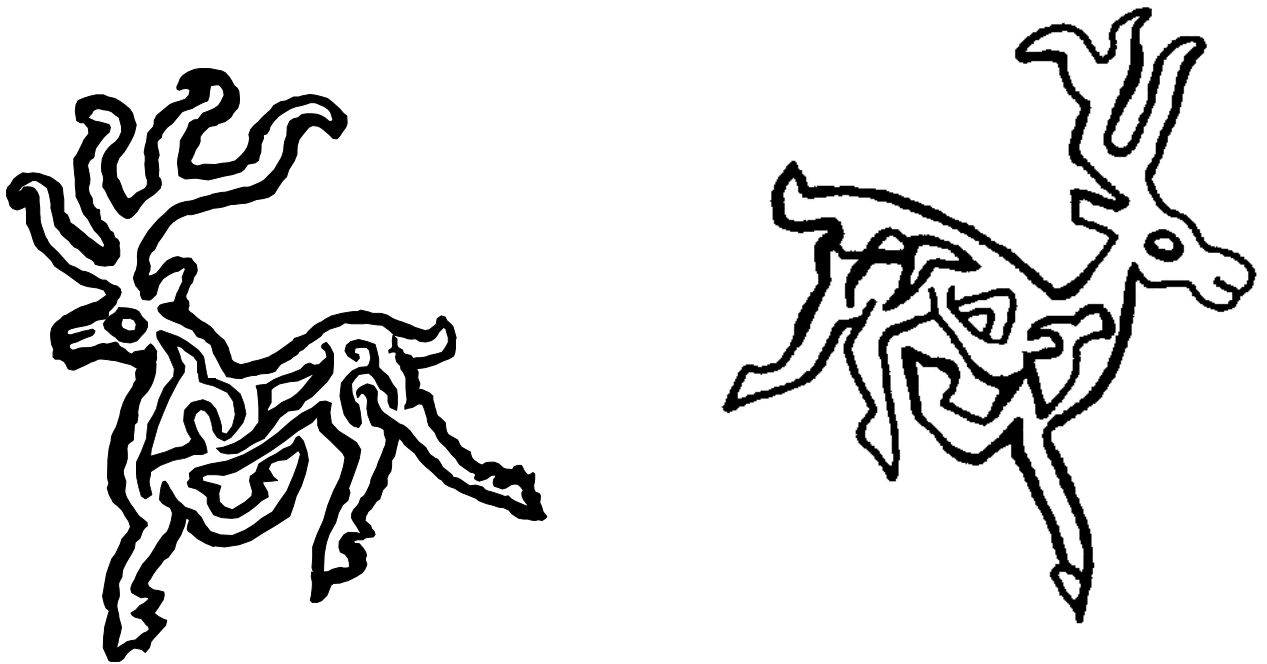
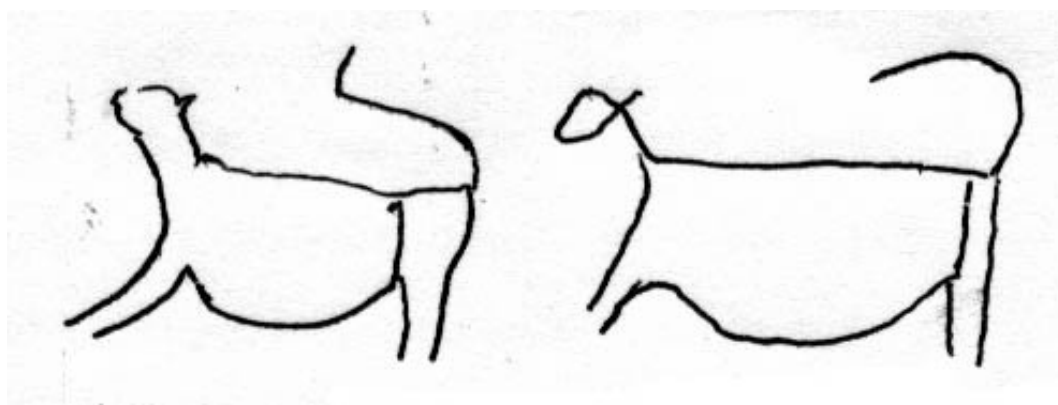


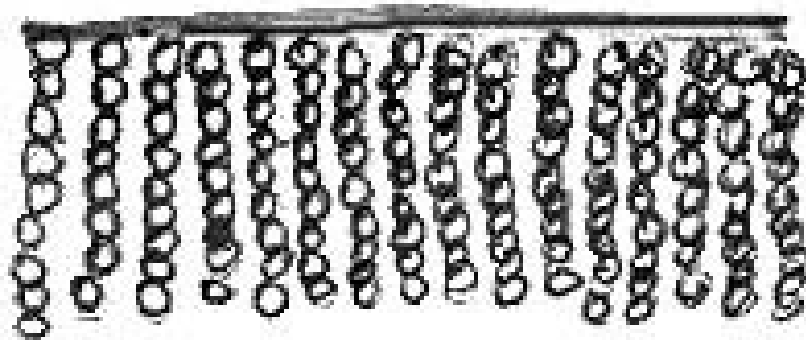
**A REVIEW MEETING OF THE STATE
COORDINATORS AND MULTIDISCIPLINARY
TEAM MEMBERS OF THE IGNCA ROCK ART
PROJECT ON SURVEY, DOCUMENTATION AND
STUDY OF ROCK ART AND ITS ALLIED
SUBJECTS**



5th – 6th March, 2009

**Indira Gandhi National Centre for the Arts
New Delhi – 110 001.**





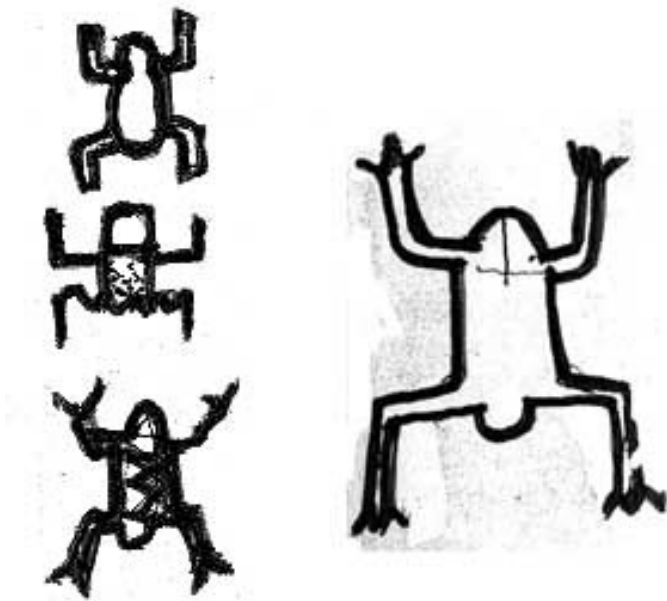
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Indira Gandhi National Centre for the Arts

The Indira Gandhi National Centre for the Arts (IGNCA) an autonomous Trust set up by the Govt. of India and established in the memory of Smt. Indira Gandhi, former Prime Minister of India is a premier resource centre engaged in research, documentation, publication and dissemination of knowledge of the arts. It is visualised as a Centre encompassing the study and experience of all the arts, each form with its own integrity, yet within a dimension of mutual interdependence and inter-relatedness with nature, social structure and cosmology. Through diverse programmes of research, publication, training, creative activities and performance, IGNCA seeks to place the arts within the context of the natural and cultural environment. In the conventional sense of research discipline it relates to indology, philosophy, anthropology, archaeology, and history. The fundamental approach of the Centre in all its work is multidisciplinary and interdisciplinary. The work of the Centre is carried through five divisions, viz. *Kala Nidhi*, *Kala Kosa*, *Janapada Sampada*, *Kala Darsana*, and *Sutradhara*. It has a well developed *Media Unit* for audio-visual documentation and film making; *Cultural Informatics Lab* for production of CD-Roms, DVDs, and developing National Digital Data Bank on Culture.





IGNCA ROCK ART PORJECT

Adi Drshya: A Primeval Vision of Man

One of the major academic programmes of the Indira Gandhi National Centre for the Arts (IGNCA) relates to exploring artistic manifestations emanating from man's primary sense perceptions. Because, the classification of arts in Indian tradition is based on different aesthetic senses. Amongst the senses that lead to aesthetic experience are vision (*Drshya*) and hearing (*Shravya*). Architecture, sculpture and painting originate from vision, and music and poetry originate from hearing, and theatre from the two together. Most probably man's first awareness of the world around came through his primeval sense of sight and ability to hear. The rock art forms a crucial component of the *Adi Drshya* programme. The goal of the Centre is not merely the development of an exhibition or a gallery on the rock art but also to establish *Adi Drshya* into a school of thought and research on alternate means of understanding prehistoric art. So far, we have mechanistic, analytical approaches which assume that the underlying significance of this kind of creativity can not be inferred by statistical counts of frequency of figures etc. Nothing could undermine the complexity and richness of this tradition more. At the moment there is not much available in India by way of interpretive treatment of prehistoric art. The interpretive research and dissemination through display(s), etc. should go hand in hand. The methodology of research and multidisciplinary documentation of the IGNCA's rock art programme is being followed on the same lines.

The prehistoric rock art has been interpreted with different theoretical orientations - generally based on vague and misguided notions of "primitive mentality". Primitive man is denied of having "deeper aesthetic feelings" and "highest moral and intellectual speculations". Following the evolutionary approach - addressing the propositions about human cognitive development and the process of evolving emergence of language - "scientific" claims are made for the "origin of art". But we should not ignore the fact that in the old world the cosmocentric view dominated the lifestyle. Even the authors of rock

art and sages of the *Upanisadic* philosophy reveal the same experience of the cosmos and man's place in it. Both look at the universes sacred artifacts. Interestingly, the text of the classical Indian theory of art is consistent with the context of what is known today as aboriginal art. The fundamental intuition, motifs and styles of rock art persist in their art.

The rock art is one of the richest cultural resources in the world, which depicts the earliest expressions of humankind. This prehistoric art perhaps comes to signify the underlying philosophies and the world-view of the ancient people, and tells us about the soul of a community, its thoughts, beliefs and emotions. It is associated with the cultural values, particularly in countries like India and Australia, where this art is a part of the living cultural heritage of its native population. Fortunately, India has one of the world's six major Prehistoric rock art concentrations of stone age era, and is the first country in the world to discover the same (in 1867 A.D. at Mirzapur, Uttar Pradesh). The other places of the globe are South-Western Europe, Russia, North Africa, South Africa and Australia. The term 'Rock Art' is generally used for all types of artistic activities found on rocks and is classified into two main forms; 'pictographs' and 'petroglyphs'. The pictographs refer to painted figures and are also termed as rock paintings and petroglyphs include engravings, carvings, brushing, dotting and cup marking. The pictographs are found on rock shelters, while petroglyphs are usually confined to open rocks and boulders.

It is necessary to mention here that the fundamental approach of the IGNCA in its entire works is multi-disciplinary, multi-dimensional, multi-directional, multi-layering, and multi-meaning within the systematic cultural whole. Its conceptual plan aims to open the doors to the realisation that the rock art is pure and absolute and hence capable of dispensing great experience beyond its original culture and time. The IGNCA's concern with prehistoric rock art is not restricted to the Archaeologists, and the prehistorians' concern with establishing a linear chronological order of prehistoric rock art, nor it is restricted

to the identification of style and school as criterion for establishing chronology. Instead, it is a concern for man's creativity across time and space and civilisations and cultures through the perception of the sight.

