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ARCHAEOZOOLOGICAL REMAINS FROM WEST BENGAL, INDIA

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INTRODUCTION

The work – a brief resume on the archaeozoological remains from the State of West Bengal, studied so far, unraveled a marvellous past scenario which may take us retrospectively to the zone of present day Bankura, Birbhum and Purulia, where we may well imagine as a fact, some twenty – thirty thousand years ago, lion with its pride used to slumber under shady trees, after a heavy meal on black buck or nilgai, spotted hyaena chuckled from the bush, before hesitantly approaching a left over carcas; far away by the side of a meandering river, a large buffalo with magnificently curved horns was masticating in the reeds, some where to a little distance, a herd of grazing black buck, suddenly became alert by the presence of an ambushing leopard and galloped away with lightning speed, or in the chilly winter noon, a large gharial, opening its jaws, as if to exhibit the array of innumerable pointed teeth, busked on gravel-filled river bank to warm itself up.

During next twenty thousand years, not only this area, but also other places of the State, which were either arable or situated close to some rivers (for fishing advantage) became inhabited by the Neolithic farmers, who retained their hunting dogs for guarding, but also started keeping some economically important indigenous species; pig, buffalo, fowl etc.

Later, with the entrance to the Chalcolithic and Ferro – Chalcolithic stages the people started keeping more milch and flesh animals and beasts of burden and transport. Besides the indigenous pig, cattle, buffalo and elephant, they very soon acquired the goat, sheep and horse. The camel, probably very occasionally reached the state. However, its remains from Chalcolithic Bharatpur suggest that two thousand fivehundred years ago, the site established a sort of nexus with the far off Western States (Table 1).

In a nut-shell, the present study of animal remains gives us some ideas of the past animal life as well as the initial history of the domesticated animals in the State. However, it is hoped, that with the exploration of rest of the State, specially, the northern districts, the Archaeozoologists would be able to enlighten the readers more about all these unknown facts.

The study on the animal remains not only helps in determining ancient people's inter-species relation, but also in assessing the fauna in space and time, a number of constituent species of which might have disappeared by now (Table 2).

It is known that vegetation and animal life are shaped by environmental factors - climate, soil, altitude etc. and are influenced greatly by any change in these factors. So, correct identification of species in a particular period from a locality or site enable researchers to determine the environment prevalent at the time. Moreover, correct analysis of the remains of different breeds of domesticated animals, throws interesting light on their origin and migration.

Considerable progress has been made on the archaeozoological investigation on the material unearthed from the State of West Bengal, though began only in the early sixties.

The cultural heritage in the State dates back as early as to Palaeolithic phase. From this pebble – tool making stage, with passing of time, gradual development in the life-style of ancient inhabitants, brought forth Neolithic, Chalcolithic and Iron Age cultures at different sites, which ultimately merged with present advanced stage through a brief historical and Mediaeval periods. Invariably, in every phase the people left behind some relics of their own used artifacts as well as some skeletal remains of animals, be it domestic or wild. As already proven, explorations and excavations of these sites would unravel diversified species, some of which are extinct by now and some on which we had no earlier idea. The state largely belongs to the monotonous alluvial plain formed by the Ganga and Brahmaputra on the Bengal Basin (see map). But the northern high altitudinal zone (Darjeeling, Jalpaiguri) of the State, has been formed by the orogenic process and composed of hilly sub-Himalayan ranges. On the other hand, the western section of the State (Bankura, Purulia and parts of Midnapur) is formed of the secondary lateritic deposition on a medley of the ancient Archaean-Proterozoic rocks, Gondwana rocks underlain in places by Neogene sediments. The southern or lower section is consisting of immature deltaic or estuarine sediments of recent to subrecent time. Naturally, these varied landscapes harboured diversified species and with the change in geomorphology and human cultural pattern, the distribution of animals were also influenced from time to time.

However, in this paper, we would restrict our study dealing with the description of Archaeozoological species only, i.e., on remains either recovered from settlement sites or having antiquity not older than Early Hominid culture in the State, that have been strewn in some quarternary rocks. As such, the Permo-Triassic fossils of fish, amphibia and reptiles recovered from Gondwana rocks in this State (Ranigunge, Asansole) from time to time are not included here.

A brief discussion on the species unearthed from the State of West Bengal follows the description of the remains of different species, according to their systematic order. The registration number (if any) and name(s) of the investigator(s) preceded by the collector's name(s) have been given in parenthesis.

MATERIAL AND METHODS

The ancient animal remains are generally retrieved through archaeological excavations (Plate I) from settlement, cemetries and kitchen midden sites. Though infrequently, specimens of archaic importance are also recovered from flood-filled peats or alluvial deposits, either through accidental digging or exposure caused by erosion. However, entombed remains in different sites are generally incomplete and fragile. So, during the process of recovery, even for apparently hard fossils, adequate care is taken lest the specimens get damaged. Very brittle bone fragments are needed to be chemically strengthened by the application of shellac solution (in spirit) or venyl acetate, before, plucking from situe. Detached or dislocated fragments from a bigger specimen, are required to be articulated again with the help of synthetic resins or adhesives to restore the original shape.

In an excavation, the most critical job of the Archaeological, is to label each of the specimens with relevant data *viz.*, site, locus, stratum, depth etc., besides the information about associated archaic objects *viz.*, potterics, coins, tools etc. Antiquity of the remains may be ascertained from the

TABLE 1

The domesticated species of mammals recorded from some early settlement sites in the State of West Bengal

Domesticated Animal	Earliest Record In the State	Possible Centre & Period of Domestication	Remarks
DOG (*Canis familiaris*)	Bhaluksoda (Late pleistocene) Binpur (Neolithic)	Undecided, some held that wolf-like canid was domesticated 10,000 years ago in norhtem Israel & Iraq.	The pariah type of Indian dog is the most ancient domesticated animal in this country. Probably were possessed by the Neolithic aborigines.
PIG (*Sus scrofa cristatus*)	Binpur (Neolithic)	Remains of earliest bred, a small size animal were recovered from Cayonu in the South Anatolia dated 7,000 B.C.	The Indian native pig *S.S. cristatus*, was domesticated during Neolithic phase. Midnapur, Bankura and adjoining zone is the possible centre.
HUMPED CATTLE (*Bos indicus*)	Bhaluksoda (Late pleistocene) Binpur (Neolithic).	Indus Valley & Mesopotamia, both older than 3000 years B.C. are believed to be pioneer in domesticating the large humped cattle.	Occurrence of the remains from Binpur & Bhaluksoda proves that a small breed of humped cattle was already domesticated by the aborigin 5000 years ago.
BUFFALO (*Bubalus bubalis*)	Pandu Rajar Dhibi (Chalcolithic) Mangolkot (Chalcolithic) Kotasur (Chalcolithic)	It was held earlier that Indus Valley (2500 B.C.) might be possible centre of domestication of buffalo.	Present study confirms that domestic buffalos were already deployed by the Chalcolithic farmers of this State 3000 years ago.
GOAT (*Capra hircus aegagrus*)	Pandu Rajar Dhibi (Chalcolithic)	Zagros in between present Iraq and Iran about 7000 B.C.	The remains from Pandu Rajar Dhibi (Chalcolithic) probably belonged to a short size animal.
SHEEP (*Ovis orientalis vignei*)	Bharatpur (Ferro-Chalcolithic)	The zone between Palestine, Lebanon and southern Turkey, about 8000 years ago (Mesolithic).	Very possibly appeared first in this site through traders.
ONE-HUMPED CAMEL (*Camelus dromedarius*)	Bharatpur (Ferro-Chalcolithic)	Somewhere in Arabia, about 5000 years ago.	Reached the site probably through traders.
HORSE (*Equus caballus*)	Kotasur (Chalcolithic) Bhratpur (Ferro-Chalcolithic)	Central Asia & Easten Europe, about 3500 B.C.	The settlement sites of Kotasur and Bharatpur are dated to be 2500 to 2800 years B.P.
ELEPHANT (*Elephas maximus*)	Binpur (Neolithic) Jamtholgore (Meso Neo.)	India, about 5000 years ago.	The elephant was made domesticated by the aborigines of north-east India.

TABLE 2

The list of extinct species from the State of West Bengal (extinct during Pleistocene and Holocene period)

	Species	Locality	Period/Culture	Environment
1.	*Gavialis gangeticus*	Barrackpur	Late Holocene (3500 years)	Warm, moist, proestuarine.
	Gavialis gangeticus	Pandu Rajar Dhibi	Early Historic (2500 years)	Warm, moist, inundated alluvial plain
	Gavialis gangeticus	Saragdih	Late pleistocene (20,000 to 30,000 years)	Warm, humid, river bourn lateritic terrace.
	Gavialis gangeticus	Kansara	Late pleistocene (20,000 to 30,000 years)	Warm, humid, river bourn lateritic terrace
2.	*Panthera* cf. *leo*	Susunia	Late pleistocene (20,000 to 30,000 years)	Warm, humid, open high land with grass land and shrubs.
3.	*Crocuta* sp.	Susunia	Late pleistocene (20,000 to 30,000 years)	Warm, humid, open high land with grass land and shrubs.
4.	*Equus onager khur*	Susunia	Late pleistocene (20,000 to 30,000 years)	Warm, less humid, open high hard soil with patches of grass land.
	Equus onager khur	Babladanga	Middle to late Pleistocene (35,000 to 20,000 years)	Warm, less humid, open high hard soil with patches of grass land.
	Equus onager khur	Hatinal	Pleistocene (20,000 years and above)	Warm, less humid, open high hard soil with patches of grass land.
	Equus onager khur	Baltora	Pleistocene (20,000 years and above)	Warm, less humid, open high hard soil with patches of grass land.
5.	*Giraffa* cf. *camelopurdalis*	Jamthol	Lower Palaeolithic to Mesolithic (15,000 to 20,000 years).	Warm, less humid, with thorny shrubs and trees.
6.	*Boselaphus namadicus*	Pairasol	Late Pleistocene (20,000 to 30,000 years)	Summer hot, humid, winter cold, dry, upland with grass land & shrubs.
	Boselaphus namadicus	Babladanga	Late Pleistocene (20,000 to 30,000 years)	Summer hot, humid, winter cold, dry, upland with grass land & shrubs.
	Boselaphus namadicus	Biribari	Middle Pleistocene (35,000 years)	Summer hot, humid, winter cold, dry, upland with grass land & shrubs.
	Boselaphus namadicus	Dhuliapur	Middle Plesitocene (35,000 years)	Summer hot, humid, winter cold, dry, upland with grass land & shrubs.
7.	*Boselaphus tragocamelus*	Bharatpur	Ferro-Chalcolithic (2200 to 2800 years).	Summer hot, humid, winter cold, dry, upland with grass land & shrubs.
8.	*Bos namadicus*	Susunia	Late Pleistocene (20,000 to 30,000 years)	Warm, humid, tropical rain forest with grass lands.

	Species	Locality	Period/Culture	Environment
	Bos namadicus	Aduri	Middle to Late Plesitocene (15,000 to 20,000 years)	Warm, humid, tropical rain forest with grass lands.
	Bos namadicus	Tentulrakha	Middle to Late Pleistocene (15,000 to 20,000 years)	Warm, humid, tropical rain forest with grass lands.
	Bos namadicus	Biribari	Middle Pleistocene (15,000 years).	Warm, humid, tropical rain forest with grass lands.
	Bos namadicus	Jamthol	Lower Palaeolithic to Mesolithic (15,000 to 20,000 years).	Warm, humid, tropical rain forest with grass lands.
	Bos namadicus	Bharatpur	Holocene (Ferro-Chalcolithic) 2700 years	Warm, humid, tropical rain forest with grass lands.
	Bos namadicus	Mochpol	Late Holocene (Mauryan period) 2600 years	Warm, humid, tropical rain forest with grass lands.
9.	*Bos namadicus bengalensis*	Chandraketugarh	Late Holocene (Mauryan period) 2600 years	Hot, humid, alluvial inundated grass land.
	Bos namadicus bengalensis	Biribari	Middle Pleistocene (35,000 years)	Hot, humid, alluvial inundated grass land.
	Bos namadicus bengalensis	Dhankora	Early Neolithic (5,000 years)	Hot, humid, alluvial inundated grass land.
10.	*Bubalus Palaeindicus*	Saragdih	Late Pleistocene (20,000 to 30,000 years)	Hot, humid, riverine with swampy grass land.
	Bubalus Palaeindicus	Dhankora	Early Neolithic (5,000 years)	Hot, humid, riverine with swampy grass land.
11.	*Hystrix crassidens*	Susunia	Late Pleistocene (20,000 to 30,000 years)	Moderately worm & humid undualated land with bushes & ground vegetations.
	Hystrix crassidens	Babladanga	Middle to Late Pleistocene (35,000 to 20,000 years)	Moderately worm & humid undulated land with bushes & ground vegetations.
12.	*Palaeoloxodon* sp.	Beldanga	Late Pleistocene (20,000 to 30,000 years)	Warm, humid, plains or hills with fresh water vegetation.
	Palaeoloxodon sp.	Kansara	Late Pleistocene (20,000 to 30,000 years)	Warm, humid, plains or hills with fresh water vegetation.

cultural chronology or from the rate of fossilisation and also could be obtained from the age of stratified rock, in case it yields the fossils. Isotopic method for age determination is possible only when the remains are sufficiently old (say older than fifty thousand years) and contains radioactive elements like C-14/Flourien or Lead.

After recovery, the animal remains are categorised by the Zoological according to their groups e.g. mollusca, pisces, mammalia etc. then again sorted out topographically e.g. shells, valves, skulls, horns, antlers, mandibles, vertebrae etc. or portion thereof.

The final and most important task lies in the identification of the species i.e. remains of which animal ? Is it a crab, a turtle, a horse ? More important is to assign the scientific binomial or trinomial zoological nomenclature than to attribute a common name which risks to be a misnomer.

The determination of the age of one individual animal at the time of its death may be ascertained from the condition of teeth eruption, dental, erosion, stage of ossification, development of antlers or horns and number of annual growth rings in the centrum or otoliths in the case of fish.

