



# Dr. Dennys Frenez

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## Biography

Dr. Dennys Frenez – Ph.D in Archeology from the University of Bologna – is currently investigating and modeling trade and cultural interactions between urban level societies in South and Middle Asia during the Bronze Age (ca. 3200-1300 BC), with a specific focus on the Indus Civilization. The research of Dr. Frenez involves a wide range of theoretical and methodological approaches, including the study of ancient administrative and writing systems, traditional technologies and crafts and socio-economic and political organization. Dr. Frenez directed archaeological excavations in India and works on archaeological collections in collaboration with several museums and archaeological expeditions in India, the Sultanate of Oman, UAE, Tajikistan and Turkmenistan, and established an extensive network of collaborations.

## Abstract:

MIRRORED SIGNS: VISUAL AND SCRIPTORIAL INFORMATION ON THE INDUS CIVILIZATION CLAY SEALINGS.

This paper describes the use of the Indus Script within a defined socio-economic context allowing to determine some of its basic structural and operational features. Stamp seals bearing a short string of Indus scriptorial signs above the image of a male animal or a narrative scene were suddenly introduced in the Indus Tradition during the Early Harappan Phase (2800-2600 BC), for the administrative control of storerooms and movable containers by sealing a lump of refined clay applied on their closing device. Such administrative technology and bureaucratic practices remained in use without major variations until the disaggregation of the Indus Civilization as an integrated cultural and socio-economic system in the first centuries of the second millennium BC. The morphological and functional analysis recently conducted on large clusters of clay sealings found at the Indus Civilization sites

of Lothal and Dholavira in Gujarat, plus significant contributions from smaller sites along the shores of the Gulf of Kutch, allowed proposing a functional distinction between the string of Indus scriptorial signs and the animal/narrative icon engraved on the standard Indus seals. Moreover, they contribute to precise the use of some particular Indus-inscribed media and the syntactical interpretation of the message they conveyed.



# Dr. Andreas Fuls

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## Biography

Dr. Andreas Fuls is a geodesist specialized in mapping and surveying. He has been working at the Technical University of Berlin in the Institute of Geodesy and Geoinformation Science since 1988. He holds a Ph.D. in the field of History of Mathematics, Natural Sciences and Techniques from the University of Hamburg. His publications deal with archaeoastronomy as well as epigraphy of the Maya, Indus and Minoan cultures. Since 2007 he has been developing and managing an online database for Indus inscriptions in cooperation with Dr. Bryan Wells, the Interactive Corpus of Indus Texts (ICIT).

## Abstract:

Ancient Writing and Modern Technologies – Structural Analysis of Numerical Indus Inscriptions

The Indus culture (2600 to 1700 BCE) developed a writing system that still remains mostly undeciphered. The inscriptions found on several artefacts (i.e. seals, tablets, pots, bangles, tags, and other types of artefacts) show a distinct pattern of Indus signs. An Interactive Concordance of Indus Texts (ICIT) has been developed and is accessible through a web-interface. It contains at present 5318 Indus texts on 4351 artefacts and additional 869 artefacts with iconography. The signs are coded according to an extended sign list with 702 distinct signs (Wells 2015). This interactive-searchable database facilitates the study of specific sets of iconographic elements, signs, and artefacts. Several tools allow for the statistical and spatial analysis of inscribed artefacts and Indus signs. The aim is to make all Indus inscriptions accessible to scholars worldwide and to stimulate further research on Indus writing and Indus culture in general.

A detailed study of sign sequences has become possible through the Multivariate Segmentation method. It enables one to perform structural analysis and the identification of segments of Indus inscriptions with similar meaning. The structural analysis focuses on texts with numerical signs and allows us to have a better understanding of the economic content of many Indus inscriptions.



# Dr. Asma Ibrahim Ph. D

Director, State Bank Museum, Archives &  
Art Gallery Department.

## Biography

Eminent scholar in the fields of Archaeology, Museology and Conservation, Dr. Asma Ibrahim did her Post-Doctoral Fellowship as a Fulbright scholar in United States in Archaeological Chemistry. She completed her PhD in General History (Numismatics) from the University of Karachi. Also a Fellow of the Salzburg Seminar. Her noteworthy achievement is the establishment of the first Monetary Museum of Pakistan in State Bank of Pakistan (inaugurated on 1<sup>st</sup> July, 2011).

