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ADVANCES IN THE STUDY OF PREHISTORIC AND
ANCIENT ANIMAL REMAINS IN INDIA: A REVIEW

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(With 3 Tables; and 4 Plates)

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I—INTRODUCTION

The work done on the prehistoric and ancient zoological remains obtained from the excavation sites of India is of comparatively recent origin and commenced from about 1930 onwards.

The importance of the study is three fold: First, it gives an idea of the domestication of animals by the prehistoric people. Secondly, it helps us to know the geographical, topographical and climatic conditions

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and other environmental complexes, together with economic aspects of the bygone periods. Thirdly, the prehistoric animal bones provide us a valuable dating material of the past. Further, the history of the various types of animals is revealed through the art and paintings of prehistoric people and from the actual bony remains found in the excavations. The animal remains reported from the various prehistoric sites are briefly reviewed here, some of the data being from my own unpublished work.

So far some 17 different sites (Table 1) have been worked out, three of which (Mohenjodaro, Harappa and Taxilla) are now in West Pakistan. The oldest of these sites are Mohenjodaro and Harappa (both ca. 2500—1500 B.C.). The most recent site is Sarnath (12th century A.D.). In many sites, several periods of culture are met with in the different layers.

From all these sites, remains of about 92 different species of animals have been found as follows :—

I—VERTEBRATA :

1. Mammalia	41 species
2. Aves (birds)	2 "
3. Reptilia	12 "
4. Pisces (fishes)	5 "

II—INVERTEBRATA :

5. Mollusca	31 "
6. Coelenterata (Corals)	1 "
Total	<u>92 species</u>

The most numerous remains are those of mammals, and in certain places (e.g. Nevasa site) Mollusca are also quite common. Among mammals the following 14 families are met with :—

(A) Perissodactyla—

1. Equidae (horse, ass).
2. Rhinocerotidae (rhinoceros).

(B) Artiodactyla—

3. Bovidae (zebu cattle, buffalo, nilgai, gaur, sheep, goat, four-horned antelope, blackbuck).
4. Cervidae (several species of deer).
5. Suidae (wild boar).
6. Camelidae (one-humped camel).

(C) Proboscidea—

7. Elephantidae (Indian elephant).

(D) Primates—

8. Colobidae (langurs).

(E) Carnivora—

9. Canidae (dog, wolf, jackal).
10. Felidae (cat).
11. Viverridae (mongoose).

(F) Lagomorpha—

12. Leporidae (hares and rabbits).

(G) Rodentia—

13. Muridae (rats, gerbilles, porcupines).

(H) Insectivora—

14. Soricidae (shrews).

Among the reptiles are found remains of the monitor lizards (*Varanus* spp.), the Gharial, the Muggar and several species of turtles and tortoises.

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II—ANIMAL REMAINS FROM VARIOUS EXCAVATION SITES

(Tables 2 and 3)

A brief account of the animal remains of the various excavation sites, both prehistoric (Table 2) and historic (Table 3), in India and West Pakistan is now given below, only the more important points being mentioned.

1. Mohenjodaro (2500—1500 B.C.)

(Table 2)

The first report on the remains of the Indus civilization was from Mohenjodaro (Larkana District, Sind, now in W. Pakistan) and was

studied by Sewell & Guha (1931). It represented about 37 species of animals which may be classified into five categories as follows :—

- (a) Animals which were probably maintained in a state of domestication were : *Bos indicus* L. (Indian Humped Cattle); *Bubalus bubalis* (L.) (Indian Buffalo); *Ovis* sp. (sheep); *Canis familiaris* L. (domestic dog); *Sus scrofa cristatus* Wagner (Indian Pig); *Camelus dromedarius* L. (One-humped Camel); *Elephas maximus* L. (Indian Elephant); and *Gallus* sp. (fowl); and at a later period, *Equus caballus* L. (horse).
- (b) Animals that were not actually domesticated but which frequently lived in the vicinity of human habitation were : *Herpestes auropunctatus* (Hodg.) (Small Indian Mongoose); *Suncus stoliczkanus* (And.) (Anderson's Shrew); *Rattus rattus* L. (Common Rat).
- (c) Animals that were caught and utilised as food were : *Gavialis gangeticus* (Gmelin) (Gharial); several turtles and tortoises, viz., *Trionyx gangeticus* Cuv.; *Geoclemys hamiltoni* (Gray), *Chitra indica* (Gray) and *Batagur baska* (Gray); *Lissemys punctata* (Bonn.); and the fishes *Rita rita* (Ham.-Buch.); *Wallago* sp. and *Arius* sp. (an estuarine cat fish).
- (d) The remains of shells imported for use as ornaments and other purposes were those of : *Lamellidens marginalis* Lamk. (a freshwater mussel), *Arca granosa* L. (Marine Ark Shell), *Erosaria ocellata* (L.), *Arabica arabica* (L.) (a cowry), *Babylonia spirata* (L.) (a marine Gastropod), *Fasciolaria trapezium* L. (a marine Gastropod); *Xancus pyrum* var. *acuta* Hornell and var. *fuscus* Sowerby (the Chank Shell); *Viviparus bengalensis* (Lamk.) (Banded Pond-Snail); *Indoplanorbis exustus* (Desh.); *Parreyssia favidens* (Benson) (a bivalve).
- (e) The following deer species were imported for medicinal purposes according to Sewell & Guha (1931, p. 672) : *Cervus hanglu* (Wag.) (Kashmir Stag), *Cervus unicolor* Kerr. (Sambar), *Axis axis* (Erxl.) (Chital) and *Axis* (*Hyelaphus*) *porcinus* (Zimm.) (Hog Deer).

