

ANIMAL REMAINS FROM BRAHMAGIRI
(MYSORE STATE, INDIA)

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(With 4 Plates)

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I—INTRODUCTION

This report deals with the collection of animal remains from Brahmagiri (Chitradurga district, Mysore State) made by the Archaeological Department of the Government of India during the field season of 1947. The remains belong to three different cultural phases as follows:—

I. *Brahmagiri Stone Axe Culture* : Early first millennium B. C. to the beginning of 2nd century B.C., which has been sub-divided into two subcultures, e.g., 1A (Early Stone Axe Culture) and 1B (Late Stone Axe Culture).

II. *Megalithic Culture* : After ca. 200 B.C. to the middle of the first century A.D., overlapping the Andhra Culture.

III. *Andhra Culture* : About the middle of the first century to the third century A.D.

The animal remains are mostly fragmentary and fragile. The organic materials of the bones have disappeared to a large extent, and are impregnated with inorganic materials ; the remains are thus heavily mineralized as in the case of Mohenjodaro, Harappa, Hastinapura,

Maski, Nagda and Rugar. Most of the bones, including the long bones such as humerus, radius, femur, tibia and the cannon bones, are fragmentary and hence unsuitable for measurement, etc. In many cases charred bones have been found as at Harappa, Mohenjodaro and Hastinapura and Rugar.

The following species are represented :—

In subphase 1A (Earlier) of Brahmagiri Stone Axe Culture : *Equus* sp., *Lepus nigricollis* Cuvier, *Bos indicus* Linn. and *Ovis vignei* Blyth, race *domesticus*.

In Subphase 1B (Later) of Brahmagiri Stone Axe Culture : *Canis familiaris* Linn., *Bos bubalis* Linn., *Bos indicus* Linn., *Ovis vignei* Blyth race *domesticus*, *Capra hircus aegagrus* Erxl., *Axis axis* Erxl., and *Sus scrofa cristatus* Wagner.

In Brahmagiri Megalithic Culture : *Bos indicus* Linn., *Bos (Bubalus) bubalis* Linn., *Ovis vignei* Blyth, *Capra hircus aegagrus* Erxl., *Axis axis* Erxl., and *Gallus* sp.

In Brahmagiri Andhra Culture : *Bos indicus* Linn., *Bos (Bubalus) bubalis* Linn., *Ovis vignei* Blyth, *Capra hircus aegagrus* Erxl., *Lepus nigricollis* Cuvier, *Pila globosa* (Swainson).

The majority of remains are of domestic animals, those of *Bos indicus* Linn. being by far the most predominant. The remains of *Bos (Bubalus) bubalis* Linn., are much fewer in as compared to *Bos indicus*, which shows that the inhabitants probably did not maintain large herds of this animal. The remains of sheep (*Ovis vignei* Blyth race *domesticus*) and the goat (*Capra hircus aegagrus* Erxl.) are also fairly common, which indicates that the people were practising pastoral economy. The pig (*Sus scrofa cristatus* Wagner) is very scantily represented in the late Stone Axe Culture, but is surprisingly absent in the Brahmagiri Megalith and the Andhra Cultures. The presence of the wild equid (*Equus* sp.) in the earlier Stone Axe Culture is rather noteworthy. The find of the hare, *Lepus nigricollis* Cuvier in the Earlier Stone Axe Culture, and again its occurrence in the Brahmagiri Andhra Culture, is also interesting, as there is no record of any remains of this animal from Harappa, Mohenjodaro, Hastinapura and Rugar so far.

Among the wild animals, only one member of the deer family *Axis axis* Erxl. is represented.

The Brahmagiri remains of the prehistoric sites resemble, in their species, those of Harappa (Prashad, 1930), Mohenjodaro (Sewell & Guha, 1931), Hastinapura (Nath, 1955), Maski (Nath, 1957), Nevasa (Eapen, 1960), Nasik (George, 1955), Taxilla (Nath, 1959), Sarnath (Nath, 1958) and Nagda and Rugar (Nath, unpublished reports), and wherever necessary, comparison with their remains has been made under each species.

As in case of Anau (Duerst, 1908), Mohenjodaro, Harappa, Hastinapura, Maski, Rugar and Rangpur, there is a large number of bones which belong to young animals indicating thereby that the people practised a full fledged domestication of these animals. In this report each

individual bone is marked "Br.", followed by a number which denotes the Brahmagiri site number from which the bone was excavated, along with the particulars of "find spot", *i.e.*, the locus which denotes the fixed landmark of the excavated surface; the stratum denotes the layer of soil from which the find was obtained at a particular depth from the surface.

Abbreviation used.—Z.S.I., Zoological Survey of India, Calcutta.

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II—SYSTEMATIC ACCOUNT OF BRAHMAGIRI ANIMAL REMAINS

(a) *The Stone Axe Culture*

The description of the animal remains of the different species which lived in this cultural period is given below.

CLASS MAMMALIA

ORDER CARNIVORA

FAMILY CANIDAE

1. *Canis familiaris* Linn. (The Domestic Dog)

(Pl. 5, Figs. 1-3)

Br. 17; Locus B 1; Stratum 10; Sub-phase 1B (Stone Axe Culture). Fragment of the left ramus of mandible with 1st & 2nd molar teeth.

The single find of the domestic dog, *C. familiaris* Linn., resembles in shape and size those from Mohenjodaro as well as with the recent pariah dog such as is now met with at present in India. Below is given its measurements (Table 1) so far as can be taken, along with those from Mohenjodaro, Harappa and the recent pariah dog for comparison.

TABLE 1.—*Measurements (in mm.) of the lower jaw of Canis familiaris Linn.*

Item	Brahmagiri Dog	Mohenjodaro Dog (Sewell & Guha, 1931)	Harappa Dog (Prashad, 1936)	Indian Pariah Dog (Sewell & Guha, 1931)	Modern Pariah Dog (in Dept. of Anthropology)
Height of horizontal ramus opposite molar 1 .	23	23	22	21	19
Length of molar 1 .	20	18.5	19	21.5	18.5
Breadth of molar 1 .	8	8	8	9	8
Length of molar 2 .	9.5	9.5	—	10	8

From Table 1 it is abundantly clear that the single find of the left ramus of mandible of a domestic dog, *C. familiaris* Linn., obtained from Brahmagiri comes extremely close to Mohenjodaro dog (Sewell & Guha, 1931, p. 652), as well as to the recent pariah dog. In measurements though the mandible of dog from Brahmagiri resembles with the Harappa dog (Prashad, 1936, p. 24), yet it differs from the latter in having a marked curvature of the inferior border of the horizontal ramus from the 4th premolar outwardly and forwardly, as in the Mohenjodaro and the recent pariah dogs. The mandible of the Harappa dog, *C. tenggeranus* Kohl., race *harappenis* Prashad, on the other hand, shows incipient curvature in the inferior border from the 4th premolar tooth outwardly and forwardly, as is found in case of the wolf, and as such, Harappa dog (Prashad, 1936, p. 24) shows distinct affinity with the wolf *C. lupus*. It is thus clear that the solitary find of the left ramus of mandible of a canid from Brahmagiri belongs to domestic dog—closely akin to pariah dog now met with in India, and not the wolf. Also the size and structure of the teeth of the Brahmagiri dog shows closer resemblance with *C. familiaris* Linn. than with the wolf.

Order PERISSODACTYLA

Family EQUIDAE

2. *Equus* sp. (The Wild Ass)

(Pl. 5, Figs. 4-6)

Br. 22; Locus I-IV ; Stratum 15 ; Sub-phase 1 A (Stone Axe Culture). One 5th cervical vertebra without transverse process.