Dr. Asma has to her credit the very human and modern considerations for making this museum the most accessible museum of Pakistan by adding features such as the first ever Braille Guide book and tactile objects for visually impaired people & teach Photography. Special educational and recreational programs for visitors with special needs and others are also devised. State Bank Museum is the First Museum of Pakistan to get the membership of ICOM (International Committee of Museums) and CAM (Commonwealth Association of Museums).

Dr. Asma's experience in the field of Archaeology and Museums spans nearly three decades. She has many acclaimed projects of Excavations and Explorations in Sindh & Baluchistan to her credit, as the first woman Archaeologist of the Country.

She is also the only scientist of Pakistan working on Ancient Human remains and glass analysis of Strontium, nitrogen & oxygen isotopes on the basis of which a study is being carried out to know the provenance of Indus valley population & glass. She is the only member of the International scientific committee for glass from Pakistan, and member Scientific Committee for the International Conference on Mohenjodaro.

She is serving on several consultative Committees for Government of Sindh, Board of Governors of various Educational Institutions, an author of several Research articles, Catalogues and Books. Her research projects are aired time and again by BBC (Horizon), *Discovery Channel*, ZDF, BBC Channel-4, in the form of documentaries. Her work on confiscated Mummy acclaimed her international fame and recognition as a scholar from Pakistan. The other great discoveries to her credit are the discovery of an underwater city, in the Indus delta, and the fortress of Alexander the Great at Gujjo, Sindh, never mentioned in the historical sources before.

She has established the Oxford University Press Museum & Archives, Sindh Police Museum, Mukhi House Cultural Museum; as member of the Advisory Committee she is in the process of bringing the idea of *Women Museum* and several others in to being.

As a founding member establishment of an NGO *Sindh Exploration & Adventure Society*, under this NGO a very remarkable 'Centre for Archaeological & Environmental Research' is functional, carrying out documentation, and assisting preservation and conservation of heritage of the country. She is a founding and Executive Committee member of 'Karachi Conference Foundation,' organizing conferences to have a dialogue about the issues of Karachi. Since 2015 she is working for the establishment of Archives of State Bank of Pakistan, a division has already been created under the Museum & Art Gallery Department. Conservation of Varun Dev temple, Rumi graveyards & Ancient DNA with Harvard University, USA others are few projects to mention.



# Dr. Gregg Jamison

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## Biography

Dr. Gregg Jamison is an Assistant Professor of Anthropology at the University of Wisconsin-Milwaukee at Waukesha. He received his PhD in Anthropology from the University of Wisconsin-Madison with an emphasis in prehistoric archaeology. Professor Jamison's primary research interests focus on seal production and use in the Indus Civilization (2600-1900 BCE) of ancient Pakistan and India. More broadly, he studies the origins of urbanism and state-level societies, prehistoric craft production, and experimental and ethnoarchaeological approaches to the study of the past. Professor Jamison has conducted fieldwork in Pakistan, India, the Sultanate of Oman, France, and Belgium. He also has extensive experience in Cultural Resource Management (CRM) archaeology and historic preservation in the state of Wisconsin and throughout the Upper Great Lakes Region in the United States.

## Abstract

The undeciphered script is one of the most fascinating and mysterious aspects of the Indus Civilization (2600-1900 BCE). Considerable scholarly attention has been paid to the study of the script, including compiling sign lists and corpora of inscriptions, attempts at decipherment, and investigations of sociolinguistic affiliations. While this research has been influential and contributed to our understanding of the script and its role in the Indus Civilization, to date comparatively few studies have examined the technologies and methods involved in creating inscriptions. This paper presents an analysis of the carving techniques and styles used to engrave inscriptions on Indus seals. Using complementary methods of formal stylistic and metric analyses, it has been possible to identify patterned variation in inscriptions that may represent the carving styles and techniques of the artisans who produced them, some of which are compatible with patterns of stylistic and metric coherence identified in the iconography of Indus seals. Taken together, these data provide new insights into social and technological aspects of Indus seal and script production and use that are crucial to exploring how and why they were made and used.



