STRUCTURAL ANALYSIS OF INDUS SCRIPT AND EVALUATING BASIC SIGNS TO DETERMINE THE LANGUAGE OF INDUS PEOPLE

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FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

BY

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C E R T I F I C A T E

This is to certify that the thesis entitled, 'Structural analysis of Indus Script and evaluating basic signs to determine the language of Indus people', submitted by Mrs. Rama Sarker for the award of degree of Doctor of Philosophy in History is based on the results of investigation carried out by her under my supervision and that the same has not been submitted for any degree of this Institute or any other University on any previous occasion.

S.R. Rao 27.4.93

(S. R. Rao)

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Rama Sarker

(RAMA SARKER)

CONTENTS

Page.No.

LIST OF FIGURES

SYNOPSIS

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The work embodied in this dissertation is a critical assessment of the methodologies followed and models suggested for the decipherment of the Indus Script by scholars during the last 50 years. The objective of the assessment is to highlight the progress made in decoding the enigmatic script and identifying the language.

The theory of Aryan invasion of the cities of Harappa and Mohenjo-daro propounded by Wheeler and others has resulted in considering the Indus Civilization as non-Aryan, especially Dravidian. With this hypothesis as the basis most Western and Indian Scholars have attempted to read a Dravidian language in the inscriptions on Indus seals and sealings. Such an a priori assumption vitiates objectivity in any approach to the decipherment of Indus inscriptions of which neither the language nor the script is known.

Excavations at Harappan sites in and outside India during the last three decades have brought to light the Pre Harappan, Late Harappan and Post-Harappan phases in addition to the Harappan (mature) phase of the Indus Civilization. More light is thrown by the new excavations on the early, middle and late stages of the development of the Indus Script also. For instance, the evolution of Indus writing towards simplification can be traced at Lothal, Rangpur, Rojdi, Mohenjo-daro (Dales, 1965), Harappa (Dales, 1988) and to some extent at Chandigarh. It is now fairly clear that the Indus Script was partly pictorial and partly cursive and linear in

the early stage but gradually dropped most of the pictorials and retained only the cursive and linear signs (S. R. Rao, 1982, Fig. 2 & 3; 1979, Fig. 26) as can be deduced from the seal inscriptions of late levels of Mohenjo-daro (1965 excavation) and Harappa (1987-88 excavation). The simplified script appears in the inscriptions of Chandigarh and Rakhi Shahpur (S.R.Rao, 1979, Fig. 36-C) also.

The process of simplification of Indus Script by dropping pictures resulted in a reduction in the number of basic signs in the Late Harappan writing. Fairservis (1991) and Mahadevan contend that the total number of basic signs is 400 (I. Mahadevan, 1988) which needs to be critically examined. While admitting that short strokes were attached to most of the signs, they continue to count the accented signs also along with basic (unaccented) signs for arriving at the number of the basic signs (Mahadevan, 1988, Plate, I and Fairservis, 1991).

The structural analysis of the Indus Script attempted by Mahadevan was limited to analysis of the interse position of signs and their frequency. A thorough analysis should include the analysis of compound signs. Unless this is done it is difficult to arrive at a correct number of basic signs on which depends the identification of the script as pictographic, ideographic or phonetic. From S. R. Rao's analysis of the accented and compound signs it can be concluded that one of the basic features of Indus Script is accenting which was later followed by the Brāhmi scribes

also. Another equally important feature is the joining of two independent basic signs and accenting the conjunct sign. The process of joining signs can be easily traced in Indus inscriptions of all phases and in Brāhmi Script. The decipherer is led astray if he ignores this feature and considers the compound signs as pictures as has been done by some scholars. By recognizing the two basic features namely accenting and forming compound signs, the basic signs have been distinguished from the nonbasic picture-like signs. This reduces the number of basic signs to 60 or 62 in the mature Indus phase. The number 400 arrived at by others are only permutations and combinations of these basic signs. With 60 or 62 basic signs the Indus Script must have been a phonetic writing only which necessitates giving a sound value to each sign. This sound value may be syllabic or alphabetic. There are, however, a few pictures which had attained a stage of syllabic value and a few others continued to be determinatives. Taking all these facts into account the classification of signs of the Indus Script has been done by S.R.Rao. His classification of signs as cursive, linear and pictorial has been critically examined to ascertain the validity of the methodology vis a vis the methodology followed by others.

After ascertaining the total number of basic signs assigning phonetic value to these signs is a crucial issue. Rao has assigned values to cursive signs on the principle of analogy taking into account the close graphic resemblance of

Indus cursive signs with Semitic signs. Whether any other script contemporary with the Harappan or Late Harappan Script can serve as a basis for assigning phonetic value is also examined.

Prof. Subhash C. Kak has accepted Rao's identification of Indus language as Old Indo-Aryan but tries to derive most Brāhmi letters from Harappan signs. As there is a time gap between the Late Harappan and Brāhmi Scripts, caution should be exercised in comparing the former with the latter. Recently, however, one of the missing links between the two systems of writing has been found in the inscription on the votive jar of Bet Dwarkā.

B.V.Subbarayappa has proposed a model : wherein Indus signs stand for numbers or mathematical notations. The validity of this model will be examined. In ancient scripts numerals account for a small portion of the number of signs, whereas Subbarayappa considers a very large majority of the Indus signs as numerals.

The validity of a model can be accepted if it leads to the decoding of a majority of seal inscriptions and corroborates the cultural and economic, religious condition of the times. For instance the brazier is identified as a symbol of Iranian fire-altar by Rao and as a ***Soma Vessel*** by Mahadevan. Both relate to Aryan-Iranian socio religious practices. The religious structures found at Kalibangan, Lothal and Banawali suggest fire worship and animal sacrifice. Some motifs on seals represent the fire-god. One

should expect a reference to the fire god and sacrifices in the seal inscriptions. Similarly the commercial use of seals as attested to by the terracotta sealings from the warehouse of Lothal should be reflected in the names of a few commodities traded in. If the inscription on the amulet of Mohenjo-daro depicting a boat with a cabin and two birds refers to the sea or voyage the reading of the inscription on the amulet can be considered as valid. In all these cases the methodology of decoding should proceed on the basis of first identifying the stage of development of script and the language.

CHAPTER - I

SALIENT FEATURES OF INDUS CIVILIZATION

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As late as 1920 it was generally held that civilization in the Indian subcontinent began only after the invasion of Alexander in 326 B.C. But the archaeological discoveries made in 1921 and 1922, added a new chapter to Indian history taking it back to the 3rd millenium B.C. In 1921 D.R. Sahni[1] carried out trial excavations at Harappa in Montgomery District of Punjab and in the following year R. D. Banerjee[2] dug at Mohenjo-daro in Larkana District of Sind (Fig. 1), both bringing to light hitherto unknown seals, pottery and other antiquities of a Bronze Age Civilization. The discoveries made by Sahni and Banerjee were followed by large-scale excavations at Mohenjo-daro under the general direction of John Marshall[3]. Further excavations at the same site were carried out by E. J. H. Mackay[4] who also dug at Chanhu-daro. M. S. Vats[5] excavated at Harappa, which was subjected to further digging in 1946 by R. E. M. Wheeler[6]. On account of its being widespread in the Indus Valley, this civilization was given the name the Indus Valley Civilization. Explorations conducted during the twenty-five years following its discovery in 1921, indicated that its area of spread lay principally in the Sind plains with significant cultural contacts with sites in Baluchistan and Makran coast, close to the Iranian border on the one hand and with Harappa in Punjab and Kotla Nihangkhan (near Ropar) on the Sutlej. A few sites along the Hakra in the erstwhile

Bahawalpur state and Rangpur on the Sukha Bhadar in the former Limdi state of Kathiawad, Gujarat were the only other recorded sites of this civilization, lying outside the Sind region (Fig.2). The post-partition India has witnessed an enormous increase in the number of sites of the Indus Civilization in Rajasthan[7], Haryana[8], Punjab[9] and Gujarat[10], thereby extending the limits of this civilization in the east up to Alamgirpur on the Hindon, a tributory of the Yamuna some 45 kilometres north of Delhi, in the north upto Manda[11] on the right bank of the Chenab, about 28 kms north-west of Jammu, and upto Bhagatrav (Gujarat) in the south[12]. Daimabad which lies on the left bank of the Pravara, a tributory of the Godavari, some 230 kms east-north-east of Bombay is also a settlement of the Late phase of Indus Civilization.

The spread of the Indus Civilization far beyond the Indus valley in all directions has necessitated redesignating it as Harappa Civilization which is further subdivided into Mature Harappa Culture (2500 - 1900 B.C.) and Late Harappa Culture (1900 - 1600 B.C). The latter includes a Transition Phase (1700 - 1600 B.C.) of the culture when an evolved culture with a distinct pottery known as the Lustrous Red Ware (LRW) makes its first appearance at Rangpur.

This area of Harappa Civilization falls broadly into four different geographical regions which are designated by S.R.Rao as (1) the Central Province, (2) the Western Province (3) the Eastern Province and (4) Southern Province.

MAP OF SITES OF MATURE HARAPPAN PERIOD

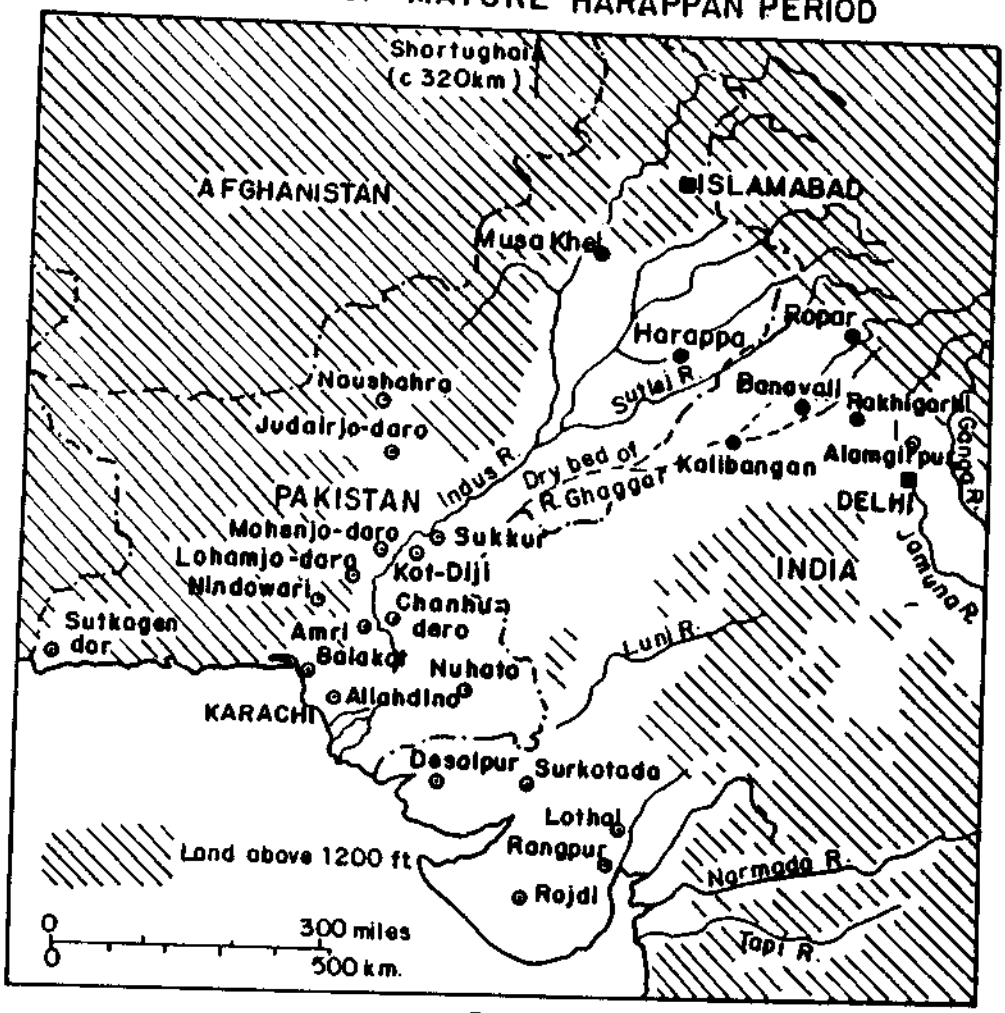

FIG. 1

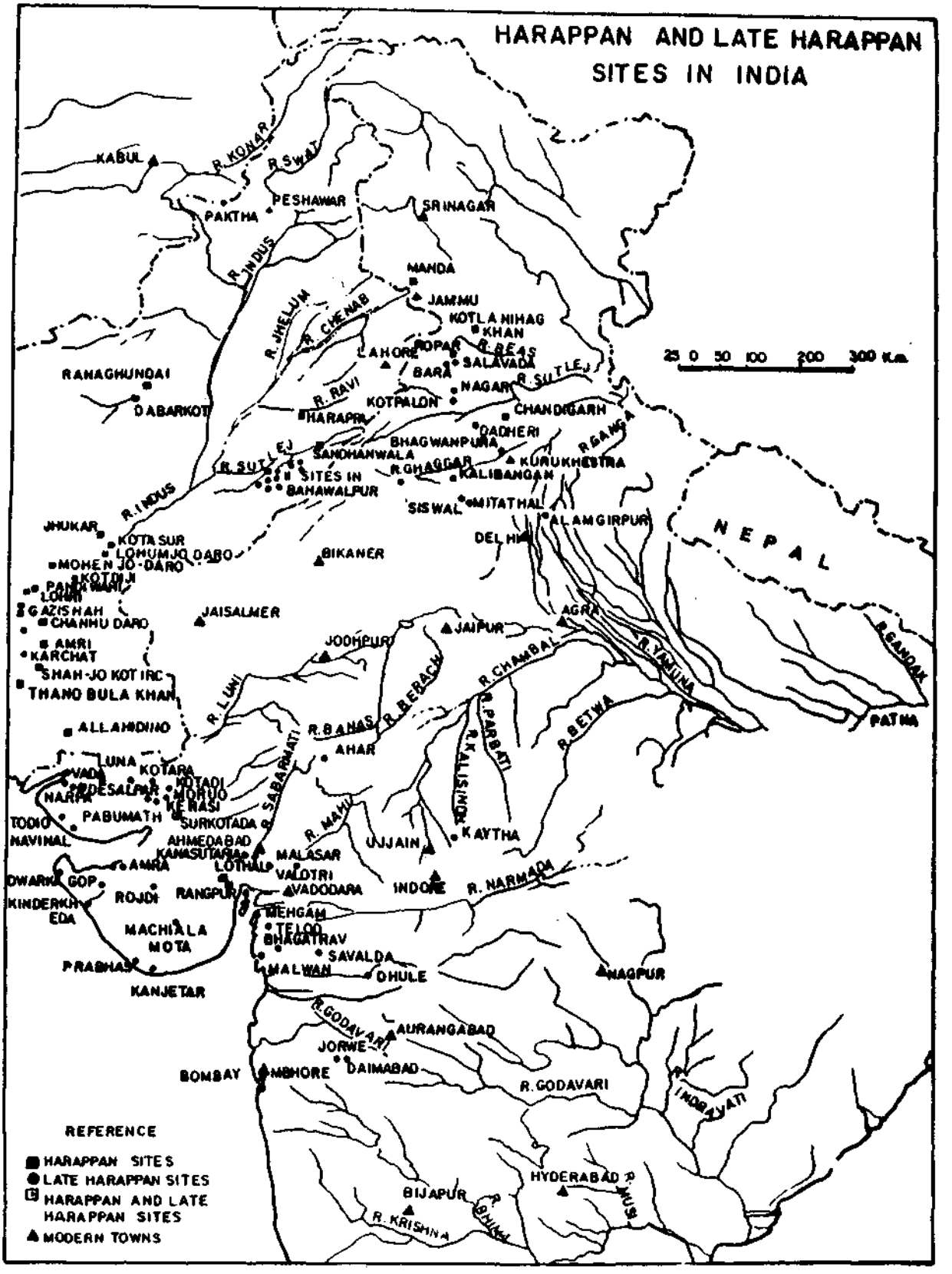
HARAPPAN AND LATE HARAPPAN SITES IN INDIA
KABUL
R. KONAR
R. SWAT
PAKTHA
PESHAWAR
SRINAGAR
R. INDUS
MANDA
JAMMU
R. JHELUM
R. CHENAB
KOTLA NIHAG KHAN
ROPAR
R. BEAS
LAHORE
SALAVADA
25 0 50 100 200 300 K.m.
RANAGHUNDAI
BARA
NAGAR
R. SUTLEJ
R. RAVI
KOTPALON
DABARKOT
HARAPPA
CHANDIGARH
DADHERI
BHAGWANPURA
R. GANGA
SANDHANWALA
R. SUTLEJ
R. GHAGGAR
KURUKHESTRA
KALIBANGAN
SITES IN BAHAWALPUR
R. INDUS
SISWAL
MITATHAL
ALAMGIRPUR
JHUKAR
KOTA SUR
LOHUMJO DARO
DELHI
NEPAL
BIKANER
MOHEN JO-DARO
KOTDIJI
PANDWANI
LOHRI
GAZI SHAH
JAISALMER
CHANHU DARO
AGRA
JODHPUR
JAIPUR
AMRI
KARCHAT
R. CHAMBAL
R. YAMUNA
R. GANDAK
SHAH-JO KOT IRC
THANO BULA KHAN
R. LUNI
R. BERACH
R. BANAS
R. PARBATI
R. KALISINDH
R. BETWA
PATNA
ALLAHDINO
AHAR
LUNA
KOTARA
SABARMATI
VADA
KOTADI
DESALPAR
MORJO
NARNA
KERASI
PABUMATH
R. MAHI
SURKOTADA
TODIO
NAVINAL
AHMEDABAD
KANASUTARA
UJJAIN
KAYTHA
MALASAR
AMRA
LOTHAL
VALOTRI
VADODARA
INDORE
R. NARMADA
DWARKA
GOP
ROJDI
RANGPUR
KINDERKHEDA
MEHGAM
TELOD
MACHIALA MOTA
BHAGATRAV
SAVALDA
PRABHAS
MALWAN
DHULE
NAGPUR
KANJETAR
R. GODAVARI
AURANGABAD
JORWE
BOMBAY
AMBHORE
DAIMABAD
R. GODAVARI
R. INDRAVATI
REFERENCE
HARAPPAN SITES
LATE HARAPPAN SITES
HARAPPAN AND LATE HARAPPAN SITES
MODERN TOWNS
HYDERABAD
BIJAPUR
R. KRISHNA
R. BHIMA
R. MUSI

FIG.2

EARLY HARAPPAN PERIOD SITES OF THE HAKRA RIVER COAST :

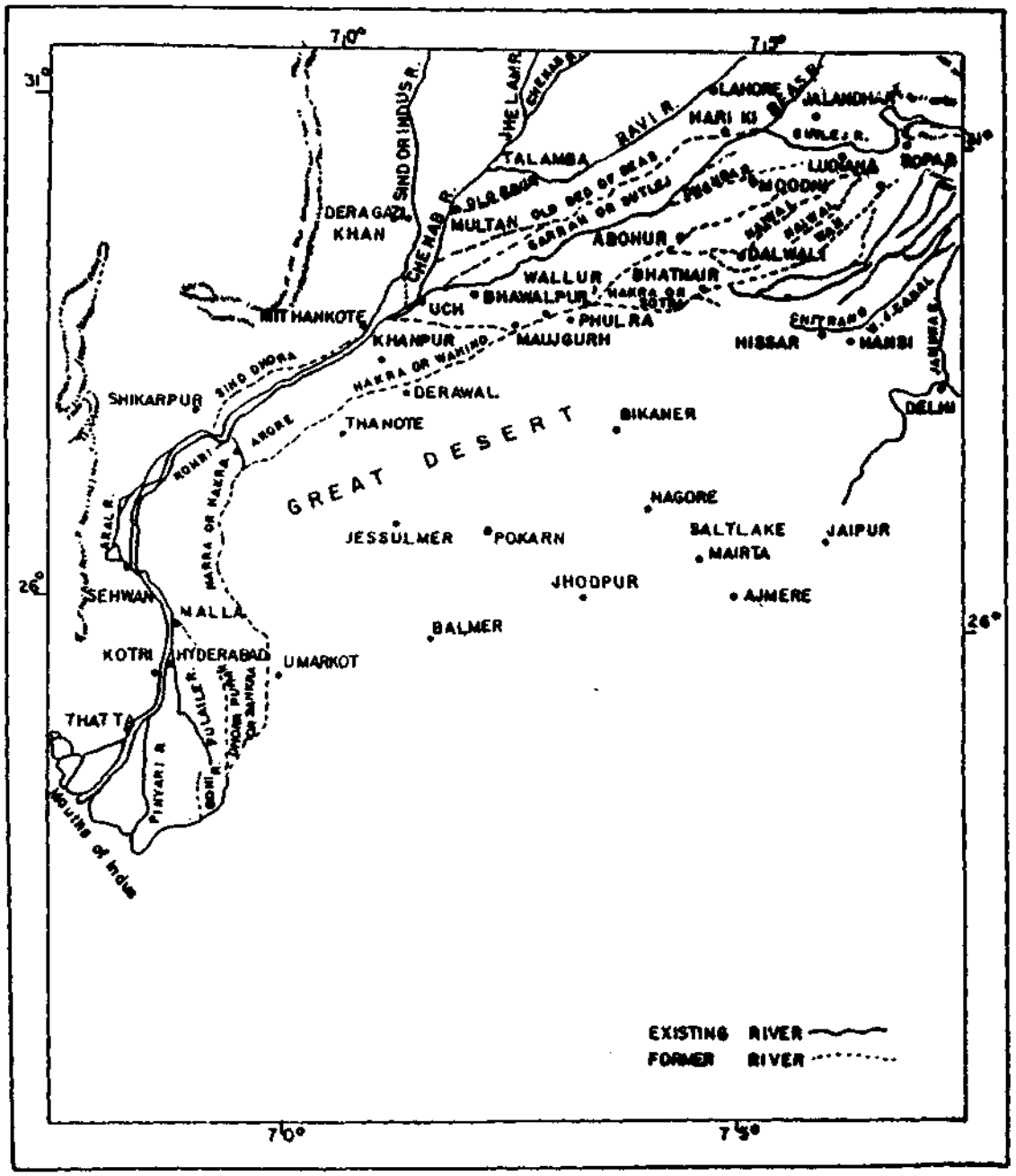

FIG. 3

(1) In the Central province of the Indus Empire, several new Indus sites were located by M. Rafique Mughal[13]. The Kot-dijian sites of Cholistan which Mughal terms as 'Early Harappan' are actually 'Pre-Harappan'. The culture is represented in the vast plains extending from Rehman Dheri to Jalilpur.

Mughal's Cholistan exploration has produced as many as fortyone sites of the early Harappan period[14]. In this period, the settlements increase in number over those of the preceding Hakra sites and the main focus of occupation appears to have been between Fort Derawar and Fort Abbas where settlements of Hakra wares are very few. This pattern seems to extend across the border in India up to Kalibangan and even further east to Banawali near Fatehabad (Fig. 3).

(2) The Western Province of the Indus Empire can be recognized as a distinct geographical unit comprising the highlands of Baluchistan and North-Western Province extending from the Makran (Pakistan) coast to the Khyber and Bolan passes.

Dabar Kot in the Loralai Valley is an important Harappan settlement. Sutkagendor and Sotkakoh are two ports on the Pakistan Makran coast. Proto-historic settlements discovered by A.H.Dani include Gumla, Hathala, Bud-ki-Terai and Kot Allah Dad[15]. Sarai Khola and Rehman Dheri[16] near Islamabad shed new light on Harappa culture in the north-west.

(3) The Eastern Province, affording wide flood plains, topographically homogeneous with vast aggravational surface for the annual flood-silt, was a formative region for the development of Indus Civilization. The site of Kalibangan is noted for its pre-Harappan and Harappan settlements. Other Harappan settlements along the Indus and lower reaches of the (Ghaggar) Sarasvatī must have been deserted during the Late Harappan period. They are termed as 'arma' and 'armaka' by the Vedic Aryans who were in occupation of the middle and upper courses of the Sarasvatī. By the time the Mahābhārata was composed the lower reaches of the Sarasvatī was turned into a semi desert. In the Yamuna-Sutlej Valleys there are some significant Harappan settlements at Manda, Banawali, Chandigarh, Ropar, Alamgirpur and Bara.

(4) The Southern Province shows different geographical features;

(i) Small dissected plateaus and scarplands in Kutch and Kathiawad

(ii) a long sea-board indented by large inlets like the Gulf of Cambay and the Rann of Kutch and

(iii) tidal flats, fertile plains and a marshy coastal zone- offered amongst other things possibilities of maritime activity[17]. In the north-western parts of Gujarat, where the rivers Banas, Sarasvatī and Rupen, flowing into the Little Rann of Kutch, and in Saurastra proper, over seven hundred sites of pre-Harappan, Harappan, Late Harappan affiliations have been located[18]. Some of the noteworthy

sites of different regions are given below with the years of excavation.

The Central Province:

Harappa (1986-88), Mohenjo-daro (1921-22), Chanhu-daro (1931), Kot-diji (1957), Balakot (1973-75), Amri (1927), Allahdino (1973-77).

The Western Province:

Mehrgarh (1977), Saraikhola (1968-71), Gumla (1970), Sutkagen-dor (1931), Dabarkot (1929), Rehman Dheri (1976).

The Eastern Province:

Kotla Nihang (1929), Ropar and Bara (1953-55), Kalibangan (1960-69), Mitathal (1968), Siswal (1970), Sanghol (1968-73 and 1980-86), Banawali (1975-83), Bhagwanpura (1975-76), Manda (1976-77), Hulas (1978-83) and Rohira (1982-83).

The southern Province:

Rangpur (1935, 1937, 1947 and 1953-56), Rojdi (1951-52, 1977-78 and 1983-84), Bhagatrav (1953-55), Lothal (1955-62), Prabhas Patan (Somanath) (1956-57 and 1975-77), Desalpur (1963-64), Malvan (1969-70), Surkotada (1972-75), Daimabad (1974-78) and Lakhabawal (1955-56).

Sumer and Egypt had long emerged into a civilized way of living at the time the Indus People built their remarkable cities. Egypt had been unified for seven centuries and the Early Dynastic period in Sumer was over four centuries old. Among these civilizations the Indus Valley was by far the largest in area covering more than what Egypt and Mesopotamia

together covered. Its frontiers reached well beyond the watershed of the Indus river. From Ropar to Sutkagen-dor is 1600 Kms. The axis of the two Egypts is only some 960 Kms and lowland Mesopotamia is of a similar length[19]. Behind so vast a uniformity lay a remarkable administration and economic discipline.

A brief account of the cultural remains from the recent excavations is given below as a background for the study of the Indus Script and language.

Harappa: M.S. Vats excavated Harappa between 1923 and 1934 and published the report in 1940. The University of California at Berkeley and the University of Wisconsin at Madison excavated Harappa from 1986 to 1988. The report by G.F.Dales, J.M.Kenoyer and others highlights some important findings[20]. The excavation in Mound E revealed Harappan brick structures, mud-brick platforms, sump pits etc. Craft activity such as copper smelting, agate bead manufacture, stone tool manufacture, shell working and wood-working was prominent on the southern slopes of the mound. Some strata yielded undisturbed cemetery H and transitional Harappan habitation deposit. Harappan architectural units with streets and drains were exposed in the excavation of mound E. Wheeler[21] and M.R.Mughal[22] excavated Harappan Cemetery. Excavation by Dales team revealed the western extension of the Cemetery into the fields, where the Harappan burials were dug into natural soil. A few burials contained a large number of pots and a significant variety of ornaments too, but the

majority had very limited grave goods.

A very significant finding of the excavation by Dales' team was the construction of platforms of mud-bricks revetted with burnt bricks as in Lothal. The plans of buildings and streets in 'Area G' and 'Mound AB' at Harappa are not traceable owing to brick-robbing. Another interesting feature is that all the inscribed seals of Harappa are of the Late phase when pictures of hill, pipal leaf, insects, birds and animals were omitted from the scripts.

Mohenjo-daro, situated on the river Indus in Larkana district of Sind was excavated under the direction of John Marshall in 1921-22 and continued upto 1930[23]. E.J.H.Mackay (1938) who also excavated the site suspects that originally a channel of the Indus washed the northern edges of the Citadel. The Citadel complex encompasses within its limits several important buildings, such as the Great Bath, the Granary and the Cottage, all built on massive platforms of mud-bricks below which there are some earlier buildings, not yet fully explored.

The Citadel of Mohenjo-daro is protected against flood by a peripheral wall in which towers and salients have been traced on the northern, western and south-western sides. There is a public bath situated in a courtyard. The brick-paved courtyard is surrounded by Verandahs, at the back of which are ranged rooms on three sides. Across a lane to the north of the Great Bath there is a block with eight small bath rooms ranged in two rows, one on either side of a drain.