Thus, it appears that the inhabitants of the Indus civilization from Mohenjodaro practised a high grade of domestication of animals, and also utilized them for food, medicine and ornamentation.

2. Harappa (2500—1500 B.C.)

(Table 2)

The next site of importance is that of Harappa (Montgomery District, Punjab, now in W. Pakistan) which was studied by Prashad (1936). He listed 30 species of animals and also traced the probable ancestries and the areas of domestication of some of them.

In general, the bony remains from Harappa resemble those described by Sewell & Guha (1931) from Mohenjodaro. Several species are identical, while some like the shrew, *Suncus stoliczkanus* (And.), and a number of stags and deer are not represented in Harappa. On the other hand, the Monitor Lizard (*Varanus* sp.), the cat (*Felis ochreata* Gm. race *domestica*), the Jackal (*Canis aureus* L.), the wolf (*Canis lupus* L.) the rhinoceros (*Rhinoceros unicornis* L.), the goat (*Capra hircus aegagrus* Erxl.), found at Harappa were not represented in Mohenjodaro.

The presence of the remains of rhinoceros (*Rhinoceros unicornis* L.) and water buffalo (*Bubalus bubalis* L.) which live in marshy land mixed with forests, indicates that the climatic conditions of Punjab at that time were different from those found today. The occurrence of the rhinoceros is particularly interesting as this animal is no longer found in that region. The other animal remains, except those of the invertebrates and the reptiles, all belong to those of domestic animals. As in Mohenjodaro, there is a large number of bones which seem to have belonged to young animals which had apparently been killed for food.

Prashad (1936, p. 22) also described a new dog from Harappa, *Canis teneranus* race *harappensis* Prashad, resembling the original ancestral type of dog found in the orient in diluvial times and which was of the greyhound type (with an elongated snout having distinct affinities to the Indian wolf, *Canis lupus* L.). It is interesting to note the occurrence of dog from the early days of the Harappan culture. Prashad (1936, p. 37) also noted that the cattle remains from Harappa belong to two distinct types : (i) a large, massive form probably of the type of long-horned humped cattle; and (ii) a smaller form with short horns.

Recently, Nath (1962) has reported on the remains of the horse (*Equus caballus* L.) and the Indian Elephant (*Elephas maximus* L.) from the prehistoric site of Harappa, found in the unworked collections with the Zoological Survey of India. This is the first record of the true horse and the Indian Elephant from the region. The horse remains were obtained from Area G (Harappa) at the end of the Harappa civilization when alien invaders overran this prehistoric city and destroyed it (Piggot, 1950, p. 230). On the other hand, the elephant remains occur in the Harappan period (2500—1500 B.C.).

3. Rupar (2000—900 B.C.)

(Table 2)

Another site of Harappan culture recently excavated is that of Rupar (Ambala district, East Punjab), Nath (in press) has found 18 species, all of which are identical with those of Harappa and Mohenjodaro, with the exception of two, viz., *Francolinus francolinus* (L.) (Black Partridge) and *Bandicota bengalensis* Gray & Hardw. (Bandicoot Rat). A few cut marks on the bones, particularly those of *Bos indicus*, *Bubalus bubalis*, *Ovis vignei*, *Capra hircus aegagrus* and *Sus scrofa cristatus*, indicates the probable use of these animals as food.

The Rupar remains are mostly those of the domestic animals which resemble in their species those of the Harappan culture. Both domestic ass (*Equus asinus* L.) and the true horse (*Equus caballus* L.) are found in the late period of Harappan culture of Rupar.

