica of about the ninth century. The usual interpretation of its appearance on Aegean ware is that it is used as a decorative motif to fill in blank spaces. It is not necessary to deny this interpretation, but it is to the point to remark that in certain cases it appears in a connection in which it seems to have a particular meaning. Thus on the "Dipylon" pots illustrated in *Cambridge Ancient History*, pl 1, p 282, it is placed in many blank spaces of a scene depicting a naval battle in a manner that suggests an

Strokes at
beginning or
end

Analysis of an
inscription

interpretation, the signs may denote objects carried in the boat as articles of commerce, and emptied out when the crew were thrown out. The most natural interpretation of the sign on pots would be that it denoted the stuff they contained, or the measure they could contain. Curiously enough, this sign, placed sideways, appears in the Sabæan alphabet as the letter *zaym*, the meaning of which is much disputed, the older interpreters believed the word meant a kind of weapon, but more recent authorities have advanced widely divergent views. There is a Cretan sign which closely resembles the Sabæan *zaym*, but there is an important difference in that a small horizontal stroke is attached to the centre of the sign in such a manner that it is reasonable to see in this Cretan sign a representation of the double-axe. The shape of the sign is peculiar, though the opinion that the sporadic occurrences are due to accident rather than borrowing will doubtless appeal to some¹. But at least a possible interpretation of all this evidence is that sign No CXXXIX depicts some material commonly contained in earthenware vessels, which was carried far and wide over the ancient world, even by sea, for very many centuries, this interpretation does not impose itself, but is to be borne in mind as a possibility.

Cretan sign

Sign depicting some material

Many signs rarely used

Signs as ideograms

Signs in various positions

It may be, then, that inscription No 314 consists of a series of five signs, each having a separate meaning. An analysis of longer inscriptions would show that they contain an even larger number of elements. But it is first necessary to mention a very important fact in this script, namely, that the greater number of the signs in this list occur only once or twice, and a considerable increase in the number of inscriptions would result in an increase in the number of these rare signs. The form of the inscriptions in certain cases proves that these signs are capable of standing alone, a clear case may be found under Nos CL and CLI. It is extremely probable that these signs are for the most part ideograms. In many cases they occur alone immediately before a "beginning" sign or after an "end" sign. Two typical instances will serve to illustrate this, listed under sign No CXV, viz inscriptions Nos 324 and H 148. The first, No 324, consists of a group of three signs and an end sign, preceded by a "beginning" sign, which also occurs in H 148 but with a different "end" sign. In front of the "beginning" sign in both inscriptions there are other signs. That which appears in No 324 occurs in one other inscription, also as the first sign. The second sign in H 148 occurs also in one other inscription, at the end, in a group of three signs of very rare occurrence. The first sign in H 148 is sign No CLXXX which is probably identical with sign CLXXXI, it occurs five times, in various positions, sometimes before or after an "end" sign, inscriptions No H 164, H 146, and 106. There is no logical proof to be adduced in this matter, but there is a strong impression that these signs are separate and distinct from the groups which follow them, in other words that they are ideograms. As to the signs which follow the "end" sign in H 148, the inscriptions listed under sign XLIII are sufficient to show that the penultimate sign has a sense in itself, since it appears alone before the "end" sign, and has a sense which frequently requires it to appear after the "end" sign. As to the last sign, it belongs to a group of signs consisting of strokes with a varying number of small strokes attached, the ideogrammatic nature of which is fairly clear, an observation of such cases as inscriptions Nos 339 and 116 points to this inference for the group.

There seems a vague, and indemonstrable, probability that a not inconsiderable proportion of these signs are ideograms, but even so there are many difficulties to be considered. For instance, the sign which seems to resemble a table with a cloth on it, No CCCXXII, appears at the end, sometimes after the commonest "end" sign, of all the listed inscriptions save one, No 440. In that case the signs exactly reverse the order of the last three signs in No 435. Were it not for inscription 440, the explanation of

¹ The sign occurs at Selima in the Libyan desert, *Antiquity*, 1928, p 283

sign CCCXXII as an ideogram would fit. But if inscription 440 were reduced to three ideograms to accord with this, inscription 435 would necessarily be reduced to the first two signs, and three ideograms, thus severing the sign with seven strokes from sign No CCCIV. But this seems inadmissible, because the sign with seven strokes is very closely connected with this sign, as in inscriptions Nos 211, 113, H 11, and H 8, a connection that cannot be accidental if sign No CCCVIII be considered as a development of No CCCIV. There is a mass of material of this kind in these inscriptions, and until certain proof is forthcoming it will remain very problematical whether any sign is certainly an ideogram. But the expression of a purely personal opinion may be allowed, namely, that the evidence points to inscription 435 being a succession of separate words.