The solitary remains of a young equid from Brahmagiri is incomplete and broken, and is, therefore, difficult to place specifically, but it shows close resemblance with the corresponding part of a wild ass (*E. kiang* Moorcroft) in the collection of the Z.S.I. The maximum length of the body of the vertebra is 80.1 mm. and the maximum breadth of posterior articular processes is 50.3 mm.

Order LAGOMORPHA

Family LEPORIDAE

4. *Lepus nigricollis* Cuvier (The Indian Hare)

(Pl. 5, Figs. 7-10)

Br. 22 ; Locus I-IV ; Stratum 15 ; Sub-phase 1 A (Stone Axe Culture). One proximal fragment and one distal fragment of the right tibia ; one distal fragment of the right humerus with medial and lateral condyles.

The remains of the Indian hare, resemble very closely, both in structure and configuration, the bones of a recent specimen of *Lepus nigricollis* Cuvier present in the collection of the Z.S.I. These limb-bones are very fragmentary. The maximum breadth of distal end fragment of humerus is 10 mm. ; maximum lengths of the proximal and distal

fragments of right tibia are 50 mm. and 45 mm., respectively. The find of this hare is rather interesting as it had not so far been recorded from any prehistoric site of India.

Nath (1958, p. 172) recently recorded the remains of another race of the Indian hare, viz., *Lepus ruficaudatus* Geoffroy, from the Sarnath site (near Varanasi, Uttar Pradesh).

Order ARTIODACTYLA

Family BOVIDAE

Subfamily (i) BOVINAE

Bos indicus Linn. (The Domestic Humped Cattle of India) (Pl. 6, Figs. 3, 5, 6 and 9)

- Br. 17 ; locus C₄ ; stratum (5). Subphase 1B (Stone Axe Culture). Proximal fragment of a right femur with head and without tuberosity
- Br. 17 ; locus A₁ ; stratum (5). Subphase 1B (Stone Axe Culture). Fragment of the shaft of left 3rd & 4th metatarsal ; two fragments of ribs.
- Br. 17 ; locus A₁ ; stratum (6). Subphase 1B (Stone Axe Culture). Left calcaneum without distal facet for cuboid ; distal fragment of left 3rd & 4th metatarsal ; 1st phalanx of left fore-foot of an young individual ; 1st left lower premolar.
- Br. 17 ; locus A₁ ; stratum (7). Subphase 1B (Stone Axe Culture). 1st upper left molar ; fragment of the shaft of rib.
- Br. 17 ; locus A₁ ; stratum (8). Subphase 1B (Stone Axe Culture). Proximal fragment of the left tibia of an young one ; fragment of the anterior horizontal left ramus of mandible without teeth of an young one ; coronoid process of the mandible of an young one ; one-incisor tooth.
- Br. 17 ; locus B₁ ; stratum (10). Subphase 1B (Stone Axe Culture). Left astragalus ; left calcaneum with tuber calcis & sub-stentacular facet and without distal facet for cuboid ; fragment of ilium of left pelvis ; distal fragment of the right tibia ; right fused navicular & cuboid fragment of a scapula ; fragment of upper right jaw with 2nd molar of an young specimen ; fragment of the ilium of right pelvis ; distal fragment of the left humerus with medial and lateral condyles ; proximal fragment of right femur with head and without greater trochanter and with trochanteric fossa ; 6th cervical vertebra with body, transverse process ; with ant. & post. articular surfaces and with a portion of spinous process ; fragment of the acetabulum with a portion of ilium of the left pelvis ; body of a cervical vertebra.
- Br. 17 ; locus B₁ ; stratum (11). Subphase 1B (Stone Axe Culture). Right astragalus of an young one ; two proximal fragments of right metatarsals ; fragment of the rib ; one fragment of the left lower jaw with 1st molar tooth ; fragment of left upper 3rd molar tooth ; left upper 1st molar of an young one.
- Br. 19 ; locus A₁ ; stratum (4). Subphase 1B (Stone Axe Culture). Fragment of rib ; transverse process of the lumbar vertebra of an young one.
- Br. 19 ; locus A₁ ; stratum (4b). Subphase 1B (Stone Axe Culture). Fragment of the right upper jaw with 3rd premolar tooth ; several fragments of the shaft of thoracic ribs ; 3rd left phalanx ; fragment of the acetabulum of left pelvis ; right upper 1st molar ; fragment of a pelvis.
- Br. 19 ; locus A₁ ; stratum (5). Subphase 1B (Stone Axe Culture). Fragment of the proximal end of the right radius ; fragment of ulna with olecranon process and semilunar notch.

- Br. 20 ; locus B₂ ; stratum (4). Subphase 1B (Stone Axe Culture). Two distal fragments of the 3rd & 4th metacarpals ; shaft of the right 3rd & 4th metacarpal without distal end ; one distal fragment of the 3rd & 4th metatarsal ; left 3rd & 4th metatarsal without distal portion ; distal fragment of left humerus with lateral and medial condyles ; fragment of the shaft of femur ; proximal shaft of right tibia of a young one ; 2nd phalanx of left fore-foot ; fragment of the shaft of femur with supracondyloid fossa ; fragment of the frontal bone ; 8th cervical vertebra ; several fragments of the shaft of thoracic ribs ; fragment of 1st phalanx of hind-foot ; two fragments of the body of thoracic vertebrae ; lateral condyle of the left tibia ; fragment of a thoracic vertebra with transverse process and anterior articular process ; fragment of ilium with a part of acetabulum of right pelvis of a young one ; fragment of the right molar bone with zygomatic and temporal processes of the skull ; distal fragment of metacarpal of an young one.
- Br. 20 ; locus B₂ ; stratum (5). Subphase 1B (Stone Axe Culture). Two distal fragments of the left humeri ; proximal fragment of the right radius ; proximal fragment of the left tibia ; fragment of the shaft of left femur ; distal fragment of the shaft of 3rd & 4th metacarpal without distal condyles ; left calcaneum ; fragment of the distal condyle of 3rd & 4th metacarpal ; right astragalus.
- Br. 20 ; locus B₂ ; stratum (5a). Subphase 1B (Stone Axe Culture). 1st phalanx of the left hind-foot ; fragments of thoracic ribs ; distal fragment of the 1st phalanx of left hind-foot ; fragment of the left scaphoid of proximal carpus.
- Br. 20 ; locus B₂ ; stratum (6). Subphase 1B (Stone Axe Culture). Five fragments of the shaft of thoracic ribs ; left astragalus ; fragment of the cervical vertebra without spine ; transverse process ; anterior and posterior articular processes ; fragment of the shaft of left radius with a portion of the shaft of ulna ; shaft of right calcaneum ; 3rd phalanx of hind-limb ; right fused 2nd & 3rd tarsal *i.e.*, middle & external cuneiform ; two distal end fragments of left radius.
- Br. 20 ; locus B₂ ; stratum (7). Subphase 1B (Stone Axe Culture). Right fused navicular and cuboid of the proximal tarsal ; proximal fragment of right radius ; fragments of the ribs.
- Br. 2 ; locus B₂ ; stratum (8). Subphase 1B (Stone Axe Culture). Distal fragment of the right femur without lateral condyle ; three fragments of the rami of mandible ; one fragment of the shaft of thoracic rib ; proximal fragment of the right femur with trochanteric fossa ; fragment of the ischium with ischiatic spine of right pelvis ; left lower 2nd premolar of a young one ; right lower 2nd premolar ; right lower 3rd premolar of a young one ; left lower 1st molar of a young one ; left lower 2nd molar of a young one ; fragment of a molar tooth.
- Br. 20 ; locus B₂ ; stratum (8a). Subphase 1B (Stone Axe Culture). Proximal fragment of the right ulna with semilunar notch and without olecranon process ; proximal fragment of the 3rd & 4th right metacarpal.
- Br. 20 ; locus B₂ ; stratum (7c). Subphase 1B (Stone Axe Culture). Distal fragment of the shaft of left 3rd & 4th metatarsal of an young one ; left lower proximal fragment of the left 3rd & 4th metacarpal (charred) ; fragment of the left ramus of the mandible with mental foramina and without body (corpus mandibulae) ; distal fragment of the 3rd & 4th metacarpal.
- 21 ; stratum 19. Subphase 1A (Stone Axe Culture). Proximal fragment of right metatarsus with fused scaphoid and cuboid of proximal tarsal and fused 2nd & 3rd cuneiform ; proximal fragment of the right 3rd & 4th metatarsal ; distal fragment of the 3rd & 4th metacarpal ; neural arch of the thoracic vertebra without spine ; right upper 3rd premolar ; body of a thoracic vertebra ; five fragments of the ribs ; body of a thoracic vertebra with a portion of transverse process ; fragment of the shaft of ulna with fragmentary ploc of radius.