4. Rangpur (2000—800 B.C.)

(Table 2)

Recently, the excavations at Rangpur (Ahmadabad district, Gujarat) by the Archaeological Survey of India, has brought to light the large extension of the Harappan culture to Gujarat, south of Sind. Nath (in press) has studied these remains and found 10 species. All the remains are of domestic animals which resemble, in their species, those of the Harappan culture. The presence of the domestic ass, *Equus asinus* L. but not of the horse, is noteworthy. The remains of the dog, *Canis familiaris* L., have been found from the earliest times of Harappan culture at Rangpur. The other remains of domestic animals, e.g., cattle, goat, sheep and pig, are akin to those of Harappa, Mohenjodaro and Rupar.

5. Lothal (2000—1200 B.C.)

(Table 2)

Nath (unpublished) has worked out the animal remains from excavations at Lothal (Ahmadabad district, Gujarat), the most notable Harappan cultural site in Gujarat excavated recently by the Archaeological Survey of India. The number of species represented is 23. The majority of remains are of domestic animals, those *Bos indicus* being by far the most common. The remains of other domestic animals, e.g., the buffalo, goat, sheep, and pig are akin to those of Harappa, Mohenjodaro, Rupar and Rangpur. The dog, *Canis familiaris*, is found from the earliest times of Harappan culture at Lothal. The presence of the remains of the rhinoceros, *Rhinoceros unicornis* L., and the Indian elephant, *Elephas maximus* L., which live in marshy land mixed with forest, indicates that the climatic conditions of Gujarat at that time were different from those found today. Among wild species two species of deer, *Axis axis* (Erxl.) (Chital) and *Cervus unicolor* Kerr. (Sambar) are represented. The remains of the Nilgai (*Boselaphus tragocamelus* Fall.) and the common house rat (*Rattus rattus* L.), and the Indian Black-naped Hare (*Lepus nigricollis* Cuv.) are also found. The remains of the small Indian Mongoose (*Herpestes auropunctatus* Hodg.) and the Jackal (*Canis aureus* L.) are akin to those of Harappa and Mohenjodaro. The presence of the true horse, *Equus caballus* L., from the late period of Harappan culture at Lothal is noteworthy. The remains of the fowl (*Gallus* sp.) are akin to those of Harappa and Rupar. The reptilian remains are those of the river turtle, *Chitra indica*. The molluscan shell remains are mainly of the chank shell (*Xancus pyrum*), the Banded Pond-snail (*Viviparus bengalensis* Lamk.), and other marine Gastropod shells such as *Telescopium telescopium* (L.), *Olivancillaria subulata* (Lamk.) and *Conus (Rhizoconus) rutilus* Brug.

6. Nevasa (1500—1000 B.C.)

(Table 2)

Eapen (1960, pp. 531-536) has studied the remains of the Nevasa excavations (Ahmednagar district, Maharashtra) and found 13 species

of which *Bos indicus* L. is the most common. The remains of the goat, *Capra hircus aegagrus* Erxl., are numerous. Among wild animals, two species of deer, *Axis axis* (Erxl.) and *Cervus duvauceli* Cuv., are comparatively well represented. The remains of fish and a bird (*Gallus* sp.) are also found. The reptilian remains are mainly of the turtle, *Chitra indica* (Gray).

The bony remains of the Chalcolithic period in Nevasa are mainly those of domestic cattle (*Bos indicus* L.) and wild Barasinga (*Cervus duvauceli* Cuv.). Remains of the goat (*Capra hircus aegagrus* Erxl.) and turtles are less common. The absence of pig is rather surprising.

7. Nasik (1500—500 B.C.)

(Table 2)

The animal remains at Nasik (Maharashtra), were studied by Georg (1955, pp. 142-143) who reported 13 species. The remains are mostly those of domesticated animals, viz., *Bos indicus* L., *Bubalus bubalis* (L.) *Ovis* sp., *Capra* sp. and *Sus cristatus* Wag. Among wild species three species of deer, *Cervus unicolor* Kerr., *Axis axis* (Erxl.) and *Tetraceros quadricornis* Blainv., the Nilgai (*Boselaphus tragocamelus* Fall.) and the rat (*Rattus rattus* L.) are reported. The occurrence of a Primate (*Simopithecus* sp., the langur) is noteworthy, as Primates have not been recorded from any other prehistoric sites in India.

