

Walking with the Unicorn

Social Organization and Material Culture
in Ancient South Asia

Jonathan Mark Kenoyer
Felicitation Volume

Edited by

Dennys Frenez, Gregg M. Jamison, Randall W. Law,
Massimo Vidale and Richard H. Meadow

ARCHAEOPRESS ARCHAEOLOGY



ARCHAEOPRESS PUBLISHING LTD

Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978 1 78491 917 7

ISBN 978 1 78491 918 4 (e-Pdf)

© ISMEO - Associazione Internazionale di Studi sul Mediterraneo e l'Oriente, Archaeopress and the authors 2018

Front cover: SEM microphotograph of Indus unicorn seal H95-2491 from Harappa (photograph by J. Mark Kenoyer © Harappa Archaeological Research Project).

Back cover, background: Pot from the Cemetery H Culture levels of Harappa with a hoard of beads and decorative objects (photograph by Toshihiko Kakima © Prof. Hideo Kondo and NHK promotions).

Back cover, box: Jonathan Mark Kenoyer excavating a unicorn seal found at Harappa (© Harappa Archaeological Research Project).



ISMEO - Associazione Internazionale
di Studi sul Mediterraneo e l'Oriente
Corso Vittorio Emanuele II, 244
Palazzo Baleani
Roma, RM 00186

www.ismeo.eu

Serie Orientale Roma, 15

This volume was published with the financial assistance of a grant from the Progetto MIUR 'Studi e ricerche sulle culture dell'Asia e dell'Africa: tradizione e continuità, rivitalizzazione e divulgazione'

All rights reserved. No part of this book may be reproduced, or transmitted, in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of the copyright owners.

Printed in England by The Holywell Press, Oxford

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

Jonathan Mark Kenoyer and ISMEO – Occasions in Continuumv Adriano V. Rossi	v
Jonathan Mark Kenoyer – The Tale of Sikander and the Unicorn ix Dennys Frenez, Gregg Jamison, Randall Law, Massimo Vidale and Richard H. Meadow	ix
Jonathan Mark Kenoyer – Bibliography xi	xi
Fish Exploitation during the Harappan Period at Bagasra in Gujarat, India. An Ichthyoarchaeological Approach1 Abhayan G. S., P. P. Joglekar, P. Ajithprasad, K. Krishnan, K. K. Bhan and S. V. Rajesh	1
The Sincerest Form of Flattery? Terracotta Seals as Evidence of Imitation and Agency in Bronze Age Middle Asia19 Marta Ameri	19
Reflections on Fantastic Beasts of the Harappan World. A View from the West26 Joan Aruz	26
Fish Symbolism and Fish Remains in Ancient South Asia33 William R. Belcher	33
Some Important Aspects of Technology and Craft Production in the Indus Civilization with Specific Reference to Gujarat48 Kuldeep K. Bhan	48
Chert Mines and Chert Miners. The Material Culture and Social Organization of the Indus Chipped Stone Workers, Artisans and Traders in the Indus Valley (Sindh, Pakistan)68 Paolo Biagi, Elisabetta Starnini and Ryszard Michniak	68
Ceramic Analysis and the Indus Civilization. A Review90 Alessandro Ceccarelli and Cameron A. Petrie	90
Family Matters in Harappan Gujarat104 Brad Chase	104
Revisiting the Ornament Styles of the Indus Figurines: Evidence from Harappa, Pakistan120 Sharri R. Clark	120
The Harappan ‘Veneer’ and the Forging of Urban Identity150 Mary A. Davis	150
Private Person or Public Persona? Use and Significance of Standard Indus Seals as Markers of Formal Socio-Economic Identities166 Dennys Frenez	166
Lithic Blade Implements and their Role in the Harappan Chalcolithic Cultural Development in Gujarat ...194 Charusmita Gadekar and P. Ajithprasad	194
Who Were the ‘Massacre Victims’ at Mohenjo-daro? A Craniometric Investigation210 Brian E. Hemphill	210
Indus Copper and Bronze: Traditional Perspectives and New Interpretations251 Brett C. Hoffman	251
A Short Note on Strontium Isotope Analysis of Human Skeletal Remains from the Site of Sarai Khola265 Asma Ibrahim	265
The Organization of Indus Unicorn Seal Production. A Multi-faceted Investigation of Technology, Skill, and Style272 Gregg M. Jamison	272

The Size of Indus Seals and its Significance	292
Ayumu Konasukawa and Manabu Koiso	
The Art and Technology of Reserving a Slip. A Complex Side of Indus Ceramic Tradition	318
K. Krishnan and Sneh Pravinkumar Patel	
The Art of the Harappan Microbead – Revisited	327
Randall W. Law	
The North Gujarat Archaeological Project – NoGAP. A Multi-Proxy and Multi-Scale Study of Long-Term Socio-Ecological Dynamics	343
Marco Madella, P. Ajithprasad, Carla Lancelotti, J. J. García-Granero, F. C. Conesa, C. Gadekar and S. V. Rajesh	
Toponyms, Directions and Tribal Names in the Indus Script	359
Iravatham Mahadevan and M. V. Bhaskar	
Ganweriwala – A New Perspective	377
Farzand Masih	
Personal Reflections on some Contributions of Jonathan Mark Kenoyer to the Archaeology of Northwestern South Asia	384
Richard H. Meadow	
Invisible Value or Tactile Value? Steatite in the Faience Complexes of the Indus Valley Tradition	389
Heather M.-L. Miller and Jonathan Mark Kenoyer	
What Makes a Pot Harappan?	395
Heidi J. Miller	
Dilmun-Meluhhan Relations Revisited in Light of Observations on Early Dilmun Seal Production during the City IIA-c Period (c. 2050-1800 BC)	406
Eric Olijdam and H��l��ne David-Cuny	
Unicorn Bull and Victory Parade	433
Asko Parpola	
Analytical Study of Harappan Copper Artifacts from Gujarat with Special Reference to Bagasra	443
Ambika Patel and P. Ajithprasad	
Looking beneath the Veneer. Thoughts about Environmental and Cultural Diversity in the Indus Civilization	453
Cameron A. Petrie, Danika Parikh, Adam S. Green and Jennifer Bates	
Decorated Carnelian Beads from the Indus Civilization Site of Dholavira (Great Rann of Kachchha, Gujarat)	475
V. N. Prabhakar	
Artifact Reuse and Mixed Archaeological Contexts at Chatrikhera, Rajasthan	486
Teresa P. Raczek, Namita S. Sugandhi, Prabodh Shirvalkar and Lalit Pandey	
Pre-Prabhas Assemblage in Gujarat. An Assessment based on the Material Culture from Somnath, Datrana and Janan	495
Rajesh S. V., Charusmita Gadekar, P. Ajithprasad, G. S. Abhayan, K. Krishnan and Marco Madella	
The Indus Script and Economics. A Role for Indus Seals and Tablets in Rationing and Administration of Labor	518
Rajesh P. N. Rao	
Beads of Possible Indus Origin with Sumerian Royal Inscriptions	526
Julian E. Reade and Jonathan Taylor	
The Role of Archaeology in National Identity: Muslim Archaeology in Pakistan	530
Shakirullah	
The Smallest Scale of Stone. Pebbles as a Diminutive Form of Nature	536
Monica L. Smith	
Five Thousand Years of Shell Exploitation at Bandar Jissah, Sultanate of Oman	547
Christopher P. Thornton, Charlotte M. Cable, David Bosch and Leslie Bosch	

Indus Stone Beads in the Ghaggar Plain with a Focus on the Evidence from Farmana and Mitathal.....	568
Akinori Uesugi, Manmohan Kumar and Vivek Dangi	
Locard’s Exchange Principle and the Bead-Making Industries of the 3rd Millennium BC.....	592
Massimo Vidale, Giuseppe Guida, Gianfranco Priori and Anna Siviero	
Inscription Carving Technology of Early Historic South Asia. Results of Experimental Archaeology and Assessment of Minor Rock Edicts in Karnataka.....	605
Heather Walder	
The Volumetric System of Harappa.....	623
Bryan K. Wells	
An Harappan History of US Researchers in Pakistan. In Celebration of Jonathan Mark Kenoyer	628
Rita P. Wright	
Editors	636
Authors Contacts.....	637

Archaeopress Open Access

Archaeopress Open Access

Toponyms, Directions and Tribal Names in the Indus Script

Iravatham Mahadevan and M. V. Bhaskar

Identification of ideograms in the Indus Script depicting the physical features ‘hills’ and ‘plains’, ‘high’ and ‘low’, and the directions ‘West’ and ‘East’, is proposed in the paper. It is also shown that the ideograms, when combined as pairs in the Indus texts, correspond to specific toponyms in the Indus Realm, especially ‘high mountains’, ‘highlands’, ‘western hills’ and ‘eastern hills’. Names of tribes, also serving as place names, depicted by the ideograms are also identified. In Dravidian languages, terms for ‘high’ also denote ‘West’, and terms for ‘low’ also denote ‘East’. The Dravidian usage reveals that the architecture of the Indus cities with the ‘high’ citadel in the west and the ‘lower’ town in the east is in conformity with the Dravidian world view. The results strongly support the Dravidian authorship of the Indus Civilization. The authors acknowledge their indebtedness to the studies by R. Balakrishnan, especially to his insight that it is the Dravidian linguistic usage ‘high-west’ and ‘low-east’ that must have influenced the architecture of the Indus cities.

Keywords: Indus Script, toponyms, directions, place names, Indian history.

Table 1. Physical Features, Directions, and Tribal Names in the Indus Script.

Signs						
Labels	HILLS	PLAINS	CONE	HORN	ROOT/WEEDS	AXE
Alphabetic Index	A	B	C	D	E	F
Frequency	54	207	76	26	54	21

Introduction¹

Ideograms in the Indus Script depicting the physical features ‘hills’ and ‘plains’, ‘high’ and ‘low’, and the directions ‘West’ and ‘East’, are identified and interpreted in this paper (Table 1). It is also shown that the ideograms which occur as pairs in the Indus inscriptions correspond to known toponyms in the Indus Region including especially ‘high mountains’, ‘highlands’, ‘western hills’ and ‘eastern hills’. While physical features like ‘hills’ (A) and ‘plains’ (B) can be discerned directly from the pictorially transparent signs, it is the Dravidian language that provides the clues, through rebus, to identify the signs depicting the directions ‘West’ (C and D) and ‘East’ (E), and the elevations ‘high’ and ‘low’ respectively, and the tribal names (F).

¹ We present the evidence and the results in the following Sections: 1) Ideograms depicting physical features and directions in the Indus Region; 2) Sign pairs depicting Toponyms of the Indus Region; 3) Survival of Indus Toponyms in the Indo-Aryan tradition; 4) Survival of Indus Tribal names in the Indo-Aryan tradition. Results of the investigation are summarized in tables to facilitate discussion. Texts and frequencies are cited from the Archaeological Survey of India Concordance (Mahadevan 1977); references are given to the ‘Corpus of Indus Seals and Inscriptions’ (CIS: Joshi and Parpola 1987; Parpola *et al.* 2010; Shah and Parpola 1991) for photographic illustrations of seals and inscriptions; ‘D.’ prefixed to Entry Numbers in DEDR; for other abbreviations, see the ‘Abbreviations’ list at the end of the paper.