If this view is not altogether mistaken, then it has a certain relevance to the assumption that these inscriptions contain proper names. It must, under this assumption, be granted that the inscriptions do not all contain only personal names, there must be other elements as well. Secondly, it will be evident that in certain cases the name is expressed by one single sign. This may be seen from the two inscriptions listed under sign No CXXIII. In the first of these, the form of the inscription clearly shows that the sign belongs, in its "mechanical" nature, to the class tentatively considered ideograms. In the other inscription there are only two signs, and unless we are to assume that the ideogram which apparently forms a description of the name in one class can with the same or a different sense be part of a personal name in the second—which is possible, but unlikely in view of its comparative rarity in this large number of inscriptions—the personal name is reduced to a single sign. Thirdly, some of these names include rather peculiar ideograms. One of the most obvious pictograms in this script is the chair (No CCCXIX). It is true that this is not beyond all doubt an ideogram, but a glance at the first three inscriptions listed under No LXXX is sufficient to show the possibility that it is such. Now a chair may naturally, as an ideogram, represent very diverse meanings, but it is of rare occurrence, and it seems most probable that a rare pictogram would retain one meaning closely allied with its origin. If this formed part of a personal name, then that name must belong to a language which must be classed in this respect with a very limited group. One inevitably thinks of certain English and German personal names, the mere comparison is instructive because it shows how limited this type of name is. If on the other hand, the chair represents a prefixed title, the group of languages concerned is again probably a small one. Again, in certain cases very obvious pictograms, e.g. of a bird, are repeated. One expects the repetition in such a case to denote a plural (or at least a dual). Men are often called by the names of birds or fowls, but the plural seems unsuitable for a personal name.

A fourth consideration must involve the difficult question of the longer inscriptions, of the kind exemplified by No 400, listed under sign No LXXV. This consists of three lines, of which the first and second each have as the last sign a common "end" sign, and there is nothing in either line separately to distinguish them from single-line inscriptions with the same "end" signs. We should expect two personal names on a seal either to be joined by the word or words "son of", or by some grammatical inflection which should denote that relation. Yet in all these inscriptions it is impossible to single out any constantly recurring sign or group the position of which "mechanically" points to such a meaning. Certainly the third line of inscription, No 400, might be so interpreted, but it presents no striking analogy to groups in other long inscriptions, and therefore such an interpretation would not be probable. Much could be written of a speculative nature on this subject, thus it might be suggested that the grammatical relation of the first and second "names" is expressed by the very same grammatical form as that in which the names appear. If, for instance, the language possessed a genitive, then it is conceivable that the second name is a genitive after the first

**Suggested
separate words
on inscription**

**Not only
personal names
on inscriptions**

**Long
inscriptions
discussed**

name, and that all the names appear in the genitive, owing to some unexpressed idea like "property of" Nevertheless, these long inscriptions are a very considerable difficulty for any "mechanical" explanation of these inscriptions as personal names, or even as personal names and titles It does look as if these long inscriptions were lists of words, or word-groups, and some other hypothetical explanation than that of personal names would suit the case better

The attempted examination of these signs so far has led to the conclusion that most of them have meanings by themselves, and that some are probably "ideograms", in that they convey a word as an idea, and are therefore not used with syllabic values Are there any that can be shown to have syllabic values? That unfortunately is beyond the limited means of analysis at our disposal Those signs which are constantly found in recognizable groups may well be syllabic, but it is at present impossible to be sure that the extraordinary permutations and combinations possible for a sign like No CCCLX (a bird of some sort) really prove that it is such Indeed, this variety of order that is possible renders one extremely doubtful of such an explanation in the case of the "fish" sign and its modifications

At present, as has already been said, the difficulties of dividing these Indus signs into classes are insuperable There is a general probability that most of them could have a meaning by themselves and that some are pure ideograms Were it possible to be sure that these inscriptions were personal names, more might be said, for an examination of the inscriptions proves, to the present writer, that those names were marked by a series of peculiarities which must be very rare But there could be no more dangerous hypothesis at present The arguments that have been adduced against considering the "numerical" signs as numbers can at least be countered by the observation that in certain cases they almost certainly do represent numbers, and the assumption that they are numbers might even be reconciled with the hypothesis that the inscriptions contain personal names—which would be of considerable importance, for we know a language that not infrequently contained numbers in the personal names But it is safer to believe that these inscriptions may in fact have an import quite other than personal names The analogy of the devices of certain Indian coins to the devices of these seals has already been mentioned It is fitting to note that certain themes in these signs may be compared to the punch-marks on those coins, thus, for example, the little man who brings along two hooks, if the description may be allowed, is strikingly similar to the little man of the punch-marks, who holds a hook in either hand It is disappointing, but wise, to admit that these inscriptions may in fact mean, on the present evidence, almost anything An open-minded consideration of the evidence led, in 1924, to the conclusion that the similarity of some of these signs in form (not in use or meaning) to Sumerian signs showed an early connection between Sumer and the Indus valley That connection has since been conclusively proved to have existed An open mind may equally find very close and remarkable similarities between some of these signs and the marks (*wasm*) of Arab and African tribes, such signs have also been found at Selima in the Libyan desert Some will certainly hold that the resemblances are accidental They may equally be due to a traditional use of certain trading marks which has lasted until a comparatively recent period

NB—In the Sign Manual on Pls CXIX–CXXIX, the letter H attached to the reference number of an inscription signifies that the inscription in question comes from Harappā, and that the seal or other object on which it occurs is not illustrated in this work All other inscriptions come from Mohenjo daro and, with very few exceptions, are reproduced in Pls CII–CXVI The exceptions referred to are distinguished by the letter S

The following corrections should be made in the Sign Manual —Pl CXXV, Col 4 delete Sign CCLXVII, *ibid*, Sign CCLXXX delete Inscr H 329, the correct reading of which is as shown under Signs CCLXIII and CCLXVI, Pl CXXVI, Col 3, Sign CCXC the last sign of Inscr 534 is No CCXCII, not No CCXC The latter sign should therefore be deleted —[ED]

Division of
Indus signs into
classes difficult

Arab and
African signs
similar to those
of the Indus