

## BEGINNING OF CATTLE DOMESTICATION IN SOUTHERN BIHAR AND ADJOINING JHARKHAND: PERSPECTIVES OF ROCK ART AND ARCHAEOLOGY

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**Abstract:** Prehistoric rock art in the present State of Bihar was for the first time brought to light by the author in a very remote, inaccessible and dangerous jungle of Ranigadar in Kowakol block of Nawada district on 22nd January 1994. Further explorations in Nawada and Jamui districts of Bihar and adjoining Giridih and Kodarma districts of the newly formed state of Jharkhand resulted in the discovery of 92 rock art sites and many archaeological sites ranging from Stone Age to historic period (Prasad 2003-04, 2010). The rock art of the Mesolithic hunters and gatherers depicts hunting and dancing scenes besides symbols and intricate and geometric designs. It is followed by the rock art of the pastorals with domestication of cattle. Cattle appear for the first time in the rock paintings inside the rock shelters/caves and as engraved figures in the open on the granite boulders during the late Mesolithic/early Neolithic period. The rock paintings contain mainly cattle with very small humps while humped cattle are depicted in the rock engravings. Both types are shown individually as well as in groups. Cattle domestication in the region discussed appears to have begun with cattle having small hump in the late Mesolithic/early Neolithic period as in other parts of India (Kumar 2007, Kumar and Pradhan 2008, Chandramouli 2012).

### Introduction

Cattle have played very important role in the development of human culture and civilization. People kept cattle around for easy access to food including milk, meat and for use as load bearers and plough pullers. They are perhaps the oldest form of wealth. Cattle are a prominent modern member of the subfamily Bovine and most widespread species of the genus *Bos* and are most commonly classified as *Bos primigenius* (Wikipedia, the free encyclopedia). The beginning of cattle domestication was a landmark event in history of mankind. Domestication (from Latin *domesticus*) is the process where population of animals or plants is changed at the genetic level through a process of selection, in order to accentuate traits that benefit humans. It differs from taming in that a change in the phenotypical expression and genotype of the animal occurs, whereas taming is simply the process by which animals become accustomed to

human presence. Domestication of cattle probably started during the late Mesolithic or early Neolithic period from the wild ox (*Bos primigenius*). The present day domestic cattle are classified into two groups: Zebu (humped) and taurine (humpless) which are scientifically referred as *Bos indicus* and *Bos Taurus* respectively. The origin and taxonomic status of domesticated cattle are controversial. Cattle were originally identified as three separate species: *Bos taurus*, the European or "taurine" cattle (including similar types from Africa and Asia); *Bos indicus*, the zebu; and the extinct *Bos primigenius*, the aurochs. The aurochs is ancestral to both zebu and taurine cattle. Recently these three have increasingly been grouped as one species, with *Bos primigenius taurus*, *Bos primigenius indicus* and *Bos primigenius primigenius* as the subspecies (Opinions 2003). The aurochs originally ranged throughout Europe, North Africa, and much of Asia. In historical times its range became restricted to

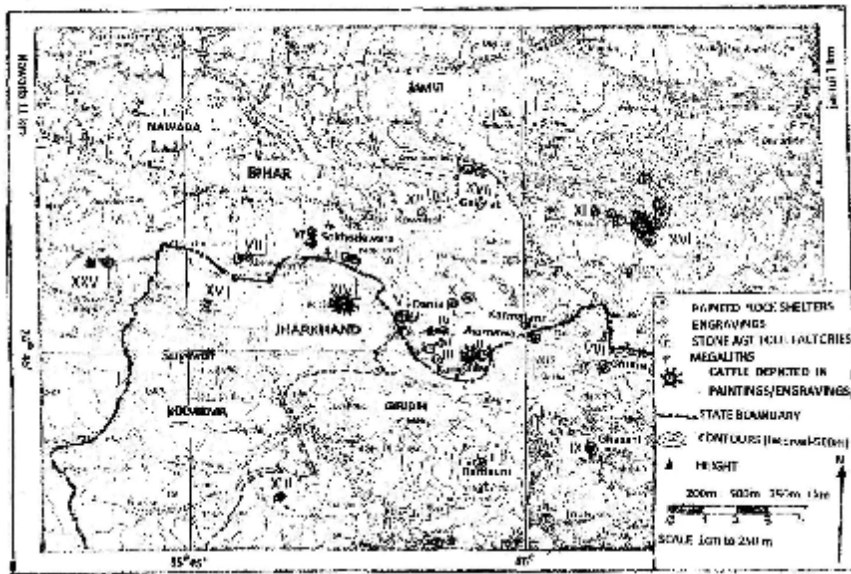


Fig.1. Location Map : Depiction of cattle in the rock art of southern Bihar and adjoining Jharkhand

Europe, and the last known individual died in Masovia, Poland, in about 1627 (Van Vuure, C. T. 2003). Modern genetic research suggests that the entire modern domestic stock may have arisen from as few as 80 aurochs tamed in the upper reaches of Mesopotamia about 10,500 years ago near the villages of Çayönü Tepesi in southeastern Turkey and Dja'de el-Mughara in northern Iraq (Bollongino, Routh. 2012). The humped cattle, including Indian Zebu cattle, *Bos indicus* have hump over the withers, large drooping ears, dewlap and sheath. Cattle have been held in high esteem in India and some other countries. They are venerated by the Hindus since the ancient times all over India. The cattle also played very important role in the lives of the men living in the rock art region of southern Bihar and adjoining Jharkhand. It is evident from the depictions of cattle in the rock art of this region.

The domesticated cattle and dog make their appearance in the rock paintings of the late Mesolithic or early Neolithic period in India. Such animals appear in a group of paintings which are stylistically well demarcated from the pictures of the hunter-foragers. Cattle, with long lyre-shaped horns and a prominent hump at their back become the thematic centre of these pictures. The earliest depiction of humped cattle appear together with distinct Neolithic / chalcolithic

traits and innovations, like riding on cattle, the yoking of cattle to carts and charots and draught animal for ploughing. The style and content of the rock paintings is very uniform all over India (Neumayer, Erwin. 1993).