Bathing is a necessity and an important ritual to one and all. Mohenjo-daro had the unique distinction of providing a public bath. There is a large building which might have served as an assembly hall.

The Great Bath, the Assembly Hall and other impressive buildings lend dignity to the Citadel as a seat of power. A significant observation made in 1964-66 excavation of Mohenjo-daro is the presence of the so-called Jhukar pottery in the uppermost layers of Mature Harappan phase along with the typical Mature Harappan pottery and architecture thus shedding welcome light on the contemporaneity of the two cultures. The physical presence of the Jhukar and Kulli folk in Harappan centres has a distinct cultural identity among the advanced Indus people who had attained a high degree of literacy and technical achievement.

An important contribution made by Dales to our knowledge of Indus Script is the convincing evidence about the simplification of the writing during the last days of Harappa culture by the exclusive use of cursive signs on the seals recovered from the latest structural levels.

Chanhu-daro[24] 129 Km south of Mohenjo-daro is one of the three major towns of the central province of the Indus Empire. Majumdar who excavated this site confirmed that it was a Harappan settlement. Mackay recognized three cultural periods at Chanhu-daro, the earliest representing the Harappa culture and the second and third were identified with Jhukar and Jhangar cultures respectively.

There was some time lag between each sub-period in Chanhu-daro. In phase Ia, no platforms were built to serve as high plinth for houses of mud bricks. Platforms came into existence in Phase Ib at Chanhu-daro, but no fortification or peripheral wall was built. Chanhu-daro was prosperous in Phase Ib as can be made out from the large number of copper tools and weapons, stone weights, seals and ornaments. Phase Ic is better represented on Mound II than on Mound I by houses, streets and drains.

Chanhu-daro Ia and Ib should be equated to Mature Harappa culture and Chanhu-daro Ic to Late Harappa culture.

Kot-diji which was excavated by F.A. Khan is situated on the national highway 24 Km south of Khairpur and 40 Km east of Mohenjo-daro. The thick deposits of the Pre-Harappan settlements of the site indicate that it was inhabited by a distinct well organised and prosperous community several centuries before the arrival of the Harappans. These inhabitants could be called the 'Kot-Dijians', their houses built in stone and mud brick. The skill displayed in the manufacture of their wheel-made pottery has little or no affinity with the Harappan ware. A terracotta figurine of bull found along with Kot-diji pottery, represents their skill in the art of modelling[25]. The Harappans lived in houses having mud-brick walls raised on stone foundations and used tools and personal ornaments made of copper and bronze.

Casal[26] finds a few Ceramic types common to Kot-diji and Amri suggesting the contemporaneity of Kot-dijian culture

with periods I and II of Amri.

Amri excavated by N.G. Majumdar is situated south of Mohenjo-daro. The Amri culture is known for pots with thin walls painted with a plain reddish brown band at the neck, a chocolate band on the inner side of the lip and geometric patterns on the body in black or chocolate or pink. Majumdar distinguished the Amri ware from the polychrome of Nal on which three or more paints were used[27].

Another Harappan site Allahdino was excavated by Walter A. Fairservis[28]. It is situated 40 km east of Karachi and 16 km east north -east of the Indus river. Three phases of occupation have been distinguished so far. Structures of mud-brick were noticed in the upper levels of Phase I, while in the lower levels, mud brick and stone structures rebuilt several times were encountered. Phase II is noted for mud brick architecture with courtyard features. The basic decorated pottery of every phase was of the black-on-red type designated Mature Harappan. There was no central planning although there was regularity within and between architectural units.

After exploration in Bahawalpur a distinctive group of ceramics was discovered from a Cemetery called 'H' at Harappa. Similar material was also reported from two sites explored by Aurel Stein[29] in Bahawalpur.

Beautiful red pottery, often treated with thick glossy slip and black painted designs, many vessel forms and other materials from the Late Harappan sites in Cholistan compare

well with the known evidence from contemporary sites in Pakistan and India[30].

Mehrgarh was excavated by J.F.Jarrige[31]. Its importance lies in the succession of pre-pottery Neolithic, Neolithic and Chalcolithic cultures beginning from the sixth millenium B.C. Mehrgarh is situated 150 km south-east of Quetta on the perennial river Bolan at the head of the Bolan Pass which connects the Indian sub-continent with West Asia. The excavator has distinguished seven cultural periods in this area.

Houses of mud bricks and mud have been traced throughout Period I and the imprints of barley and datestone noticed on clay in the early Neolithic levels throw light on the food habits of the people. In the Upper levels, a large settlement with symmetrical houses, also of mud bricks, built on a sort of mud-brick platform has come to notice.

Small stone blades used for cutting sea shell, a very large number of bone tools, cores of conch shell and pottery turned on a slow wheel formed the main equipment of the Neolithic folk of the period II. The only metal object found in this period is a copper bead. Large quantities of wheat, barley and cotton seeds were found in the excavation. Painted pottery was very popular in Period III. Terracotta female figures and bone and terracotta seals distinguished period IV from the preceding and succeeding ones. In Period V, the distinct ceramic industry is the Grey Ware painted with **'pipal leaf'** motif in red. There is a profusion of

terracotta female figurines with prominent applique breasts and exaggerated hairdo. Monumental architecture and Kot-Dijian pottery are encountered in Period VI assignable to the first half of the second millenium[18a] B.C. Rehman Dheri, an important pre-Harappan settlement situated 23 km north of Dera Ismail Khan was excavated by F.A.Durrani[32]. It is a large urban centre with mud-brick structures. Durrani mentions three cultural phases: Rehman Dheri (Lowest), Rehman Dheri II (intermediate), and Rehman Dheri III (uppermost). The lowest level represents a ceramic assemblage that seems to be proto-Kot-Dijian. The intermediate phase represents typical Kot-Dijian specimens with some motifs such as pipal leaf, peacock, intersecting circles and some geometric designs typical of the Mature Harappan phase. The upper phase yields some Kot-Dijian ceramic complex with more elements of continuity from Proto-Harappan to Harappan period.

Lower levels at Kalibangan, a Harappan town situated to the south-east of Harappa on the now-dry Ghaggar river indicate a pre-Harappan culture of some sophistication[33]. The settlement was fortified from the beginning of the occupation and within the walled area there were mud brick houses with ovens, water-storage-pits and drains. The inhabitants made a wide range of earthenware vases and bowls as well as bull figurines, beads and toy cartwheels. They were acquainted with copper, though tiny blades of chalcedony and agate were also used. The economy of Mature Harappan

period depended on agriculture, industry and trade.. They have produced goods for both home markets and foreign trade. Potters turned sturdy red ware, often painted with black floral or geometric designs. Terracotta and stone figurines display the sculpture's remarkable art. Human portraiture reached a very high standard in the few surviving pieces. The contrast between this pre-Harappan cultural phase and the later Harappan or Indus style lies not only in the pottery forms, the size and materials of blades, the size of bricks and the layout of houses, but also in the scale of urbanization and the advent of literacy. The Cemetery at Kalibangan is noted for profusion of ceramic wares in a few burials. The fire altars in the Citadel are comparable with those of Lothal.

East of Kalibangan there is an important Harappan settlement at Banawali which is situated along the ancient bank of Sarasvatī, some 220 km north-west of Delhi, in District Hissar, Haryana(34).

The pre-Harappa culture of Banawali bears striking similarity to that of Kalibangan in ceramic wares and other equipments though copper is poorly represented. The structures were made of mud-bricks, the use of Kiln-burnt bricks was also recorded in drains. The important finds obtained from this site are : points and awls of bone, bangles of shell, copper and terracotta beads of semi-precious stone, shell, bone and gold and terracotta animal figurines. Another find is a sherd depicting a canopied cart

with spoked wheels. During the Harappan occupation, the settlement was fortified showing two subjoined parts with a bipartite wall. Other important finds are cubical weights, one terracotta and ten steatite seals bearing Indus Script, a few terracotta mother goddess figurines and a terracotta model of a plough.

Bhagwanpura is situated on the right bank of the Sarasvatī in District Kurukshetra, Haryana. The excavation[35] revealed in 2.70 metre-thick occupation strata a two-fold sequence of cultures of which the earlier was represented by the so-called Late Harappan and the latter, which was found interlocked with the preceding one, by the Painted Grey Ware culture. The finds from the Late Harappan occupation include in addition to pottery, terracotta bulls, toy-cart wheels, copper rods and pins, bone pins, terracotta bangles and beads of terracotta and semiprecious stones. The houses were built atop mud platforms for protection against flood. A noteworthy find from the overlapped phase was a terracotta seal bearing incised Indus characters. The interlocking of the Late Harappan and Painted Grey Ware cultures has also been attested to at Sanghal in District Ludhiana of Punjab.

Lothal, literally meaning in Gujarati 'the mound of the dead' is situated on the coastal flats at the head of the Gulf of Cambay, 80 km. South-West of Ahmedabad in Gujarat. Being situated only 16 km. north-west of the junction of the Sabarmati and Bhogavo rivers with the sea, Lothal was

subjected to frequent floods. The settlement, therefore, had to be reinforced with both mud and mud-bricks against floods. The excavations[10,b,c] revealed five phases of continuous occupation of which the earlier four are included in Lothal period A and the fifth in Lothal period B. Except for the terminal one, the end of each phase was marked by flood damage.

The settlement was found to be fortified with a mud and mud-brick wall. Both public and private buildings stood on the terraced platform. The prominent structures located in the Acropolis included a regimented series of rooms, each with a brick-paved bath and a remarkable system of underground drainage with silting chambers. Lothal being a major Harappan port it had the distinction of building a dockyard bigger than the modern dock at Vishakhapatnam. In the Western embankment there was a mud-brick platform which was intended for handling cargo. The structure has been proved to be a dockyard for shipping. It had a lock-gate system for controlling water flow in high tide and low tide. Another important structure located in the citadel part is a warehouse. Both the dockyard and the warehouse coupled with the discovery of a Persian Gulf style seal[36] at the site, are indicative of the maritime trade of this coastal site.

A noteworthy ceramic ware of Lothal A is the reserved slip ware which indicates connection with Mesopotamian ware. The painted decoration on the Harappan pottery includes pipal leaf, intersecting circles, fish scale, peacocks etc besides

geometric designs. Other finds were characteristically of Indus mode such as seals, cubical weights, chert blades, copper objects and ingots, bone pins and terracotta sealings. The most important contribution of Lothal to Indus Script is the evolution of the writing from a sophisticated to a simple system through a large variety of seals.

Lothal B was marked by certain changes in ceramics; goblets, painted jars, loops, fronds, triangles, volutes, panels, stylized peacocks and birds, drawn in a free style on a limited surface of the pot. As regards other finds, terracotta bangles were completely replaced by those of shell, cubical chert weights and long ribbon flakes by short blades. A significant change in the script was the absence of the animal motif and other pictographic elements. The houses of period B were jerry-built, with bathrooms made of brick-bats. The settlement gradually shrank in size and lost its urban character. Frequent flooding is the principal cause of the decline of this settlement.

Rangpur is situated in District Surendranagar, in Gujarat, on the river, Sukha Bhadar. The site has been excavated four times. M.S. Vats who first excavated the site in 1934, came to the conclusion that Rangpur was a Harappan outpost.[37] G.S. Ghurye[38] agreed with Vats. But H.D. Sankalia's excavation in 1947 cast some doubts regarding its Harappan affinity[39]. Finally in 1953-56 when a large-scale excavation was undertaken by Rao[10a] among other things its status as a Harappan site was restored. The excavation

yielded pottery, stone weights, blades and beads typical of Harappa culture. Drains of Kiln-fired bricks and platforms of mud-bricks were also encountered here.

Three cultural periods are recognized at Rangpur. Period I represents the Late stone Age culture of Saurastra. Period IIA represents the Mature Harappa culture and Period IIB the Late Harappa culture. Period IIC marks the transition phase.

In Period III an evolved culture i.e. 'the Lustrous Red ware culture' was prominent. Period II is divided into three phases, denoting respectively the mature, decadent and transition stages of the Harappa culture. In sub-period IIA, the pottery is typically Harappan. The pots were painted in black over red or chocolate over buff. Other finds are cylindrical carnelian beads, lenticular agate beades, disc beads of steatite and gold, chert blades, cubical stone weights, shell bangles and copper pins. The occupation of this sub-period was destroyed by floods. In sub-period IIB, the fabric of the pottery becomes coarser. The bulk of the pottery is not painted with any intricate pattern, the peacock being the only important animal motif. In sub-period IIC new forms and fabrics were introduced. The cylindrical perforated jar was totally dropped. Terracotta triangular cakes went out of use. Certain new painted motifs such as loop with fronds, fish, row of birds and deer were introduced.

The last cultural period at this site is marked by the dominant use of Lustrous Red Ware. Painting was now

restricted to the upper part of the vessel and executed in a deep black pigment over a shining red surface with less complicated designs and animals like bull, deer, bird. The black and redware, occurring in smaller quantities in the earlier sub-period IIC also came into greater prominence during this period. Faience, agate and steatite beads went out of use. Terracotta beads and shell bangles became more popular. Among terracotta animal figurines, the most noteworthy was of a horse. The graffiti marks on potsherds closely resembling cursive signs on Indus seals, suggest the survival of the Indus Script.

The Decline

Now the obvious question is that how such a well established and sophisticated civilization disappeared suddenly. In this regard Dales[40] says that the decline is due to natural calamity. He discarded the invasion theory propounded by Gordon Childe and supported by Wheeler[21]. The peripheral walls and the terraced platforms over which houses were built were antiflood bolsters. Sometimes hurried repairs were carried out to the Citadel walls of Harappa and Mohenjo-daro to prevent further damage by floods. The accumulation of flood debris in 'HR Mound' is a clear proof of inundation of Mohenjo-daro.

The invasion and destruction of Harappa by the Cemetery H people is now dismissed as it is not supported by archaeological evidence. The hiatus between the Harappa and

Cemetery H culture establishes that the invaded were not present when the socalled invaders came. At Mohenjo-daro Dales has proved that the socalled massacare does not belong to the last phase. Hence destruction of Mohenjo-daro cannot be attributed to any invasion. The peripheral walls were not defenses against invaders but a protection against flood.

The Indus civilization made several permanent contributions to the progress of man. The Harappan metrology laid the foundation of science and technology with its decimal graduation system. It had the minutest measurements in weights and on linear scale. The Harappans met the danger of flood by building solid and massive platforms of brick and mud to serve as high plinths for blocks of houses to keep them above the normal flood level. In doing so they standardized the most convenient sizes of bricks and developed the technique of firing on modern principles. The burnt-brick revetments of the mud-brick fortification at the three major settlements namely Harappa, Mohenjo-daro and Lothal confirm that the inhabitants had to safeguard the mud-brick walls against erosion. The engineering skill of the Harappans, especially in building a dock after a careful study of tides, waves and currents is remarkable for the age. They not only followed modern principles in building docks, warehouses, drains and baths but also achieved advanced standards of construction. The science of Yoga is another great contribution of the Harappans to the progress of man in the material and spiritual field. Several terracotta human

figures depicted in Yogic postures have been recovered from Harappa, Mohenjo-daro and Chanhu-daro. The Indus seals also show the gods seated in Yogic postures. They had recognized three forms of energy namely the fire, the sun and the lightning and postulated a theory of single supreme source. This energy is responsible for the creation, sustenance and destruction of the Universe which is beautifully expressed by their immediate successors namely the Vedic Aryans in several hymns of the Rg. Veda. The Harappans worshiped the fire god and offered sacrifices as did the Vedic Aryans later. The most important contribution of the Indus Valley Civilization is the simplified alphabetic system of writing which facilitated quick communication and recording of thought. Without such an easy system of writing sophistication would not have been possible(18).

The Harappans maintained their individuality both in the shape of the seals and in the script adopted for communicating their ideas. More than 3000 Indus seals and sealings have been found throughout the Indus Empire. The intaglio designs on the seals include a wide range of animals associated in almost every case with groups of signs in a semi-pictographic script. Some seals, however, bear script only and some bear human or semi-human forms. There are likewise purely cursive designs, notably the swastika, multiple squares set concentrically, a criss-cross pattern and a plain multiple cross. The early and Late seals and tablets were taken together by early excavators of Indus

sites in considering the Indus Script as pictographic, while recent stratigraphic evidence from Lothal, Kalibangan, Mohenjo-daro and Harappa shows a clear evolution of the writing by dropping pictures in Late levels. Until this fact was known, the Indus Script was considered as uniform throughout its long life of 800 years from 2500 B.C. to 1700 B.C. The inscriptions begin from the right, but where there is a second line it begins from the left, i.e. the sequence is boustrophedon. Till now it was believed that the script bears no ascertainable relationship with any contemporary or near contemporary script. But recent researches have shown that the signs in the Late Harappan cursive script resemble those of the Semitic Script to a large extent.

The conditions requisite for the interpretation of the script - a bilingual inscription including a known language or a long inscription with significant recurrent features - are not available. A majority of the available inscriptions are short, with an average of half a dozen letters. Their variety prevents from assuming that they relate to the limited designs on the seals. It has been conjectured, with all reverve, that they may consist largely, though not entirely, of proper names, sometimes with the addition of a patronymic, a title or a trade. Such conjectures made without proper analysis of the script have not proved fruitful.

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CHAPTER - II

THE INDUS SCRIPT

AND ITS MAIN FEATURES

THE INDUS SCRIPT - AND ITS MAIN FEATURES:

A seal is a stamp bearing a device or letter or both pertaining to its owner, while its impression on any material is called sealing.

The stamp seals of Harappa, Mohenjo-daro[1], Lothal[2], Chanhu-daro[3], Kalibangan[4] and other sites covered in intaglio with beautiful animal figures are masterpieces of art noted for their realism. The calligraphy of the short inscriptions on the seals is known for the symmetry of the signs engraved. The average size of the seals is 3x2 cms and the average size of signs is 0.5x1 cm. Some of the Indus inscriptions on the seals contain a single sign while in many others the average number is five. The Harappans maintained their individuality both in the shape of the seals and in the script adopted for communicating their ideas. More than 3000 Indus seals and sealings have been found throughout the Indus empire. But their concentration and use was mostly in industrial and commercial centres like Mohenjo-daro, Harappa, Lothal, Chanhu-daro, Kalibangan and Dholavira. The major contribution is from Mohenjo-daro and Harappa accounting for more than 2000 seals and sealings. Next in order comes Lothal which has contributed 213 seals and sealings. Being the major port of the Indus Empire, Lothal sealed the outgoing Cargo in the warehouse. Chanhu-daro and Kalibangan have yielded a much smaller number of seals. Only four or five seals are found at other Harappan sites.

The seals are generally made of steatite, a soft stone of blue to greyish tinge. Sometimes copper, ivory, agate, chert, faience and clay were also used. Three categories of steatite seals can be made out. One group consists of soapstone with a white coating on the same material producing a greasy lustre. Steatite of light grey colour or light bluish tinge was used for making such seals. The softness of the material rendered itself easy for carving. The second group consists of seals made from a steatite paste pressed into a mould, dried, engraved and heated. In the third group soapstone seals without any coating are included.

Mr. Sana Ullah has made an exhaustive analysis of the surface coating on one of the seals (DK 4479)[5] and his results are given below:

Compound	Percent
Silica	61.2
Oxides of Aluminium & Iron ..	2.4
Lime	nil
Magnesia	34.6
Water	1.8
Total	100.00

In another seal (DK 3557)[5], the amount of water was found to be 2.17 percent[5]. Therefore, it seems to be clear that the coating upon these seals is made of the same material.

The stone seals were first cut into shape by means of a

saw, the marks of which are clearly seen on unfinished seals. The average thickness of the saw blade used in this process was 0.025 inch. The whole process of sawing blocks of steatite to required size, cutting a button on the back, engraving the motif and script is fairly clear. A copper wire seems to have been used for cutting steatite. The groove in the button or boss was cut in V shape. Specimens of this have been found in Lothal and Indus Valley sites. The seal was held by means of a copper ring which passed through the hole in the button at the back to enable the owner to press it on soft material. Engravers of Conch shell, bone and chert used for engraving the device and inscription on seals are found at Mohenjo-daro, Lothal and Chanhu-daro.

Distribution of seals and sealings in Indo-Pakistan subcontinent[6] :

1.	Mohenjo-daro	- 1540
2.	Harappa	- 985
3.	Lothal	- 215
4.	Kalibangan	- 99
5.	Chanhu-daro	- 66
6.	Banawali	- 7
7.	Kotada (Dholavira)	- 28
8.	Chandigarh	- 4
9.	Surkotada	- 3
10.	Alamgirpur	- 3
11.	Nindowari	- 3
12.	Amri	- 2
13.	Balakot	- 2
14.	Desalpur	- 2
15.	Others	- 67
Total		- 3026

Indus seals and sealings found outside Indian subcontinent

1.	Mugaiyar (Ur)	-	10
2.	Uhaimir (Kish)	-	2
3.	Djoka (Umma)	-	1
4.	Tello (Girsu)	-	3
5.	Tell Asmer	-	2
6.	Tepe Gawra	-	1
7.	Susa	-	2
8.	Bahrain	-	2
9.	Failaka	-	1
10.	Hama	-	1
	Total	-	25

It is because Marshall published the seals of Mohenjo-daro for the first time in the Illustrated London News (1924)[7] that the Western Scholars soon realised the importance of Mohenjo-daro and Harappa as Bronze Age sites. Five thousand years ago, the Punjab and Sind, were enjoying an advanced and singularly uniform civilization of their own, but in some respects superior to that of contemporary Mesopotamia and Egypt, even though they continued to use stone blades alongside copper, celts, arrowheads, spears and bronze vessels.

The discovery of a few Indus seals at Mesopotamian sites provided the Indus Civilization with a relative chronology. Gadd[8] has listed as many as eighteen seals of the so called

Indus type found at Ur. Some more were subsequently found in Kish, Brak and other places.

The evidence from the Late Harappan levels at Lothal corroborates the evolution of the Harappa culture noticed for the first time at Rangpur[9]. This cultural evolution is of tremendous significance because the Indus Script also underwent transformation during the Late phase of **Mature Harappa Culture (Lothal A)** and in the devolutionary stage (Lothal B). Stratigraphically the simplification of the writing could be proved here and further substantiated by the seals of Late levels in recent excavations of Harappa and Mohenjo-daro.

As many as 71 terracotta sealings recovered from the warehouse at Lothal bear positive impressions of Indus seals on one side. Some seal impressions of the type found at Harappa and Mohenjo-daro are also noticed at Lothal. At Kalibangan steatite seals and a few potsherds with inscription have been discovered[10]. A broken steatite seal and potsherds with incised pictographic signs have been recovered from Kot-diji[11]. An inscribed bowl from Rojdi bears three Indus signs[12]. Though no seal has been found at Rojdi, its importance lies in adducing evidence in the graffiti inscription for a simplified purely cursive writing omitting pictures in the Late Harappan period. A copper seal has been found in Surkotada[13]. Recently Dholavira and Pabumath in Kutch and Shikarpur in Saurastra have yielded a few seals[14]. Among them Dholavira is important because of

its large urban settlement and cursive writing on most seals and sealings. One terracotta seal and ten steatite seals bearing Indus Script mostly in cursive form have been recovered from Banawali[15]. Two terracotta circular seals bearing an Indus character has been discovered from Daimabad[16], where pottery is painted as in Surkotada with Indus signs. In Mohenjo-daro also some copper tablets legends were written in paint or colour indicating that writing on a perishable material was known to Harappans.

It was generally believed that the seals were used as amulets or charms meant for protecting the wearer from evil forces. But now the real purpose can be ascertained from the 71 terracotta sealings found in the warehouse at Lothal and a few from Kalibangan. The purpose of producing sealings was mainly commercial. They bear an impression of the seal on the face and that of the packing material such as cloth, reeds, and cords on the back. Obviously seals must have been used for sealing cargo wrapped in cloth or bamboo mats. After wrapping the packages with vegetable mats, reeds or textiles they were secured by tying cords around them. Lebels of wetclay covering the knots were impressed with seals in order to authenticate the contents and secure them against pilfering. Thereafter wet clay on the margin of seal impression was pressed with fingers. Perhaps the finger impression was a further authentication of the genuineness of the contents and the source which could be verified by the recipient.

Although the purpose of seal was mainly commercial, there are also the motifs of short horned and long horned bulls, elephant, rhinoceros, goat, unicorn etc. below the inscription. On the surface of Lothal seal-impression and on a few others animal figures and inscription occur. Such sealings seem to have served as tokens or prayer tablets or identity cards of the persons, carrying them as there is no mark of their use on packages. A similar use can be attributed to the tiny seals of Harappa and Mohenjo-daro and a few faience and terracotta seals of Lothal without any button at the back.

The reason for the non-survival of rawclay sealings in Harappa and Mohenjo-daro may be that they melted away in water as they were not cooked. The Lothal sealings from the warehouse are better preserved by fire in an accident which destroyed the warehouse and the sealed cargo. A rare sealing of bitumen with a motif of the cross enclosed in a border is found at Lothal. A few sealings of bitumen have been recovered in Harappa and Mohenjo-daro also. Faience sealings are very few in number.

The sudden disappearance of seals except for the few in the late levels of Mohenjo-daro, Harappa and Lothal period B may be attributed not only to the stoppage of long-distance trade but also to the decline in the general prosperity of Harappan population. This does not imply that the Late Harappans became suddenly illiterate. Surviving of writing is attested to by a few Late Harappan seals and pottery. All the

writing on perishable material such as palm leaf or papyrus must have been totally destroyed in the tropical weather.

The occurrence of inscriptions on commonplace items such as pottery would indicate that a fairly sizeable section of the population was literate. Out of the total number of 246 sealings there are several repetitions; 210 seals do not bear any inscriptions and many seals are found to be fragmentary and illegible. After deducting these seals the rest of the seals are to be read and interpreted.

NATURE OF THE SCRIPT

Writing is the most important source of communication of human thoughts and feelings. There are five different ways of writing such as **pictography, logography, rebus writing, syllabary and alphabetic writing.**

1. **Pictures** : The forerunner of the full system of writing consisted of simple pictures of objects or action. They are termed as pictograms[17].

2. **Logography** : It is a device in which individual signs can express individual words and should naturally lead toward a development of a complete system of word signs, that is a word writing or logography. For example to write the word 'chairman' the sign of 'chair' and 'man' may be written.

3. **Rebus writing** : A primitive logographic writing can be developed into a full system only if it succeeds in

attaching to a sign a phonetic value independent of the meaning which this sign stands as a word. This is phonetization, the most important single step in the history of writing. In modern usage this device is called rebus writing exemplified in the drawing of an eye and of a saw to express the phrase 'I saw'. With the introduction of phonetization and its subsequent systematization a complete system of writing was developed to make it possible to express any linguistic form by means of symbols with conventional syllabic values. This system was prevalent in Egyptian hieroglyphic writing.

4. Syllabic system : Phonetization of signs led to the syllabic system in which conventional signs were standardized. The Sumerians were the first to develop a syllabary consisting of signs representing monosyllables ending in a vowel or consonant. Mesopotamian, Babylonians and Assyrians accepted the Sumerian system of writing.

5. Alphabetic : The word 'Alphabet' means a writing which expresses the single sound of a language. The first complete alphabetic system was formed by the Greeks. The writing began with the Semitic consonantal Scripts[18] (ca., 1500 B.C.). But the vowels were added by the Greeks (ca., 800 B.C.) to complete the developement of alphabetic writing. It will be presently shown that Semitic writing was evolved from the Late Harappan alphabetic writing.

Historically the ancient Oriental Scripts were evolved from logographic to syllabic and finally to the alphabetic

stages. However, the scripts were conservative and retained some ideographic elements till the end even while increasingly employing phonetic syllabic signs. An important result of the transition was a sharp reduction in the total number of signs in a script. Early pictographic Sumerian had about 2000 signs. This was reduced to about 900 in Sumerian Cuneiform and further to about 600 in Akkadian and 450 in Hittite Cuneiform. The Elamite Cuneiform Syllabary used 163 signs while in the old Persian Cuneiform Syllabary the number was further reduced to 41. Finally the Ugaritic Cuneiform alphabet used only 30 signs.

The Indus Script is one of the seven ancient oriental systems of writing developed in the ancient orient during the Bronze Age (ca. 3000-1500 B.C).

Seven ancient Oriental Scripts

No.	Script	Area	Earliest Occurrence
1.	Sumerian	Mesopotamia	3100 B.C.
2.	Egyptian	Egypt	3000 B.C.
3.	Proto-Elamite	Elam	3000 B.C.
4.	Indus	Indus Valley	2500 B.C.
5.	Cretan	Crete	2000 B.C.
6.	Hittite	Anatolia	1500 B.C.
7.	Chinese	China	1500 B.C.