High-West, Low-East in Dravidian: In Dravidian languages, terms for ‘high’ also denote ‘West’, and terms for ‘low’ also denote ‘East’. The Dravidian usage is in contrast with Indo-Aryan in which ‘north’ is the ‘upper’ direction (*uttara*). The comparison reveals that the architecture of the Indus cities with the ‘high’ citadel in the ‘West’ and the ‘lower’ town in the ‘East’ is in conformity with the Dravidian rather than Indo-Aryan world view. The results strongly support the Dravidian authorship of the Indus Civilization. The authors wish to acknowledge their indebtedness to the studies by R. Balakrishnan (2010, 2011, 2012, 2016), based on extensive analyses of present-day place names in the Indus and adjoining regions, and in the Dravidian South, especially to his insight that it is the Dravidian linguistic usage ‘High-West’ and ‘Low-East’ that must have influenced the architecture of the Indus cities.

Parallel interpretations: Some of the signs in Table 1 have parallel, alternative interpretations with different meanings. Thus, Sign B is also identified through rebus as denoting an ‘assembly’ or ‘guild’. Similarly, Signs E and F are identified, also through rebus, as depicting the names of a pair of closely allied ‘hill tribes’. Parallel interpretations are based on the evidence of survival of Indus signs in later times as verbal or graphic symbols of various kinds and the legends that evolved around them in Dravidian and Indo-Aryan traditions. Multiple

parallels can also occur due to the vast area of the Indus Realm and the millennial duration of the Indus Civilization. The actual meaning of the signs will depend on the context in the inscriptions. This explanation however begs the question: how to determine the context? We admit that the question is not always easy to answer. The Indus people were familiar with the context; but we cannot always find it, partly because we miss the clues in the still undecoded signs which may indicate the context. In the present state of our knowledge of the Indus Script, this level of uncertainty seems unavoidable. But that should not deter us from pursuing parallel interpretations for which there is substantial evidence from the bilingual traditions.

Section 1 – Ideograms depicting physical features and directions in the Indus Region

Ideogram A – HILLS 

The ideogram showing ‘three peaks’ is a self-evident pictorial depiction of ‘hills’ or ‘mountain ranges’. The identification is corroborated by similar-looking signs in other ancient pictographic scripts of the Bronze Age (Table 2).

The occurrence of the ‘three peaks’ motif on punch-marked silver coins and later copper coins issued by various dynasties across the country (Sharma 1990) provides further evidence for the correctness of the literal meaning of the Indus ideogram A. In later times, the top of the peaks is rounded off, and the number of peaks increased to six, known to numismatists as the ‘three-arched’ and ‘six-arched’ hills (Figure 1).



Figure 1. Hills motifs on the coins of the Early Historical Period (modified after Savita Sharma 1990: pl. 36-38).

We interpret the ideogram ‘hills’ through parallel expressions in Dravidian, their meaning depending on the context in the Indus inscriptions.

- i. D.4742: Ta. *malai* ‘mountain, hill’
- ii. D.1864: Ta. *kunru* ‘hill’ > *kunravar*, ‘mountaineers’
D.1844: Ta. *kuram*, ‘kurava tribe’; Te. *korava* ‘name of a tribe of mountaineers’
- iii. **Literal** D.2178: Ta. *kō* ‘mountain’
Rebus D.2177: Ta. *kō* ‘king, great man, leadership’

Table 3. Interpretation of ideogram A: HILLS.

 A	(i)	<i>mal-(a)</i> ‘mountains’; <i>ku(n)r-(u)</i> ‘hills’
	(ii)	<i>kur-(a)</i> ‘mountain/hill tribes’
	(iii)	<i>kō</i> ‘mountain’ (literal) > ‘chieftain’ (rebus)

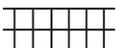
Table 2. Comparison of Indus ideogram HILLS with pictograms from other scripts (modified after Parpola 1994: fig. 4.7).

Script	Sign	Meaning
Archaic Sumerian		mountain hill-country foreign country
Hieroglyphic Egyptian		sandy hill-country foreign country mountain
Archaic Chinese		mountain hill mound
Hieroglyphic Hittite		citadel country
Indus		mountain hill

Ideogram B – PLAINS 

This is also a transparent pictorial sign depicting a ‘ploughed field’ crisscrossed by furrows. The famous ploughed field excavated at the Indus site at Kalibangan points to the physical basis of the symbolism (Figure 2).

A similar sign with near-identical form occurs in the Egyptian hieroglyphic script.

 Land marked out with irrigation runnels
Ideo. or det. for ‘district, province’
(Gardiner 1978: N. 24)

The corresponding Dravidian expression is D.3638: Ta. *nātu* ‘country, province, rural tract’. We propose, on the basis of literary and inscriptional Tamil usage, as well as archaeological evidence for the well-administered Indus polity, the following parallel meanings of the sign:

- nāt-(u)* (i) ‘cultivated fields, lowlands, flood plains’; ‘region’ (country, province)
- (ii) ‘assembly’ (of a region)
- (iii) ‘guild’ (of merchants or artisans)

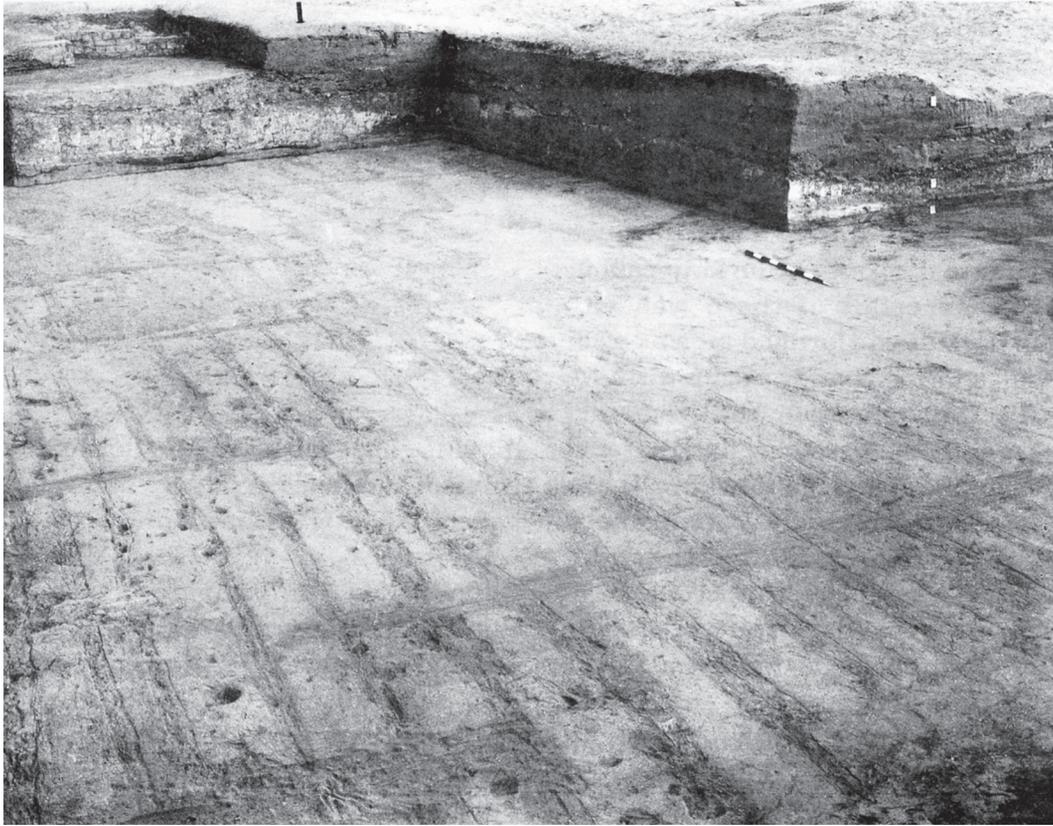


Figure 2. Kalibangan. Ploughed Field with furrows (Lal *et al.* 2003: pl. XXII).

It is relevant to notice the striking parallels attested in Tamil inscriptions (Subbarayulu 2002-2003):

- ūr ‘village, village assembly’
- nāṭu ‘region, regional assembly’; ‘guild (of merchants or artisans)’
- cf. ūr āy icainta ūr ‘people of the village meeting in assembly’; nāṭu āy icainta nāṭu ‘people of the region meeting in assembly’; cittira mēli periya nāṭu ‘the great (mercantile) guild known as Cittira-mēli’.

Table 4. Interpretation of ideogram B: PLAINS.

 B	(i) ‘region’ (ii) ‘assembly’ (of a region) (iii) ‘guild’ (of merchants or artisans)
--	---

Ideogram C – CONE > ‘high’ or ‘West’ 

The sign depicts pictorially a ‘cone, heap, pile or pyramid’ and is interpreted as ‘high’ or ‘West’ through rebus.

Literal D.5094 Ka. mēruve ‘pile, pyramid’;
Te. mēruvu ‘pyramid, cone’.

Rebus D.5086 Ta. mēl ‘west, that which is over or above’; > ‘head, leadership, superiority’;
mēlai ‘upper, western’.
mēṛku ‘West’.
mēkku ‘height, West’.

Table 5. Interpretation of ideogram C: CONE.

 C	(i) mēr-(u) ‘cone’ (literal) (ii) mēl ‘high’ > superior (iii) mēl ‘West, western’ (rebus)
--	---

Ideogram D – HORN > ‘west, western’ 

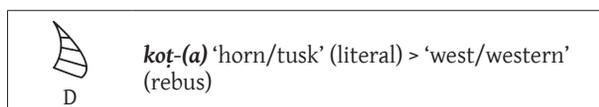
The sign depicts pictorially the ‘horn (of an animal)’ or the ‘tusk (of the elephant)’. We propose that the sign is an ideogram with the intended meaning ‘west, western’ through rebus.

Literal D.2200 Ta. kōṭu ‘horn, tusk’

Rebus D.1649 Ta. kuṭa- ‘western’, kuṭakku ‘West’
D.2203 Ta. kōṭai ‘west wind’; Ma. kōṭa ‘West’
cf. kuṭa malai ‘western hills’ (Paṭṭiṇa. 188; Malai. 527).
kuṭa kaṭal ‘western sea’ (Pura: 2: 10).