### Geomorphology of the region.

Geographically this region lies in the north eastern part of the Chhota Nagpur plateau- the northern extension of the Vindhyan ranges. This plateau is the meeting point of the oldest rock formations like granite and gneiss and the comparatively young Vindhyan sandstones, and the volcanic basalt (Sankalia 1974). There are several folded hill ridges running east to west with narrow valleys and 'tanrs' (uplands). Elevation of the hill tops varies between 300 m and 673 m. The entire area is hilly and densely forested and is drained by the south north flowing Kiul and Sakari rivers and their tributaries. Besides several seasonal streams flowing in different directions, there are numerous perennial water points and springs providing water to the tribal population as well as the wild animals throughout the year.

Geologically this 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 and Sakari rivers. The oldest groups of pre-quaternary rocks are unclassified Metamorphites comprising quartzite, pyroxenite, amphibolite, calc-silicate rocks, mica schist and hornblende schist. The Chhotanagpur Gneissic complex, younger to these metamorphic rocks comprises of mainly granite gneiss and migmatites which are generally highly weathered, forming subdued undulatory topography (Geological Survey of India' District Resource Maps, 2001-02).

Climate of this region is the typical monsoon type. The entire area is hilly and densely forested mainly with sal trees ( *Shorea robusta* ). A large





*Fig. 2. A group of humped bulls engraved on a granite hillock in Rajabar forest (Jharkhand).*



*Fig. 3. Close-up view of the two humped bulls engraved on the granite hillock in Rajabar (in the bottom row).*



number of wild animals such as bear, wild boar, deer and even tiger and leopard etc. are found in the forest particularly in the foothills. The rock art region is a tribal belt mainly inhabited by the Santhals.

The granite hillock containing the engraved figures of humped bulls as well as humpless! cattle or cattle with a small hump is situated in the Rajabar forest of Kodarma district in Jharkhand while the rock shelters/caves containing the painted figures of cattle are located in forested hills of Nawada and Jamui districts in Bihar and Giridih district in Jharkhand (Fig.1).

### Engraved bulls

Unique and very rare engraved figures of cattle and especially the humped bulls found on the open surface of a granite hillock at Domani Pani, deep inside Rajabar foothills (Prasad 1996 ). Bulls with very prominent humps are engraved in the eastern face of a hillock near a perennial water-source. The humped bulls are shown standing in a row roughly forming a

triangle. Being in the open, many figures are fully or partially weathered away. Out of the seven bulls facing north only one is fully visible. It is interesting to note that the first and second bulls (from the left) in the bottom row are shown facing each other. The most prominent bull figure, second from the left in the bottom row, has been depicted in the sexually arousal state with a prominent phallus (Fig.3). They are quite big in size ranging from 70.8 cm to 84 cm. There are some more engraved figures of humped bulls to the left and above the triangular group. They are badly weathered.

Besides, a small group of cattle, probably cows and calves, has been executed in somewhat different style (Fig.4). These are humpless! cattle having concave horns unlike the humped bulls. There is another engraved figure of a cattle with concave horns to the right of this group.

### Continuity of the significance of cattle in life till present



Fig. 4. Very faded engraved figures of a group of humpless! cattle along with calves adjacent to the humped bulls.



Engraving the figures on the hard and steep surface of a granite hillock must have been an extremely difficult, risky and time consuming mission closely related with life. Importance of the cattle in the life of agro-pastoral tribes of the region is still continuing. They still consider these engraved cattle as their important devata (deity). They assemble there in the month of March every year to perform pooja in the honour of their deity (humped bulls). The ceremony is conducted by a bhagat (priest) after attaining state of trance. The local musical instrument dhol (drum) keeps on playing during the ceremony. Some white dots are put below the figure of the main humped bull. Sacrificing of goats/chicken also forms part of the ritual.

#### Depiction of cattle in the rock paintings of this region

There is predominance of symbols and intricate/geometric designs in the rock paintings of southern Bihar and adjoining Jharkhand. However, cattle have also been depicted in some of the rock

shelters/caves mostly in association with the symbols/geometric signs. Three such rock shelters/caves containing figures of cattle namely III.C.5, I.A.8 and XVI. A. 7 are briefly described below –

#### Cave III.C.5

Cave III.C.5 is the smallest painted cave in this entire rock art region. It measures 4.78 m in length, 4.03 m in width and only 0.80 m in height. It is situated in Karamatanr forest about 2 km south-west of a tribal village Jharanwa in Kowakol block of Nawada district in Bihar. It is on top of a low hillock left of the Sokhodewara-Karamatanr forest track. The surrounding area below this cave is generally flat with mixed forest of mainly saal trees.

The Cave must be containing a large number of paintings in its three cavities but presently only 17 figures are visible. These include mainly animals in association with symbols / geometric designs and human figures (Fig.5). All the figures are painted in



Fig. 5. Cave III.C.5- Close-up view of the cattle in the front in the second row from the bottom.

brick red outlines. These are presently under thick encrustation. A humpless! cattle ( 37 cm in length) followed by a human figure in triangular form is shown in the second row from the bottom. Another figure of cattle is painted at the end. Interestingly various types of symbols /geometric signs are painted in association of these figures. They include double banded circles and squares with cross inside, triangles with a dot in the centre, etc.

#### **Cave I.A. 8.**

Cave I.A.8 is one of the most beautiful and fascinating caves in the entire region. It looks like an umbrella and measures 15.6 m from north to south and 12.20 m from east to west. It is situated on a hillock in Gawan block of Giridih district in Jharkhand. There is a vast patch of open ground with mixed vegetation in the front as well as at the rear of the cave. It is overlooking the confluence of the two streams coming from the eastern and western sides of the cave. Nearby the cave there is a big pond where tirthals assemble in very large numbers from the surrounding villages every year on a particular day during the summer to catch fish. The nearest village Bardauni, inhabited by the Santhal tribe is situated about one and half km to the south- east of the cave.