Similarly, the sexing of the animal may also be possible when specimens exhibit some sex-orienting characters. Generally male animals and their skeletons are larger or stouter than those of the females. Of course, exceptions are there in some species of turtles, aquatic mammals and in rabbit. Almost invariably, the antlers or horns are found to grow in the male deer and antelopes while their females do not bear these. The canines or tusks in the male elephant and boar are generally more robust than those of the females. However, precaution should be taken in dealing with the remains of castrated animal in which the male or secondary sexual characters are not much developed. The obturator foramens in most of the females in mammals are rather roundish and spaceous than those of the males.

Besides the specific identification, status of the animal, whether it belonged to wild or domestic, indigenous or exotic, rare or common species, have been added in the report.

ABBREVIATIONS AND SYMBOLS USED

Arch. surv. = Archaeological Survey of India; Arch. W. B. = Directorate or Archaeology, Govt. of West Bengal; G.S.I. = Geological Survey of India; Z.S.I. = Zoological Survey of India; Univ. Burd. = University of Barddhaman; Univ. Cal. = University of Calcutta; Univ. Delhi = University of Delhi; Gen. = Genus; Sp. = Species; Spp. = More than one species; lt. = Left; rt. = Right; I = Incisor; C = Canine; P = Premolar; M = Molar; Pl. = Plate; Fig. = Figure; (F) = Fossilised; * = Exstinct in West Bengal; ** = Absolutely extinct.

List No. 1 : Some General Characters of the Girdles and Limb Bones in the Mammals for sorting in the Preliminary Stage.

PELVIC GIRDLE : Each half of the girdle comprising of three more or less flat bones i.e.; Ilium, Pubis and Ischium, having a deep socket at their junction.

FEMUR : Long roundish shaft, proximal end with a ball-like head smaller than that of

the convex head of humerus, generally on a neck; distal end with two condyles, separated by a deep groove.

SCAPULA : Flat, roughly triangular often fan-like, with a ridge (spine) along length, proximally with a cavity for accommodation of the head of humerus (glenoid).

HUMERUS : Shaft a little twisted; more or less robust, with comparatively larger head; having ridges with deep fossa at the distal end for articulation with radius and ulna, presence of deltoid ridge.

TIBIA : Shaft proximally more triangular, with relatively flat ridges; distal end claw-like to fit a pulley.

FIBULA : Slender, often flattened, shaft with small relatively flat articulations.

RADIUS : Proximal articulation with two or three hollows, other end complicated with a number of facets, cross-section of shaft 'D' shaped.

ULNA : Shaft distally narrowed but proximally keeled with the large articulating notch before the free end.

METAPODIALS : Proximal end flat but the distal end with two knuckles with central ridge.

PHALANGES : Proximal end with articulating depression, the distal end knuckle-shaped.

SYSTEMATIC DESCRIPTION

Phylum MOLLUSCA
Class GASTROPODA
Order MESOGASTROPODA
Family CYCLOPHORIDAE
Genus ***Cyclophorus*** Montfort, 1810

Cyclophorus sp.
(A Land Snail)

Material : One dry empty shell (Arch. W.B., 1976; M. Ghosh, Z.S.I.) from Jamtholgora.

Family AMPULARIDAE
Genus ***Pila*** Bolten, 1798

Pila globosa (Swainson)
(The Apple-Snail)

Material : Five dry soil-filled shells (Arch. W.B., 1987; M. Ghosh, Z.S.I.) from Mainagar.

Family VIVIPARIDAE
Genus ***Bellamya*** Jousseaume, 1886

Bellamya bengalensis (Lamarck)
(The Common Pond Snail)

Material : Three dry shells (Arch. W.B., 1987; M. Ghosh, Z.S.I.) from Mainagar.

Order NEOGASTROPODA
Family TURBINELLIDAE
Genus ***Turbinella*** Lamarck, 1799

Turbinella pyrum (Linnaeus)
(The Chank-Shell)

Material : Broken columellar folds of the shell (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Phylum ARTHROPODA
Class CRUSTACEA
Order DECAPODA
Family POTAMONIDAE

Undet. fresh water crab.

Material : Fragment of calcified tibia (Arch. W.B. 1985; M. Ghosh, Z.S.I.) from Pandu Rajar Dhibi; Fragment of calcified tibia (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Phylum CHORDATA
Class OSTEICHTHYS
Order CYPRINIFORMES
Family CYPRINIDAE
Genus ***Catla*** Cuvier & Valenciennes, 1844

Catla sp.
(The Katla Fish)

Material : An opercular bone (Arch. W.B. 1985; M. Ghosh, Z.S.I.) from Pandu Rajar Dhibi.

Undet. Carp remains

Material : A number of pleural ribs (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Order SILUROIDEA
Family BAGRIDAE
Genus ***Rita*** Bleeker, 1853

Rita sp.
(The Rita Fish)

Material : One proatlas (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi.

Genus ***Mystus*** Hamilton, 1822

Mystus sp.
(The Aor Fish)

Material : One pectoral spine (Arch. W.B. & S. Banerjee, 1987; M. Ghosh & U. Saha, Z.S.I.) from Boral; Broken lt. pectoral spine (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. Condylar portion of the rt. pectoral spine (Arch. W.B. 1985; M. Ghosh, Z.S.I.) from Pandu Rajar Dhibi.

Order PERCIFORMES
Family ANABANTIDAE
Genus ***Colisa*** Cuvier, 1831

Colisa cf. fasciata (Bloch)
(The Kholisha Fish)

Material : A charred skeleton impressed on the bottom of an earthen pot (Arch. W.B. & S. Banerjee, 1986; M. Ghosh, Z.S.I.) from Boral.

Undet. Telcostean fish

Material : Thirtyseven vertebrae and cranial portion (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur.

Class REPTILIA
Order CROCODILIA
Family GAVIALIDAE
Genus ***Gavialis*** Oppel, 1811

* ***Gavialis gangeticus*** (Gmelin)
(The Gharial)

Material : (F) Posterior portion of mandible with three teeth sockets (G.S.I. Type No. 19144), and three isolated teeth (G.S.I. Type No. 19145) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.S.I.) from Saragdih and Kansara. Post orbital portion of skull (Sp. No. PBQA 1) and three vertebrae (Sp. No. PBQA 2,3,4) (Univ. Cal.; P.K. Sen & M. Banerjee, Univ. Cal) from Barrackpur. A dorsal scute (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi.

Family CROCODILIDAE
Genus ***Crocodylus*** Gmelin, 1789

Crocodylus palustris (Lesson)
(The Marsh-Crocodile)

Material : Three teeth; Fragment of lower jaw (Arch. W.B. 1984; M. Ghosh & U. Saha, Z.S.I.) from Boral.

Crocodylus porosus Schneider
(The Salt-Water Crocodile)

Material : Teeth; Maxilla and Mandible (Arch. W.B. 1984; M. Ghosh & U. Saha, Z.S.I.) from Boral.

Order TESTUDINES
Family TRIONYCHIDAE
Genus ***Lissemys*** Smith, 1931

Lissemys punctata punctata (Bonnaterre)
(The Spotted Flap Shell Turtle)

Material : Fragmentary plastron and carapace (Arch. W.B. 1984; M. Ghosh & U. Saha, Z.S.I.) from Boral. Broken carapace (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Genus ***Chitra*** Gray, 1844

Chitra indica (Gray)
(The Asiatic Soft Shell Turtle)

Material : Three fragmentary pieces of coastal plates of carapace with rib attachment (Sp. Nos. PBQA 5,6,7); One completely preserved coastal plate with rib attachment joint to a single neural plate with few vertebrae; One slightly broken part of the coastal plate of carapace (Sp. No. PBQA 8); A well-preserved carapace (Sp. No. PBQA 9) (Univ. Cal.; P.K. Sen & M. Banerjee, Univ. Cal.) from Barrackpur. Broken carapace and plastron (Arch. W.B. 1984; M. Ghosh & U. Saha, Z.S.I.) from Boral. Fragmentary plastron (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Genus ***Trionyx*** Geoffrey, 1809

Trionyx gangeticus Cuvier
(The Ganges Soft Shell Turtle)

Material : Fragment of carapace and plastron (Arch. W.B. 1986; M. Ghosh & U. Saha, Z.S.I.) from Bhaluksoda. Fragment of plastron (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. One broken hypoplastron; One Femur (Arch. W.B. 1983; K.D. Saha & others, Z.S.I.) from Boral. Fragment of carapace (Arch. Surv. 1975; S. Banerjee & others, Z.S.I.) from Tamluk.

Family TESTUDINIDAE
Genus ***Batagur*** Gray, 1855

Batagur baska Gray
(The Common Batagur Turtle)

Material : (F) Portion of scapula (G.S.I. Type No. 19146), one epiplastron (G.S.I. Type No. 19147) and some isolated fragments of plastron (G.S.I. Type No. 19148) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.S.I.) some unregistered carapace and limb bones from Biribari, Saragdih and Kansara. Seven fragments of plastron (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Order CHELONIA
Family EMYDIDAE
Genus ***Hardella*** Gray, 1870

Hardella thurji Gray
(The Brahminy River Turtle)

Material : A complete plastron (Arch. W.B. & S. Banerjee, 1984; M. Ghosh & U. Saha, Z.S.I.) from Boral.

Family CHELONIDAE
Genus ***Lepidochelys*** Fitzinger, 1843

Lepidochelys olivacea (Eschscholbz)
(The Olive Ridley Turtle)

Material : Lower jaw and carapace (Arch. W.B. & S. Banerjee, 1984 : M. Ghosh & U. Saha, Z.S.I.) from Boral.

Class AVES
Order GALLIFORMES
Family PHASIANIDAE
Genus ***Gallus*** Rafinesque, 1815

Gallus gallus murghi Robinson & Kloss
(The Indian Red Jungle Fowl)

Material : Distal end of humerus (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Fragment of humerus, broken shaft of tibia and distal phalanx (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. Broken shaft of femur, distal condylar bone of lt. Tibia, charred broken oblique process of sternal bone, broken coronoid bone and broken scapula (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi.

Order COLUMBIFORMES
Family COLUMBIDAE
Genus ***Columba*** Linnaeus, 1758

Columba sp.
(The Pigeon)

Material : Broken shaft of tibia (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot.

Class MAMMALIA
Order CARNIVORA
Family FELIDAE
Genus ***Felis*** Linnaeus, 1758

Felis chaus Guldenstaedt
(The Jungle Cat)

Material : One canine tooth and fragment of rt. femur with head (Arch. Surv. 1964; B. Nath & M. Ghosh, Z.S.I.) from Mahisdal.

Genus ***Panthera*** Oken, 1816

* ***Panthera cf. leo*** (Linnaeus)
(The Lion)

Material : (F) Portion of rt. mandibular ramus with P4 and M1 (No. 18710) (Arch. W.B.; A.K. Dutta, Z.S.I.) from Susunia.

Panthera pardus Linnaeus
(The Leopard)

Material : (F) A fragment of mandible with the carnassial (K.D. Saha & party, 1984; K.D. Saha & others, Z.S.I.) from Jhirkoria (Susunia).

Family CANIDAE

Genus ***Canis*** Linnaeus, 1758

Canis aurius indicus Linnaeus
(The Jackal)

Material : Occipital portion of skull with condyles, upper lt. canine and 5th metatarsal of lt. pes (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. A skull, rt. humerus, rt. & lt. femur, lt. tibia and pelvis (Arch. W.B. 1984; K.D. Saha & others, Z.S.I.) from Boral.

Canis lupus pallipes Linnaeus
(The Wolf)

Material : One canine and one claw (Arch. Surv. 1964; B. Nath & M. Ghosh, Z.S.I.) from Mahisdal.

Canis familiaris Linnaeus
(The Paráiah Dog)

Material : Broken vertebra, rt. tibia and shaft of radius used as a scraper (Arch. W.B.; M. Ghosh & U. Saha, Z.S.I.) from Bhaluksoda. rt. mandible of young one, cervical vertebra, thoracic vertebra and lt. tibia (Arch. W.B.; M. Ghosh & U. Saha, Z.S.I.) from Jamtholgora. Isolated canine, premolars and molars (Arch. W.B.; M. Ghosh, Z.S.I.) from Binpur. Fragment of ulna (Arch. Surv. 1971; S. Banerjee, Z.S.I.) from Bharatpur.

Family HYAENIDAE

Genus ***Crocuta*** Kaup, 1828.

* ***Crocuta*** sp.
(The Spotted Hyaena)

Material : (F) Portion of lt. mandibular ramus with molar and three premolars (Paschim Banga Paribrajak Samity; A.K. Dutta, G.S.I.). from Susunia.

Order PERISSODACTYLA
Family EQUIDAE
Genus ***Equus*** Linnaeus, 1758

* ***Equus onager khur*** Lesson
(The Asiatic Wild Ass)

Material : (F) Isolated upper and lower molars (Nos. 19122-19141), one hoof (No. 19143) and distal part of one metatarsal (No. 19142) (Arch. W.B. & G.S.I.; D.C. Dassarma & others, G.S.I.) from Hatinal, Baltora, Gogra, Kansara and Babladanga. Upper rt. M2, broken lt. mandible with P2 - P4 and M1 - M3 (Z.S.I., 1969 & 1982; M. Ghosh & others, Z.S.I.) from Dhankora.

Equus caballus Linnaeus
(The Horse)

Material : Fragments of tibiae and metatarsal (Arch. Surv. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Third phalanx (Arch. Surv. 1975; S. Banerjee, Z.S.I.) from Tamluk. Almost entire skeletal remains (Z.S.I. 1984; M. Ghosh, Z.S.I.) from Gayeshpur. Lower rt. premolar (P. K. Panda & S. Pal. 1982; M. Ghosh & others, Z.S.I.) from Kotasur.

Family RHINOCEROTIDAE
Genus ***Rhinoceros*** Linnaeus, 1966

Rhinoceros unicornis Linnaeus
(The One-Horned Rhinoceros)

Material : (F) Broken lower jaw with teeth, thoracic vertebra, fragment of rib, astragalus, cuneiform, fragment of radius and sternal bone (N.C. Das, 1990; M. Ghosh & others, Z.S.I.) from Sonarpur.