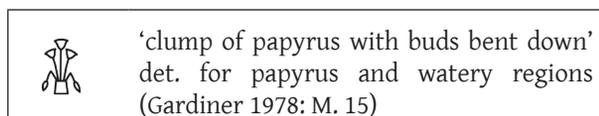
Sign D, unlike Sign C, does not have the alternative meaning ‘high’. Signs C and D are independent with different pictorial origins and must therefore have distinct meanings. In Old Tamil, *kuṭa* is restricted to the meaning ‘west, western’ unlike *mēl* which has the alternative meanings ‘high or west’. We propose that the same distinction obtained in Indus-Dravidian between *mēl* ‘high or west’ and *koṭ-(a)* ‘west, western’.

Table 6. Interpretation of ideogram D: HORN.



Ideogram E – ROOT > ‘low’ or ‘East’; WEEDS > Name of a ‘hill tribe’ 

This is a pictorial sign of a plant with a bulbous ‘root’ underground and the shoots above. Hunter identified the sign as depicting a ‘marsh plant’. He drew attention to ‘our own conventional way of indicating a marsh in map-drawing’ (Hunter 1934: pp. 80-81 and Table XVII). A near-identical sign with similar meaning occurs in the Egyptian Hieroglyphic Script:



Accordingly, we propose that the ideogram E can be interpreted literally as a ‘marsh plant’, and ideographically as ‘marsh, wetlands, or low-lying areas’. Sign E can be interpreted in two distinct ways, one from the lower part (root), and the other from the upper part (weeds), depending on the context. The literal meaning ‘root’ and the intended meanings:

Literal D.1578 Ta. *kīlaṅku* ‘bulbous root’
Intended D.1619 Ta. *kīl* ‘place or space below’;
kīlakku ‘East’

cf. *kīlaṅku kīl vīlntu* ‘bulbous root extending below (the ground)’ (*Narr.* 328: 1).
kīlatu ‘land which is at a low level’ (*Pura.* 6: 5).
kīl kārru ‘eastern wind’ (*Tivā.*).
 The literal meaning ‘weeds’ and the intended meanings:

Literal D.1373 Ta. *kaḷ*, ‘to weed, weeding’;
kaḷai ‘weeds’
 Ma. *kaḷa* ‘tares’; Ka. *kaḷuba*
 ‘weeds, grass’
 D.1383 Ta. *kaḷḷi* ‘milk-hedge’
 D.1384 Ka. *kaḷḷe*, ‘N. of a plant’
 Tu. *kaḷḷe* ‘a kind of grass’

Intended D.1376 Ta. *kaḷamar* ‘husbandmen’;
kaḷam ‘threshing floor’
 Te. *kalanu* ‘threshing floor’

cf. Ta. *kaḷḷar*, *kaḷ(a)var*, *kaḷamar* ‘N. of a hill tribe, warriors, husbandmen’.
kaḷamar ‘warriors’ (*Matur.* 393); ‘husbandmen’ (*Cilap.* 1.10: 125).
 cf. *kaḷ(a)var kōmān... mā vaḷ pulli* ‘Pulli, great liberal, lord of the Kaḷ(a)var’ (*Aka.* 61: 11-12). Note that the chieftain’s name is derived from *pul* ‘grass’.
 Ta. Lex. *kaḷar* ‘marsh, bog (*cērru nilam*)’;
 cf. *kāl āḷ kaḷar... kaḷiṟu* ‘(when) the elephant’s leg is stuck in the marsh...’ (*Kuraḷ* 500)

The *kaḷ-* tribe migrated to the plains and took to agriculture. They were mainly engaged in weeding (*kaḷ*) and other activities on the threshing floor (*kaḷam*). They also served as warriors as seen from the evidence summarised above. In later times, the name of the Dravidian tribe *Kaḷḷar* was confused with the homonymous *kaḷḷar* ‘thieves, robbers, deceitful persons’ (D.1372).

Bull-baiting in the Indus. For the later history of the *Kaḷḷar* and the allied Dravidian tribes in South India, the best account is found in Thurston and Rangachari (1909). The work is a goldmine of ethnographic data. We have space here to mention only a single detail: *jalli-k-kaṭṭu* ‘bull-baiting’, which has remained the most popular sport of the *Kaḷḷar* and *Maṟavar* down the ages. The eye-witness account of the event at the end of the 19th century finds an exact parallel in *ēru taḷuvutal*, lit., ‘embracing the bull’, described in *Caṅkam* literature two thousand years earlier (*Kali.* 101-107). The most convincing visual evidence for bull-baiting in the Indus two thousand years still earlier is found in a remarkably realistic seal from Mohenjo-daro (CISI: M-312) (Figure 3). This is unquestionably the most compelling evidence that the Tamil *Maṟavar* (*Kaḷḷar* and *Maḷavar*) have their roots in the Indus Civilization.

Note: This is an ethnographic account. We express no opinion on the ethic of the continuance of bull-baiting in the present day.

The literal meaning ‘marsh plant’ and the intended meanings:

Literal cf. D.2347 Ta. *campu* ‘elephant grass’;
campai-kōrai ‘elephant grass’
 Ka. *jambu* ‘a kind of reed or sedge’
 Te. *jambu* ‘bulrush, sedge’
 cf. also D.2235 Ta. *kōrai* ‘sedges and bulrushes’



Figure 3. Mohenjo-daro. Seal with bull-baiting in the Indus (Joshi and Parpola 1987: M-312).

identification is confirmed by variants of the sign (Mahadevan 1977: Sign 253):



A miniature golden axe of exquisite workmanship assigned to the early centuries AD was found in the excavations at Pattanam (Kerala) identified with Muciri, the famous seaport of the Cēras in the Classical Period (Figure 4). The artefact featuring an axe with blade tied to the handle resembles the Indus ideogram. The gold miniature used as a pendant is likely to be associated with the legend of Paraśurāma, lit., ‘Rāma with the axe’ who is said to have reclaimed Kerala from the sea by the throw of his axe (for a critical appraisal of the myth, see Choudhary 2010).

Intended *campu* ‘marshland, wetlands’
(ideographic)

The usage can be illustrated with the legend of *jambulingam* (< Ta. *campu*-) or *appulingam* (< Skt. *ap-* ‘water’) in the temple of Jambukesvaram (< Ta. *campu*-) at Tiruvanaikkoyil in Tamilnadu. The lingam is installed in a watery region at a low level with the *garbhagriha* always flooded in ankle-deep water. The proposed interpretations are summarized in Table 7.

Ideogram F – AXE > Name of a ‘hill tribe’ / Name of a region’ □

The ideogram is a pictorial sign depicting an axe with the blade tied or fastened through a handle. The



Figure 4. Miniature golden axe from Pattanam, Kerala (courtesy Kerala Council of Historical Research, Pattanam Project).

Table 7. Interpretation of Indus-Ideogram E: ROOT/WEEDS (see also Tables 18 and 19).

Indus Sign	Literal Interpretation	Intended Interpretation	
		Ideographic	Through Rebus
E: ROOT (lower part)	i. kīl- ‘bulbous root’ (cf. <i>kīlanku</i>)	<i>kīl-</i> ‘low’ (cf. <i>kīl</i> , <i>kīlatu</i>)	<i>kīl-</i> ‘east, eastern’ (cf. <i>kīlakku</i> , <i>kīl</i> , <i>kīlai</i>)
E: WEEDS (upper part)	ii. kaḷ- ‘weeds’ (cf. <i>kaḷai</i>)	a) <i>kaḷ</i> ‘to weed, weeding > ‘one who weeds’ b) <i>kaḷ</i> ‘N. of a tribe’ (cf. <i>kaḷlar</i> , <i>kaḷavar</i>)	a) <i>kaḷa-</i> ‘marsh, bog’ (cf. <i>kaḷar</i>) <i>kaḷa-</i> ‘threshing floor’ (cf. <i>kaḷam</i>) <i>kaḷa-(m)-ar</i> ‘husbandmen, warriors’ (cf. <i>kaḷamar</i>)
	iii. camp-(u) ‘plants of the marsh’ (cf. Ta. <i>campu</i> , <i>campaiḱōrai</i> ; Ka. and Te. <i>jambu</i>)	<i>camp-(u)</i> ‘marsh, wetlands’	

The literal and intended meanings of the ideogram F:

Literal D.4749 Ta. *maḷu* ‘axe, battle axe’; Ma. *maḷu* ‘hatchet’.
 Koḍ. *matti* ‘axe with blade fastened through wooden handle’.

Rebus D.4747 Ta. *maḷa-* ‘youth’, *maḷavan* ‘young man, warrior’.

cf. Ta. *maḷavar* ‘N. of a hill tribe’.
maḷavar perumakaṇ māvaḷ ōri ‘Ōri, the great liberal, lord of the Maḷavar’ (*Nar.* 52: 9).
maḷa-pulam ‘country inhabited by the Maḷavar’ (*Aka.* 61: comm.).
maḷa-pulam vaṇakkiya māvaḷ pulli ‘Pulli, the great liberal, who subdued Maḷa-pulam’ (*Aka.* 61: 12).
maḷa-nāṭu ‘country of the Maḷavar’ (*Tol. Col.* 273, comm. *ḷampūraṇar*).

In Tamil tradition, the Kaḷḷar and the Maḷavar were two closely allied warrior tribes known for their valour. Hence they are referred to more frequently together as the Maṛavar ‘warriors’.

cf. D.4763 Ta. *maṛam* ‘valour’; *maṛavan* ‘inhabitant of hilly tract, person of the Maṛava caste, warrior, military chief.’
 Ma. *maṛavar* ‘the Tamil tribe of warriors’.
 Tu. *marava* ‘the caste of the Maravas’.

Sign F ‘axe’ is also interpreted ideographically as a ‘battle axe’ with the meaning *maṛ-(a)-* ‘valour > N. of a warrior tribe (cf. *maṛavar*).

The Kaḷḷar and the Maḷavar also call themselves *akamuṭaiyār* lit., ‘palace attendants’ based on the tradition that they served in earlier times in the palaces of the Tamil kings. Kaḷḷar and Akamuṭaiyār are presently regarded as subdivisions of the Maṛavar (Thurston and Rangachari 1909: *Maṛavan*). Kaḷḷar, Maṛavar and Akamuṭaiyār are also included in the common name

Mukkulattōr ‘people of the three tribes’. The name Mukkulattōr and the parallel name Mukkuvvar ‘people of the three peaks’, a tribe in Kerala, appear to be connected with the symbolism of the ‘three-peaked hill’ (Indus Sign A: HILLS). The Indus origin of the Dravidian tribes, (Kaḷḷar, Maḷavar, and Maṛavar), is corroborated by their survival with sanskritised names in Northern and Central India (Section 4). Interpretations of Sign F ‘axe’ are summarized in Table 8.

Table 8. Interpretation of Ideogram F: AXE.

 F	maḷ-(u) ‘axe’ (literal) > maḷ-(a) ‘N. of a tribe’ (rebus) (cf. <i>maḷavar</i>); ‘battle axe’ (ideo.) > maṛ-(a)- ‘N. of a tribe’ (cf. <i>maṛavar</i>)
--	--

Origin of Indus-Dravidian tribes from Hilly Regions

There is evidence in the Indus inscriptions that the original habitat of the two tribes, Kaḷ- and Maḷ-(a), was in hilly regions, and that they must have migrated to the Indus plains where they took to agriculture and also served as warriors, indicating a long period of acculturation commencing from much earlier times. The evidence comes primarily from the paired signs with high frequency linking the tribal names with ‘hills’ (Figure 7).