8. Nagda (1500—200 B.C.)

(Table 2)

Recently, Nath (in press) has studied the remains from Nagda (Chambal Valley, Madhya Pradesh) and has recorded 16 species. The majority of remains are of domestic animals, those of *Bos indicus* L., being by far the most common. The remains of the goat (*Capra hircus aegagrus* Erxl.) and the sheep (*Ovis vignei* Blyth) are fairly numerous and that of *Bubalus bubalis* (L.) fewer. Among the wild species, two species of deer, *Cervus unicolor* Kerr. (Sambar) and *Cervus duvauceli* Cuv. (Barasingha) are present. The occurrence of the Muggar or Great Indian Crocodile, *Crocodylus palustris* Lesson, is noteworthy as this animal has so far not been reported from any other prehistoric site of India. The other reptilian remains are mainly those of the turtles *Lissemys punctata* (Bonn.), *Chitra indica* (Gray) and *Trionyx gangeticus* Cuvier.

9. Hastinapura (1100 B.C.—3rd Century A.D.)

(Table 2)

Hastinapura, (Meerut district, Uttar Pradesh) is a site which is also mentioned in the oldest Indian epic, the *Mahabharata*. The remains have been studied by Nath (1955) who found 13 species. As in Mohenjodaro and Harappa, there is a large number of bones which belong to young animals. A number of bones of *Bos indicus* L., *Bubalus bubalis* (L.), *Ovis vignei* Bly., and *Sus scrofa cristatus* Wag. have definite cut

marks by sharp instruments, suggesting that the inhabitants used these animals for food.

The majority of the remains are those of the domestic animals, those of *Bos indicus* L., being by far the most common. The remains of the goat (*Capra hircus aegagrus*) and the sheep (*Ovis vignei* race *domesticus*) are fairly numerous. The remains of *Bubalus bubalis* (L.) are fewer, but *Sus scrofa cristatus* Wag. is well represented. The Indian Elephant, *Elephas maximus* L., the *Cervus duvauceli* Cuv., are also represented. The presence of the horse, *Equus caballus* L., during the painted greyware period of Hastinapura is significant, as this animal played an important part in the everyday life of the people. Besides, in this period people seemed to have been fond of hunting deer the bones of which were used for style and other decorative objects. The remains of a carp is the only record of fish from this site.

10. Brahmagiri (1000 B.C.—200 A.D.)

(Table 2)

Nath (1968) has studied the collection from Brahmagiri (Chitradurga district, Mysore State). The remains belong to three cultures : (i) *Brahmagiri Stone Age Culture* (1000 B.C.) divided into two subcultures : (A) Early Stone Age Culture and (B) Late Stone Age Culture. (ii) *Megalithic Culture* (200 B.C.—mid-1st century A.D.); and (iii) *Andhra Culture* (mid-1st century—3rd century A.D.). The species represented in these cultures are as follows :—

(i) Brahmagiri Stone Age Culture—

(A) Earlier Stone Age : *Equus* sp., *Bos indicus* L., *Ovis vignei* Bly. race *domesticus* and *Lepus nigricollis* Cuv.

(B) Late Stone Age : *Canis familiaris* L., *Bos indicus* L., *Bubalus bubalis* (L.), *Ovis vignei* Bly. race *domesticus*; *Capra hircus aegagrus* Erxl., *Sus scrofa cristatus* Wag. and *Axis axis* (Erxl.).

(ii) Brahmagiri Megalithic Culture—

Bos indicus L., *Bubalus bubalis* (L.), *Ovis vignei* Bly. race *domesticus*; *Capra hircus aegagrus* Erxl., *Axis axis* (Erxl.) and *Gallus* sp. (fowl).

(iii) Brahmagiri Andhra Culture—

Bos indicus L., *Bubalus bubalis* (L.), *Ovis vignei* Bly. race *domesticus*; *Capra hircus aegagrus* Erxl., *Lepus nigricollis* Cuv. and *Pila globosa* (Swani.).

Except for the Chital (*Axis axis* Erxl.), the other mammal remains are those of domesticated animals.

11. Maski (1000 B.C.—100 A.D.)

(Table 2)

Nath (1957, pp. 121-129) has studied the remains from Maski (Raichur district, Mysore State) and found 8 species. The excavation mainly comprises chalcolithic and megalithic cultures. The animal remains closely resemble those of Harappa and Hastinapura, and the following were found :—

(a) *Chalcolithic* : Invertebrates (Mollusca) : Freshwater mussel (*Parreyssia* sp.) and the Banded Pond-snail (*Viviparus bengalensis* (Lamk.)). Vertebrates : The common Rat (*Rattus rattus* L.), the short-horned humped cattle (*Bos indicus* L.), the buffalo (*Bubalus bubalis* (L.)), the sheep (*Ovis vignei* Bly. race *domesticus*), and the goat (*Capra hircus aegagrus* Erxl.). Of the latter, a large number of short-horned cattle and sheep occur, and apparently herds of these were maintained. The domestication of these animals indicates a pastoral economy tending towards food growing.