- Br. 21 ; locus IV—V ; depth 13' 3½" Subphase 1 A (Stone Axe Culture). Stratum 18a. Proximal fragment of the right ulna with olecranon process and semi-lunar notch ; distal fragment of the shaft of left femur with supra-condyloid fossa ; left proximal fragment of 3rd & 4th metatarsal ; proximal fragment of right radius ; distal end of the 3rd & 4th metatarsal ; 2nd left upper 3rd molar of a young one ; right upper 3rd molar of a young one ; right lower 1st molar of a young one ; fragment of the shaft of a thoracic rib.
- Br. 21 ; locus O—III ; stratum (11). Subphase 1B (Stone Axe Culture). Fragment of the distal end of left radius ; right & left upper 2nd molar of a young one ; 1st phalanx of hind-foot ; proximal fragment of 1st phalanx of fore-foot ; 2nd phalanx of fore-foot ; 2nd phalanx of hind-foot of a young one ; two fragments of the frontal bone of skull (one charred) ; left cuneiform bone of the proximal carpus of a young one ; fragments of ribs.
- Br. 21 ; locus VI—IX ; stratum 12. Subphase 1B (Stone Axe Culture). Fragment of the distal end of right humerus with medial and lateral condyles ; distal fragment of right tibia with styloid process ; two proximal fragments of right 3rd & 4th metatarsal ; one left & one right fused navicular and cuboid bone ; left calcaneum with tuber calcis & without distal facet for cuboid ; proximal fragment of the shaft of left tibia ; two lumbar vertebrae almost complete except without transverse processes and spinous processes ; two bodies of lumbar vertebrae ; one vertebra with odontoid process, ant. and post. articular processes, intervertebral foramina and with incomplete spinous process ; one cervical vertebra without transverse process and spinous process ; body of a cervical vertebra with a bit of transverse process on one side ; posterior articular process with a portion of neural arch of lumbar vertebra ; fragment of cervical vertebra with a portion of transverse process, and ant. articular process ; left upper 1st molar ; fragment of right upper jaw with 3rd premolar and 1st molar of a young one ; left upper 2nd molar of a young one ; left lower 3rd molar of a young one ; lower left and right 1st molars of young ones ; fragment of lower jaw with 2nd premolar tooth ; fragment of left 3rd & 4th metacarpal ; proximal fragment of left ulna with semi-lunar notch and processus anconaceus and a part of olecranon process ; two left calcanei with tuber calcis and without distal facet for cuboid ; distal extremity of left tibia ; body of the thoracic vertebra ; fragment of the medial condyle of humerus ; fragment of the proximal extremity of left radius ; fragment of a patella bone ; two 1st phalanges of fore-foot of young ones ; 2nd phalanx of fore-foot ; left upper 1st molar ; lunate bone of proximal carpus.
- Br. 21 ; stratum—Pit "DD" Sealed by (10). Subphase 1B (Stone Axe Culture). Distal fragment of the right humerus with medial and lateral condyle ; fragment of the distal extremity of the left femur ; one of fragment the left humerus with deltoid tuberosity ; one cervical vertebra without transverse process and spinous process ; two bodies of thoracic vertebrae ; distal fragment of the 3rd & 4th metacarpal with condyles ; fragment of a horn-core ; orbital part of the frontal bone with orbital opening ; fragment of a lumbar vertebra with posterior articular process & spinous process ; two fragments of the lower jaws (charred) ; left lower 3rd premolar of a young one ; 1st phalanx of hind-foot ; left upper 1st premolar ; right and left fused navicular and cuboid of proximal tarsal ; distal fragment of the 3rd & 4th metacarpal with condyles ; fragment of the superior horizontal ramus of right mandible ; fragment of the vertical ramus of mandible with a portion of corneoid process and condyle ; right upper 3rd premolar ; left upper 3rd premolar ; right 2nd

molar of a young one ; left lower 3rd molar ; right lower 2nd molar of a young one (charred) ; right lower 1st molar of a young one (charred) ; left lower 2nd premolar broken ; fragment of a thoracic vertebra with body ; transverse process of the cervical vertebra (charred) ; fragment of an axis vertebra with a dontoid process and anterior articular process (charred) ; proximal fragment of left ulna with semilunar notch and processus an conaeus ; one fragment of rib ; fragment of cervical vertebra with posterior articular process (charred) ; two 1st phalanges of fore-foot of an young one ; three 2nd phalanges of hind-foot and one 2nd phalanx of fore-foot ; distal fragment of the shaft of right radius without distal extremity of a young one ; proximal fragment of the left femur without head and tuberosity of a young one ; 5th cervical vertebra without transverse processes ; lumbar vertebra without transverse process, spinous process and ant. articular processes ; proximal fragment of the left 3rd & 4th metacarpal (charred) ; 42 fragment of the left ramus of the mandible with mental foramina and without body (corpus mandibulae) ; distal fragment of the 3rd & 4th metacarpal.

Br. 22 ; locus IV—VI ; stratum (11). Subphase 1B (Stone Axe Culture). Fragment of the shaft of radius ; fragment of a rib.

Br. 22 ; locus V—VIII ; stratum (12). Subphase 1 B (Stone Axe Culture). 1st phalanx of the hind-foot of a young one ; proximal fragment of the 3rd and 4th metacarpal of a young one ; 1st phalanx of fore-foot ; left upper 1st molar of a young one ; two incisor teeth of the lower jaw ; fragment of the shaft of 3rd and 4th metacarpal of a young one.

Br. 22 ; locus II—V ; stratum (13) ; Subphase 1 B (Stone Axe Culture). Proximal fragment of the right metacarpal ; 2nd phalanx of the left fore-foot ; one left incisor tooth of a young one ; fragment of an upper molar tooth.

Br. 22 ; locus IV—VI ; stratum (14). Subphase 1 B (Stone Axe Culture). Right upper 3rd molar of a young one ; fragment of the anterior portion of the right ramus of the mandible with mental foramina and without body ; proximal fragment of the medial condyle of the femur ; fragment of an upper molar of a young one ; left lower 1st molar of a young individual.

Br. 22 ; locus I—IV ; stratum (15). Subphase 1 A (Stone Axe Culture). Distal fragment of the shaft of 3rd and 4th metacarpal ; left lower 3rd molar of a young one ; fragments of ribs ; 1st phalanx of the fore-foot ; two 2nd phalanges of the fore-foot of young ones ; patella bone of a young one ; 3rd phalanx of hind-foot ; right lower 2nd premolars ; left lower 2nd incisor tooth ; proximal fragments of the right and left 3rd & 4th metacarpals ; two bodies of thoracic vertebrae ; right calcaneum with tuber calcis and without distal facet for cuboid ; fragment of the right ramus of the lower jaw with 2nd and 3rd molar teeth ; fragment of the right ramus of mandible with 1st molar of a young one ; proximal fragments of the thoracic ribs ; 3rd phalanx of the hind-limb ; distal fragments of femur with supra-condyloid fossa ; right astragalus of a young one ; fragment of the cervical vertebra with anterior and posterior articular processes ; fragment of lower jaw ; fragment of lateral condyle of femur ; 2nd phalanx of the fore-limb of a young one ; right and left 1st premolar of young ones ; left 1st upper premolar of a young one.