# Prof. Dr. Michael Jansen,

## SI, HI, German Cross of Merit

c/o German University of Technology GUtech in Oman  
Halban, Oman

### Short biography

Prof. Dr. Michael Jansen is affiliated to Mohenjo-Daro and the Indus Civilization since 1970. His PhD (1979) deals with the architecture of Mohenjo-Daro and the Indus Civilization. He was appointed full professor at RWTH in 1992 and was its Vice-Rector from 1996 till 1999.

From 1979 till 1987 he was director of the German Research Project 'Mohenjo-Daro', since 1981 in cooperation with Prof. M Tosi and IsMEO.

Since 1985 he was member of the UNESCO International Consultative Committee (ICC) of the largest UNESCO Campaign so ever 'Safe Mohenjo-Daro'. In this context he jointly organized with CNRS (Dr Jarrige) the first UNESCO international exhibition on 'Forgotten Cities of the Indus' where the 'Priest King' left for the first time Pakistan. In 2008 he curated a second UNESCO exhibition on 'The Gandhara Culture in Pakistan'. After conclusion of the UNESCO Campaign in 1996 he was appointed as member of the Technical Consultative Committee (TCC) of the newly established 'National Fund of Mohenjo-Daro' (NFM) of which he later was appointed chair of TCC and where he still is active member. His special field within UNESCO/ICOMOS is conservation and management of archaeological settings and here, especially, in clay architecture. In this respect he was several times monitoring and reactive monitoring expert ICOMOS/UNESCO, also in Pakistan. He was director of extensive UNESCO conservation projects in Otrar (Kazakhstan), Krasnaja Rechka (Kirgizstan) and in Bamiyan (Afghanistan). Presently his office is loading the documentation of historic architecture of Oman into a complex data bank which is already hosting the historic sites of Afghanistan and Sindh/Pakistan. From 1994 to 2000 he directed the setting up of the Archaeological Park 'Al Baleed', Oman.

Besides several publications on the architecture of Mohenjo-Daro, his centre is presently working on a long awaited three D re-placement of more than 38000 objects from the Field Register Mohenjo-Daro into the morphological complexity of the structural context Mohenjo-Daro. This research work is the essential key to the understanding of the socio-economic cultural behaviour of the Indus people in MD.

The RIO Centre is working on preparations for the 2021 centenary jubilee of the discovery of Mohenjo-Daro and the Indus Civilization in 1921.

Professor Emeritus and former vice rector RWTH Aachen University of Technology

Co-Founder of the German University of Technology GÜtech in Oman and

President of RIO/ Research Centre Mohenjo-Daro

Former chair and present member TCC NFM, MD

Senior advisor UNESCO/ICOMOS

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# Dr. Ayumu Konasukawa

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## Biography:

AyumuKonasukawa (ayumu-konasukawa@ioc.u-tokyo.ac.jp; kotdiji@hotmail.co.jp) is Research Fellow of Japan Society for the Promotion of Science (JSPS). He is doing his Post-doctoral fellowship in the Department of South Asian Studies at the Institute for Advanced Studies on Asia, University of Tokyo and completed his Ph.D. in the Department of Archaeology at the Deccan College Postgraduate and Research Institute (Pune, India). His research interest is focused on social structure of the Indus Civilization (2600-1900 BCE) that developed in the territory of present-day Pakistan and northwest India with a specific focus on the seals from the Early Harappan period to the Harappan periods. Archaeological researches and studies in India and Pakistan were unique opportunity to him for gaining insight into the Indus Civilization. He has conducted archaeological researches in the Ghaggar Basin, India. His publication is *Social Structure of the Indus Civilization and the Principles of Cities* (Doseisha, Tokyo, 2016).

## Paper Title:

Chronological Change and Continuity of Seal Carving Techniques from the Early Harappan to the Harappan periods in the Ghaggar basin

## Abstract:

In this paper, the author discusses seal carving techniques from the Early Harappan to the Harappan periods in the Ghaggar Basin.

The data for the analyses in this paper comprise of fired steatite seals, which are discovered from Kunal, Banawali and Farmana. Through SEM (Scanning Electron Microscope) and 3D (PEAKIT) analyses, it has become evident that the seals from the Early Harappan to the Harappan periods in the Ghaggar Basin are characterized in various carving techniques, and although the seals of the both periods have lots of differences in terms of manufacturing

techniques and the design such as the motif of the surface etc., they also have commonality as regards a part of the carving techniques. As is indicated by this study, in the Ghaggar Basin, it can be pointed out that a part of carving techniques of the seals of Early Harappan period were passed on to those of the earliest type of Indus seals and gradually evolved into those of the typical Indus seals.