(b) *Megalithic* : Only the sheep (*Ovis vignei* Bly. race *domesticus*) has been found but in large numbers.

12. Nagarjunakonda (Neolithic—1200 A.D.)

(Tables 2 and 3)

The animal remains from the excavations at Nagarjunakonda (Guntur district, Andhra Pradesh) have been recently studied by Nath (unpublished). They belong to three cultures, viz., (i) Neolithic (date not yet assigned); (ii) Megalithic (200 B.C.—mid-1st century A.D.); and (iii) historical period (2nd century—1200 A.D.). The following species are represented :—

(i) *Neolithic culture* : Eleven species were found. The remains are mostly of domesticated animals, viz., *Bos indicus* L., *Bubalus bubalis* (L.), *Ovis vignei* Blyth race *domesticus* and *Capra hircus aegagrus* Erxl. The absence of the pig, *Sus scrofa cristatus* Wag., is rather surprising. Among wild animals, three species of deer, *Cervus unicolor* Kerr., *Cervus duvauceli* Cuv., and *Axis axis* (Erxl.), occur. The presence of the black buck, *Antilope cervicapra* (L.), is noteworthy as this animal has not so far been reported from any of the other prehistoric sites of India. The remains of the Nilgai (*Boselaphus tragocamelus* Pall.) also occur. The presence of all these animals in the neolithic site suggests that the habitational sites at that time were situated amidst jungles and undulating grassy land, and the settlers were practising pastoral economy tending towards food growing.

(ii) *Megalithic culture* : Five species have been found, all being domestic animals, viz., *Bos indicus* L., *Bubalus bubalis* (L.), *Ovis vignei* Blyth race *domesticus*, *Capra hircus aegagrus* Erxl., and *Sus scrofa cristatus* Wag. These remains were obtained from the megalithic human burials.

(iii) *Historical period* : Thirty species occur. The majority of the remains are of domestic animals, that of *Bos indicus* L. being by far the most common. The other domestic animals, viz., *Bubalus bubalis* (L.) (domestic buffalo), *Capra hircus aegagrus* Erxl. (goat), *Ovis vignei* Blyth race *domesticus* (domestic sheep) and *Sus scrofa cristatus* Wag. (pig) are fairly common. Among wild cattle, the remains of the wild buffalo, *Bubalus bubalis*, the gaur, *Bos gaurus*, and the Nilgai, *Boselaphus tragocamelus*, are noteworthy. Of these, *Bos gaurus* was hitherto not found in any of the prehistoric sites. Remains of both the true horse and the smaller breed or pony (both *Equus caballus* L.) as well as the domestic ass (*Equus asinus* L.) have been found. The remains of a sacrificed pony from the *aswamedh* site of Nagarjunakonda is of especial significance as it throws light on the ritual and cultural practices of the descendants of the Ikshuvaku kings who ruled there at that time. The remains of the Indian Elephant, *Elephas maximus* L., are found in considerable numbers. Among other mammalian remains are those of the following :—The domestic dog (*Canis familiaris* L.); three rodents, viz., the common rat (*Rattus rattus* L.), the Indian Mole Rat (*Bandicota bengalensis* Gr. & Hardw.), and the Large Bandicoot (*Bandicota indica indica* Kerr), and the Indian Crested Porcupine (*Hystrix indica* Kerr). Of these, the occurrence of the porcupine is noteworthy as this animal has not previously been found in any of the prehistoric sites in India. The Indian Black-naped Hare (*Lepus nigricollis* Cuv.), and three species of deer, viz., the Sambhar (*Cervus unicolor*), the Chital (*Axis axis*) and the Barking Deer (*Muntiacus muntjak*) have also been found.

Other vertebrate remains are those of the fowl (*Gallus* sp.), several reptiles, viz., the turtles (*Chitra indica* Gray and *Trionyx* sp.) and the Monitor lizard (*Varanus griseus* Daud.), and a teleostean fish (*Rita rita* Ham-Buch.).

Among the invertebrates are the molluscan shell remains of the chank shells, *Xancus pyrum* L., and *X. rapa* (Lamk.) and other marine shells such as *Tonna maculata* (Lamk.), *Area granosa* L., *Meretrix meretrix* (L.) and the Money Cowry, *Monetaria moneta* (L.).