The entire ceiling of the cave contains hundreds of paintings in red, ochre, black and white colours. They range from the Upper Palaeolithic / Mesolithic period down to the early historic era. The painted figures include various types of symbols/geometric designs, humans, animals, reptiles, birds, trees and some Brahmi inscriptions datable to 4th century A.D. A large number of microliths, animal bones including *Bos indicus* , charcoal, pot sherds and also some arrow heads made of quartz crystals as well as bone were found from inside the floor during the trial digging. Three figures of cattle are drawn in ochre red outline in one of the cavities in the eastern portion of the cave. Figure of a calf is found painted in red outline slightly above and almost superimposed over another figure of a fully grown up humpless! cattle. Third figure of cattle is painted in brick red outline in front and facing these two cattle.

#### **Rock shelter XVI.A. 7.**

The painted rock shelter XVI.A.7 is situated at the base of a hillock in the Gidheshwar hills in Khaira block of Jamui district in Bihar. Facing to the south it measures 31.86 m in length, 2.70 m in width and 4.38 m in height. Grid reference of the site is : Latitude 85° 57.5' and Longitude 24° 51.5'. The jungle around the rock shelter is dense containing mainly saal trees. A stream flows in front of the rock shelter. There are a large number of rock shelters around it but they do not contain any rock paintings. Rock shelter XVI.A.7 contains a large number of paintings mainly symbols / geometric signs, figures of symbolic humans, hand prints, plants, reptiles, bees and also cattle. Interestingly many paintings are executed in combination of three colours - white, yellow and red. Rock shelter XVI.A.7 contains three figures of cattle in its two cavities. The cattle depicted in the right cavity is drawn in outline in brick red colour. Shown with slightly raised head it has big belly and disproportionately very small legs. It is interesting to notice hoof of a cattle drawn in white colour to the left of this cattle. Other painted figures in this cavity include a man with upraised hands, spread out legs and unusually long phallus, hand print, a plant and a long bunch of bees shown as white dots. Another figure of a cattle painted in brick red colour is found at the top right side in the left cavity. The figure is proportionately drawn and looks very elegant and natural. It is interesting to observe four concentric circles drawn on its neck in white and red colours. The outer circle is decorated with small triangles all along its rim. Another figure of cattle is drawn in outline in white and brick red colours to the left of the cattle.

#### **Other archaeological evidences from the painted rock shelters/caves.**

Bone fragments of *Bos indicus* and other animals have been found in association with microliths, late Mesolithic/Neolithic pot sherds and charcoal in some of the rock art sites from inside the painted rock shelters/caves such as Bardauni (Cave I.A.8.), Jogia (Cave VI.A.1), Gaighat (Rock shelters XVII.A.5, XVII.A.2 and Cave XVII.B.1), Kohwarwa (Rock shelter III. A.1), Karmatanr forest (Rock shelter II.B.1), Kali Pahari (Rock shelter II.D.2), Garainthwa



(Rock shelter XI.A.1) and Hadahadwa (Rock shelter XI.B.1) during the trial diggings (Prasad, A, K. 2003-04). A detailed report on these bone pieces is under preparation by Dr G.L. Badam (Personal communication).

### Observations

The engraved figures of bulls on the granite hillock in Rajabar forest in Kodarma district of Jharkhand are rare and very unique. The only other such region containing engraved figures of humped bulls has been found in Karnataka at Kajuru, Gavali, Kurkalu, Sonda, Shivmogga, Holenhatti and Holaluru (Sundara 2010-11). There are striking similarities between the engraved bull figures of these two regions located hundreds of km far away from each other. Both the sites in Jharkhand and Karnataka have mostly identical style and certain features such as the hump, convex horns and other associated patterns which remind the general style of the Harappan bull. Apparently the bulls were held in high esteem and formed part of their rituals. This tradition of worshipping the bulls continues even today in both the regions of Jharkhand and Karnataka besides other parts of India. It is very interesting to observe that both types of cattle, humpless! as well as humped, are found depicted both in rock paintings and engravings in this region. The rock shelters/caves contain painted figures of humpless ! cattle or cattle with very small humps. But there are figures of humped as well as humpless ! cattle engraved on the open granite rock surface in Rajabar forest. The engraved figures of the humpless ! cattle found on the top right side of the hillock are very much faded. Apparently these must have been engraved much earlier than the figures of the humped bulls engraved in the triangular panel on the lower front portion of the hillock. This process of evolution from humpless ! to humped one must have taken a long span of time. The rock shelters/caves containing paintings of cattle and related archaeological remains such as bones of cattle/other animals, charcoal and late Mesolithic/Neolithic pot sherds are located in a particular pattern. They are situated on low hills but well protected and having comparatively easier access from the front. There is vast open ground available in its surroundings especially in the front. It has normally mixed type of

vegetation mainly saal trees. Various types of fruit bearing trees/bushes such as piar (chironji), Karonda, ber, bel, keon etc. are also available in addition to edible tubers and roots. Perennial streams provide water throughout the year. It appears that during the later phases of the Mesolithic period the rock shelters/caves located deep inside the dense forest on the higher terrain were not preferred being unsuitable for farming and domestication of animals. As such the occupants of such rock shelters/caves moved downward in comparatively open forest. It is evident from the fact that some of the rock shelters /caves located in these areas contain only Upper Palaeolithic / Mesolithic paintings and no paintings of the later periods.