This paper concludes that there were chronological change and continuity of seal carving techniques from the Early Harappan to the Harappan periods in the Ghaggar basin. This conclusion suggests an important evidence that helps to understand 'invention' of the Indus seal.



# Dr. Jonathan Mark Kenoyer

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## Biography:

Jonathan Mark Kenoyer, Ph D

Jonathan Mark Kenoyer, is the George F. Dales Jr. and Barbara A. Dales Professor of Anthropology, at the Department of Anthropology, University of Wisconsin, Madison. He obtained his Ph D in 1983 at the University of California Berkeley and has been teaching archaeology and ancient technology at the University of Wisconsin, Madison since 1985. He has served as Field Director and Co-Director of the Harappa Archaeological Research Project since 1986. He has worked on excavations and ethnoarchaeological studies in both Pakistan and India, and more recently in Oman. He has a special interest in ancient technologies and crafts, including textiles and textile production, socio-economic and political organization as well as religion. These interests have led him to study a broad range of cultural periods in South Asia as well as other regions of the world, including China, Japan, Korea, Oman, and West Asia in general. His work has been featured in the National Geographic Magazine and Scientific American and on the website [www.harappa.com](http://www.harappa.com).

He is the author of numerous books and edited volumes on the archaeology of South Asia and the Indus civilization. He has published 4 monographs two edited volumes with more in process, over 71 influential journal articles, had over 85 articles appear in edited volumes, 12 encyclopedia entries and 19 book reviews on works relating to South Asian topics. He had helped curate major exhibitions on the Indus Civilization as well as textiles and experimental archaeological exhibits. Great Cities, Small Treasures: The Ancient World of the Indus Valley, in 1998-1999, at the Asia Society, in New York, and two other venues. He was also a consultant for the exhibit, Art of the First Cities: The Third Millennium B.C. from the Mediterranean to the Indus exhibition curated by Joan Aruz at the Metropolitan Museum of Art, New York, May, 2033.

# Abstract

## Origin and Development of the Indus Script: Insights from Harappa and other sites.

The origin and development of the Indus script can be defined on the basis of excavated samples of inscribed potter, seals, and sealings dating to the Early Harappa Phase at the site of Harappa. Discoveries from the Ravi Phase (>3700-2800 BCE) and KotDiji Phase (28-2600 BCE) levels at Harappa provide strong evidence for the indigenous development of key Indus signs that eventually are incorporated into the fully developed Indus Script. The meanings on these signs cannot be deciphered yet, but the contexts of their use provide evidence for the ways in which early writing was being used and the variety of objects on which it was recorded. Comparisons between the Early Indus Script at Harappa will be made with similar examples of signs on pottery from the sites of Rehmandheri, Kalibangan, Balakot and other Early Harappan sites throughout the Greater Indus Valley Region. These comparisons show that similar developments of writing were taking place over a broad geographical region and that the eventual development of the Indus Script may have been the result of the synthesis of multiple regional writing systems rather than simply the evolution of writing in one specific region or site. This pattern may also explain the diversity of the Indus Script in that it may incorporate many regional forms of writing.



# Dr. Paras Kumar Choudhary

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## Short Profile

Dr. Paras Kumar Choudhary ( Double M.A, Ph.D in sociology from Patna University, Bihar, India) , Ex Prof in charge (H.O.D) Deptt of sociology, Ex Director of Human Rights Education Ranchi University, Ranchi, India; Worked as an expert in various recruitment Committee, Editorial Board, Various Research and Project Work. Worked in the field of Principle of Sociology, Sociology of Religion, Sociology of Terrorism, Participated in several National and International Conferences, Visited abroad for academic purpose ( U.S.A, Japan , Bangladesh, China , Singapur, Nepal, Thailand, Germany, Poland, Dubai, and Berlin) is currently involved in different religions, published three books and twenty articles.

Dr. Choudhary has been working as Associate Professor University Deptt of Sociology Ranchi university, Ranchi, Jharkhand, India.

## Abstract

PAPER TITLE: STUDY OF INDUSVALLEY SCRIPTS THROUGH SOCIO-ECONOMIC APPROACH.