Br. 23 ; locus IV—VI ; stratum (12). Subphase 1 B (Stone Axe Culture). Left astragalus slightly broken ; fragment of the left calcaneum ; fragment of ribs ; one fragment of the shaft of humerus ; distal fragment of the radius fused with cuneiform bone of the proximal carpus.

The remains of the humped cattle are mainly fragmentary. Not a single complete bone or a skull is available, and it is difficult, to be certain about the sizes or to take particular measurements for comparison. The teeth available do not show any special peculiarities and generally resemble those from Mohenjodaro, Harappa, Hastinapura, Rupar, Maski and Nagda and as well as recent domesticated Humped Cattle of India present in the collection of the Z.S.I.

The lower jaw (pl. 6, Fig. 3) is incomplete and resembles in all respects that of a recent specimen. Its maximum length is 79.6 mm. ; and the length of the tooth row 63.8 mm.

The vertebrae are mostly incomplete and fragmentary. But some are intact, such as some cervical vertebrae and lumbar vertebrae (Pl. 6, Figs. 5 and 6). The maximum length of the body of a cervical vertebra is 24.4 mm. ; maximum distance between two posterior articular processes is 78.5 mm. The maximum length of the body of the lumbar vertebra is 30 mm. ; maximum distance between two anterior articular process is 21 mm.

The limb-bones are all fragmentary. In Pl. 6, Fig. 9 is shown a well preserved and intact specimen of a scapho-cuboid bone of the distal tarsal. The maximum breadth of the scapho-cuboid bone is 55 mm.

The humped cattle from the Stone Axe Culture resembles the smaller humped, short-horned variety from Harappa, Mohenjodaro, Hastinapura, Maski, Sarnath, Taxilla, Rupar and Nagda (Nath, unpublished).

From the close resemblance between the skeletal remains from Brahmagiri and those of the modern domestic humped cattle of India, it is clear that the two are identical.

The remains of small humped cattle have also been reported from Nasik (George, 1955, pp. 142-43), and Nevasa (Eapen, 1960, pp. 532-536).

The great frequency with which the remains of *Bos indicus* Linn. are met with as compared with the finds of other animals from the Stone Axe Culture, indicates that the inhabitants probably maintained large herds of this animal. Amongst the remains, two bones bear definite marks of cuts by sharp instruments, which shows that the inhabitants probably slaughtered this animal.

***Bos (Bubalus) bubalis* Linn. (The Indian Domestic Buffalo)**

(Pl. 7, Fig. 2)

Br. 17 ; locus A₁ ; stratum (5). Subphase 1 B. Distal fragment of the left humerus with lateral and medial condyle ; 2nd phalanx of the left fore-foot ; 3 fragments of the left ramus of the mandible.

Br. 21 ; pit "DD" sealed by (10). Subphase 1 B. Distal fragment of the right humerus with medial and lateral condyles ; 2 proximal fragments of the left humerus with head and without tuberosity ; 4 complete axis vertebrae ; 5 fragments of rib ; 6 fragments of the shaft of humerus with deltoid tuberosity ; 7 fragments of the ilium near tuber coxae of the pelvic girdle ; 8 fragments of the scapula ; 9 neural arches of a thoracic vertebra without spine ; 10 fragmen

of the blade of scapula ; 10 left fused navicular and cuboid of the proximal tarsal ; 12 proximal fragments of the left humerus with head ; 12 left tibiae without distal portion ; 14 proximal fragments of the left 3rd & 4th metacarpal ; 15 fragments of the left horizontal ramus of the mandible with 2nd & 3rd premolars ; 16 fragments of the ilium of right pelvis (charred) ; 17 fragments of the right pelvis with a part of acetabulum and a portion of ischium ; 18 fragments of the left upper jaw with 1st & 2nd premolars ; 53 fragments of the right upper jaw with 2nd premolar ; 20 right upper 1st premolar.

All the remains of the domestic buffalo are fragmentary. The few teeth available do not show any special peculiarities and generally resemble those of the recent domestic buffalo.

The limb-bones too are very fragmentary. A well preserved distal fragment of humerus is shown in Pl. 7, Fig. 2. In Table 2 are given some comparative measurements.

TABLE 2.—Measurements (in mm.) of the distal fragment of humerus of *Bos (Bubalus) bubalis* Linn.

Humerus	Maximum distal epiphyseal breadth	Maximum depth of condyles
Brahmagiri (Br. 17 ; 10)	81	80
Rupar (RPR 7—109)	79	81
Modern specimen (in Z.S.I.)	80	80

The find of a limited number of fragments of bones of this species shows that the inhabitants probably did not maintain large herds of it (*cf. Bos indicus* Linn. above).

These remains show very close resemblance with those of the modern domestic buffalo in India. They are also similar to those of Mohenjodaro, Harappa, Hastinapura, Sarnath, Taxilla and Rupar (Nath, unpublished report).

Subfamily (ii) *CAPRINAE*

Ovis vignei Blyth race *domesticus* (The Domestic Sheep)

Br. 21 ; stratum (19) ; Subphase 1A (Stone Axe Culture Earlier). Fragment of the left horizontal ramus of the mandible with 1st, 2nd & 3rd molar teeth.

Br. 22 ; locus I—IV ; stratum (15) ; Subphase 1 A (Stone Axe Culture). A complete thoracic vertebra ; fragment of a lumbar vertebra with neural arch and neural spine and post-articular process ; distal fragment of the shaft of humerus ; 61 fragments of the shaft of radius ; 62 fragments of the shaft of femur.

Br. 21 ; stratum—pit "DD" sealed by 10 ; Subphase 1 B (Stone Axe Culture). 31 fragments of the shaft of radius ; 32 right scapula with glenoid cavity, coracoid process and a portion of spine and blade ; 133

distal fragments of the right humerus with medial and lateral condyles ; 34 left lower 3rd molar and 1st molar of a young one ; shaft of 3rd & 4th metatarsal without proximal and distal epiphysis of a young one.

Br. 21 ; locus O—III ; stratum (11) ; Subphase 1B (Stone Axe Culture). Fragment of the shaft of femur ; distal fragment of the shaft of humerus.

Br. 22 ; locus V—VII ; stratum (12) ; Subphase 1B (Stone Axe Culture). Distal fragment of the left humerus with head and greater tuberosity ; 58 right lower 1st molars of a young one.

The remains of domestic sheep are very fragmentary. The few available teeth do not show any specialized peculiarities and generally resemble those of the recent domestic sheep. No horn-core is available. The limb-bones too are very fragmentary and unsuitable for measurements, etc.

These fragments of bones of domestic sheep show close resemblance with those of the sheep from Harappa, Hastinapura, Maski, Sarnath and Rupar and Nagda (Nath, unpublished reports), and are also closely akin to the modern domesticated goat.

***Capra hircus aegagrus* Erxleben (The Domestic Goat)**

Br. 17 ; locus B 1 ; stratum (10) ; subphase 1 B (Stone Axe Culture). Fragment of the vertical ramus of left mandible with condyle and a part of coronoid process ; 2 fragments of the shaft of left humerus without distal and proximal extremities ; 3 distal extremities of right radius ; 4 fragments of the shaft of femur ; fragment of the shaft of radius ; 6 fragments of the lower left 3rd molar of a young one.

These remains are very fragmentary. The few teeth available do not show any peculiarities and generally resemble those of the recent domestic goat. The limb-bones too are very fragmentary.