13. Ujjain (750 B.C.—1400 A.D.)

(Table 2)

Nath (unpublished) has recently identified the animal remains from the excavations at Ujjain (Madhya Pradesh) and 12 species have been recorded. The remains are mostly of domesticated animals, viz., *Bos indicus*, *Bubalus bubalis*, *Ovis vignei* race *domesticus*, *Capra hircus aegagrus* and *Sus scrofa cristatus*. The domestic ass, *Equus asinus*, and the horse, *Equus caballus*, are both found. The remains of the small Indian Mongoose, *Herpestes auropunctatus* Hodg. and the Indian Elephant, *Elephas maximus* L., found at Ujjain are akin to those of Harappa and Mohenjodaro. Among deer only two species occur, viz., the Chital (*Axis axis*), and the Black buck, *Antilope cervicapra*. The molluscs are represented by a single species, the chank shell *Xancus pyrum* L.

14. Jaugada (400 B.C.—200 A.D.)

(Table 2)

Nath (unpublished) has studied the remains from the excavations at Jaugada (Ganjam district, Orissa), and found ten species. The remains are mostly those of domesticated animals, viz., *Bos indicus*, *Bubalus bubalis*, *Ovis vignei* race *domesticus*, *Capra hircus aegagrus* and *Sus scrofa cristatus*. The occurrence of the dog, *Canis familiaris*, and the domestic ass, *Equus asinus*, from this earliest iron age period is noteworthy. Of wild mammals only a species of deer, the Chital (*Axis axis*) is found. The reptilian remains are mainly those of the turtles, *Chitra indica* (Gray) and *Lissemys punctata* (Bonn.).

15. Taxilla (mid-1st century B.C.—2nd century A.D.)

(Table 2)

The remains from the prehistoric site of Taxilla, 22 miles north of Rawalpindi (W. Pakistan) have been studied by Nath (1959), and 5 species found as follows :—*Equus asinus* L., *Equus caballus* L., *Bos indicus* L., *Bubalus bubalis* (L.), and *Sus scrofa cristatus*. All the remains are those of domesticated animals. Of *Bos indicus*, two distinct forms of humped cattle have been found at Taxilla as at Harappa (Prashad, 1936), viz., (i) a large massive form, probably of the type of long-horned humped cattle; and (ii) a small form with short horns as is found in India today.

16. Arikamedu (20—50 A.D.)

(Table 3)

The remains from Arikamedu (near Pondicherry, southern India) were studied by Chatterjee & Bose (1946, pp. 114-116) and 4 species were found as follows :—The humped cattle (*Bos indicus* L.), the pig (*Sus scrofa cristatus* Wag.), the turtle *Lissemys punctata* (Bonn.) and the fowl *Gallus* sp.

17. Sarnath (12th century A.D.)

(Table 3)

Nath (1958, pp. 165-185) has studied the remains from a drain in Monastery No. 4 at Sarnath (near Varanasi, Uttar Pradesh), and found the remains of the following 12 species :—Mollusca : *Monetaria moneta* (Linn.); *Cypraea pallida* Gray; *Parreysia* sp.; Reptilia (turtles): *Lissemys punctata* (Bonn.) f. *typica*; *Chitra indica* (Gray); *Batagur baska* (Gray). Mammalia: *Bos indicus* L., *Bubalus bubalis* (L.), *Ovis vignei* Bly. race *domesticus*, *Capra hircus aegagrus* Erxl., *Elephas maximus* L. and *Lepus ruficaudatus* Geof. With the exception of the remains of mollusc shells and reptiles, all others are those of domestic animals. The single

find of the charred remains of the hare, *Lepus ruficaudatus*, is noteworthy as the species has not been found in Harappa, Mohenjodaro and Hastinapur.

III—SUMMARY

1. This paper reviews the prehistoric and ancient (ca. 2500 B.C. to 12th century A.D.) animal remains obtained from the various prehistoric and historic sites of India such as Mohenjodaro and Harappa (2500 B.C.—1500 B.C.), Rupar (2000—900 B.C.), Rangpur (2000—800 B.C.), Maski (1000 B.C.—1st century A.D.), Taxilla (mid-1st century B.C.—2nd century A.D.), Brahmagiri (1000 B.C.—200 A.D.), Nasik (1500 B.C.—500 B.C.), Arikamedu (20 A.D.—50 A.D.), Nagda (1500—200 B.C.) and Sarnath (12th century A.D.), and Nevasa (1500—1000 B.C.), and others.

2. Remains, mostly bones and shells of 92 different species (60 vertebrates and 32 invertebrates), have been found from the various sites, thus :—*Vertebrates* : Mammalia (41); Aves (2); Reptilia (12); Pisces (5). *Invertebrates* : Mollusca (31); Coelenterata (Corals, 1). The bulk of the mammal remains in all cases are those of the domesticated animals.