It is noteworthy that *kō* ‘mountain’ is the root of the names of many Dravidian hill tribes (e.g., Koṇḍa, Koḍagu, Kota, Kuṛava, Kui, Kurumba, Kurukh, Kuvi). It is thus likely that *kō* ‘mountain’ (D.2178) is semantically connected with *kō* ‘great man’ (D.2177), the latter with the meaning ‘he of the mountains’. The preferred location for the temples of the Dravidian gods, Murukaṇ and Māl, are on hills, or artificially built terraces; cf. Old Ta. *māṭa-k-kōyil*.

Table 9. Evidence for the origin of Indus-Dravidian tribes from hilly regions.

Sign Pairs		
Alphabetic Index	A E	A F
Frequency*	16	14
Interpretation	<i>kaḷ- kō</i> ‘chieftain of the Kaḷ- (tribe)’ (cf. <i>kaḷḷar</i>)	<i>maḷ-(a) kō</i> ‘chieftain of the Maḷ-a (tribe)’ <i>maṛ-(a) kō</i> ‘chieftain of the Maṛ-a (tribe)’ (cf. <i>maḷavar</i> and <i>maṛavar</i>)
* Frequencies include other occurrences with meanings not related to tribal names.		

Table 10. Sign pairs depicting Indus toponyms.

Sign Pairs					
Alphabetic Index	A C	A D	A E	B C	B D
Frequency*	12	1	16	31	3
Interpretation	High Mountains	Western Hills	Eastern Hills	High Country	Western Country
* Frequencies include other occurrences with meanings not related to toponymy.					

SECTION 2 – Sign pairs depicting toponyms of the Indus Region

The prominent topographical features which appear to be related to the Indus ideograms are shown in Figure 5. Paired signs from the Set A - F (see Table 1) attested in the inscriptions appear to denote well-known topographical features of the Indus Region (Table 10).

‘High mountains’ – The Himalayas

The topography of the Indus Region indicates that the sign pair CA ‘High mountains’, must refer to the Himalayas, the highest mountain range known to the Indus Civilization.

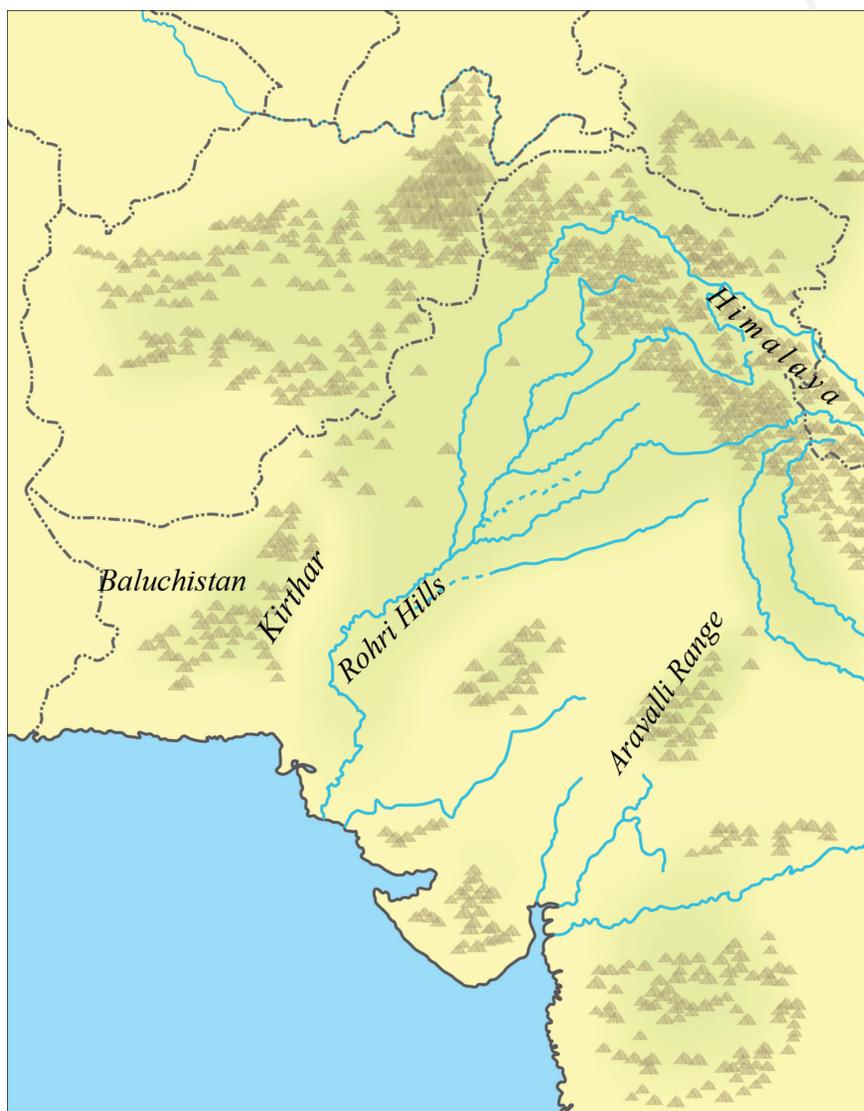


Figure 5. Map of Indus Region showing Toponyms associated with Indus Ideograms.

Table 11. Interpretation of the Sign Pair CA: The Himalayas.

		<i>māl mal-(a)</i> 'high mountains' The Himalayas
---	---	---

‘Western hills’ – The Kirthar Range

The ‘Western hills’ are most probably to be identified with the Kirthar Range to the west of the Indus plains forming the border between the alluvial plains to the east and the Balochi highlands to the west. The Kirthar range was an important source for raw materials, especially lead, silver and limestone, utilized by the Indus artisans (Wright 2010).

Table 12. Interpretation of the Sign Pair DA: The Kirthar Range.

		<i>koṭ- ku(n)r-(u)</i> 'western hills' The Kirthar Range
---	---	--

‘Eastern hills’ – The Rohri or Aravalli Hills

The ‘Eastern hills’ may be identified with the Rohri Hills to the east of the Indus plains. These hills produced the best quality chert much sought after by the artisans especially for making the standard cubical stone weights used throughout the Indus Realm (Wright 2010). Alternatively, the ‘Eastern Hills’ may also refer to the Aravalli Range at the eastern perimeter of the greater Indus Region. Khetri and other sites in the Aravalli Range supplied most of the copper extensively used in manufacturing a variety of tools, weapons and utensils by the Indus artisans (Wright 2010).

Table 13. Interpretation of the Sign Pair EA: The Rohri or Aravalli Hills.

		<i>kīl ku(n)r-(u)</i> 'eastern hills' The Rohri or Aravalli Hills
---	---	---

‘High country’ – The Balochi Region

The ‘High Country’ or highlands may be identified with the Balochi uplands to the west of the Indus alluvial plains. This region had made remarkable contribution to the economic prosperity of the Indus Civilization. The region supplied the raw material, especially, arsenic-rich copper, silver, lead and limestone for manufacture and export of finished goods (Wright 2010). Highly skilled artisans from the Balochi region migrated to the Indus urban centres (Pargola 1994).

Table 14. Interpretation of the Sign Pair CB: The Balochi Region.

		<i>māl nāl-(u)</i> 'high country' The Balochi Region
---	---	--

‘Western country’ – The Balochi Region

This pair of signs DB ‘Western Country’ is an alternative to CB noted above. The difference is, while Sign C denotes ‘high’, Sign D denotes ‘west/western’.

Table 15. Interpretation of the Sign Pair DB: The Balochi Region.

		<i>koṭ-(a) nāl-(u)</i> 'western country' The Balochi Region
---	---	---

Personal nouns derived from Indus toponymy

Identification of the Indus signs serving as Gender-Number suffixes has led to the formulation of the basic grammatical paradigm in Indus-Dravidian as summarized in Table 16 (for details of interpretation not included here, see Mahadevan 2010, 2011b).

Personal nouns are formed by the addition of Gender-Number suffixes to toponyms as illustrated by the seal texts from Mohenjo-daro (Table 17).

Table 16. Grammatical paradigm of gender-number suffixes in the Indus Script.

SIGN	Pictorial identification	Phonetic value in Indus-Dravidian	Grammatical category
	JAR	-(a)nr(u)	Masculine singular suffix
	ARROW	-(a)mp(u)	Non-masculine (feminine/neuter) singular suffix
	four-stroke modifier (added to signs)	-(a)r	Epicene (human masculine and/or feminine) plural suffix

Table 17. Personal nouns based on Indus toponyms.

Text	Interpretation	Reference (CISI) See Figure 7
	<i>mēl mal-(a) -(a)nr(u)</i> 'he of the High Mountains'	M-1307
	<i>koṭ-(a) ku(n)r-(u) -(a)mp(u)</i> '... she of the Western Hills'	M-809
	<i>mēl nāt-(u) -(a)nr(u)</i> 'he of the High Country'	M-269
	<i>koṭ-(a) nāt-(u) -(a)nr(u)</i> '... he of the Western Country'	M-1726

Section 3 – Survival of Indus toponyms in later Indo-Aryan tradition

Indo-Aryan toponyms related to Sign A: HILLS

Tri-kūṭa – Name of a mountain

The name *tri-kūṭa*, literally 'three-peaked hill', appears to be a survival of the symbolism of Indus Sign A: HILLS.

cf. *tri-kūṭa* 'having three peaks, humps, or elevations; N. of a mountain; Mount Mēru' (MW).

tri-kūṭa 'N. of a mountain near the Gangā river; N. of a mountain near Lankā' (Mbh. Index).

cf. *tiri-kōṇa malai*, literally, 'three-peaked hill' (in SriLanka).

It also appears that *-kūṭa* 'peak' is borrowed from Dr. *kuṭa* 'curved, bent' (D.2054).

cf. IA *kūṭa* 'heap' (CDIAL 3392); *kūṭa* 'summit, peak' (CDIAL 3394).

Trai-kūṭakas: The *Trai-kūṭaka* dynasty ruled over parts of southern Gujarat and northern Konkan in the 5th century AD. They derived their name from the *Tri-kūṭa* hill, probably situated in Northern Konkan (Majumdar 1952).

Tri-kūṭa: Architectural style of Jaina temples in Karnataka. The Jaina temples in medieval Karnataka were marked by special architectural styles based on regional tradition and mythological concepts. One of the more remarkable styles of Jaina temple architecture in Karnataka is known as *Tri-kūṭa basadi*; the temple consists of three *garbhagrhas* in a row, each with a rectangular base, capped by a *śikhara* 'peak' in the Dravida style, the central one with higher elevation (Suresh 2010: 79–84). We suggest that the *Tri-kūṭa* temple is a conscious three-dimensional architectural creation based on the mythical imagery of the three-peaked Malaya or Mēru mountain celebrated in the Jaina religious tradition.