Order ARTIODACTYLA
Family SUIDAE
Genus ***Sus*** Linnaeus, 1758

Sus scrofa Linnaeus
(The Wild Boar)

Material : (F) Lower last molar (No. 19106), lower second molar (No. 19107), lower last premolar (No. 19108) and broken lower canine (No. 19109) (Arch. W.B. & G.S.I. 1960; Dassarma & others, G.S.I.) from Kansara.

Sus scrofa cristatus Wagner
(The Indian Pig)

Material : Damaged upper 2nd molar of young one (Arch. W.B., 1984; M. Ghosh, Z.S.I.) from Binpur. (F) Broken lower jaw with teeth, rt. maxillary portion with teeth and fragment of frontal bone

(Arch. W.B. ; M. Ghosh & U. Saha, Z.S.I.) from Jamtholgora. Broken limb bones and teeth (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Fragment of rt. mandible with P4, apical portion of lt. canine, broken lower rt. canine, fragmentary scapula and lt. humerus (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. Fragment of lt. mandible with M3, damaged body of mandible with incisors, broken zygomatic arch, fragment of rt. maxilla with P3 & P4, fragment of frontal bone with supra orbital foramen and 4th metatarsal (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. Ramus of rt. mandible, isolated teeth, fragments of metatarsal and metacarpals, broken limb bones (Arch. Surv. 1975; S. Banerjee & M. Ghosh, Z.S.I.) from Tamluk. Broken rt. mandible with teeth (P.K. Panda & S. Pal, 1982; M. Ghosh & others, Z.S.I.) from Kotasur.

Family CERVIDAE

Genus *Axis* Smith, 1827

Axis axis Erexleben
(The Spotted Deer)

Material : Four isolated molars, two belonging to the upper and two belonging to the lower jaw (Arch. W.B. & G.S.I. 1960 : D.C. Dassarma & others, G.S.I.) from Tentulrakha. Distal end portion of rt. tibia, proximal end portion of rt. metacarpal (Arch. W.B.; M. Ghosh, Z.S.I.) from Biribari. Broken piece of lt. mandible, fragment of lt. scapula (Arch. W.B.; M. Ghosh & U. Saha, Z.S.I.) from Dhuliapur. Fragmentary antler, tibia and metatarsal (Arch. Surv. & Univ. Cal. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Four fragments of antler (Arch. Surv. 1964; B. Nath & M. Ghosh, Z.S.I.) from Mahisdal. Antler and lower jaw (Arch. W.B. & S. Banerjee, 1984, 1984; K.D. Saha, Z.S.I.) from Boral. Fragment of antler (Arch. Surv. 1975; S. Banerjee & others, Z.S.I.) from Tamluk.

Axis porcinus Zimmerman
(The Hog Deer)

Material : Apical portion of lt. antler, erupting antler with pedicel of lt. side, a broken tine, broken right mandible with P1 – dP3 and M1, rt. humerus, broken lt. calcaneum and 2nd phalanx (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. Disc of thoracic vertebra, glenoid portion of scapula, two fragmentary rib, portion of rt. maxilla with M2 (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi.

Genus *Cervus* Linnaeus, 1758

Cervus duvauceli Cuvier
(The Swamp Deer)

Material : (F) Three incomplete horn core (Nos. 19083-85), part of a lt. mandible (No. 19086) many isolated molar (No. 19087) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.S.I.) from Babladanga, Saragdih and Beldiha. Four phalanges and two calcanei (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Fragmentary antlers (Arch. Surv. 1964; B. Nath & M. Ghosh, Z.S.I.) from Mahisdal. Distal fragment of lt. radius, with ulnar bone a fragment of metatarsal (Univ.

Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. charred piece of mandible, distal fragment of rt. tibia and rib (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. Upper lt. M2 and M3 (Arch. Surv. 1975; S. Banerjee & Others, Z.S.I.) from Tamluk. Antlers, teeth and limb bones (Arch. W.B. & S. Banerjee; M. Ghosh, K.D. Saha & others, Z.S.I.) from Boral.

Cervus unicolor Kerr.
(The Sambar)

Material : (F) Isolated upper molar (No. 19088), one lower molar (No. 19089) and one upper premolar (No. 19090) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.S.I.) from Saragdih, Babladanga and Gogra. (F) One shaft of rt. tibia, olecranon process with ulnar shaft, rt. astragalus of young one, lt. scapho-cuboid and damaged shaft of metatarsal (Arch. W.B. 1986; M. Ghosh & U. Saha, Z.S.I.) from Bhaluksoda. Fragmentary antler (Arch. Surv. 1964; B. Nath & M. Ghosh, Z.S.I.) from Mahisdal.

Genus ***Muntiacus*** Rafinesque, 1815

Muntiacus muntjak Zimmermann
(The Barking Deer)

Material : (F) Two isolated upper cheek teeth and part of maxilla showing M1 and M2 (Arch. W.B. & G.S.I. 1960; Dassarma & others, G.S.I.) from Tentulrakha. (F) A shaft of tibia and ulnar bone with broken notch (Arch. W.B. 1986; M. Ghosh & U. Saha, Z.S.I.) from Bhaluksoda. Fragmentary rt. calcaneum and a proximal portion of rt. radius (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur.

Family BOVIDAE

Genus ***Bos*** Linnaeus, 1758

Bos indicus Linnaeus
(The Humped Cattle)

Material : Broken ramus of jaw with 1st to 3rd premolar and 1st, 2nd molar; fragment of rt. metatarsal (Arch. W.B. 1986; M. Ghosh & U. Saha, Z.S.I.) from Bhaluksoda. Upper and lower lt. premolar and upper lt. molar (Arch. W.B. 1981; M. Ghosh, Z.S.I.) from Binpur. Broken vertebrae, limb bones and phalanges (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Fragmentary ribs, shaft of humerus of young one, condylar portion of humerus, fragment of radius and head of femur (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. Broken 3rd thoracic rib, upper lt. 2nd molars, upper rt. 3rd molar, shaft bone of lt. metatarsal, distal end of metatarsal and condylar fragment of lt. humerus (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. Mandibles, isolated teeth, vertebrae and limb bones (Arch. Surv. 1975; S. Banerjee & others, Z.S.I.) from Tamluk. Mandibles with teeth and broken limb bones (P. K. Panda & S. Pal, 1982; M. Ghosh & others, Z.S.I.) from Kotasur, Mandibles and broken skulls besides a number of limb bones (Arch. W.B. & S. Banerjee, 1983-85; M. Ghosh, K.D. Saha & others, Z.S.I.) from Boral.

Bos qaurus H. Smith
(The Indian Bison)

Material : Fragmentary lt. femur and a 3rd phalanx (Arch. W.B. & S. Banerjee, 1986; K.D. Saha & others, Z.S.I.) from Boral. Fragmentary atlas, broken lt. humerus and fragmentary head of femur (Univ. Delh. 1981; M. Ghosh & others, Z.S.I.) from Bahiri.

** ***Bos cf. namadicus*** Falconer
(The Extinct Siwalik Cattle)

Material : (F) lt. ramus of mandible with 1st, 2nd and 3rd molar (Arch. W.B. 1969; S. Banerjee & U. Saha, Z.S.I.) from Susunia. Lt. 2nd and 3rd molar (Arch. W.B. 1973; S. Banerjee, Z. S.I.) from Mochpal. Cervical vertebra, fragments of rib, fragment of ulna, rt. calcaneum, rt. astragalus, 1st phalanx (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. (F) Part of skull (No. 19058), rt. horn core, lt. horn core broken from base, isolated and broken piece of horn core (Arch. W.B. & G.S.I. 1960; Dassarma & others, G.S.I.) from Tentulrakha.

** ***Bos namadicus bengalensis*** Ghosh
(The Extinct Bengal Cattle)

Material : Lower rt. 2nd molar Chandraketugarh. (F) Three isolated molar (Arch. W.B. 1986; M. Ghosh, Z.S.I.) from Biribari. Upper rt. 2nd molar (Arch. W.B. 1987; M. Ghosh & U. Saha, Z.S.I.) from Dhankora.

Genus ***Bubalus*** Smith, 1827

Bubalus bubalis (Linnaeus)
(The Wild Buffalo)

Material : (F) Broken skull with massive horn core, complete lt. radius (Arch. W.B. 1987; M. Ghosh, Z.S.I.) from Dhuliapur. Lower lt. molar, upper lt. 2nd molar and upper 2nd premolar (Arch. W.B. 1988; M. Ghosh, Z.S.I.) from Kattara. (F) Skull with horns, vertebrae and limb bones (B. Mallik, 1989; S. Biswas & others, Z.S.I.) from Maslandpur. Fragments of mandible and isolated teeth (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Nasal bone, upper rt. 2nd premolar, broken 1st phalanx (Univ. Cal. 1988; M. Ghosh, Z.S.I.) from Mangolkot. Upper 1st molar, damaged upper 3rd molar, fragmentary rib, broken scapula (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. Upper lt. 2nd molar, (P.K. Panda & S. Pal, 1982; M. Ghosh, Z.S.I.) from Kotasur. Broken mandibles, isolated teeth, vertebrae and limb bones (Arch. W.B. & S. Banerjee, 1984-85; M. Ghosh, K.D. Saha & others, Z.S.I.) from Boral. Lower jaw with teeth, vertebrae and broken limb bones (A. Sardar, 1985; M. Ghosh, Z.S.I.) from Canning.

** ***Bubalus palaeindicus*** (Falconer & Cautley)
(The Extinct Siwalik Buffalo)

Material : (F) Part of a skull with horn cores completely broken (G.S.I. Type No. 19059) Arch. W.B. & G.S.I.; D.C. Dassarma, Z.S.I.) from Saragdih, lt. mandible with P1-P2 and broken M2-M3 (Z.S.I. Colln.; M. Ghosh & others, Z.S.I.) from Dhankora.

Genus ***Miotragoceros*** Stromer, 1928

** ***Miotragoceros cf. punjabicus*** (Pilgrim)
(The Extinct Siwalik Antilope)

Material : (F) A fragment of lt. ramus of mandible with P3 and M1-M3 (Arch. W.B. 1969; S. Banerjee & others, Z.S.I.) from Aduri, Susunia.

Genus ***Boselaphus*** de Blainville, 1816

** ***Boselaphus namadicus*** (Rutimeyer)
(The Extinct Siwalik Nilgai)

Material : (F) A solitary rt. horn core with a part of frontal bone (No. 19068) (Arch. W.B. & G.S.I. 1960; Dassarma & others, G.S.I.) from Biribari.

Boselaphus sp.
(The Nilgai)

Material : (F) Part of rt. mandible with M2 and M3 (No. 19069), two isolated molar M2 (No. 19070), lt. maxilla (No. 19071), two lower premolars (No. 19072) and part of femur (No. 19073) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.SI.) from Biribari, Babladanga and Pairasol. (F) Fragmentary limb bones and lower jaw (Arch. W.B. 1987; M. Ghosh, Z.S.I.) from Dhuliapur.

* ***Boselaphus tragocamelus*** Pallas
(The Nilgai)

Material : Isolated teeth, vertebrae and fragment of limb bones (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur.

Genus ***Antilope*** Pallas, 1766

Antilope cervicapra Linnaeus
(The Black Buck)

Material : (F) Numerous horn cores (Nos. 19076 & 19077), isolated teeth and and more or less complete mandibles (Nos. 19079 & 19080), and maxilla (No. 19078), broken skulls, one of these with portions of parietal and orbital, left horn core, lt. orbit, lt. maxilla with dentition. (No. 19074), another with maxillae, palate and vomer. One metatarsas (No. 19081) and one metatarsus (No. 19082). (Arch. W.B. & G.S.I. 1960; D. C. Dassarma & others, G.S.I.) from Pairasol. (F) Fragment of jaw with M3 (Arch. W.B. 1986; M. Ghosh & U. Saha, Z.S.I.) from Dhuliapur. (F) Fragment of maxilla with 1st - 3rd molar, fragment of rt. maxilla with 1st and 2nd molar, fragment of lt. mandible with broken 1st and 2nd molar, fragment of lt. mandible with 1st molar and condylar portion of rt. mandible (Arch. W.B. 1987; M. Ghosh & U. Saha, Z.S.I.) from Beldanga. (F) Numerous broken maxillae and mandible with teeth, broken horn cores and limb bones (Z.S.I. 1970-84; S. Banerjee & others, Z.S.I.) from Susunia.

Genus ***Capra*** Linnaeus, 1758

Capra hircus aegagrus Linnaeus
(The Domestic Goat)

Material : Fragment of mandible with teeth, proximal end of scapula and fragment of illium (Arch. Surv. & Univ. Burd. 1971; S. Banerjee, Z.S.I.) from Bharatpur. Fragments of horns and isolated teeth (Arch. Surv. 1964; B. Nath & M. Ghosh, Z.S.I.) from Mahisdal. Broken olecranon process and shaft of rt. humerus (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. Mandibles with teeth, humerus, fragmentary limb bones and pelvic girdles (Arch. Surv. 1975; S. Banerjee & others, Z.S.I.) from Tamluk.

Genus ***Ovis*** Linnaeus, 1758

Ovis orientalis vignei Blyth
(The Domestic Sheep)

Material : Two distal fragment of lt. humerus and isolated M3 (Arch. Surv. 1971; S. Banerjee, Z.S.I.) from Bharatpur.

Family CAMELIDAE

Genus ***Camelus*** Linnaeus, 1758

Camelus dromedarius Linnaeus
(The One-Humped Camel)

Material : One upper 1st molar (Arch. Surv. 1971; S. Banerjee, Z.S.I.) from Bharatpur.

Family GIRAFFIDAE

Genus ***Giraffa*** Brisson, 1762

* ***Giraffa cf. camelopardalis*** Brisson
(The Giraffe)

Material : Broken shaft of lt. tibia, broken distal end of rt. tibia (Arch. W.B. 1969; S. Banerjee & M. Ghosh, Z.S.I.) from Jamthol, Susunia.