Continuity of the significance of cattle in the life Engraving the above mentioned figures of cattle on the hard and steep surface of a granite hillock in Rajabar foot hills must have been an extremely difficult, risky and time consuming mission closely related with life. Importance of cattle in the life of agropastoral tribes of the region is still continuing. The cows and bulls have been held in high esteem and venerated throughout India. It appears that though the ancestors of the tribes inhabiting the nearby villages had abandoned these rock shelters/caves and settled in the open upland down below, they still continued visiting them occasionally. Their descendents kept this tradition alive. The local tribes from Rajabar and Ranigadar can still be seen performing rituals on some important occasions at Domani pani ( the site where cattle are engraved on the open rock surface) and Kohawarva (in vicinity of Cave III.C.5 containing painted figures of cattle) respectively. The tribals still consider these engraved and painted cattle as their important devata (deity). They assemble there in the month of March every year to perform pooja in the honour of their deity (humped bulls). The ceremony is conducted by a bhagat (priest) after attaining state of trance. The local musical instrument dhol (drum) keeps on playing during the ceremony. Some white dots are put below the figure of the main humped bull. Sacrificing of goats/chicken also forms part of the ritual.

The figures of cattle are found in association with other painted figures which can be assigned to the late Mesolithic/Neolithic period based on style,

superimposition, colour and subject matter. There are no paintings of later periods in the rock shelters/caves containing depiction of cattle except in Cave I.A. 8 which remained in use till the early historic period being on the ancient forest trade route. It can be assumed that these figures of cattle were painted around the period when domestication of cattle began during the late Mesolithic/early Neolithic period in this rock art region.

Conclusion Based on the above rock art and archaeological evidence it can be assumed that domestication of cattle began with the humpless ! cattle during the late Mesolithic or the early Neolithic period in the rock art region. The cattle occupied very important place in development of human civilization since then. Depiction of cattle in association with symbols and geometric designs in the rock shelters/caves indicates that they were venerated even at the early stages and this tradition continues even today. The rare engraved figures of humped bulls with their unique style and features in Rajabar forest remind the Harappan bulls. Existence of the engraved figures of humpless ! as well as humped cattle at the same site in Rajabar is also very important. Detailed explorations in the surrounding area and intensive research in this matter and also further excavations in some selected rock shelters/caves are desirable which may add new dimensions to the study of origin and beginning of domestication of cattle in eastern India in particular and the Indian sub continent in general.

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## BEGINNING OF AGRICULTURE AND DOMESTICATION IN THE UPPER VINDHYAS

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**Abstract:** The Vindhyan Neolithic culture is marked for the evidence of early agriculture and domestication and has also revealed evidence of art activity on pottery, beads and other movable artistic objects.

The Vindhya (North-central India) is one of the most intensively researched areas of India where a long cultural sequence from Lower Palaeolithic to Neolithic has been brought to light. The Vindhya along with the adjoining Ganga plain has been one of the early centres of agriculture and domestication in the Indian sub-continent going back to 7th millennium B.C. The hunting-gathering mode of life associated with the Mesolithic culture was still continuing in the area is attested by presence of a large number of sites - both open air settlements and rock-shelters. The Mesolithic open air settlement at Chopani Mando on the right bank of Old Belan has yielded evidence of wild rice, grinding stones, hutments, hand made pottery and geometric microliths in the last phase of habitation and has been termed as proto-Neolithic phase (Sharma and Misra 1980). The excavated Neolithic sites presenting evidence of the beginning of agriculture and domestication of animals are: Koldihwa (Misra 1977, Misra 2006), Mahagara (Sharma and Mandal 1980) and Panchoh (IAR 1975-76: 47) in the Belan valley; Tokwa (Pal 2008) on the confluence of the Belan and Adwa; Indari (IAR 80-81: 72) in the Adwa valley and Kunjhun (Clark and Khanna 1989) and Ghoghara in the Son valley (Fig. 1).

The Neolithic culture of the Vindhyan region is characterized by sedentary settlement, handmade pottery comprising cord impressed, rusticated, burnished red, burnished black and occasionally crude black and red ware, ground stone celts of rounded

variety with rectangular or oval cross section, food processing equipments like quern, muller, hammer stone, microliths and domestication of animals and cultivation of plants, single tanged bone arrowheads, earthen discs with central perforation generally made of broken pottery, spherical and conical terracotta beads, shell pendants are some other objects found at these sites. Of the animal bones found from these sites, mention may be made of bones of cattle, sheep, goat, deer, antelope, etc. Remains of aquatic creatures like turtle, fish, etc. were also recorded along with the bones of birds. Cattle, boar, sheep and goat were the domesticated animals.

The rice husk was used as degreasing agent for manufacturing the pottery (Pal 1986). Both burnt rice and rice husk along with rice chaffs have been found embedded in the potsherds. Palaeobotanical studies have revealed that the people were using both wild (*Oryza nivara*) as well as cultivated rice (*Oryza sativa*). The study of Emma Harvey and Dorian Fuller (Harvey et al. 2005) of the botanical material of Koldihwa and Mahagara has thrown welcome light on the range of cereals cultivated by the Neolithic people of Koldihwa and Mahagara. The crops identified include rice, barley, wheat, pulses, sesame and small millets. The available evidence from both Koldihwa and Mahagara indicates that wild and cultivated varieties of rice and small millets were used from the beginning of the Neolithic settlement. Barley, wheat, pulses and sesame were introduced at these sites subsequently. On the