Indus valley civilization was one of the most technological advanced civilization of ancient world. Number of eminent scholars of the world have tried their level best to decipher the Indus Scripts, but could not succeeded. So far conclusion of various studies are concerned it is stated that Indus scripts are still unknown, it is primitive language of simple pictograms, more than five hundred distinct symbols have been identified, which is similar to the ancient language of Sumerian from Mesopotamia and old Tamil script logo-syllabic, proto- Dravidian.

Hypothesis:

- 1 . There are strong relation between culture and language.
- 2 . Socio-economic factors having impact on scripts.
- 3 . Assessment of Religious and Spiritual Knowledge of existing society would be input to understand the scripts.

**METHODOLOGY:** Socio-economic aspects are very important and are closely related with the surrounding of the society. On the other hand we can say that social conditioning has deep impact over language and literature. For example, upload, download, online, offline, soft copy, hardcopy, and selfie are the languages of modern society. What type of social condition and situation had been prevailing would be evaluated through text which shall throw light on decipherence of Indus scripts.



# Kaleemullah Lashari

PhD; Post Doc Fellowship, UW (USA); (DAAD) Fellow, Germany; S I (Pak)

## Short Profile

An expert of cultural heritage and scholar of Applied Archaeology, his projects include conservation of dozens of old buildings, and establishment of museums in various specialized fields.

He is serving on high-level committees; he is Chairman, *Technical Consultative Committee* for Mohenjodaro; Chairman, *Management Board for Antiquities*; Member of the *Advisory Committee for Cultural Heritage*, Government of Sindh, to mention a few.

One of his recent initiatives is the Establishment of *Central Record Office*, in Government of Sindh; he is also Consultant for the establishment of the *Archives* in State Bank of Pakistan.

He is widely published; his works on the themes of archaeological investigations are considered masterly contributions. His recent work on Makli is an over-arching undertaking that has a permanent value for scholars on the *Epigraphy*.

He has undertaken research and studies in the country and abroad, working on the Islamic collections in the museums having wide collections such as Museum of Fine Arts, Boston; Metropolitan Museum, New York; University Museum, Philadelphia and Islamic Arts Museum, Berlin, where he also did Post Doctoral Fellowship in 2002. He is also the Post Doctoral Fellow of University of Wisconsin, Madison.

His conservation projects include *Mukhi House*, Hyderabad; *Old Principal House*, DJ College, Karachi; *Edward House*, Karachi; *VarunDevMandir*, Manora; *Rumi Graveyard*, Karachi; *Baloch Tombs*, Karachi; *PirLakho Graveyard*, Thatta; *Free Masons' Lodge*, Karachi, Historical Remains at Gujo etc.

His book 'Biographic Elements in the Letters' was well received, his short stories have been translated in to other languages as well, a collection is published under the title "*Unvehsautiasee (1983)*," also translated in Urdu, published as "*UneessauTirrassae*." His remarkable work on the tribal funerary practices "*Study of Stone Carved Graves*" has been hailed a wonderful exposition of the subject. Another of his work on the same topic is in Urdu "*ChaukandiaurQabailiQabreen*." The range of his writings is wide, "*The Study of Mural Ceramics of Sukkur*" is the only work, studying relevant aspects of architectural ceramics.



# Dr. Steffen T. Laursen

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## Biography

Dr. Steffen T. Laursen – Ph.D and Dr. phil, both in Archaeology from the University of Aarhus – is curator and head of the oriental department at Moesgaard Museum, Denmark. Moesgaard Museum has since 1953 had a special focus on the Bronze Age archaeology of the Arabian Gulf. Laursen has worked extensively on the Burial Mounds of Bahrain (c. 2250-1700 BC) and Dilmun's Royal Cemetery at A'ali in Bahrain (c. 1950-1700 BC) on which he in 2017 published a monograph. Laursen has also focused on the integration of archaeological and textual sources from the 3rd and 2nd Millennium BC related to trade and other cultural contacts between "Babylonian, the Gulf region, and the Indus" in a book by the same name co-authored with P. Steinkeller (2017). Laursen is also particularly interested in the transmission of administrative technology, notably weights, scripts seals and sealing practices from the Indus Valley to Dilmun at c. 2000 BC (Bahrain).