3. The significant role played by various species of animals in the cultural life of the people is discussed.

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PLATE 2

Skeletal remains of some animals from Harappa excavation (ca. 2500 B.C.—1500 B.C.) together with skeletons of recent forms in the collection of the Zoological Survey of India. (After B. Prashad 1936, *Mem. Archaeol. Surv. India*, No. 51.)

(Figs. 1-4).—*Camelus dromedarius* Linn.

FIG. 1.—Left scapula. No. 954 fragmentary. Harappa.

FIG. 2.—Left scapula of a recent specimen in the Zoological Survey of India.

FIG. 3.—Left radio-ulnar shaft from Mound A B, excavated from a depth of 5'9". Harappa.

FIG. 4.—Left radio-ulna of a recent specimen in the Zoological Survey of India.

(Figs. 5-6).—*Rhinoceros unicornis* Linn.

FIG. 5.—Fragmentary right scapula from Mound F, excavated from a depth of 8'7"—11'10". Harappa.

FIG. 6.—Right scapula of a specimen in the Zoological Survey of India.

(Figs. 7-11).—*Equus asinus* Linn.

FIG. 7.—Maxillary portion of palate with 4th premolar and 1-3 molars; No. 954. Harappa.

FIGS. 8 and 9.—Two 3rd right metacarpals.

FIGS. 10 and 11.—Two specimens of 2nd phalanx of right hind-leg and right fore-leg of different sizes (D.R.S. coll.) No. D.S. 40 and 29.