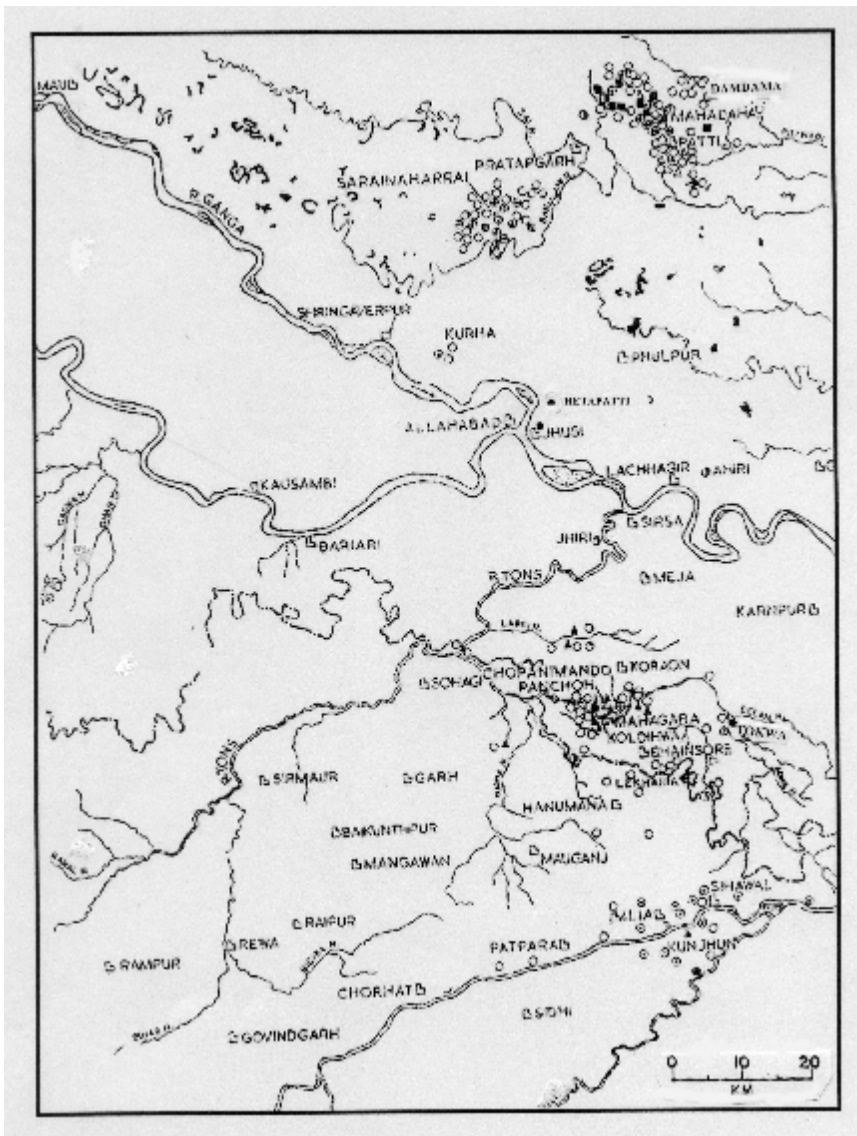


Fig. 1. Distribution of sites in the Vindhyas and the Middle Ganga valley.

basis of a preliminary study of botanical remains from Tokwa, Saraswat (pers.comm.) tentatively has come to a similar conclusion. He has identified rice, wheat, barley, green gram, lentil and small millets. According to his preliminary observation, the Neolithic people were cultivating rice and small millets in the beginning. Subsequently they also started cultivating barley, wheat, green gram, lentil, etc.

The range of cereals cultivated during the Neolithic phase at Koldihwa and Mahagara raises some interesting issues. While rice, small millets, green gram, etc. constituted kharif crops to be raised during

the rainy season, barley, wheat and lintel etc. the winter crops, were raised during the winter season. The cultivated cereals whether kharif or winter crops (rabi) were initially wild grasses. Supportive evidence regarding double crop like that of the Belan valley has also been obtained from Senuwar (Sigh 2001) in Rohtas district of Bihar. At this site the Neolithic period is divided into two sub-groups: IA and IB. From the lowest part to the middle of sub-period I A only grains of cultivated rice were obtained. But they were also using wild plants like job's tear, fox tail/kodon, wild rice, jharberi, chaulai and jangali palak. But in later phase of I A, there was a major shift in cultivation. New cereals like barley, wheat, jwar millet, field pea, finger millet/ragi and khesari were also introduced. The introduction of double crop pattern, clearly indicates that agriculture had started playing a major role by the later phase of the Neolithic culture at the site.

Stone Age man started gathering seeds of these grasses for consumption. This would indicate that the first cultivation of any cereal would have taken place only in that area where its proto types were available. Viewed against this background are finds the distribution of wild rice over a wide area

covering eastern India, south East Asia and south western china. The distribution of wild barley, wheat, lentil, etc. on the other hand is recorded from the border of Pakistan, Afghanistan to Iran, Levant, Turkey, etc. This would suggest that rice and possibly small millets were available in wild form in the Vindhyan area before these were cultivated. But wheat, barley, etc. would have been introduced in this area i.e. in the Vindhyan area only when the people of the Vindhyan area came in contact with the people of north and north-western India. The cultivation of rice in the north and north-west and those of barley and





Fig. 2. Decoration on Pottery, Tokwa

wheat in the Vindhyan region could have been possible through north-south interconnections in dim distant past.

Regarding the origins of the Neolithic culture of the Vindhyan, it can be said on the ground of present state of our knowledge that the Neolithic culture of the Vindhyan region represents an independent



Fig. 3. Punch Decoration on Pottery, TKW.

personality. For understanding the origins of this Neolithic culture, the results obtained from the excavations at Chopani Mando (Sharma et al. 1980), situated at a distance of only 3 km from Koldihwa and Mahagara are significant. The phase III of Chopani Mando, termed as Advance Mesolithic or proto Neolithic is characterized by handmade pottery and some new tool types like isosceles triangle and tranchet. The plans of hutments, hearths, food processing equipments like querns, mullers along with anvils, hammer stones, ring stones were the other characteristic features. Burnt clay lumps with reed impression suggested wattle and daub structure. The presence of wild rice, however, when

viewed in the context of the presence of food processing equipments and traits of semi sedentary settlement, would suggest the collection of wild rice during this phase. The appearance of hand made pottery in the proto-Neolithic phase of Chopani Mando on the one hand and its presence at all the Vindhyan Neolithic sites excavated so far is another

connecting link between the two. The occurrence of the tranchets during the proto-Neolithic phase at Choapani Mando on the one hand and its occurrence at Neolithic sites of Koldihwa, Mahagara, Pachoh and Tokwa on the other would suggest continuity between the two i.e. Proto-Neolithic and Neolithic. This would indicate transition from the gathering of the wild rice to that of its cultivation. In this connection it may be pointed out that presence of wild sheep, goat and cattle is recorded from gravel III and IV and from Chopani Mando in the Proto-Neolithic context (Alur 1980). At Mahagara these animals are found domesticated. This would suggest that these animals were domesticated from their wild proto types available in the



Fig. 4. Incised Triangles filled with Punched Dots, Burnished black ware, TKW.

area during the earlier period and were not introduced in the area as readymade breeds from outside. The microlithic industry of the Vindhyan Neolithic culture is a continuation from the preceding Mesolithic culture. The evolution of the Vindhyan Neolithic from the underlying Mesolithic is thus clearly indicated.