The Harappans had cultural and trading contacts with contemporary west Asians cultures[19]. Seals with Harappan motifs and writing have been found in Babylonian, Elamite, Persian Gulf and Central Asian sites[20]. Some scholars have tried to connect the Indus Script with the scripts of the ancient Sumerians[21], Proto- Elamites[22], Egyptians, Hittite and Chinese and even with Etruscan pot-marks and with script like carvings on wooden tablets found in the Eastern Island in the middle of the Pacific Ocean. The language underlying the Indus Script has been supposed to be Summerian, Proto-Dravidian, Proto-Indo-European, Proto-Indo-Iranian, Sanskrit, Prakrit[23] and even Santal language.[24] There is also an attempt to read only number and no words or sounds in every Indus sign[25].

PROBLEMS FACED IN DECIPHERING THE INDUS SCRIPT

Many attempts at deciphering this unknown writing system have been made ever since the first specimen was published in 1875 and all sorts of 'solutions' have been proposed.

There are a large number of signs in the Indus Script. They are mostly non-pictorial cursive signs with or without certain strokes attached to them although there are several pseudo pictures formed by the combination of cursive signs in addition to pictures drawn in outlines.

MIXED WRITING

Owing to the transitional character of Indus Script pictures of 'bird', 'fence', 'hill', 'hand', 'pipal leaf' etc. occur side by side with simple non-pictorial cursive and linear signs in one and the same inscription[26]. It is necessary to determine whether the cursive and linear signs are syllabic signs or alphabets or whether all the signs are word-syllables and whether the pictures served as ideographs.

A decipherer has to proceed cautiously from the simple to the complex; the simple in the Indus writing is the evolved non-pictorial cursive writing of the late phases of Harappa, Mohenjo-daro, Lothal etc. After cataloging all cursive signs, the compound signs should be analysed to find out basic signs and their number. This is what S. R. Rao[9]

did as early as 1963; later on many scholars including Fairservis followed his method only partially. They did analyse the compound signs formed by joining some signs but left out those formed with 'man' sign etc. in order to treat them as pictures to be given word on syllabic value in the language of their choice.

The inscriptions are very short with an average of five signs on a seal. But there is not a single bilingual or biscriptal seal which could provide a key to decipherement of the script. As both the language and script of Indus seals are unknown, it is extremely difficult to decipher such a writing with two unknowns. Besides, there are a number of puzzling features of the Indus writing. An attempt has been made in the following paragraphs to highlight some of the problems posed by the Indus writing.

DIRECTION OF WRITING

G. R. Hunter[27] was the first scholar to point out that the Indus writing is from right to left. B. B. Lal[28] also supported it. When we speak of the direction of writing on the seals it must be remembered that they are in the negetive; it is the positive impression on a sealing or the mirror impression of the seal-inscription which is to be read from right to left. If one is going to read the negetive seal inscription, it shall be from left to right but this is not what was intended by the seal cutter. Fairservis[29] and Verma[24] were trying to read the positive impression from

left to right which is not correct according to almost all scholars.

Total number of basic signs:

There is a misconception about the number of basic signs employed in the Indus writing. Different scholars have tried to identify the basic signs from different angles Gadd and Smith[8] thought that the number of basic signs is 400 while Hunter[27] said that they are 150. On the other hand, Meriggi[30] identified 270 signs as basic. Thus the generally accepted number of basic signs ranges from 300 to 400. This is considered too small for a pictographic or ideographic writing and too large for a syllabic or an alphabetic system. But it is very necessary to determine the stage of development of the script which will be known if the number of basic signs is known. In order to determine the exact number of basic signs of the Indus Script the pseudo pictures formed by joining basic signs should not be counted among the basic signs. The stages of combining basic signs or attaching short strokes to the basic signs if followed carefully in the seal inscriptions, the pseudo pictures can be separated from basic signs which occur independently in many inscriptions. If the pseudo pictures are not analysed any compound sign can be considered to be a picture and a phonetic value can be assigned to it to suit one's preconceived idea of the language being Aryan[27], Dravidian[31, 32], Sumerian[21], Santal[24] etc. Such an approach vitiates objectivity.

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CHAPTER - III

EARLIER

ATTEMPTS AT DECIPHERMENT

EARLIER ATTEMPTS AT DECIPHERMENT

Attempts to decipher Harappan texts were made as soon as A.Cunningham discovered in 1853 the first such script on a seal. After assembling all the Proto-Indic signs then available John Marshall[1] and his colleagues concluded that the writing in question was hieroglyphic. According to them the Harappan writing was independently developed, despite a superficial resemblance of some signs to Cretan and early Sumerian signs.

In the Late 1930s, the Czech Scholar B. Hrozny[2], who had deciphered the Hittite Cuneiform writing, tried to compare Proto-Indic writing with the then still undeciphered Hittite Cuneiform, ignoring the fact that the latter was much later in date by more than one thousand years. He claimed that he had discovered in Hittite Cuneiform signs analogous with virtually all the Harappan symbols and compared exceptions with signs from **Linear A, Cretan, Ugaritic, Egyptian characters and Phoenician.** Hrozny read several names of gods in the Harappan seal inscriptions.

A number of theories have been propounded on the basis of the resemblance between the Harappan Script on the one hand and the Sumerian and Elamite Scripts on the other. For instance, L.A. Waddel[3] and Pran Nath[4] suggested that the Harappan Script was imported into India from Western Asia. David Diringer[5] and K. N. Dikshit[6] hold the view that the Harappan Script developed independently in India.

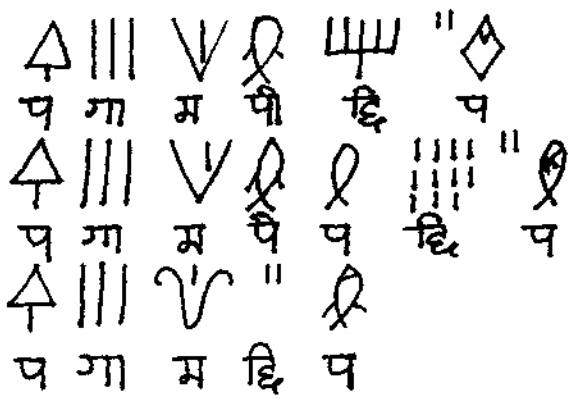
G.R.Hunter[7] made a profound study of the Indus Script in all its different aspects after copying 750 inscribed objects. Unfortunately, some of the main principles settled by him in the beginning of his work led him to wrong conclusions. He readily admitted the probability that the authors of the inscriptions were Dravidians and was inclined to believe that they were the ancestors of the present Brahuis. As to the script he believed it to be mainly phonetic, never alphabetic, though he acknowledged that its origin was pictographic and ideographic. Furthermore, he was of the opinion that the script constitutes a syllabary of open and closed syllables, roughly 250 in number, many of them being complete words. According to him, the Brāhmi Script of India is derived from the Indus Valley Script.

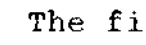
The comparison between the Indus Valley Script and the Brāhmi Script carried to an extreme mars the whole work of Hunter. Relying on this comparison he passed from the script to the language and without noticing it he applied to the language of Mohenjo-daro what is exclusively characteristic of the Sanskrit language. Moreover, he tried to classify the Indus signs but did not analyse the compound signs. But for this defective methodology, the work of Hunter would have been useful to future Scholars.

Among those who made a limited analytical study of the Indus Script mention must be made of P. Meriggi[8], S.Langdon[9]. Langdon tried to establish connection between Harappan and Brāhmi characters. According to his view, the

Brāhmi Script is derived from the ancient Indus pictographic writing. Meriggi believed that the Indus Script was an ideo-phonographic system of writing and assumed some symbols to be ideograms and others phonemes.

Swamy Sankarananda[10] has interpreted the seals as products of Aryan culture and the language to be Sanskrit. The Swami is a Tantric student, and he visualizes everything from the point of view of Tantrism. According to him the solution of the Indus Valley Script will be found in the Tantras. The resemblance between the Indus Script and the Egyptian is limited but Swami Sankarananda made use of this resemblance to decipher some signs of the former. He reads the Indus inscriptions according to the Tantric values and these values are alphabetic. But the Swami is not consistent in the values he gives to the signs and arranges them according to his fancy. As for example,



These three inscriptions will show how inconsistently he reads the signs. The first three signs '  ' are always read ' प ', ' गा ', ' म ' and at the end of each of

these inscriptions the Swami reads '  ', '  '. But the end of each of these inscriptions is different from the end of the other two. In the beginning of the inscriptions the sound '  ' corresponds to '  ' always, but how does he explain that the final '' corresponds to three different signs, one of them at least '' is totally different from the other two. So the attempt of decipherment of Swami Sankarananda does not seem to be acceptable. Sydney Smith[11] has commented on the mechanical nature of the writing and attempted to discover the determinatives, end signs and beginning signs. On the other hand Flinders Petrie[12] tried to interprete the Indus symbols as ideographs, on the analogy of those of Egyptians and assumed that the Indus seals contain only titles of the officials. Gadd[13] has ventured to discover in the Indus Script an ancient Indo-Aryan language. G.de Hevesy[14] drew attention to the similarities between the Indus Valley Script and the script of Easter Island, maintaining that the latter was the progenitor of the former. B.M.Barua[15] tried to find out some correlation between the Indus Script and the Tantric code. A.H.Dani[16] has observed that the formation of conjunct and open syllables in the later historical Indian Scripts is comparable to Indus compound signs but he did not proceed further with the actual analysis of the Indus signs. S.K.Ray[17] tried to compare the Indus signs with Devnagari and Bengali characters. Krishna Rao[18] has followed the method of comparison and identification of every Indus sign

with the original pictographic form. Its abstract forms are identified with the help of the archaic Sumerian Script and Egyptian, Minoan and Hittite Hieroglyphs. But most of the scholars failed to recognize the necessity of identifying basic signs and the system of joining them.

John E. Mitchiner[19] has considered the language of the Indus people as Indo-Aryan, the Indus Script as phonetic and the signs to be accented. Kennier Wilson[20] has assumed that the Indus language is Sumerian. According to B. B. Chakraborty[21] and Sankar Hazra[22] the Indus language is Indo-European. Gomathi K. Sankaran[23] has given value to the basic signs of the Indus Script almost same as those assigned earlier by S.R.Rao[24]. In order to interpret the seals he tried to correlate them with the names of different Rishis, prophets or legendary figures. John Newberry[25] examines the Indus Script used by the different Shaman cults of Mohenjo-daro and Harappa. Of all the Shamanist cults of Mohenjo-daro, the key related structure of the script harkens to the initial organization of the Universe into four directions personified by elephant, tiger, rhinocerous and water baffalo of the lord of the four directions shaman. Accoding to Egbert Richter[26] the Rg. Veda might have been influenced by the Indus way of thinking and that there might be more verses, which could be traced back to the inscriptions of the Indus seals. On the basis of this view he tried to identify a lot of Indus signs.

Supporting Rao's methodology P.N.Mathur[27] tried to

read a few names of early Surya Vansha dynasty. He said that in judging concordance of the names, people should allow for the variations that are natural in view of Sanskritisation of the pre-Vedic Prakrit of that time. Ramesh Jain and C.B.Tribedi have assumed that the Indus Script was phonetic in nature and followed a particular language i.e. the ancient Indo-Iranian language[28].

Some scholars have recently pointed out the need for a constructive methodology. Several of the major attempts to read the inscriptions have been made by groups of scholars, using a variety of techniques, including computers. A. Parpola[29] and his colleagues, at the Scandinivian Institute of Asian Studies, Copenhegen have systematically tried to analyse the signs and then put the data through a [illegible]. Similar attempt was made by Knorozov, Gurov and other Russian scholars[30]. In India Mahadevan[31] also worked in this direction. It is J. Vacek[32] who pointed out that the computer is not able to correct a wrong presumption of the programmer. The analysis of a computer might turn out to be false because of a wrong point of departure.

There were attempts to establish a connection of the Indus Script with some other known scripts of the world. Out of several attempts the most productive became the suggession that the Indus valley Script is similar to the Sumerian Script. The Scholar who made use of this approach was Henry Heras[33]. He assumed that the Indus people were Dravidians and tried to reconstruct a Proto-Dravidian language for them

and for his interpretation he compared the Indus signs with Sumerian, Hieroglyphic and Proto-Chinese symbols.

Secondly he said that the inhabitants of Mohenjo-daro could not have been the ancestors of the present Brahuis.

Thirdly Henry Heras held the view that the Indus Script was pictographic or partly pictographic and partly logo-syllabic owing to the fact that there are a large number of pictures of animate and inanimate objects in it. He also said that there are many signs which do not convey any idea to the careful observer, they almost look like alphabetic. They are signs that have a conventional phonetic value and may consequently be called phonetic and phonographic signs.

Fourthly, Heras observed that the signs of Mohenjo-daro do not stand for syllables and much less for consonant sounds only, but express full words.

He said that there may be a few mistakes in his interpretation of the inscriptions but in general his rendering of those ancient epigraphs seems to reveal the mind of those early writers.

The theory of Henry Heras created a sensation among the philologists and archaeologists although most of his readings were very unconvincing. The a priori assumptions of Heras led to absurd interpretations e.g. one seal is read, 'two blankets cold'.

The Russians and Scandinivian scholars and Mahadevan started with the presumption that the Indus language was Dravidian. B.V.Subbarayappa[34] and Subhash Kak[35] also

tried to decipher the Indus Script from different angles. Recently an attempt has been made by N. K. Verma[36]. He has compared the diagram drawn by Santhal tribals of Indus signs and read words based on Santhal's sound values. This is totally an a priori assumption which cannot be verified archaeologically, for instance, migration of Harappans to Bihar and the Santhals retaining the script unchanged for nearly 4000 years though there is no trace of the Indus Script in original form after 1200 B.C. except for some signs in Brāhmi anywhere in India. Likewise R. Madhivanan tried to read the Indus Script on the basis of etymological and grammatical principles of Tamil[36 c]. This way, any word in any language can be derived depending on some value given to pictures and cursive Indus signs. This cannot be a scientific method to decipher the language of a civilization.

An assessment of various recent models of the decipherment of Indus Script is what is needed in order to know how much progress has been made in decoding the script. If there are some hurdles, they will have to be identified. An objective examination of the more significant models is made in the following pages.

FAIRSERVIS'S MODEL:

In an attempt to derive a new model for decipherment of Harappan Script, Fairservis studied various aspects of standardization of the Harappan way of life, its cultural and socio-economic structure(37). In this regard the following points are to be noted. Standardization of goods and services by the Harappans on an unprecedented scale was highlighted earlier by S.R.Rao(38).

Fairservis assumed that the Harappan language is proto-Dravidian. He made a serious effort to simulate the Harappan civilization as a form of Dravidian. To this end he set forth some historical and archaeological evidences indicating the similarities of a number of signs in the Harappan Script and the so called Proto-Elamite, which was assumed to be ancestral to later Elamite. Recently Mac Alpin(39) has brought forth evidence that Elamite was a Dravidian language. On the basis of this theory Fairservis tried to correlate the literary languages of the Dravidians with the Harappans. According to Fairservis the Harappan Script or the literary Harappan script is the beginning of a Dravidian literary tradition, presumably reaching to pre-literary Tamil via the Chalcolithic and megalithic stages.

Basically, he tried to equate the Harappan language with different South Indian languages, for example, Tamil, Telegu, Malayalam and Kannada.

As regards the character of the script, Fairservis holds that it is either word syllabic or syllabic.

With regard to the order of writing, the legend was cut from right to left on the seal but as a sealing it was read from left to right.

In his early attempt Fairservis had not thought of analysing some compound signs, but after 1973 he started analysing a few compound signs, but not the majority of them.

Fairservis presumed the sign, '  ' to represent wheat or other crop, and that the sign, '  ' represents a hunter or an archer. In order to analyse this sign he followed partly Rao's method[24] of analysis of compound signs eg., the archer sign is assumed to be a combination of three signs but gave each one a picture value or a word value.


man


bow


arrow

He gave this sign a meaning in Dravidian. The word for bow is 'vil' and for arrow it is 'ampvi' in Tamil, Telegu, Malayalam and Kannada. Putting them together and at the same time applying the principles of vowel contraction, the word 'vilampan' is obtained, which in Malayalam is 'vilampan, means 'one who superintends the distribution. 'Vilampu' in Tamil means **'serve food'**.

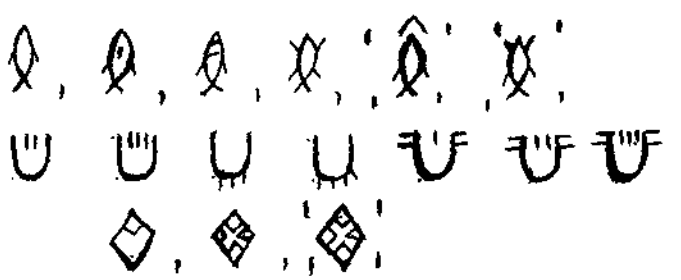
Of all the words for man and male 'al' is the only one

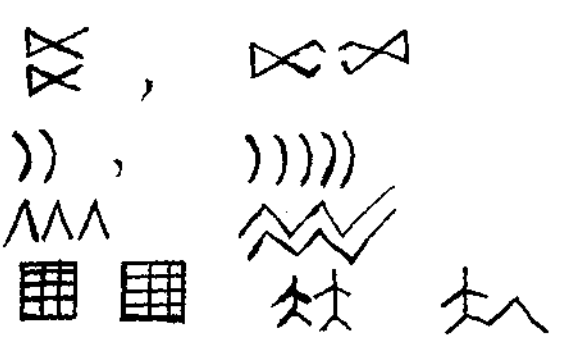
effectively shared by all the four Dravidian languages and accordingly Fairservis assigned syllabic value 'al' to the sign, '  '. He gave the syllabic value to the sign '  ' as 'val' which has a near homophone in 'valai' meaning surrounding region. He interpreted the sign '  ' as a flower and has given the syllabic value of 'pu'. The combination of the sign '  ' is read by Fairservis as 'vilampu'.

On the lines indicated by Rao in 1963, Fairservis made an effort to enumerate the various ways of the attachment of a number of strokes. According to his view, strokes were apparently arranged for style and it is therefore, possible to arrange them vertically as well as horizontaly,

e.g., 

He suggested a related technique of numeration, doubling or repeating of the signs.

Numeration : 

Repetition : 

DISCUSSION:

Thus on the basis of the assumptions that Indus people spoke a Dravidian or Proto-Dravidian Fairservis made a comparative study of various signs of the Harappan Script and gave them syllabic value to derive words of South Indian languages. This is an unwarranted assumption which vitiates objectivity on the part of the decipherer.

Another drawback in such an assumptions is that there is a long time gap between the Harappan and the earliest recorded Dravidian language in the Indian subcontinent. To fill that gap Fairservis tried to trace it to a language which had no script in the 3rd millennium B.C..

The next defect in Fairservis's methodology is the assumption that all Indus signs, simple as well as compound ones, stand for pictures from which a word or syllabic value is to be derived. Simple basic signs such as '  ', '', '', '  ', '  ', '  ' etc are phonetic signs. The basic signs are not distinguished by him from non-basic ones and the purpose of adding strokes and joining signs is not understood.

Let us examine some of the 'meanings' and syllabic values he has given to compound signs of man. While accepting the picture of **'pipal leaf'** as such he says that when it is attached to '  ' + '  ' = it indicates a female[37c]. This is a far fetched assumption because even

in Bahrain only a traingle stands for female. A more imaginative interpretation is given to '  ' as an arrow combined with **'pipal leaf'**[37c]. There is no pipal leaf design at all in it. Secondly the sign ' ' is accented thus ' ', ' ', ' '. Being a basic accented sign it must have a simple sound value suffixed when strokes are added. One more example of his own imaginary pictorial representation is ' ' which he takes for a container. It is generally accepted as a **'harp'**. Lastly ' ' is not a fish but a **'knot'** for him, which needs extraordinary stretching of imagination. He takes it as standing for **'chief pir'** and its accented forms as **'head chief' (talpir)**[37c]. Even if it represents **'chief'**, the word for **'chief'** can be found from any other language. While giving example of basic forms such as ' ', ' ', ' ', he thinks of a semantic value in a language of his choice namely Dravidian. He does not investigate why variations i.e. combinations of signs were made. He does not take even the few basic signs as having simple sound value because he thinks they are all pictures. With such assumptions the result could only be the imposition of a language of one's choice and thereby trying to adjust everything to one's preconceived notion of Harappan being Dravidian. The sign ' ' double stroke which is clearly a word separator is taken as syllabic <u>'jl'</u> (settlement) in Dravidian and ' ', ' ' as indicating different kinds of settlements[37c].

MAHADEVAN'S MODEL:

I. Mahadevan made an attempt to decipher the Indus Script on the basis of the following points.

(1) He presumed that the Indus language belongs to Dravidian family and the signs are pictographs on the basis that the signs depict men, animals, insects, birds, fish, implements, structure, vessels etc.

(2) The Indus Script is generally written from the right to the left. On the basis of the statistical evaluation he said that 83% of the lines included in the corpus run from the right and about 7% from the left. He also identified some of the bi-directional writing of identical texts.

(3) The total number of signs in the Indus Script is estimated to be around 425 + 25 = 450. He has not analysed compound signs.

(4) The Indus Script is a logo-syllabic Script possessing word-signs.

(5) He is strongly against a simple syllabic model of the Indus script and believes that it comes from word segmentation analysis. On the basis of word segmentation analysis he tried to establish the logographic character of the Indus Script and strongly denied the fact that it can be phonetic. He wanted to prove that the signs of the Indus Script are mostly word signs and cannot be regarded as

phonetic units (syllabic, alphabetic)[31]. Had he only analysed the compound signs he would have known that basic signs are too few to warrant an entirely non-phonetic writing.

(6) He considered some of the Indus signs as ideograms, eg.,


man


horned person


archer

(7) He tried to explain that the improbable pictograms like fish, birds, insects, animals etc. are most likely to be names and titles in the seal-texts and can be understood or read according to rebus writing.

(8) As regards the numeral signs he identified them by logical sequence and the use of different signs on pottery and bronze implements. He assumed that numbers precede the objects enumerated and the system appears to be decimal.

(9) He considered that the short strokes and the inverted semi-circles are used to represent the units and tens of the numerals respectively.

DISCUSSION:

He has arbitrarily assumed the language to be Dravidian. But he could not substantiate it with any authentic evaluation of the evolution of writing. On the contrary such an a priori assumption vitiates objectivity.

He tried to interpret most of the Harappan seals on the basis of his hypothesis that the entire Indus Script is pictographic. For two reasons this hypothesis is unconvincing. The cursive signs such as  ,  , , , , , etc. and some pictures eg., **'field', 'hill', 'pipal leaf', 'cross-road', 'scorpion' and 'triangle'** with horizontal lines have formed compound signs by being joined to other signs. The only pictures not joined are **'bird', and 'dog-like' animals,** the latter appearing very rarely. In an ideographic writing ideographs are never joined because each picture or sign stands for an independent idea or action. Thus what Mahadevan considered to be ideographs are mostly in fact compound signs formed by combination of different individual basic signs[24]. A few signs such as  ,  ,  may be determinatives.

Secondly, by analysing compound signs S.R.Rao[40] has demonstrated that the total number of basic signs including pictures in the Harappan Script is not 425 but only 62 which got reduced to 24 in the Late Harappan Script as a result of dropping pictures and alternate basic cursive signs.

By a permutation and combination of 34 basic cursive sign in Mature Harappan Script as many as 300 different looking signs were produced. With 62 cursive signs, including pictures the Indus Script could not have been ideographic. We shall soon have occasion to examine Rao's methodology and conclusions.

As regards Mahadevan's concept of Indus signs as word syllables it can be said that the basic signs did not stand for a word.

Mahadevan made a frequency distribution and positional analysis of the Indus signs with the help of computer[31b] but he did not attempt to analyse them at all to determine the basic signs. Moreover, as Prof. Vacek has pointed out, the computer is not able to correct a wrong presumption of the programmer resulting into a misleading analysis[32].

Mahadevan has concluded that unless a bilingual Harappan seal is found the Harappan Script cannot be deciphered. But it must be remembered that the Linear B was deciphered by M. Ventris[42] although the script and language were unknown and no bilingual seal was found.

Of late Mahadevan has given a new interpretation to the brazier motif appearing on the unicorn seals and has considered it as 'soma patra' referred to in the Rg. Veda and he thinks that it represents extraction of soma juice. If this is accepted, it amounts to saying that the Harappan were Aryans because the extraction of somarasa has only Aryan associations and not Dravidian. However, the objection to

considering the brazier as soma patra is that there is no vessel below the perforated vessel to hold the juice. On the other hand it may be the representation of Iranian fire altar (Rg. Veda).

EVALUATION OF AN APPROACH OF B. V. SUBBARAYAPPA

Dr. B. V. Subbarayappa has recently made an attempt to find a key in terms of numerals connoted by the various signs on the Indus seals, beads, amulets etc[34]. He is of the opinion that the Indus seals were mostly used for a commercial purpose and perhaps to a limited extent as amulets. In either case, the number reckoning and numeral representation would have played an important role. He has presumed that the Harappa culture, must have, of necessity, developed a viable commercial transaction and hence evolved a number system of their own, besides weights and measures. Based on these assumptions and also in comparison with the Egyptian, Sumerian, Chinese and Brāhmi numeral systems he carried out an in-depth study of various symbols or notations animals and other motifs on the Indus seals. He considered that the basic elements are the vertical rod forms and specific symbols for 4, 5, 6, 7, 8, 9, 10, 20, 30, 40 .....100 and 1000 and accordingly he worked out various derivatives of these notations.

He has derived various features of the Indus notations in terms of numerals as follows:

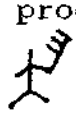
(1) To connote twice : Inclusion of the symbol, '  ' on top of the number or a repetition of the symbol concerned.

(2) Thrice : Inclusion of the symbol, '  ' on top or repetition of the symbol concerned.

(3) Four times : Sandwitching the number with four very small vertical rod forms on either side thus '  ', likewise five times and so on, by using more such rods.

(4) Horizontal cross strokes to the vertical rods (e.g. '  ') to indicate multiplication, but mere addition of strokes to the vertical rods indicates the adding up [e.g. '  ' = 11 (10+1); '  ' = 12 (10+2) etc.].

(5) Fusing or conjoining the desired notations to denote multiplied product:

e.g. '  ' = 3000, '  ' = 30,000

'  ' = 20,000, '  ' = 4 x 4 = 16

(6) Placing a notation inside another notation without any fusing to obtain the additive, e.g.

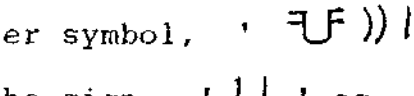
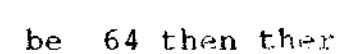
'  ' = 20 + 10 = 30

(7) Generation of derivatives by adding strokes.

(8) Addition of the values of each sign on a seal gives the total number presented.

DISCUSSION:

Subbarayappa tried to look at the various signs and symbols of the Indus seals from a different angle and assumed them as numerals only. He considered each and every stroke whether short or long as the notation for addition or multiplication ignoring the possibility of being the accenting signs for the phonetics of the signs.

But from a careful analysis of some of the numerical values assigned to the Indus signs by him (Fig. 4 & 5) it becomes clear that such an arbitrary assumption leads us in a wrong direction. As for example, the given numerical value of the sign, '  ' is 64 whereas the same value was calculated for another symbol, '  ', assuming the value of the sign. '  ' as 20, '  ' = 41, '  ' = 3. '' as 10 + 10 and '' as 40. Now the point to be noted here is that if the value of the sign, '  ' is evaluated to be 64 then there is no reason to consider another symbol equivalent to 64, leading to contradictory result.

Another drawback of his approach is that he assigned a value of 10 to all the following signs, '  ', '  ', '  ', '' ''  '  '. But it is inconceivable that the same value is carried by several different signs. Such an important point has not been clarified by him. In fact, each of these signs should be given different values.

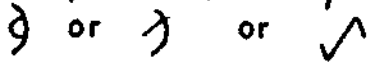
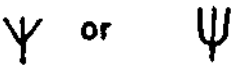
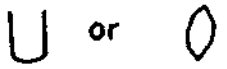
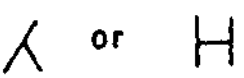
Basic numerical forms on the Indus seals	
Basic forms	Numerical values
Countable rods	1 to 12
forms	
	4
	5
	6
	7
	8
	9
	10
	20
	100
	1000

FIG. 4

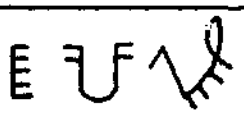
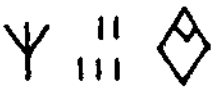
Illustration of the Numerical values derived by Subbarayappa		
Symbols	Numerical value	Total
	64 + 40+ 15	119
	(4x2) + 5 +9	22
	10 +11 + (4x4) +40	77
	20+ 41+3+10+ 10+40	124

FIG. 5

He gave the value of 1000 to the sign, '  ' in comparison with the Chinese sign, '  ' and the Brāhmi numeral, '  '. He presumed that the Chinese sign '' is somewhat similar to the Indus sign, '' being simplified further in the Brāhmi Script representing a value of 1000. But all these three signs are not alike so the assumption does not stand to reason.