## Abstract

### THE INDUS SCRIPT – THROUGH THE LENS OF DILMUN ARCHAEOLOGY.

The archaeology of Dilmun offers a lens from which to obtain a unique perspective on the Indus script. Advances in Dilmunite archaeology in recent years make it possible to significantly qualify the context in which Indus script and other administrative technologies from the Indus Civilization were adopted by the Dilmun Culture. New excavations in Kuwait and Bahrain have provided significant new insight into what conditioned the adaptation of the script within the administrative protocol of Dilmun as well as the scripts ultimate abandonment. An apparent driver behind the abandonment of Indus script and weight unit was the adoption in Dilmun of Old Babylonian cuneiform and the Babylonian unit of weight. In the Dilmun Indus script signs are known to have been used almost exclusive on circular stamp seals of the earliest so-called Gulf Type seals. The Gulf Type seals represent an obvious adaption from the square Indus seals. The sequences of Indus script signs found on Gulf Type seals are distinct from those observed in the Indus



Civilization suggesting that a different language was communicated. The use in Dilmun of the Amorite (Semitic) language at this time is proposed by several strands of evidence as well as new inscriptions found at the Royal Mounds of A'ali in Bahrain.



# Professor Dr. Farzand Masih

Forman Christian College  
(A Chartered University), Lahore

Title: Two Rare Archaeological Discoveries from Cholistan Desert

## Abstract

This paper aims to share a rare clay tablet discovered from surface of the Ganweriwal mound. The mound is located about 34km from Derawer Fort and said to have been as the third metropolis of the mighty Indus Valley Civilization. The first Indus Valley seal discovered from Wattu Wala, located about 15km southwest of Derawer Fort will also be discussed for further inquiries and considerations of the scholars. This exposition will also cover the infelicitous veracity that despite being the potential archaeological zone, it remained un-attended and suffered a lot both at the hands of nature and man.

## Biography:

Dr. Farzand Masih was born in Risalpur, District Nowshera in Khyber PukhtunKhwa. He was a Gold Medalist in his Masters degree in Archaeology, pursued a Ph. D in the same discipline from the University of Peshawar. He joined the Department of Archaeology and Museums, Government of Pakistan as Field Officer where he got a number of opportunities to conduct excavations and field surveys with eminent archaeologists and scholars of various countries like Italy, Japan, England, France and USA. His most noteworthy discovery is the four door handles/knockers unearthed from the first Islamic capital of the subcontinent known as Mansurah located in District Sanghar, Sindh. While serving in Federal Government, he discharged his official duties as Head of Antiquities Trade Control Branch in Balochistan, Curator Harappa Museum, and Curator Lahore Fort. His outstanding achievement is the establishment of Archaeology Department in 2004 in the Punjab University, Lahore where he served as professor and Chairman since the inception of the Department of Archaeology to his age of superannuation. He started Archaeology Department from nothing but scratch but upon his retirement from the Punjab University, the Department of Archaeology had her own building with a capacious library furnished with thousands of first-rate volumes and adequate field gadgets. The department started its working with M.A program and later successfully launched its M. Phil program under his supervision. During his stay at the Punjab University he published thirty

research papers and two books. He is also founder and editor of the three volumes of research journal of “Ancient Punjab”. Additionally, he edited proceedings of international conference on “Gandhara at the Cross Road of Civilizations: Art and Architecture” and national workshop on “Pre-historic Cultures of Pakistan”. He participated and presented research papers in number of national and international conferences both at home and abroad. Some of his discoveries have been reported in the international media and also have been referred to by the renowned scholars of the world in their academic discourses.

He joined Form an Christian College – A Chartered University, Lahore (American University in Pakistan) on 1st November, 2015 as professor and chair of the Department of History and Pakistan Studies where he has been working till today.



# Dr. Nisha Yadav

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## Brief Profile:

Dr. NishaYadav is a scientist at the Tata Institute of Fundamental Research, Mumbai. Her research aims at elucidating the structure of Indus script using computational methods and investigating its connection to other aspects of the Harappan culture. She has published several papers on Indus script in leading academic journals. She was awarded the INSA Young Historian of Science Award (2017) for her work on Indus script.