Order RODENTIA

Family MURIDAE

Genus ***Rattus*** Gray, 1821

Rattus rattus Linnaeus
(The Common Rat)

Material : Lower jaw with teeth and isolated upper incisor (Univ. Cal. 1988; M. Ghosh; Z.S.I.) from Mangolkot. Lower incisor (Arch. W.B. 1985; M. Ghosh & U. Saha, Z.S.I.) from Pandu Rajar Dhibi. lt. humerus (Arch. Surv. 1975; S. Banerjee & others, Z.S.I.) from Tamluk.

Family HYSTRICIDAE

Genus ***Hystrix*** Linnaeus, 1758

** ***Hystrix crassidens*** Ledekker
(The Extinct Porcupine)

Material : (F) Two upper teeth series (Nos. 19110 & 19111) and one upper incisor (No. 19112) with parts of maxilla, two lower teeth series (No. 19113) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.S.I.) from Babladanga, Gogra and Susunia.

Hystrix indica Kerr
(The Indian Porcupine)

Material : Apical portion of a quil (Arch. W.B. 1983; M. Ghosh, Z.S.I.) from Laljol Cave, Binpur.

Order PROBOSCIDEA

Family ELEPHANTIDAE

Genus ***Elephas*** Linnaeus, 1758

Elephas maximus Linnaeus
(The Indian Elephant)

Material : (F) Lamellar portion of molar (Arch. W.B. 1987; M. Ghosh, Z.S.I.) from Jamtholgora. Fragmentary molar (Arch. W.B. 1983; M. Ghosh, Z.S.I.) from Binpur. Distal end of rt. humerus (D.K. Maitey, 1981; M. Ghosh, Z.S.I.) from Gazitola, Debalaya. Fragmentary femur and tibia (Farakka Barrage Authority, 1974; S. Banerjee & M. Ghosh, Z.S.I.) from Farakka. Broken molar (P.K. Panda & S. Pal, 1982; M. Ghosh & others, Z.S.I.) from Kotasur. Proximal end of lt. radius (Arch. Surv. 1975; S. Banerjee & others, Z.S.I.) from Tamluk. Fragments of molar (Arch. W.B. 1984; K.D. Saha & others, Z.S.I.) from Boral.

Genus ***Loxodonta*** Cuvier, 1827

Subgenus ***Palaeoloxodon*** Matsumoto, 1924

** ***Palaeoloxodon*** sp.
(The Extinct Siwalik Elephant)

Material : (F) Upper lt. 3rd molar (No. 19115), lower rt 3rd molar (No. 19117), fragment of upper rt. 3rd molar (No. 19116) and lower lt. 3rd molar (No. 19118). A big tusk (No. 19121), 1st phalanx of fore limb (No. 19120) (Arch. W.B. & G.S.I. 1960; D.C. Dassarma & others, G.S.I.) from Beldanga and Kansara.

DISCUSSION

The molluscan remains from the State belong to the extant species of gastropod. The fresh water *Bellamya bengalensis*, locally known as gugli and used in dietary purpose by the aborigines and rural

people, occurs throughout the subcontinent. It is prolific in the ponds, lakes and streams. Some characters of the shell are : shell moderately large, top-shaped or turbinated, spire prominent, body whorl not very large when compared with the spire. The *Pila globosa*, commonly known as Apple-Snail and locally jal-samuk is also very common and edible. It occurs in Maharastra, Uttar Pradesh, Madhya Pradesh, Bihar, Orissa, West Bengal and Assam but not recorded from Punjab or Himachal Pradesh. Some characters of the shell are : shell considerably large, globose, body whorl very large, spire considerably small. The terrestrial or land gastropod *Cyclophorus* sp. is widely distributed in India and very common in moist, shady places. Some characters of the shell are : shell larger in size, inner lip and outer lips of the aperture strongly thickened and reflected, foot broad and not grooved. The marine *Turbinella pyrum*, commonly known as Chank-Shell and locally shankho is deemed to be sacred by the Hindus. These shells have long been used in blowing as horn during religious rites, for medicinal purposes and also in fashioning as ornaments. The species abounds in the shallow coastal waters of Tuticorin, Rameswaram, Sri Lanka, Gulf of Mannar, Palk Bay, Gulf of Kutch and Andaman & Nicobar groups of islands. Some characters of the shell are : shell large, thick, pear-shaped, covered with dark brownish heavy periostracum, spire elevated, body whorl large, inflated, slightly angulated, anterior canal equal to the height of a spire, operculam horny, narrow and elongated.

The fragmentary tibial portions, supposed to be of the fresh-water crabs, are hollowed inside and made of hard chitinised cuticle and unlike molluscan shell was not acted upon by the dilute inorganic acid. The decapods possess uniramous body appendages and five pairs of walking legs. A number of species of fresh water crabs have been widely distributed in ponds, lakes and streams in the tropical subcontinent.

The reported fish bones from the State belong to the fresh-water osteichthys groups and represent mainly the Indian major carps like *Labeo rohita*, commonly known as rohu, *Catla catla*, commonly known as katla and a few bagrid cat fishes e.g., *Mystus* sp. and *Rita* sp. It is noteworthy, that the remains from Pandu Rajar Dhibi were of very large size carps and probably caught from the rivers like Ajoy and its tributaries. A charred impression of a fish (Pl.II, Fig.2), resembling *Colisa* sp., commonly known as kholisa, was found at the bottom of one earthen pot unearthed from Mediaeval Boral. All these fishes are common and extensively distributed in North India. The fish bones are generally characterised by having irregular, flat shapes and rough texture. The vertebrae which are common-sight occurrence in the archaeological sites, are amphicoelous, constricted at the middle and bear dorsal neural spines and paired parapophysis. The caudal vertebrae bear the hemal spine below. The branchiostegal arches resemble the ribs of mammal but are generally delicate and have a groove along the outer length. The dorsal and pectoral spines in the cat fishes are very strong bones and frequently unearthed in the excavations. These are dagger-like, little curved, pointed and often serrated posteriorly. The flat portions of the spines are tuberculated in the *Rita* sp. and striated in the *Mystus* sp. The opercular bones are trigonal (Pl.II, Fig.1), little convex or flat in shape and possess a notch proximally. The ribs, when present, specially the thoracic ribs, are well-curved, slender pointed and those in the carps show distinct narrow sulcation along their length.

The reptilian remains (Pls.III & IV) from the State are quite rich. These belong to two species of crocodiles, one of gharial, five of fresh water and one of marine turtles. Though, all the species are

still extant, their number and distributional areas have been greatly reduced and shrunken. Specially, the gharial is no more found in the State. It is noteworthy, that the reptilian remains have been recorded only from those sites which were situated within the proximity of present or ancient rivers. The mediaeval Boral, situated in the proximity of Sunderbans and through which the ancient Bhagirathi used to flow, yielded three species of river turtles, one of marine, two crocodilian species, one of the marsh and the other of salt. The gharial, in the form of semi-fossilised remains, have been recovered from Barrackpur (in close proximity to the river Hooghly) and from Baltora formations of Bankura (within the proximity of river Damodar & its tributaries). A scute of this species was also identified from the remains recovered from Pandu Rajar Dhibi near the river Ajoy. The remains of turtles are mostly fragments of either carapace or plastron (Pl.III,Fig.6-9). These structures are composed of bony plates which protect the animals dorso-ventrally. The cornified upper scutes on the carapace are generally destroyed in the soil action. The bony plates are flat or little convex and having prominent impressions of sutures. The geometrical shapes, number of plates and species-specific orientations help diagnosing the species. The jaws or maxillae of present day turtles do not bear teeth but possess sharp-edged hornified beak for cutting. The palatal bones are united, ossified and appears to be a solid structure. The union of prootic and opisthotic bones have been fused broadly with the quadrate and squamosal. The external nostrils have a common bony opening.

The bird remains from the State are scanty and belong to the jungle fowl and pigeon. Of course, the remains of fowl from Chalcolithic phase of Bharatpur (in Barddhaman) may belong to the semi-domesticated birds. The bird remains were recovered from the settlement sites, so they are assumed to be dietary relics. The native colourful domestic cock probably originated from the jungle fowl-its direct ancestral form and the domestication was likely brought about by the aborigines of eastern India in Neolithic period. The bird bones are generally delicate, light but strong and having comparative thin compact bony wall. The skull is having a large roundish brain case, single occipital condyle and large orbits. The cranium is without any suture. The vertebrae are characterised by having a saddle-shaped ends. The ribs possess a side branch or projection that abuts the rib behind. The sternum is vertically flat and very much expanded to accommodate the flight muscles. The coracoid of the girdle bone, unlike the mammalian, is very prominent. The ulna is comparatively stouter than the radius. The pelvic girdle in bird is a large bone, having a long ilium that fuses with the sacrum but the two pubis never unite as is found in the mammals. The femur is short but robust. The tarso-metatarsus in the hind legs are characterised by having three pulley-like articulating condyles.

The mammalian remains from the State of West Bengal belong mostly to the domesticated animals. However, some natural species and a few of comparatively very old chronology have also been unearthed from some typical zones (See Table No.1). Some of these species show interestingly an affinity with the present day Ethiopean fauna. The *Panthera leo, P. pardus, Crocuta* sp. and *Giraffa cf. camelopardalis* unearthed as fossilised remains from Bankura are estimated to be Late Pleistocene. Out of these, the *Crocuta* sp., commonly known as spotted hyaena and *Giraffa camelopardalis*, the giraffe were extinct in this subcontinent long back along with the Siwalik mammals in Northern India. Surprisingly, these species, though evolved and became extinct in this country, have succeeded to continue their existence through migration to and adaptation in Africa. On the contrary, the stripped hyaena, *Hyaena hyaena*, reciprocated this phenomena through a reverse migration from Africa to India.

Among the other extinct species, worth mentioning are the *Equus onager khur. Bos namadicus* (or rather *Bos namadicus bengalensis*), *Bubalus palaeindicus, Boselaphus namadicus, Miotraqocerus cf. punjabicus* (Pl.VII, Fig.33), *Hystrix crassidense* and *Palaeoloxodon* sp. (or rather *Elephas namadicus*). Fossilised remains of these species were unearthed from the quarternary deposits within the zone of Bankura, Purulia and Midnapur. It appears that a Holocene population of the extinct Siwalik Cattle, *Bos namadicus* Falconer, some how, could manage to thrive in the alluvial plains of West Bengal. This species, though derived from the Upper Pleistocene progenitor, *Bos namadicus*, exceeded the former in body proportions and dental measurements and have been grouped under the subspecies *Bos namadicus bengalensis* Ghosh (1977), of the former. The nomenclature of the extinct Pleistocene elephant from Bankura reported by Dassarma *et. al.* (1982), may more correctly be equated with *Elephas namadicus* in the line of a recent work by Tripathy & Basu (1983).

The remains of wild and natural species, which presently have very vulnerable status in the State are comprising *Rhinoceros unicornis* (Pl.VII, Fig.29), *Cervus duvauceli* (Fig.17 & 21), *Axis porcinus* (Fig.19, 20 & 22), *Bos qaurus*, *Bubalus bubalis* (wild) (Fig.23,24 & 27) and *Antilope cervicapra* (Fig.30, 31). The *Boselaphus tragocamelus*, commonly known as Nilgai, in all probability became extinct from the State only in the last century of the pre-Christian era. Fossil remains of Nilgai and Black Buck (*Antilope cervicapra*) (Pl.VII, Figs.30 & 31) from the quarternary deposits in the South-western districts of the State attest that out of the surviving four Asiatic species of antelopes, the ancestors of atleast these two species used to haunt the scrub jungles of Bankura and Birbhum, twenty to thirty thousand years ago. The only remains of *Rhinoceros unicornis*, the Great One-Horned Rhino, recently unearthed from Sonarpur, testify that the distribution of this species was extended up to the southern West Bengal from where it disappeared very recently. Of course, past occurrence of the *Rhinoceros sondaicus*, the Lesser One-Horned Rhino from Lower Bengal has been well recorded and representative skulls and skeletons are preserved the departmental repository.

The domesticated species of mammals from the State as represented by the bone remains from archaeological sites (see Table No.2), cover *Canis familiaris* (The Pariah Dog), *Sus scrofa cristatus* (The Pig), *Bos indicus* (The Humped Cattle), *Bubalus bubalis* (The Buffalo), *Capra hircus aegagrus* (The Goat), *Ovis orientalis vignei* (The Sheep), *Equus caballus* (The Horse) and *Camelus dromedarius* (The One-Humped Camel).

It is definite that horse, camel, goat and sheep were not indigenously domesticated in the State. These were rather introduced slowly from the western countries. The horse was domesticated as a draft or transport animal in central Asia and East Europe about 3500 B.C. ago. However, the remains unearthed from Chalcolithic Bharatpur and Kotasur testify that the animal reached the area of present Barddhaman and Birbhum as early as first millennium B.C. The remains of horse from Gayeshpur are not much old and very likely belong to the same individual, a heavy-built dobbin type breed. The camel, so called ship of the desert was domesticated in southern Arabia about 3000 B.C. ago. This riding cum draft animal was indispensable to the Arab traders and West Asiatic nomads in their journey from place to place across the hot dry desert. Of course, very shortly the people of Rajasthan and Gujarat in India, learnt the domestication and deployed the animal in carriage and transport. However, the remains of camel from Iron Age phase of Bharatpur suggest that the animal reached the

area about 200 years B.C. ago, either directly through the Arabian merchants or via the traders of the aforesaid provinces.

The sheep and goats were domesticated about nine thousand years ago from the ancestral mountain-living wild species of Asia Minor and Kashmir. However, from the remains of goat unearthed from the State, it appears that a breed with short stature had been maintained by the farmers since 2500 years B.P.

