

Occasional Paper 11

Linguistics, Archaeology
and
the Human Past

INTER-REGIONAL INTERACTION AND URBANISM
IN THE ANCIENT INDUS VALLEY

A GEOLOGIC PROVENIENCE STUDY OF
HARAPPA'S ROCK AND MINERAL ASSEMBLAGE

RANDALL WILLIAM LAW



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FOREWORD

Toshiki Osada

Project leader of the Indus Project

Professor, Research Institute for Humanity and Nature

It is a pleasure for me to publish Dr. Randall Law's magnum opus "Inter-regional interaction and urbanism in the ancient Indus Valley: a geologic provenience study of Harappa's rock and mineral assemblage" as a special publication of our Occasional Paper.

I have conducted the Indus project at the Research Institute for Humanity and Nature, Kyoto since 2006. The full title of our RIHN project is "Environmental Change and the Indus Civilization". This research project examines the social character and environmental context of the Indus civilization, and attempts to determine how they are related to the civilization's short life and rapid decline. In particular, we aim to evaluate the impact of environmental change on the subsistence economy and trade network that sustained the Indus civilization's urban system. We have carried an archaeological excavation at Kanmer, Gujarat and Farmana, Haryana both in India. Final reports for both excavations will be published by the end of March, 2011. The project unites a range of internationally recognized and interdisciplinary scholars. We have so far published ten volumes of Occasional Papers in which the full variety of scholars collaborating in the project presents papers as the project's latest results.

This book is an updated version of Randall Law's Ph.D. dissertation, which was submitted to the University of Wisconsin-Madison in 2008. He conducted the bulk of this research under the guidance of Professor Jonathan Mark Kenoyer, who is one of the most famous and active archaeologists in this field and co-director of Harappa Archaeological Research Project. Dr. Law's intensive field work took him across an area that ranged from the Northern Areas of Pakistan to Gujarat, India in the south and from Makran coast of Balochistan in the west to the Aravalli Range Rajasthan in the east. He has recently expanded his research activities to the eastern Arabian Peninsula. Along the way he collected geologic samples of rocks and minerals used by Harappans such as steatite, chert, limestone, agate and copper. These samples were later directly compared to artifacts from Harappa using a range of methods such as X-ray diffraction analysis, electron microprobe analysis, Pb isotope analysis and neutron activation analysis. I believe Dr. Law's research goals dovetail nicely with those of our RIHN project and, thus, I have decided to publish his work as part of our Occasional Paper series.

I hope Dr. Law will continue his original work and lead his generation in Harappan Studies.

PREFACE

Jonathan Mark Kenoyer

Professor, Department of Anthropology

University of Wisconsin-Madison

Writing a book about rocks and minerals of a long dead civilization is a daunting task, and while there are many who have taken up the challenge few have succeeded like Randall Law. Without doubt Randall's doctoral dissertation, which is now being published in this well illustrated book, represents the most important recent contribution to the ongoing studies of the Indus Civilization. It is an outstanding example of how to develop new strategies to study old problems, and how to squeeze blood from old rocks and make a dead civilization live again. The old problems that have been examined in this book relate to the origin and development of the Indus Civilization (2600-1900 BC), an urban society that emerged in the vast plains of the ancient Indus and Ghaggar-Hakra-Saraswati Rivers. The "blood" or information that Randall has extracted from the study of rocks and minerals has been used to test long held models on the development of inter and intra-regional exchange and its role in the emergence of Indus urban centers. The results of his studies have brought to life a whole new set of interaction networks that connected Indus cities such as Harappa, to other Indus settlements and regional resource areas.

I met Randall Law at a lecture I gave as part of a panel at the Anthropological Association of America Annual meetings in San Francisco in November 1996. The lecture was titled "Urban Development and Craft Production at Harappa, 3300-1700 B. C." and included discussion of pottery making, lithics and stone bead production at Harappa. After the lecture we had a chance to talk about his interests in studying the archaeology and trade networks of Western China and Central Asia. Although he was not focused on the Indus I pointed out to him that there were possible connections between the Indus and Western China and that he might want to expand his research in this area. When he came to Madison to start graduate studies with me, he had recently spent several months in China and was hoping to carry out his dissertation research somewhere in Xingjiang. However, over the course of his graduate studies, and after working with me in the study of rocks and minerals from the site of Harappa, he decided to shift his focus to the Indus. This shift would still allow him to explore the regions to the north of Harappa, including northern Afghanistan and parts of Central Asia. Based on the success that he has had in these studies, I am confident that he will eventually extend his explorations to the area of his original interest, Western China, in the coming years.