The available evidence indicates that the Neolithic people of the Vindhya, besides cereals, were consuming meat of animals, aquatic creatures and birds also. Hunting and catching went on along with agriculture and domestication of animals.

The material remains suggest that the Neolithic people of the Vindhya manufactured mainly utilitarian objects. Their artistic expression is attested by ornaments and decoration on pottery and



Fig. 5. Beads with incised dot-decoration, TKW.

beads. The excavation at Tokwa is especially significant for yielding art evidence. Perforated shell object, recovered from the excavations at Mahagara, was used as pendant (Sharma et al. 1980: Plate MGR. XXIV C). Mention may be made of appliqué decoration with rope design, incised and punch decoration on bright red surface of burnished red basins (Fig. 2 and 3). The burnished Black ware sherd with incised triangles filled with punch dots is also significant (Fig.4). Besides on pottery the bright black slip is used also on the conical terracotta beads at Tokwa. Terracotta beads are not well baked but due to slip and fine punch decoration these form one of the attractive art objects (Fig. 5). The Neolithic people of the Vindhya were fond of ornaments is attested by beads of semiprecious stones, micro beads (Fig. 6) of steatite and terracotta beads. Some of the rock paintings in rock shelters of area especially the humped cattle may be



Fig. 6. Steatite Beads, TKW.

considered as domesticated animals (Varma 2012: 63).

Radio Carbon dates have been obtained from Koldihwa (Possehl and Rissman 1992) and Mahagara ((Possehl and Rissman 1992). From Koldihwa three dates reading  $4530 \pm 185$  B.C.,  $5440 \pm 240$  B.C. and  $6570 \pm 210$  B.C. have been obtained. Mahagara has yielded six dates of which two are Thermoluminescence (T.L.) dates and the rest  $^{14}\text{C}$  dates. The two T.L. dates read 2265 B.C. and 1616 B.C. The four  $^{14}\text{C}$  dates read  $1400 \pm 150$  B.C.,  $1330 \pm 120$  B.C.,  $1440 \pm 100$  B.C. and  $1480 \pm 110$  B.C. From two more Neolithic sites of the Vindhyan region out of Allahabad

district, also <sup>14</sup>C dates are available. Three calibrated <sup>14</sup>C dates from Kunjhun (Possehl and Rissman 1992: 473-74) River-face (Sidhi, Madhya Pradesh) read 1565-1265 B.C, 2665-2675-2515 and 3530-3535 B.C. In the light of these dates Possehl and Rissman have proposed a time bracket of 4000 B.C. to 1200 B.C. for the Neolithic culture of north-central India. Recently three <sup>14</sup>C dates have been obtained from Tokwa (Mirzapur, Uttar Pradesh) when calibrated these read 6591 B.C. (B.S. 2417), 5676 B.C (B.S. 2669) and 4797 B.C. (B.S. 2464). In the light of the available dates from Koldihwa and Tokwa the antiquity of the Neolithic culture of the Vindhya may be pushed to 7th millennium B.C.

The evidence indicates that the first farming culture of the area evolved indigenously from the preceding Mesolithic culture and even during and after the Neolithic hunting-gathering mode of life persisted. Excavations in the rock-shelters and rock-paintings also have revealed evidence of contact in the form of ceramic and other industries.

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## EARLY ANIMAL DOMESTICATION IN SOUTHERN ERITREA: PERSPECTIVES OF ROCK ART AND ARCHAEOLOGY

**D. B. Garnayak**

*Abstract:* The article throws light about the origins and initial spread of animal domestication in the Southern region of Eritrea, through the evidence of rock art and material culture noticed from the archaeological sites. The archaeological findings and the rock art motifs reflect upon, how, pastoralists became agro-pastoralists with the environmental changes. It led the foundation for the development of the subsequent complex societies and early civilization in this region.

Eritrea in northeast Africa is one of the countries with largest concentration of the African rock art heritage. The sandstone belt of Southern Eritrea possesses many rock art shelters, due to its geological landscape, which is favorable for weathering. The rock shelters are of varied size and shape, some of them were used by hominins at different times in human history.

The rock art of the Southern region of Eritrea gives first hand information about the pastoral life of the people. The depiction of humpless and humped cattle, camels, donkey etc in the rock art associated with human figurine and other abstract motifs, itself gives a message about the socio-economic life of the region in general and pastorals in particular. The important rock art sites of the southern region are the rock shelters of Qohaito, Hesmele, Dera' Hawatsu.

The theme of the rock paintings and engravings in the southern region is of both animate and inanimate. The animate figures and scenes are dominated by the domesticated animals (humpless and humped cattle, camels, donkey, goats, sheep), human figurine, while few sites contain motifs of wild fauna such as elephant and lion. The inanimate motifs are rare and are limited to a few rock shelters only. They are in the form of Sun motifs, tree patterns and a few abstract patterns. The extensive depiction of domestic animals, particularly cattle and the near-

exclusion of wild animals from the rock art have compelled the investigators to describe the art of the region as pastoral.

The paintings are executed in either outline or flat wash. The pigments used by the shelter dwellers for executing the art, are basically of black, red, ocher and white colours. The humpless cattle are depicted in ocher-red and black colour while the camels, donkey and humped cattle are mostly done in white colour. The superimposition of motifs and colour suggests a tentative chronology of these art motifs, as, the black and ocher are older than the white colour motifs.

