# FAUNAL REMAINS FROM BANGANARTI SEASON 2007

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The excavations in the Banganarti churches had yielded very little faunal material obviously because of the sacral function of the buildings, hence the excavation of the curtain wall proved a boon in that it provided a collective assemblage of 2347 bone fragments for analysis. Of these, 1884 fragments originated from a test trench dug inside a domestic structure situated just inside the eastern curtain wall and 405 from the exploration of the southern, western and eastern stretches of the actual wall. Another 26 fragments came from the Lower Church and 32 fragments from the West Building.

## ASSEMBLAGE

The preservation of the bone assemblage wehich was recovered from the excavations was good [*Fig. 1*], permitting practically full identification of the remains. Almost no post-depositional impact resulting from climatic factors were could be observed on any of the bones.

The assemblage from the test trench by the east wall was divided into three groups corresponding to three arbitrary archaeological layers. All the material from the various trenches dug on the curtain wall was treated as one set as it came from stratigraphically the same context.

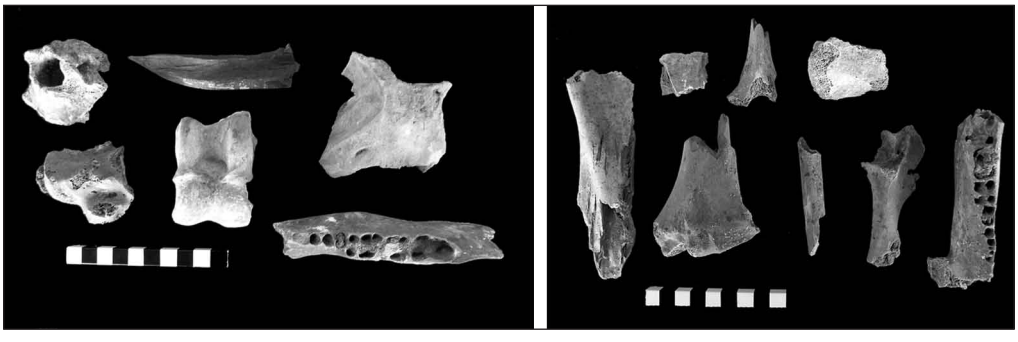

*Fig. 1. Selection of bones from the assemblages studied in 2007 (Photo M. Osypińska)*

# METHODS

The archaeozoological analysis of osteological material comprised determination of the species and anatomical identification of the remains, followed by ageing and sexing and morphological studies of the domesticated species.

The zoological identification was based on an analysis of systematic skeletal traits which are the basis for determination of animal species (Akajewski 1979; Krysiak, Świeżyński 1987). Ovicaprids were treated as a single group due to the similarities between the two species making reliable identification difficult. Percentage shares were calculated for all the species by the different assemblages [*Table 1*], assuming the total number of identified bones as the complete sample.

The results provided data for a comparative analysis of the species composi-tion from the two non-sacral assemblages at Banganarti and the set from Kom A in Old Dongola (see Osypińska 2004). Of particular interest were the differences in calculated percentages of the four species unequivocally connected with consumption: cattle, sheep, goat and pig.

Anatomical identification of the animal remains supported an analysis of anatomical distribution for cattle, pig, sheep, goat and horse in assemblages with frequency equal or more than 70. Seven groups were distinguished for the bones based on position in the skeleton:

1. Head: skull, corneal processes, antler, hyoid bone, mandible, teeth;
2. Body: vertebrae, sacrum, sternum, ribs;
3. Proximal part of dorsal limb: scapula, humerus, radius, ulnar bone;
4. Distal part of dorsal limb: carpal and metacarpal bones;
5. Proximal part of ventral limb: pelvis, femoral and tibial bones, patella, fibula;
6. Distal part of ventral limb: tarsal and metatarsal bones;
7. Phalanges: proximal ph. I, middle ph. II, distal ph. III;

For these groups the total number of determined remains was counted and percentage shares calculated for the purposes of a comparative analysis. The anatomical distribution was studied paying attention to the presence of digits and the balance between proximal and distal parts of the ventral and dorsal limbs. Differences of more than 10% were regarded as no longer in balance.

The carcass was considered in terms of cuts that were "attractive" and "not so attractive" from the point of view of meat consumption. The former includes parts of the carcass with the most meat and fat, that is, the body and proximal parts of limbs. The caloric value of the carcass parts was the criterion for this division.

Age at death of the animals was determined by observing the ontogenetic development of the skeleton and teeth. Tooth development was graded based on data collected by Lutnicki (1972). The degree of long bone fusion was evaluated using data published by Kolda (1936) and Chaplin (1971). The goal was to determine whether breeding in the settlement was meat-oriented or multidirectional, taking into consideration also the animal's life characteristics.