Another drawback in his assumption that even pictures of **'Scorpion', 'pipal leaf', 'man' and 'fish'** indicate numbers, as if the Indus language had no words at all and was only a language of numbers. If all the signs stand for numerals or quantities what objects were quantified is not known. For example ten measures of grain or bundles of cloths or five numbers of copper ingots or ten minas of other metal, at least names of objects quantified must be mentioned.

Lastly even in Brāhmi Script the numbers 20 etc., are represented by alphabetic signs which had a sound value. Hence in comparing Indus signs with Brāhmi signs for numerals he should give the alphabet for which the sign stood in Indus Script. Ultimately it will lead to the inevitable conclusion that a large number of Indus signs had phonetic value.

EVALUATION OF AN APPROACH OF SUBHASH KAK

Subhash Kak made a statistical analysis of various signs of Indus Script and determined the frequencies of the most commonly used Indus signs[35]. He carried out frequency distribution analysis in comparison with the frequency of different sounds of the Sanskrit alphabet and also with those of Brāhmi Script. He considered that some of the signs of the Brāhmi Script are morphologically related to those of Indus Script. In his view each consonant of Brāhmi Script was assumed to have a sign in Indus Script and the vowels were represented by ligatures on the consonants. He compared the decreasing frequency of the most commonly used Indus signs with those of Brāhmi Script and Sanskrit consonants and indicated that the most likely 10 consonants of Indus Script are in the following order of decreasing frequency:

t, r, v, n, m, y, s, d, p, k

Thus he arrived at the conclusion that the frequency of each one of these consonants is greater than 1.99% and the next most frequent sounds are ś and s with frequencies of 1.57 and 1.45 respectively. He emphasized that there are ample similarities between the Brāhmi Script and the Indus Script and regarded that the Brāhmi letters are derived from the Indus signs and the language is Indo-Aryan.

With this view in mind he tried to evaluate different

signs of the Indus Script following the methodology adopted by Hunter[7], Parpola[29] and Mitchiner[19]. He presumed that the language of Indus people was Indo-Aryan rather than Dravidian as suggested by Mahadevan[31] and many other scholars. Although he had gone a step ahead of Hunter & Mitchiner he could not throw any light in regard to the identification of the basic signs of the Indus Script and their phonetization without which the decipherment will remain incomplete and methodology unconvincing.

There are a number of discrepancies present in his methodology of assigning the values to each of the Indus signs. From a careful examination of the signs (Fig. 6), it is clear that he has compared some of the Brāhmi signs e.g. ' ', '  ' and ' ' with the Indus signs, ' ', ' ' and '  ' which do not correspond with Brāhmi signs. He would have been justified if he had compared the sign, ' ' of Brāhmi script with a slightly similar sign, '  ' already present in the Indus script.

Secondly, he has assigned some value to the Indus sign, '  ' as 'v ' in comparison with the sign, '  ' which is not correct, for, the sign for 'va' in Brāhmi is '  '. Thirdly, the comparison between the pair of signs, '  ' and '  ', '  ' and '  ' are not justified at all owing to the fact that they do not seem to be similar and the values assigned to them are not acceptable.

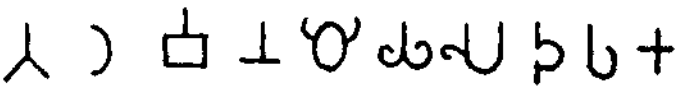
The ten most frequent Consonants in frequency										
Sanskrit consonants (decreasing frequency)	t	r	v	n	m	y	s	d	p	k
Brāhmi										
Indus										

FIG. 6

Apart from these points of discrepancies, he has wrongly assigned a value to the Indus sign, '  ' as 'ś' in comparison with that of a sign, '' of Brāhmi Script. Perhaps he has followed Lal[41] and Mitchiner[19] who considered '' as a jar 'sata' in Rg. Veda and from 'Sata' he derived 'sa'. The objection is that no such 'handled jar' is ever found in any Harappan site. If however he took it as indicative of genitive case since it is a suffix then, also difficulty arises where it is followed by '  '.

Another point of drawback is the evaluation of the Indus sign, '  ' in comparison with the sign, '' of the Brāhmi Script. Both of them are quite different from each other and there is already a sign, '' in the Indus Script. So the value assigned to both of these signs cannot be same.

In regard to the Harappan language Subhash Kak partly followed Rao's methodology[24] by accepting the basic signs arrived at by Rao and addition of strokes as vocalic indicators. Though as many as 12 basic consonantal signs of Brāhmi bear close resemblance to those of the Late Harappan Script[7] Rao did not derive the phonetic value of Indus signs from a few corresponding Brāhmi signs because there is a large time gap between the Indus and Brāhmi Scripts. Secondly Brāhmi seems to have dropped some Indus and added some for retroflexes which did not exist in Indus. Lastly the presence of 3 laryngeal signs in Indus cannot be explained with reference to Brāhmi. However, in view of an inscription of the Late Harappan- Brāhmi phase of writing from Bet Dwarkā

Rao thinks Brāhmi is largely based on Indus alphabetic system which has been modified by the forms to a some extent. Subhash Kak also tried to compare 10 consonant Indus signs with Brāhmi signs. But he has assigned different phonetic values to those signs. Lastly instead of assuming the Indus language to be Sanskrit he should have derived the language on the basis of the phonetic value of Brāhmi signs strictly recombining Indus signs.

EVALUATION OF AN APPROACH OF ASKO PARPOLA

Finish scholar, Asko Parpola and his associates held the view that the Indus Civilization was pre and non-Aryan[29]. They have carried out a positional study of the symbols of the Indus seals and elucidated that some of these namely, '  ' and '  ' tend to occur at the end (Fig. 7) to represent respectively the genitive and dative case-suffixes. But they did not explain the purpose of different signs inscribed on pots, bronze, axes etc.

It is quite likely that the inscriptions on the Indus seals, pottery etc. bear names of persons, may be along with their attributes such as profession etc. Some of the seals were actually used for sealing packages as is evident from the discovery of number of seals and sealings from the Lothal[38].

Parpola and others tried to emphasize that most of the Indus inscriptions have a genitive ending. They have given a value of a genitive suffix to the U like symbol representing a ship as '<u>ota</u>' in the Dravidian language. Applying the principle of homophony they said that the symbol represent a similar sound namely, '<u>otu</u> - <u>otu</u>', the modern comitative suffix. This would have been a reasonable proposition had there been a good case for identifying the 'U' like symbols with a ship in Indus seals, which is not the case.

But some of the old Tamil and Prakrit inscriptions on

the pottery found at Arikamedu near Pondicherry represent the names of the individuals concerned and have a nominative ending and not the genitive one. In fact, it is only the Prakrit inscription which has a genitive ending, the reading being '**ya, kha, mi, ta, sa**' i.e. of '**ya**', '**kha**', '**mi**', '**ta**', (Sanskrit Yaksamitra).

In support of their hypothesis Asko Parpola compared **'Sumerian parallel'** (Fig. 8) to a socalled **'Indian parallel'** (Fig. 9) which occurs on a pot found at Harappa but does not belong to the Indus Civilization, on the contrary to the succeeding **Cemetery H Culture.** However, there is time lag between the two cultures and the Cemetery H symbol has very little in common with a ship.

Parpola regarded the symbol '  ' and '  ' as representing the masculine and faminine genders respectively on the basis of some resemblance found in the Dravidian language. In Dravidian the word for comb namely, 'Pentike' is not much different in sound (Principle of homophony) from pen the word for ,

As regards the numeral system of the Indus language Parpola et al affirmed that it possesses the same octonary system as used in Dravidian, although a change is being noticed at the number 8 (Fig. 10). In fact, besides 8, 9, and 10 shown in the table itself, other numbers including 12 also occur. Thus the idea of octonary system has become

meaningless.

An overall assessment of Parpola's hypothesis about the Indus language, states that it did not contribute much in regard to decipherment.

CONCLUSION:

The position as obtaining now thus shows that all the claims of decipherment are invalid.

However, the work done by various scholars has to an extent helped in understanding the nature of the script and its mechanics.

Some Harappan Symbols

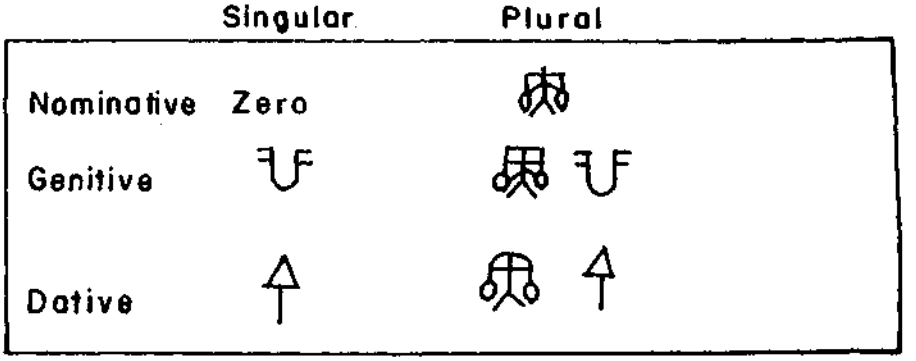


FIG. 7

Sumerian Symbols

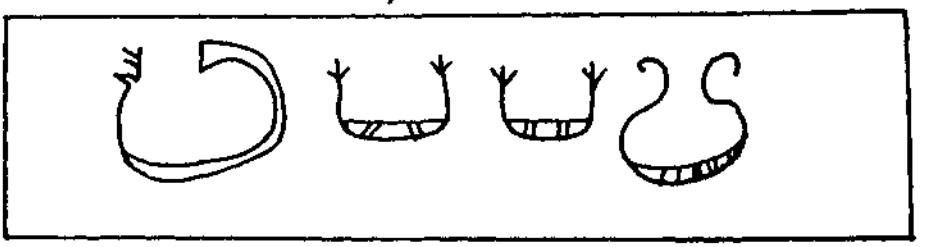


FIG. 8

Painted symbol on an earthen pot from cemetery 'H'

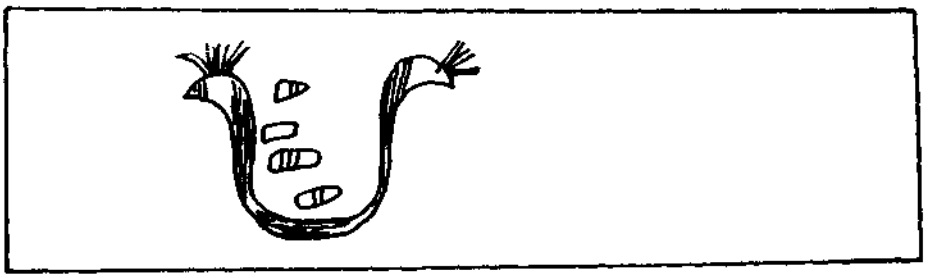


FIG. 9

Chart showing numerals

Numeral	Signs in one row	Sign in two rows	Numeral	Signs in one row	Signs in two rows
1			6		
2		numeral	7		
3		numeral	8		
4		numeral	9		
5			10		

FIG. 10

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CHAPTER - IV

AN ASSESSMENT OF THE METHODOLOGY FOLLOWED BY S. R. RAO

AN ASSESSMENT OF THE METHODOLOGY FOLLOWED BY S. R. RAO

INTRODUCTION

The problem of deciphering the Indus Script has engaged the concerted efforts of scholars for the past fifty or more years. One of the difficulties that has continually impeded the decipherment of the Indus Script is the determination of the exact number of its symbols while most scholars have considered Indus Script as static all through. For the first time it is S.R.Rao[1] who pointed out that the Indus Script passed through several stages of development, the number of signs being much reduced in the latest phases, as exemplified particularly by late seals from Mohenjo-daro[2], Harappa[3], Lothal-B[4], Rangpur[5], Dholavira[6a,b], Jajjhar[6c], Alamgirpur[6d], Rakhishahpur[6e], Daimabad[7], Surkotada[8] and Rojdi[9] (Fig. 11 -14). The excavations at Lothal from 1955 to 1962 have revealed that the Indus Civilization did not die a sudden death in 1900 B.C., but survived for nearly 300 years more in Gujarat than in the Indus Valley. The Harappans at Lothal continued to use the simplified writing, so much so that it is now possible to trace the evolution of the Indus Script from a sophisticated picture-cum-cursive system of the early days (2500-1900 B.C) to the purely cursive system in the Late phase (1900-1600 B.C.)[2] (Fig. 15-16).

Inscriptions of (Late Levels)

Harappa[2]

Mohenjo - daro[2]

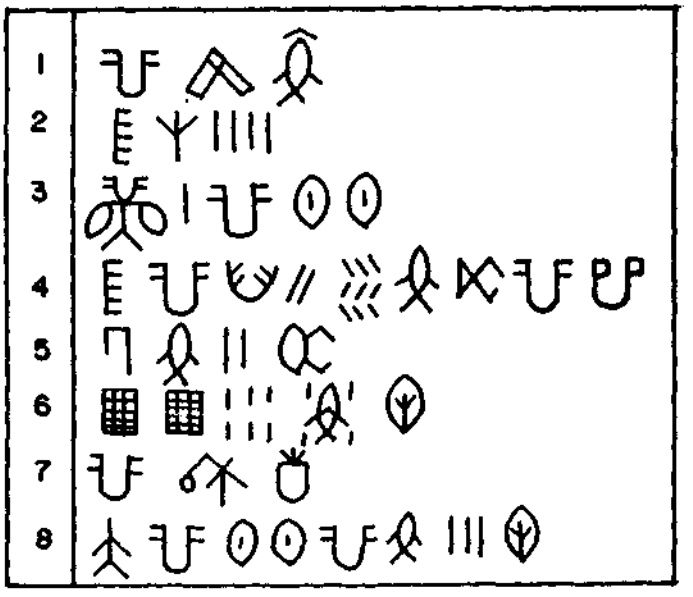
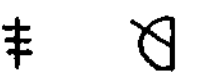
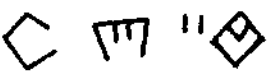
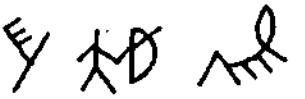
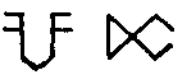


FIG. 11

Inscriptions of Late levels

Lothal

No.	Inscription
1	
2	
3	
4	
5	
6	
7	
8	

Jajjhar

Rangpur IIc–III

Rojdi

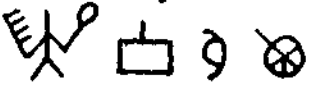
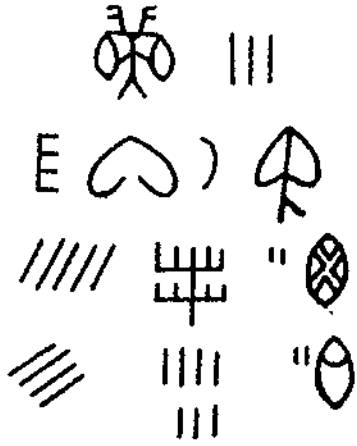


FIG. 12

Inscription of Late levels

Dholavira Late levels



Rakhi - Shahpur (Jajjhar)

Kalibangan

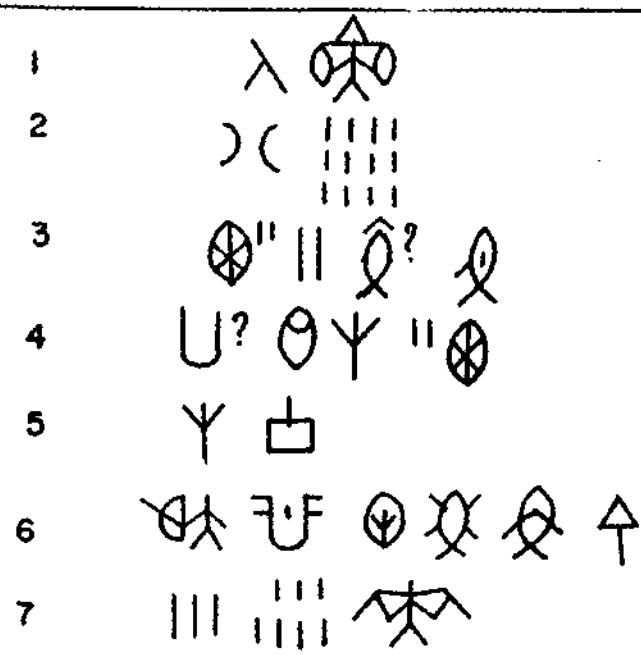


FIG. 13

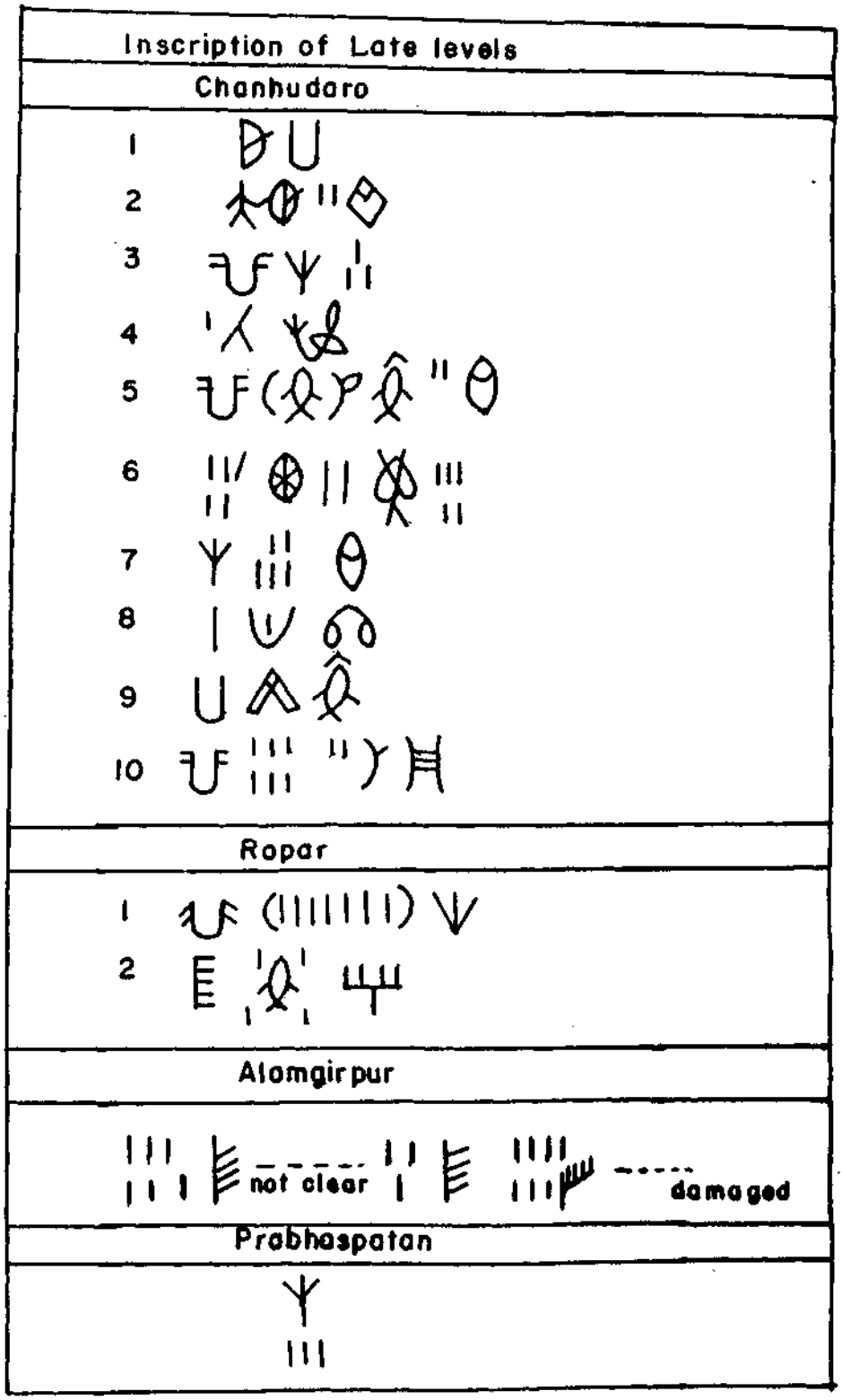

Inscription of Late levels
Chanhudaro
1
2
3
4
5
6
7
8
9
10
Ropar
1
2
Alamgirpur
not clear
damaged
Prabhaspatan

FIG. 14

Inscriptions with pictures

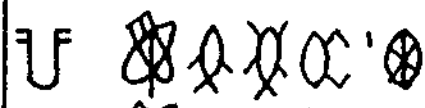
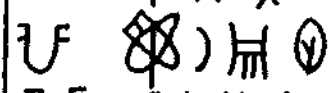
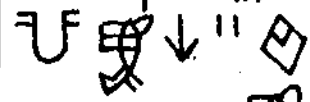
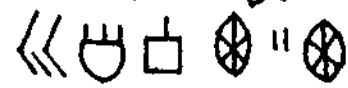
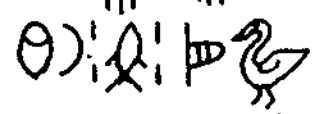
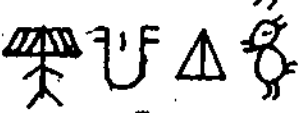
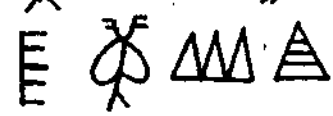
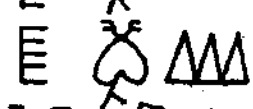
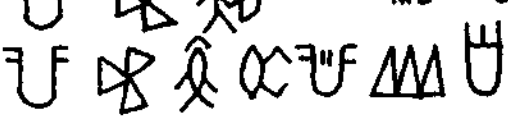
No.	Inscription	Site	Plate	No	Source
1		HP	LXXXVI	16	Vats
2		MD	CVIII	161	Marshall
3		MD	CVIII	181	Marshall
4		MD	CIII	13	Marshall
5		HP	LXXXVIII	97	Vats
6		MD	CV	69	Marshall
7		HP	LXXXIX	120	Vats
8		HP	XCII	284	Vats
9		MD	CVI	83	Marshall
10		MD	CIV	36	Marshall
11		MD	CVIII	182	Marshall
12		MD	CVIII	143	Marshall
13		MD	CVIII	163	Marshall
14		MD	CXIII	417	Marshall
15		MD	CXIII	420	Marshall

FIG. 15

Inscriptions with cursive signs only

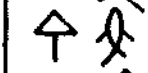
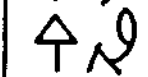
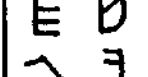
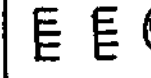
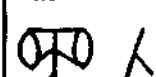
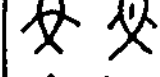
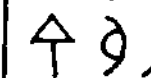
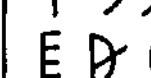
No.		Site	Plate	No	Source
1		HP	LXXXIX	155	Vats
2		HP	LXXXVI	31	Vats
3		HP	LXXXIX	149	Vats
4		HP	LXXXIX	129	Vats
5		HP	XCIV	646	Vats
6		HP	XCV	422	Vats
7		MD	CIX	195	Marshall
8		MD	CXIII	409	Marshall
9		HP	XCV	379	Vats
10		MD	CIX	204	Marshall
11		MD	CVII	127	Marshall
12		MD	CXIII	455	Marshall
13		MD	CVIII	176	Marshall
14		HP	XCV	422	Vats
15		HP	LXXXIX	161	Vats
16		HP	LXXXIX	149	Vats
17		HP	LXXXIX	113	Vats
18		Lothal	CXXV	12	S. R. Rao
19		Lothal	CXXV	2	S .R. Rao

FIG. 16

This cursive writing noticeable in Late Mohenjo-daro[2] and Harappa levels also continued to be in use at Surkotada[8], Dholavira[6a,b], Rangpur[5] (Gujarat) upto 1500 B.C. and Daimabad[7] (Maharastra) and even later at Bet Dwarkā[10].

It is Dr.S.R.Rao who carried out an extensive study on the decipherment of Indus Script. An exclusive evaluation has been made to assess his contribution in regard to decoding of the Indus Script.

S.R.Rao has demonstrated convincingly that the decipherment of an unknown script such as the Indus Valley script written in an unknown language is not possible unless the stage of development of the writing itself is determined. This is possible only when the number of basic signs in the script is determined by a careful analysis of the compound signs. He has also pointed out that an a priori assumption of language misleads the dicipherer. Rao has further highlighted the drawback of assuming pseudo-pictures as words in the assumed language. The necessity of analysing them is stressed by him for finding basic signs. It is the number of basic signs which determines whether the script is pictographic, logographic or phonetic.

Pictographic and Ideographic scripts have thousands of signs, while logographs like the Egyptian, Sumerian and Hittite scripts have signs ranging from 700 to 450. Phonetic scripts have 100-150 signs, (e.g. Sumerian) or even less, (e.g. Hittite syllabic writing). All signs in the Indus

Script cannot be considered as basic signs for many have additional strokes or diacritics attached to them and hundreds of signs are compound signs. In these circumstances it was felt necessary to carry out the structural analysis of compound signs, so as to arrive at the correct number of basic signs in the Indus Script.

An important point brought out by S.R. Rao is that the Indus, Brāhmi and Devnāgari Scripts have certain common features such as the doubling of signs, (e.g. p + p = pp) attaching strokes (diacritics) to basic signs and joining of two or more signs to form conjunct consonants (Samyukta Aksharas) (e.g. pta, tra, dra, pṛ etc.). The diacritics were used as vocalic indicators in Brāhmi (k + a = ka, k + ae = kae etc.). These two techniques originated in Indus writing. The Indus compound signs, formed by joining two or more basic signs look like pictures and are given word value by Soviet[11], Finnish[12] and other scholars. In fact, S.R. Rao assumed that the majority of the signs in the inscriptions are modifications of the basic signs made by adding short strokes (Fig. 17) and by doubling the same sign or compounding two or more signs with or without the appendage of these strokes (Fig. 18). These processes of modification of the basic signs are essentially like those found in Asokān Brāhmi (Fig. 19) and Kharoshthi inscriptions and inherited by all the later derivative Indic writing systems[13].

By separating the simple signs from those with strokes attached (Fig. 20) and by a careful analysis of pseudo

pictures such as 'archer', 'porter' etc. S.R. Rao concluded that the number of basic signs in Indus Script is not 400 as presumed by most other scholars but only 62 in Early Harappan Script and 24 in Late Harappan (Fig. 21). He has listed 40 cursive signs and 12 pictograms in Early Harappan Script (2500 - 1900 B.C) and 22 cursive in Late Harappan Script which had dropped pictures and some alternate cursive signs also. With such a small number of basic signs the script cannot be pictographic, ideographic or logographic but it has to be classified as phonetic, partly syllabic and partly alphabetic[14]. There appear to be a few determinatives in addition to 40 cursive signs and 12 pictograms in the Early Harappan writing. The linear signs stand for cardinal numbers.

In assigning phonetic values to the twenty basic signs of the Late Harappan Script, S.R. Rao is guided by the more or less contemporary consonantal Semitic Script of the Lachish and Ahiram inscriptions (1600 - 1300 B.C.), 17 of whose signs are shown to bear remarkably close resemblance to those of Late Harappan.

In comparing similar signs of two distinct scripts one must be careful to make sure that they are contemporary or almost contemporary as in the case of Late Harappan and Semitic scripts. Some signs in any two ancient or even modern scripts are likely to bear resemblance but this should not lead the decipherer to assign the phonetic value of the signs in a late or recent script to similar Indus signs if there is

a gap of a thousand years or more. This is the reason why Rao did not take phonetic value of Brāhmi signs into account in the beginning for decipherment. On the other hand he confined himself to the 18th -16th century B.C. Semitic writing for comparison with Late Harappan Script. Here the term Late Harappan is used for the declining phase of Mature Harappa culture dated 1900-1600 B.C.

The inscriptions of Tell-el-Hesy (1600 B.C.), Lachish (1250 B.C.) and Deir Alla (1500-1200 B.C.) in Jerusalem-Palestine-Sinai Peninsula are contemporary with those of Lothal[4], Rangpur[5] IIB-C (1900-1600 B.C.), Rojdi[9] (1900-1600 B.C), and Daimabad (1600-1200 B.C.)[7]. Lately he has taken the Late Mohenjo-daro and Harappa Script of 1900-1750 B.C. also into account. Among the western Semites, the Cananaites and Phoenicians had trade contacts with India even before 14th century B.C. either directly or through the south Arabian people who also used a Semitic Script. In Bahrain all the eight seals of early levels carry Indus cursive signs and Cuneiform Script appeared later here. The Late Harappan Pottery (LHP) and Script are also found in the 16th century B.C. levels of Bahrain. The Kassites and Phoenicians met the Late Harappans in Bahrain. By 19th century B.C. the LHP writing had already become a cursive alphabetic script in Mohenjo-daro and Lothal and the Semites seem to have borrowed signs from LHP. The LHP sign for 'm' is analogous to the sign for this sound in south Semitic which has at least 13 more signs resembling LHP signs (Fig. 22). All the LHP cursive

signs occur with or without pictograms in the Harappan (HP) script also. Both the Semitic and Indus Script are written from right to left. The inscription on seals is in the negetive and it is the mirror impression (positive) that should be read from right to left. In very rare instances the Indus writing seems to be from left to right. It is reasonable to infer from the identity of more than 70% of the Semitic cursive signs with 75% of the basic cursive signs of the Indus writing that the analogous signs in the two scripts had the same phonetic value.

