

Determination of Aging and Sexing of animal bones in Archaeological site

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Introduction

It is a well-known fact that, wild type animals and Domesticated animal had been hunted or killed for consumption purposes of the human. During the process of research and study of animal bones, it was revealed that human activities such as religious and cultural purposes, the animal have had a very close link with the human. The animal bones discovered from Archaeological premises too, provided clues and gateways in the search, and found many human activities connected with the animal. According to the study it was revealed that, cattle, Goat and pig had been killed at the ages between 1-2 years and taken for human consumption. But the cow had been looked after with special care and security for the milk that it produced for human consumption. Also the hefty and energetic cattle had been used for Agricultural and Trans portation purposes of the human beings

Sex Determination

Sex determination of animal are very important in discussing the religious economic and animal husbandry surrounding the social backgrounds. Special effort was made

in this exercise to determine the sex of animal remains discovered at ancient settlements premises. Through this it was possible reveal vital and important, Economic, religious and social information with relevant to human behavior and lifestyles. The bones of mammalian animals were very special as it was easy to identify the sex of it, compared with the bones with other animals. Sometimes the bones that we examine are not available in its natural formation they are found in pieces, and in this event it is bit difficult to identify whether it is male or female in a practical situation like this, it is not a difficult task to identify the sex of a bones of a pig as it belongs to the mammalian group of animal. The special feature of the pig can be identified by "Canine". The canine of male animals can be seen clearly whereas the canine of female animals are not visible. The boride and cerise between the head and the horns, this difference among male and female can be identified. The pelvic bone among this bones also helps to identify the sex of the animal. The pelvic bone of a male takes the shape of "V" and the pelvic bone of a female takes the shape of "U" there is also a reason, why a female pelvic takes the shape of "U" by nature it has been created to make it easy and convenient to hold the pregnancy and to pave the way for smoother child birth¹ If is not an easy task to complete an identification of this nature as the animal bones found at ancient site are mostly in broken pieces and not in its natural formation.

As regards this study, it was difficult to distinguish between the bones of males and females owing to poor preservation. Most of the bones were broken except phalanges, calcaneum, and astragalus at the archeological complex. In general, this can be attributed to determination according to some morphological characters. Basic techniques of sex determination known in literature² are followed in the present

study. The following facts provide some evidence to differentiate between sexes.

- 1) Morphological characters contain bones which exhibit the variations of male and female animals and the best exchange for this depicted in the shape of pelvic bones.
- 2) Horn cores and antlers are different in size. They are more subtentionable and male females' subtentionally.³ Some female deer species do not have antlers.
- 3) Female equid canines are smaller than the ones males have.
- 4) The presence of pelvis bones (baculum) in the male carnivore.
- 5) Some male birds have metatarsal spuss while females do not have them.
- 6) Bones measurements display sexes vary according to size and weight⁴

Generally, cattle bones can be identified from almost every archaeological site. It is important to recognize the sex of the identified animal. Sexual dimorphism can be spotted through the size and shape of the skull in cattle. A bull's skull is larger than a cow's⁵. A Horn core of domestic cattle is short and flattened. Metacarpals of male and female cattle are useful for determining sexual differences. Distal width of metacarpal shows high degree of sexual dimorphism. Cattle metapodials examined for age, sex and breed by Albarella (1997) can be seen as useful parameters in this study. Astragalus hold little importance in understanding sexual dimorphism. It is also noted that male and female metapodials can differ based on distal measurements. Cows can be different from bulls by having the flattened and pointed forward ilia- pectineal

process in pelvic girdle. Acetabulum has concave depression. It has a shallow and medial rim. The pubic bones is lozenge of diamond shaped in cross section. The pubis and the edial acetabulum in males are much thicker in cows. The Pubis is more oval shaped.⁶ The jaws of a pig are easily identified for the development of canines among male species. Thus, age and sex can be determined through pig bones.⁷

Age Determination

By examining the manner in which the animal had died, and whether the death was due to human activities or by natural causes, the age could be decided. It then was due to the need of human consumption for what reason that, it had been taken as a food item are the facts. Determine the age of the animal. By determining the age of the animal, it could be realized the lifestyle and dietary patens of the human beings of the particular region, It is also possible to determine the time period that these identified animals had lived in the given territory and premises. In the determination of age of the animals, that were subjected in this research and examination several methods were employed. The book titled "Ageing and sexing animal bones from Archaeological sites" was used and the methods were relatively the same with that of the guidance given in the book. This book has been co- authored by Bob Wilson Caroling Grison and Sebastian Payne in the year 1982. The methods described in the book with regard to age determination i.e. teeth eruption and replacement, tooth were and epiphyseal fusion was employed in this search and examination process. Out of this "teeth eruption" method is used commonly and with confidence in the process of age determination. This methodology was first introduced in the year 1982 by Esret Demiz and Sebastian Payne. These researchers have conducted the examination using Anatolian

sheep and Goat in the determination exercise and has been able to calculate the age of the animal under scrutiny very effectively and accurately. It is consider to be a victory of the Archaeologists, in the sphere of animals. Out of the bones discovered from archaeological premises, only the animals' teeth were used in the examination to determine the animals. Accordingly by employing the methods of teeth eruption and tooth were the age was determined. The complete jaw bones were not many in number but the few jaw bones that were available paved the way calculate the age accurately. Most of the teeth were found separately and individuals the entire animal bones at the site has been, naturally subjected to serious and careful examination and reach. Age determination of animals is a difficult task, especially when bones are fragmented.

