

# Orignity of The Number Symbol in The Indus Valley Civilization

PUJA KUMARI SRIVASTAVA, \*K. B. SINGH

Department of Mathematics, B. R. A. Bihar University, Muzaffarpur, Aryabhata Knowledge University, Patna, India.

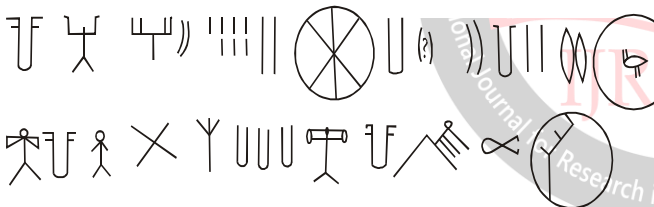
**ABSTRACT** - In this section emphasis is laid on the fact that the number-symbol had its origin in the Indus valley civilization. The vedic Civilization was considered the oldest civilization of our Country till 1920 A.D. But, it has been proved wrong. Two old great cities have been discovered after 1920 A.D. They are Mohen-jo-daro and Harappa. The excavations at Mohen-jo-daro and Harappa had unearthed many documents viz. Seals, inscriptions etc. dating from 3500 B.C.1 Here, the civilization is known as Indus Valley civilization.

**Keywords** – Number, Symbol, Indus valley, civilization.

## I. INTRODUCTION

In Indus Valley Civilization weights were used in multiples of twos and also in decimal System of numeration. There is also an idea of Geometrical progression in the weights used. As will be found in Table Numbers 1,2 and 3; there were also Symbols to represent numbers in Indus Valley Civilization.

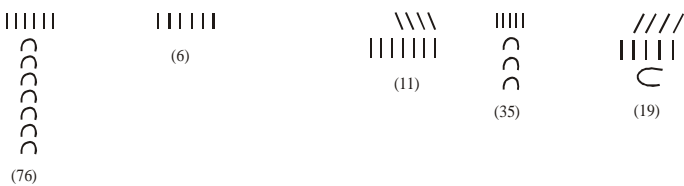
TABLE-1 Numeral-symbols used in 3500 B.C. in India (found in Mohen-jo-daro and other excavations)



Not yet fully explained

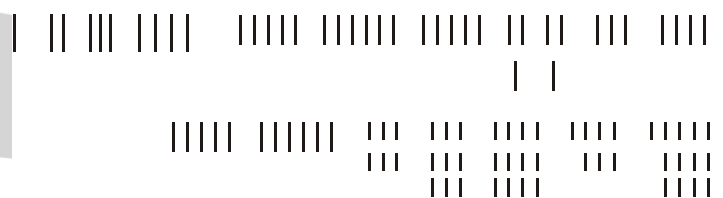
V. Nerojnak (Russian), Sindhu Savyata ki lipi kearth ki khoj. He opines that according to knorojov all vertical lines represent symbols from 1-9.

TABLE-2 Numerals in Indus Valley



Swami Shankaranand, Decipherment of the ancient pictographic scripts of India, 1969, P.101.

TABLE-3



These are the numbers from 1 to 13 in Indus Valley Civilization.(Datta and Singh, History of Hindu Mathematics, P.20.) Vedic ages have been placed between 1500 B.C. to 1000 B.C. Simultaneous with the civilization of Indus Valley, Vedic Civilization was also growing in India. Now, there are evidences to prove that writing of numerals was also in Vogue during the Rg Vedic period.

*११glaz es nnrks v''Vd.;Z%*

*RV 10-62-7*

Give me thousand Cows on whose ears the number eight is written. There have been lots if gaps in Indian Civilizations. Civilizations grew, touched their peak and again Vanished away and in between came the dark ages. The Vedanga Jyautisa was in use during the Mahabharata period. According to this calculation the uttarayana (north-ward course of the sun) has the start when the sun was at the appearance of Dhanistha. On account of the ayana or shift, there occurs a difference of one nakshatra, (1/27 of the period of revolution) in the start of the uttarayana during the course of 1000 years. During the Mahabharat time the uttarayana point was in the Sravana Nakshatra. This fixes up a date of the Mahabharat as 450 B.C.2 The time of Mahabharat and Ramayana is between 1400 B.C. to 1000 B.C.3 and then comes the period of Nanda kings and Maurya dynasty in 400 B.C. with the tide of Buddhism and Jainism. So, it is just possible that the number symbol might have remained in India hidden in some corner in some form which came to light in the inscriptions of Maurya period simultaneous with the Greek invasion. At

the same time India also evolved another script numeral known as Brahmi Numeral (250 B.C.) which is not completely disconnected with the numerals of the Indus-Valley Civilization. Professor Langden goes so far as to opine that Brahmi Script has come out of Indus Valley script. Professor V.S. Agrawal also writes:

*¶ Czkg~ehfyfi fla/q fyfi ls gh fudyh gS A ,b*

Moreover there have been very few excavations in India and if further excavations are made, there may be found some proofs of Continuity of Indus-Valley Numerals during the Vedic period. Aryans who are the oldest representative of the Indo-German Race and who lived in the northern part of India between the Himalayas and Vindhya Mountains must have left some evidences somewhere of their numerical Symbols in the form of inscriptions which are yet to be dug out & brought to light. However, in any case, the vertical strokes in Kharosthi numerals not only resemble Greek Numerals but also have a strong resemblance with Mohen-jo-daro numbers vide Table Numbers 4, 5 & 6.