Tri-kakuda – Name of a mountain

cf. *kakuda* 'peak, bull's hump' (CDIAL 2581).

kakuda 'peak, summit, mountain; hump of Indian bullock' (MW).

Kakut-stha 'standing on a hump', N. of the Ikṣvāku family.

Kākut-stha 'descendant of Kakut-stha', Rāma, Lakṣmaṇa, etc.

cf. *tri-kakud* 'having three peaks; N. of the Himālaya mountain' (MW).

tri-kakuda 'three-peaked (hill)' (Mbh.).

The meaning of *kakuda* 'bull's hump' recalls the coin motifs showing the top of the three peaks rounded off as humps (see Figure 1).

Malaya – Name of a mountain

cf. D.4742 Ta. *malai* 'mountain, hill' (see paragraph 'Ideogram A – HILLS' in Section 2). The entry notes the Dr. origin of IA *malaya*.

IA *malaya* 'N. of the mountain range of the Western Ghats; also name of a hilly district in Sri Lanka' (CDIAL 9902).

Malaya also occurs with suffixes meaning 'mountain' as in *Malayādri*, *Malayācala*, *Malaya-giri*, *Malaya-parvata*, etc. (MW). *Malaya-parvata* was regarded as one of the *kula-parvatāḥ* of Bhāratavarṣa (Mbh. Index). *Malaya* mountain was famous for the forests of sandalwood. The cool fragrant breeze blowing from the mountains is often alluded to in literature as *malaya-māruta* or *malaya-samīra*. *Malaya-dhvaja*, the legendary Pāṇṭiya king, was named after the insignia marking his banner, most probably the 'three-peaked hill', which also occurs on the Pāṇṭiya silver punch-marked coins (Krishnamurthy 1997). This detail links *malaya* with *tri-kūṭa*.

The myth of goddess with 'three breasts': According to Old Tamil tradition, *Malaya-dhvaja* had a daughter named

Mīnākṣi (Skt.), probably derived from Dr. *mīn-ācci* ‘the fish goddess’, referring to the ‘fish’ insignia of the Pāṇṭiya dynasty. Mīnākṣi was born with three breasts, causing great anxiety to her parents. However, the court astrologer assured them that the third breast of their daughter would disappear the moment she saw her would-be husband. And it did vanish when Mīnākṣi met Sundara, ‘the beautiful’ (god Śiva), who came to do battle with Mīnākṣi, but married her, an event still being celebrated annually at Madurai. It appears that the legend of ‘three breasts’ of the goddess is ultimately derived from the symbolism of the Indus Sign A: HILLS. In Indian tradition, peaks of the hill (from where life-giving water flows) are compared to the breasts of the woman (nourishing her child with milk).

Himālaya – Name of a mountain

Himālaya has been identified with the Indus toponym *mēl mal-(a)* ‘High Mountains’ (see Table 11). IA *malaya* has also been derived from Dr. *mal-ay* ‘mountain’. We continue our investigation into the etymology of IA *himālaya*.

cf. *himācala* ‘the Himalaya’ (CDIAL 14104) from *hima-* ‘snow’ (CDIAL 14096; RV).
himavat ‘a snowy mountain’ (RV).
himālaya ‘abode of snow’ (*Bhagavadgītā*).

Himālaya appears to be a relatively late name for the mountain earlier known more often with names like *himācala*, or with other suffixes denoting ‘mountains’ as in the case of *malaya* (see the previous paragraph). Even though the expression *himālaya* ‘abode of snow’ is apt and meaningful, it is still unique as no other mountain range in the sub-continent has the suffix *-ālaya* ‘abode’. Among the several words ending in *-ālaya* listed in CDIAL 1366, it is significant that *himālaya* is not included. It seems possible that *himālaya* is the result of an incorrect segmentation through folk etymology: *him-* (‘snow’) *-malaya* (‘Name of a mountain’) > *him-ālaya* (‘abode of snow’). Though irregularly formed, *himālaya* would still be a meaningful description of the mountain. However, further investigations lead to the conclusion that *himālaya* is likely to be a loanword from Dravidian.

Alternative Dravidian etymology for himālaya: IA *himālaya*, interpreted as ‘abode of snow’, is probably a loanword from Dravidian with the compounding of two words, *cim-(ay)* ‘peak’ and *mal-(ay)* ‘mountain’; *cim* may also mean ‘to shine, twinkle’ (D. 2545).

cf. D.2544 Ta. *cimai* ‘summit of a mountain’; *cimaiyam* ‘summit of a mountain, peak, hill’
 Kur. *cum’ā* ‘projecting point on a hill, mountain or peak’
 cf. Old Ta. *cimayam* ‘peak’ (*Aka.* 94: 1).
imaiyavar uṛaiyum cimaiya-c-cevvarai, ‘the good

mountain peak where the celestials dwell’ (*Perum.* 429).

cimaiya-k-kurala cāntu arunti iruḷi imaiya-k-kāṇam nārum kūntal ‘(her) tresses, wearing the flowers blooming in the forests on the peak of the Himālaya, are fragrant’ (*Aka.* 399: 1–2).

On the basis of the evidence summarised above, the following Dravidian etymology is a possible alternative:

Dr. *cim-(ay) mal-(ay)* > *imaya malaya* (with the loss of initial palatal) > IA *him-ālaya* (with the addition of initial *h* T. the loss of initial palatal *c > h > Ø* is also possible in Dravidian).

Indo-Aryan toponym related to Sign C: CONE

Mēru – Name of a mountain

IA *mēru*, is derived from Dr. *mēru-* ‘cone’ (literal) (see Table 5). *mēr-(u)* is pictographically depicted by Sign C: CONE. Mēru is arguably the most celebrated mountain in the Indian religious and literary tradition, its legendary origin lost in the mists of time.

cf. CDIAL 10330: *mēru* ‘fabulous mountain in Himalaya’ (Mbh.).
 CDIAL 6533: *dēva-mēru* ‘mountain of gods’.

MW: *mēru* ‘N. of a fabulous mountain’ regarded as the Olympus of Hindu mythology; Mēru is said to form the central point of Jambu-dvīpa; all planets revolve around it; the river Gangā falls from heaven on the summit of Mēru; the regents of Four Quarters occupy the corresponding faces of Mēru; the whole of Mēru consists of gold and gems; gods (including Śiva and Pārvatī) and the Seven Rishis reside on Mēru (Mbh.).

mēru ‘N. of a mountain’; gods hold counsel there; the sun and the moon revolve daily around Mēru; the abode of Viṣṇu is to the west of Mēru; the juice from the beautiful, high *jambū* tree on its summit flows around Mēru; *mēru-kūṭa* ‘the summit of Mēru’ (Mbh. Index).

A Tamil epic, *Mēru-mantara-purāṇam*, by the Jaina ascetic Vāmaṇa Muṇivar (14th century AD) narrates the story of personified Mēru and Mantara hills. According to a different tradition, Mantara is another name for Mēru.

Indo-Aryan Toponym related to Sign E: WEEDS/ROOT

Jambu-dvīpa – Ancient name of ‘Indian Subcontinent’

We propose that *jambu-dvīpa* lit., ‘country of the jamun (tree)’, but signifying ‘Indian Subcontinent’ in ancient Indo-Aryan sources, is borrowed from the still earlier Indus-Dravidian *camp-(u)-nāt-(u)* lit. ‘land of the weeds’, but denoting ‘wetlands’. The proposed interpretation

connects the Indus Sign E: WEEDS with the toponym Jambu-dvīpa (see also Table 7).

cf. D.2347 Ta. *campu* ‘elephant grass’; Ka. *jambu* ‘reed or sedge’ Te. *jambu* ‘bulrush, sedge’.

We suggest that Indus-Dravidian *camp*-(u) was borrowed as IA *Jambu* through an early Dravidian dialect with *c > j* (as in later Ka. and Te.).

cf. CDIAL 5131 *jambū* ‘the rose-apple tree’.
 CDIAL 5134 *Jambu-dvīpa* ‘central of the seven continents surrounding Mount Mēru’ (Mbh.);
Jambu-dīpa (Pkt.) ‘India’.
 PED: *Jambu-dīpa* ‘the country of rose-apples (India)’.

Jambu-dvīpa ‘N. of the *dvīpa* south of Mēru, and also the whole circular central *dvīpa*’ (Mbh. Index).

The earliest epigraphical references to *Jambu-dīpa* as the ancient name of India are found in the Edicts of Asoka at Brahmagiri and elsewhere (CII: I: *Edicts of Asoka*). These attestations are significant as they prove that Jambu-dvīpa (India) was perceived as a single country even though divided into numerous political domains, conventionally 56 in number. Jambu-dvīpa is one of the two ancient names of the Indian subcontinent, the other being *Bhārata-varṣa* (or *Bharata-khaṇḍa*). It is significant that both the ancient names of India, *Bhārata* and *Jambu-dvīpa*, are ultimately derived from the Indus (for *Bhārata*, see Mahadevan 2009).

Myth connecting the jambū tree with Jambu-dvīpa: according to Mbh., there is a huge, eternal rose-apple (jamun) tree named Sudarśana on Mount Mēru which can grant every wish. The tree is 11000 yōjanas in height and touches the heavens. The circumference of a fruit of the tree measures 2500 cubits. The fruit bursts out when ripe and pours out the silvery juice, which becomes a river passing around Mount Mēru (Mbh. Index). MW adds that Jambu-dvīpa is so named either from the (common) *jambū* tree or from the enormous *jambū* tree on Mount Mēru, visible like a standard to the whole continent (Mbh.). The latter explanation is more likely in the present context.

Pipal leaf on three-peaked hill: we draw attention to the Indus sign depicting the pipal leaf at the summit of a three-peaked hill (Mahadevan 1977: sign no. 232). The pipal leaf is one of the prominent art motifs of the Indus Culture, featured on painted pottery and on seals and other inscribed objects. The pipal leaf occurs also in the Indus Script with high frequency (Signs 326 and 327 with a total frequency of 77) (Figure 6).