On the same line, the IGNCA has taken up an ambitious project on the rock art survey and documentation, and also the ethno-archaeological study of the rock art. The purpose of the project is: (i) to make textual, contextual video and photo documentation (ii) to communicate with people in the hinterland for archaeological research, and to build up a biocultural map, a mental and ecological atlas of the rock art landscape, on the basis of documentation of related folklore and natural and man made features (iii) to make suggestions for structural, ecological, and, in rare cases, direct conservation, preferably using local materials and techniques (iv) to develop a video, photo and digital archive (v) to make documentaries on the basis of the video documentations in the field (vi) to organise displays (Permanent, Mobile, Temporary) (vii) to bring out publications, both in print and electronic media. A multidisciplinary approach is being adopted for this project. The field documentation is being done in collaboration with the local experts and institutions of the areas/zones concerned.

The present rock art project was initiated in the year 1989-90. But the field based documentation work at large scale was started in the year 2005. In North India, the documentation work was initiated in the states of Uttarakhand and Jammu & Kashmir. In Central India, the work has been initiated in the states of Madhya Pradesh, Chhattisgarh and Jharkhand. In Eastern India, the work has been completed in the state of Orissa. In Western India, the work has been initiated in the state of Rajasthan and in the Southern India, the work was initiated in the states of Andhra Pradesh, Karnataka and Tamilnadu. Under rock art publication series, so far, five volumes have been published. A CD in electronic media has also been published. An international conference (1993) and three national seminars (1991, 1996 & 2004) have been conducted on the subject.

An exhibition on the 'Deer in Rock Art of India and Europe' was held in 1993.

In Orissa, the documentation work was completed in the four districts - Bargarh, Jharsuguda, Sundargarh and Sambalpur. Seven rock art sites and five villages were documented in these four districts. In the Raigada district of Orissa, fifteen villages were also documented for the study of tribal art. In Madhya Pradesh, the documentation work was completed in the three districts - Bhopal, Raisen and Sehore. Eight rock art sites and three villages were documented. In Chhattisgarh, the documentation work was done in the Raigarh district. Ten rock art sites and three villages were documented. In Jharkhand, the documentation work was done in Hazaribagh and Chatra districts. Eight rock art sites and two villages were documented.

In Uttarakhand, the documentation was conducted in Almora and Nainital districts. Fifteen rock art sites and three villages were documented. In Jammu & Kashmir, the documentation work was done in the two districts of Leh and Kargil, in the Ladakh region. Thirty three rock art sites and a village were documented.

In Rajasthan, two phases documentation work was conducted in the Bundi district. In the first phase, thirteen rock art sites and three villages were documented. In the second phase documentation work, twelve rock art sites and two villages were documented.

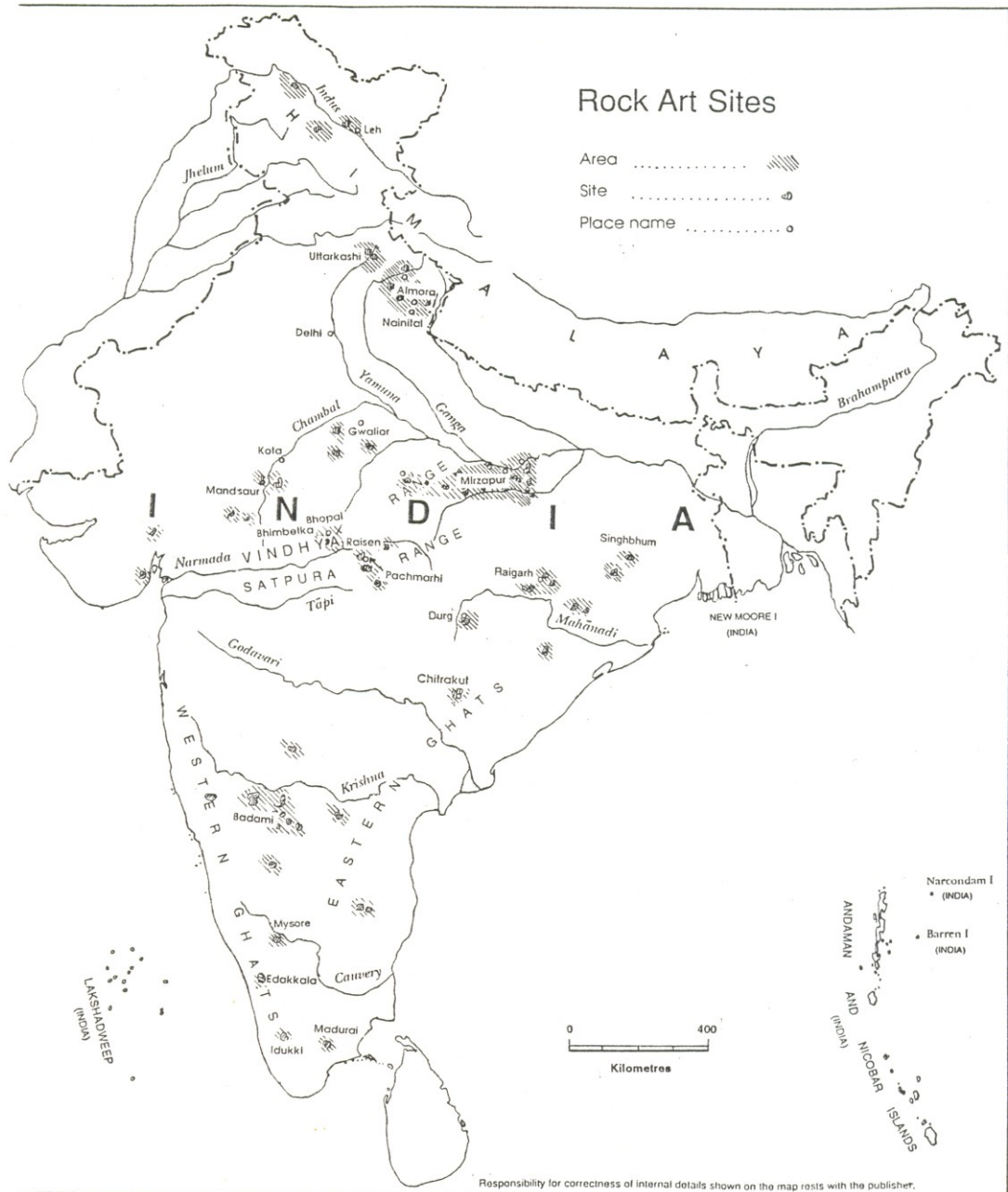
In Karnataka, the documentation work was completed in the Bellary district. Thirteen rock art sites and five villages were documented. In Andhra Pradesh, two phases documentation work has been completed. In the first phase, the documentation work was initiated in the districts of Hyderabad, Medak, Mahabubnagar, Warangal and Khammam. Seven rock art sites and four villages were documented. In the Second phase, the documentation work was initiated in the districts of Anantpur, Cuddapah, Kurnool and Mahabubnagar. Six rock art sites and the Shiva temple of Alampur were documented. In Tamilnadu, two phases documentation work has been conducted so far. In the first phase, the work was initiated in the districts of

Krishnagiri and Dharampuri. Thirteen rock art sites and five villages were documented. In the Second phase, the documentation work was initiated in the district of Dindigul. Eight rock art/ dolmen sites were documented. Four villages and one community, namely Paliyas of this region were surveyed and documented for ethno-archaeological study. The famous Murugan temple of Palani and Thandikudi were also documented.

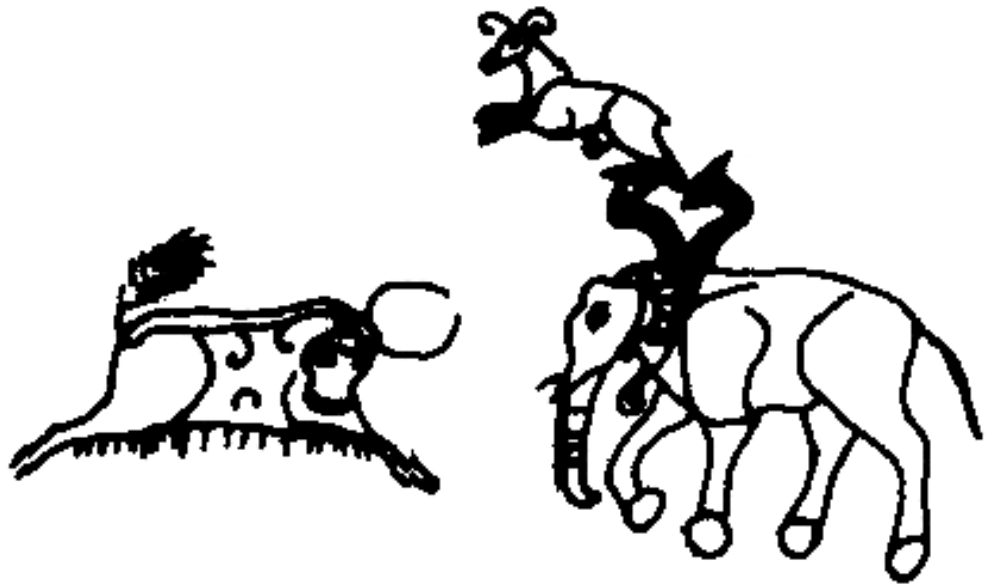
The physical output of the present project is in the form of huge data base of photographs, slides, video recording, line drawings, and GPS data of all the documented sites.

Since we are loosing rapidly the rock art due to both natural and human reasons, the time is not far away when all this data would form the rare and prestigious collection of the Centre. It would also help in generating finances for the Centre in future. The immediate need is to preserve, analyse and propagate about the project and its collections. For the conservation of data, digital cataloguing, conversion of GPS data, etc, the process has been already initiated. For making DVD's for the transmission in TV (etc), the work has been initiated. The project review meeting (5th –6th March, 2009) of the state coordinators and multidisciplinary team members of the project has been organised to assess the progress of the project and get scholarly input from the multidisciplinary scholars, their observations and suggestion. Also to work out action plan for those rock art sites/areas which have not been documented so far.