Title of paper:Structure of Indus Script

## Abstract:

Indus script has defied decipherment. There have been several attempts to decode the Indus writing in the past, but there is no agreement on its contents. The lack of precise knowledge of its structure makes it difficult to evaluate any claim of decipherment objectively. In our research, using various computational techniques, we tried to fill this lacuna by analyzing the structure of the Indus texts in detail. Our study focuses on identifying patterns in the Indus writing and exploring its underlying logic without making any assumptions about its content. The present article summarizes our work on the structure of Indus script.



# Dr. Asko Parpola

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## Short Biography

AskoParpola is Professor emeritus of Indology and South Asian Studies at the University of Helsinki, Finland.

His publications include among other things the following books related to the Indus Civilization:

*The Sky-Garment: A study of the Harappan religion and its relation to the Mesopotamian and later Indian religions.* (StudiaOrientalia, 57.) Helsinki: The Finnish Oriental Society, 1985.

*Corpus of Indus Seals and Inscriptions*, vols. 1, 2, 3.1. Helsinki: Finnish Academy of Science and Letters, 1987; 1991; 2010.

*Deciphering the Indus script.* Cambridge: Cambridge University Press, 1994.  
*The Roots of Hinduism: The Early Aryans and the Indus Civilization.* New York: Oxford University Press, 2015.

Besides the script and religion of the Indus Civilization, Parpola has studied Vedic texts, especially Sāmaveda, and conducted field research in South India.



# Dr. Rajesh P. N. Rao

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## Biography

Rajesh P. N. Rao is the CJ and Elizabeth Hwang Professor of Computer Science and Engineering and Electrical and Computer Engineering, and Director of the NSF Center for Neurotechnology at the University of Washington. He is the recipient of a Guggenheim Fellowship, a Fulbright Scholar award, an NSF CAREER award, a Young Investigator Award from the Office of Naval Research, a Sloan Faculty Fellowship, and a Packard Fellowship for Science and Engineering. He is the author of the book *Brain-Computer Interfacing* (Cambridge University Press, 2013) and the co-editor of two volumes, *Probabilistic Models of the Brain* (MIT Press, 2002) and *Bayesian Brain* (MIT Press, 2007). Besides working in the areas of computational neuroscience, artificial intelligence, and brain-computer interfacing, Prof. Rao also works on the 4000-year-old Indus script. His work with collaborators on statistical analyses of the Indus script has been published in journals such as *Science* and *Proceedings of the National Academy of Sciences*. Prof. Rao has also given a TED talk on the Indus script which has garnered close to 2 million views.

## Abstract:

Indus Script and Indus Culture by M. N.Vahia, Rajesh P. N. Rao and Nisha Yadav

We discuss the current state of understanding of the syntax of the Indus script and the limits it puts on the possible interpretations of the script. We then discuss possible uses of the script to further constrain possible models that can explain the writing in Indus Script. We present a framework for the broader aspects of Indus writing and search for a model of writing that may best fit the Indus script in the background of its culture. We believe such a framework will help narrow down the possible models that can be applied to the Indus script.



# Dr. Azhar Ali Shah

## Chahat Batool & Farhan Surhio

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## Abstract

### Computational Linguistic Approaches to Decipherment of Indus Script

Indus Valley Civilization is one of the earliest and ancient civilizations of the world. Though archeological site of *Mohenjo Daro* being major city and largest settlement belonging to Indus Valley Civilization was rediscovered in 1920s but the language and the writing system produced by Indus Valley Civilization i.e. *Indus Script* has not been deciphered yet. This article provides a succinct review of the computational linguistic approaches for the decipherment of Indus Script and proposes a framework of potential tools and techniques for prospective research projects aimed at utilization of computational techniques for the decipherment of Indus Script.

One of the major computational linguistic approach for decipherment of ancient language scripts is the application of phylogenetic algorithms. These algorithms help analyze the evolutionary relationship between the family of writing systems. In the context of computational linguistics, the text of the unknown script is converted to speech and then the sounds are interpreted with the help of grammatical and phylogenetic comparison, clustering and analysis of all major writing systems including alphabetic, syllabic and logographic. The unknown script is deciphered by matching its characters and sounds with the known languages and inferring the similarity from the phylogenetic tree of languages. Computational linguistic approaches have helped decipherment of many ancient civilization scripts including *Egyptian hieroglyphics*, *Maya* and *ancient Chinese* writing systems. This matching could be achieved with computational statistical models such as non-parametric Bayesian framework for character mapping and morphemic correspondences. This article provides critical analysis of such approaches used for decipherment of Indus Script and proposes a road map of gold-standard tools and techniques for prospective researchers.