The pipal leaf represents the tree (*Ficus Religiosa*) held sacred in India from times immemorial. Every village in the Tamil country has a pipal tree with a raised platform around its base on which stone sculptures

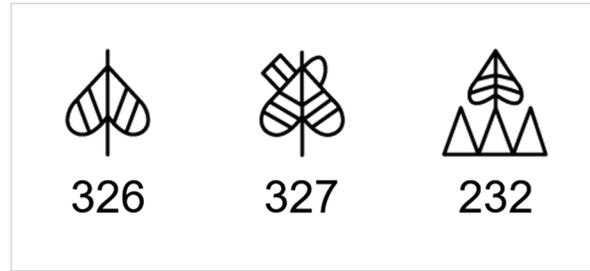


Figure 6. Pipal leaf and associated signs in the Indus Script.

of ‘entwined serpents’ (fertility symbols), are planted. It is likely that worship of the pipal tree for granting fertility of the land and of the woman is a religious practice going back to the Indus-Dravidian society. The RV does not mention the pipal tree as such, but does refer to its wood for making vessels to hold the Sōma juice (RV 1.135.8, note by Griffith). This detail connects the Indus filter cult, a fertility rite, with the Sōma of the RV (Mahadevan 1985, 2017). When the Indus Script was no longer in use, Sign 232 was understood literally as a symbol ‘pipal on the summit of a three-peaked hill’. This interpretation leads us straight to the myth noticed above of the huge, eternal, wish-fulfilling *jambū* tree on the summit of Mēru. The myth was invented to link the *jambū* tree and Jambu-dvīpa when the true origin from the Indus-Dravidian *campu/jambu* ‘weeds’ > ‘wetlands’ was forgotten in later times.

IA *jambu-dvīpa* < Dr. *campu nāṭu*: the Tamil tribes included in Mukkulattōr claim Sembu-nāḍu (*campu-nāṭu*) as their ancestral homeland (Mackenzie and Wilson 1828: *Maṛava-jāti-varṇanam*; Thurston and Rangachari 1909: *Maṛavaṇ*, in the Madras Census Report 1891). They are considered to be among the earliest Dravidian tribes and least ‘sanskritised’. We suggest that the ancestral home, Sembu-nāḍu, claimed by the Tamil tribes is based on dim memories of the distant past when their ancestors inhabited *campu-nāṭu* ‘the lowlands’ of the Indus Region.

IA *jambu-dvīpa* > Ta. *nāval-am-tīvu*. In Old Tamil poems, IA *jambu-dvīpa* is re-borrowed as a loanword *campu-tīvu*, literally translated as *nāval-am-tīvu* ‘country of the Jamun tree’.

cf. *campu-t-tīvu* (*Maṇi*. 17: 62)
 cf. D.2914 Ta. *nāval* ‘jamoon plum’.
nāval-am-taṅ polil (*Perum*. 465; *Pari*. 5: 8).
nāval-am-tīvu (*Ēlāti* 56: 4).

The re-borrowing indicates a break in the Dravidian tradition, when the original meaning of *campu-nāṭu* ‘wetlands’ as in Indus-Dravidian was forgotten and replaced by *campu-tīvu* or *nāval-am-tīvu* ‘country of the jamun tree’ as in the Indo-Aryan myth.

A further linguistic twist in Old Tamil: the word *nāval* ‘jamun tree’ can also be segmented as *nā-val* ‘oratorical skills’.

cf. D.3633 Ta. *nā, nākku, nāvu* ‘tongue’.
D.5276 Ta. *val* ‘skilful’.

The rebus between *nāval* ‘jamun’ and *nā val* ‘oratorical skills’ was exploited by theological disputants who planted a branch of the *nāval* tree in the village common and challenged the local *nā valar* ‘learned scholars’ to join debate with them.

cf. *nāval pulavar avai nāppaniṅ nāṭṭal uṟṟēṅ*, ‘I planted the *nāval* (jamun) at the centre of the place of assembly of *nā val pulavar* (learned scholars)’ (*Nīla. avai. 3*).

Summary of Indus toponyms in Indo-Aryan borrowals

The interpretations suggested in Section 3 are summarized in Table 18.

Indus origin of toponyms

Before parting with this topic, we would like to point out the special significance of the fact that the names of geographical features and toponyms like Malaya, Himālaya, Mēru, Jambu-dvīpa and Bhārata-varṣa occur in close juxtaposition and high frequency in Indian religious literature. Even though the names are in Indo-Aryan, there is no evidence that the Aryan speakers brought the memory of these places from their earlier homelands beyond the Himalayas. The Dravidian South is also too far away for the location of the toponyms except for the southern reaches of Malaya ‘Western Ghats’. Thus, the only possible source for the ultimate origin of these names of geographical features and toponyms is the Indus. The succeeding Indo-Aryans

occupying the same region retained the place names, but translated them into their own speech.

Section 4 – Survival of Indus tribal names in the Indo-Aryan tradition

After the decline and collapse of the Indus Civilization, the majority of the population stayed back merging with the incoming Aryans and, in course of time, adopting the Aryan speech. Their names and titles in the Indus-Dravidian were borrowed into Indo-Aryan through loanwords and loan translations. The borrowals were not always faithful to the originals, giving rise to myths invented to explain them. We shall consider in this section Indo-Aryan survivals of the Indus tribal names connected with the ideograms E and F.

Indo-Aryan Names of Tribes related to Indus

Ideogram E: ROOT/WEEDS 

Indo-Aryan tradition has preserved the names of a pair of closely allied tribes known as the *Aśmakas* and the *Mūlakas*. We show that these names are derived respectively from ‘weeds’ and ‘root’ depicted by the Indus ideogram E.

***Aśmakas* – Name of a people**

The name *aśmaka* is apparently derived from *aśman* ‘stone’ (CDIAL 915). We propose that the name is, in reality, a loan translation from the Indus-Dravidian tribal name *kaḷ-* through a dialectal form substituting *ḷ* with *l*.

cf. Ta. *kaḷ*, Te. *kalupu* ‘weeds’ (D.1373).

The expression *kaḷ-* ‘weeds’ was confused with the homonym *kal* ‘stone’ (D.1298), which is the source for

Table 18. Indus-Dravidian toponyms borrowed into Indo-Aryan.

Indus Signs	Indus-Dravidian Interpretations	Indo-Aryan Borrowals
 A: HILLS	mal-(a) ‘mountains, hills’ (cf. Ta. <i>malai</i>)	Names of different mountains: Trikūṭa Trikakuda Malaya Himālaya
 C: CONE	mēr-(u) ‘cone’ (cf. Ka. <i>mēruve</i> ; Te. <i>mēruvu</i>)	Mēru ‘a fabulous mountain’
 E: WEEDS	camp-(u) ‘weeds’ (various kinds of grass) > ‘wetlands’ (cf. Ta. <i>campu</i> ; Ka. and Te. <i>jambu</i>)	Jambu-dvīpa ‘India’ from <i>jambū</i> ‘jamun’ (connected through a myth)

the IA loan translation: *aśman* ‘stone’ and *Aśmaka* ‘N. of a tribe’. There is evidence that in early historical times, the *Aśmakas*, also called *Aśvakas* (Skt.) or *Assakas* (Pkt.) were present in the Punjab. Pāṇini and other early sources like the *Bṛhatsamhitā* locate the tribe in the northwestern region. The Greek writers regard the battle against the Assakenoi (*Aśmakas*) as the greatest feat of Alexander in the Indian campaign (Majumdar 1952).

The *Aśmakas* migrated from the Punjab region to Central India where their presence is attested by the expression *avanty-aśmaka* ‘the *Aśmakas* of Avanti’ (MW). The *Aśmakas* finally settled down in the Deccan in the upper Godavari valley, where they established a non-monarchical state (*gaṇa-saṅgha*). According to Buddhist texts, *Aśmaka* was counted as one of the Sixteen Mahājanapadas of ancient India (Singh 2009). The tribe was so well-known that it finds mention in both the epics, Ramayana and the Mahabharata, and in the *purāṇas*.

Mūlakas – Name of a people

This Mūlaka is derived from *mūla* ‘root’.

cf. CDIAL 10250 *mūla* ‘root’.

The name appears to be a loanword from Dravidian (as noted in D.5004).

cf. D.4997 Ta. *muḷai* ‘shoot, sprout’; Ka. *moḷake* ‘bud, sprout’.

cf. D.5004 Ta. *muḷā*, *mullāṅki* ‘radish’; Te. *mullaṅgi* ‘radish’.

We suggest that the Indo-Aryan tribal name Mūlaka is ultimately derived from the symbolism of the ‘bulbous root’ pictorially depicted in the Ideogram E.

The Mūlakas also established a non-monarchical state (*gaṇa-saṅgha*) on the Godavari (Singh 2009). The Mūlakas are attested in the epics and the *purāṇas*. Mūlaka is said to be the son of *Aśmaka* (MW). According to the *purāṇas*, *Aśmaka* and Mūlaka, father and son, ruled over Ayodhya. It is said that Mūlaka reigned during the time of Paraśurāma. Mūlaka was in fear of Paraśurāma and had to be protected by a group of women (Pargiter 1922). The Mūlakas appear to be a subdivision of the *Aśmaka* tribe both of which are depicted pictorially by a single Indus ideogram E, for ‘weeds’ and ‘root’. The supposition is confirmed by the fact that there is no record of a Dravidian tribe named after ‘root’ or ‘radish’. The name Mūlaka dates only from the Indo-Aryan times.

Kṣudrakas – Name of a people

Kṣudrakas ‘Name of a people living by warfare’ (MW). Their army fought on the side of Duryōdhana in the Bhārata war (Mbh. Index).

The name Kṣudraka is apparently derived from *kṣudra* ‘minute’ (CDIAL 3712).

kṣudra ‘minute, little, trifling’; ‘mean, low, vile; also name of several plants’ (MW).

We suggest that *kṣudraka* is a loan translation from Indus-Dravidian *kaḷ-* ‘N. of a tribe’ depicted by the ideogram E. The tribal names, both Dravidian and Indo-Aryan, appear to be connected with the meaning ‘weeds’. The later pejorative meanings of *kṣudra* find parallels in similar meanings for Dr. *kaḷ-*. In classical Sanskrit *khala* means ‘vile people’ and is the antonym of *sajjana* ‘good people’. Here we see yet another instance of Dr. *kaḷ* > IA *khala* acquiring a pejorative sense in later usage (see also paragraph ‘Ideogram E – ROOT’ in Section 3).

cf. D.1376 Ta. *kaḷam*, Te. *kalanu* ‘threshing floor’; Ta. *kaḷamar* ‘husbandmen’.

Dr. *kaḷam* > IA *khala* ‘threshing floor’ (RV 10.48.7; here, Indra boasts that he thrashed his enemies ‘like sheaves (of grain) on a threshing floor’ (Jamison and Brereton 2014).

The hyphenated name *kṣudraka-mālava* in the Epic connects the two warrior tribes who lived in the Mālava region of the Punjab, where they survived into the historical times. It is recorded in Greek sources that the Oxydrakai (Kṣudraka) fought valiantly against Alexander (Majumdar 1952). There is no region in North and Central India named after the Kṣudrakas, even though they were a powerful warrior tribe. The absence may be due to the pejorative connotation of the expression *kṣudra*. This situation finds a parallel in the Dravidian South where no territory was named after the Kaḷḷar, apparently because of the pejorative meaning of the homonym *kaḷḷar* ‘thieves’.