The remains of pig, buffalo and elephant from the State, specially from sites older than one millennium B.C. are comprising both wild and domesticated animals. It is definite that the domesticated stock of these animals inherited their ancestry to the indigenous wild species. For example, it is observed that the piglings of domesticated pigs, specially in the area of Midnapur, Burdwan and South 24-Parganas very often show the characteristic pelage and horizontal stripes similar to those of the wild youngs. Actually, excepting more robust dentition, bit slender and longer limb bones, the wild animals that haunting in the neighbouring jungles are indistinguishable from those of the local breeds. The local breed of pig was very likely domesticated in the area of Midnapur and Burdwan during the Late Neolithic and Early Ferro-Chalcolithic phase, as evidenced from the study on the remains from Binpur, Jamtholgora, Bharatpur, Mangolkot and Pandu Rajar Dhibi.

The majority of the early domesticated breeds of buffalo, as testified by the unearthed remains from the State are of river type, characterised by having curved or sickle-shaped short horns and with elevated parietal bone. However, the wild projenitor of this breed is not found in the State. But the other breed i.e. swampy type with trigonal (in corss section) semi-circular horns and more or less plain parietal bone, certainly owe their origin to the still extant wild buffalo now restricted in the northern West Bengal. The remains of wild buffalo from Dhuliapur. Canning, Moslandpur and Boral belong to the swamp type.

The remains of the other domesticated animal unearthed from the State belong to the elephant. Remains of the animal from Early Historic settlement sites of Kotasur, Farakka, Debalaya and Tamluk, clearly prove that the people of the State not only learnt the technique to tame this huge wild animal prior to 500 years B.C. but also deployed the animal in town or port services. The remains of elephants from Binpur, Jamtholgora and Boral are probably of wild animals. It is mentionworthy that in practice, young animals are caught from the jungles, made domesticated by the animal trainer and then engaged in the works

The wild natural species of mammals which have been extinct from the State is listed in the Table No.1 and the earliest record of domesticated mammals in the State has been shown in the Table No.2.

Some characters of the mammalian skeleton are : Skull with two occipital condyles, long facial and narrow nasal bones, enlarged brain case bound anteriorly by alisphenoid and posteriorly by squamosal process, palate without ectopterygoid bone, reduced parasphenoid. Neck vertebrae seven, the elements of the first vertebra or atlas have been fused to form a ring capable to rotate around the odontoid process of axis, teeth heterodont and in sockets, modified according to food habit, shoulder girdle without interclavicle but with lateral superspinatus fossa; feet and toes variously adopted for walking, running, climbing, burrowing, swimming and flying. Some general characters of the limb bones have been given under materials and methods.

TABLE 3

List of Animal species recorded during Archeological Survey

	Species	Group	Site of Occurrence	Det/Studied by	Remarks
1.	*Bellamya bengalensis*	Gastropoda	Mainagar, 24-Parganas (S)	M. Ghosh, 1988 (un. pub.)	
2.	*Cyclophorus* sp.	Gastropoda	Jamtholgora, Midnapur	M. Ghosh, 1988 (in press)	
3.	*Pila globosa*	Gastropoda	Mainagar, 24-Parganas (S)	M. Ghosh (in press)	
4.	*Turbinella pyrum*	Gastropoda	Mangolkot, Burdwan	M. Ghosh, 1988 (in press)	
5.	Fresh water crab	Crustacea	Mangolkot, Burdwan	M. Ghosh, 1988 (in press)	
	Fresh water crab	Crustacea	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha 1985 (in press)	
6.	*Catla Catla*	Osteichthys	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha 1985 (in press)	
7.	*Colisa* cf. *fasciata*	Osteichthys	Boral, 24-Parganas (S)	M. Ghosh & U. Saha 1985	
8.	*Rita* sp.	Osteichthys	Pandurajar Dhibi, Burdwan	M. Ghosh 1991	
9.	*Mystus* sp.	Osteichthys	Pandurajar Dhibi, Burdwan	M. Ghosh 1991	
	Mystus sp.	Osteichthys	Mangolkut, Burdwan	M. Ghosh, 1988 (in press)	
0.	*Mystus* sp.	Osteichthys	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
1.	Undet. carps	Osteichthys	Mangolkot, Burdwan	M. Ghosh, 1988 (in press)	
	Undet. carps	Osteichthys	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha 1985 (in press)	
2.	*Crocodylus palustris*	Reptilia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
3.	*Crocodylus porosus*	Reptilia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
4.	*Gavialis gangeticus*	Reptilia	Babladanga; Kansara & Saragdih, Bankura	D.C. Dassarma & others, 1982.	
	Gavialis gangeticus	Reptilia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha 1985 (in press).	
	Gavialis gangeticus	Reptilia	Barrackpur, 24-Parganas (N)	P.K. Sen & M. Banerjee, 1984.	
5.	*Batagur baska*	Reptilia	Biribari; Kansara & Saragdih, Bankura	D.C. Dassarma & others, 1982.	
	Batagur baska	Reptilia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
5.	*Chitra indica*	Reptilia	Barackpur, 24-Parganas (N)	P. K. Sen & M. Banerjee, 1984.	

	Species	Group	Site of Occurrence	Det/Studied by	Remarks
	Chitra indica	Reptilia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
	Chitra indica	Reptilia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
17.	*Hardella thurjii*	Reptilia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
18.	*Lepidochelys olivacea*	Reptilia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
19.	*Lissemys punctata punctata*	Reptilia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Lissemys punctata punctata	Reptilia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha 1985 (in press).	
20.	*Trionyx gangeticus*	Reptilia	Bhaluksoda, Bankura	M. Ghosh, 1987 (un pub).	
	Trionyx gangeticus	Reptilia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Trionyx gangeticus	Reptilia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
	Trionyx gangeticus	Reptilia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
21.	*Columba* sp.	Aves	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
22.	*Gallus gallus murghi*	Aves	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Gallus gallus murghi	Aves	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Gallus gallus murghi	Aves	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	
23.	*Hystrix crassidens*	Mammalia	Babladanga; Gogra & Susunia, Bankura	D.C. Dassarma & others, 1982	
24.	*Hystrix indice*	Mammalia	Binpur, Midnapur	M. Ghosh, 1985 (in press).	
25.	*Rattus rattus*	Mammalia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Rattus rattus	Mammalia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	
	Rattus rattus	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
26.	*Bos indicus*	Mammalia	Bhaluksoda, Bankura	M. Ghosh, 1987 (un pub.)	
	Bos indicus	Mammalia	Bahiri, Birbhum	M. Ghosh & others, 1988 (in press.)	
	Bos indicus	Mammalia	Pandurajar Dhibi, Burdwan,	M. Ghosh & U. Saha, 1985 (in press).	
	Bos indicus	Mammalia	Binpur, Midnapur	M. Ghosh, 1985 (un pub).	
	Bos indicus	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	

	Species	Group	Site of Occurrence	Det/Studied by	Remarks
	Bos indicus	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Bos indicus	Mammalia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Bos indicus	Mammalia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	
27.	*Bos gaurus*	Mammalia	Bahiri, Birbhum	M. Ghosh & others, 1988 (in press).	
	Bos gaurus	Mammalia	Boral, 24-Parganas (S)	K. D. Saha & others, 1989 (in press).	
28.	*Bos namadicus*	Mammalia	Aduri; Biribari & Tentulrakha, Bankura	D.C. Dassarma & others, 1982.	
	Bos namadicus	Mammalia	Jamthol & Dhankora Bankura	M. Ghosh, 1987 (un pub).	
	Bos namadicus	Mammalia	Susunia, Bankura	S. Banerjee & U. Saha, 1976.	
	Bos namadicus	Mammalia	Biribari, Bankura	M. Ghosh, 1987 (un pub).	
	Bos namadicus	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Bos namadicus	Mammalia	Jamtholgora, Midnapur	M. Ghosh, 1987 (un pub).	
	Bos namadicus	Mammalia	Mochpal, 24-Parganas (N)	S. Banerjee, 1976.	
29.	*Bos namadicus bengalensis*	Mammalia	Chandraketugarh 24-Parganas (N)	M. Ghosh, 1977.	
	Bos namadicus bengalensis	Mammalia	Jamtholgora, Midnapur	M. Ghosh, 1987 (un pub).	
30.	*Boselaphus tragocamelus*	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
31.	*Boselaphus namadicus*	Mammalia	Babladanga; Biribari & Pairasol; Bankura	D.C. Dassarma & others, 1982.	
32.	*Boselaphus* sp.	Mammalia	Dhuliapur, Midnapur	M. Ghosh & U. Saha, 1985 (un pub).	
33.	*Bubalus bubalis*	Mammalia	Bhaluksoda, Bankura	M. Ghosh, 1987 (un pub).	
	Bubalus bubalis	Mammalia	Bahiri, Birbhum,	M. Ghosh & others, 1988 (in press).	
	Bubalus bubalis	Mammalia	Kotasur, Birbhum	M. Ghosh & others, 1988 (in press).	
	Bubalus bubalis	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Bubalus bubalis	Mammalia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Bubalus bubalis	Mammalia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	
	Bubalus bubalis	Mammalia	Kattara, Midnapur	M. Ghosh & others, 1988 (un pub).	

	Species	Group	Site of Occurrence	Det/Studied by	Remarks
	Bubalus bubalis	Mammalia	Maslandpur, 24-Parganas (N)	S. Biswas & others, 1988 (un pub).	
	Bubalus bubalis	Mammalia	Boral, 24-Parganas (S)	M. Ghosh, U. Saha & K. D. Saha, 1988.	
	Bubalus bubalis	Mammalia	Canning, 24-Parganas (S)	M. Ghosh, 1985.	
34.	*Bubalus bubalis palaeindicus*	Mammalia	Dhuliapur, Bankura	M. Ghosh, 1987 (un pub).	
	Bubalus bubalis palaeindicus	Mammalia	Saragdih, Bankura	D.C. Dassarma, 1982.	
	Bubalus bubalis palaeindicus	Mammalia	Panihati, 24-Parganas (N)	Ghosh & U. Saha (un pub).	
35.	*Antilope cervicapra*	Mammalia	Beldanga, Bankura	M. Ghosh & U. Saha, 1987 (un pub).	
	Antilope cervicapra	Mammalia	Pairasol, Bankura	D.C. Dassarma & others, 1982.	
	Antilope cervicapra	Mammalia	Dhuliapur	M. Ghosh & U. Saha, 1987 (un pub).	
36.	*Miotragocerus cf. punjabicus*	Mammalia	Aduri, Bankura	S. Banerjee & others, 1987.	
37.	*Capra hircus aegagrus*	Mammalia	Mahisdal, Birbhum	B. Nath & M. Ghosh; 1968 (un pub)	
	Capra hircus aegagrus	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Capra hircus aegagrus	Mammalia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	
	Capra hircus aegagrus	Mammalia	Binpur, Midnapur	M. Ghosh, 1985 (in press).	
	Capra hircus aegagrus	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (in press).	
38.	*Ovis orientalis vignei*	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
39.	*Muntiacus muntjak*	Mammalia	Bhaluksoda, Bankura	M. Ghosh, 1987 (un pub).	
	Muntiacus muntjak	Mammalia	Tentulrakha, Bankura	D.C. Dassarma, 1982.	
	Muntiacus muntjak	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
40.	*Axis axis*	Mammalia	Baldiha; Kansara & Tentulrakha; Bankura	D.C. Dassarma & others, 1982.	
	Axis axis	Mammalia	Biribari, Bankura	M. Ghosh, 1987 (un pub).	
	Axis axis	Mammalia	Jamtholgora, Midnapur	M. Ghosh & U. Saha, 1987 (in press).	

	Species	Group	Site of Occurrence	Det/Studied by	Remarks
	Axis axis	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
	Axis axis	Mammalia	Bahiri, Birbhum	M. Ghosh & others, 1988 (in press)	
	Axis axis	Mammalia	Mahisdal, Birbhum	B. Nath & M. Ghosh, 1968 (un pub)	
	Axis axis	Mammalia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
41.	*Axis porcinus*	Mammalia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Axis porcinus	Mammalia	Pandurajar Dhibi	M. Ghosh & U. Saha, 1985 (in press).	
42.	*Cervus duvauceli*	Mammalia	Beldanga; Beldiha & Saragdih, Bankura	D.C. Dassarma & others, 1982.	
	Cervus duvauceli	Mammalia	Bahiri, Birbhum	M. Ghosh & others, 1988 (in press).	
	Cervus duvauceli	Mammalia	Mahisdal, Birbhum	B. Nath & M. Ghosh, 1968 (un pub).	
	Cervus duvauceli	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
43.	*Cervus duvauceli*	Mammalia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Cervus duvauceli	Mammalia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	
	Cervus duvauceli	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
	Cervus duvauceli	Mammalia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
44.	*Cervus unicolor*	Mammalia	Babladanga; Gogra & Saragdih, Bankura	D.C. Dassarma & others, 1982.	
	Cervus unicolor	Mammalia	Bhaluksoda, Bankura	M. Ghosh, 1987 (un pub).	
45.	*Camelus dromedarius*	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
46.	*Giraffa cf. camelopardalis*	Mammalia	Jamthol (Susunia), Bankura	S. Banerjee & M. Ghosh, 1977.	
47.	*Sus scrofa cristatus*	Mammalia	Kansara, Bankura	D.C. Dassarma & others, 1982.	
	Sus scrofa cristatus	Mammalia	Bahiri, Birbhum	M. Ghosh & others, 1988 (in press).	
	Sus scrofa cristatus	Mammalia	Kotasur, Birbhum	M. Ghosh & others, 1988 (in press).	
	Sus scrofa cristatus	Mammalia	Mahisdal, Birbhum	B. Nath & M. Ghosh, 1968 (un pub)	
	Sus scrofa cristatus	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Sus scrofa cristatus	Mammalia	Mangolkot, Burdwan	M. Ghosh, 1988 (in press).	
	Sus scrofa cristatus	Mammalia	Pandurajar Dhibi, Burdwan	M. Ghosh & U. Saha, 1985 (in press).	