Studies of the morphology were based on bone measurements according to standards unified by von den Driesch (1976). Processing traces on the bones reflecting man's use of the animals in life, as well as for meat consumption and craftsmanship purposes were examined. Post-depositional traces on the bones were also recorded.

*Table 1. Species identification for the animal bone sample from Banganarti examined in 2007 (percentage shares calculated only for the test trench by the east curtain wall; where the sample was sufficiently)*

| | Cattle | | Sheep/goat | | Pig | | Dog | | Camel | | Donkey/horse | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | n | % |
| **Test trench by east curtain wall (domestic structure)** | | | | | | | | | | | | |
| Level I | 191 | (60.0%) | 91 | (28.6%) | 34 | (10.7%) | – | | – | | – | |
| Level II | 144 | (58.0%) | 72 | (29.0%) | 31 | (12.9%) | – | | – | | – | |
| Level III | 82 | (42.7%) | 61 | (31.7%) | 49 | (25.5%) | – | | – | | – | |
| **Subtotal** | **417** | | **224** | | **114** | | – | | – | | – | |
| **Curtain wall** | | | | | | | | | | | | |
| North Tower | 9 | | 13 | | – | | – | | – | | 1 | |
| West Tower | 35 | | 14 | | 3 | | – | | – | | – | |
| Road | 8 | | – | | – | | – | | – | | – | |
| Sector IV | 32 | | 34 | | 7 | | – | | 3 | | – | |
| Sector V | 4 | | 1 | | – | | – | | | | 1 | |
| Sector VI | 4 | | 1 | | 4 | | – | | 4 | | – | |
| Sector VII | 49 | | 17 | | 7 | | 2 | | 3 | | 4 | |
| Sector VIII | 11 | | 12 | | 2 | | 2 | | – | | – | |
| **Subtotal** | **152** | | **92** | | **23** | | **4** | **(1%)** | **10** | **(3%)** | **6** | **(2%)** |
| **Lower Church** | | | | | | | | | | | | |
| Level I | 1 | | 9 | | 1 | | – | | – | | – | |
| Level II | 3 | | 3 | | 1 | | – | | – | | – | |
| Level III | 4 | | 2 | | | | – | | – | | – | |
| Level V | 2 | | | | | | – | | – | | – | |
| **Subtotal** | **10** | | **14** | | **2** | | – | | – | | – | |
| **West Building** | | | | | | | | | | | | |
| Room 7 | 1 | | 1 | | – | | – | | – | | – | |
| Room 8 | 1 | | 2 | | – | | – | | – | | – | |
| Room 10 | 2 | | 3 | | – | | – | | – | | – | |
| Room 14 | 4 | | – | | – | | – | | – | | – | |
| Room 49 | 1 | | – | | – | | – | | – | | – | |
| Room E | 2 | | 2 | | – | | – | | – | | – | |
| Room W | 7 | | 2 | | 4 | | – | | 1 | | – | |
| **Subtotal** | **18** | | **10** | | **4** | | | | **1** | | | |
| **Total** | **597** | | **340** | | **143** | | **4** | | **11** | | **6** | |

# RESULTS

In view of the very limited size of the faunal sample from the Lower Church and West Building, this material was largely eliminated from a comprehensive analysis of the assemblage. Thus, the following discussion of results and conclusions are based mainly on the animal bones found in the exploration of the curtain wall and the domestic structures standing against the eastern stretch of the defenses.

## SPECIES DISTRIBUTION

Mammals (*Mammalia*) were the predominant species in the two contexts connected with the curtain wall [cf. ***Table 1***]. Moreover, cattle (*Bos primigenius* f. *domestica*) prevailed in the material from the curtain wall, as well as from the domestic buildings: 51% from the curtain wall context and 60%, 58% and 42.7% respectively from the three arbitrary layers (I, II, III) identified in the domestic building by the east wall.

Second in number were sheep (*Ovis orientalis* f. *domestica*) and goat (*Capra aegagrus* f. *domestica*), considered as one group: 34% from the curtain wall context and respectively 28.6%, 30% and 31.7% for the three arbitrary layers of the test trench. Third in line in terms of number was pig (*Sus strofa* f. *domestica*): 8% in the curtain wall contexts, and 10%, 13% and 25% for the three test-trench layers respectively. The curtain-wall assemblage also contained remains of dog (*Canis lupus* f. *domestica*) 1%, camel (*Camelus dromedarius* f. *domestica*) 3%, and donkey or horse 2% [cf. ***Table 1***].