These fragments of bones resemble those of the remains of goat from Harappa, Hastinapura, Maski, Sarnath and Rupar, Rangpur and Nagda (Nath, unpublished reports), and also the modern domesticated race of sheep.

Family CERVIDAE

***Axis axis* Erxleben (The Chital or Spotted Deer)**

Br. 19 ; locus A₁ ; stratum (5) ; Subphase 1 B (Stone Axe Culture). Two fragments of the antlers.

Br. 21 ; pit "DD" ; Subphase 1 B (Stone Axe Culture). Two fragments, of the antlers.

These fragments resemble those from Mohenjodaro and Rupar (Nath, unpublished), as well modern specimens.

Family SUIDAE

Sus scrofa cristatus Wagner (The Indian domestic pig)

(Pl. 8, Figs. 4 and 5 ; and Table 3)

Br. 17 ; locus B₁ ; stratum (11) ; Subphase 1 B (Stone Axe Culture). Fragment of right upper jaw without teeth.

Br. 21 ; locus VI—IX ; stratum (12) ; Subphase 1 B (Stone Axe Culture). Third metatarsal of the right hind-foot. Only two finds were met with.

The find of an intact and well preserved specimen of the 3rd right metatarsal of the hind-foot of an adult pigs, resembles that of a modern specimen of *Sus scrofa cristatus* Wagner in the collection of the Z.S.I.

TABLE 3.—Measurements (in millimetre) of 3rd metatarsal *Sus scrofa cristatus*. wag.

Metacarpal (3rd toe)	Maximum length	Proximal width	Distal width
Brahmagiri . .	97.5	28.5	18.5
Modern specimen (in the Z.S.I) .	83	23	16.5

It is evident that the 3rd metatarsal of the Brahmagiri pig is larger than that of the modern pig, and the former may be regarded as an old adult pig.

These remains resemble those from Mohenjodaro, Harappa, Hastinapura, Taxilla ; and Rupar and Nagda (Nath, unpublished reports).

(b) *The Megalithic Culture*

An account of the remains of animals which lived in this culture is given below :

Class AVES

Family PHASIANIDAE

Gallus sp. (The Domestic Fowl)

Br. 22 ; locus IV—VIII ; stratum 6d ; Megalithic Culture. One distal fragment of the left tarsometatarsus.

The solitary find of the domestic fowl belongs to a young chick and agrees closely in general form with the corresponding bone of the domestic fowl.

Domestic fowl has also been recorded from Mohenjodaro, Harappa and from Rupar.

Class MAMMALIA

Order ARTIODACTYLA

Family BOVIDAE

Subfamily (i) BOVINAE

Bos indicus Linn. (The Domestic Humped Cattle of India)
(Pl. 6, Figs. 4, 7 and 8)

- Br. 17; locus A₁; stratum 2A. Megalithic Culture. Two left astragali of young ones; left calcaneum; proximal fragment of right radius; distal fragment of the metacarpal of a young one (charred); body of a thoracic vertebra; distal fragment of left tibia; rib fragment; thoracic vertebra of a young one; distal fragment of the left tibia; 1st phalanx of the left fore-foot; 2nd phalanx of fore-foot of a young one; posterior articular process of a lumbar vertebra; fragment of the distal extremity of left femur having medial condyle; fragment of a thoracic rib.
- Br. 17; locus C₁; stratum 3. Megalithic Culture. Three distal fragments of the left humeri and one distal fragment of the right humerus; two proximal fragments of left radius; four left and four right astragali; one left calcaneum with tuber calcis, peroneal and subtentacular facet for astragalus and without distal facet for cuboid; one proximal fragment of left radius of a young one; fragment of the proximal end of left radius; fragment of the proximal shaft of left femur with trochanter minor; proximal fragment of right ulna with semilunar notch and a portion of olecranon process; one proximal and one left distal fragment each of the right 3rd and 4th metatarsal; two proximal fragments of scapula, with glenoid cavity, tuber scapulae, and a part of blade with spine; one fragment of a thoracic rib with neck and tubercle; one fragment of a cervical vertebra with ant- and post-articular and transverse processes; three 2nd phalanx of fore-foot of young ones; three 1st phalanx of the fore-foot and one 1st phalanx of hind-foot; two fragments of a molar teeth; right scaphoid; proximal fragment of a metacarpal.
- Br. 17; locus A₁; stratum (4). Megalithic Culture. Proximal fragment of left tibia of a young one; distal fragment of the shaft of left radius of a young one; fragment of the rib; fragment of the vertical ramus of left lower jaw with condyle and coronoid process; epiphysis of a vertebra; fragment of a cervical vertebra with body, transverse process and foramen transversarium; 2nd upper right premolar. Locus C₁—Left latero-ventral arch of the atlas vertebra with intervertebral and alar foramen; proximal fragment of the right 3rd and 4th metacarpal; 1st phalanx of fore-foot of a young one; several fragments of the shaft of thoracic ribs, head of right femur of a young one; left calcaneum; 2nd phalanx of fore-foot; fragmentary piece of a horn core; coronoid process of right mandible; fragment of the cervical vertebra with ant- & post-articular process and transverse process of the left side only; fragment of a lumbar vertebra with neural arch, and post articular process and without spinous process; right upper 1st molar.
- Br. 17; locus A₁; stratum—Pit A. Megalithic Culture. Proximal fragment of the right humerus with head, lateral and medial tuberosity; two proximal fragments of the right tibia without proximal epiphysis; fragment of the left scapula with glenoid cavity and tuber scapulae; 3rd phalanx of the fore-foot; one fragment of the horizontal ramus of the mandible of a young one; 1st lower left premolar; fragment of the 1st left lower molar tooth; fragment of a rib; 2nd phalanx of the fore-foot.

- Br. 21; locus V—VII; stratum (7). Megalithic Culture. Right astragalus, 2nd phalanx of right fore-foot; proximal fragment of the left tibia; proximal fragment of a thoracic rib; fragment of 2nd phalanx of fore-foot; 2nd phalanx of fore-foot of a young one; locus VII—VIII; right fused navicular and cuboid of proximal tarsal; distal fragment of the shaft of right humerus without distal extremity; distal fragment of left tibia; with a portion of shaft and lateral condyle; three proximal shafts of the left tibia without distal extremity; distal fragment of the right radius with a portion of shaft and lateral condyle; proximal fragment of the shaft of 3rd & 4th metatarsal; fragment of medial condyle of humerus; 1st phalanx of hind-foot; 2nd phalanx of hind-foot; left upper 1st molar; right upper 3rd premolar; right upper 1st premolar; proximal fragment of rib with tubercle and neck, no head.
- Br. 22; locus IV—VIII; stratum (6). Megalithic Culture. Fragment of the shaft of left tibia; body (corpus mandibulae) of the mandible with incisor teeth; fragment of the left ramus of the mandible with 1st & 2nd premolars; fragment of a rib; proximal fragment of the right ulna with semilunar notch and without olecranon process of a young one; 1st left phalanx of the fore-foot of a young one; fragment of a molar tooth; left upper 1st molar; fragment of the coronoid process of the left and right ramus of the mandible; fragment of the shaft of femur.
- Br. 22; locus IV—VIII; stratum (6d). Megalithic Culture. Distal fragment of the right humerus without medial condyle; fragment of the left radius with a portion of ulna having semilunar notch and processus anconaeus and without olecranon process; distal fragment of the left humerus with a part of medial condyle fragments of ribs; proximal fragment of the left 3rd & 4th metatarsal; fragment of the shaft of femur; fragment of a cervical vertebra with post.-articular process.
- Br. 22; locus 0—IV; stratum (9b). Megalithic Culture. Distal fragment of the left radius; left upper 2nd molar of a young one; left upper 2nd premolar of a young one; fragment of an ulna.
- Br. 22; locus VI—VII; stratum—pit (25). Sealed by (6). Megalithic Culture. Fragment of the occipital bone with a portion of supra-occipital condyles and paramastoid process with a portion of basioccipital of the skull; fragment of the hind frontal bone with parietal bone; proximal fragment of the left femur without head, trochanter and trochanteric fossa of a young one; distal fragment of the 3rd & 4th metacarpal; shaft of the 3rd & 4th metatarsal; right calcaneum with a portion of tuber calcis; fragments of ribs; fragment of the anterior horizontal left ramus of the lower jaw; two fragments of the vertical ramii with coronoid process and condyle; three 2nd phalanges of the fore-foot of the young one; fragment of the inferior border of the horizontal ramus of the lower jaw without teeth; fragment of a scapula; right fused 2nd & 3rd cuneiform of the distal tarsal; fragment of the head of femur of a young one; proximal fragment of the right ulna of a young individual; fragment of the left upper jaw with 2nd and 3rd molar; two proximal fragments of the 3rd & 4th metacarpals; 3rd left upper premolar of a young one; left incomplete astragalus (charred).