Indo-Aryan names of tribes related to the Indus

ideogram F: AXE 

Mālavas, Madras and Yaudhēyas are among the well-known ancient warrior tribes in the Northwest of the Indian sub-continent. They were in origin Dravidian who continued to flourish in the region with sanskritised names in early historical times. We shall trace their origin to the Indus Civilization through the ideogram F: AXE associated with their names.

The Mālavas

Indus-Dravidian origin of the Mālavas is derived as follows:

maḷ-(u) ‘axe’ > *maḷ-(a)* ‘N. of a tribe’ (cf. Ta. Maḷavar; see Table 8).

Maḷavar was borrowed into Indo-Aryan as a loanword:

Dr. *maḷava* > IA *maḷava* ‘N. of a tribe’ > *mālava* ‘N. of a people and of their country’.

cf. *mālava* ‘N. of a country’ (AV. Pariśiṣ.); *mālava* (Pkt.)
mālwa (Hindi), *maḷwa* > *mālavī*
(Gujarati) ‘N. of a country’ (CDIAL 10090).

The form *maḷ-* is significant as it points to the derivation from Dr. *ḷ* > IA *ḷ* / *l*.

The name was re-borrowed from IA into Tamil, always with *-ḷ-*.

cf. *māḷuva vēntar* ‘kings of the Mālava country’ (*Cilap.* 30: 159);
mālavattu ‘of the Mālava country’ (*Cīvaka.* 2159);
mālavam ‘N. of a country’ (*Periya.* 1621).

The form *māḷuva* appears to be related literally to the symbol ‘axe’:

Ta. *maḷu-ar* (*maḷavar*) ‘they with the axe’.

Mālavas in the Punjab: the Mālavas and the Kṣudrakas are mentioned together by Pāṇini as *āyuda-jīvi-saṅghas* ‘non-monarchical tribes who lived by the profession of arms’. The Mbh. also refers to the hyphenated name Kṣudraka-Mālavas who served in the army of Duryōdhana (Mbh. Index). The Mālava Country in the Punjab is identified with the Malwa Plateau in the Eastern Punjab. The Mālavas lived to the north of the confluence of the rivers Ravi and Chenab. The Kṣudrakas lived in the neighbouring Montgomery District. The two tribes formed a confederacy to fight Alexander. The Greek sources refer to the Mālavas and the Kṣudrakas respectively as Malloi and Oxydrakai. Their joint forces are said to have numbered 90,000 foot soldiers, 10,000 cavalry and 900 war chariots. They were eventually defeated, but Alexander had to withdraw from the Punjab (Majumdar 1952). Though their original habitat was in the Punjab, the Mālavas occupied a much wider area in Northwest and Central India during early historical times and even later. Their settlements are also found in Rajasthan and in the Malwa plateau in Central India.

Mālavas in Rajasthan: a section of the Mālava tribe occupied South Eastern Rajasthan from at least the 2nd century BC. They established their capital at Mālava-

nagara identified with modern Nagar near Jaipur. The Mālavas of Rajasthan are mainly known from numismatic evidence. Hoards of inscribed coins of the Mālava-gaṇa dated in the 2nd-4th centuries AD have been found at Nagar. Many of them bear the legends: *malavānām jaya* (or) *malava-gaṇasya jaya*. Allan (1936: cv), commenting on the coin-legends, notes the absence of the long vowel in *mā*. We ascribe this significant feature to the fact that the coin-legends refer to the name of the people *malava*, and hence the absence of the *vridhhi* form *mālava* referring to the country.

Mālavas in Central India: Avanti (later Ujjaini; modern Ujjain) was the principal settlement of the Mālavas in Western Madhya Pradesh between the Aravalli hills in the North and the Vindhya in the South. Avanti (Ujjaini) was one of the Sixteen Mahājanapadas in ancient India. It was a non-monarchical *gaṇa-saṅgha* ruled by a tribal council (Singh 2009).

The edict of Asoka at Dhauḷi is the earliest epigraphical reference to Ujēni (CII: I *Inscriptions of Asoka*). Coins with the Brāhmi legend *ujeni* in characters dated from the 2nd century BC have been found in and around Ujjain. Ujjain developed into one of the greatest centres of culture and learning in Central India during the medieval period. For a comprehensive historical account (see Jain 1972).

The Madras

Madra was the name of an ancient people in the Northwest region of the sub-continent.

cf. *madra* ‘a country in Northwest India; people of Madra (pl.)’ (CDIAL 9782; Ś Br.);
‘a country Northwest of Hindustan proper; a king of the Madras’ (MW);
‘N. of a people’ (Mbh. Index).

We propose that IA *madra* is a loanword from Indus-Dravidian *maḷ-(a)* (cf. Ta. *maḷavar*). The phonetic development, Dr. *-r-* voiced in IA as *-dr-* has a parallel: Dr. *anr-* (‘masculine singular suffix added to personal names’) > IA *andhra* ‘N. of a non-Aryan people’ (Ai. Br. VII: 18) (Mahadevan 2010). The Mahabharata enumerates Andhra-Madras among the ‘low people’, a legend that has at least the merit of connecting the Andhras with the Madras, indicating that they descended from the Dravidian tribes with ultimate origin in the Indus Civilization.

According to Mbh., Aśvapati, King of the Madras, had a daughter Mādri who was married to Pāṇḍu. Mādri begat Nakula and Sahādeva through the gods Aśvins. Śalya, king of Madra and brother of Mādri, was one of the great commanders of the army of Duryōdhana in the Bhārata war. Mālavī was the name of another wife

of the Madra king Aśvapati. According to the legend in Mbh., Yama promised that Mālavī would bear a hundred Mālavas to Aśvapati. The legend is significant in connecting the Madras with the Mālavas.

The Yaudhēyas

The Yaudhēyas were one of the most powerful warrior tribes in the Punjab, judging from literary and numismatic evidence.

cf. *yōdhā* ‘warrior’ (CDIAL 10533; RV); *yaudhēya* ‘prob. from *yōdhā*; a war-like ethnic group mentioned in the Mbh’ (MW).

The Yaudhēyas are mentioned by Pāṇini as the *āyudha jīvin* ‘people living by the profession of arms’. They had a non-monarchical form of government (*gaṇa-saṅgha*). Their main settlement was in Eastern Punjab. They exercised political control over neighbouring regions in Rajasthan and Uttar Pradesh, where their coins and inscriptions are found. They flourished from at least 4th century BC to 4th century AD. after which they disappear from history, weakened by incessant battles with more powerful adversaries like Rudradāman, the Western kṣatrapa in the 2nd century AD. and with Samudragupta in the 4th century AD.

We propose that *Yaudhēya*, lit. ‘warrior’, is a loan translation from Dr. *maṛ-(a)* also lit. ‘warrior’ from *maṛam* ‘valour’. The loan translation is a parallel formation with the loanword *madra*, also derived from Dr. *maṛ-(a)* as shown above. It is likely that, originally,

Yaudhēya was a common appellation to denote warrior tribes, but became a specific tribal name in course of time (cf. the parallel development in Old Tamil in which *Maṛavar* was the common term for both *Kaḷḷar* and *Maḷavar*, but developed into a specific tribal name as at present).

It is instructive to study the course of derivation of the three IA tribal names from the symbolism of the Indus Ideogram F: AXE:

maḷava from Dr. *maḷ-(u)*;
madra from Dr. *maṛ-(a)*;
yaudhēya from the ideogram ‘axe’, denoting ‘warrior with the battle axe’.

Yaudhēyas were organised into *gaṇas*. At least two of them issued coins inscribed *dvi* and *tri*, the numerals by which their *gaṇas* were identified. This practice is reminiscent of the Indus inscriptions mentioning numbered formations as in the case of the fish signs (Mahadevan 2011b: figs. 1.6 and 6.2). We mentioned above the possibility of *Yaudhēya* being a common, earlier appellation for ‘warrior tribes’. It is instructive to compare this with similar usage in Old Tamil where *maṛavar* is used in the sense of ‘warriors’ who are identified by their affiliation to specified monarchies:

cf. *teṇṇavar* [...] *maṛavaṇ* ‘Maṛavaṇ of the Pāṇṭiyar’ (*Puṛa*. 380: 5);
vāṇavaṇ maṛavaṇ ‘Maṛavaṇ of the Cērar’ (*Aka*. 143: 10);
cōḷar maṛavaṇ ‘Maṛavaṇ of the Cōḷar’ (*Aka*. 326: 9).

Table 19. Indus-Dravidian tribal names borrowed into Indo-Aryan.

Indus Signs	Indus-Dravidian Interpretations	Indo-Aryan Borrowals: Names of different tribes
 E: WEEDS	<i>kaḷ</i> ‘weeds’ > ‘N. of a tribe’. (cf. Ta. <i>kaḷḷar</i>)	Aśmaka < <i>aśma</i> ‘stone’ (cf. Dr. <i>kaḷ</i> ‘weeds’ > <i>kaḷ</i> ‘stone’) Kṣudraka < <i>kṣudra</i> ‘minute, N. of plants’ (cf. Dr. <i>kaḷ</i> ‘weeds, grass’)
 E: ROOT	<i>kīḷ</i> - ‘bulbous root’ (cf. Ta. <i>kīḷaṅku</i>)	Mūlaka < <i>mūla</i> ‘root’ (cf. Ta. <i>mūlai, muḷḷaṅki</i>)
 F: AXE	<i>maḷ-(u)</i> ‘axe’ > <i>maḷ-(a)</i> ‘N. of a tribe’ (cf. Ta. <i>maḷavar</i>)	Mālava < <i>maḷava</i> (cf. Gujarati <i>maḷwa, māḷavi</i>)
	<i>maṛ-(a)</i> ‘N. of a tribe’ < <i>maṛam</i> ‘valour’ (cf. Ta. <i>maṛavar</i>) connected by ideo. ‘battle-axe’	Madra Loanword from Dr. <i>maṛ-</i> with voicing of Dr. <i>-ṛ-</i> as IA <i>-dr-</i>
		<i>Yaudhēya</i> < <i>yōdhā</i> ‘warrior’, loan translation from Dr. <i>maṛ-</i>

Table 20. Re-interpretation of Indus Sign 267 with the top to the West.

Sign 267	
Frequency	Initial: 298. Total: 376.
Pictorial Interpretation	Four walls of the city with the citadel inside the top quadrant
Indus-Dravidian Interpretation	<i>aka-(m)</i> 'inside, house' (D.7)
New Finding	Top of the sign to the West

Summary of Indus tribal names in Indo-Aryan borrowals

The interpretations suggested in Section 4 are summarized in Table 19.