	Species	Group	Site of Occurrence	Det/Studied by	Remarks
	Sus scrofa cristatus	Mammalia	Binpur, Midnapur	M. Ghosh, 1985 (in press).	
	Sus scrofa cristatus	Mammalia	Jamtholgora, Midnapur	M. Ghosh & U. Saha, 1987 (un pub).	
	Sus scrofa cristatus	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
	Sus scrofa cristatus	Mammalia	Boral, 24-Parganas (S)	M. Ghosh & U. Saha, 1988.	
48.	*Equus onaqer khur*	Mammalia	Babladanga; Gogra & Kansara, Bankura	K. D. Saha & others, 1969-75 (un pub).	
	Equus onager khur	Mammalia	Hatinal, Burdwan	D. C. Dassarma & others, 1982.	
	Equus onager khur	Mammalia	Baltora, Purulia	D. C. Dassarma & others, 1982.	
49.	*Equus caballus*	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
	Equus caballus	Mammalia	Gayeshpur, Nadia	M. Ghosh, 1986 (un pub).	
50.	*Rhinoceros unicornis*	Mammalia	Ramchandrapur, 24-Parganas (S)	M. Ghosh & others, 1992.	
51.	*Felis chaus*	Mammalia	Mahisdal, Birbhum	B. Nath & M. Ghosh, 1968 (un pub).	
52.	*Panthera cf. leo*	Mammalia	Susunia, Bankura	A. K. Dutta, 1976.	
53.	*Panthera cf. leo pardus*	Mammalia	Jhirkoria (Susunia), Bankura	K. D. Saha & others, 1984.	
54.	*Crocuta* sp.	Mammalia	Susunia, Bankura	A. K. Dutta, 1976.	
55.	*Canis lupus pallipes*	Mammalia	Mahisdal, Birbhum	B. Nath & M. Ghosh, 1968	
56.	*Canis aurius*	Mammalia	Pandurajar Dhibi	M. Ghosh, 1990.	
	Canis aurius	Mammalia	Boral, 24-Parganas (S)	K. D. Saha & others, 1989 (in press).	
57.	*Canis familiaris*	Mammalia	Bhaluksoda, Bankura	M. Ghosh, 1987 (un pub).	
	Canis familiaris	Mammalia	Bharatpur, Burdwan	S. Banerjee, 1981.	
	Canis familiaris	Mammalia	Binpur, Midnapur	M. Ghosh, 1985 (in press).	
	Canis familiaris	Mammalia	Jamtholgora, Midnapur	M. Ghosh, 1985 (in press).	
	Canis familiaris	Mammalia	Tamluk, Midnapur	S. Banerjee & others, 1975 (un pub).	
58.	(*Palaeoloxodon* sp.) = *Elephas namadicus*	Mammalia	Beldanga & Kansara, Bankura	D.C. Dassarma & others, 1982.	
59.	*Elephas maximus*	Mammalia	Jamtholgora, Midnapur	M. Ghosh & U. Saha, 1987 (un pub).	
	Elephas maximus	Mammalia	Laljol, Midnapur	M. Ghosh, 1985 (in press).	
	Elephas maximus	Mammalia	Kotasur, Birbhum	M. Ghosh & others, 1990 (in press).	
	Elephas maximus	Mammalia	Farakka, Murshidabad	S. Banerjee & M. Ghosh 1984 (un pub).	
	Elephas maximus	Mammalia	Debalaya, 24-Parganas (N)	M. Ghosh, 1984.	

TABLE 4

Collection sites of animal remains

Sites	Districts	Geo-Coordinates	Period/Chronology
Aduri	Bankura	23°23' 09" N 87°00' 40" E	Middle to Late Pleistocene
Babladanga	Bankura	23°23' 09" N 87°00' 40" E	Middle to Late Pleistocene
Baldiha	Bankura	23°24' 03" N 87°04' 42" E	Late Pleistocene/upper Palaeolithic.
Bhaluksoda	Bankura	23°23' 06" N 87°00' 00" E	Late Pleistocene/Neolithic
Biribari	Bankura	23°25' 40" N 86°58' 30" E	Middle Pleistocene.
Dhankora	Bankura	23°22' 50" N 86°57' 54" E	Early Neolithic
Gogra	Bankura	23°27' 32" N 86°57' 03" E	Late Pleistocene.
Jamthol	Bankura	23°23' 40" N 86°56' 20" E	Lower Palaeolithic to Mesolithic.
Jhirkoria	Bankura	23°27' 30" N 86°00' 30" E	Lower Palaeolithic.
Kansara	Bankura	23°32' 26" N 87°03' 28" E	Late Pleistocene.
Pairasol	Bankura	23°30' 30" N 87°04' 06" E	Late Pleistocene.
Saragdih	Bankura	23°31' 34" N 87°05' 13" E	Late Pleistocene.
Susunia	Bankura	23°23' 38" N 86°58' 06" E	Late Pleistocene.
Tentulrakha	Bankura	23°35' 21" N 86°55' 22" E	Middle to Late Pleistocene.
Bahiri	Birbhum	23°38' 56" N 87°46' 20" E	Chalcolithic to Iron age
Kotasur	Birbhum	22°55' N 87°45' E	Chalcolithic.
Mahisdal	Birbhum	23°14' N 87° E	Chalcolithic to Iron Culture.
Bharatpur	Bardhaman	23°28' N 87°20' E	Chalcolithic to Iron Culture.
Hatinal	Barddhaman	23°42' 15" N 86°48' 22" E	Pleistocene.
Mangalkot	Barddhaman	23°32' 14" N 87°52' 20" E	Chalcolithic.
Pandurajar Dhibi	Barddhaman	23°34' N 87°43' E	Chalco to Early Historic.
Beidanga	Medinipur	23°28' 28" N 87°04' 06" E	Late Pleistocene.
Binpur	Medinipur	22°40' 50" N 86°41' 02" E	Neolithic.
Dhuliapur	Medinipur	22°38' 28" N 86°50' 44" E	Middle Pleistocene.

Sites	Districts	Geo-Coordinates	Period/Chronology
Jamtholgora	Medinipur	22°44' 11" N 86°40' 59" E	Mesolithic to Neolithic
Kattara	Medinipur	22°40' N 86°40' E	Palaeolithic to Neolithic.
Tamluk	Medinipur	22°21' N 87°53' E	Neolithic to Early Historic.
Farakka	Murshidabad	24°46' 25" N 87°48' 00" E	Early Historic to Mediaeval.
Gayeshpur	Nadia	22°51' N 88°30' E	Late Historic.
Baltora	Puruliya	23°37' 26" N 86°51' 30" E	Pleistocene.
Barrackpur	North 24-Parganas	22°47' 08" N 88°23' 00" E	Holocene.
Chandraketugarh	North 24-Parganas	22°29' 54" N 88°35' 20" E	Early Historic (Pre-Maurian).
Debalaya	North 24-Parganas	22°41' 10" N 88°40' 35" N	Early Historic (Pre-Maurian).
Maslandpur	North 24-Parganas	22°51' 26" N 88°42' 00" E	Holocene.
Mochpal	North 24-Parganas	22°43' 10" N 88°34' 18" E	Early Historic.
Panihati	North 24-Parganas	22°40' N 88°20' E	Historic/Subrecent.
Boral	South 24-Parganas	22°29' 54" N 88°35' 20" E	Early Historic to Mediaeval.
Canning	South 24-Parganas	22°19' 08" N 88°40' 21" E	Recent
Mainagar	South 24-Parganas	22°27' 17" N 88°22' 19" E	Early Historic to Mediaeval.
Ramchandrapure	South 24-Parganas	22°25' 50" N 88°24' 42" E	Sub-recent.

SUMMARY

Archaeozoological investigations in West Bengal reveal a total of 60 species and subspecies of animals belonging to Mollusca (4), Crustacea (1), Pisces (7), Reptilia (9), and Mammalia (37) (Table 3). These animal remains collected from 40 different sites in 9 districts (Table 4) of West Bengal, largely from southern part of the state indicate the past distribution of some species now extinct in the state or India, the approximate period of domestication of some wild species and the distribution range of some species now considered vulnerable.

ACKNOWLEDGEMENTS

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MAP OF WEST BENGAL SHOWING THE CULTURAL SITES AND GEOMORPHOLOGICAL SECTIONS

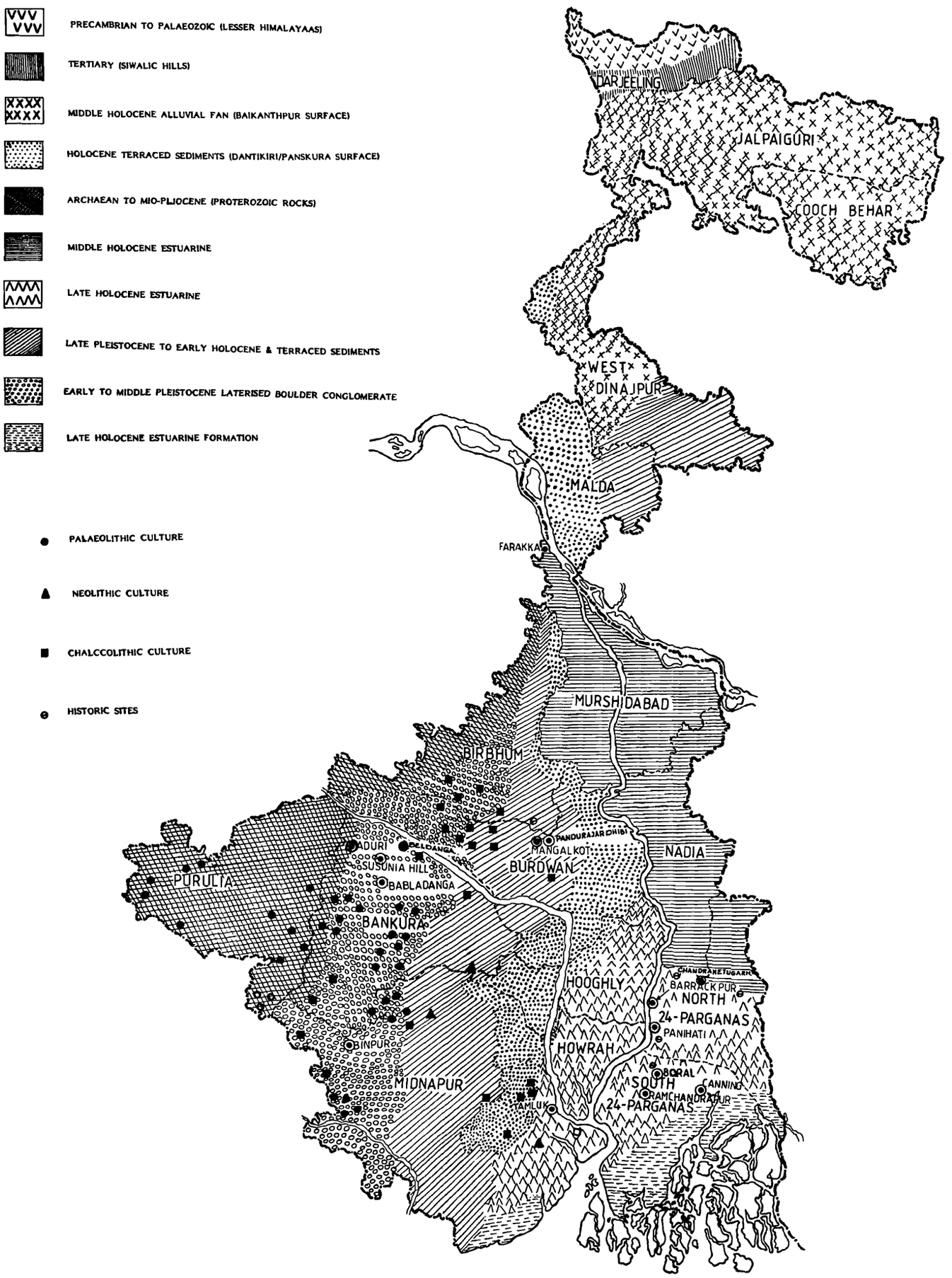

PLATE - I

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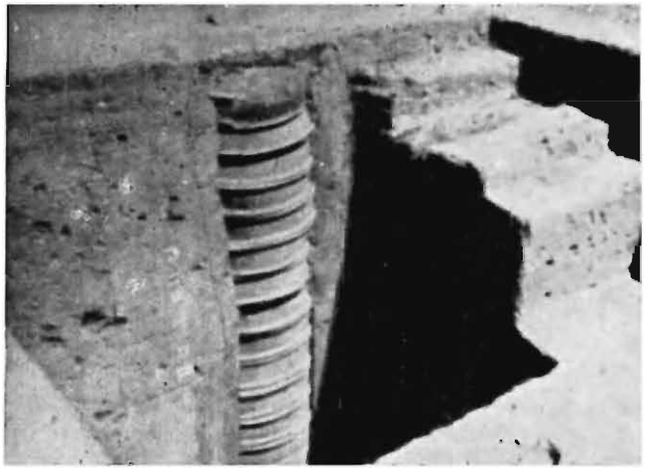

Fig - A

Fig - B

Figs. A. & B. Showing to typical excavated trenches at the Pandu Rajar Dhibi (Burdwan).