Thus on the basis of such resemblance between the two contemporary scripts S. R. Rao has made a thorough investigation to determine the phonetics of various signs of the Indus Script. The language of 137 Indus inscriptions read in the first stage is found to belong to the Indo-European family. In Vocabulary, Semantics and gramatical features, it shows close affinity to Old-Indo-Aryan (OIA). Other words which are not readily recognizable as Indo-Aryan, are not interpreted as such. Some of the words are monosyllabic roots, used as nouns or adjectives. Many of them were in fairly common use in the Rg. Veda.

After reading Indus inscriptions in which signs identical with Semitic signs occur, other inscriptions involving the use of non-Semitic signs of **'man' and 'fish'** are read. Both the signs are fully accented and used phonetically. As the Indus language is found to be akin to OIA, the **'fish' and 'man'** signs are given the value **'ś'**

derived from 'śakula' or 'śafari' a variety of fish and 'ṛ' derived from 'nṛ' for man respectively. Rao himself has pointed out that a few signs were used as ideographs for instance, the **'cross-road'** sign and **'triangle'** with horizontal lines.

The cursive signs are accented and joined to form compound signs, (Fig. 20), so also some pictures e.g. **'field', 'hill', 'pipal leaf', 'cross-road', 'scorpion' and 'triangle' with horizontal lines.**

They form compound signs. The only pictures not joined are the bird and dog-like animal, the latter appearing very rarely. In an ideographic writing the ideographs are never joined because each picture or sign stands for an independent idea or action. The analysis of compound signs shows that the total number of basic signs including pictures in the Harappan Script is 62 which got reduced to 22 in the Late Harappan Script as a result of dropping pictures and alternate basic cursive signs. With such a limited number of basic signs, the Indus Script could not have been ideographic.

A number of pictorial signs regarded as depicting the **'pipal leaf', 'scorpion', 'bird', 'field', 'insect', 'hand', 'hill' and 'horn'** are treated as phonograms and on the basis of the initial syllables of the OIA words for these pictures. From the words Aśvattha, Vṛścika, Śakunta, Kṣetra, makṣa etc. the first syllable of the word namely aśv, vṛś, ś'ak and kṣa/kṣe is taken for respective pictograms.

Another important point for consideration is whether all the Indus signs stood for words. In most instances the basic sign did not stand for a word but sometimes the accented form of a solo sign e.g. ra, da, pa, ha, sa and compound signs which were open or closed syllables stood for word. For instance, ppra, pah, pak/ppaka, gṛ, tṛ/tra, bhag, mhah, śah, ppat/pata and śās/sāś are all compound signs each of which conveyed the full sense of the words **'great', 'protect', 'guard'/'guardian', 'sing', 'save'/'saviour', 'bountiful', 'great', 'victorious', 'govern', and 'rule'** respectively. Fundamentally each cursive basic sign had a single phonetic value and it is only the combination of signs looking like pictures which produced a word or syllable. It is only the sounds k, p, b, t, and d had two signs each in early stage. The evolution from a partly logosyllabic through syllabic into an alphabetic system is fairly clear from the chronologically arranged seals of Lothal and those from the latest levels of Mohenjo-daro and Dholavira.

Rao has given 120 examples of nominal compounds in Indus seal inscriptions and listed 70 verbal bases which bear ample testimony to the Indus language being closely related in Semantic, vocabulary and etymology to old Indo-Aryan. He has demonstrated that it was an inflexional language. The Indus Script represents a pre-separation phase of the Indo-European language, which Rao calls Proto-Indo-Aryan.

Moreover, an eminent epigraphist, Maurer[15] who reviewed 'Decipherment of Indus Script' says " the

decipherment of an unknown script, the enciphered language of which cannot be ascertained beforehand is intrinsically bound to be a controversial matter because, so many attempts by scholars of highest repute have gone before. But on the basis of Rao's methodology it can be said that he has approached the difficult problem with praiseworthy impartiality as to the enciphered language and its implications to the historians ".

ANALYSIS OF COMPOUND SIGNS

Dr. S.R. Rao has analysed most of the compound signs of the Indus Script by adopting the following techniques only:

(a) Short strokes were added to basic signs
(b) The same basic sign was doubled to form a compound sign
(c) Short strokes were added to the doubled signs also
(d) Two and occasionally three different basic signs were joined to form compound signs
(e) Short strokes were added to the compound signs
(f) While combining three different basic signs one of them was doubled.

It has been found that altogether 20 basic signs are being involved in the addition of short strokes attached to them (Fig. 17).

Fig. 23 shows how some basic signs are doubled to form compound signs. It has clearly indicated here that only two basic signs have been doubled to form four different compound signs.

The analysis of compound signs (Fig. 24) shows that short strokes are added to the compound signs formed by combination of either two identical or different basic cursive signs.

It has been found that there are a number of compound signs which are formed by joining two different basic signs but without attaching short strokes. Fig. 18 clearly illustrates the formation of such compound signs. It includes 13 basic signs which are involved in the formation of only 11 compound signs.

Sometimes short strokes are added to the compound signs formed by combination of two or three different basic signs as revealed in Fig. 20. It shows the addition of short strokes to such compound signs that are formed in different ways involving 16 basic signs.

Apart from these, it has been observed that there are a number of compound signs formed by joining three, or occasionally four, basic signs, one of which was doubled as illustrated from the Fig. 25. It clearly points out that 14 different basic signs are involved in such combinations.

The most stricking point to be noted is that all the individual cursive signs which are combined to form different compound signs, occur independently so many times in the same or different inscriptions. Comprehensive charts with regard to the use of the individual basic sign in the formation of various compound signs are given to substantiate the identity of such signs.

Short strokes are added to the basic signs

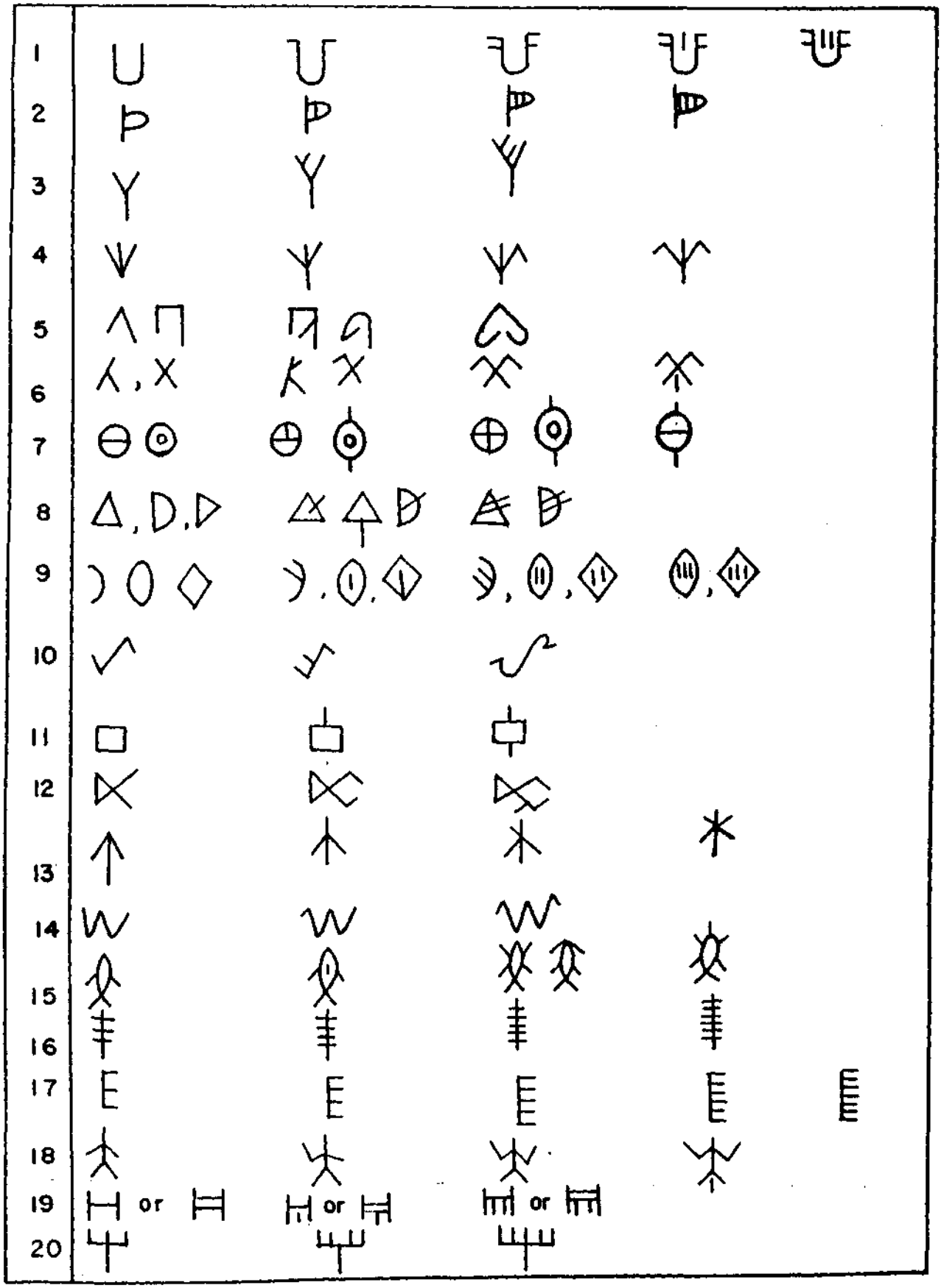


FIG. 17

The compound signs formed by joining two different basic signs.

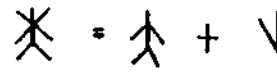
No.	Compound sign Analysis	No.	Compound sign Analysis
1		7	
2		8	
3		9	
4		10	
5		11	
6			

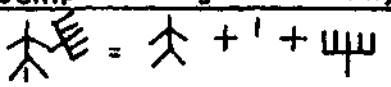
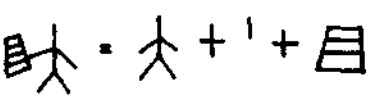
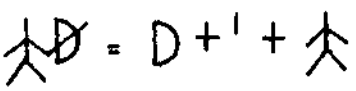
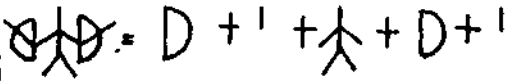
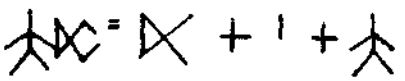
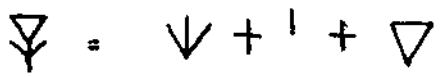
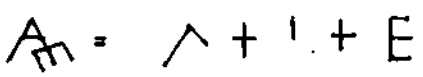
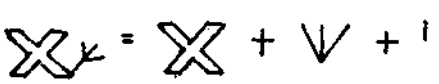
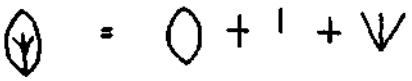
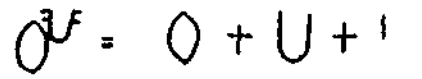
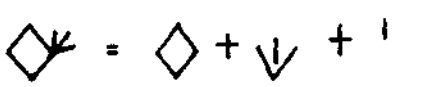
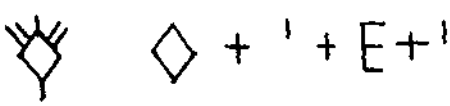
FIG. 18

Late Harappan and Aśokan Brāhmi Script

No.	Late Harappan (1900-1500 B.C.)	Aśokan Brāhmi (3rd Century B.C.)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

FIG. 19

Analysis of the compound signs in which short strokes are being added.

No.	Compound sign	Analysis
1		= + ' +
2		= + ' +
3		= D + ' +
4		= D + ' + + D + '
5		= + ' +
6		= + ' +
7		= + ' + E
8		= + + '
9		= + ' +
10		= + U + '
11		= + + '
12		+ ' + E + '

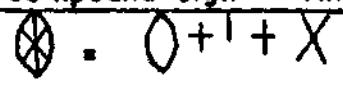
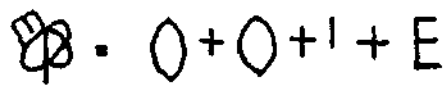
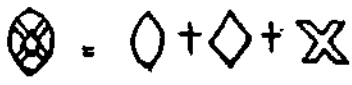
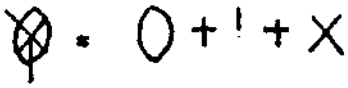
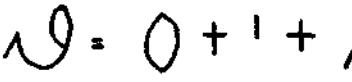
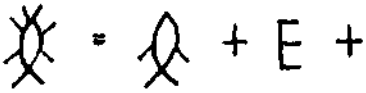
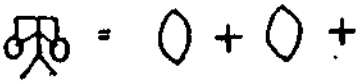
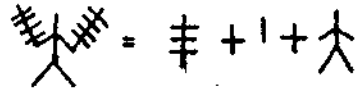
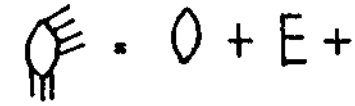
No.	Compound sign	Analysis
13		= + ' +
14		= + + ' + E
15		= + +
16		= + ' + + '
17		= + ' +
18		= + E + ' + '
19		= D + E + '
20		= + E + '
21		= + + + '
22		= + ' + + ' + + '
23		= + E + ' + E

FIG. 20

Basic Cursive Signs of Indus Script identified by S.R. Rao

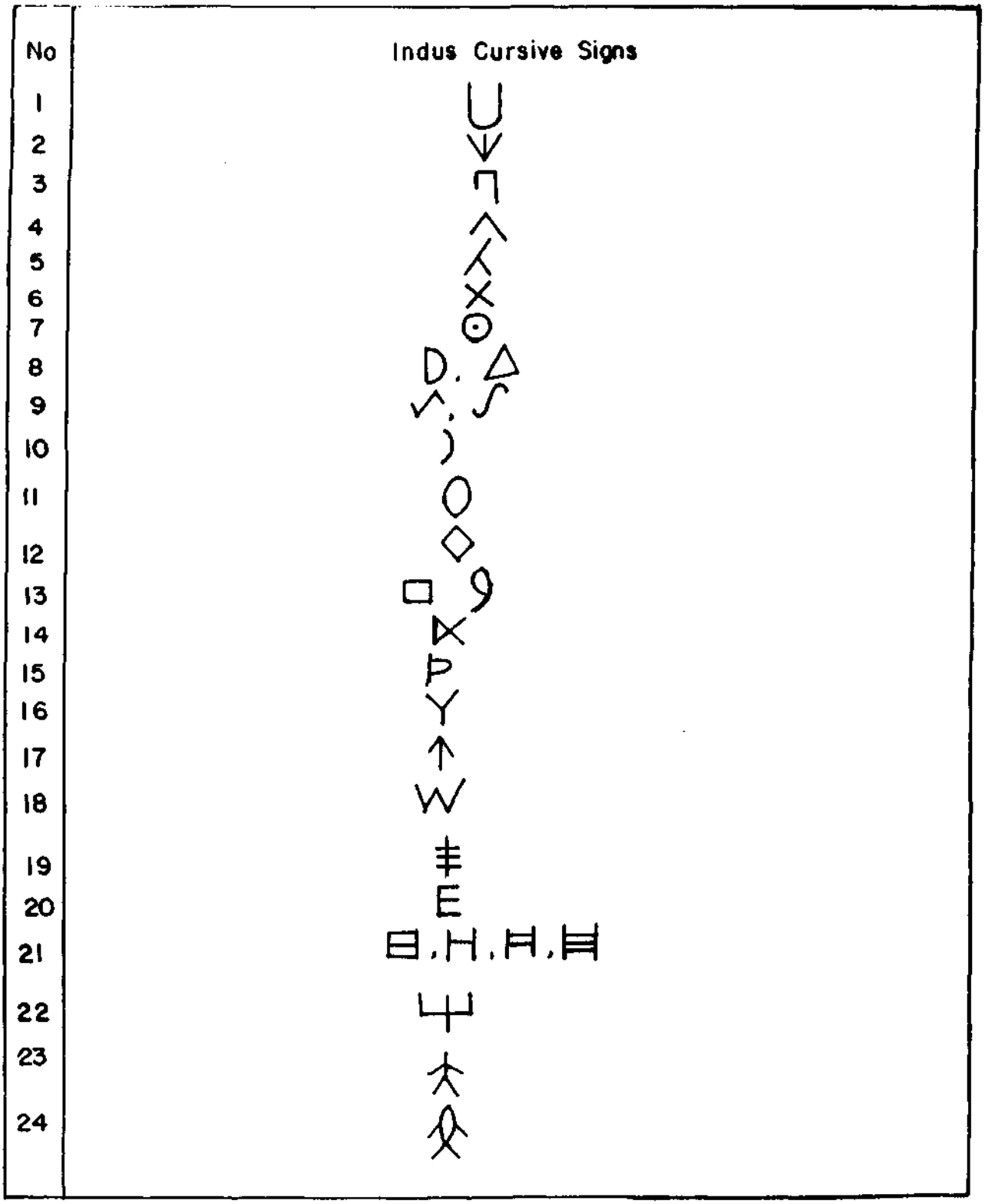


FIG. 21

Comparison of the Signs, Semitic, Early Harappan and Late Harappan

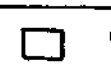
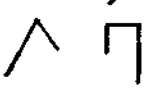
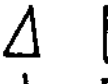
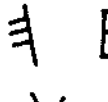
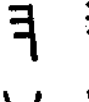
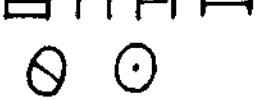
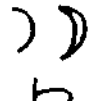
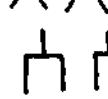
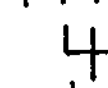
No.	Early Harappan sign	Late Harappan sign	Old North Semitic
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			

FIG. 22

The same basic sign is doubled to form a compound sign.

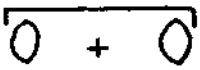
No.	Compound sign	Analysis
1		
2		
3		
4		

FIG .23

Short strokes are added to the doubled sign

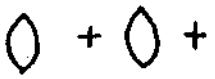
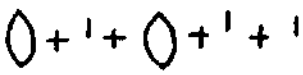
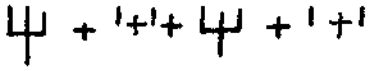
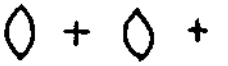
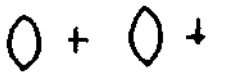
No.	Compound sign	Analysis
1		
2		
3		
4		
5		
6		
7		

FIG. 24

Analysis of the compound signs formed by joining three different basic signs of the Indus Script, one of which being doubled.

No.	Compound sign	Analysis	Double sign (basic)
1		= ○ + ○ + 人	(○)
2		= 𐌃 + 人 + 𐌃	(D)
3		= ○ + ı + ○ + 人	(○)
4		= ≡ 人 + ≡	(≡)
5		= ⩛ + ∪ + ⩛	(⩛)
6		= ○ + ∪ + ○	(○)
7		= ○ + ○ + ∪ + ⩛	(○)
8		= ○ + ○ + 目	(○)
9		= ○ + ○ + E	(○)
10		= ○ + ○ + λ	(○)
11		= □ + E + E	(E)
12		= ⋉ + E + E	(E)
13		= ⩛ + ⩛ + ∪ + X	(⩛)
14		= ○ + ○ + ∪ + Y	(○)
15		= ○ + E + E	(E)
16		= ◇ + V + E + E	(E)
17		= ○ + ○ + ı + E	(○)
18		= 目 + ∪ + 目	(目)

FIG. 25

The analysis of the compound signs clearly shows the process of their formation by the combination of different basic signs:

Fig. 26 illustrates the use of the sign, '  ' with different basic cursive signs of the Indus Script to form about 11 different compound signs.

Similarly is the case with the sign, '  ' which has been joined with six different cursive signs to form as many as 9 different compound signs (Fig. 27).

The most commonly used **'man'** sign, '  ' of the Indus Script is found to combine with ten different cursive signs in such a way that 21 different compound signs have been formed (Fig. 28).

A very frequently used Indus sign, '  ' has also been found to combine with three different cursive signs in such a way that it produces six different compound signs (Fig. 29).

One of the most important Indus signs is the sign, '  ' which has been found to occur independently in many inscriptions as well as in the combined form with different cursive signs. Fig. 30 has clearly illustrated the formation of as many as 18 different compound signs by joining with this '  ' sign.

Another important basic sign, '' of the Indus Script has been used, although not very frequently, to form quite a number of compound signs by joining with five different cursive signs as ascertained from the analysis of such

compound signs (Fig. 31).

Another most frequently used Indus sign, '  ' has been identified by the analysis of a number of compound signs formed by the combination of the sign, '  ' and different other cursive signs. Fig. 32 clearly illustrates the formation of 18 such compound signs in combination with this sign.

It is intersting to find here that the most controversial **'fish'** sign '  ' of the Indus Script has been found to occur independently as well as combinedly with other cursive signs. A few of such compound signs have been analysed in Fig. 33.

The analysis of certain pictures and pseudo pictures such as '  ', '' of the Indus Script has indicated that they do not really seem to be the picture of something or the other but compound signs are formed by joining the symbol, '  ' and '  ' as illustrated in Fig. 34.

It is clear from the Fig. 35 that the sign, '  ' has been combined with three different cursive signs to form three different compound signs.

Similarly, it has been illustrated in Fig. 36 that the sign, '  ' has not only been found to occur independently in an inscription but also combined with different cursive signs to form several compound signs.

The various processes of combinations of the cursive sign, '  ' with other cursive signs, have been shown in Fig. 37. It shows how this sign has been combined with five

different cursive signs to form five different compound signs.

The analysis of the compound signs has revealed that although there is only a few compound signs formed by joining the sign, '  ' with other cursive signs, it is highly significant from the point of view of identification of basic sign. Fig. 38 has clearly revealed the formation of such compound signs by joining with this sign.

The analysis of another group of compound signs has illustrated the use of an important Indus sign, '  ' in the formation of a number of compound signs by combining with different cursive signs (Fig. 39).

By analysing the compound signs (Fig. 40) the identification of the basic sign, '  ' combined with different cursive signs is easy. This has already been ascertained to occur idependently in many inscriptions.

Apart from these, there are a few more compound signs which were formed by the combination of an important Indus sign, '  ' with different cursive signs (Fig. 41) or strokes added although this has been considered by many scholars as mere a symbol of a **'field'** or so.

The structural analysis of Indus signs has revealed that several picture-like signs were produced by permutation and combinations of only a few basic signs.

Analysis of the compound signs formed by combination of the sign 'Ψ' with different independent signs of the Indus script

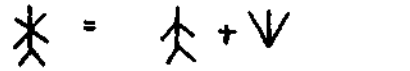
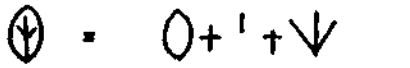
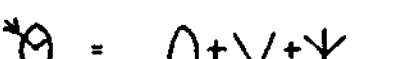
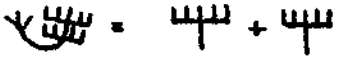
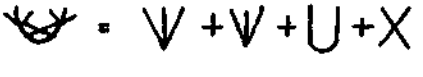
No.	Compound sign Analysis	No.	Compound Analysis
1		7	
2		8	
3		9	
4		10	
5		11	
6			

FIG. 26

Analysis of the compound signs formed by combination with the signs, 'U'

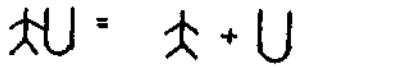
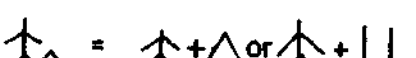
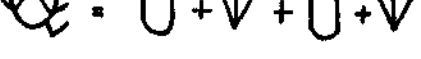
No.	Compound sign Analysis	No.	Compound Analysis
1		6	
2		7	
3		8	
4		9	
5			

FIG. 27

Analysis of the compound signs formed by combination with the sign '人'

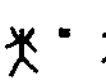
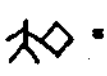
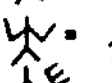
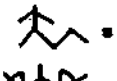
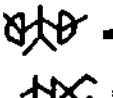
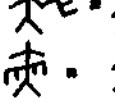
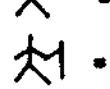
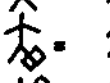
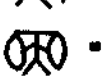
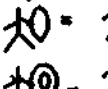
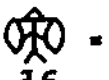
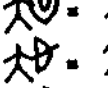
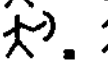
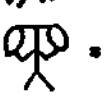
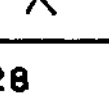
No.	Compound sign	Analysis	No.	Compound sign	Analysis
1			12		
2			13		
3			14		
4			15		
5			16		
6			17		
7			18		
8			19		
9			20		
10			21		
11					

FIG. 28

Analysis of the compound signs fromed by combination with the sign, '人'

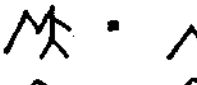
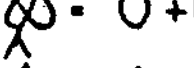
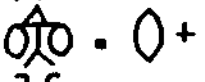
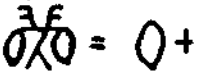
No.	Compound sign Analysis	No.	Compound sign Analyis
1		4	
2		5	
3		6	

FIG. 29

Analysis of the compound sign formed by combination with the sign, 'E'

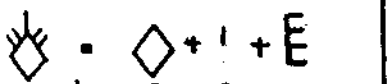
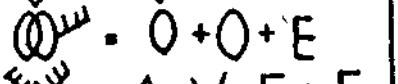
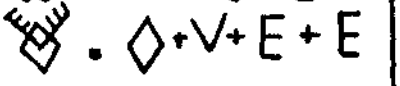
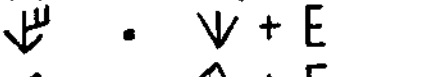
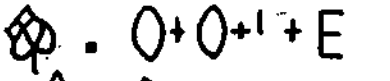
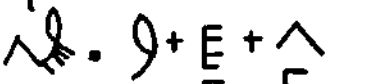
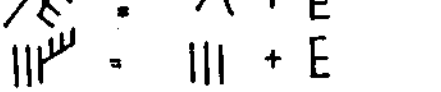
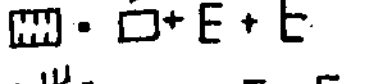
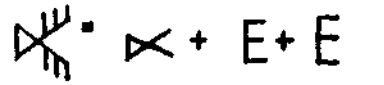
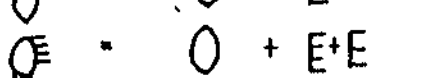
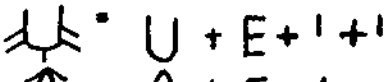
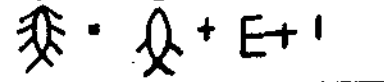
No.	Compound sign	Analysis	No.	Compound sign	Analysis
1		= + E+'+'+'	10		= ◇ + ' + E
2		= + E	11		= O + O + E
3		= + E	12		= ◇ + V + E + E
4		= + E	13		= O + O + ' + E
5		= + E	14		= ∫ + E + ^
6		= + E	15		= □ + E + E
7		= + E	16		= ✕ + E + E
8		= + E	17		= U + E + ' + '
9		= + E+E	18		= + E + '

FIG. 30

Analysis of the compound sign formed by combination with the sign '日'

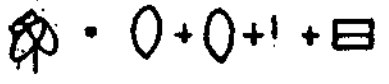
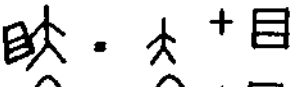
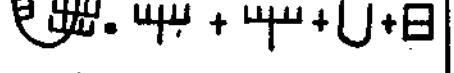
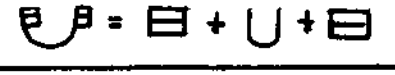
No.	Compound sign	Analysis	No.	Compound sign	Analysis
1			5		
2			6		
3			7		
4			8		

FIG.31

Analysis of the compound signs formed by combination with the sign '○'