TABLE-4 Greek Numerals 5th Century B.C.

/// /// 6

From a fragment of a temple record found on the island of Cyprus, Metropolitan Museum of Art, New York. Encyclopaedia Britannica, Vol. 16, P.610 H. Brugsch, Numerorum apud Veteres a Egyptiis Demoticorum Doctrina, Berlin 1849, quoted by Smith, Ibid, P. 48 foot note.

Later Greek Numerals:-

33	34	35	
0=10	0=70	0=100	X=1000

TABLE-5 Kharosthi Numerals, 300-400 B.C.

/	//	///	////
1	2	4	5

-Datta and Singh, 1.c., P.21

TABLE-6 Kharosthi Numerals, 100 B.C. – 200 A.D.

/	//	///	X	/X	//X	///X
		XX	?	3		
1	2	3	4	5	6	7
		8	10	20	100	

-Shukla, K.S., Hindu Ganita Sastra Ka Itihasa, P.19

## II. SIMILITUDE

No doubt, the invention of the numerical Symbols preceded the discovery of zero. Here, our only intention is to show that the Sumerian, Babylonian, Egyptian, Greek and Roman Numerals were guided by the Indian Numerals of Indus Valley Civilization of 3500 B.C.

(1) Indus Valley Civilization and Sumerian Civilization:-

- i. In both the civilizations, numbers 1,2,3..... have been represented by the similar Vertical Strokes like (1).
- ii. In the Indus Valley Civilization the number ten has been represented by the symbols and these Symbols are present in Sumerian Numbers also.
- iii. The symbol like have been used by both.

(2) Indus Valley Civilization and Babylonian Civilization:-

- i. One has been represented by the Symbol Y in Babylon, while in Indus Valley Y and inverted combined, present a symbol \*. In Indus Valley there is a symbol like also.
- ii. In Babylon 10 has been represented by < while in Indus Valley, there is symbol which represent 10. In one case an angle has been formed, in another case an arc.
- iii. The symbol o (Circle) represents ten in Babylon while there is a symbol oo (double circle) in Indus Valley.

(3) Indus Valley Civilization and Egyptian Civilization:-

- i. Numerals have been denoted by pictures in both the civilizations. The exact similarity is that in both, a picture of bird is present.
- ii. Numbers from 1 to 9 have been represented by the vertical lines in both of them.
- iii. In both the traditions the number ten has been represented by represents 100 in Egyptian Civilization while in Indus Valley there is a Symbol for this number.

When we observe the number seven as written in both the civilizations, it is found that the vertical lines are placed from right to left.

The similarity between Indus valley and Egyptian numerals to a great extent leads to the strength of the opinion of Sri Shankaranand that the Mathematicians of Indus valley went away to Egypt in a lot and began to develop the Mathematics of that country.

(4) Indus Valley Civilization and Greek Civilization:-

- i. The symbol / has been used in Greek numerals and the symbol 1 has been used in Indus Valley numerals to represent numbers from one to six. Thus, similar strokes of vertical lines have been used in both the number systems.
- ii. In Greek numerals o (circle) represents 10, 70 and 100 while in Indus Valley Civilization's numeral System there is a symbol oo (double circle)
- iii. In Greek X represents 1000 while there is a symbol like X in Indus Valley Numeral System

(5) Indus Valley Civilization and Roman Civilization:-

- i. In Roman Numerals 1 and Indus Valley Numeral System 1 represent one.
- ii. In Roman Numerals, V represents the number five whereas in Indus Valley Numeral System there is a symbol like U.
- iii. In Roman Numeral System X represents the number ten and in Indus Valley Numerals, there is an identical symbol X.
- iv. In Roman Numerals, C represents 100 whereas in Indus Valley Number System represents 10.

(6) Indus Valley Civilization and Kharosthi Civilization:-

- i. In both the Numeral Systems vertical lines represent numbers from 1 to 5.
- ii. X represents four in the later part of Kharosthi numerals and also there is an identical symbol X in Indus Valley Number System.
- iii. In Kharosthi Numeral System ? represents the number ten and for this number Indus Valley Number System has Symbol like ).

Thus, we have got an indication that the invention of Numeral Symbols had also taken place in India during Indus Valley Civilization which prepared the back ground for the discovery of zero. Sometime in the Vicinity of 500 B.C. we have tried our best in this section and have been Successful, it is hoped, to some extent in exposing the influence of the numerals and symbols of Indus Valley Civilization in India on those of Sumerians, Babylonians, Egyptians, Greeks, Romans and Kharosthi (in India).

Thus, the opinion of Smith, as given in his Book "History of Mathematics", Vol.II P.69 that the origin of Numerals is uncertain, is untenable as Numerals like zero had their origin in India.

### III. REFERENCES

- [1] Datta and Singh, "History of Hindu Mathematics-I", P. 19. However, Datta and Singh fix the time 3000 B.C.
- [2] Sarasvatī, Swamī Satya Prakash, "Founders of Sciences in Ancient India", Published by Vijay Kumar, Govindram Hasanand, 4408 Nai Sarak, Delhi-110006.
- [3] Mazumadar, R.C., suggest that the time of Mahbhārata is 1400 B.C. vide History and Culture of Indian People, Vol. 1, P. 300.
- [4] Agrawal, V.S., i.c., P. 48.
- [5] Opinion of Langden, quoted by V.S. Agrawal, i.c., PP. 47-48 and also opinion of Maxmuller in Sampurnānand's "Āryon Kā Ādidesa", P. 16.