B.L. Malla
Project Director







PROGAMME SHEDULE
5th – 6th March, 2009

05-03-2009 (Thursday)

Inaugural Address : K.K. Chakarvarty

Session I : 10.00 AM – 01.00 PM

Chairperson : K.K. Chakarvarty

Spatial Attribution of Petroglyph of Ladakh Region

Tashi Ldawa Thsangspa

Archaeological Background of North East India With Some Reference to the Rock Art Sites

Dwinpen Bezbaruah

Rock Art of Uttarakhand Himalaya: Some Refelections

Girija Pandey

Some Ecological Aspect of Rock Art Sites in Uttrakhand

G. C. S. Negi

Selection of Rock Art Sites: Some Geological Aspects

P. D. Pant

Lunch: 01:00 PM – 02.00 PM

Session II : 2:00 PM – 5.30 PM

Chairperson : N. Chandramauli

Rock Art of Andhra Pradesh: A New Synthesis

N. Chandramauli

Quality of Pictograph Art in The Rock Art Sites of Andhra Pradesh- A Geological Prospective

P.V.Nageswara Rao

Botanical Survey at the Rock Art Sites of Andhra Pradesh

M. Raghu Ram

Geological Aspect of 'Rock Arts' in part of Krishnagiri and Dindigul District, Tamilnadu

V. Subramanian

Survey and Documentation of Rock Art in Krishnagiri District, TN – A Preliminary Account on Floristic Elements

M.V.Rao

Ethno-Archaeological Studies of Rock Art Site in Krishnagiri and Dindigul Districts of Tamilnadu

A. Chellaperumal

Rock Art of Karnataka, Special Reference to Bellary District

R. M. Sadaksharaiah

Geological Aspects, Rock Art sites in Bellary District, Karnataka

B. K. Wadeyar

Botanical Survey, Rock Art sites in Bellary District, Karnataka

C. K. Rudramuniyappa

06-03-2009 (Friday)

Session III : 09.30 AM – 01.00 PM

Chairperson : Sadashiv Pradhan

Rock Shelters & Rock Arts of Orissa

Sadashiv Pradhan

Rock shelters and Rock Arts of Orissa- An approach to geological Perspective

Devananda Berua

Report on the Microbial Growth on the Rock Shelter and Their Possible Control

S. P. Adhikari

Lunch: 01:00 PM – 02.00 Pm

Session IV : 2:00 PM – 04.30 PM

Chairperson : V.H.Sonawane

Rock Art of Bihar

A.K. Pradash

Rock Paintings of Jharkhand

Satyendra Kumar Jha

Rock Art of Gujarat

V.H.Sonawane

Rock Art of Rajasthan

Murari Lal Sharma & M.L. Meena

Rock Art of Rajasthan (Some New Discoveries in Bundi district)

Omprakash Sharma

Management of Rock Art Centre in Madhya Pradesh

Narayan Vyas

Rock shelter Geology, District Raigarh, Chattisgarh

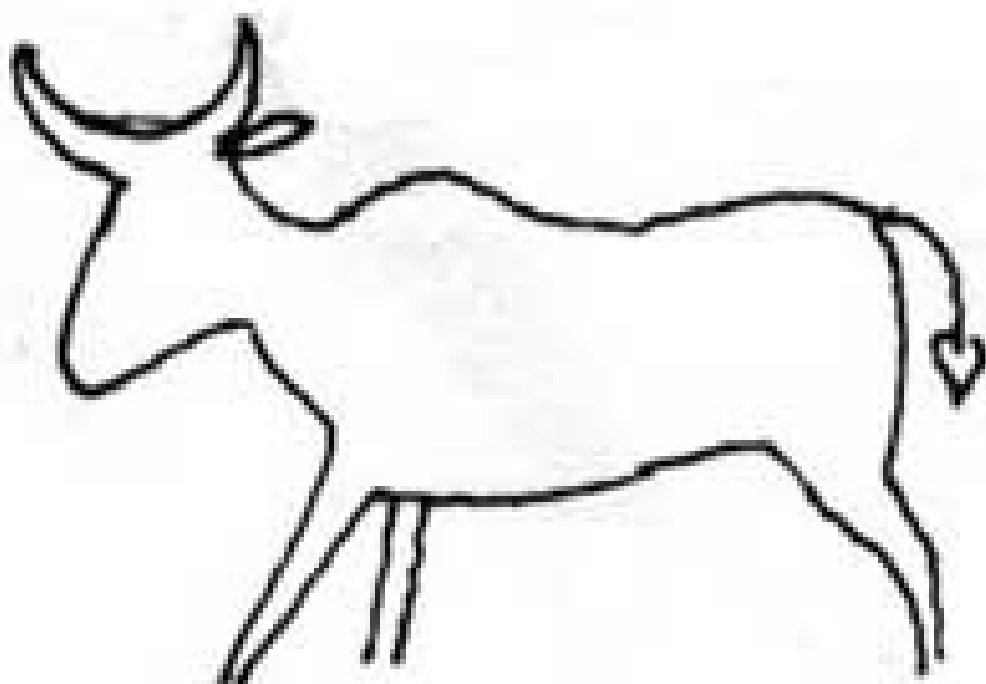
S. K. Pandey

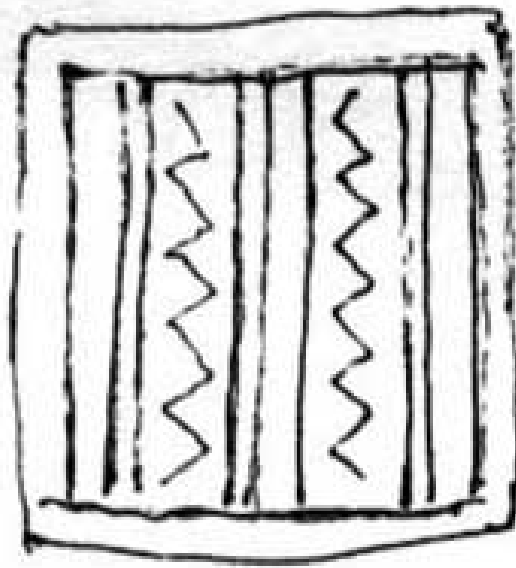
Rock Art Sites In Kohbahur, Korla District

Bharti Shrotri

04-30 PM – 05-30 PM

Discussion and Finalisation of Future Action Plan





ABSTRACTS OF THE PARTICIPANTS

Spatial Attribution of Petroglyph of Ladakh Region

TASHI LDAWA THSANGSPA

The petroglyph of Ladakh and its spatial distribution throughout Ladakh region that we have discovered since last ten years has special significance. Although, only a fraction has been reported, the present study is a comprehensive survey containing more than 40 sites with hundreds of constellations. It includes more than 200 km along the Indus and almost all the major tributaries and valleys. Few of these petroglyph has been repeatedly reported i.e. Tangtse inscriptions. It has been reported since 1907 by half a dozen people or scholars. Vohra reported different aspects of the same in different papers since 1980s. The most elaborate report on petroglyph of Ladakh by Francfort et. al. (1988) is comprehensive but contains only few sites with less than a dozen rock art.

Our study reports only the ones that we consider to be of exotic, incongruous and primarily belonging to pre-buddhist period. Broadly we have logically generalized that the exotic petroglyphs are confined to the routes which once existed since prehistoric times. There is no doubt and surprise that many of these arts shows homogenous character with neighbouring states, but still there are many which shows no resemblance to any cited literatures so far and hence need further research.

Arts resembling the 'mascoïd', of Okunev Culture of South Siberia, of third millennium BC has also been reported from Chilas (Pakistan), Zaskar and Gya. However, the ones we have discovered in Nubra valley shows the best sameness to the ones found in Siberia. Likewise, petroglyph in the 'Domkhar Sanctuary' reported for the first time has no parallel in stylized animals in the entire Upper Indus Valley. It also has Chinese inscriptions. The 'Tangtse Chase' from Changthang region, shows so much resemblance to a part of the art composition of Renmudong. It shares resemblance with the art of Tibet of Iron Age. The hundreds of anthropomorphic figures of Sham region correspond

to the rich tapestry of belief and myths of pre-Buddhist period that reflects a special wave of human traffic on this particular route. Likewise, Kargil, Chilling, Kere valleys also reflect their own peculiar depictions.

Till date, except publication of papers, no single effort has been done to save or conserve these rock art sites which are succumbing to the natural weathering and human activities and vandalism. Since only little has been discovered so far, perhaps it remained neglected. For the first time we are taking the task with both the Councils of Kargil and Leh to formulate a policy for the conservation of all archeological monuments in general under the name 'Ladakh Protected Monuments' in line with National and State protected monuments. Creation of a Heritage Rock Art Garden, already underway, will house rocks with petroglyph that are under immediate threat.

The state of Madhya Pradesh claims Worlds Longest Chain of Rock art extending 12 km, but Ladakh in one stretch it extends 60 km! If we achieve the claim it will give the greatest impetus to the importance of petroglyphs, which is so far a neglected field.

Archaeological Background of North East India with some reference to the rock art sites **DWIPEN BEZBARUAH**

The northeastern region of India comprising the eight states is a vast tract with marked ecological and ethnic diversities. Geo-historically its location is significant since it is bordered by China, Burma and Bangladesh and bridges the mainland India with territories of Eastern and Southeast Asia – a situation which is significant from anthropo-archaeological consideration. The anthropological importance of this region has been highlighted by G.N. Bhuyan (1999) through the following remark, “ This region thus naturally in a sort of splendid isolation almost completely cut off from the rest of the world and yet from time immemorial has served as a crucible for various ethnic groups who entered the area through

various mountaineous passes on the north, northeast, east and south and in due Geologically it is bordered on the north by the great Himalayas and forested hilly ranges of Tertiary origin in the east and the oldest part represented by the Shillong Plateau comprising the Garo and the Khasi-Jayantia Hills. Geologist (Krishnan 1960) opine that the present configuration of this part of India is not more than 30 million years old which is comparatively a recent time in consideration to the total age of the earth (4600 million years).

The prehistoric tradition of this region was initially reported by the British administrators and scholars who in the course of their exploration recorded the findings of stone implements from different parts of erstwhile Assam. Those artifacts were various types of stone implements of Neolithic culture. British scholars like Hutton (1928), Mills (1929), Lubbock made pioneering contribution to the prehistoric research in this region. After the British left the country and with the establishment of the Gauhati University, scholars from the department of Anthropology undertook the task of systematic archaeological investigation in this region. The first excavation was carried by the said department at Daojali Hading in NC Hills of Assam in 1961-63 where traces of Neolithic culture was recovered from a 45 cm thick single culture deposit consisting of axes, adzes, hoes, chisels, grinding slabs, flat and concave querns, mullers and pestles and a hand made cord marked pottery. The existence of large quantities of grinding slabs suggest that this was a factory site (Goswami and Sharma 1963). Sarutaru in Kamrup district of Assam is another Neolithic site excavated by the department of Anthropology, Dibrugarh University. The site geologically coming under Shillong plateau exposed a single layer deposit of about 35cm thickness containing a small hoard of nine ground stone tools of slate stone about 78% of which are shouldered celt and the remaining ones being rounded butt axes. The sites also contain handmade cord marked pottery tempered with quartz particles and also basket marked pottery

(Rao, 1973). Dibru Valley in the district of Dibrugarh in Assam is also an important Neolithic site which have yielded celts of different variety with handmade potsherd. The site has been dated back to 2210±140 B.C. (Saikia 88). Besides the entire tract in Assam from Karbi Anglong and NC Hills in Khasi-Jayantia border upto Kasomari-Jamaguri in Nagaland border consist of numerous megalithic sites. The megalithic structures are also of different sizes and shapes and socio-ideological meaning attached to them have raised their academic significance. The present author has tried to explore, record and study the megalithic remains of Karbi-Anglong in Assam considering the fact that the practice of erecting megaliths still survive among the Karbis (a hill tribe of Assam now also residing in the plains of Assam) as a post-cremation rite (Bezbaruah, 2003)..

Next to Assam, Meghalaya is an important state as far as the prehistory is concerned. Garo Hills district is an important area where more than ten sites containing the artifacts of Stone Age, the ancestries of which are still being debated. Typologically artifacts resembling Neolithic as well as pre-Neolithic culture have been confirmed. Medhi (1980) on the basis of the geochronological studies has opined that the stone age culture of Garo Hills belong to the late Pleistocene period. The other half of the state in Khasi-Jayantia district has both pre-Neolithic Stone Age and megalithic sites. The megalithic tradition is important from the ethno-archaeological consideration as megalithic tradition survived as a living practice among the Khasis. Megalithic structures as dolmen, menhir, cist etc. dominate the region.

The state of Manipur is also important as far as Stone Age archaeology is concerned. The earliest evidence of Stone Age culture was reported by O.K. Singh (1968) who discovered a series of limestone caves in the Ukhrul region and his excavation in cave no 7 at Khangkhui unearthed a number of palaeoliths which he claims have affiliation with those found in Kurnool caves. Some pebble choppers have also been

collected from this region and he reports the finding of a small pebble chopper layer overlaid by a cultural deposit containing Neolithic artifacts from a site called Napachik. The hilly tract of the state inhabited by various Naga tribes is also important from the point of megalithic tradition as it abounds in a number of megalithic structures affiliated with the socio-ideological system of the ethnic groups associated with them.