PLATE - II

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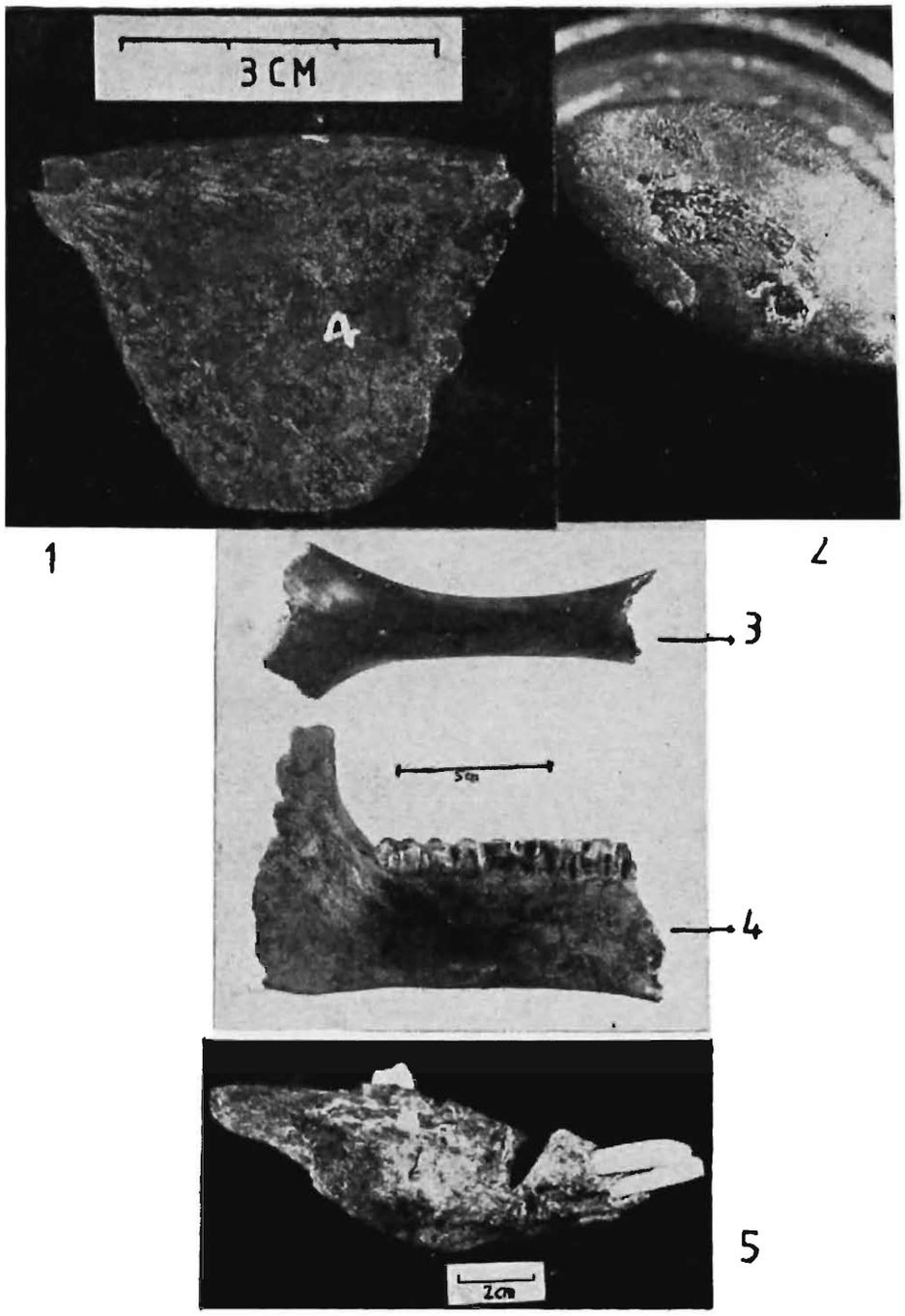

Fig. 1 : Opercular bone of a carp from Mangolkot, Burdwan.

Fig. 2 : Charred skeleton of one fish impressed on the base of an earthen pot ('handi') from Boral, South 24-Parganas.

Fig. 3 : Left humerus without condylar ends of undetermined ungulate from Boral. South 24-Parganas.

Fig. 4 : Broken left mandible with teeth of wild boar. *Sus scrofa cristatus* from Boral, South 24-Parganas.

Fig. 5 : Broken mandible with the body and incisors of boar, *Sus scrofa cristatus* from Bahiri (note the cut mark).

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PLATE - III

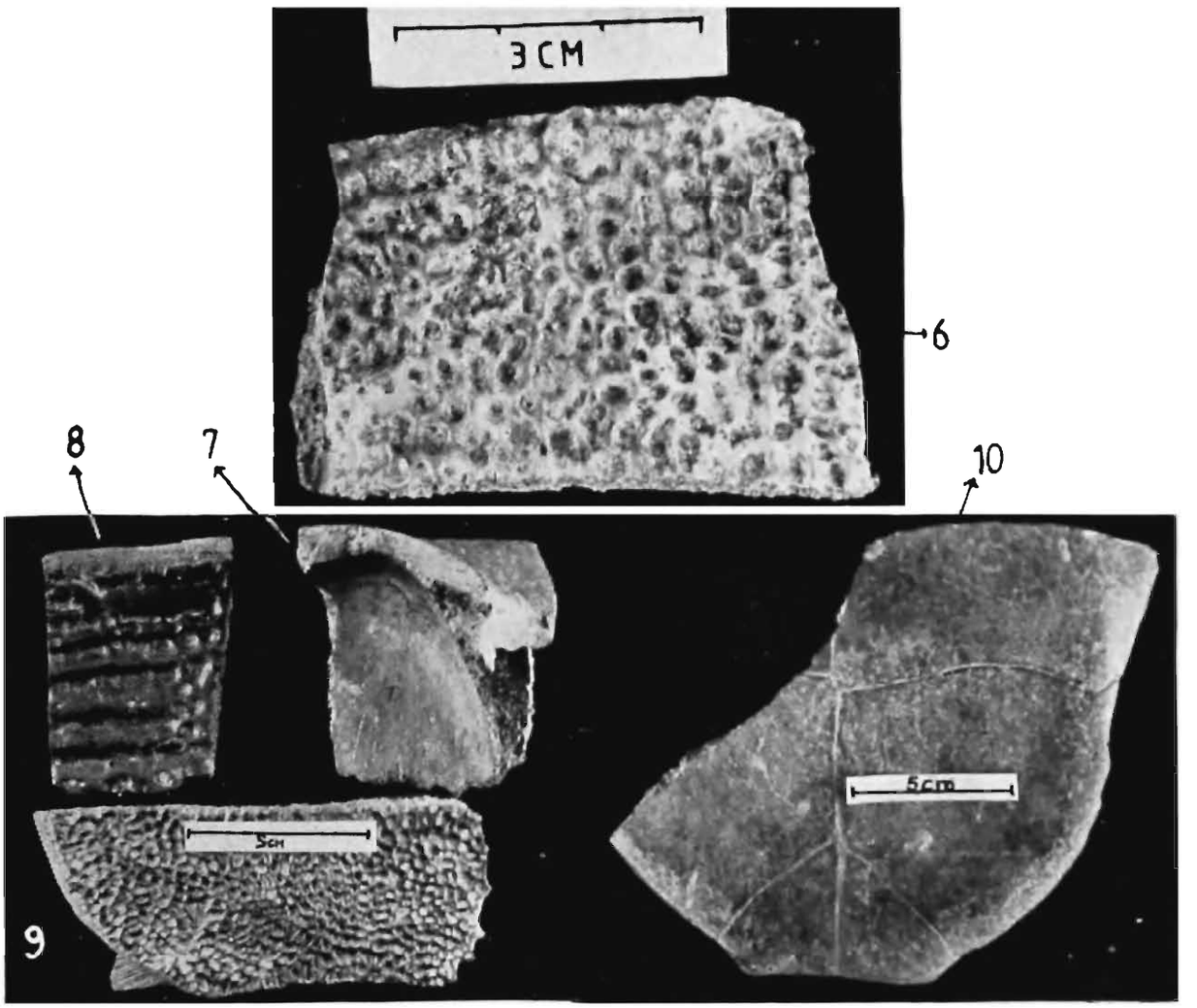

Fig. 6 : Broken hypoplastron of Narrow Headed Soft Shell Turtle *Chitra indica* from Mangolkot. Burdwan.

Fig. 7 : Piece of plastron of undetermined turtle from Boral, South 24-Parganas.

Fig. 8 : Piece of carapace of Indian Soft Shell Turtle, *Trionyx gangeticus* from Boral, South 24-Parganas.

Fig. 9 : Piece of carapace of Narrow Headed Soft Shell Turtle, *Chitra indica* from Boral, South 24-Parganas.

Fig. 10 : Broken plastron of Brahminy River Turtle. *Hardella thurji* from Boral, South 24-Parganas.

PLATE - IV

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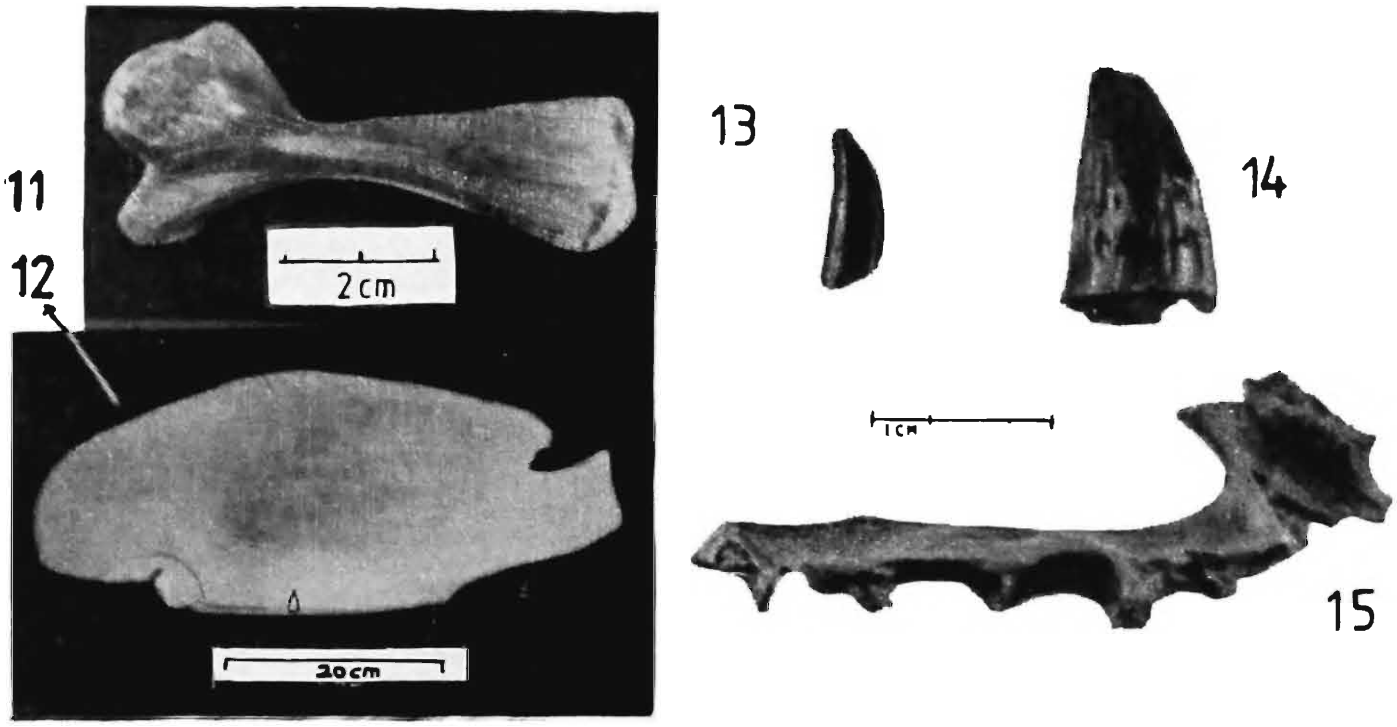

Fig. 11 : Left humerus of Indian Soft Shell Turtle, *Trionyx gangeticus* from Boral, South 24-Parganas.

Fig. 12 : Plastron of Brahminy River Turtle, *Hardella thurji* from Hadipur, North 24-Parganas.

Fig. 13 : Tooth of lower jaw of Marsh Crocodile, *Crocodylus palustris* from Boral, South 24-Parganas.

Fig. 14 : Tooth of lower jaw of the Salt Crocodile, *Crocodylus porosus* from Boral, South 24-Parganas.

Fig. 15 : Broken lower jaw with teeth sockets of Marsh Crocodile, *Crocodylus palustris* from Boral, South 24-Parganas.

PLATE - V

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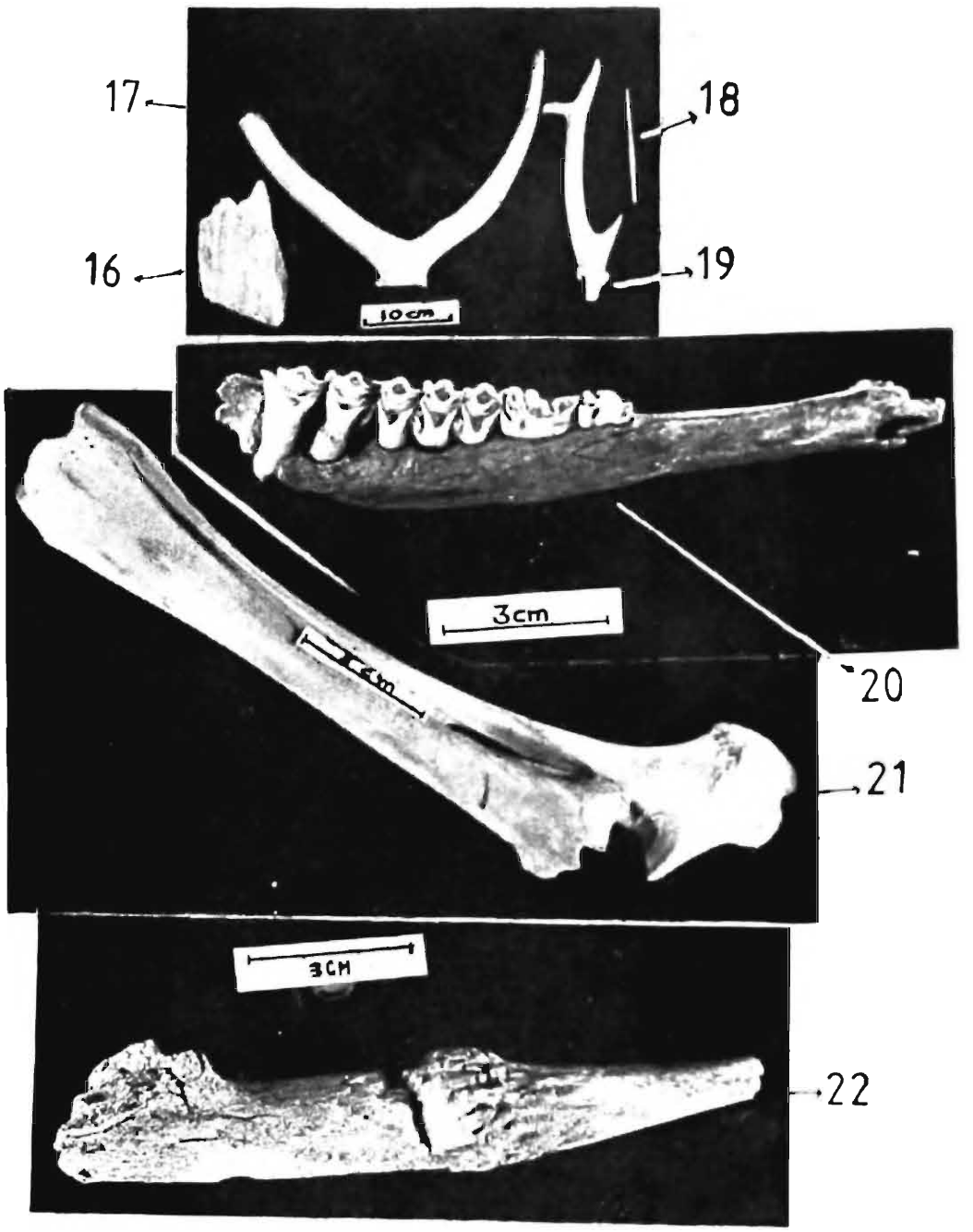

Fig. 16 : Lamellar portion of molar of Indian Elephant, *Elephas maximus* from Hadipur, North 24-Parganas.