The remains of the Humped Cattle are similar to those of the Brahmagiri Stone Axe Culture. Not a single complete bone is available, and it is difficult to take measurements for comparison. Some better preserved fragments of skull are shown on Pl. 6, Figs. 1 and 2. The maximum length of the fragment of occipital bone is 81.3 mm.; and its breadth 90.4 mm.; the maximum length of the frontal bone is 85.8 mm.

The teeth available do not show any specialized peculiarities and generally resemble those of the recent domestic Humped Cattle of India present in the Z.S.I. collection. The limb-bones are fragmentary. The carpal bones are, however, well preserved and intact. The scaphoid and lunate bones of the proximal carpus are shown in Pl. 6, Figs. 10 and 11. Maximum breadth of the scaphoid bone 40.4 mm.; anteroposterior length 30 mm. Maximum width anteriorly of the lunate bone 24 mm., maximum antero-posterior length 39 mm.

These remains resemble those of the Brahmagiri Stone Axe Culture, and also resemble the smaller humped short-horned variety from Mohenjodaro, Harappa, Hastinapura, Maski, Taxilla and Rupar and Nagda (Nath, unpublished). They also show close resemblance with modern domestic Humped Cattle of India.

Bos (Bubalus) bubalis Linn. (The Indian Domestic Buffalo)

- Br. 17; locus A1; stratum (4). Megalithic Culture. Proximal fragment of the left ulna with semilunar notch and processus anconaeus and without olecranon process; Megalithic Culture. Fragment of the superior surface of the horizontal ramus of the right mandible without teeth; 3 fragments of the shaft of metatarsal of a young one; 4 fragments of the vertical ramus of the mandible with a part of coronoid process and condyle; 5 1st phalanx of the left hind-foot; 6 fragments of the ilium of the left pelvis (charred); 7 right zygomatic process of the molar bone of the skull; 8 fragments of a thoracic rib; 9 2nd phalanxes of the fore-foot of a young individual.
- Br. 21; locus VII—VIII; stratum (7). Megalithic Culture. Right upper 1st premolar.
- Br. 22; locus IV—VIII; stratum (6d). Megalithic Culture. Distal fragment of the left humerus with medial and lateral condyles; 1st phalanx of the fore-foot.

As compared with the skeletal remains of domestic humped cattle the skeletal remains of domestic buffalo from the Brahmagiri Megalithic Culture are few and fragmentary. No long bone or skull is available, and it is difficult to compare with other forms. These fragments resemble those of the remains from the Brahmagiri Late Stone Axe Culture, *vide* above, Harappa, Hastinapura, Maski and Rupar, and also the modern domesticated buffalo.

Subfamily (ii) *CAPRINAE*

Ovis vignei Blyth race domesticus (The Domestic Sheep)

(Pl. 7, Figs. 6-10; Pl. 8, Figs. 2, 3)

Br. 17; stratum (3); Megalithic Culture. Left astragalus of a young one.

Br. 17; locus A₁; stratum (4); Megalithic Culture. Distal fragment of the shaft of tibia of a young one; distal fragment of the shaft of humerus of a young one.

- Br. 17; locus A₁; stratum—pit A. Sealed by (4); Megalithic Culture. Fragment of the vertical ramus of the lower jaw with coronoid process and condyle; 5 fragments of the left pelvis with a portion of the shaft of ilium and acetabulum; 6 fragments of the horizontal ramus of the left mandible with the 1st & 2nd molar; 7 distal epiphysis of the left tibia of a young one.
- Br. 21; locus V—VII; stratum (7); Megalithic Culture. Fragment of the shaft of right tibia; 24 fragments of the proximal extremity of the right femur with head and without greater trochanter; 25 distal fragments of the shaft of right tibia; 26 left astragali of a young one; body of a thoracic vertebra; 27 fragments of the shaft of radius; 28 fragments of the right vertical ramus of the mandible with coronoid process and without condyle.
- Br. 21; locus VII—VIII; stratum (7); Megalithic Culture. Thoracic vertebra with spinous process and transverse process; proximal fragment of the right radius; 30 fragments of the shaft of femur.
- Br. 22; locus IV—VIII; stratum (6d); Megalithic Culture. Fragment of the left horizontal ramus of the mandible; several fragments of the lower molar teeth; 41 fragments of the shaft of radius; 42 proximal fragments of the shaft of left femur without proximal extremity.
- Br. 22; locus IV—VIII; stratum (6); Megalithic Culture. Two shafts of the 3rd & 4th metatarsal; one shaft of the left 3rd & 4th metacarpal without distal extremity of a young one; distal fragment of the right humerus with medial and lateral condyles; proximal fragment of the shaft of right humerus without proximal extremity; fragment of the left pelvis with acetabulum and a part of pubis and ilium; left lower 1st molar of a young one; body of a thoracic vertebra; fragments of ribs; fragment of the shaft of tibia (charred); fragment of right upper jaw with 1st, 2nd & 3rd premolars and 1st molar of a young one; fragment of right horizontal ramus of mandible with 2nd and 3rd premolars; right and left 1st lower molar of a young one; distal fragment of left femur with medial and lateral condyles and intercondyloid fossa.
- Br. 22; locus VI—VII; stratum—pit 25. Sealed by (6). Megalithic Culture. Fragment of the left frontal bone with the horn-core; fragment of the horizontal ramus of the left mandible with 2nd & 3rd molars; spinous process of a thoracic vertebra; fragment of a rib.

These remains are mainly fragmentary, and not a single long bone or skull is available for measurements.

The few teeth do not show any specialized peculiarities and generally resemble those of the recent domestic sheep in the collection of the Z.S.I. (Maximum length of upper jaw 59 mm.; length of the tooth-row of same 47.3 mm. Maximum length of lower jaw 79 mm.; length of tooth-row 51.4 mm.)

A single horn-core (maximum length 73.3 mm). with a fragment of frontal bone is available. (Pl. 7, Fig. 6).

A better preserved and intact thoracic vertebra (maximum length of body 18 mm.; maximum height 49 mm.), is shown on Pl. 7, Figs 7 and 8. (Maximum distance between two anterior articular processes 17 mm.; and between two posterior processes 18 mm.)

The limb-bones too are fragmentary (Pl. 7. Figs. 9, 10). (Maximum length of astragalus 27 mm., and of the shaft of 3rd and 4th metacarpal 95 mm.)

These fragments closely resemble those from Harappa, Hastinapura, Maski, Sarnath, and Rugar and Nagda (Nath, unpublished), and also modern Indian domesticated sheep.

***Capra hircus aegagrus* Erxl. (The Domestic Goat)**

Br. 17; locus A₁; stratum (2a). Megalithic Culture. One thoracic vertebra.

A single find is present. It closely resembles with the modern sheep in the collection of the Z.S.I.