The state of Arunachal Pradesh was initially explored by Bopradikar (1972) who reported the findings of a number of palaeoliths from Lohit district. His work was followed by the archaeologists from the Directorate of Research, Arunachal Pradesh and they reported the findings of prehistoric sites and artifacts from different parts of Arunachal Pradesh. D.K. Bora and A.A. Ashraf explored the Kamla valley of lower Subansiri District and collected some stone artifacts and pottery and recorded these findings in Ashraf's book *Prehistory Archaeology of Lower Subansiri* (1990).

As far as the historical period is concerned the main archaeological sites are located in the state of Assam particularly in the Brahmaputra Valley and its adjoining feeder basins. Except Assam, the archaeological sites of historical period in NE India have been reported from the plain valley regions of Tripura, Manipur and Arunachal Pradesh. It will be very difficult to describe all the sites of Assam considering the vastness of collection and numerical preponderance. The important among these are the historical sites at Ambari in the heart of Guwahati city. The site during excavation during 1970-71 revealed abundant pottery remains besides icons of gods and goddesses and also few pieces of coins. On the basis of typological classification of pottery the cultural stratum has been divided into four phases and this has been ascribed a chronological span of 7th to 13th century based on the radiocarbon dating (Bhuyan 99). Surya Pahar in the district of Goalpara is another site which indicates the co-existence of Saivism, Buddhist and Jain tradition in

Assam. Situated at the banks of Brahmaputra the site on excavation revealed a sanctum-sanctorum. Besides rock cut figures of Budha as well as Sivalinga and numerous icons of gods and goddesses, animals and anthropomorphs are also present on the hilly terrain. Daparbatiya in Tezpur and Madan Kamdev near Guwahati are two other noteworthy sites with ruins of ancient temples and different figures of gods and goddesses, human figurines, animals and decorative designs and motifs. These two sites have been correlated with the Gupta dynasty of mainland India from typological and architectural considerations. The ruins of the Bhismanagar and Rukmininagar now in Arunachal Pradesh represent the earliest evidence of contact of the people of this region with the mainland India. Situated in the plains formed by the rivers Dibang and Lohit in Arunachal Pradesh the site has an elongated fortress of semi-circular shape extending over an area of 10km and opined to be belonging to the period as early as 10th century A.D.

As far as the rock art of the region is concerned, the only form that has been recorded so far is the petroglyph. The rock art mainly consist of engraving and carved figures. Some of the important sites of rock art in NE India are Unakoti (Tripura), Dimapur (Nagaland), Suryapahar (Assam) etc.

Unakoti near Kailashsahar in Tripura is an important site bearing the trace of rock art. Situated in a forested hilly terrain the images at Unakoti are of two types namely rock-carved figures and stone images. Among the rock cut carvings, the central Shiva head and gigantic Ganesha figures deserve special mention. The central Shiva head known as Unakotiswara Kal Bhairava is about 30 feet high including an embroidered head-dress which itself is 10 feet high. On each side of the head-dress of the central Shiva, there are two full size female figures - one of Durga standing on a lion and another female figure on the other side. In addition three enormous images of Nandi Bull are found half buried in the ground. There are various other

stone as well as rock cut images at Unakoti. These images are dated back to 7th to 9th century AD.

Dimapur in Nagaland is another noteworthy site consisting of monoliths with engravings on them. Monoliths are observed scattered in around the town and some of them are as high as ten to twelve feet with a girth of six feet. Opined to be erected during thirteen century these monoliths are beautifully designed with mythical animal figures, birds, flowers, leaves, draggers etc. Besides designs such as circles, semi circles, straight lines etc are also observed.

In Assam besides the important site of Suryapahar as mentioned above a number of other sites with rock cut figures are noticed in different areas. The rock cut hut near Maibong in NC Hills district is a mentionworthy site. Besides megaliths of different shapes and sizes are also spread in the hilly region of North Cachar and Karbi Anglong, Kamrup and Nagaon district. Some of the megaliths of NC Hills have engravings of different sizes and shapes. This megalithic belt in fact spread to Khasi-Jayantia Hills in the west to Naga Hills in the east. The dominant structures recorded so far consist of menhir, dolmen, dissolith (menhir with a stone platform in front), stone circle, cist etc. Considering the archaeological richness amidst ethnic groups with diverse cultural traits the Northeastern states of India thus happens to be an important region as far as the rock art study is concerned. The hilly terrain with suitable rock types which covers more than half of the region is also important area for flourishing of rock art in the past. Against this backdrop what is needed is a systematic multi-disciplinary effort to retrieve record and study this form of ancient art.

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Some Ecological Aspects of Rock Art Sites in Uttarakhand

GIRISH NEGI

This presentation deals with a firsthand exploratory survey of various rock art sites in Kumaun hills of Uttarakhand under a joint field work with IGNCA, New Delhi. During this survey Rock shelters, Paintings, Rock engravings, Cup marks, Monoliths, Menhirs and Memorial stones were studied particularly for ecological aspects. The mountainous terrain of the study area although experience cool atmosphere but the rock art sites lying in warm valleys below 1000 m alt. sometimes experience over 40°C during summer. Also during winter frost is a common phenomenon. The chilling action of frost on the mineral rocks (e.g., micaceous schists) is evident that promotes the physical weathering of these rocks and they become vulnerable to slow weathering frost damage. Deposition of rain water and snowmelt on the upper surface of rocks bearing the artwork also leads to leaching and dilution of artwork due to seepage that also induces cracks in the rock mass and makes it prone for breaking into pieces. During summer the wind carries some dirt and most notably the yellow coloured pollen grains and winged seeds of Pine trees (the dominant vegetation type in the area) and the rock crevices present a better micro site for the germination of plants thus carried by the wind or by birds, monkeys and rodents and make

the rocks vulnerable to biological weathering, water seepage and cracks due to growth of plant roots. During the survey we collected many varieties of plants growing within the rock art sites.

The rock art sites were mostly in the midst of forests of Chir Pine (*Pinus roxburghii*). The resin containing inflammable pine needles when fall on the ground catch fire easily. The wild fire thus occur every year and pose a potential threat to the rock art sites. During the survey we noticed the scars of wildfire that has crept into the close vicinity of these rock art sites. The Pine forests are also frequented by the local people for fuel wood, grazing grounds, etc. Therefore, they are under the influence of local people, particularly grazers. These sites are often used as shelter against rain, or common resting places by the people while collecting fodder/fuel wood. The presence of wood stoves under the rock sites and defacing the rock art or overwriting indicates that these sites need well-thought strategy for protection in harmony with the local people.

Rock Art in Uttarakhand Himalaya: Some Reflections **Girija Pande**

The study of past is like visiting strange far-off lands. Like travel, it takes us out of narrowness and commonplace events of every day life. It presents before us an exciting picture of the march of mankind across the centuries. Besides this, it also helps us to understand how the civilisations moved into what they are today. A proper understating of human activities in the past lends a hand to have wisdom of belongingness and identity to the subject.

In this context *Rock Art*, a symbol of human imagination, creativity and aesthetics across time and space has been an area of interest for the scholars across the globe. For the past couple of years a fresh approach in which along with archaeology, the geological, ecological, philosophical, anthropological, and historical insight is being

incorporated to study these various forms of human imagination and ingenuity to understand the mind and activities of our ancestors.

Rock Art of Andhra Pradesh: A New Synthesis **N.CHANDRAMOULI**

Andhra Pradesh (12° 14' to 19° 15'N; 76° 50' to 84° 15'E) is situated on the Eastern Sea Board of the Peninsular India and extend westwards in to the Deccan Plateau. From the view point of Archaeological wealth, Andhra Pradesh is one of the richest areas in the subcontinent having evidences of the human habitations of all periods continuously right from the Paleolithic times. It is also one of the important areas for the rock art data as well. The discovery of rock art in Andhra Pradesh was reported in 1941. Between 1941 and 1983 when the book by Dr. V.V. Krishna Sastri on the *Proto & Early Historical Cultures of the Andhra Pradesh* was published which contained some discussion of the then known rock art sites, not much progress has been achieved. Only brief periodic reports of the discovery of Rock art sites appearing in the annual numbers of Indian Archaeology - A Review continued till 1985, when the present author took up the study of Rock art.

The author was the first in Andhra Pradesh, to take up the analytical study of Rock art for his M.Phil degree and continued it culminating in his Doctoral thesis. As the coordinator of the IGNCA Documentation Project of Rock art in Andhra Pradesh, he got an opportunity to have a fresh re - appraisal of the rock art data, after a gap of more than a decade since the completion of his doctoral Thesis. In addition, data from the newly discovered sites was recorded in the IGNCA documentation. The theoretical prepositions suggested earlier needed some modifications in the light of new discoveries.

At the present state of our knowledge there are 30 rock art sites found in all the three geographical regions of Andhra Pradesh. The density of the rock art sites is, however, more in the Telangana

(Northern Andhra) and Rayalaseema (Southern and South western Andhra) Plateau regions. Only two sites have so far been discovered in the coastal region. This paper presents the comprehensive analysis of the Rock art of Andhra Pradesh, in the light of the recent documentation and study.

Quality of Pictograph Art in the Rock Art Sites of Andhra Pradesh – A Geological Perspective

P.V. NAGESWARA RAO

The rock art site investigations have been carried out in February and December 2008, these confirm that the shelters are composed of grey granites (Medak, Mahabubnagar and Anantapur districts), leucogranite (Warangal district), garnetiferous quartzofeldspathic rock (Khammam district) and quartzite's (Kadapa and Kurnool districts). In these locations, both pictograph and petroglyph art sites are observed, but majority of the shelters show pictograph art. The conservation status of pictograph art reached to various degrees of deterioration from fair to SSD in the sites of Khammam, Warangal, Medak, Mahabubnagar and Anantapur districts, while it is SSD to DOD in Kadapa and Kurnool districts. The causative factor for the deterioration is the rain water leaching and superimposes of Fe-Mg oxide solution coatings over the painting panels. This process is controlled by the presence of structural elements (joints and fractures), which allows the percolation of rain water in the rock shelters of the investigated regions. The comparison of weathering rates, \approx ages of panels and disposition of colour stains, gave a conclusion that the light colour (natural kaolin) base developed due to the alteration of feldspars in to kaolin and coated on the surface of panels prior to art making in the sites of grey granites. The coloured bands (red, light yellow etc.) formed due to chemical decomposition of accessory minerals under oxidizing conditions, superimposed over panel surfaces of quartzite's later to the paintings. I suggested the two important conservation measures to prevent the further

deterioration of pictograph and petroglyph art are as follows: 1) Sealing of the external surface of the shelters with cement plastering, so that it avoids the percolation rain water in the weak zones of shelter. 2) It is high time for the state department of Archaeology and Museums to instruct the department of Mines and Geology to stop the granting of leases for quarrying in the rock art sites of Andhra Pradesh.

Botanical survey at the rock art sites in Andhra Pradesh **M. RAGHURAM**

Existence of the plants on earth was evident from paleozoic period (330,000,000 y). However, the first human beings set their foot on the Indian subcontinent, including peninsular India, somewhere between 200000 BC and 40000 BC. Presumably, agriculture began in the Mesolithic period (from 12000 to 6000 B.C.). The prehistoric man used to live in rock shelters and made several rock paintings. The rock arts in India, belongs to the period of Mesolithic to megalithic period (6000BC to 400AD) and records from 12,000 BC are also available. The prehistoric man drawings include the figures of animals, skeletons and some human figures. He used the natural colours including the plant extracts. Though it is a fact that human life on this earth is inseparable from plant life, from these rock art paintings, direct link can not be drawn between the plants and the prehistoric man.