## ANATOMICAL DISTRIBUTION

The anatomical distribution of the three most numerously represented species pointed to their post-consumptional character. In the material from the test trench, the largest quantity of remains came from the proximal part of the ventral limbs which are the meatiest parts of the carcass. Digits of all three consumptional species were recorded, indicating that the entire quartering process took place on the spot. Moreover, the balance between the remains of the dorsal and ventral limbs constitutes proof that parts of the carcasses, whether of cattle or the small ruminants, were not moved around.

The situation was different with regard to the material from the curtain wall where no digits of the small ruminants or pigs were found. There was also no balance between the dorsal and ventral limbs of cattle and the small ruminants, indicating that parts of the carcasses were brought here, especially the meatiest ones.

## AGE AND SEX

In both curtain-wall contexts (excluding the Lower Church and West Building, as said above), the biggest number of morphologically immature individuals represented cattle: 3.3% for the material from the test trench and 8% for the curtain wall. Pig was second in abundance, respectively 7.8% for the test trench and 4.3% for the curtain wall. Immature ovicaprids were represented the least abundantly, that is, 2.6% in the test trench and none in the curtain wall context. Very young individuals were not observed anywhere, the remains belonging rather to immature animals which had attained a size corresponding to maturity.

Sex could be determined only for some of the pig remains. One bone of a male pig and three teeth of a female pig were recorded in the animal bone assemblage from the test trench. One tooth of a male pig was noted in material from the curtain wall.

*Table 2. Osteometry of cattle remains from Banganarti*

| Test trench by the east curtain wall (domestic structure) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Scapula* | | | | | | | | | | | | | | |
| GLP | 64 | 70 | 76 | | | | | | | | | | | |
| *Humerus* | | | | | | | | | | | | | | |
| Bd | 65 | 69 | 86 | | | | | | | | | | | |
| *Radius* | | | | | | | | | | | | | | |
| Bp | 82 | – | | | | | | | | | | | | |
| Bd | – | 69 | | | | | | | | | | | | |
| *O. metacarpi* | | | | | | | | | | | | | | |
| Bp | 47 | – | – | | | | | | | | | | | |
| Bd | 47 | 55 | 56 | | | | | | | | | | | |
| *Femur* | | | | | | | | | | | | | | |
| SD | 39 | – | | | | | | | | | | | | |
| Bd | – | 98 | | | | | | | | | | | | |
| *Tibia* | | | | | | | | | | | | | | |
| Bp | 58 | 98 | – | – | | | | | | | | | | |
| Bd | – | – | 51 | 58 | | | | | | | | | | |
| *Calcaneus* | | | | | | | | | | | | | | |
| GL | 120 | | | | | | | | | | | | | |
| *Talus* | | | | | | | | | | | | | | |
| GLI | 68 | 68 | – | | | | | | | | | | | |
| GLm | 63 | 63 | – | | | | | | | | | | | |
| Bd | 40 | 42 | 35 | | | | | | | | | | | |
| *O. metatarsi* | | | | | | | | | | | | | | |
| SD | 25 | – | – | – | – | | | | | | | | | |
| Bd | 48 | 50 | 54 | 55 | 59 | | | | | | | | | |
| *Ph. Proximalis* | | | | | | | | | | | | | | |
| Bp | 25 | 27 | 27 | 27 | 28 | 28 | 28 | 28 | 30 | – | 30 | 30 | 31 | 58 |
| SD | 23 | – | – | 24 | 25 | – | – | 26 | 26 | 26 | 23 | – | 25 | 26 |
| Bd | 25 | – | – | 26 | 29 | – | – | 25 | 28 | 28 | – | – | 30 | 25 |
| GL | 63 | – | – | 58 | 63 | – | – | 66 | 64 | – | – | – | 67 | 63 |
| *Ph. Media* | | | | | | | | | | | | | | |
| Bp | 25 | 26 | 27 | 27 | 27 | 28 | 28 | 28 | | | | | | |
| SD | 21 | 21 | 22 | 21 | – | 24 | 24 | 24 | | | | | | |
| Bd | 20 | 22 | 23 | 22 | – | 25 | 25 | 27 | | | | | | |
| GL | 42 | 36 | 40 | 41 | – | 40 | 43 | 45 | | | | | | |
| *Ph. Distalis* | | | | | | | | | | | | | | |
| DLS | 59 | 60 | 60 | 60 | 64 | – | 64 | 64 | 66 | 68 | | | | |
| Ld | 47 | 51 | 49 | 46 | 50 | 49 | 52 | 47 | 51 | 50 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Curtain wall** | | | | | |
| *Scapula* | | | | | |
| SLC | 48 | – | – | – | – |
| GLP | 65 | 59 | – | – | – |
| *Humerus* | | | | | |
| Bd | 64 | 77 | – | – | – |
| *Talus* | | | | | |
| GLI | 74 | 67 | – | 70 | 62 |
| GLm | – | – | 61 | 63 | 56 |
| Bd | 44 | – | – | 44 | 35 |
| *Calcaneus* | | | | | |
| GL | 104 | – | – | – | – |
| *Radius* | | | | | |
| Bp | 68 | – | – | – | – |
| *Tibia* | | | | | |
| Bd | 53 | – | – | – | – |
| *O. metacarpi* | | | | | |
| Bp | 43 | – | – | – | – |
| SD | 22 | – | – | – | – |
| *Ph. proximalis* | | | | | |
| Bp | 29 | 28 | – | – | 27 |
| SD | 25 | 25 | – | – | 23 |
| Bd | 27 | 28 | – | – | 27 |
| GL | 60 | 65 | 61 | – | 60 |
| **West Building** | | | | | |
| *Talus* | | | | | |
| GLm | 64 | – | – | – | – |
| *O. metatrsalia* | | | | | |
| Bp | 49 | – | – | – | – |
| SD | 26 | – | – | – | – |