Fig. 17 : Antler of *Cervus* sp from Hadipur, North 24-Parganas.

Fig. 18 : Undetermined mammalian fibula from Hadipur, North 24-Parganas.

Fig. 19 : Antler of Hog Deer, *Axis porcinus* from Hadipur, North 24-Parganas.

Fig. 20 : Brcken right mandible with P_1P_{-3} and M_1 of Hog Deer, *Axis porcinus* from Mangolkot, Burdwan.

Fig. 21 : Complete right radio-ulna of Swamp Deer, *Cervus duvauceli* from Boral, South 24-Parganas.

Fig. 22 : Erupting antler with pedicel of Hog Deer, *Axis porcinus* from Mangolkot. Burdwan.

PLATE -VI

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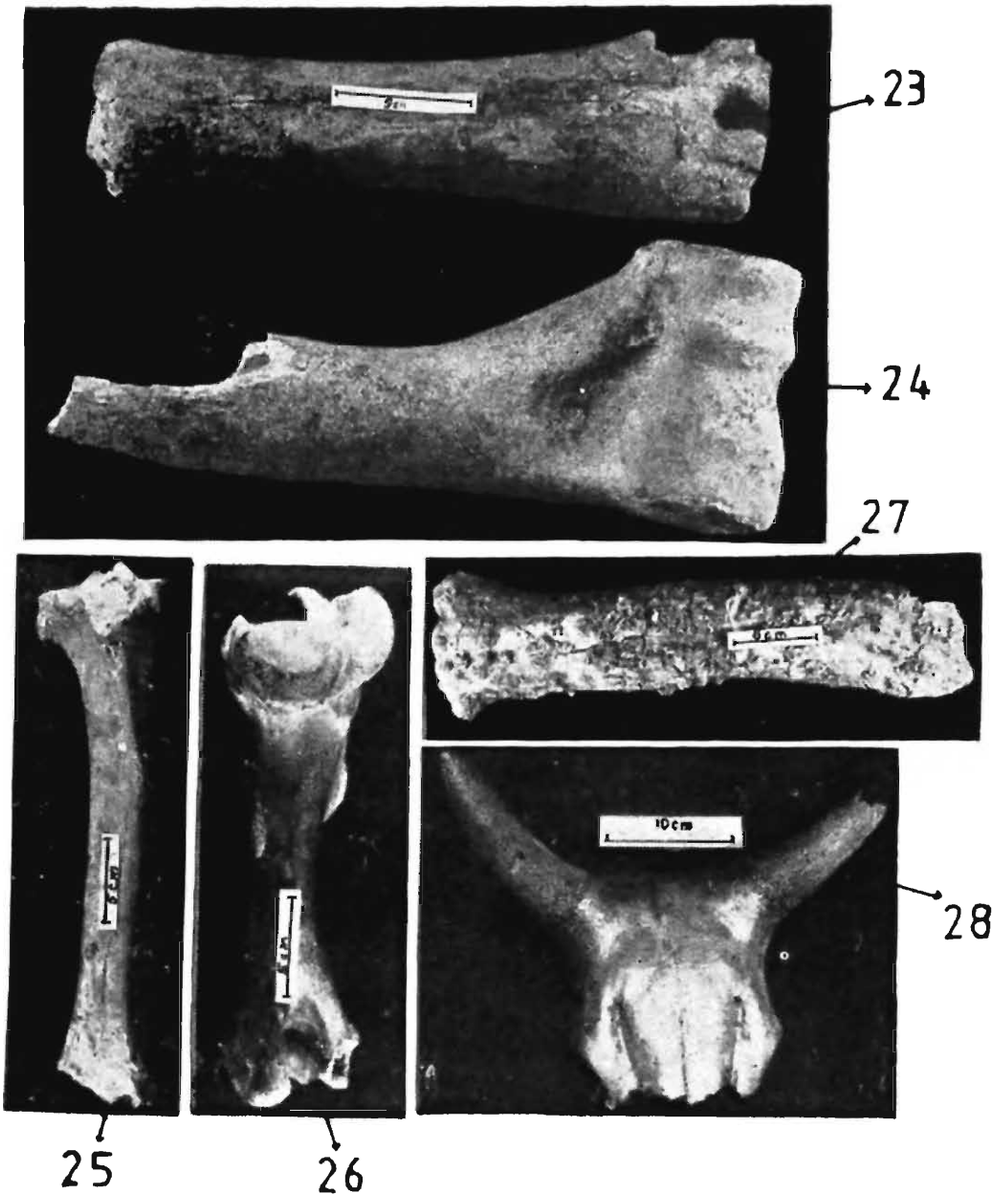

Fig. 23 : Left metatarsal of wild buffalo, *Bubalus bubalis* from Boral, South 24-Parganas,

Fig. 24 : Left humerus without head, of wild buffalo, *Bubalus bubalis* from Boral. South 24-Parganas.

Fig. 25 : Right tibia of cattle, *Bos* sp. from Boral, South 24-Parganas.

Fig. 26 : Right humerus of undetermined cattle akin to the species of *Connochaetus*, from Boral, South 24-Parganas.

Fig. 27 : Fossilised specimen of left radius of Wild Buffalo, *Bubalus bubalis* from Dhuliapur, Midnapur.

Fig. 28 : Broken skull of Humped Cattle, *Bos indicus* from Central Calcutta (unearthed from three meters below by Metro Rail Authority)

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PLATE - VII

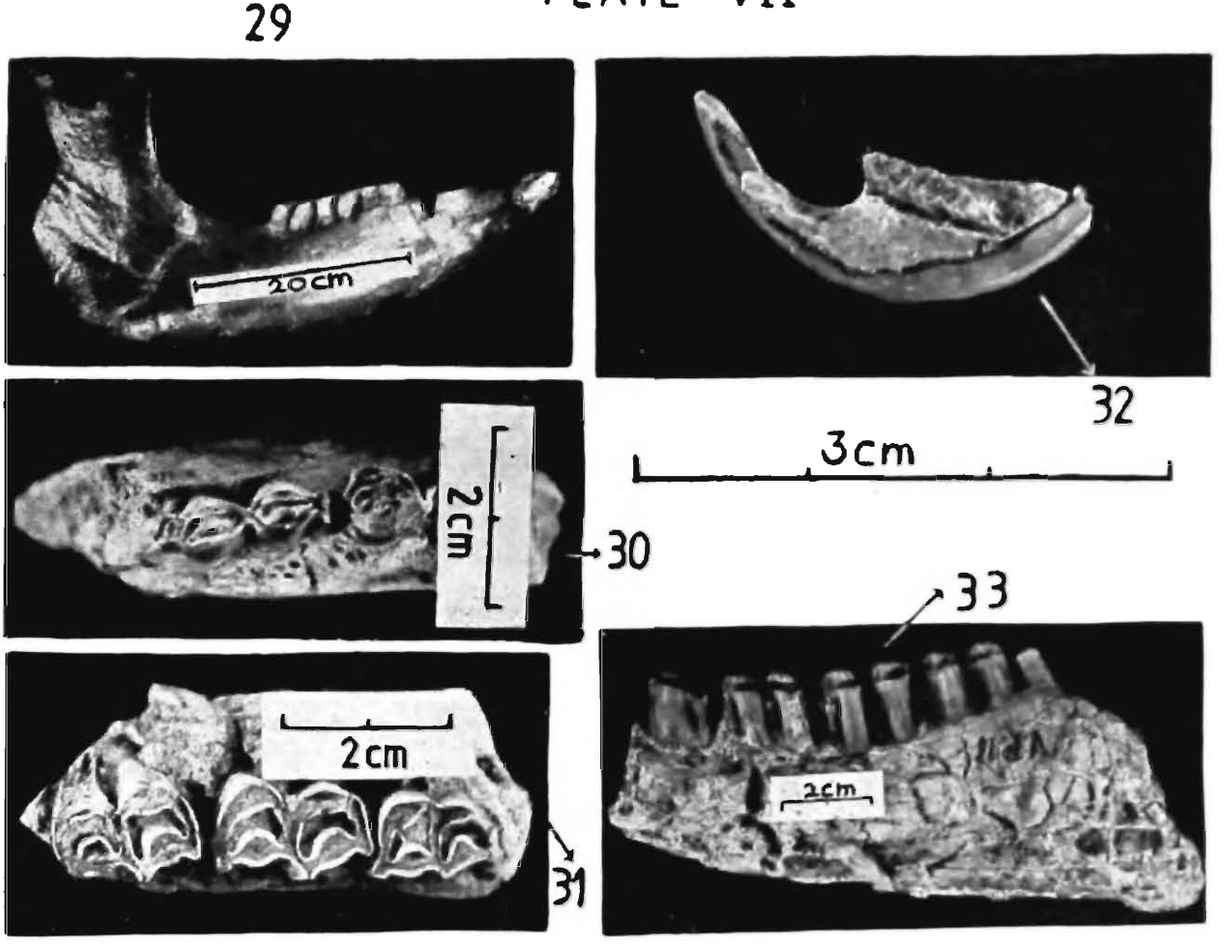

Fig. 29 : Lower jaw with teeth of the Great Indian One-Horned Rhinoceros, *Rhinoceros unicornis* from Sonarpur, South 24-Parganas.

Fig. 30 : Fossilised fragment of left mendible with teeth P_2 & P_3 of the Black Buck, *Antilope cervicapra* from Aduri, Bankura.

Fig. 31 : Fossilised fragment of maxilla with M_1-M_3 of the Black Buck, *Antilope cervicapra* from Dhuliapur, Midnapur.

Fig. 32 : Right mandible with incisor and three molars of House Rat, *Rattas rattus* from Mangolkot, Burdwan.

Fig. 33 : Broken mandible of extinct antelope, *Miotragoceros of punjabicus* from Susunia, Bankura.

PLATE - VIII

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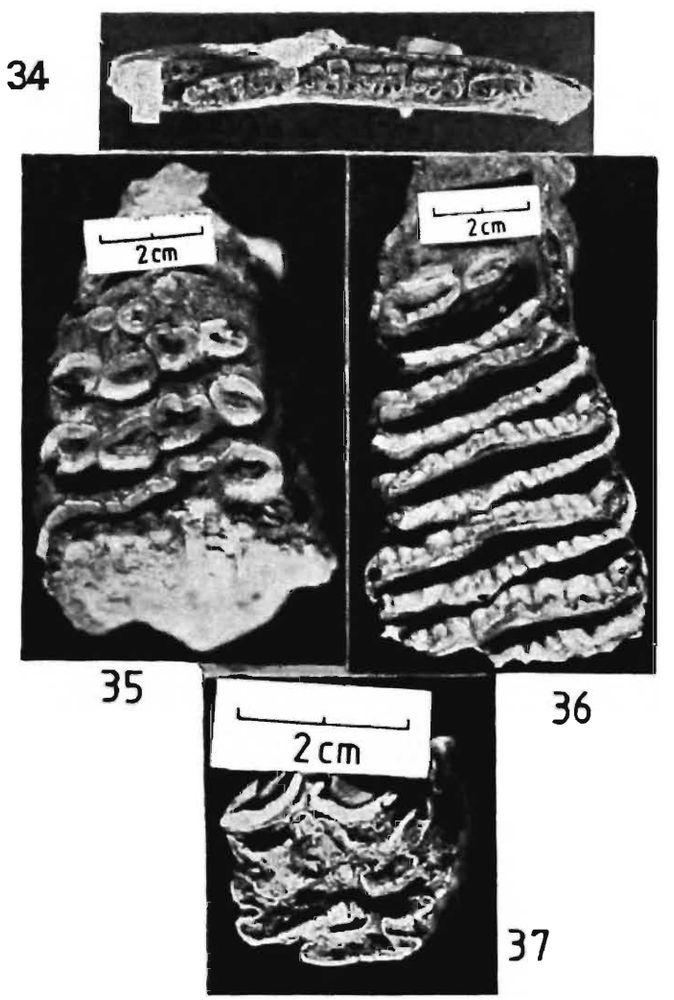

Fig. 34 : Broken left mandible with P_2-P_4 and M_1-M_3 of extinct Equine, *Equus* sp. from Jhirkoria, Bankura.

Fig. 35 & 36 : Two pieces of the molar tooth of domestic Indian Elephant, *Elephas maximus* from Kotasur, Birbhum.

Fig. 37 : Isolated upper right molar M^2 of extinct Equine, *Equus* sp. from Dhankora, Bankura.

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A.

B.

A. Fishing operation in progress Shankarpur (Midnapore dist., West Bengal)
B. Catfish catches at Shankarpur.

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