In A.P. we surveyed nearly fifteen rock art sites in six districts. In all the sites, the paintings are mostly on animals like deer, stag, antelope, hyena, and fish. Some are on human figures. There were no figures of any plant parts on any rock arts in the state. In majority of the sites, the figures were very much faded due to exposure to sun and rain. In addition to rock arts, mural paintings were observed at one site- PANDAVULAGUTTA, Warangal district. At that site, this mural painting on pictures of Mahabharata was under severe threat of loss due to vandalism.

Geological Aspects of ‘Rock Arts’ in Parts of Krishnagiri And Dindigul Districts, Tamilnadu
V. SUBRAMANIAN

Rock Art is the term used in Archaeology to define the Man-made features on naturally occurring stones and rocks. After the discovery of rock shelters at Bhimabetaka, south-west of Bhopal in Madhya Pradesh, the exploration for prehistoric features have been intensified in India. Subsequently, after declaring the rock paintings of Sierra-de-San Francisco as the World’s Heritage Site in 1993, the significance for searching such paintings has increased. The day onwards, Petroglyphs and Pictographs have been documented throughout the Indian subcontinent. In this context, rock arts of some parts of Krishnagiri and Dindigul Districts of Tamilnadu have been studied with an integrated approach, especially on their geological, geographical, biological and archeological environmental aspects. In this paper, the geological criteria chosen for the selection of sites for the construction of Dolmen Structures and Rock Shelters, source materials preferred for cave paintings and articulation of stone wares have been discussed. In addition, a comparative analysis has been made between the rock art sites located in Eastern-Ghats (Krishnagiri) and Western-Ghats (Dindigul).

Survey and Documentation of Rock Art in Krishnagiri District, TN – A preliminary account on floristic elements
M.V.RAO AND J.H.FRANKLIN BENJAMIN, T.SENTHIL KUMAR

Krishnagiri district is the latest district of Tamil Nadu carved out of Dharmapuri. It shares the border of Tamil Nadu with Karnataka and Andhra Pradesh. According to Champion and Seth’s (1968) “A *revised* survey of the forest types of India”, there are 34 forest types prevalent in Tamil Nadu. A perusal of this shows 8 forest types present in Krishnagiri District viz. 1.Tropical riparian fringe forest, 2.Southern tropical dry mixed deciduous forest, 3.Dry deciduous scrub, 4.Hardwickia forest, 5.Southern dry tropical riverine forest,

6.Secondary dry deciduous forest, 7.Southern thorn scrub and 8.Tropical dry evergreen forest.

Tamil Nadu forms part of peninsular shield which is one of the ancient land masses of the world. Granite gneiss is the main type of rock found in Krishnagiri district. The soil types of Krishnagiri are red loam and black cotton soil. The average rainfall of this region is 800 – 1000 mm per year and the average temperature is about 22-40°C.

The programme, “*Survey and Documentation of Rock Art in Krishnagiri District, TN*”, has been perceived by multidisciplinary team of 14 members, during August 17th -24 2008. During the programme we have surveyed 15 sites and documented rock arts data in various approaches. The vegetation is classified as “Thorny Scrub Jungle”, dominated with xerophytes and thorny bushes on undulated terrain. The preliminary survey of flora and fauna has been made. The detailed information of the flora and fauna will be presented during the deliberations. The present programme is very helpful to prepare the biodiversity status around the rock arts and to suggest the methods of biodiversity conservation. It is further suggested that the material used for rock arts may be analyzed to find its nature. If it is plant based we can throw some light on the existing flora has been utilized during those days. However, the objectives of multidisciplinary approach of the present study have yet to be defined very clearly.

Ethno -Archaeological Studies of Rock Art site in Krishnagiri and Dindigul districts of Tamilnadu

A. CHELLAPERUMAL

There is a number of rock art sites found in Tamil Nadu. We have also got a good number of studies on them highlighting their age and artistic interpretations. However not many studies we found on their ethno-archaeological importance. As an anthropologist I have attempted to approach the rock art sites of Krishnagiri and Dindigul Districts in particular and other sites of Tamil Nadu in general from

an ethnoarchaeological point of view. This paper is an outcome of the project on Documentation of Rock art in Tamil Nadu sponsored by the IGNCA.

Study of Rock Art sites in Ethno-Archaeological context in Bellary dist Karnatak State
R.M.SHADAKSHARIAH

Under a project of Rock Art Survey and ethno Archaeological Study etc., in the State of Karnataka of the Indira Gandhi National Centre for Arts, New Delhi, as a Co-ordinator/Resource person of the team of multidisciplinary scholars the first ten days programme was successfully carried out in Bellary district, Karnataka State during the year 2007. The team consisted of the scholars of Indira Gandhi National Centre for Arts, New Delhi and the local scholars of Folklore, Enthno-botany, Athropology, Geology, Chimestry, and ethno-Archaeology.

It may be noted that a large number of rock art sites of Mesolithic, Neolithic-Chalcolithic, Iron Age Megalithic and Early historic period were brought to light by various scholars in the State of Karnataka. These sites are concentrated largely in North Karnataka. The sites other than the sites surveyed found so far are Badami area, Hirebenkal, Balachakra, Mallapura, Anegundi, Hampi, Ramadurga, Rampura, etc., have varieties of rock art sites of the above said periods. It is expected that these sites will be surveyed by the same team in the next trips.

Within the limited period of survey the rock art sites at Sanganakallu, Siritwara, Kapgal (Kupgal), Bellary fort, Halakundi, Appayyanahalli, Gudekoti, Kurugod, Tekkalakote and Masalayyanagudde (Hampi) were surveyed and studied by the team. A brief account of these sites are given here from the point of ethno archaeological aspect. The study comprised of the geographical setting, ecological features, locations, type of figures, type of rock art sites, important sites and figures, comparative study, etc., traditions and culture in the present society

and dating in relation to their cultural materials of the contemporary sites.

Almost all the rock art sites are located either on the bed of the open air boulders, hillocks or caves/rock shelters and are associated with the required resources like Stone, Water, Flora and fauna and environment. The rock art hillocks are either highly elevated with the occupation of larger area or running narrow strips (Halakundi) or scatter of big boulder (Kurugodu, Gudekote). The human settlements like habitation are largely located on the top of the hillocks (Sanganakallu, Siriwara, Tekkalakota and Masalayyana gudda-Hampi). The excavated sites like Tekkalakota, Sanganakallu, Kupgal etc shown with the remains of the huts etc. the present dwellings located near these sites have the similar huts and with the drawing of human figure rangoli etc., It indicates the continuation of the tradition from that period!

The rock art sites are divided into three categories: 1. Rock Art painted caves/shekters 2. Rock-Art engravings, bruising 3. Rock Art Mandalas and Rangolies. The brief accounts are given below:

1.The Rock Art painted shelters or caves: The rock paintings on the caves/rock shelters located on the tall granite hillocks are at Sanganakallu, Tekkalakota, Bellary Fort hill and Kuditini. The rock bruising on the bed of the hill boulders at Siriwara/Kupgal, Tekkalakota, Halakundi, and Appayyanahalli. The habitation sites with the cultural materials of Middle Palaeolithic, Mesolithic, Neolithic-Chlcolithic and Iron Age Megaliths, are within the vicinity of Sanganakallu rock art site (red painted) . Besides, a disturbed ashmound is near the habitation on the top of the hillock here and Bellary fort hillock is significant. The painted Jorwe wares were also encountered on the top of the site. There is also a Neoliths factory site at Sanganakallu. The rock painted shelters of Gudekote are associated with chert blades.

The rock painted shelters at Masalayyanagudda (Hampi) are also associated with the remains of Neolithic-Chalcolithic period.

Painted Figures: Horse riders, human figures are more in numbers.

Open Air Rock Art Bruisings:

The sites like Siritwara/Kupgal, Halakundi, Tekkalakota and Appayyahalli have the rock art bruising/engravings. The rock bruising sites like Siritwara or Kupgal have the remains of the habitations of Neolithic –Chalcolithic. There are three disturbed ash mounds, a Neolithic factory site and iron age Megaliths near the site at Kupgal /Siritwara, Both the habitation and Iron Age Megaliths are located near the bottom of the hillock; rock bruising sites at Appayyanahalli and Halakundi.

Figures: The rock art bruising are classified into two categories.

The first category of figures are made by bruising and the other is engravings. The figures are three types in this category. They are as follows:

1. Animals, creatures and cattle/Bull
2. Human
3. Mandalas and Rangoli, Foot prints, ladder, etc.,

The first type of figures are elephants (Tekkalakota, Halakundi etc), naked human Foot prints, deer, bullock, bird, figures (Siritwara, Halakundi), ladder, human, figures (Appayyanahalli), Lion, Stag, peacock, bullocks with or without humps with tall horns with or without branches (Siritwara) aquatic creatures like Snail, Snake, Fish etc., (Siritwara and Appayyanahalli). The mandala/Rangoli are shown at Appayyanahalli, Siritwara etc., The large number of varieties of rock arts particularly bruising and engravings associated with human habitations, Neolithic factory site, three disturbed ash mounds etc., of Siritwara/Kupgal is treated as an unique site in Indian art site.

The cultural materials of the habitation sites located near the rock art sites are pottery (gray ware and its varieties) painted Jorwe Ware, red ware a burial grey ware lid with punctured figures of Snake, Stag, bull and peacock (is third phase of Tekkalakota), neoliths, Microliths, Terracotta bull figurines (Sanganakallu, Piklihal), bone implements, beads etc

Most of the figures like bull, Snake, peacock, etc., of Siriwara/Kupgal are similar to some figures of burial lid figures of Tekkalakotta. From the point of cultural context of neolithic Chalcolithic sites, Neolithic factory sites, ash mounds, most of the brisings may be dated to Neolithic-chalcolithic. The painted figures like horse riders etc are comparable to Iron Age megalithic.

The Mandala and rangoli figures of this region are rare. But they may be dated to Meghalithic period. The white painted figures and the brisings of Appayyanahalli may be dated to early historic period or end of Iron Age megalithic period.

However, only after the survey and documentation of all the other rock art sites in Karnataka it will be possible to give a full picture on Rock Art Sites of Karnataka.

Suggestions

The other large number of rock art sites in Karnataka, should be surveyed and documented by the same team.

(2) Some of the rock art sites like Sanganakallu, Appayyanahalli, Halakundi, Siriwara (Kupgal) etc in Bellary district proper conservation.

(3) The quarrying and blasting activities of the sites like showing Siriwara/Kupgal, Sanganakallu, should be stopped.

(4) The Siriwara (Kupgal) rock art site various type of figures and is associated with the contemporary human habitation, ash mounds, microlithic and Neolithic factors. The location of the rock brisings are on a single bed of boulders from bottom to top. This type of site is

believed to have rarely come across in any part of Indian rock art sites. Therefore this natural setting of the rock art site should be made an open air rock art site Museum for future generation.

(5) Cataloguing each figure of each rock art sites in Karnataka is also needed.

(6) The study and cataloging of rock art figures is also highly risky. Therefore the work may be distributed to different universities specially for the rock art specialists by providing the necessary grant from Indira Gandhi National Centre for Arts, New Delhi.

Acknowledgement : It is indeed a great opportunity provided to participate, carryout survey and study of rock art sites through a team of inter disciplinary subject scholars in Karnataka in first stage by the Indira Gandhi National Centre for Arts New Delhi. Therefore I am highly grateful to the Director and Research Officers of the IGNCA, New Delhi.