Age Determination through Skulls

The degree of skull suture closure can be used as a rough indicator of age. The most useful indicator in archaeozoological material is the closure of the sutures between the frontal and parietal in the region between the horn core base and the temporal groove at 7-10 years.⁸

Age Determination through Horn Core

This kind of identification can be carried out by the size, shape, and surface texture of the core.

Age Class of Infant

The appearance of the core is under developed and appears as a small conical protuberance (horn bud). Frontal – parietal suture unfused

Age Class 1- Juvenile

Appearance of core: whole of surface is comprised of a soft 'spongy' bone. Core may be starting to curve. Frontal-parietal suture unfused

Age Class 2- Sub Adults

Appearance of core: whole of surface comprises of soft porous bones. Frontal- parietal suture: starting to fuse along the line of the nuchal eminence.

Age Class 3 -Young Adults

Appearance of core: length of core approaching the maximum in short and medium horn specimens but in long horn specimens the core may still be actively growing in length. Frontal- parietal suture: partially fused along the line of the nuchal eminence. Unfused at back of skull, that is along the upper edge of the temporal fossa immediately below the horn core.

Age Class 4 - Adults

Appearance of core: substance of core is in a transitional state between age class 3 and 5. Greater part of core comprises of compact bone. Basal region and tip nearing end of some female and castrate longhorn cores where the tip may still be at an earlier stage. Frontal- parietal suture: fused along the line of the nuchal eminence but unfused at back of skull.

Age Class 5 - Old Adults

Appearance of core: entire surface of core, including the tip region, has become compact. In very old animals, the surface may become roughened and a knobby may develop around the

base. Frontal- parietal suture: in some specimens the suture may be completely fused along the length, in may remain only partially fused along the back of the skull.

Age Determination from Teeth

Teeth are the hardest bones in animal body; therefore, it is easy to preserve them in different environmental conditions at archaeological sites. Tooth eruption was a useful age indicators of animals. In this case, pre molars and molars of maxilla and mandible are taken to determine the age of animals. When a tooth erupts, its upper surface is completely covered with enamel. The shape of the enamel and dentine on the occlusal surface form distinct patterns. At first, 'islands' of internal enamel are left within the dentine, but due to wear and tear these islands will gradually disappear so that the occlusion surface of the tooth is formed entirely of dentine, with only a border of enamel around the age. Measurements of teeth have to be taken as length, width, and height of the crown. Details about the tooth wearing stages have been given by Annie grant (1982) as follows.

- C - Perforation in crypt visible
- V - Tooth visible in crypt but below head of bone.
- E - Tooth erupting in through bones.
- U - Tooth almost at height but unworn⁹.

Most of the teeth are well preserved in the present collection. It appears that most of cattle were killed or butchered when they were 6 or 7 years of age. The maximum age of cattle is reported around 12 and half years. This evidence shows that cattle was used for eating and agricultural purposes and could be helpful in case of draught. The long bones were in defused and unfused. It was the ratio of 8%

young cattle, 26% sub adults, 66% adults. This counting throws light on the practice of cattle breeding at Jethavanaramaya.

Goats are represented in some trenches in the collection at Jethavanaramaya. The age of the animals ranged from 8 months to 3 years. This suggests that goats were kept as food items rather than serve economic purposes. Most of them were killed between the ages of 8 to 3 years. As far the goats 24% were young, 42% sub – adults, and 34% adults. In view of some of the adults identified, perhaps some sheep were kept to obtain wool and milk. Pig bones were very high in quantity at Jethavanaramaya. This materials show the age of pig meat was around 2 and half years. The pig was used for eating purposes only.

End notes

- 1 Grigson, D. K. (1984) Quantitative zoo-archaeology, Academic Press. 10p.
- 2 Uerpmann, H.P. (1973) Animal bone find and economic archaeology, London. 312-313p.
- 3 Chapline, R. C. (1971) The study of animal bones from archaeological site, Seminar press. London. 226p.
- 4 Grigson, D. K. (1984) Quantitative zoo-archaeology, Academic Press. 07p.
- 5 ibid, 17p.
- 6 ibid, 13p.
- 7 ibid, 18p.
- 8 ibid, 18p.
- 9 Albarella, Umberto. (1997) Shape variation of cattle metapodials, Anthropozoologica., 25-26p.