### **Beginning of animal domestication**

No one knows exactly how domestication of animals began. Domestication of stock- cattle, sheep and goats may be assumed to have been equally revolutionary innovation for human economy. It would, however, have had particular significance in providing a permanent source of protein.

The ecological and economic factors influenced human beings for domestication. The herds are regarded as a walking bank account. It can be exploited for a wide range of materials useful to people, including meat, hides, hair, dung, and dairy products. Beyond this, livestock, especially large animals, such as cattle and camels are viewed as wealth

and enters into various kinds of social transactions, such as bride-wealth payments; herd size is indicative of the owner's social status (Bower 1997); as well as, in loan payment, as is prevalent in many ethnic groups of pastoralists.

Three vital elements are to be maintained in the domestication of animals. They are: 1. constraining the movement of the target population, 2. regulating the breeding, and 3. controlling their feeding to save their own as well as animals' future generation. The process of domestication is undoubtedly a prolonged one and is spread over in several areas throughout the world.

The available data suggests that stone tool and pottery-used by the nomadic pastoralists dependent upon humpless cattle (*Bos taurus*), goats, and sheep were being migrated from Sudan into the Eritrean highland around ca. 5000–4000 B.P. (Smith 1992).

Some writers have suggested that the whole cattle complex of the Sahara Neolithic peoples was derived from Arabia via Horn of Africa. But the archaeological evidence, however, lends no support to this hypothesis; and, the rock art in particular, indicates that the pastoral group depicted therein came from the Sahara or Nubia to the Horn, and not the other way round (Clark 1954).

The work of Brandt and Carder (1987), suggests a relationship between rock art and transhumant mobility patterns of pastoralists from the lowlands to the highlands, depending on the seasonal and or temporal availability of resources and as a response to ecological stress. They hypothesized that environmental fluctuations of the middle Holocene in the Sahara caused populations to move into the Horn (northeastern Africa).

According to Shillington (1995) that cattle may have been first brought to the area by people from the north, possibly the region of the present Sudan. Besides herding, hunting and gathering remained an important part of their livelihood and probably they also cultivated cereals. Their basic tools such as knives, scrapers and spearheads etc were made of stone. They also made fired clay pottery, reed baskets, grinding stone and characteristic stone bowls.

The views of archaeologists and anthropologists regarding the migration of people and domestication of cattle in the Horn of Africa began during the time of environmental changes occurring in the mid-Holocene period in the Sahara region. But till now, the available archaeological evidences are so scanty for giving any exact and reliable theory and date to this phenomena.

The areas today have very little or no vegetation at all; which raises questions as to how domestication of animals was possible in this region in the past. But the depiction of lion, elephant and humpless cattle in the shelter of Quahito suggests a savanna type of grassland environment existing in the past. The environment might have changed due to sudden or gradual climatic change in the latter period which can be known from the depiction of dry and semi-arid environmental animals, such as, humped cattle and camel motifs.

In the absence and scarcity of traditional archaeological data, rock art had played a crucial role in giving a tentative theory and date to the emergence of pastoral economy in this region. It answers the question about the existing environment in the present as well as in the past.

The detailed study of the rock paintings of the Southern region gives an idea about the environment and the existing animal species from, time to time, as well as, in the field of human behavioral patterns of the area.

### **Evidence of rock art**

Rock paintings provide a major source of information concerning not only the domestication of animals, notably cattle but also about the environment, cultures that have met and mixed over thousands of years.

Stylistically, few rock art motives like the humpless cattle of the Southern Eritrea have similarity with the Saharan rock art depicting herds and herders of domestic stock. It also attests to the widespread distribution of and communication of these early pastoral communities. The earliest paintings in red and black colours may be the creation of the migrated Saharan people.





Fig. 1. Herding scene of humpless cattle: Quahito.

As also stated by Brandt and Carder regarding the Pastoral paintings of humpless cattle with tiny heads, long thin horns basically in red and black colours are the art of Nilo-Saharan speaking people who migrated up the Nile valley some 3000 years ago. Humpless long horn cattle are shown in paintings in Eritrea and in Harar province, as well as Somalia, stylistically resembles with the humpless cattle of Sahara region (Brandt & Carder 1987).

The depiction of humped cattle, camels, donkey in white colours are of latter period and may be the work of Bantu speaking farmers or the Arabian people who migrated to these places in the early Christian era. As stated by Shillington that during the



Fig. 2. Herding scene of humped cattle: Quahito.

sixth century BC, hunters and traders began crossing the Red Sea from Saba in the southwestern Arabia in search of cultivable and grazing land as well as for trading activity. These people had knowledge about the sea trade and took full advantage of their strategic trading position between Red Sea and the Indian Ocean. It was in search of ivory for the Persian and Indian trade that they crossed the Red Sea to northeast Africa (Shillington 1995). These people have intermixed

with the local people and settled in this region.

The depiction of donkey and camel in the rock art of Quahito justify the history of migration of people from the southern Arab to this highland. Basically, these two animals are associated with the inland trade activities as camel is known as the ship of the desert and in my opinion, donkey -the beast of burden, can be regarded as the ship of the mountainous region. This species is more used by the southern Arabian people. The rock art which exhibit these animals are found in the shelter located at more than 2500 MSL which are arid and completely mountainous regions. For doing trade in this region, donkey as the beast of burden is more suitable in comparison to the other animals. The

depiction of these species in the rock art gives a vivid and clear picture about the importance of it. This justifies that along with the pastoral practices among the pastoralist, some were moving into the profession of trade in the latter period.

The humped cattle (*Bos indicus*) arrayed in the rock art suggests new class of pastoralist who had reached in this region in the





Fig. 3. Camels: Quahito.

late period. The introduction of more drought - and disease-resistant humped cattle (*Bos indicus*) and dromedary camels sometimes later had enhanced the potential for specialized pastoral productions.