Geological and Palaeoclimatic Aspects of Rock Art Heritage Sites of Bellary District, Karnataka State

B. K. WODEYAR

Geology of Karnataka state has attracted the attention of geoscientists from all over the world because of its varieties of rocks, and minerals of different ages. Likewise, the rocks of Karnataka state are treasure houses of rock art sites and temples. Though lot of research has been made on the rock – art of this state, it deals mainly with the archaeological interest; geological aspect is neglected because of many reasons.

Preliminary geological investigations of the rock – art heritage sites of Bellary district revealed that prehistoric man has selected particular rock types for a specific work viz., brusings have been made on joint planes in dark coloured rocks like dolerites and paintings on light coloured rocks, deep brusings in granites. High hardness rocks have been used for tool making. There are some evidences to show that at

that time only they knew the effect of textures of rocks in their art work.

Detailed investigation has revealed that the palaeoclimate of this region was not like the present arid climate. Instead, it might have had high annual rainfall. In this paper, studies on rock types and petroglyphs, rock properties and petroglyphs and the probable palaeoclimatic conditions of the region are discussed.

Vegetational Survey of Rock Art Sites of Bellary District, Karnataka State

C. K. RUDRAMUNIYAPPA

Random vegetational survey was made in the hilly areas of Bellary district in the month of May, 2007. Bellary district in Karnataka state is known to have low rainfall and highest temperature in summer. In all the areas surveyed, no climax kind of vegetation (thick forest type) was found. Because of low rainfall, the type of vegetation in those areas surveyed was found to be scrubby thorn type represented by majority of Succulents and Spiny plants. These plants are physiologically known to withstand dehydration for considerable period. No accumulation of humus in the soil and the soil is well aerated. Along the slopes of some hills, considerable vegetation was seen and this may be due to the availability of water through gravity. In some elevated places, almost no vegetation is observed. It appears that no replacement of any dominant plant species has taken place since large and old trees adapted to desert conditions were found to be absent.

Animal life appears to be adapted for specific dry conditions. Commonly, rodents, reptiles and some birds which are adapted for dry conditions were present.

Most of the Succulent plants found belong to the family Euphorbiaceae and few belong to Cactaceae. Added to these plants, Azima tetracantha (Salvadoraceae), Cassia auriculata (Caesalpineae), Ziglyphus jujuba (Rhamnaceae), Carissa caranda (Apocynaceae),

Calotropis (Asclepiadaceae), Cymbopogon (Poaceae), Jatropha (Euphorbiaceae), Bidens (Compositae), Prosopis (Mimosae), Cactus (Cactaceae), Dodonea Viscosa (Sapindaceae), Vitex (Verbinaceae) are also present.

The survey also revealed that some evidences of ancient human inhabitation and their cultural activities were noticed in some sites. In support of this, the rock depictions, occurrence of ash mounds and some ancient tools etc were noticed. The archaeological studies of these areas have supported the existence of human inhabitation.

The surveyed places include the hills of Kappagal, Sanganakallu, Halkundi, Appayyanahalli, Kurugodu, Tekkalakote and past Hampi (near Vijaya Vittal Temple). In all these sites, where rock art (paintings, brusings, carvings etc) were depicted was found to show not much difference in vegetational types. It is interesting, although, no reasons could be ascribed for the coexistence of rock art and the type of vegetation found. In this regard, experts concerned might throw some light on their coexistence.

Rock Art of Orissa **SADASIBA PRADHAN**

The Project entitled “Rock Art and Allied Subjects in Orissa” was undertaken in collaboration with IGNCA, New Delhi & IGRMS, Bhopal during 2005-06. In order to fulfil the objective of interdisciplinary perspective, a multidisciplinary team was constituted with the following persons.

1. Prof. Sadasiba Pradhan, H.O.D, Dept. of Ancient Indian History Culture and Archaeology, Utkal University as the State coordinator.
2. Prof. S.P.Adhikari, Professor Dept. of Botany, Utkal University as Botanists for Biological inputs.
3. Prof. Jagannath Dash, Professor, Dept. of Anthropology, Utkal University for ethnographic inputs.

4. Dr. Debananda Beuria, Lecturer in Geology, Utkal University for Geological inputs.
5. Sri Dibishada Brajasundar Garnayak, M.A., M.Phil, Dip-in-Archaeology, Research Associate.
6. Sri Kunja Bihari Barik, M.A., M.Phil, Research Associate.

The multidisciplinary team visited rock art sites and adjoining village settlements in four phases.

1. Field trip of first two phases was funded and accompanied by the IGNCA.
2. Field trip of the last two phases was funded and accompanied by IGRMS
(Still photographs and video films are with the funding agencies in original)

The detailed report was submitted to IGNCA in the month of May 2008.

The report includes documentation of rock art in 106 sites in eleven districts and ethnographic data of 12 tribal groups of Orissa. The report gives an account of the rock art sites in respect of location, dimensions of the rock shelters, subject matter of rock pictures, be it painting or engraving and associated archaeological material such as tools, implements and potteries. In case of tribal art and craft, detailed account of art traditions of the Sauras, Juangs, Kondhs, Santals, Binjhals have been included.

A detailed account of the rock formations, Granite, Sandstone, Quartzite, associated with rock art along with their scientific analysis have been prepared by Dr. Debananda Beuria.

Prof. S.P.Adhikari collected micro-organic samples from four rock panels and prepared a scientific report on different species of micro-organism causing damage to the rock art panels.

Three presentations shall be given by i) Prof. S.Pradhan, ii) Prof. S.P. Adhikari & iii) Dr. D. Beuria

The study is not complete and it is proposed to undertake the following works to complete the interdisciplinary exercise.

1. Survey and Documentation of Rock Art and Tribal and Folk art in potential areas like lower Mahanadi Valley covering the districts of Khurda, Dhenkanal, and Cuttack .
2. More intensive study of Microbiological growth in rock art shelters for preparing scientific strategies for preservation of picture panels.
3. AMS dating of rock pictures in collaboration with Institution of Physics, Bhubaneswar because any amount of study in art is not complete without ascertaining the antiquity of the rock pictures.

Rock Shelters And Rock Arts Of Orissa-An Approach To Geological Perspective **DEVANANDA BEURA**

Arts/drawings manifested on the rock bodies are termed as rock arts. Rock arts are normally found in three forms such as (a) painting on the rock surfaces, (b) engraving on the rocks and (c) engraving and painting the engraved arts. These arts mostly appear on the rock surfaces/walls of the rock shelters. Rock shelters have been formed by natural disposition of rock bodies under the dynamic activities of earth crust that creates hollow structures with architectural variations.

The expressional patterns of arts in different forms are probably regulated by the physical properties of rocks. Hence effort has been made both in field and laboratory to deliberate the characteristics of art containing rocks. Hard and competent rocks like quartzite and granite are hardly found to be engraved, rather abundant paintings are noted on them. On the other hand, soft and incompetent rocks such as sandstones are engraved with arts. This indicates the cerebral aptitude of ancient man towards identifying and selecting the rock types for making art.

The study entrusts the scope of geomorphological observations, as rock shelters are geomorphological settings of rock bodies that become habitable for the ancient man. Geomorphology, though not the sole, is responsible for the litho setting of any area. It includes every odd arrangement but choosing a suitable one gives the definition to the rock shelter. Geomorphological indicators play an important role in exploration of rock arts.

A detailed discussion after thorough study is made regarding pictographs, painting and sources of colours. Various parameters like rock surfaces, textures, matrix, pore space and alteration of rocks have been taken into account to analyze the probable characteristics of painting. Image on rock surface is produced either by modification of rock surfaces or by pigments, sometimes by both. Pictographs are the images that are created using pigments. Paintings are discriminated from rubbing paints by suspended liquid pigments. The nature of pigmentation and painting such as shining, adherence, depth etc, though not solely, depend upon the rock properties.

Special attention has been focused on the superposition of rock arts. In many rock art sites it is often observed that some arts appear indistinct due to overlapping of figures drawn at different times, one on the other. When one set of arts are found overlain by another set, the earlier one is said to be superposed by the later. They are regarded as the creations of different generations. Superposition of paintings and engravings are demarcated by observing the characteristics like colour difference, geometry of arts, and interference pattern etc.

The study advocates many threats to the rock arts and suggests the preservation methods. Geological delineation of individual rock shelters has been included in the report.

Report on the microbial growth on the rock shelters and their possible control.
S.P. ADHIKARY

The study: Samples were collected from the exposed surfaces of human habitations of the pre-historic period located at four places of western regions of Orissa state. These sites are: Bhimmandali, Ambjholkhol, Manikmoda and Kendukhol, all located at about 80 to 100 Km from Sambalpur headquarters.

Observation: The substratum of all these localities are rocks with calcifications on their surfaces. At shaded locations and darkened areas of the shelters, especially at Manikmoda shelter the calcification was profuse. In many locations the rock arts have been eroded/disfigured due to uncontrolled growth of microorganisms and crustose lichens, and also due to vandalism by the visitors at these places.

Methodology of sampling and analysis: The microbial samples on the rock arts and neighbouring regions of the shelters were carefully sampled following non-destructive sampling using adhesive tape. The patinas arising at excessive microbial growth areas were also collected for analysis in the laboratory. Samples through adhesive tapes, scrapped from areas with out art as well as patinas were raised in defined culture media for phototrophic microbes with or without nitrogen sources under fluorescent light at 25°C for 2 to 3 months. Visible growth appeared in the media were analysed using a Meiji trinocular phase contrast microscope and photographed with a Nikon coolpix 4500 camera. One dominant species each of the cyanobacteria occurring at Manikmoda and Kendukhol shelters, a species of *Tolypothrix* and *Lyngbya* respectively were used to find out the suitable chemical which can be used for their control.

Findings and conclusion: The microbial species diversity on the exposed surfaces of the rock shelters at diffused light and sheltered areas are very few, and mostly belongs to one or the other species of cyanobacteria. No green algal form or fungus were encountered. Often

a species of cyanobacteria at a particular location along with growth of crustose lichens was observed. The major species of the microorganism on the rock shelters investigated were as follows:

Bhimmandali : *Gloeocapsa* sp., *Lyngbya* sp., Crustose lichens.

Ambjhokhol: *Lyngbya* sp., *Nostoc microscopium*.

Manikmoda: *Tolypothrix scytonemoides*.

Kendukhol : *Lyngbya arboricola*.

Tolypothrix scytonemoides and *Lyngbya arboricola* were raised in BG11 medium and their growth pattern was studied. Both the species grew extremely slowly in culture (doubling time exceeds 300 hours) , hence it was difficult to obtain sufficient biomass with in a reasonable time for detail analysis to develop suitable control methods. Preliminary study showed that both the species tolerated up to 0.5 % of aqueous ammonia and up to 2 µg/ml of CuSO₄ , hence can be regarded as highly tolerant species to chemicals. Ammonium sulphate at 0.1 µg/ml was found effective to control their growth. However the chemical should not sprayed or rubbed on the rock arts. Absorbent cotton soaked with the specific concentration of Aluminium sulphate in dilute gum-acacia base and PVA(Poly Vinyl Acetate) can be applied on the microbial affected areas of the rock arts for about a week, followed by gentle brushing using a nylon brush can be effective for their restoration. However, field-on site experiment at a specific location covering about 1 to 10% per cent area of the rock art in the rock shelters should be carried out for confirmation of the laboratory finding before its wide application for conservation of rock arts from uncontrolled growth of phototrophic microorganisms.