Family CERVIDAE

***Axis axis* Erxleben (The Chittal or Spotted Deer) (Pl. 8, Figs. 6, 7)**

Br. 17; locus A₁; stratum (2a); Megalithic Culture. Two fragments of antlers.

Br. 22; locus VI—VII; stratum pit (25). Sealed by (6). Megalithic Culture
Fragment of an antler.

Well preserved specimens of antler are shown in Pl. 8, Figs. 6 and 7. Maximum lengths 135 and 165 mm.

The occurrence of *Axis axis* Erxl., has also been reported from Mohenjodaro and Rugar (Nath, unpublished).

(c) *The Andhra Culture*

Below is given the account of the animal remains of the different species which lived in this cultural period.

(a) INVERTEBRATA

Phylum MOLLUSCA

Family PILIDAE

***Pila globosa* (Swainson) (The Land Snail)**

Br. 18; locus A₁; Stratum (4); Andhra Culture. One shell.

This single shell of the land-snail resembles in shape and configuration recent specimens of *Pila globosa* in the collection of the Z.S.I. The species is widely distributed in India, in ponds, lakes and rivers, etc.

(b) VERTEBRATA

Class MAMMALIA

Order LAGOMORPHA

Family LEPORIDAE

***Lepus nigricollis* Cuvier (The Indian Hare)**

(Pl. 5, Fig. 10)

Br. 20; locus B₂; Stratum (2); Andhra Culture. Fragment of the right horizontal ramus of mandible with molar teeth.

This solitary piece closely resembles the mandible of the recent Indian Hare, *Lepus nigricollis*, present in the collection of the Z.S.I. (Maximum length of the fragment 25 mm.; length of tooth row 13 mm).

There is no record of any remains of this hare from Harappa and Mohenjodaro. Nath (1958, p. 172) has recently recorded the remains of another hare, *Lepus ruficaudatus*, from Sarnath.

Order ARTIODACTYLA

Family BOVIDAE

Subfamily (i) BOVINAE

Bos indicus Linn. (The Domestic Humped Cattle of India)

(Pl. 6, Figs. 1, 2, 10, 11)

- Br. 18; locus A₁; stratum (1). Andhra Culture. Fragment of the right lower 3rd molar; two left astragali; fragment of the frontal bone; proximal fragment of right femur with head and trochanter minor and trochanteric fossa; two distal fragments of the left humerus with medial condyles; right astragalus; distal end of right tibia; fragment of the inferior border of the horizontal ramus of mandible; neural arch of a thoracic vertebra; proximal fragment of 1st phalanx of the hind-foot.
- Br. 18; locus A₁; stratum (1B). Andhra Culture. Proximal fragment of the right 3rd & 4th metatarsal of a young one; distal fragment of the shaft of left humerus.
- Br. 18; locus A₁; stratum (3a). Andhra Culture. Proximal fragment of the left radius; fragment of a thoracic rib; one fragment of the shaft of humerus; fragment of a thoracic vertebra with lamina, neural arch and without spinous process.
- Br. 18; locus A₁; stratum (3). Andhra Culture. One distal fragment of the left humerus with medial and lateral condyle; shaft of the 3rd & 4th metatarsal without proximal and distal ends; spinous process of the thoracic vertebra; fragment of shaft of ulna with semilunar notch and without olecranon process; fragment of the acetabulum of pelvic girdle; left astragalus; fragment of the distal end of left tibia; incomplete left fused navicular and cuboid of the proximal tarsal.
- Br. 18; locus A₁; stratum (3B). Andhra Culture. Two fragments of the scapula; two fragments of thoracic vertebrae with neural arch and a portion of spinous process.
- Br. 18; locus A₁; stratum (4). Andhra Culture. Two distal fragments of the 3rd & 4th metacarpals and one distal fragment of the 3rd & 4th metatarsal; distal fragment of the left tibia; left fused navicular & cuboid; 1st phalanx of hind-foot; several fragments of the shaft of the thoracic ribs; proximal fragment of left ulna without olecranon process; left upper 1st premolar; two fragments of molar teeth; two right lower 3rd molar teeth; fragment of an axis vertebra having anterior articular process; distal fragment of right femur with medial condyle; fragment of the acetabulum of the right pelvis; left lunate bone of proximal carpus.
- Br. 18; locus A₁; stratum (5). Andhra Culture. Fragment of the blade of scapula with broken spine; proximal fragment of the left 3rd & 4th metacarpal; three fragments of the thoracic ribs; fragment of left lower 3rd molar,

- Br. 19; locus A₁; stratum (2a). Andhra Culture. Distal fragment of the right humerus with medial condyle.
- Br. 20; locus B₂; stratum (1). Andhra Culture. Right calcaneum; two left astragali one belonging to an young one; lumbar vertebra with transverse process & neural spine; fragment of right ventral arch of atlas vertebra with alar foramen; one distal fragment of the shaft of humerus; one distal end fragment of left humerus with medial condyle; Proximal fragment of 1st phalanx of hind-foot; fragmentary piece of a molar tooth; several fragments of ribs.
- Br. 20; locus B₂; stratum (2). Andhra Culture. Distal fragment of the left humerus with medial and lateral condyle.
- Br. 20; locus B₂; stratum (3). Andhra Culture. Proximal and distal fragments of the 3rd & 4th metacarpal; distal fragment of the shaft of humerus; fragment of a rib; one left astragalus.
- Br. 21; stratum (2b). Andhra Culture. One complete atlas vertebra; right horizontal ramus of lower jaw without teeth; fragment of rib; fragments of the frontal bone with frontal sinuses; fragment of bone with bony horn-core; left molar bone with zygomatic and temporal processes of the skull; right upper 1st molar; right upper 2nd molar; fragment of the 3rd upper premolar of a young one; fragments of molar teeth of young ones; right 3rd & 4th metacarpal bones. The bones were found in layers (2b) & (2a).
- Br. 21; Locus VII—VIII; Stratum (7); One right upper 1st premolar.

The remains of Humped Cattle are very fragmentary here as in the Stone Axe Culture and Megalithic Cultures, discussed above.

The teeth do not show any special peculiarities, and generally resemble those of the recent domestic humped cattle of India.

A better preserved and conspicuous atlas vertebra is shown on Pl. 6. Fig. 4; (maximum width 90 mm.)

The measurements of the limb-bones of well preserved and intact specimens such as those of the 3rd and 4th metacarpals and the astragalus are given in Table 4, along with those from Harappa, Rupar and the modern specimens (also see Pl. 6, Figs. 7 and 8).

TABLE 4.—*Measurements of limb-bones of Bos indicus Linn.*

Item	Greatest length	Proximal diameter	Median diameter	Distal diameter
3rd & 4th metacarpal- Brahmagiri (Br. 21; Str. 2b)	213	56	26	51
Rupar (Bara 1-D.A. 501)	234	62	34	65
Harappa (Cemetery Site H/C)	235	52	32	65
Modern specimen (in the Z.S.I.)	218.5	54	29	50
Astragalus—Brahmagiri (Br. 17; Str. 3)	67	43	37	39
Rupar (RPR 7-1)	72	50	40	46
Harappa (Found F)	75	51	4.35	46

The measurements of the limb-bones resemble the smaller short-horned variety of Harappa (Prashad, 1930, pp. 38-39) which is also the form now met with in India. They also resemble closely the modern domestic Humped Cattle of India.

The other remains also resemble the smaller short-horned variety of the present day, and may be regarded as of the same species.

The skeletal remains also closely resemble those from Mohenjodaro, Harappa, Hastinapura, Maski and Rupar (Nath, unpublished).

As compared with the finds of other animals, the remains of *Bos indicus* have been found in large number. This indicates that the people of the Brahmagiri Andhra Culture used to maintain large herds of this species.