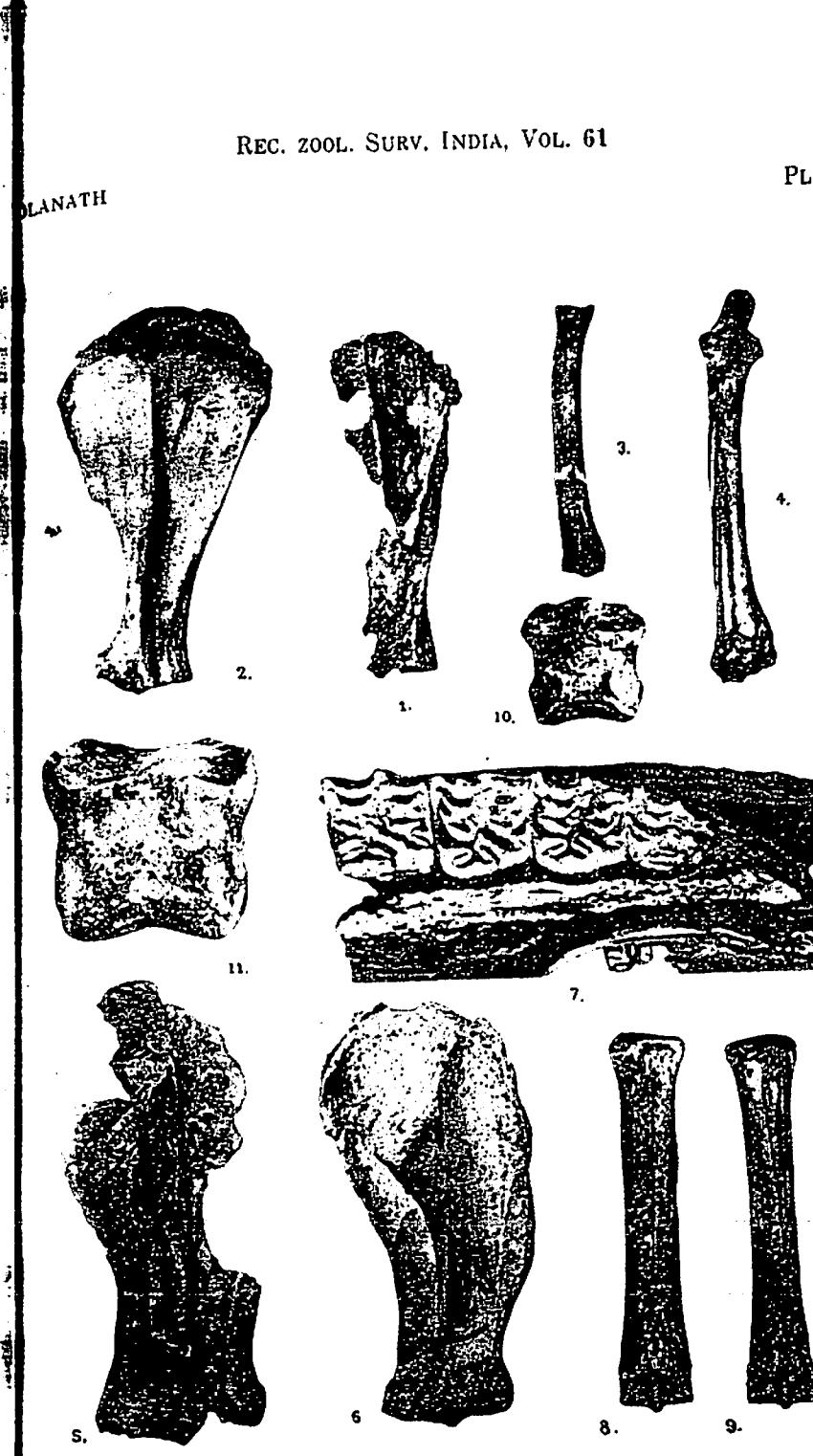


TABLE 2.—List of animal species whose remains have been found end of 1962. (For historic sites,

Sl. No.	Name of species		Order	Family	Ex- cavation Name, State, (Country)
	Scientific	Common			
1	2	3	4	5	6
I.—MAMMALIA					
4.	<i>Rhinoceros unicornis</i> Linn.	The Indian one-horned Rhinoceros	Perissodactyla	Rhinocerotidae	1. Harappa, Dist. Montgomery (W. Pakistan)
"	"	"	"	"	2. Lothal, Dist. Ahmedabad, Gujarat (India)
5.	<i>Bos taurus</i> Linn.	The Zebu or Domestic cattle of India	Artiodactyla	Bovidae	1. Mohenjodaro, Dist. Larkana (W. Pakistan)
"	"	"	"	"	2. Harappa, Dist. Montgomery, (W. Pakistan)
"	"	"	"	"	3. Rupar, Dist. Ambala, E. Punjab (India)
"	"	"	"	"	4. Rangpur, Gujarat (India)
"	"	"	"	"	5. Lothal, Dist. Ahmedabad, Gujarat (India)
"	"	"	"	"	6. Nevasa, Dist. Ahmednagar, Maharashtra (India)
"	"	"	"	"	7. Nasik, Dist. Nasik, Maharashtra (India)
"	"	"	"	"	8. Nagda, Chambal Valley, Madhya Pradesh (India)
"	"	"	"	"	9. Hastinapura, Dist. Meerut, Uttar Pradesh (India)
"	"	"	"	"	10. Brahmagiri, Dist. Chitradurga, Mysore State (India)
"	"	"	"	"	11. Maski, Dist. Raichur, Mysore (India)

- I.—Mammalia
II.—Aves.
III.—Reptilia.

from prehistoric sites in India and West Pakistan up to the see Table 3)—contd.

IV.—Pisces.

V.—Mollusca.

VI.—Cocienteata.

Culture	Age	Reference	Kind of remains found		Excavated by
			7	8	
MAMMALIA—contd.					
Harappan	2300 B.C.—1500 B.C.	Prashad (1936); Nath (1962).	Fragments of right scapula		Archaeological Survey of India.
"	2000 B.C.—1200 B.C.	Nath (unpublished)	Right ramus of mandible without body		"
"	2300 B.C. to 1500 B.C.	Seewall & Guba (1934).	Teeth & fragments of mandible		"
"	"	Prashad (1936); Nath (1962).	Teeth, fragments of mandible; limb bones; scapulae, pelvic girdle & ribs		"
"	2300 B.C.—900 B.C.	Nath (in press)	Skull; mandibles appendicular and axial skeleton		"
"	2000 B.C.—800 B.C.	Nath (in press)	Skull, mandibles appendicular and axial skeleton		"
"	2000 B.C.—1200 B.C.	to	Axial and appendicular bones and skull parts		"
"	1500 B.C. to 1000 B.C.	Eapen (1960)	Limb and jaw bones	Dept. of Archaeology and Ancient History, Deccan College, Poona.	
Chalcolithic	1500 B.C.—500 B.C.	George (1955)	Limb and jaw bones		"
"	1500 B.C.—200 B.C.	Nath (in press)	Pelvis, scapula, ribs, mandibles and teeth	Archaeological Survey of India.	
Northern Black Polished ware; and greyware cultures	1100 B.C. to 3rd Century A.D.	Nath (1955)	Ribs, vertebrae, limb bones, mandible and teeth		
Stone age, Megalithic (Andhra)	1000 B.C.—200 B.C.	Nath (1967)	Ribs, vertebrae, limb bones and teeth		
Chalcolithic	1000 B.C. to 1st century A.D.	Nath (1959)	Vertebrae, teeth, scapula and limb bones		