The increase in the population over time, pastoralists there came in the direct competition with the farming communities in the highlands. This may have resulted in risk- minimization strategies including critical interregional information exchange systems and the institution of rituals. Rock art might have played an important role in these rituals (Brandt & Carder 1987).

The cultural material in the form of grinding stone (saddle quern), pestle stone in numbers, ceramic



Fig. 4. Herding scene of Donkey: Quahito.

assemblage found in the rock art shelters of this region signify that pastoral nomads of these regions were rarely self sufficient and also that they existed in a symbiotic relationship to groups (typically agricultural group) focusing on other subsistence strategies. The findings of grinding stone suggest that they consumed different types of grains which they either cultivated themselves or they depended upon the agricultural

group of nearby areas. In return, nomadic pastoralists provided animal products (milk, meat, hides and manure) to the sedentary peoples.

The examination of rock art and the material culture noticed in the rock art shelter suggests that the pastoral economy was a way of life which in due course of time gave way to agro-pastoral economy in this region.

**Chronological status**

Unfortunately, the paintings cannot be dated directly, but the archaeological settlements found near to the sites are dated between 800 BC to 400 BC; and a few are contemporary to the Aksume (early Christian era). The highland of Southern Eritrea supported the earliest settled agro-pastoral communities in this region. The presence of humped cattle (*Bos indicus*) species in the archaeological sites, in the form of terracotta figurine, and the faunal remains, as well as, in the rock art, shows that this area was settled by the agro-pastoral people only. Pre-Axumite settlement has been dated to approximately 500 BC by





Fig. 5. Herding scene of domestic humped cattle: Quahito.

French archaeologist Francis (1967, 1974). The C14 dates of the few sites of the Southern region are dated to 800/700 BC to 400/300 BC (Fattovich 1997a). Fattovich subscribes to the presence of South Arabian cultural influence within the then material culture of the region, and links undated petroglyphs to the sites found around Asmara on the basis of the motifs found in the Arabian Rock Art, being dated between 3rd and 1st millennium BC. (Fattovich 1988).

The ceramic evidence found from the rock art sites of Hesmelle and other sites are dominated by the



Fig. 6. Herding scene of humpless cattle: Hesmelle I.

black ware followed by red ware. The pot shards are adorned with finely executed hatched incising punctuated and wavy lines, and comb-incising patterns. The decorative patterns of these ceramic assemblage resemble to the geometric motifs of Kassala ceramic of eastern Sudan in the Nile valley which are dated to 2nd millennium BC' (Fattovich 1997b).

The excavations at Sembel within the greater Asmara area yielded stone and terracotta Bull heads the hump between the horns (dated to approximately 500 BC). A clay figurine of humped cattle was also found in the excavation at Matarra (in the Southern part of Eritrea) near Quahito. It is ascribed to the Aksumite period (early part of the Christian era) (Anfray 1967).

The most characteristic domestic equipments noticed from these shelters consist of fragments of stone bowls, together with flat and deep grindstones, bag-shaped pottery, sometimes with handles and spouts. In some instances, evidence of permanent dwelling and settlements suggest a different cultural tradition with a fairly long history and probably having some form of incipient agriculture also. The grindstones and bowls strongly suggest some form of crop cultivation. The crops may have been wheat, barley, and teff (Simoons 1961). The stone bowls found from this region can also be dated tentatively to the known carbon date- 1063± 80 BC (Deevey 1960).

The stone tools yielded from the shelter and from the surrounding area are made of obsidian, quartz, and chert. The tools found





Fig. 7. Super imposition of motifs Humpless Cattle: Hesamele I.

are scrapers, burins, arrow head, flaked tools etc., which suggest a somewhat more mobile hunting and pastoral form of livelihood. These form the important traits of the Neolithic cultures of East Africa and in the highland of Eritrea and Ethiopia. The above dates from different sites suggest that from the beginning of

Neolithic period to the early Christian era this area was occupied by different pastoral groups. The evidence of humpless cattle and the humped cattle in the rock art, the archaeological evidence from the explored and excavated sites, indicate how the humpless cattle replaced by the humped cattle and latter by the camels.

The valley of Quahito is still occupied by the Saho ethnic groups belonging to Afro-Asiatic-speaking communities of the Cushitic branch. They practice an agro-pastoral way of life. Most of them depend on the herding of sheep, goat, donkey and cattle (*Bos indicus*). Few of them still use the rock shelter as their abode and for keeping the domestic animals. But it is interesting that they are not claiming the authorship of these arts executed in the shelters.

### Conclusion

The southern region of Eritrea acts as the corridor of interaction between the highlands and lowland zone of Eritrean and Ethiopian region. Different pastoral groups and agro-pastoral groups inhabited in this region from time to time and had intermixed with each other. The composition of the animal herds in the rock art reflects the web of social relationships. The evidence of rock painting of humpless cattle and the depictions of humped cattle (*Bos indicus*), camels provides us the first hand evidence of different pastoral groups in this area. The presence of *Bos indicus*, with its higher milk production qualities under arid conditions and its natural resistance to disease, may well have been a key element of



Fig. 8. Herding scene of humpless cattle: Hesamele II.





*Fig. 9. Rock shelter having cultural deposit: Hesmele-III.*



*Fig. 10. Rock Art shelter of Qualhito*

predictability and stability that allowed settled life to take root in this region; and, the presence of grinding stones in their settlements suggests that they also harvested grain. The settlements within the rock art site and nearby area indicate sedentary communities practicing a mixed economy of agriculture and animal domestication. The evidence from rock art archaeology throw sufficient light upon that how pastoralists became agro-pastoralists with the environmental changes.

Thus, the Southern Eritrean rock art basically represents the herding scene of the domestic animals, and is more representational of this aspect only. It appears like the visual documents of the unspoken culture of the pre-literate society created by themselves. It provides information about the subsistence economy, cultural transformation, migration and interaction between the shelter dweller and the other people.

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