***Bos (Bubalus) bubalis* Linn. (The Indian Domestic Buffalo)**

(Pl. 7, Figs. 1, 3, 4 and 5)

Br. 18; locus A1; stratum (3). Andhra Culture. Head of the right femur of an young one; right astragalus; 3rd phalanx of the fore-limb; medial condyle of the right femur; fragment of the proximal shaft of left humerus with deltoid tuberosity; fragment of a cervical vertebra with ant. articular process and with broken transverse process of the left side; fragment of the trochlea of right femur.

Br. 19; locus A1; stratum (1a). Andhra Culture. Proximal fragment of the right 3rd and 4th metacarpal; proximal fragment of the scapula with glenoid cavity and coracoid process; proximal fragment of the left ulna without olecranon process; fragment of the head of humerus; fragment of the right pelvis with a portion of acetabulum & ischium; 1st phalanx of left fore-foot; coronoid process of the lower jaw.

Br. 20; locus B2; stratum (2). Andhra Culture. Right calcaneum without distal facet for cuboid and with sustentaculum; fragments of ribs; neural arch of the thoracic vertebra; fragment of jaw.

Br. 20; locus B2; stratum (3). Andhra Culture. Left astragalus.

The remains of the domestic buffalo are very fragmentary. Better preserved specimens of limb bones such as the distal fragment of 3rd and 4th metacarpals and the astragalus are shown in Pl. 7, Figs. 1, 3 and 4. Their measurements along with measurements of the Rupar and modern specimens of the domestic buffalo are given in Table 5.

TABLE 5.—Measurements (in mm.) of the distal fragment of the 3rd and 4th metacarpal of *Bos (Bubalus) bubalis* Linn.

3rd and 4th large metacarpal	Maximum distal epiphyseal breadth	Maximum depth of condyles
Brahmagiri (Br. 21)	70	39
Rupar (RPR-132)	70	33
Modern specimen (in the Z.S.I.)	68	34

TABLE 6.—*Measurements of astragalus of Bos (Bubalus) bubalis Linn.*

Astragalus	Lateral length	Median length	Proximal width	Median width	Distal width
Brahmagiri (Br. 20, 3)	82	76	48	46	52
Modern specimen (in the Z.S.I.)	76	76	50	45	47

These fragments show close structural resemblance with those of the modern domestic buffalo present in the collection of the Z.S.I., and also with those from the Brahmagiri Stone Axe Culture and Megalithic Culture discussed above.

A well preserved specimen of a broken calcaneum is shown in on Pl. 7, Fig. 5; maximum length 123 mm.

As compared with the skeletal remains of domestic Humped Cattle (*Bos indicus* Linn.), the remains of domestic buffalo are very few, which indicates that the people probably did not maintain large herds of this animal.

Subfamily (ii) *CAPRINAE*

Ovis vignei Blyth race *domesticus* (The Domestic Sheep)

Br. 18; locus A₁; stratum (1); Andhra Culture. Distal fragment of the shaft of left tibia.

Br. 18; locus A₁; stratum (3); Andhra Culture. Distal fragment of the left tibia; shaft of the right femur without proximal and distal extremities, distal fragment of the right femur with lateral condyle.

Br. 18; locus A₁; stratum (4); Andhra Culture. Fragment of the distal extremity of the left femur with medial condyle; distal fragment of the left humerus; fragment of the left pelvis with a portion of ilium and acetabulum; fragment of the left calcaneum without peroneal facet for astragalus.

Br. 19; locus A₁; stratum (1A); Andhra Culture. Proximal fragment of the right femur of a young one.

Br. 20; locus B₂; stratum (2), depth 4 ft.; Andhra Culture. Proximal fragment of the left femur without the head and trochanter; distal fragment of the right humerus with medial and lateral condyle; fragment of the shaft of radius; fragment of the vertical ramus of right mandible with condyle and without coronoid process; cervical vertebra with neural arch, neural spine, ant. articular process and with a portion of body and transverse process of a young one.

Br. 21 stratum (2b); Andhra Culture. Proximal fragment of the right femur.

These fragments closely resemble those of the Brahmagiri Stone Axe and the Megalithic Cultures, also those from Harappa, Hastinapura, Maski, Saranath, and Rupar and Nagda (Nath, unpublished). They also resemble the modern Indian domesticated race of sheep.

Capra hircus aegagrus Erxleben (The Domestic Goat)

(Pl. 8, Fig. 3)

Br. 19; locus B₁; stratum (1); Andhra Culture. One 1st phalanx of the right fore-foot.

Br. 21; right upper 1st molar of an young one.

Br. 18; locus A₂; stratum 3a. Andhra Culture. One fragment of the left ramus of mandible with 2nd & 3rd molar teeth; one fragment of the left horizontal ramus of mandible with 2nd, 3rd and 4th pre-molars and without body (corpus mandibulae); one fragment of a thoracic vertebra with lamina, neural arch and without neural spine; one fragment of the vertical ramus of left ramus of mandible with the condyle.

As compared with the skeletal remains of domestic sheep the remains of the goat are much fewer. The teeth do not show any specialised peculiarities and generally resemble those of the recent domestic goat. The lower jaw is incomplete but resemble in all respects that of a recent specimen in the Z.S.I.; it is shown in Pl. 8, Fig. 3; maximum length 123.5 mm.; length of tooth-row 68 mm.

No complete bone or skull are available and it is difficult to compare sizes.

These fragments closely resemble the remains from Harappa, Hastinapura, Maski, Sarnath, and Rupar (Nath, unpublished). They also closely resemble the modern Indian domesticated race of goat.

III—SUMMARY

1. This report deals with the collection of animal remains (bones and shells) from the excavations of prehistoric sites at Brahmagiri (Chitradurga district, Mysore State, India), made by the Department of Archaeology of the Government of India, during the field season of the year 1947. The remains belong to three cultural periods, as follows:—

I. *Brahmagiri Stone Axe Culture* (early 1st millennium B.C. to the beginning of the 2nd century B.C., which is further been subdivided into two subcultures e.g., 1A (Early Stone Axe Culture), and 1B (Late Stone Axe Culture).

II. *Brahmagiri Megalithic Culture* (ca. 200 B.C. to the middle of the 1st century A.D.).

III. *Brahmagiri Andhra Culture* (ca. middle of the 1st century to 3rd Century A.D.).

2. The species represented in the various cultures are given below.

Brahmagiri Stone Axe Culture 1A (Earlier): *Equus* sp.; *Bos indicus* Linn.; *Ovis vignei* race *domesticus*; *Lepus nigricollis* Cuvier.

Brahmagiri Stone Axe Culture 1B (Later): *Canis familiaris* Linn.; *Equus asinus* Linn.; *Bos (Bubalus) bubalis*; *Bos indicus* Linn.; *Ovis vignei* race *domesticus*; *Capra hircus aegagrus* Erxl.; *Axis axis* Erxl.; *Sus scrofa cristatus* Wag.

Brahmagiri Megalithic Culture: *Bos indicus* Linn.; *Bos (Bubalus) bubalis* Linn.; *Ovis vignei* Blyth, race *domesticus*; *Capra hircus aegagrus* Erxl. ; and *Gallus* sp.

Brahmagiri Andhra Culture: *Bos indicus* Linn.; *Bos (Bubalus) bubalis* Linn.; *Ovis vignei* Blyth, race *domesticus*; *Capra hircus aegagrus* Erxl.; *Lepus nigricollis* Cuv.; *Pila globosa*.

3. There are two fragments of bones *Bos indicus* in the collection which have definite marks of impact of sharp instruments; this indicates that the inhabitants probably used this species for food. In many cases charred bones have also been found.

4. Except for the Cheetal deer, *Axis axis* Erxl., the remains of the other animals (birds and mammals) excavated at Brahmagiri are those of the domesticated animals maintained by the inhabitants of those periods.

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