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## Biography:

Mayank Vahia is a scientist with a deep interest in the history of Indian astronomy as well as the Harappan Civilization. He retired from the Tata Institute of Fundamental Research a year ago and is now the Dean of School of Mathematical Sciences at the NarseeMonjee Institute of Management Studies, in Mumbai. He has published several papers on history of astronomy, on the evolution of Harappan civilization and the Harappan script. His work on Harappan Script has largely been focused on the statistical analysis of the syntax of Indus Script.

## Abstract:

We will discuss the current state of understanding the syntax of the Indus script and the limits it puts on the possible interpretations of the script. We will then discuss possible uses of the script to further constrain possible models that can explain the writing in Indus Script.





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## Biographic note

Massimo Vidale was born in Bassano del Grappa (Vicenza, Italy) on April 10th, 1956. He teaches as Associate Professor Near Eastern archaeology and Archaeology of Craft Production. Formerly, he taught ancient technology classes at ISCR (Istituto Superiore per la Conservazione e il Restauro, Rome) school for conservators from 1990 to 2003. His main fields of expertise include the study of ancient craft technologies and their relevance to the understanding of early state formation processes; the study of contemporary traditional craft technologies from an ethnoarchaeological perspective; the application of stratigraphic and micro-stratigraphic recording procedures and interpretation for the reconstruction in detail of ritual funerary behaviour.

He got his MA degree in Oriental Archaeology in 1980 at the University of Padua (Italy) with a thesis on the ceramic sequence of Shahr-i Sokhta (3rd millennium BC). In 1987 he got his Research Doctorate at the Istituto Universitario Orientale (Naples, Italy) with a thesis on the geoarchaeological formation processes of the craft activity areas detected by an Italian-German project on the surface of Mohenjo-Daro (Pakistan). Between 1987 and 1988 he was a Fellow in Material Analysis at the Conservation Analytical Laboratory of the Smithsonian Institution (Washington DC). The research he accomplished at CAL under the tutorship of J. M. Blackman and P. Vandiver was centered on the chemical characterization of the stoneware bangles found at Mohenjo-daro and Harappa. Between 1987 and 1988 he studied at the Italian Archaeological School of Athens, where he got a specialization in Ancient Greek and Roman Archaeology.

Since 1976, he has an uninterrupted record of field experience in Italy, Middle and South Asia and (secondarily) north Africa. He has carried out archaeological and ethnoarchaeological projects in Italy, Iran, Iraq, Kuwait, Pakistan, Turkmenistan, India, Nepal, Indonesia, Tunisia and Eritrea.

He is the author of about 350 specialistic papers on the results of his research, as many papers addressed to a more general audience, a dozen of books and four co-edited volumes.



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## Biography

Dr. Bryan K. Wells is an archaeologist, epigrapher and geographer. He has excavated on the east and west coasts of North America and in Pakistan. Wells studied ancient writing systems, including the Indus script, since 1990, and holds a PhD. in anthropology from Harvard University.

## Abstract:

### Indus Weights and “Fish” (Set 11) Signs

This paper examines the ideas first posited by Bonta (1995) that Indus “fish” signs are metrological in nature, perhaps standing for Indus weights. Progress in the comparison of the details of “fish” signs to weights has been slowed by the poor quality of data and the lack of a detailed sign list and an incomplete corpus. In 2010 while visiting Chennai, a concerted effort was made to find source material for weights, beyond the summary tables published by Marshall (1931). The result was a database of 744 descriptions of individual Indus weights. While data listings for weights are incomplete in many cases, 271 examples (mostly from Mackay 1938) are described in detail. These weights formed the basis of the following analysis. At the same time (2010) a major expansion of the ICIT database was undertaken, which increased the basic “fish” total to 1438 examples. This increase in the analytical data and in our understanding of both data sets made the comparison of “fish” signs and weights possible. Several interesting matches between weights and “fish” signs allows for the equation of these items. The matches are based on the overall pattern of both data sets internal structures. This paper offers 17 equivalents between “fish” signs and weights, allowing for calculations of the scale of economic transactions.