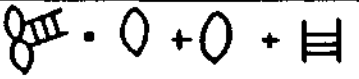
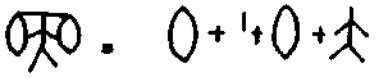
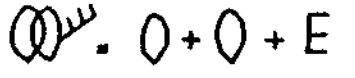
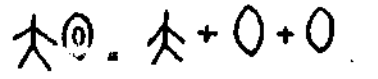
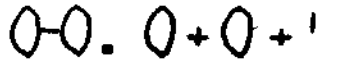
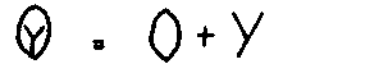
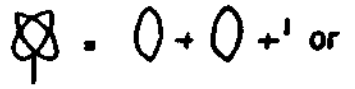
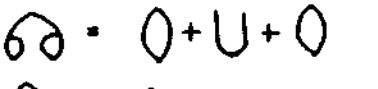
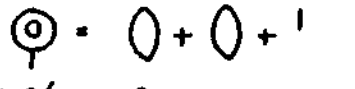
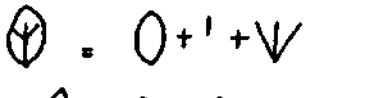
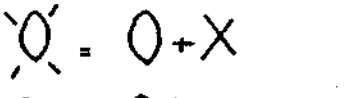
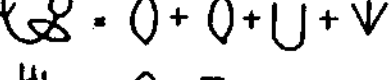
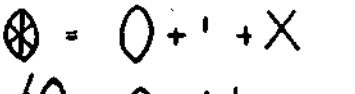
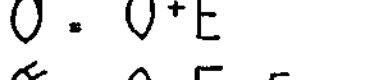
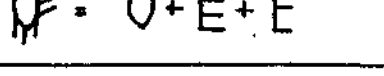
No.	Compound sign	Analysis	No.	Compound sign	Analysis
1		= ○ + ○	10		= ○ + ○ + 目
2		= ○ + 丨 + ○ + 人	11		= ○ + ○ + E
3		= 人 + ○ + ○	12		= ○ + ○ + 丨
4		= ○ + Y	13		= ○ + ○ + 丨 or ○ + 丨 + ○
5		= ○ + U + ○	14		= ○ + ○ + 丨
6		= ○ + 丨 + V	15		= ○ + X
7		= ○ + ○ + U + V	16		= ○ + 丨 + X
8		= ○ + E	17		= ○ + U + 人
9		= ○ + E + E	18		= ○ + ○ + 人 + 丨

FIG. 32

Analysis of the compound signs formed by combination with the sign, '  '

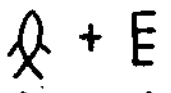
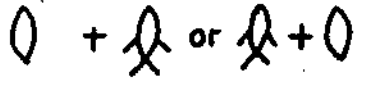
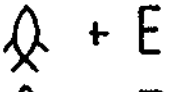
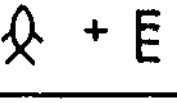
No.	Compound sign		Analysis
1		=	
2		=	
3		=	
4		=	

FIG.33

Analysis of the compound signs formed by combination with the sign, 'D'

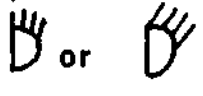
No.	Compound sign	Analysis
1		= D + 1 + 人
2		= D + 1 + 人 + D + 1
3		= D + E

FIG. 34

Analysis of the compound signs formed by combination with the sign, '丰'

No.	Compound sign	Analysis
1		= 丰 + 1 + 人 + 丰 + 1
2		= △ + 丰
3		= 丰 + U + E + 丰

FIG. 35

Analysis of compound signs formed by combination with the sign, '山'

No.	Compound sign	Analysis
1		= 人 + 山
2		= 山 + 山 + U + E
3		= 山 + 山 + U + 日
4		= 山 + 山 + U + V

FIG. 36

Analysis of the compound sign formed by combination with the sign, '  '

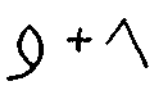
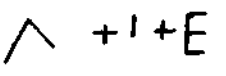
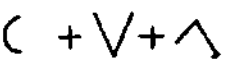
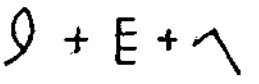
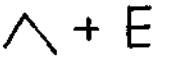
No.	Compound sign		Analysis
1		=	
2		=	
3		=	
4		=	
5		=	

FIG. 37

Analysis of the compound sign formed by combination with the sign '  '

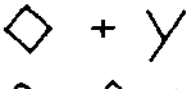
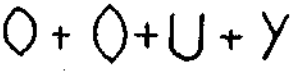
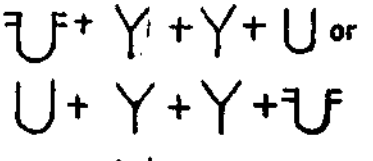
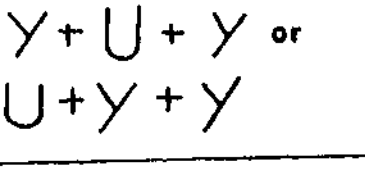
No.	Compound sign		Analysis
1		=	
2		=	
3		=	
4		=	

FIG. 38

Analysis of the compound signs formed by combination with the sign ,'↑'

No.	Compound sign		Analysis
1		=	↑ + ↓
2		=	↑ + ' + O
3		=	↑ + ' + ∧
4		=	↑ + ∪ + ↑ + '
5		=	↑ + ∪ + ↑ + ∝
6		=	↑ + ↑ + ∪ + ∝ + ↑ + ↑

FIG .39

Analysis of the compound sign formed by combination with the sign ,'  '

No.	Compound sign		Analysis
1		=	⋉ + ⅄
2		=	⋉ + E + E
3		=	⋉ + E + E
4		=	∝ + E
5		=	⋉ + ' + ⋉
6		=	⋉ + E + E + E

FIG.40

Analysis of the compound sign formed by combination with the sign, ' □ '

No.	Compound sign	Analysis
1		= □ + 𓏤 + 𓏤 or □ + 𓏺
2		= □ + 𓏥 or □ + 𓏦
3		= □ + 𓏤
4		= □ + 𓏺 + 𓏺
5		= □ + 𓏺

FIG. 41

Picture

In addition to these basic cursive signs and the compound signs formed from the former, there are certain pictures representing parts of the human body **(hand)**, **plants (pipal leaf)**, **animals (dog and goat)**, **birds and insects (scorpion, ant)** etc. which were used extensively in the Harappan Script (Fig. 15). Besides, some inanimate objects such as the **'furrowed field'** and **'hill'** or **'mountain'** are also represented by pictures. In fact, there are only twelve pictures in addition to forty cursive signs in the Harappan Script of the early and middle phases of occupation.

Significantly all the pictures except the **'field'** drawn in outline were dropped in the late seals of Mohenjo-daro, Lothal and Rakhigadhi. In Lothal the existence of various pseudo pictures are less frequently observed in phases IV and V than in I - III[4]. This will be more clear from the period-wise distribution of pictures in the inscriptions from Mohenjo-daro (MD), Harappa (HP), Chanhu-daro (CD), Lothal, Rangpur (RGP) and Rojdi (RJD) illustrated.

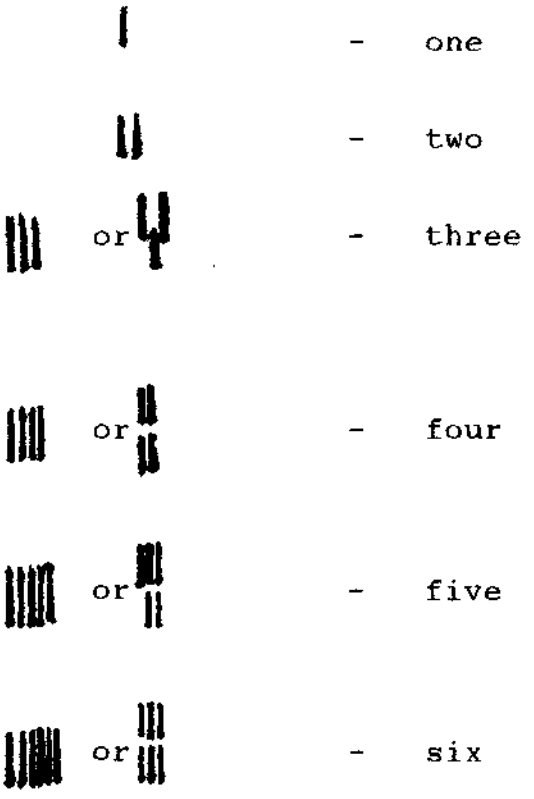
Distribution of Pictorial Signs in the Inscriptions of Harappan and Late Harappan Script

	Harappan Script					Late Harappan Script			
Sign	MD	HP	CD	Lothal	Total	Lothal	RGP	RJD	MD (Dales)
Field	92	20	1	13	126	-	-	-	2
Pipal leaf	41	13	2	4	60	-	-	-	-
Scorpion	35	20	1	3	59	-	-	-	-
Bird	31	4	-	4	39	-	-	-	-
Hill	30	4	-	2	36	-	-	-	-
Insect	23	6	-	4	33	-	-	-	-
Hand	24	6	2	-	32	-	-	-	-
Three animal	20	5	2	1	28	-	-	-	-
Three peaked hill									
Triangle									

A remarkable change can be noticed in Lothal toward less frequent use of picture compared to their use in Mohenjo-daro and Harappa. During the final phase of the Harappa culture in the Indus Valley and Gujarat, the Indus Script was simplified to such an extent that almost all pictures of **'bird', 'hill', 'pipal leaf', 'scorpion', 'hand' and 'insect'** were dropped (Fig. 11 - 14).

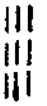
Numerals

Apart from the basic cursive and compound signs there are also the numeral signs on the Indus seals. Numerals 1 to 10 and 12 are represented on the Indus seals by vertical strokes. Except in a few instances where space is very limited the vertical strokes for numerals 1 to 5 are written in one line while numerals 6 to 12 are written in two or three lines one below the other. Of course sometimes 3 to 5 also are written in two lines. Following signs stand for the cardinal number in the Indus Script.



 - seven

 - eight

 - nine

 - ten

 - twelve

A few examples of inscriptions with cardinals are given in the fig. 42.

Inscriptions: Numerals with cursive and pictures

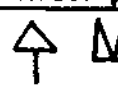
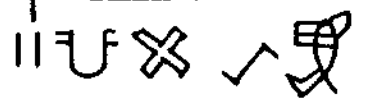
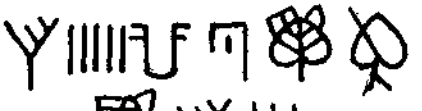
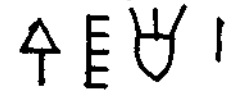
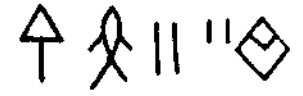
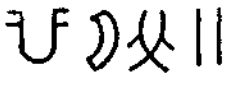
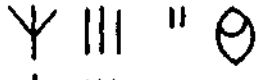
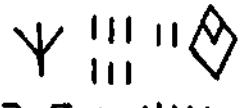
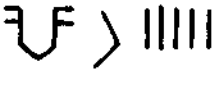
No.	Inscription	Site	Plate	No.	Source
1		HP	XC	233	Vats
2		MD	LXXXIX	369	Mackay
3		MD	CVV	542	Marshall
4		MD	LXXXIV	90	Mackay
5		HP	XCIX	614	Vats
6		MD	CX	309	Marshall
7		HP	LXXXIX	148	Vats
8		MD	CXV	551	Marshall
9		MD	CVII	120	Marshall
10		MD	CVII	131	Marshall
11		MD	CIX	220	Marshall
12		MD	CX	266	Marshall
13		MD	CVII	133	Marshall
14		MD	CVIII	157	Marshall
15		HP	XCIX	618	Vats
16		MD	CIX	243	Marshall

FIG. 42

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CHAPTER - V

PHONETIC

VALUE OF CURSIVE SIGNS

PHONETIC VALUE OF CURSIVE SIGNS BASED ON SEMITIC VALUE AND THE RELATION BETWEEN INDUS AND BRĀHMI SYSTEM OF WRITING

INTRODUCTION

Although the total number of Harappan Script is 62 including pictures, they were reduced to 24 basic cursive forms (including two signs, one for man and the other for fish) in the Late Harappan Script (Fig. 43). The next step which Rao took was to evaluate the basic cursive signs. As made clear earlier a script with 62 basic signs as in the Mature Harappan system of writing can neither be pictographic nor logographic. It can only be phonetic, that is either syllabic or partly syllabic and partly alphabetic. Assigning phonetic value to Harappan signs needs much caution as the language is an unknown factor here. If one assumes a language and imposes a word value or phonetic value to a sign, basic or compound, objectivity is lost. S.R.Rao says it is better to proceed from the known to the unknown that is to give the phonetic value of comparable signs in an already deciphered contemporary or almost contemporary phonetic script. The nearest comparable Script is the Semitic Script of the 15th - 10th century B.C.[1].

SEMITIC SCRIPT

Semitic Script includes the writing of the people speaking Phoenician, Hebrew and South Arabic languages and generally known as the Old North Semitic and South Semitic Scripts. Rao has taken the earlier forms of the Semitic

Phonetic value given to basic cursive signs of Indus Script identified as such by Rao.

No.	Indus cursive sign	Phonetic value
1		ə
2		k
3		g
4		
5		t
6		
7		th
8		ɸ
9		n
10		
11		p
12		
13		ɓ
14		m
15		r
16		v
17		ʻś
18		sh
19		s
20		h
21		h̆
22		ḥ
23		r
24		ʻś

FIG .43

Comparative study of the semitic, Harappan and Late Harappan signs (S. R. Rao)

No.	phonetic value	Old North Semitic	Harappan sign	Late Harappan sign
1	b			
2	g			
3	d			
4	h			
5	w			
6	h			
7	th			
8	k			
9	s			
10	ay			
11	p			
12	r			
13	sh			
14	t			
15	n			
16	's'			
17	ḥ			
18	ə			
19	m			
20	ṛ			
21	ṣ			

FIG. 44

alphabetic signs traced in the Sinaitic or Proto-Arabic Script (Driver, G. R., 1976) and also taken (Fig. 44) the Gezer, Sechem, Laschish, Tellel-Hesy and Der Alla inscriptions. As many as 17 (excluding U) and their variants out of 24 cursive signs (including 'man' and 'fish' signs) (Fig. 44) and their variants in the Indus writing are identical with 17 semitic signs and their variants. It is, therefore, reasonable to assign to Indus cursive signs the same phonetic value which identical signs in Semitic Script have. It may also be noted that the Harappan and Semitic cursive scripts are both written leftward. In the days of the Mature phase of the Harappan culture (2400 - 1900 B.C.) the Indus merchants had their colonies in Bahrain, Ur, Kish, Brak and Arpachiya. The Bahrain seals of 2000 B.C. carry Indus cursive signs[2]. Recently in 1985 a round seal with a short-horned bull motif and Indus Script was found in Bahrain excavation by the Indian Archaeological team and a Bahrain seal without script occurs in Lothal. King Sargon of Agade (Mesopotamia) says that the ships from Dilmun Magan and Meluhha were anchored in Agade (near Babylon) Meluhha is often identified with the Indus region. Harappan colonies were found in Bahrain, Failaka, Ur and further north in Mesopotamia[2].

Seventeen signs of the Late Harappan writing being graphically similar to the Semitic Script, the former have been given the same value, i.e. b ( , ), g ( , ), d (, ), h ( ,), w ( ,), <u>h</u> (),

th (,), k (,), n (,), s ( ), ay (,), p (, ,),  ( ), sh (,), t (, ,), s ( ) and  ( ) by Rao[3].

Out of four Late Harappan and Harappan signs occurring frequently namely , , ,  , two basic ones '  ' and ' ' bear resemblance to the Semitic signs (Fig. 44). Hunter [4] and other scholars have argued that signs '  ' and '  ' are different in value but ' ' appears to be an accented forms of '  '. Sign , '  ' occurs more frequently than its basic form , '  '. Its frequent occurrence with almost every other signs shows that it was used for spelling out words and in a number of compound signs as a medial vowel. The value assigned to '  ' in the Semitic writing is ' '. In the Harappan and Late Harappan writing too ' ' is given the value '  ' . With this value it acts as a vowel helper. The Hittite sign, ' ' has the value a and in Brāhmi it is doubled ' ' to form open a. The basic sign ' ' can be compared to the South-Semitic sign ' ' (Driver Fig. 44) with the value 'm '. Hence the same value is given to Harappan and Late Harappan sign ' '.

The Harappan and Late Harappan signs ' ', ' ' and ' ' are given the phonetic value ' ' because of their identity in graphic form with Semitics signs which have the value 'p '. As in semitic the Harappan Script had two or three alternative signs for the same sound. It may be noted here that although 22 signs are identified as the basic

cursive signs by Rao (Fig. 22), however, the phonetic value was given only to 21 signs. The phonetic value of the sign, '⋈' could not be given due to lack of supporting evidence.

In the first instance, the simple Late Harappan and Harappan inscriptions which contain only those cursive signs which are identical with Semitic signs are read and the language is determined on the basis of the phonetic value given to them. S.R.Rao has identified the language of 137 cursive inscriptions as belonging to the Indo-European family with close affinity to Old-Indo-Aryan. Though the Semitic value is given to Harappan signs the language is non-Semitic because the medial and initial vowel signs which are absent in Semitic writing are present in Indus writing. The Harappan cognates thus read are eka, daś, happt and Śata for one, ten, seven and hundred. Other words such as Śās - 'ruler', pa - 'protector', maha = great are all Indo-Aryan words. According to Rao the suffixes a. ae (e) and ah/ha are used for indicating the instrumental dative and genitive cases respectively. There are no signs for palatals and cerebrals but the use of conjunct consonants (Samyukta aksharas) suggests that the Indus language does not belong to the Dravidian family[5]. The commonly occurring Indus words pa/pā = 'protect' pak = guardian, śada = eminent, śah = victorious, da = give, bhaga = bountiful or lord or god, maha = great, pava = pure etc. are used by Harappan in the same sense in which they are used in OIA.

On the basis of the above illustration of phonetics of various signs some of the inscriptions are read (Fig. 45 - 47).

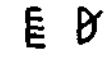
No.	Inscriptions	Reading	Site	Source
1		= P-ā=pā	HP	Vats (Lxxxv, 18)
	Protector or protect			
2		= ma - ā = mā	HP	Vats (c,709)
	Great, ma is the abbreviation of 'maha' Ma = 'Protector,'build (RV)			
3		= Śa - da = 'Śada'	HP	Vats (Lxxxix 149)
	'eminent			
4		= Pag - da	HP	Vats (Lxxxix 129)
	Pag = Strong or mighty da = Giver "strong giver" or "mighty giver"			
5		= Pa - da - ha	HP	Vats (xcv.422)
		= 'Protector of giver'		
6		= Pa - ka = paka	HP	Vats (Lxxxix 165)
	'Guardian' or 'Protector'			
7		= Ppr = Protector	HP	Vats (xci, 246)
	✓Pr = Protector (RV)			
8		= Pak - ā = pakā	MD	Marshall (CIX, 217)
		= Guardian or Protector		
9		= bhag - ā = bhagā = bountiful or God	MD	Marshall (cx; 279)

FIG. 45

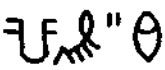
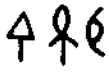
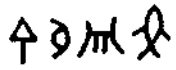
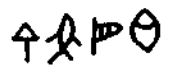
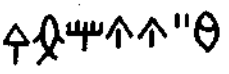
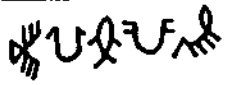
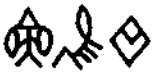
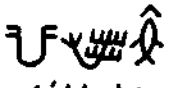
No.	Inscription	Reading	Site	Source
10		= Pa-bhag-ā = pa-bhagā	MD	Marshall
	'Protector - Lord'			(CIX, 232)
11		= pa-sa-da = pa-sada	MD	Marshall
		= protector - eminent		(CIX, 225)
12		= śa-ha-pa-da = saha-pa-da	MD	Marshall
	saha = Ruler, Pa = protector, da = bestower			(CVIII, 176)
	Ruler, Protector, bestower			
13		= pa-ra-śa-da = para-śada	MD	Marshall
	chief or supreme, eminent			(CVI, 103)
	parą = chief or supreme (RV),			
	śáda = eminent			
14		= pa-śa-śa-ha-ś-da	MD	Marshall
		= pa-śaśa-ha-śada		(CIV, 32)
	protector of commander-eminent			
	śáśā = commander			
15		= bhag-ā-śa-a-mhh	MD	Marshall
		= bhagā-śā-mhh		(CVII, 119)
	Lord - ruler - great √sah = ruler,			
	mhh = maha = great			
16		= pa-bhag-papr	MD	Marshall
	Protecting - Lord - protector			(CXV, 557)
17		= p-ā-hā=pā-hā	HP	Vats
		= of protector		(XCV, 379)
18		= aś-ḥhak-ā	Lothal	S. R. Rao
	= Aśhhaka = Aśvaka, Aśvaka is the name of a person			(CXXV, 14)

FIG. 46

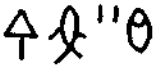
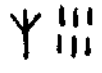
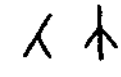
No.	Inscription	Reading	Site	Source
19		= bhag - ā = bhagā = Lord or God	Lothal	S.R.Rao (cxxv, 10)
20		= Pa"- śa - da = Pa"- śada Protector eminent. (Śada = eminent)	Lothal	S. R. Rao (cxxv, 12)
21		= ppr = protector	Lothal	S. R. Rao (cxxv, 2)
22		= eka - ka = supreme (Unique)	MD	Marshall (cIII, 7)
23		= trika - consisting of three	MD	Mackay (215)
24		= Ṣas - ka = consisting of six	MD	Marshall (243)
25		= hapta - ha - Seven fold	MD	Marshall (25)
26		= Śa - t = Śata = hundred	MD	Mackay (692)

FIG 47

After reading the above inscriptions the following meaningful phonemes are obtained : Pa = Protector, maha = Great, Śada = eminent, Pag - da = mighty or strong giver, Pa - da - hae = 'Protector of giver' Paka = Guardian, ppṛ = Protector, bhaga = Lord, Pa - bhaga = Protector, Lord, Pa - Śada = Protector-eminent. Saha - Pa-da = ruler - Protector, bestower, Para - śada = chief or Supreme eminent, Pa - śa śa - ha - śada = 'Protector of commander - eminent', bhaga - sa - maha = Lord -ruler, great, Pa-bhag - Papṛ = 'Protecting Lord Protector' Pa-ha = 'of Protector' a ś-hhaka = A śvaka is a name of a person, eka - ka = Supreme, tri - ka = consisting of three, Sas - ka = consisting of six, hapta - ha = sevenfold, Śata = hundred. The sequence of these phonemes are very meaningful. All these words are found to be common to the Rg. Vedic language. Etymological studies of Vedic as well as Harappan words indicated that there are many common words among them which are almost similar from the point of their semantics and the clear distinction between voiced and unvoiced language. As most Indus words corresponds in form and meaning to the words in the Rg. Veda its language can only be Indo-European although the phonetic value has been given similar to the Semitic Script. One may wonder how this could happen when the basic cursive signs are given the phonetic value of Semitic signs. The medial ''(a), '  '(ā), '  '(ae), ''(ao) and initial vowels () (Pa), () (Pā), () (Pae) signs which are absent in Semitic writing are present in Indus writing.

An assumed language namely Proto-Indo European is suggested by some scholars. On the basis of a scrupulous study of the language of the Rg. Veda and Old Iranian, a proto Aryan may be suggested for the Indus language. This proto-Aryan itself may be considered as part of the Proto-Indo-European. A similar approach has been implemented by Rao[3] on the basis of a comparative study of the vocabulary and grammatical features of the Harappan language with those of the Rg. Veda.

Moreover, the study of the religion and culture common to the Harappans as well as Rg. Vedic people[6], has clearly indicated that the Harappan language is an earlier form of the Indo-Aryan language. It has also been noticed that the materialistic approach and spiritual life of the Harappan and Rg. Vedic people are very much alike as evidenced from their inscriptions and archaeological objects. There are many such evidences discovered at Lothal[7] and Kalibangan[8] in the form of altars built for fire-worship and animal sacrifice in Harappan levels that clearly indicates the ritual activities of the inhabitants usually attributed to the Aryans. The same kind of fire-worship was found to be observed in Rangpur[9].

All these evidences and comparative studies of the Harappan language and the language of the Vedas encouraged us to interpret that the Harappan belongs to the Indo-European family. The Harappan and another Indo-European languages i.e. Hittite have certain common features namely preservations of ' h '. Another important features of the Harappan scribes

is the use of seperate signs for voiced and voiceless stops namely 'k', 'g', 't' and 'd', 'p' and 'b' which are found to be distinguished in Tamil[10]. The outcome of all these studies and evaluation is that the Harappan language can be recognized as an earlier form of the language of Vedas.

After reading Indus inscriptions in which signs identical with Semitic signs occur, other inscriptions involving the use of non-Semitic signs of 'man' () and 'fish' () are read. Both are fully accented and their phonetic character is not in doubt.

As the Indus language is found to be akin to OIA, the man () sign is given the value 'r̥' by Rao on acrophonic principle from the word nr̥/nara used for man in the Rg. Veda. Phonetic value derived from alternate words for man in OIA e.g. 'm' from manushya does not make sense when the inscriptions with this sign are read. e.g. p + m = pm meaningless, but p + r = pr () means 'protect' in Rg. Veda. Similarly, dr = pierce (RV), tra = save, rk = worship, praise (RV), rad = Shine (RV), ram = 'enjoy' etc.

The 'fish' ( ) sign is given the value 'ś' derived from 'Śakula' or 'Śafari' a variety of fish referred in Rg. Veda. The words with 'fish' sign read Śās = Punish (RV), 'Śak ='be powerful' (RV). 'Śama = calm (RV), 'Śaka = be powerful (RV). 'Śah/Śāh = 'be victorious', 'Śada = 'triumphant' or 'eminent' (RV).

RELATION BETWEEN INDUS AND BRĀHMI SYSTEM OF WRITING

Many scholars have attempted to find correlation between the Indus Script and the Brāhmi Script which was of no use in the 5th century B.C. whereas the Indus Script is known to occur on seals, pottery etc. upto 13th century B.C.

The earliest Brāhmi characters occur in the piprahwa casket inscription which is assigned to 450 B.C. The Bhattiprolu inscription is also considered as Pre - Aśokan.

The Brāhmi Script appearing in the Aśokan inscriptions is already a beautiful and finished alphabet and exhibits no sign of adolescence or imperfection. This fact leads us to infer that writing had a long history before Aśokan inscriptions.

Langdon[11] suggested that the early syllabic alphabet of northern India, known as Brāhmi Script from which all later characters were derived is most probably a survival of the early pictographic system of the Indus valley. Hunter[4] has tried to show that the Brāhmi Script descended from the Harappa Script. He has traced out the signs of Brāhmi from Indus Valley seals to a tentative affinity between the two. He ventured to suggest vowel signs on this very basis. Both Hunter and Langdon argued for a syllabic system in Harappan writing. But the time lag between the disappearance of the

civilization of Mohenjo-daro and the first appearance of Brāhmi is too great to make a direct descent probable. R.B.Pandey[12] another advocate of the indigenous origin of Brāhmi believed that the Brāhmi characters were invented by the genious of Indian people and were derived from pictographs, ideographs and phonetic signs, the earliest specimens of which are to be found in the Indus valley inscriptions. D.C.Sircar[13] thought that the Brāhmi alphabet seems to have been derived from the pre-historic Indus valley Script. On the other hand A.H.Dani traces the origin of Brāhmi to Aramaic Script[14].

Despite the chronological gap between the latest Indus cursive writing of Mohenjo-daro, Rangpur, Lothal, Bet Dwarkā (BDK) and Daimabad (16th - 13th century B.C), on the one hand the Brāhmi Script of Aśokan and Piprahwa inscriptions on the other, as many as 10 Indus cursive signs including ' E ' which has a different value and 'b' which occurs only in BDK inscription have a close graphic resemblance to those of Brāhmi alphabets (Fig. 48). But a few more signs which do not occur in Indus cursive writing seem to have been introduced into Brāhmi Script same time in the post Harappan phase.

Secondly, the signs for Cerebrals and Palatals which the Indus Script had not yet developed, occur frequently in Brāhmi. An indication of this intermediate stage is vaguely discernible in the Daimabad signs on pottery. It is observed that 17 cursive signs are common to the Indus and Semitic script and 10 Indus signs are analogous to those in

Brāhmi Scripts. The principle of accenting and formations of conjunct consonants are common to both. Since the Indus Script is earlier than the Semitic it is obvious that the latter borrowed signs from the former for their consonantal value. Brāhmi too must have borrowed some and added some more. Some scholars are of the view that Brāhmi was locally developed out of the Indus valley system. This hypothesis may not be wrong but how new signs were added in Brāhmi needs to be explained. Perhaps the day is not far when this also can be proved through the Megalithic signs provided as in Sanur they suggest word formation.

The non-pictorial cursive of Late levels of Lothal, Mohenjo-daro and Rangpur occurs in simplified form in the Jhajjar seal, Daimabad pottery and Sanur inscriptions providing some links here and there with the Indus and Brāhmi Script.