Rock art of Bihar

A.K. PRASAD

The present state of Bihar was brought on the rock art map of India when I discovered the first painted rock shelter in the remote and extremely dangerous forested hills of Ranigadar on 22nd January 1994 after several years of unsuccessful explorations in the region

.Another 69 rock shelters containing prehistoric/historic rock paintings, petroglyphs and ancient inscriptions were discovered in this area and the adjoining region forming part of Nawada and Jamui districts of Bihar.16 more rock shelters / open rock surfaces containing rock paintings and engravings were also discovered by me in the adjoining area in the Giridih and Kodarma districts which now form part of Jharkhand, the new state carved out of Bihar on 15 Nov 2000. In addition to these discoveries some rock paintings were also reported from Kaimur and Rohtas districts of Bihar during 1995 - 1999 .Thus, about 104 rock shelters containing rock paintings have been brought to light in Bihar- 45 in Nawada, 25 in Jamui, 18 in Kaimur and 16 in Rohtas districts so far.

Physiologically the state of Bihar consists of three distinct units viz. the small mountainous northern tract, the southern plateau region (the Chotanagpur plateau) and hemmed in between the two lies the Gangetic plain. The rock paintings have been found in forested hills of the Chotanagpur plateau region which also includes the Rajmahal and Kaimur hills. Geologically the rock art region can be divided into two domains viz. the pre-quaternary formations of Archaen to Proterozoic age covering its major portion and the quaternary formations of Pleistocene to Recent age constituting the valley areas of Kiul, Sakari, Karmanasa and Son rivers. The rock shelters are mainly made of granite gneiss in Nawada district, quartzite/quartz-sericite schist in Jamui district and sand stone in Jamui district . Most of the painted rock shelters are found in the forested hilly terrain sparsely inhabited by the tribals such as santhals, oraons, kharwars, cheros, bhuians, karias, etc. The main flora comprise of salt trees. Other plants/trees include tendu, mahua, khair, bamboo, aonla, bel, kari, chirongi etc. The forest areas especially the foothills are still infested with wild animals such as tiger, leopard, bear, wild boar, deer, nilgai, monkey, rabbit, fox etc.

Detailed scientific documentation of the rock art has been completed in the Prasad rock art site in Nawada and Jamui districts by the author but it is yet to be done in the rock art sites in Kaimur and Rohtas districts. All the 70 painted rock shelters/caves discovered so far in Nawada and Jamui districts in Bihar and 16 rock shelters/open rock surfaces in Giridih and Kodarma districts of Jharkhand have been meticulously documented by the author. These have been divided into 18 geographical/topographical areas (I to XVII and XXV). Each area has further been subdivided into clusters or group of shelters named alphabetically i.e. A, B, C etc. Within each group the individual rock shelters/caves/open rock surfaces have been numbered i.e. 1,2,3,4 etc. Thus each painted/ engraved rock shelter/open rock surface has a three-tiered number written on the wall/ adjacent surface in black /white paint, for example, XVI.A.7. In doing so I have followed V S Wakankar's system of classification initially adopted by him in the Bhimbetka region. Due precaution has been taken not to put any classification number on or near any painting/engraving. All the rock shelters/ caves have been measured. Meticulous tracing of the painted figures of most of the rock shelters/caves has been done on the cellophane sheets. Very high quality photography of the paintings/engravings has been done personally by me. Use of flash gun has been avoided except in a few cases where it was unavoidable. A young videographer was persuaded to do videography of majority of the painted rock shelters in this extremely difficult and dangerous terrain.

The rock art of Bihar consists of pictographs (rock paintings) as well as petroglyphs (engraving, carving, bruising dotting, cup marks etc.).All most all the colours used in rock art are found in the rock paintings of Bihar including the rare blue colour. The main mineral colour used is the hematite red in different shades ranging from orange, vermilion, light red ,crimson to brown and purple as also applied in other rock art sites in India. Other colours used are white,

black, yellow, green and blue. The paintings have been executed in various techniques and styles including stencil and x-ray styles. Subject matter of the rock paintings is quite varied. Man is depicted engaged in various activities such as hunting, dancing, food gathering etc. Animals, reptiles, birds, insects and trees etc. as well as the geometric designs/symbols also form part of the subject matter.

The archaeological evidences found in and around the rock shelters include various types of Stone age tools, potsherds ranging from Neolithic to early historic period, pieces of bones, charcoal, used geru, clay/terracotta tablets and seals etc. Some stone age tool factory sites and megaliths have also been found in this rock art region.

The rock art of Bihar shares many common features with other Indian rock art regions in respect of subject-matter, colours, style, motivation, state of preservation etc. but it has also **some special/unique features as well as its own identity**. In contrast to the Central Indian rock art, here especially in the Prasad rock art site we find very obvious predominance of symbols, geometric and intricate designs indicating its purpose being ritualistic in nature. Striking difference in style of depicting the human and animal figures is also seen in this rock art region. Instead of vigour and dynamism of the Central Indian rock art here we find the figures comparatively simple and static. This can also be observed in some other neighbouring rock art regions such as Hazaribag (Jharkhand), Orissa and to some extent in Mirzapur (U.P.) and Chhatisgarh. Selecting only one rock shelter out of the entire cluster for executing paintings observed in the Prasad rock art site is another very special feature which distinguishes this rock art site from other Indian rock art regions. Various other features such as depiction of a Garuda-dhvaj, presence of blue colour painting and rare Kharoshti and Kharoshti-Brahmi inscriptions also contribute significantly in making this rock art region one of the major rock art sites of India. Here a complete

sequence of cultural evolution of man can be observed and studied in most reliable and comprehensive manner. It has potentiality of bridging history with prehistory and throws light on many of the living tribal symbols and rituals. The Kharosti and Kharoshti-Brahmi rock inscriptions in association with the rock paintings have important bearing on the history of India. They furnish evidence of communication between the North West and Vanga through inter alia Magadha. Thus, the rock paintings in Bihar endowed with unique features point towards existence of some different motivational and stylistic trends prevalent in the rock art of eastern India. Though more than 100 rock shelters containing rock paintings have been discovered/reported so far in Bihar during the last decade of the 20th century, still there is requirement of undertaking further extensive explorations not only in Nawada, Jamui, Kaimur and Rohtas districts but also in other hilly regions of Bihar especially in the forested hills of Rajgir, Kakolat, Rajauli, Gaya, Munger, Banka etc. where hundreds of painted rock shelters must be waiting to be brought to light. It is suggested that a project for detailed scientific documentation of the rock art sites in Kaimur and Rohtas districts should be taken up at the earliest. There is also urgent requirement of initiating remedial measures for preservation and conservation of the endangered rock art in this region.

Rock Paintings of Jharkhand **SATYENDRA KUMAR JHA**

Ever since the discovery of Isco (Hazaribagh district, Jharkhand) in 1991, the rock painting infused a great deal of enthusiasm in the erstwhile Bihar (of which Jharkhand was carved out in the year 2000). As a result, a slew of expeditions undertaken by as diverse streams of people as the groups of rock art lovers to the officers of the Indian army, brought in volumes of information about the rich wealth of rock art heritage of Bihar and Jharkhand.

Of the several places from where the rock paintings are discovered in Jharkhand, those found in the upper Damodar Valley are distinctly prolific, varied, and very old and represent, in a way, the very best of the rock art heritage of Jharkhand. The present paper mainly deals with the paintings of this very region.

In the beginning, the backdrop of the geological formation of Jharkhand and particularly the Damodar Valley, the largest river basin of the State, is provided. The relics of different prehistoric and historic phases that lay scattered close to the rock art sites have also been taken note of. Attempt is made to relate these stages of developments/changes with those that are reflected in the rock paintings.

The second part of the paper attempts to appraise briefly the features of the painting panels, painting materials, colour schemes and most importantly, the subject of the paintings. The delightful variations of the painting motifs/subjects are underlined. The highly diversified geometrical designs, the most naturalistic and candid moments of the wild life, the actions of men (though much restricted) and the plant lives, all have been touched upon in order to get an idea of the creative human mind that is responding to its environment.

Towards the end of the paper, concerns are expressed towards such factors as posing grave threats to this delicate and fragile heritage. Suggestions are also made as to how these imminent threats may be averted or at least minimized without having any head - on confrontation with the developmental aspirations.

Rock Art of Gujarat **V.H. SONAWANE**

An attempt has been made here to highlight some of the interesting features of the rock art of Gujarat as a regional study. Gujarat, in spite being one of the neighboring regions of central India having maximum concentration of rock art sites, remain Terra Incognita in

the field of rock art studies until 1970. The geomorphological setting of rock art sites of Gujarat is strikingly different from those of the adjoining Vindhyan region of Central India. The rock art sites of Gujarat are basically restricted to the granite outcrops of the North Eastern, Eastern and South Eastern region confined to the hilly regions of Gujarat. Besides, few rock art sites are also reported from isolated granite hillocks of Saurashtra peninsula. Very few rock art sites so far discovered in Gujarat are confined to five districts only i.e Panchmahals, Sabarkantha, Vadodara, Bhavanagar and Surendranagar districts.

So far as the prehistoric rock art is concerned it belongs to Mesolithic period representing hunting scenes and some individual animals of which some are decorated with intricate geometric patterns and some isolated abstract motifs. Rock paintings representing Chalcolithic phase are totally absent. The obvious reason being the absence of Chalcolithic habitation sites within the regions which are covered under the granite extension. However, the paintings of historic period reflect the impact of social and religious structure of the society. The depiction of stupas speaks of Buddhist influence. The domination of Shankha and Brahmi inscriptions again indicates the strong hold of literate community. The execution of sailing boats at Chamardi generated interest among the rock art specialist and those working on ancient ship building technology and maritime activities. Depiction of monkeys is one of the special features of Gujarat historic rock art. Other paintings depicting floral and geometric patterns, signs, symbols etc resemble mostly the similar depictions found at several places in Central India as close parallels indicating their popularity and common ethos.

The present day tribal art of the indigenous population confined to Vadodara and Panchmahals districts practiced by Rathawas and Naikas, popularly known as Pithora paintings show many common features with the late historic paintings of Gujarat. This obviously

shows traditional continuity as a living tradition but in a different form. Therefore, a cursory glance at the panorama of the Indian rock art reveals that there is a definite need for regional studies and peculiarities of the micro-regions should not be overlooked in the holistic micro-level study.

Rock Art of Rajasthan
MURARI LAL SHARMA,
MADAN LAL MEENA
OM PRAKASH SHARMA (KUKKI)

Before independence, north-western part of India was known as “Rajwara”, “Raithan”, or “Rajputana”. It is known as Rajasthan at present. It is the largest state in our country by geographical area. It is situated between 23°3’ to 30°12’ North Latitude and 69°30’ to 78°17’ East longitude. Roughly rhombic in shape, it is surrounded by Pakistan, Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and Gujarat.

The most important geographical feature of Rajasthan is the Aravalli range which runs across it from South-West to North-East. It divides the state into two unequal parts with clearly distinguish-able features. It’s West and Northern part lie in the plain sand hills of Marwar, Jaisalmer and Bikaner. On the East and South-East are the forests and plains of Black loam, furrowed by the perennial water streams of Mewar, Hadoti, Jaipur and Alwar region.