I was thrilled with Randall's decision to work at Harappa, and although I had already begun collecting comparative samples of rocks and minerals from many parts of Pakistan and India, I knew that I would not have time to exhaustively collect samples from all of the potential source areas. Because of his strong science background

and his passion for geology and geography I knew that he would go far beyond anything that I had ever done. Over the course of his dissertation studies it became quite clear that he had a special gift for searching out rock sources and collecting samples from obscure regions. He also had the ability to write successful applications for funding to undertake both field research and laboratory analysis. His ability to understand complex archaeometric issues in the analysis of raw materials ensured that he used the best possible methods for sourcing various types of rocks. Furthermore, his engaging discussions and the fact that he was willing to spend generous amounts of his time helping others, opened up the doors and comparative collections of major institutions and local scholars, as well as guidance of enthusiastic villagers in all regions of Pakistan and India. I was fortunate to be able to share in the excitement as he began to collect samples and visit different source areas. In the summer of 2000 we took a road trip from Harappa to Skardu to collect rock samples for his dissertation and he loaded so many rock samples into the Harappa Toyota Corolla that it broke the rear springs. It was important to collect all of these rocks, and because of his extraordinary efforts, he has been able to obtain an unparalleled set of original samples of rocks and minerals from almost every possible source area surrounding the Indus and Ghaggar-Hakra-Saraswati River plains.

Randall's multi-disciplinary approach to the investigation of early urbanism combines geology and scientific materials analysis, with state of the art archaeological excavations of a complex urban center. The primary archaeological data set is from the renewed excavations at the site of Harappa, Pakistan, begun by Dr. George F. Dales and me in 1986 (Dales 1989), and continuing up to the present as the Harappa Archaeological Research Project (Meadow 1991, Meadow and Kenoyer 2008). The overall goal of the project has been to understand the origin and development of Harappa as one of the major urban centers of the Indus Civilization (Dales and Kenoyer 1991). Many different strategies were developed to examine all aspects of the site. One important approach was to collect samples of raw materials, specifically rocks and minerals, from all excavation areas so that in the future, a dedicated scholar, in this case Randall Law, would be able to carefully study each and every fragment to reconstruct the trade and exchange networks that brought these materials to the site.

This book begins with a well-articulated introduction that outlines the overall objectives and the theoretical frameworks being used, as well as the various methodologies needed to address specific questions. He has done an excellent job in developing an engaging writing style that tells the story of a rock, its discovery and analysis, and its overall importance to his research questions, while at the same time presenting details that will be of interest to specialists. Over the course of his dissertation research, he employed multiple complementary analytical techniques to carry out analyses of more than 3000 archaeological and modern geological samples. With the results from these studies he was able to compile for the first time, a detailed provenience map for the archaeological rock and mineral samples from Harappa and several other contemporaneous sites. He has also been able to convincingly demonstrate that only a limited number of source areas can be linked to specific raw materials from Harappa. This critical use of scientific data has allowed him to generate maps of potential source areas that would have supplied Harappa with specific raw materials during different occupational phases, (circa 3500-1700 BC). He has intentionally kept his conclusions conservative, because there are always more sources that need to be sampled, and the widespread extent or internal variation in some geological deposits are often too large to

allow pin-point accuracy for sourcing. Nevertheless, the conclusions that he does reach are extremely important and serve to address two of his primary lines of inquiry regarding changing inter-regional interaction/acquisition patterns, and variations in the acquisition and use of raw materials at Harappa itself. One of the most important discoveries has been the fact that many of the important raw materials used for creating both utilitarian and prestige goods came to Harappa from sources located far to the north in the mountainous regions of the northern Indus valley. At most of these source areas there is no evidence for the presence of Harappans or in some cases there are no reported prehistoric sites at all. This has made it difficult to answer one of his other research question regarding the identification of specific communities that were providing raw materials to the Harappan cities. Clearly more research needs to be done on this topic but due to the current security situation in these regions, such studies will need to be undertaken in the future.

It is highly unlikely that any one person in the near future, will be able to collect the vast range of materials that he has accumulated and undertake a comparative study of this scale. I want to thank Randall for this stimulating presentation of a complex set of data that will take many more years to fully appreciate. Every time I prepare a lecture or write a new article, I am able to include new updates and insights based on his innovative research. This book and its extensive appendices will be a major reference for any future studies of the Indus region and beyond, not only for rocks and minerals, but all aspects of regional and extra-regional interaction.

In conclusion I also want to commend the publishers and editors of this series, Dr. Toshiki Osada and Dr. Akinori Uesugi, for selecting this outstanding piece of research for their publication series. I am honored to have been able to contribute to various aspects of this project and look forward to many more years of productive collaboration.

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This book is an updated version of my PhD dissertation, which I defended at the Department of Anthropology, University of Wisconsin-Madison in May of 2008. I am deeply grateful to Prof. Toshiki Osada and to the Research Institute for Humanity and Nature (RIHN), Kyoto for agreeing to publish it and for sponsoring my August 2010 stay at the institute in order to complete the revisions. I am likewise grateful to Dr. Akinori Uesugi at the RIHN, for giving up his valuable time in order to format the final text and illustrations. Thanks also to Dr. Steve Weber, Dr. Marco Madella, Endo Hitoshi and Takeru Sonoda for their friendship, advice and assistance during my stay in Kyoto. I wish to express my heartfelt gratitude to Prof. Asko Parpola. It was his encouragement at the January 2010 RIHN-sponsored roundtable in Bhuj, India, that prompted me to pursue publishing my dissertation in this form.

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On October 15th 2005, Prof. Hamidullah died in a helicopter crash while taking part in relief efforts for the victims of the October 8th 2005 earthquake in northern Pakistan.

This book is dedicated to him.



Prof. Dr. Syed Hamidullah, near Jamrud, NWFP, December 2000