The discovery of the Proto-historic inscription at Bet Dwarkā by the Marine Archaeology centre of the National Institute of Oceanography in 1984 is a land mark in the evolution of writing[15]. As inscribed sherd of a votive jar of sturdy red ware was found from the intertidal zone of the site BDK - I -II. There are seven distinctly inscribed characters above the shoulder of this wide mouthed jar. Out of seven, six letters are identical with the Late Harappan characters, one of which (i.e. the fourth from left) is a combination of two signs one of which is Late Harappan. Sign for 'ga' and the other is a non-Harappan sign resembling the

Brāhmi signs for 'b' for 'ca'. The inscription runs from left to right as in most Aśokān Brāhmi inscriptions. All the signs except the compound sign bear close resemblance to the Semitic (Phoenician) letters on the one hand and Late Harappan on the other. The last three signs and part of the fourth are analogous to Brāhmi characters. The repetition of the sign in the Bet Dwarkā inscription shows the continuance of the Harappan tradition.

This 'jar' with the inscription belongs to the Late or Post-Harappan period. The date of the inscription is assigned to the 15th century B.C. because similar jar is found in association with the Lustrous Red ware at Bet Dwarkā which is dated 1500 B.C. (Rao, 1991). Its significance lies in corroborating evidence from Rangpur and Daimabad besides Mohenjo-daro and Lothal about evolution of the Indus Script and its use in simplified form in the Vedic and Epic periods. It also points to the fact that the Brāhmi Script was derived from the Late Harappan Script. Thus the discovery of the Bet Dwarkā inscription has helped on in forgoing one more link between the Indus and Brāhmi Script.

Comparison of the signs of Late Harappan, Bet Dwarkā and Aśokan Brāhmi

Late Harappan (1900 - 1500 B.C.)		Bet Dwarkā (1300 B.C.)	Aśokan Brāhmi (3rd Century B.C.)	
b				ba
g		 g		ga
d				dha
h				Ja
th				tha
p		 pā		pa
sh		s.		sa
t				ta
ś				śa
m		 m		ma
		 ca		ca

FIG. 48

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CHAPTER - VI

AN EVALUATION OF THE READING OF SEAL INSCRIPTIONS

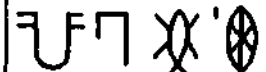
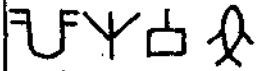
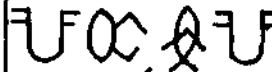
AN EVALUATION OF THE READING OF THE SEAL INSCRIPTIONS

The close affinity of the Indus language with the Old-Indo-Aryan language has been demonstrated in chapter-VI. Although the phonetic values given to Indus signs are the same as those of the Semitic signs, the language of Indus seals is of the Indo-European family because of vocalic indicators and conjunct consonants prevalent in Indus writing with Brāhmi and Nagari Scripts.

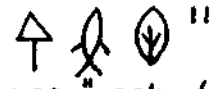
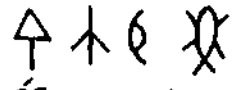
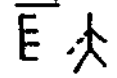
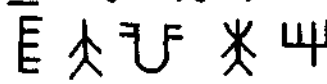
On the basis of the above findings an attempt has been made to read a large number of Indus inscriptions to unravel the inherent meaning of the seals. It has been found that there are three categories of inscriptions namely, **inscriptions with cursive signs only, inscriptions with cursive signs and pictures and inscriptions with numerals, cursive signs and pictures.** Dani has suggested to Rao that the second and third categories may be called hieratic.

The reading of inscriptions and their meaning based on S. R. Rao's reference to Vedic words corresponding to Indus words is given below.

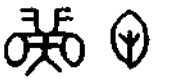
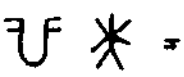
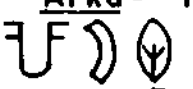
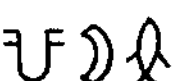
The meaning of the inscriptions illustrated in the following pages conforms to S.R. Rao's interpretations.

No.	Inscription	Reading	Site	Source
1		Pa - ba - ha - ā	Harappa	Vats (LXXXVIII no. 99)
	= pa - bahā = Protector 'baha'			
	'Baha' is the name of a person and 'Pa' = Protector (RV)			
2		= Pa " - Śā - Sā - p - ā	HP	Vats (LXXXVIII no.101)
	= Pa " - SaSa - pā = Protect " ruler - Protecting			
	Śaśa = ruler Śas = ruler, a commander (RV)			
3		= Pat ! - Śā - g - ā	HP	Vats (LXXXVIII no.78)
	= pat - Śāgā = Governor or Lord Powerful or friendly			
	Śāga = Śāka = 'Powerful' (RV) or friend			-
	Pat = Governor or Lord			
4		= Śa - ba - Ka - ā	HP	Vats (XCIV no. 646)
	= Śa - bakā = powerful Baka (RV)			
	'Baka' is the name of a person			
	Śa is an abbreviation of Śaka			
5		= Par - ā - śa - ma - ā	HP	Vats (LXXXIX no.113)
	= Parā - Śamā = 'Supreme-happiness' or Suremely happy			
	Śam = Calm, Soothe, happiness (RV)			
	Parā = Supreme (RV)			

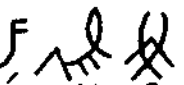
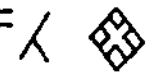
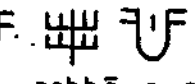
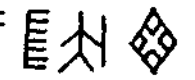
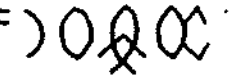
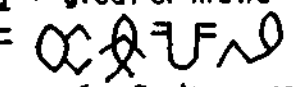
* Source for meaning of words in OIA : Monier – Williams Sanskrit – English Dictionary.

No.	Inscription	Reading	Site	Source
6		= Pa "- pak - śa - da	HP	Vats
	= pa "- pak - śada	= protect"- Guardian – eminent		(LXXXIX no.112)
	Śada = eminent (RV) Pak = Guardian			
7		= Śā - pa - śa - da	HP	Vats
	Śāpa – sada = curse - eminent			(LXXXIX
	✓Śap = to curse or take an oath (RV)			no. 125)
8		= ra - ha = 'of Ra'	HP	Vats
	'Ra' is a name or title or 'of the bestower'			(XCI no. 235)
	ra = to grant, give, bestow (RV)			
9		= hā - rā - ā - r - hā = hārā - ārhā	HP	Vats (XCIII no.325)
	= Praise worthy and desrving = Hara = praise worthy or gratified (if hārā = har = it means gratified) ✓Ar = to praise (RV) ✓Arh = to deserve Arha = deserving (RV) Hara = gratified, praise worthy (Hitt)			
10		= ra – hā or arhā	HP	Vats (XCV no.414)
	= 'or bestower' or deserving (RV)			
11		= pa – da – hā	HP	Vats (XCV no.422)
	= ' Protector of giver' (RV) or 'of a quarter' pada = a 'quarter'			

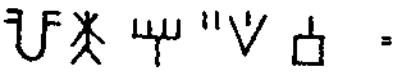
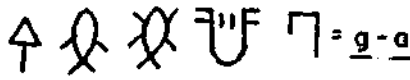
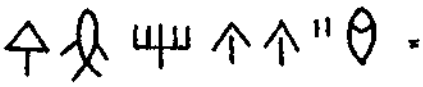
Source for meaning of words in OIA : Monier – Williams Sanskrit-English Dictionary.

No.	Inscription	Reading	Site	Source
12	 = Pa - Pa-Pap - r = Pa - pa - papr = Protect - Protector the great or protect, Protector of the protector, Papr *Protector'		HP	Vats (LXXXVIII no. 80)
13	 = Pak - papr = Guardian - protector		HP	Vats (LXXXVI no. 29)
14	 = gah - pah - papāt = Ga - Protector - Governor Ga = go to or to sing or 'Ga' is an epithet of Bṛhaspati (RV) or Gha = Indra (RV), also Gha = Agni (S. Br)		HP	Vats. (XCIX no. 628)
15	 = rā - ā = rā = bestow or grant or rk - ā = rkā = Arkā Arka = 'fire, sun, plant, arka'		MD	Marshall (CVII no. 137)
16	 = Pak - p - ā = Pak - pā = Guardian-protector or Guardian-protect		MD	Marshall (CIX no. 224)
17	 = Śa - p - ā = Śa - pā = If 'Sa' is an abbreviation of Śaka, the inscription conveys 'mighty Protector'		MD	Marshall (CIX no. 208)

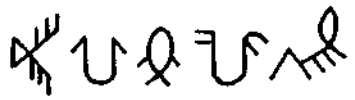
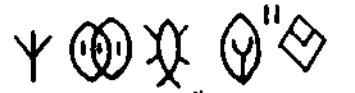
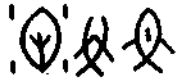
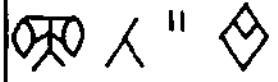
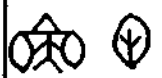
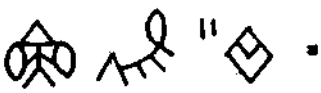
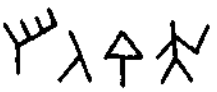
* Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

No.	Inscription	Reading	Site	Source
18		= Śa - bhag - ā = śa - bhagā = powerful, Lord, Bhaga = Gracious Lord, patron (AV/RV)	MD	Marshall (CX no. 295)
19		= rad - pa - ā = rad - pā = prosperous protector √Rdh = to increase prosper (RV) or dar - pa - ā = dar - pā = respected - protector √dṛ = 'to respect to honour (Dhāt up)	MD	Marshall (CX no. 305)
20		= Pat - t - ā = pat - tā = Governor 'Ta' 'Ta' is a name or a title	MD	Marshall (CX no. 285)
21		= ae - hha - ā = If aehhā = aeka = it means one	MD	Marshall (CIX no. 234)
22		= pat - tar - hao - ā = 'of Governor Saviour' or Governor or Lord of the saviour tar = to cross, save	MD	Marshall (CVIII no. 118)
23		= ma - śa - p - p - ā = ma - śa - ppā = 'Great - ruler protector ma = great or maha (AV)	MD	Marshall (CVIII no. 188)
24		= bag - ā - śa - ma - ā = baga - śamā = 'bountiful and happy' bhaga = Lord, bountious (RV) śamā = calm or happiness, patron prosperity (RV, AV)	MD	Marshall (CVII no. 107)

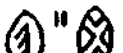
Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

25	 = pat-" bhag- -ha-ra-ā = pat "- "bhag - harā = 'Governor- Lord Praiseworthy 'hara = 'gratified, praiseworthy (Hitt)	MD	Marshall (CIII no.10)
26	 = ba-k "ha-ra-ā = baka - harā = Baka praiseworthy or gratified	MD	Marshall (CX no.310)
27	 = g-ae-śa-ś-da = gae - śāś -da = to Ga, commander giver(RV) = gae - śāśda = 'to Ga, Triumphant' Ga = to sing or to go(RV) śaśda = śaśāda = 'triumphant' from triumph (RV)	HP	Vats (VIII no.155)
28	 = pa " śa-śa-hā-ś-da = pa "- śaśa -ha - śada = protecor-Commander-eminent	MD	Marshall (CIV no. 32)
29	 = pat "- pak-śa- śa-da = pat "- pak -śaśada = Lord "-Guardian,Commander śasada = giver of Command	MD	Marshall (CVI no.86)
30	 = pah - pah -hā -hā = ' of protector, protector' or of protector of protector 'pah = protect. (Hitt)	MD	Marshall (CIX no.204)
31	 = bhag - ā - pa - 'sa' = bhagā - pa - 'sa' If 'sā' is an abbreviation of śāsa = ruler, the inscription conveys Lord - Protector - ruler'	MD	Marshall (CVII no.125)

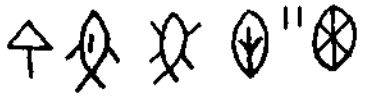
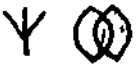
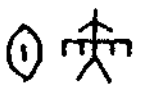
Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

No.	Inscription	Reading	Site	Source
32		= bhag-ā-śa-a-mhh = bhagā -śā -mhh	MD	Marshall (CVII no.119)
	='Lord-ruler-great'-mhh =maha great or bhag-āśa- maha =Great Lord (of the) order asa = order (AV).			
33		= pa "- pav - śa- papa-ka	MD	Marshall
	= Protector "- pure - ruler - guardian pav= purify (RV) papaka = ppaka = paka=Guardian			(CVI no. 80)
34		= śā - śa - 'pak'	MD	Marshall
	='ruler Guardian'			(CX no. 308)
35		= pa -"t -papr	MD	Marshall
	=Protect-saviour-protector 't' = tar = 'save' 'T' is a abbreviation of 'Tar'			(CVII no.127)
36		= pak - papr	MD	Marshall
	= 'Guardian, protector'			(CV no.45)
37		= pa" - bhag-papr	MD	Marshall
	='protect - Lord - protector'			(CXV no.557)
38		= ra-da-t-hā	MD	Marshall
	= radat - hā 'of the prosperous' √Rdh = to increase, prosper, succeed (RV)			(CXIII no. 410)

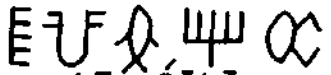
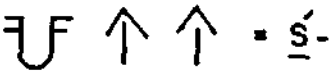
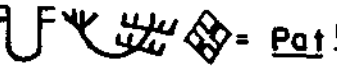
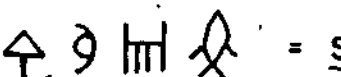
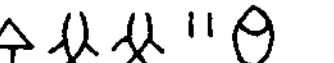
Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

No	Inscription	Reading	Site	Source
39		= Pat - Śā - Śa = Pat - ŚāŚa = Governor, ruler √Śās = rule, command (RV)	MD	Marshall (CXIII no.455)
40		= Pat - Pah = Govern, Protector	MD	Marshall (CXIII no.445)
41		= Pat - Pat - ā = Pat - Patā = Govern / Governor that is 'Great Governor'	MD	Marshall (CXIV no.490)
42		= ma - da - ha = 'Of the blessed / delightful' √Mad = delight (RV)	MD	Marshall (CXIV no.479)
43		= a - a - pa = "āpa" = 'water' also name of a river (RV)	MD	Marshall (CXIV no.476)
44		= Śa - ma ā = Śamā = 'auspicious' or 'calm' √śam = calm, soothe, happiness (RV)	Lothal	S.R.Rao. (CXXV no.16)
45		= ba - k-"ha - ra - ā = Baka - "Harā, 'Baka' may be a name of a person or Baka = baga = Lord Hara = Gratified, praiseworthy (Hitt) The meaning of the inscription is 'Lord gratified'	Lothal	S.R.Rao. (CXXVII no.36)

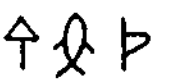
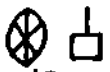
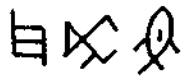
* Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

No.	Inscription	Reading	Site	Source
46		= Pat - Pak - śā - śa - da = Pat - Pak - śāśa da = Governor - Guardian - commander - bestower	Lothal	S.R.Rao (CXXVII no. 31)
47		= Pap - ka - hā = 'Of the Guardian / Protector pap / pab = 'Protect' (Hitt)	Lothal	S.R.Rao (CXXV no. 4)
48		= rahā - hā = 'Of Raha' rha = arha - ha = Of the deserving'	Lothal	S.R.Rao (CXXV no. 19)
49		= Ppa - ka = Ppaka = 'Guardian' Ppaka = Paka = Guardian	Lothal	S.R.Rao (CXXV no. 3)
50		= rha - pa = able, Protector arha = 'deserving' able (RV)	Lothal	S. R. Rao (CXXV no. 20)
51		= Papr = Protector	Lothal	S.R.Rao (CXXV no. 2)
52		= ra - d - hā = radhā = ' Of the prosperous' √Rdh = to increase, prosper succeed (RV)	MD	Mackay (LXXXV no. 148)

* Source for meaning of words in OIA : Monier – Williams Sanskrit– English Dictionary.

No.	Inscription	Reading	Site	Source
53		= ma-hā-ś-ā-hā = mahā - Śāhā = great, mighty (RV) = mahas = greatness, glory (RV) sah = able, mighty	HP	Vats (XCIV no. 352)
54		= Ś-Ś-ā = ŚaŚā = name of a hymn in the RV and also of its authors. Both ŚāŚā and Sasa may refer to the same person. or Śāśā = ruler √Śaś = rule, Command (RV)	MD	Mackay (LXXXVI no. 200)
55		= Pat !! hhak-ā = Pat -!! hhakā = 'Protect trustworthy' √Ha = trust (Hittite)	MD	Marshall (CX no. 294)
56		= Pa !! Śa-g-ā = Pa !! Śagā = 'Protect, mighty Ga' or 'Protect powerful' 'Śaga' should be equated to śaka as k and g were often interchonged in HP (Śaga = powerful from Saka)	HP	Vats (XCIV no. 343)
57		= Śa-ha-pa-da = Śaha-pada = Victorious, Protector bestower = Śah / Sah = 'be victorious' (RV) (or bestower of Protection)	MD	Marshall (CVIII no. 176)
58		= Pa !! -ś-ś-da = Pa - Śaś da = ' Protector - commander Śaśada = Commander (RV)	HP	Vats (XC, no. 232)

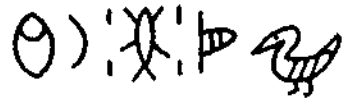
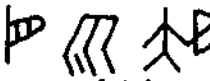
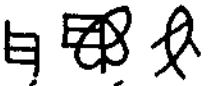
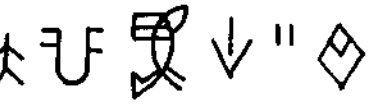
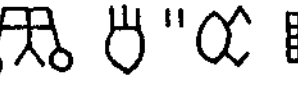
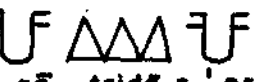
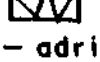
* Source for meaning of words in OIA: Monier –Williams Sanskrit –English Dictionary.

No.	Inscription	Reading	Site	Source
59		= paḥ - śa - da = paḥ - śada = 'protector - eminent , paḥhs = protect, keep, Oath (Hitt)	MD	Mackay (XCIV no. 394)
60		= pa - ra - śa - da = para - śada = 'supremely eminent	MD	Marshall (CVI no. 103)
61		= ba - pat = 'Ba, governor' 'Ba = Baga = God (AV)	MD	Mackay (LXXXIII, no. 5)
62		= śā - śa - ā - 'T' = śāśa - āt = ruler - illuminator āto = illuminator (RV)	MD	Marshall (CV, no. 53)
63		= pa - "śa - mā - ḥa = pa - śa - māḥa .= 'protector - powerfull - great 'śa' is the abbreviation of śaka	HP	Vats (XXXVIII, no. 92)
64		= pāt (pata) -ma - śa - ś - aśvaḥ - a = pat - ma - śaś - asvaḥā = Governor - great - ruler - asvaka (RV) Aśvaka is the name of a person Aśva is the name of a teacher with the patronymic sāmudri (S.Br) 'Aśvaka' is also the name of a people (M.Bh)	HP	Vats (LXXXVI, no. 16)

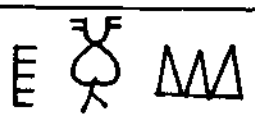
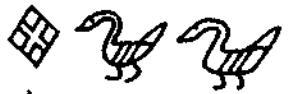
Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

No.	Inscription	Reading	Site	Source
65		= tra - kṣhatra - kṣhatra = tra - kṣha - kṣha = tra - kṣhatra = 'Saviour of dominion' or 'Save the great dominion' If we take the field sign as a word syllable reading 'Kṣhatra' it means 'Supremacy, dominion, power, might' (RV).	HP	Vats (LXXXIX no. 120)
66		= tra - Kshatra - ā = trakṣhā = 'Trkshi' is the name of a man with the patronymic (RV) or 'Saviour of dominion'	HP	Vats (XCI, no. 240)
67		= maksh - da - ppat = Cheerful - distributor - Governor Makh = Cheerful, active, vigorous (RV)	HP	Vats (XCII, no. 280)
68		= Kṣhatra - Kṣhatra - da - a - ha = Kshatra – Kṣhatra – dā – ha = 'Of the distributor-dominion' (RV) or 'great dominion of Daha, Dahyas were a people (RV).	HP	Vats (C, no. 674)
69		= Vrsha - n - t - (tar) - ā = Vṛshan saviour or 'Protector vigorous, God' or 'Protector vṛshan God Vṛshan = manly, vigorous, strong, powerful, great (RV).	MD	Marshall (CIII, no. 13)

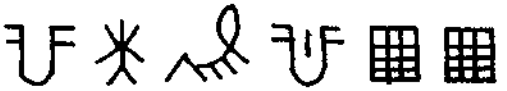
* Source for meaning of words in OIA: Monier – Williams Sanskrit – English Dictionary.

No.	Inscription	Reading	Site	Source
70		= śak – rae – 'śa' – p – pa	MD	Marshall
	= śak – rā – 'śa' – ppa = 'to-the-powerful – ruler – protector'			(CIV, no.36)
	śak = powerful, strong (RV)			
71		= dra – has – rā	MD	Marshall
	= powerful (strong) bestower,			(CV,
	drh = to make firm, strong, fix (RV)			no.69)
	Drhas = Drhyu a people			
72		= śa – aśvah – hā	MD	Marshall
	= śa – Aśvaka = 'mighty Aśvaka			(CVI,
	Aśvaka is a name (RV)			no. 75)
73		= maksh – maksh – ā	MD	Marshall
	= makh – makhā = 'very cheerful'			(CVI,
	Makh = cheerful, active, vigorous (RV)			no. 83)
74		= pa "k – vrśa – ā – r = pa "ka – vrśa – ā	MD	Marshall (CVII
	= 'protector, ka (Prajāpati) vigorously praised			no.115)
75		= kṣha – ma – "pah – papr	MD	Marshall
	= Great dominion of protector- protecting			(CVII no.121)
76		= p – ā – trida – ā	MD	Marshall
	= pā – tridā = 'protector – saviour' (RV)			(CVIII,
	If  = adri, inscription read			no. 160)
	pā – adri = 'protector of mountain'			

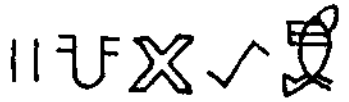
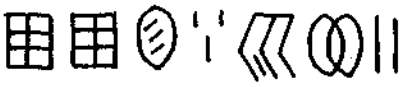
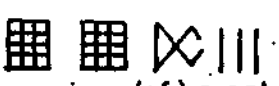
Source for meaning of words in OIA: Monier-Williams Sanskrit-English Dictionary.

No.	Inscription	Reading	Site	Source
77		= trida - ppāt-hā	MD	Marshall
	= of triply protecting			(CVIII, no.163)
78		= pa -" k - vrśa -ā = pa - ka - vrsā	MD	Marshall (CVIII,
	= 'protector ka' (prajāpati) vigorous			no.181)
79		= para - ā - aśva - ā	MD	Marshall
	= parā — aśvā = ' to the supreme Aśva ,' Aśva 'is a name (S.Br)			(CVIII, no.183)
80		= pat "- aśvaḫa- ā	MD	Marshall
	= pat - aśvaḫā = 'Governor Aśvaka'			(CIX, no.200)
81		= ba-adri - ā = badra = bhadra	MD	Marshall (CIX,
	='auspicious, wealth or ba- trida - ā = ba - tridā = Lord saviour ba = baga = bhaga			no.201)
82		= aśvaḫ - ḫā	MD	Marshall
	= 'of Asvaka' (S. Br)			(CIX no. 244)
83		= kṣhatra - kṣhatra - - tra - hao	MD	Marshall (CIX,
	= 'saviour of great dominion'			no.248)
84		= śak — śak - pt	MD	Marshall
	='powerful - powerful - governor' 'Very powerful governor'			(CXI, no.338)

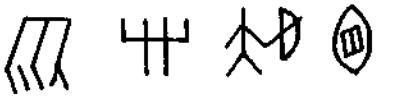
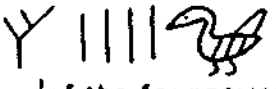
Source for meaning of words in OIA : Monier - Williams Sanskrit - English Dictionary.

No.	Inscription	Reading	Site	Source
85	 = 'Strong triply' tridha = triply, in 3 ways (RV)	= dra-trida-ā = dra-tridā	MD	Marshall (CXIII, no. 417)
86	 = Protector-saviour (of) great dominion	= Pa" tra-kṣha-kṣha	MD	Marshall (CXIII, no. 424)
87	 = Saviour (of) great dominion	= tra-kṣhatra-kṣhatra	MD	Marshall (CXIII, no. 437)
88	 ='Protector of Aśva '& 'Aśva of governor'	= Pa-aśva-aśva-ppat-hā-hā	MD	Mackay (LXXXIII, no. 43)
89	 = Kṣhatra-Kṣhatra-ae-bhaga-ra-ā = Kṣhatra-Kṣhatra-ae-bhaga-rā ='to the great dominion of bountiful -bestower	= Kṣhatra-Kṣhatra-ae-bhaga-ra-ā	MD	Mackay (LXXXIII no. 50)
90	 = Protector-laughter-governor	= Pa-has-pāt	MD	Mackay (XCV, no. 468)
91	 = eka-aśva-pa-ā = eka-aśva-pā-'singular Aśva-Protector' or Singular Aśvapa' or 'Chief Protector of horses' or Aśva is a name of horse'.	= eka-aśva-pa-ā	MD	Mackay (XCIV, no. 397)

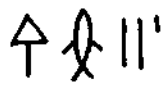
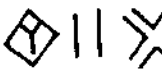
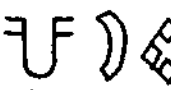
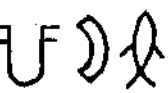
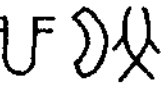
* Source for meaning of words in OIA: Monier - Williams Sanskrit — English Dictionary.

No.	Inscription	Reading	Site	Source
92		= eka - dra - trida - ś	MD	Marshall (CVIII, no. 190)
	= singular strong thirty (stoma of gods)			
93		= Vrsa -n -tar-ā- dyu	MD	Mackay (LXXXIX no. 369)
	= Viril – saviour divine tar = 'save, cross' (RV)			
94		= Pat "-pak-dyu - Aśva-ā = pat "- pak-dyu- Aśvā	MD	Marshall (CVII, no. 126)
	=Governor-protector-divine-Aśva			
95		= dyu-pp - has-tr-pae - kṣhatra - kṣhatra	MD	Marshall (CXV, no. 552)
	= dyu-pphas - tr - pae -kshatra - kṣhatra = divine-protector-saviour= to protect great dominion ppahas = pahs = protect (Hitt) trpa = *a type of boat, so the inscription can be read as* 'Divine protector of the boat of great dominion'			
96		= tri - m - khṣatra - khṣatra	MD	Marshall (CXV no. 542)
	= Great saviour (of) great dominion 'ma' is an abbreviation of 'maha'			
97		= tri -ma - khṣatra - khṣatra	MD	Mackay (LXXXIX no. 346)
	= saviour (of) great dominion			
98		= tri - tr kṣhatra - kṣhatra	MD	Mackay (LXXVII no. 240)
	= Saviour (of) great dominion'			

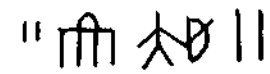
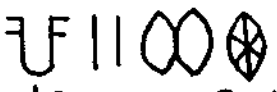
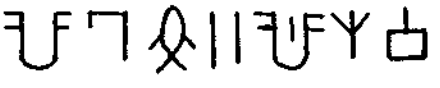
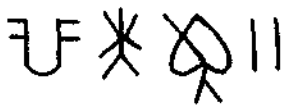
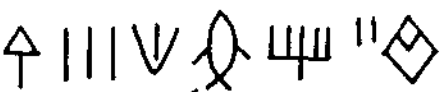
Source for meaning of words in OIA: Monier - Williams Sanskrit - English Dictionary.

No.	Inscription	Reading	Site	Source
99		= tra-mra-kṣatra-kṣatra = tra-mrakṣatra-kṣatra	MD	Mackay (LXXXIV, no. 88)
	= tra-mraks-kṣatra '= save from the destructing of kingdom' mrksh = 'grinding, destroying' (RV)			
100		= vṛsa-śa-ae-tri-t-ā	MD	Marshall
	= vṛsa -śa -ae – tritā = to the powerful saviour or to powerful Trita, Trita is a name (RV)			(CVIII, no. 179)
101		= tra-pha dra hā-. hāś	HP	Vats
	= tra-phadra (bhadra) -hāhas ='saviour auspicious and cheerful'			(XCII no. 266)
102		= kṣhatra – kṣhatra – catush-ka	MD	Marshall (CVIII, no. 159)
	=' Great four dominians'			
103		= śak- catush – ha	MD	Marshall
	= 'of the four powerful' śak = powerful (RV)			(CIX, no. 207)
104		= śaś -ha -vṛsa hā	MD	Marshall
	= 'of the six virile'			(CX, no. 309)
105		= pa -"dyu -aśvaḥ ā = pa -"dyu – aśvaḥā	HP	Vats (XCII, no. 268)
	='protector – divine Aśvaka			

Source for meaning of words in OIA: Monier – Williams Sanskrit – English Dictionary.