Rajasthan is very rich as far as archaeology is concerned. This fact has been repeatedly proven by the various archaeological excavations and other investigations carried out in this state. It was in the seventies of the nineteenth century that C.A. Hackett of the Geological Survey of India (G.S.I.) had made a surface collection of palaeoliths from Jaipur, Bundi and Indragarh. After 1950, H. D. Sankalia, S. B. Rao, M. N. Deshpande, A. P. Khatri, K. V. Sounder Rajan and V. N. Misra made a substantial contribution in this field. Misra’s

explorations on Banas, Berach and Luni basin added a lot to our knowledge of stone age complex in Rajasthan. Paleolithic tools have been reported from Pali, Barmer, Jaisalmer, Bikaner, Nagaur, Jodhpur, Udaipur, Chittaurgarh, Jaipur, Alwar, Sikar, Jhunjhunu, Sirohi, Kota and Sawaimadhopur districts. It has been also conceived that during the middle Paleolithic period the Luni river in western Rajasthan was perennial. The discovery of Mesolithic sites in different parts of Rajasthan is very interesting in as much that dozens of such sites have recently been discovered even in Jaipur, Alwar, Sikar and Jhunjhunu districts, all along the river beds of Kantli, Sahibee, Sota, Dohan and Kansawati.

Chambal valley is the most important area from the view of rock art study. In 1979, first rock art site was reported by Dr. V.S. Wakankar and his student Giriraj Kumar and Ramesh K. Pancholi from Kota and Baran districts in Chambal valley. Some rock art sites were discovered by Shri Vijay Shankar Srivastav and Shri Jagat Narayan Srivastav from Upper Chambal Valley around 1981. Some exploration work has been done by Dr. M.L. Sahu in Kota district, Shri Tejsingh and Shri Om Prakash Sharma "Kukki" in Bundi and Bhilwara districts. In 1989, a joint survey of North-East Rajasthan was done by Department of History, Government College, Neemkathana and the State Department of Archaeology and Museums, Government of Rajasthan. In last decade, a general survey of rock art sites have been done in the districts of Jaipur, Sikar, Jhunjhunu, Alwar, Bharatpur, Dausa, Sawai Madhopur, Pali, Jodhpur, Sirohi, Chittaurgarh, Bhilwara, Kota, Bundi, Jhalawar, etc in which more than hundred sites are discovered.

Rock art found in prehistoric homes consist of a number of paintings and engravings that adorn walls and ceilings of rock shelters and cavities of the cliff walls or well- protected cliffs. These rock shelters were not inhabited in their depths, but probably used as cult shrines. The drawings of various animals in different forms, human beings and

their hand prints, a number of signs, designs and other motifs have been found. Creation of rock art on surface of rock shelter is generally done by an easily available iron mineral.

Most of the rock art sites in Rajasthan are situated in Chambal Valley. In Chambal valley, they are mainly concentrated in Hadauti region and its adjoining area such as Chittaurgarh and Bhilwara districts. Few of these shelters, paintings and sites were documented in a small time-duration by Indira Gandhi National Center for Arts (IGNCA). This region is still not fully explored which is evident by recent discoveries of few very important rock art sites. Similarly much emphasis is needed in documenting various rock art sites in North-east Rajasthan, though their nature differs from that of Chambal valley rock shelters. (In Chambal valley rock shelters, smooth canvas is found for painting while here surface is granular. This is the reason why we find so many rock shelters at Chambal valley in a continuation, whereas in North-East Rajasthan hillocks only a few in number). There are a lot many rock shelters found in Central Rajasthan also (Ajmer, Pali) which also need to be documented.

Management of Rock Art Centre in Madhya Pradesh **NARAYAN VYAS**

Most of the parts of Madhya Pradesh with 24 districts having more than 250 rock art centres with thousands of painted rock shelters are discovered by Dr.Wakankar, S.K.Pandey, Shankar Tiwari, S.S. Saxena, Giriraj Kumar and other scholars. But the main problem is after discovering these centres who will properly preserve them. Few rock art centres like Bhimbetka, Adamgarh, Chaturbhujnath Nala, Sitakhedi etc. are protected by the Archaeological Survey of India, Bhopal Circle and Bhimbetka is also inscribed in World Heritage, UNESCO.

For better management of rock art centres, we make proper development plan after forming a "**Rock Art Development Committee**" with the chairmanship of IGNCA.

Following works need to be done under the committee on approval:

1. Photographic documentation of rock paintings.
2. Indexing and recording.
3. Copying of paintings in same colour and to the scale.
4. Classification and dating of rock arts ranging from stone age or Prehistoric time to the later available periods.
5. Archaeological Excavations in the important rock shelters.
6. Collection of special funds.
7. Perfect role of residents residing in the vicinity of the rock art centre.
8. Organizing awareness programmes time to time.
9. Quarterly meeting for assessment of the work done by the various departments like ASI, State Archaeology, Universities etc.

Rock Shelter Geology, District Raigarh, State Chhattisgarh, India S.K. PANDE

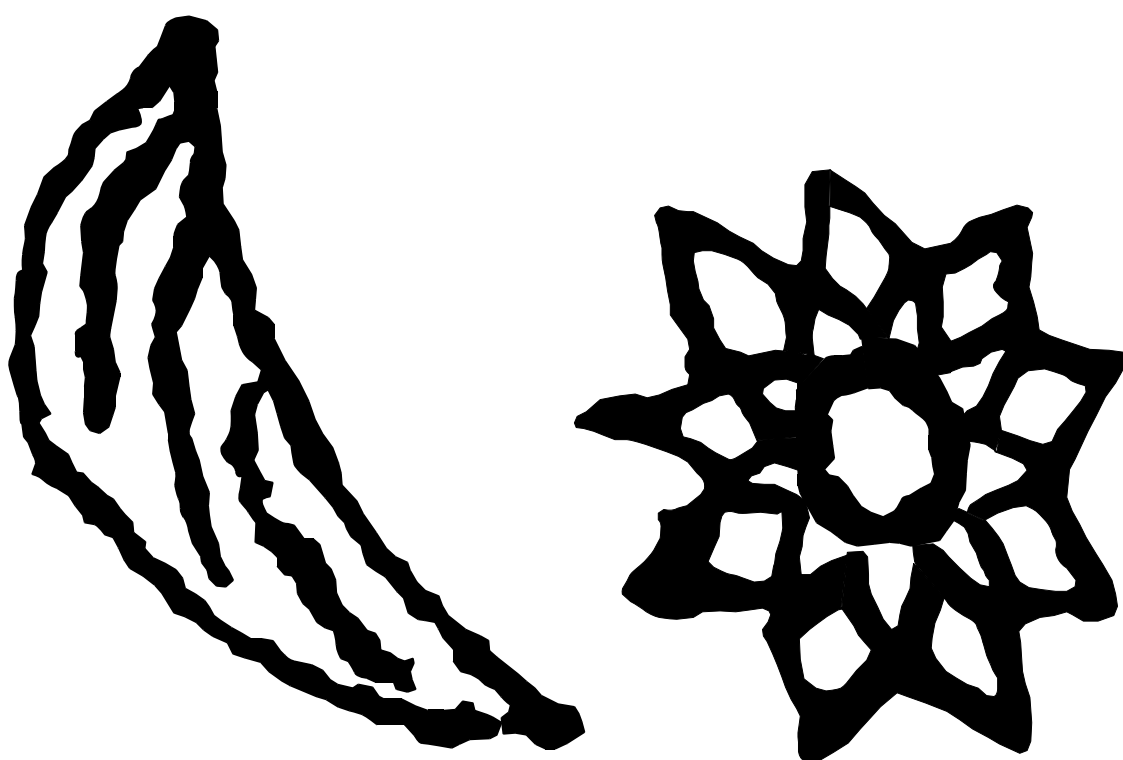
Raigarh district is underlain by rocks, as old as of Archaean and as young as of Holocene period on geologic time scale. The southern part of the district is dominated by rock of Chhattisgarh Supergroup, which belong to Meso-Neo Proterozoic age time period. The Bastar granite and Dongargarh granite of Archaean and Palaeo- Proterozoic age, respectively, occur in small patches along southern district boundary. The northern part of the district is dominated by rock of Gondwana Supergroup of Upper Carboniferous - Lower Cretaceous time period. Chota Nagpur gneissic complex of Archaean - Palaeo-Proterozoic and Unclassified Metamorphics of Palaeo-Proterozoic age occur in patches along eastern and northern district boundary.

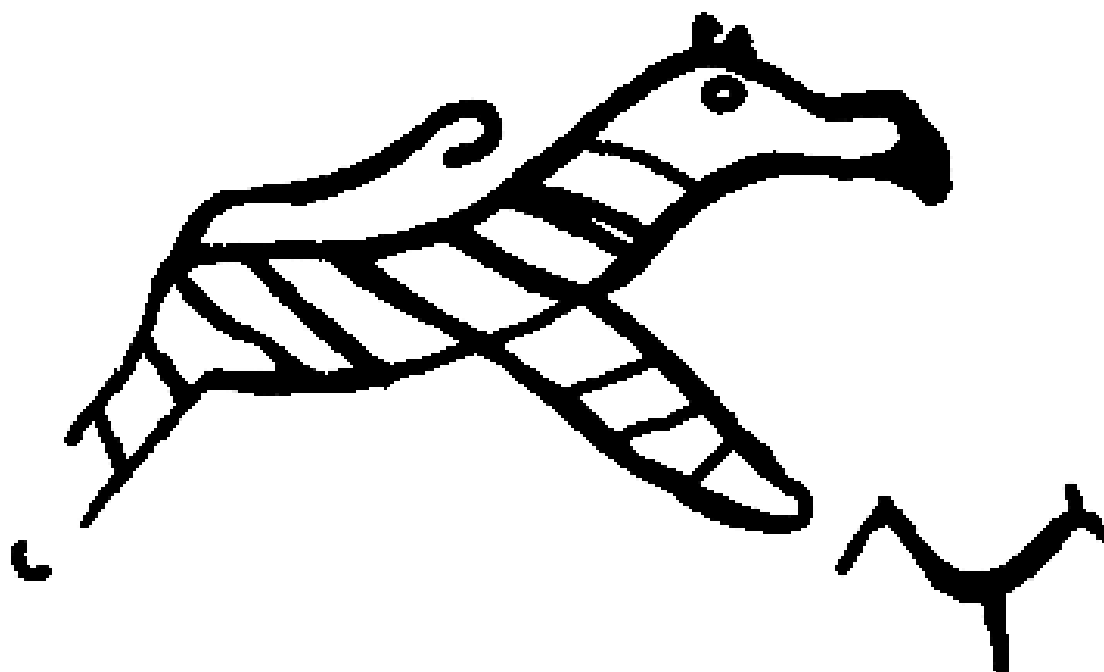
Rock Art Sites in Kohbahur, Koria District

BHARTI SHROTI

Chhattisgarh (part of Dakshin Kosal), the newly formed state carved out of Madhya Pradesh. The state abounds in richness of cultural heritage, archaeological antiquities (ranging from Paleolithic to Historical period), monuments and rock art sites. However, many of the rock art sites have not been properly explored so far. The Department of Culture and Archaeology of the Chhattisgarh Govt. is embarking on a number of projects which would bring the culture and archaeological heritage of the state to the fore in national and international arena and also indirectly enhance the tourism industry. In the present paper an attempt has been made to put the important rock art discoveries from this state.

Chhattisgarh is very rich in rock paintings ranging in age from Mesolithic to Historical period and as said above, some of the rock paintings date back even to prehistoric period. Many of the rock paintings throw interesting light on the life ways and art of Early Man. By far the most prolific rock art sites in the state of Chhattisgarh are located in the district of Raigarh at Singhanpur, Kabra Pahar, Basnajar, Ongna, Karmagarh, Khairpur, Botalda, Bhanwarkhol, Amargufa, Gatadih, Siroli Dongri, Bainipahar etc. In the district of Kanker some of the rock paintings are located in the shelters of Udkuda, Garagodi, Khairkheda, Kulgaon, Gotitola etc. Rock art sites of Ghodsar and Kohabaur in the district of **Koria** are also worth mentioning. These have the paintings of human figures, animal figures, scenes of day to day life, generally painted in white.





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