High-West equivalence. Application to Indus Sign 267

Finally, we return to Balakrishnan’s finding: High-West equivalence in Dravidian (see paragraph ‘High-West, Low-East in Dravidian’ in the Introduction). It leads us to a significant new result relating to Sign 267, the



Figure 7. Seals from Mohenjo-daro (see Table 17). Clockwise from top left: M-1307, M-809, M-269, M-1726 (from Joshi and Parpola 1987; Shah and Parpola 1991).

most frequent initial sign in the Indus Script. The sign has been interpreted as an ideogram depicting the four walls of the city with the citadel inside the top quadrant (Mahadevan 1981, 2011a). We can now understand that Sign 267 also indicates simultaneously the elevation (High) and direction (West) of the citadel. The sign is oriented with the top to the west. Modern maps of the Indus cities showing north at the top follow cartographic conventions different from those of the Indus (Table 20).

Conclusion

One may ask: even if the proposed results are plausible, what is the proof that they are correct? Our answer is: the proof comes from the firm inter-locking of evidence at three levels: Indus ideograms, Dravidian equivalents and Indo-Aryan borrowals. Such grid-like interlocking cannot happen by chance (for discussion and more examples, see Mahadevan 2014). This is indeed the best proof we have for the proposed interpretations. Clues for decoding the Indus Script come from survivals in the bilingual Indian tradition. Dravidian is the warp and Indo-Aryan the weft of the closely woven fabric of India's cultural past.

Abbreviations

Ai. Br. Aitareya Brāhmaṇa
Aka. Akanānūru
ASI Concordance = Mahadevan 1977
AV Atharva Veda
BMC British Museum Catalogue of Ancient Indian Coins = Allan 1936
CDIAL Comparative Dictionary of Indo-Aryan Languages = Turner 1969
Cilap. Cilappatikāram
Cīvaka. Cīvakacintāmaṇi
CII Corpus Inscriptionum Indicarum = Hultzsch 1925
CISI Corpus of Indus Seals and Inscriptions 1 = Joshi and Parpola 1987
CISI Corpus of Indus Seals and Inscriptions 2 = Shah and Parpola 1991
CISI Corpus of Indus Seals and Inscriptions 3.1 = Parpola et al. 2010
D. Prefixed to Entry Numbers in DEDR
DEDR A Dravidian Etymological Dictionary = Burrow and Emeneau 1984
Dr. Dravidian
IA Indo-Aryan
Ka. Kannada
Kali. Kalittokai
Ko. Kota
Koḍ. Koḍagu
Kuraḷ. Tirukkuraḷ
Kur. Kurukh
Matur. Maturaikkāñci
Ma. Malayalam

Malai. Malaipaṭukaṭām
Mbh. Mahābhārata
Mbh. Index Mahābhārata Index = Sorensen 1904
Maṇi. Maṇimēkalai
MW Monier-Williams = Monier-Williams 1899
Narr. Narrīṇai
Nīla. Nīlakēci
Paṭṭina. Paṭṭinappālai
PED Pali-English Dictionary = Rhys Davids and Stede 1925
Periya. Periyapurāṇam
Perum. Perumpāṇāruppaṭai
Pkt. Prākṛt
Pura. Puṛānānūru
RV Ṛgveda
ŚBr. Śatapatha Brāhmaṇa
Skt. Sanskrit
Ta. Tamil
Ta. Lex. Tamil Lexicon = Pillai 1926-36
Te. Telugu
Tivā. Tivākara Nikaṇṭu
Tol. Col. Tolkāppiyam: Collatikāram
Tu. Tuḷu

Bibliography²

- Allan, J. 1936. *A Catalogue of the Indian Coins in the British Museum. Coins of Ancient India*. London, Longmans and Co.
- Balakrishnan, R. 2010. Tamil Indus? Korkay, Vanji and Tondi in the North West and and a 'Bone-eating Camel' in the Cankam text. *Journal of Tamil Studies* 77: 191-206.
- Balakrishnan, R. 2011. *Cintu camaveḷi nākarikamum caṅka ilakkiyamum*. Chennai, International Institute of Tamil Studies.
- Balakrishnan, R. 2012. The 'High-West: Low-East' Dichotomy of Indus Cities: A Dravidian Paradigm (*Bulletin of the Indus Research Centre* 3). Chennai, Roja Muthiah Research Library.
- Balakrishnan, R. 2016. *Cintuveḷi paṇpāṭṭiṇ tirāviṭa aṭittaḷam*. Chennai, Roja Muthiah Research Library.
- Burrow, T. and Emeneau, M. B. 1984. *A Dravidian Etymological Dictionary* (Second Edition). Oxford, Clarendon Press.
- Choudhary, P. K. 2010. *Rāma with an Axe. Myth and Cult of Paraśurāma Avatāra*. New Delhi, Aakar Books.
- Gardiner, A. 1927. *Egyptian Grammar. Being an introduction to the study of hieroglyphs*. Oxford, Clarendon Press.
- Joshi, J. P. and Parpola, A. (eds) 1987. *Corpus of Indus Seals and Inscriptions, Vol. 1, Collections in India* (Annales Academiae Scientiarum Fennicae B239 / Memoirs of the Archaeological Survey of India, 86). Helsinki, Suomalainen Tiedeakatemia.
- Griffith, R. T. H. (trad.) 1896. *The Hymns of the Ṛg Veda, Second Edition*. Benares, E. J. Lazarus.

² Only modern works, including translations, are included here (see also Abbreviations).

- Hultzsch, E. 1925. *Corpus Inscriptionum Indicarum, Vol. 1. Inscriptions of Asoka*. Oxford, Clarendon Press.
- Hunter, G. R. 1934. *The Script of Harappa and Mohenjodaro and its connection with other scripts*. London, Kegan Paul and Co.
- Jain, K. C. 1972. *Malwa through the Ages (from the earliest time to 1305 A.D.)*. New Delhi, Motilal Banarsidass.
- Jamison, S. W. and Brereton Jr., J. P. 2014. *The Rig Veda: The Earliest Religious Poetry of India*. New York, Oxford University Press.
- Krishnamurthy, R. 1997. *Sangam Age Tamil Coins*. Madras, Garnet Publishing.
- Lal, B. B. 1960. From the Megalithic to the Harappa: tracking back the graffiti on the pottery. *Ancient India* 16: 4-24.
- Lal, B. B. et al. 2003. *Excavations at Kalibangan: The Early Harappans (1960-1969)* (Memoirs of the Archaeological Survey of India, No. 98). New Delhi, Archaeological Survey of India.
- Mahadevan, I. 1977. *The Indus Script: Texts, Concordance and Tables* (Memoirs of the Archaeological Survey of India, No. 77). New Delhi, Archaeological Survey of India.
- Mahadevan, I. 1981. Place Signs in the Indus Script. In Arunācalam, M. (ed.), *Proceedings of the International Conference-Seminar of Tamil Studies*. Vol. 1, Sec. 2: 2.91-2.107: 1-23. Madras, International Association of Tamil Research.
- Mahadevan, I. 1985. The cult object on unicorn seals: a sacred filter? In Karashima, N. (ed.), *Indus Valley to Mekong Delta. Explorations in epigraphy: 219-266*. Madras, New Era.
- Mahadevan, I. 2009. Vestiges of Indus Civilisation in Old Tamil. In *Proceedings of the Tamil Nadu History Congress (16th Annual Session)*: 19-38. Tiruchirapalli.
- Mahadevan, I. 2010. Harappan Heritage of Andhra: A New Interpretation. *International Journal of Dravidian Linguistics* 39 (1): 9-17.
- Mahadevan, I. 2011a. Akam and Puram: Address Signs of the Indus Script. *International Journal of Dravidian Linguistics* 40 (1): 81-94.
- Mahadevan, I. 2011b. The Indus Fish Swam in the Great Bath: A New Solution to an Old Riddle (*Bulletin of the Indus Research Centre* No. 2). Chennai, Roja Muthiah Research Library.
- Mahadevan, I. 2014. Dravidian Proof of the Indus Script via the Rig Veda. A Case Study. (*Bulletin of the Indus Research Centre* No. 4). Chennai, Roja Muthiah Research Library.
- Mahadevan, I. 2017. The Unicorn and the Sacred Filter Standard. *International Journal of Dravidian Linguistics* 46 (1): 35-69.
- Majumdar, R. C. 1952. *Ancient India*. New Delhi.
- Mackenzie, C. and Wilson, H. H. (eds) 1828. *Mackenzie Collection: A Descriptive Catalogue of the Oriental Manuscripts and other Articles Illustrative of the Literature, History, Statistics and Antiquities of the South of India*. Calcutta, Asiatic Press.
- Monier-Williams, M. 1899. *A Sanskrit-English Dictionary. Etymologically and philologically arranged with special reference to Cognate indo-european languages*. Oxford, Clarendon Press.
- Pargiter, F. E. 1922. *Ancient Indian Historical Tradition*. New Delhi, Wentworth Press.
- Parpola, A. 1994. *Deciphering the Indus Script*. Cambridge, Cambridge University Press.
- Parpola, A., Pande, B. M. and Koskikellio, P. (eds) 2010. *Corpus of Indus Seals and Inscriptions, Vol. 3.1, Supplement to Mohenjodaro and Harappa* (Annales Academiæ Scientiarum Fennicæ, Humaniora 359 / Memoirs of the Archaeological Survey of India, 96). Helsinki, Suomalainen Tiedeakatemia.
- Pasupati, M. V. 2010. *Cemmoḷittamiḷ ilakkaṇa ilakkiyaṅkaḷ*. Thanjavur, Tamil University.
- Rhys Davids, T. W. and Stede, W. (eds.) 1925. *Pāli-English Dictionary*. The Pali Text Society.
- Shah, S. G. M and Parpola, A. (eds) 1991. *Corpus of Indus Seals and Inscriptions, Vol. 2, Collections in Pakistan* (Annales Academiæ Scientiarum Fennicæ B240 / Memoirs of the Department of Archaeology and Museums, Government of Pakistan, 5). Helsinki, Suomalainen Tiedeakatemia.
- Sharma, S. 1990. *Early Indian Symbols. Numismatic Evidence*. New Delhi, Agam Kala Prakashan.
- Singh, U. 2009. *A History of Ancient and Early Medieval India. From Stone Age to the 12th Century*. New Delhi, Pearson.
- Sorensen, S. 1904. *An Index to the Names in the Mahābhārata*. New Delhi.
- Subbarayulu, Y. (ed.) 2002-2003. *Tamiḷk kalveṭṭuc collakarāti = Glossary of Tamil inscriptions*. Chennai, Santi Sadhana.
- Suresh, K. M. 2010. Selected Jaina Trikutaka Monuments from Karnataka. *Svasti*. Balbir, Nalini (Ed.) Bengaluru.
- Vaiyapuri, S. Pillai (ed.) 1926-36. *Tamil Lexicon (6 volumes and supplement)*. Madras, University of Madras.
- Thurston, E. and Rangachari, K. 1909. *Castes and Tribes of Southern India*. Madras, Government Press.
- Turner, R. L. 1969. *A Comparative Dictionary of Indo-Aryan Languages*. London, Oxford University Press.
- Wright, R. P. 2010. *The Ancient Indus, Urbanism, Economy and Society. Case Studies in Early Societies*. Cambridge, Cambridge University Press.