No.	Inscription	Reading	Site	Source
106		= tri-sa-aśvah-ā = tri-sa-aśvabā = 'sacrifice (by) Aśva' or 'Horse sacrifice'	MD	Mackay (XCVII, no.577)
107		= eka-phag-ā = eka-phagā = 'chief Lord' = or 'singular Lord or God	MD	Marshall (CVIII, no.187)
108		= pa-"dyu-śa-da = pa-"dyu-śada = 'protector-divine-eminent'	MD	Marshall (CXV, no.551)
109		= tar-dyu-pav = save divine-purifier pav-purify (RV)	MD	Mackay (LXXXVI, no.187)
110		= śa-pa-dyu-pat-pa-ā = śa-pa-dyu-pat-pā = 'ruler-protect-divine-governor-protector'	MD	Mackay (LXXXVIII, no.278)
111		= dyu-śa-pa-ā = dyu-śa-pā = divine-mighty-protector'	MD	Marshall (CVII, no.114)
112		= dyu-śa-pa-ā = dyu-śa-pā = 'divine-mighty-protector'	MD	Marshall (CVIII, no.120)
113		= pp-dyu-ā-r-ha = ppa-dyu-ārha = 'protector-divine-praiseworthy ārha = praiseworthy (RV)	MD	Marshall (CIX, no.230)

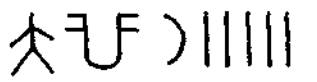
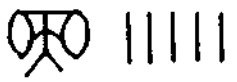
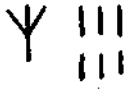
Source for meaning of words in OIA : Monier-Williams Sanskrit-English Dictionary.

No.	Inscription	Reading	Site	Source
114		= dyu - dra - gha - (ha)"	HP	Vats (LXXXIX no. 135)
	= dyu - draha" = 'divine Draha '(Dṛhu) Drhyu, a group of people mentioned in the(RV)			
115		= Pat - ppa - dyu - ā	HP	Vats (XCI, no.253)
	= 'Governor, Protector, divine'			
116		= ba - ka - ae - dyu - - ś - g - ā	MD	Marshall (CVI, no. 81)
	*baka - ae - dyu - saga='to Baka - - divine - powerful' 'Saga' may be equated to 'Saka'- as 'k' and 'g' were often interchanged in HP.			
117		= tri - ppat - rk - ā = tri - pata - rkā	HP	Vats (LXXXVI, no. 33)
	= tripta - rkā = 'pleased Arka'			
118		= tri - pp - ā	HP	Vats (XCIX, no.629)
	= tri - ppā = 'Triply protecting' or trapa = 'type of boat'			
119		= Pa" hā - ś - k - tri - - da	MD	Marshall (CVI , no. 94)
	= Pa - hās - ka - trida 'Protector' - Cheerful powerful in 3 ways.			

* Source for meaning of words in OIA : Monier -Williams Sanskrit -English Dictionary.

No.	Inscription	Reading	Site	Source
120		= tri - ppat- rā - ā - hā = trippta - arkaha = 'Of the pleased Arka'	MD	Marshall (CVII, no.116)
121		= Pa - tri - ka = Protect - three prajāpati	MD	Marshall (CVII, no. 131)
122		= eka - ka - tri - da = 'Supreme triply'	MD	Marshall (CVIII, no.168)
123		= tri - ka = 'Consisting of 3' = a three day sacrifice	MD	Marshall (CIX, no. 220)
124		= ś - k - tri - da - hā = śaka - trida - hā = 'of the triply mighty'	MD	Marshall (CIX, no. 251)
125		= Pa " Panca - ka = 'Protector of the five'	MD	Marshall (CVIII, no. 157)
126		= panca - p - ā = panca-pā = 'five Protectors' or 'Protector of five day sacrifice	HP	Vats (XCIX, no. 618)

* Source for meaning of words in OIA : Monier — Williams Sanskrit — English Dictionary.

No.	Inscription	Reading	Site	Source
127		= panca p-ā-r = panca-pār ='protector of the five praiseworthy ' ār = to praise (RV)	MD	Mackay (LXXXVII, no.254)
128		= Panca - papr = 'five protectors'	MD	Mackay (LXXXV, no113)
129		= ppat - panca - Ka = Governor of Pancaka	MD	Marshall (CX, no.301)
130		= Panca - ha = of five 'or'A Sacrifice of 5days'	MD	Marshall (CXIII, no.422)
131		= p-ā-śaṣ-ha = pā - śaṣ - ha ='Protector of the Six 'or 'a sacrifice lasting 6 days '	MD	Marshall (CXIII, no.429)
132		= Śa Ṣ - Ka = Shash- ka = Shatka = 'Consisting of six	MD	Marshall (CIX, no.243)

* Source for meaning of words in OIA : Monier –Williams Sanskrit — English Dictionary.

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1. hae – ˈsˈ 2. PPr̥ 3. Pā 4. Pak

5. Pak – śa – da – hā 6. śā – śa – ā – ṭ 7. ś – ha – p – da

8. mā – ś – p – p – a 9. Pa"-ṭ – ppār̥

Source : Marshall, J. (1931) - Mohenjodaro and the Indus Civilization, vol – III, London. Plates - CIII – CXII

Vats, Madho Sarup. (1975) - Excavations at Harappā vol – II, Plate – XCVII

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10. Pak - Śa - da - pak

11. aś - ma - ha or śa - ma - ha

12. Pa - ra - ś - da

13. aś - or - śa - ḥḥak - ā

14 aś or Śa - ba - ha - ā

15. Pat " Phag - hā - ṛk (or rā) - ā

16. Pa " ṣ - ṣ - hā - ś - da

17 Pa " śā ma - ḥā

18. Pat - da - sa

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19. eka – Phag – ā

20. ṛk or kr-" ś-aśva-pa-dyu-ā

21. eka – trida

22. tri-ś-da

23. Panca – gh ḥā"- ka

24. ba-ā-ae-śaś-ha

25

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25. Pat — śaś-ka

26. śaś-ka

27. Pat- trida rā-ā

28. dra —haś-rae

29. Vṛsha-n-t-ā

30. PPā-Vṛsha-pa-rae

CHAPTER - VII

STRUCTURE OF THE LANGUAGE OF THE INDUS PEOPLE

STRUCTURE OF THE LANGUAGE, INFLEXIONAL CHARACTER - VOWEL SIGNS & CASE ENDINGS, NUMBER, GENDER :

As most Indus words correspond in form and meaning to the words in the Rg. Veda and in some cases with the Avestan, it is possible to identify the Indus language. To identify a language it is necessary to examine its structure and ascertain whether it is an agglutinative or inflexional language. Rao has pointed out that though there are sentences in which a connecting link between words is not traceable, for example, maha-śaka-tṛ (=tṛa), maha 'great powerful saviour chief (or great)' conveying the meaning 'greatly powerful saviour and chief, it is equally true that in several inscriptions the inflexional suffixes of nominal stems are clearly traceable, for example, pa, pa-ā, pa-ae and pa-ha, pa='protector', pa-ā = 'from protector' pa-ae = 'to protector', pa-ha = 'of protector'. Similarly, Paka = 'guardian', Paka-ā = 'from guardian' paka-ae = 'to guardian' and paka-ha = 'of guardian' (1).

According to Rao(2) while evaluating compound signs consisting of two consonants and a vowel, the order in which they are joined should form the basis of pronunciation, e.g. p+p+a+t = ppat. The '𑀅' sign had the value 'a' of zero degree and its accented forms are read a, ā, ae, and ao. It is not unlikely that the signs for 'ae' and 'ao' also represented the vowels 'e' and 'o'. There was a seperate sign for 'ay' which perhaps represented 'i'. The terminal vowels,

diphthongs and voiced laryngeals serving as suffixes can be recognized easily when the preceding consonant has a vowel indicator e.g. in baka-ā, where a is a suffix and in baka-hā, ha is a suffix. The aspirates of all consonantal signs were formed by attaching the voiced laryngeal (h) sign, e.g. k + h = Kh, g + h = gh, p + h = ph etc. Only two nasals namely n (dental), and m (labial) were in use. When two 'fish' signs were written together it is likely that one of them stood for ś and other for s as in Śā-sa = Śāsa = 'ruler'. In Harappan Script there were three laryngeals one (h) of which was voiced and two (h, h) were unvoiced but in Late Harappan Script only two signs were retained.

Morphic Structure:

Rao has compared stretching of vowels especially a into ā in Harappan language with similar formation in the Avestan languages. He is also of the opinion that a single letter in an Indus inscription such as ba, ra may convey full meaning. For example, pa conveys the sense of 'protect' or 'protector' and ra 'bestow' or 'bestower'. When ra follows pa in an inscription to form a compound word, it literally means **'protection bestower'**, that is **'bestower of protection'**. But when they together form a single word para the meaning would be **'beyond, supreme'**.

An important question posed by the Indus language is whether it should be treated as agglutunative or inflexional. There are some sentences in which a connecting link between

words is not traceable, for example, maha-śaka-tṛ (tṛa) maha 'great powerful saviour chief' conveying the meaning 'greatly powerful saviour and chief'. But there are also some inscriptions where the inflexional suffixes of nominal stems are clearly traceable, for example, paka-ae-baka-ā 'to guardian from baka' Śada-ha 'of (the) eminent' etc. So we should not think that the Indus language is an agglutinative. It is a inflexional language.

Case - endings :

According to Rao, only three cases namely, instrumental, dative and genitive which are however, the primary ones, were developed in Indus language where as the old Indo-Aryan and the Avestan retained the eight cases of the Indo-European(3). A limited comparison between the Hittite(4) and Indus suffixes is also possible. The former used as or us for genitive whereas the latter used ah/ha/aha. For example, Baka-aha, Baka-ha, Baka-h etc. The dative singular of ā stems in Hittite ends in i or e. In Indus language, too it ends in ae. The Hittite instrumental ends in t, but the Indus in a as in Old-Indo-Aryan(5).

The Avestan and Old-Indo-Aryan(6) inherited the Indo-European Gender system (masculine, feminine and neuter) and the three numbers, singular, dual and plural. But Rao says that there is no indication of Gender and number in the Indus language. In that case can we consider the Indus language as

the forerunner of the Old-Indo-Aryan, that is, Proto-Aryan language.

The Indo-European languages belong to an inflexional class, but the inflexion of words did not exist from the very beginning. This was a slow process spread over centuries. Karl Brugmann[7] said, " We have to presuppose a period in which suffixal elements were not yet attached to words. The word forms of this period are called roots and the space of time prior to inflexion is called the root-period. It dates much further back than that stage of development whose word-forms we are able to deduce by a comparison of the separate Indo-Germanic groups of languages. This stage is usually simply called the Indo-Germanic (Indo-European) parent language".

Hittite has been considered to be the earliest Indo-European language attested by single words by about 1800 B.C. Prof. Kammenhuber[8] said that 'for the reconstruction of Proto-Indo-European and for the question of the original home, the most important evidences, according to expositions made to date, prove to be Greek, Indo-Iranian, Armenian and Hittite - Luvian, whose first stage even within Indo-European was more removed from the other three languages'. If Hittite[4] was in use by 1800 B.C. and had already been separated from the proto-Indo-European, there is every possibility of another Indo-European language such as Harappan also having separated itself from the parent (Proto - Indo - European) language still earlier. The Harappan

language, perhaps an earlier form of the Indo-Iranian, seems to have separated itself from the parent (Proto-Indo-European) long before the Hittite did and developed its own script in the Indus Valley and its neighbourhood, including the Afghan Baluch border, where the use of Indus signs has been attested in the early Bronze Age sites excavated by Fairservis Jr.[9].

From the structural analysis it appears that the Indus language was in the transition stage between the root suffix periods. The Harappan nominal stems were derived by the addition of suffix to a root, as in the Vedic language[10].

The Indus language is not a language of suffixes as contended by Bongard Levin[11] and his associates. On this assumption they have argued that it can not belong to the family of Indo - European language. But there are some inscription which go to prove that the Indus language had prefixes also, for example,

trippta arka = pleased arka seal no. 23 Vats

Saha pā = Able protector, seal no. 76 Vats

Śama bhaga = Peaceful God, seal no. 312 Vats.

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CONCLUSION

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As a highly disciplined people known for evolving an urban civilization the Harappans exhibit discipline in their writing also. The Indus Script which includes both Mature (early) and Late Harappan scripts is often mistaken for a pictograph on account of the presence of pictures of animate and inanimate objects along with cursive signs in the early inscriptions occurring on seals recovered from the excavations at Harappa, Mohenjo-daro, Lothal, Kalibangan, Rangpur, Dholavira and a few other sites. The origin of this mixed writing of the early phase is not known although some cursive signs were used as potter's marks in Rehman Dheri in the pre-Harappan levels. The pictures in the early script of Mature Harappa culture represent parts of the human body (hand), plants (pipal leaf and coniferous plant), animals (dog and goat), birds and insects (scorpion, bee, ant etc.) and some inanimate objects such as house, furrowed field, hill and mountain. Sometimes the cursive signs were combined among themselves. Occasionally two pictures or a picture or a cursive sign were combined.

The Indus Script was not static and evolved itself into a simple cursive script by 1900 B.C. after dropping pictures. The cursive script continued to be used later for four or five centuries more. The evolution of the script was brought to light for the first time by S.R. Rao in one of his articles in 'Manthan', Delhi (1977) and earlier in Lothal and

the Indus Civilization, (1973). This discovery opened up a new line of research in Indus Script which was hitherto considered as static. In the evolutionary process the script was simplified and the number of cursive signs was reduced to 24 only. Almost all the pictures were omitted. Although initialy it appeared that the simplified form of writing was confined to a few seal inscriptions of the Late phase the excavations of Harappa and Mohenjodaro by Dales gave confirmative evidence of evolution from more than 50 seals (Rao, S.R., 1991). Another very important observation made by Rao was that some signs occurred in their basic form and short strokes were attached to them. Both the forms occurred occasionally in the same inscription (Fig. 17) which suggested that addition of strokes was intentional and not accidental.

Early pictographic Sumerian Script had about 2000 signs. This was reduced to about 900 in Sumerian cuneiform and further to about 600 in Akkadian and 450 in Hittite cuneiform. The Elamite cuneiform syllabary used 163 signs while in the Old Persian cuneiform syllabary the number was further reduced to 41. Finally the Ugaritic cuneiform alphabet used only 30 signs. The Early Harappan script had 62 basic signs including 18 frequently occurring and a few occasionally occurring pictures. The cursive signs were 34 only. In the Late Harappan period cursive signs were further reduced to 24, including alternative signs for the same sound. Since Fairservis, Knorozov, Asko Parpola and Mahadevan

assumed that the Harappans were Dravidians, they thought that the Indus language must be Dravidian. Further, they considered the Indus Script as pictographic-cum-logographic because of the presence of pictures. Without analysing the compound signs for arriving at basic signs they assumed that there were 400 basic signs in the Indus writing. Actually they have taken the compound signs also as basic ones and given word value to those signs which look like pictures, but were not true pictures. In fact, the doubling of consonantal signs and joining two or more different signs to form conjunct consonants is a feature common to Brāhmi, Devnagari and Indus Scripts. Fairservis followed S.R.Rao's analysis partially. Had he taken the analysis to its logical end, he would have arrived at the basic signs which are very limited in number.

A careful structural analysis of the Indus signs including compound signs carried out by S.R.Rao indicated that there are only 21 basic cursive signs of the Late Harappan Script (Rao, S.R., 1992) after dropping alternate signs of the Early Harappan phase for the same sound. With such a small number of basic signs the Indus script could not have been pictographic or ideographic or logographic each of which needs hundreds of signs and even thousands as in the case of the Chinese Script. The Early Harappan writing (3500-1900 B.C) which had 62 basic signs was logographic-cum phonetic, while the Late Harappan cursive script (1900-1500 B.C.) was primarily phonetic.

As regards the decipherment of any script it is quite impossible to determine the language if both the language and the script are unknown. Having ascertained that the Indus Script was phonetic S.R.Rao proceeded from the known to the unknown. The nearest comparable script which is already known and decoded is the Semitic Script of the 15th-10th Century B.C. It was found that as many as 17 basic Indus signs in the cursive writing are identical with 17 Semitic signs. Because of such close similarities between the signs of the two scripts, the phonetic value of Semitic signs was given to the corresponding cursive basic signs of Late Harappan inscriptions. Rao has clearly stated that the Semitic people who had trade contacts with the Harappans borrowed by 1500 B.C., 17 Indus cursive signs. (Rao, 1982, p-ix, 1992, p-79) for their consonantal value. B. B. Lal misinterpreted that Rao suggests that the Indus people borrowed Semitic signs. Rao has further pointed out that the principle of attaching strokes to basic signs and joining consonantal signs in Indus Script was followed by Brāhmi scribes also. It has been observed that meaningful words could be formed if the inscription is read on the basis of the values given to Semitic signs but keeping in mind that the short strokes added to Indus basic signs indicate the vowel value of the consonant, while the joining of signs as in Brāhmi suggests to formation of conjunct consonants. The cursive Indus inscriptions read on the above principle have revealed that the language was akin to Old-Indo-Aryan (Vedic).

After reading the cursive inscriptions it becomes obvious that the Harappans added vowel values to the basic signs which the Semitic people did not do. The Indus inscriptions clearly suggest that the language is neither Semitic nor Dravidian. It shows close affinity in vocabulary, semantics and grammar with Old-Indo-Aryan (the language of the Vedas). The very fact that conjunct consonants such as pt, rk, rh, tr were formed in Indus Script indicates that the language could not be Dravidian for such formations are not possible in Tamil, Kannada and other Dravidian scripts. One more reason why the Indus Script cannot be bracketed with the Dravidian group is that the Indus Script has distinct signs for voiced and voiceless stops namely k, kh, g, gh, t, tha, d, dha, p, pha, and b, bh which is not the case in Tamil. Mitchiner has also concluded that the languages of Harappa and Mohenjo-daro had distinct features that could well indicate ancestry of Sanskrit and Prakrit respectively (Mitchiner, 1978). Prof. W. W. de Grummond of Florida State University (USA) has accepted the Indo-European affinities of the Harappan language and gives a list of verbal bases in Greek and Latin having affinities with the Harappan language (Grummond, 1992). He says that the case system so important in Indo-European inflection of nouns can be traced in the Indus inscriptions also.

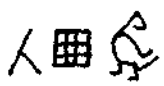
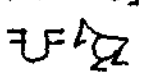
According to S.R.Rao, the Harappan language of the Indus inscriptions is not agglutinative like Sumerian, but inflexional because the Indus scribes used suffixes such as

ā, ae or ha to serve as case-endings. These suffixes are comparable to the suffixes of instrumental, dative, genitive cases respectively of nominal stems occurring in the Rg. Veda and the Avesta (Rao, 1982). The occurrence of suffixal h/ah is reminiscent of the Avestan. Many OIA cognates are traced back to the Harappan cognates. These clues lead to the recognition of the Harappan language as an earlier form of the language of the Vedas. The roots sṛ, kṛ, pṛ etc served as nouns also in the Indus language. For example, the words aeka, daśa, śata, pa, śada, paka, bhaga, trika etc. written alphabetically in cursive signs are Indo-Aryan words.

The **'man'** and **'fish'** signs which do not find a place in the Semitic Script had ceased to be pictures and had phonetic value in Indus writing. Hence the value ṛ derived from nṛ/nar for 'man' in Rg. Veda was given by Rao to **'man'** sign. The words with this sign read gṛ=Sing, tṛ=cross, pṛ=protect etc. The words in which the value **'Ś'** derived from the word śakula or śakunta is given to the **'fish'** sign. Words such as śada = eminent, śāsa = ruler, śaka=powerful belonging to the Old Indo-Aryan family occur frequently in Indus seals inscriptions.

The words for the pictures of **Scorpion, pipal leaf, hill, field** etc have been given syllabic values such as Vrś, aśv, trd, kshatra etc by S.R. Rao following the principle of acrophony.

The **'pipal leaf'** () sign has been given the syllabic value **aśv** from **aśvattha**. Aśva refers to horse as

well as Agni in the Rg. Veda. Aśva is also the name of a person. In the case of 'pipal leaf' and 'scorpion' () signs an interesting feature is the addition of two other cursive signs, one of which stood for the initial vowel 'a' (U) and the other for the laryngeal 'ḫ or h' (). The pictures should be read = aśv + a - ḫ and = Vrś + a + h. These addition of cursives to pictures proves conclusively that the 'pipal leaf'and 'scorpion' signs had assumed phonetic values and could also take vowel helpers. The scorpion sign has been given the syllabic value 'Vrś' from the Vedic words Vṛścika or Vṛścaka. It is however possible that alternate words eg. Pakṣi or Vihaga for the bird sign could be used instead of Śak derived from Śakunta. Rao's methodology is convincing but the question is whether the Indus people had used the same syllabic values for these pictures or something else. By substituting paks for bird sign a few inscriptions make sense but not a majority of them e.g.  = Paks - kṣat does not convey proper sense while  = Pakśa does convey sense.

Thus on the basis of scrupulous analysis of the various hypothesis it is clear that the Aryan speaking Harappans laid the foundation of an integrated society irrespective of the prevalence of different religious practices such as fire worship, animal worship etc. Their significant contribution to the progress of mankind is the invention of an alphabetic system of writing by disciplining the partly pictographic writing.

All the Indus seals were not used for sealing cargo. Some were used as tokens of the owners and some others contain a religious formula appealing to god to protect the owner from danger. Their god was obviously a nature god, the principal diety being the Fire god, Agni. This Fire god became a Vedic god.

It has been found that the Harappan religion was not different from that of the Vedic Aryans. Their concept of ruler or protector was similar to that of the Vedic Aryans. Both Harappans and Vedic people recognised a supreme god which is suggested by the epithet eka, para etc. The altars meant for fire-worship and other altars containing remains of animal sacrifice laid bare at Lothal and Kalibangan confirm that sacrifices and fire-worship were in vogue in Harappan times and continued to be observed by the Vedic Aryans.

It is now obvious that the Indus Script was not static but evolved itself into a simple cursive signs by 1900 B.C. and continued to be used later on also for four or five centuries. Evidence of such use is found in Jhajjar, Daimabad and Bet Dwarkā upto 1500 B.C. (Rao, 1987, 48-53, Fig. 59, Rao, 1988, 52). Although pictures were dropped in due course the principle of attaching short strokes to consonantal signs to serve as vowel helpers was continued. Similarly the technique of combining basic signs to form conjunct consonants was also retained even in the Late Harappan period e.g. Rojdi inscription. The Brāhmi and Kharoshti scripts of the 3rd century B.C. retained both the special features,

namely accenting (mātrā) for indicating the vowel value of the consonantal sign and ligaturing for forming conjunct consonants (Samyukta aksharas). They have also initial vowel signs.

After examining the validity or otherwise of the models suggested by different scholars for decoding the enigmatic Indus Script, the following conclusion appears reasonable.

1. In any attempt to decode an unknown language written in an unknown script, the clue must come from an internal analysis. A priori assumptions that the language was Aryan/Dravidian/Sumerian/Munda etc. are bound to mislead the decipherer as he is prone to adjust his readings or interpret signs as pictures and assign a word value in the language of his choice. Hence a priori assumptions must be avoided.

2. The main objective of the decipherer should be to ascertain the stage of developement of the script whether it is pictographic, ideographic, logographic or phonetic. This is possible only when the number of basic signs is determined. In a long surviving script such as the Indus Script, the evolution in the graphic forms or dropping or addition of certain signs at some stage should be identified. Fortunately, the script of the Harappan period shows a reduction in the number of signs by dropping pictures.

3. A structural analysis of pseudo-pictures which are in fact compound signs is necessary to arrive at the basic

signs which alone can determine whether the writing is pictographic or phonetic. Most scholars who have attempted structural analysis have intentionally or unintentionally failed to analyse compound signs. It must be admitted that S.R.Rao's method ensured not only objectivity as there was no a priori assumption about the language but it 'hit the nail on the load' (in the words of Dr. B. Ch. Chhabra) by pointing out that the cursive script was a simplified form of picture-cum-cursive writing of the Early Harappans. He was the first individual to analyse fully the pseudo pictures and arrive at basic signs which are 64 in Early Harappan and 24 including alternatives in Late Harappan script which established the phonetic character of the script.

4. After identifying the script as phonetic the decipherer is likely to be in a dilemma as to the which phonetic value is to be assigned to each sign. The only way to maintain objectivity is to proceed from the known to the unknown on the principle of analogy. The known script should be more or less contemporary with the Indus cursive script.

G. R. Hunter (1934) and J.E. Mitchiner (1978) tried to emphasize on the hypothesis that Brāhmi is derived from Indus as some of the Indus signs are found to be identical with those of Brāhmi characters. A. H. Dani has suggested that it is better to compare the Indus Script with the Brāhmi script instead of Semitic, because the original script of the Semitic is pictographic but this too is doubted by scholars. David Diringer says, 'nobody knows about the origin of the

Semitic writing'. S. R. Rao preferred comparison of the Indus cursive signs with those of Semitic writing because the latter is almost contemporary. In fact, 70% of the Indus signs is similar to Semitic signs, whereas only 41% is very similar to Brāhmi signs. Moreover, there is a large time gap between the Brāhmi script (300 B.C.) and the Indus script (1900 - 1500 B.C.). Further, Brāhmi has added new signs for c, ch, j, jh and t, th, d and dh.

This inference that the Indus language is OIA is compatible with the religious practices of Harappans especially fire worship and offering of sacrifices which the Vedic people speaking OIA observed. Same Iranian words and concepts are also revealed by reading in Indus inscriptions. But the full import of the seal inscriptions will be known as more number of them are read. The process is a difficult one but the new light thrown on the language of Indus seals does necessitate a reappraisal of the identity of the architects of Indus Civilization.

Attempts at decipherment by other scholars to read Dravidian have not been convincing because of improper analysis and lack of objectivity. The proof of the validity of the methodology lies in reading about 300 or 400 inscriptions which should confirm the language suggested by the scholar.

Mitchiner's approach was no doubt promising but the phonetic value sa given to '  ' did not work satisfactorily. No doubt this sign is often in terminal

position and sometimes occurs with 'E' sign. Though these terminals could be suffixes of genitive case corresponding to sa or sya in Prakrit or Sanskrit, as suggested by Mitchiner the phonetic values given to them do not produce meaningful words when they occur in other positions. Another scholar who assumed Indus language to be OIA is Subhash Kak. But on the basis of very few Indus signs comparable with Brāhmi he has drawn conclusions. The basis is rather too narrow to permit such an inference.

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GLOSSARY OF INDUS WORDS

Pa - Guarding, protecting, ruling.

√mā - Below, measure.

mada - Hilarity, rapture, excitement, inspiration, intoxication (RV)

Śada - Triumph, be eminent, cut off, knock out (RV)

gā - To go, obtain, singing (RV)

Śās - Rule, order, command (RV)

baga - Lord, gracious

Saha - Powerful, mighty

Śah - Overcome, conquer, be strong, mighty or victorious (RV)

Śaka - Power, might, help (RV)

da - Give, bestow, grant (RV)

Śasa - √śās - Rule, command (RV)

Pat - To be master, reign, rule, govern, control, own, possess (RV)

Śama - √Śam - Calm, soothe, happiness, auspicious (RV)

Para - highest, supreme, chief (RV) (from √pṛ)

Śapa - √śap - To curse or take an oath, to honour, worship, serve (RV)

Pada - To fall, fall down or out, perish (RV, Av)

Tṛ or Tṛa - Save, defend, protect (RV)

hara / hāra - Praiseworthy or gratified, praised.

maha - Great, mighty, strong (RV)

Ka - Prajāpati, pleased or satisfied.

ra - To grant, give, bestow (RV)

ABBREVIATIONS

ABORI - Annals of the Bhandarkar Oriental Research Institute

AI - Ancient India

Ant - Antiquity

AIIS - American Institute of Indian Studies

ARASI - Annual Report - Archaeological Survey of India

Arch. Orient. - Archiv. Orientaline

ASI - Archaeological Survey of India

AV - Avesta

BDCRI - Bulletin of the Deccan College Research Institute,

CD - Chanhu-daro

FIC - Frontiers of the Indus Civilization

FRP - Field Research Projects

HCCP - Harappan Civilization : A Contemporary Perspective,

Hitt - Hittite

HP - Harappa

ICO - International Congress of Orientalists

IHQ - Indian Historical Quarterly

IIAS - Indian Institute of Advanced Studies

ILN - Illustrated London News

JAOS - Journal of American Oriental Society

JRAS - Journal of the Royal Asiatic Society

JSHS - Journal of the Sind Historical Society

JTS	-	Journal of Tamil Studies
LHP	-	Late Harappa
MASI	-	Memoir of the Archaeological Survey of India
M.Br.	-	Mahābhārata
MD	-	Mohenjo-daro
NIO	-	National Institute of Oceanography
NS	-	New Series
OIA	-	Old Indo Aryan
OUP	-	Oxford University Press
PA	-	Pakistan Archaeology
PBA	-	Proceedings of the British Academi
PGW	-	Painted Grey Ware
QJMS	-	Quarterly Journal of the Mythic society
RJD	-	Rojdi
RGP	-	Rangpur
RV	-	Rg. Veda
S.Br.	-	Satapatha Brāhamana
SP	-	Summaries of Papers