## MORPHOLOGY

Osteometric measurements of the bones provided data for analyzing the morphological type. Since none of the bones were sufficiently intact for the height in the withers to be established, the only possibility was a comparative study with data from other sites and the bones of modern animals. Most of the bones measured belonged to cattle [*Table 2*]. After recalculating, the data was compared to the point scale for cattle (Lasota-Moskalewska 2005). It was found that cattle from different archaeological contexts in Banganarti represented the short-horn variety which is about 120 cm high in the withers and sometimes has a small hump; however, none of the vertebrae from Banganarti testifies to the humped variety. In the Makurian period, the animals were horned. The herd bred in the vicinity of Banganarti was morphologically uniform.

*Table 3. Osteometry of the ovicaprids and pig from Banganarti (combined results for the 2005 and 2007 seasons)*

| | | | | | |
|---|---|---|---|---|---|
| *Ovis orientalia f. domestica* | | | | | |
| *Scapula* | | | | | |
| SLC | 19 | | | | |
| GLP | 33 | | | | |
| *Humerus* | | | | | |
| Bd | 28 | 28 | 32 | 29 | 29 |
| *Radius* | | | | | |
| Bp | 23 | 23 | 24 | 24 | |
| Bd | 21 | – | – | – | |
| *Femur* | | | | | |
| Bd | 38 | | | | |
| *Femur* | | | | | |
| Bd | 38 | | | | |
| *O. metacarpi* | | | | | |
| Bp | 25 | 25 | – | | |
| SD | – | 15 | 13 | | |
| Bd | – | – | 24 | | |
| GL | – | – | 132 | | |
| *Sus strofa f. domestica* | | | | | |
| *Maxilla* | | | | | |
| M3 | 34 | | | | |
| *Scapula* | | | | | |
| SLC | 19 | | | | |
| GLP | 31 | | | | |
| *Humerus* | | | | | |
| Bd | 31 | 32 | 41 | | |
| BT | – | 23 | 29 | | |
| *Radius* | | | | | |
| Bp | 32 | – | 23 | | |
| Bd | – | 28 | – | | |
| *Femur* | | | | | |
| Bd | 36 | | | | |
| *Talus* | | | | | |
| GLI | 37 | | | | |
| GLm | 33 | | | | |
| Bd | 19 | | | | |
| *Ph. media* | | | | | |
| Bp | 38 | 26 | | | |
| SD | 24 | 21 | | | |
| Bd | 26 | 22 | | | |
| GL | 49 | 40 | | | |
| *Ph. distalis* | | | | | |
| DLS | 24 | | | | |
| Ld | 21 | | | | |

It was a medium-big type of cattle without evidence of any other races or morphological types. This is proof of a long breeding tradition in the neighborhood of Banganarti. The number of measurements made on small ruminants and pigs was much less extensive [*Table 3*], but a comparison of the results with data for modern animals demonstrated there was a close resemblance to specimens bred today in the Southern Dongola Reach. The chief morphological difference is the presence of horns in Makurite sheep and goats [*Fig. 2*] and their virtual absence in modern animals.

### PROCESSING TRACES ON BONES

Traces noted on the animal bone material from Banganarti were of consumptional character exclusively. Most of them originated from processing meat for consumption. The assemblage from the test trench brought much more evidence of this kind, comprising mainly partial and complete burning of the bone epiphysis resulting from roasting meat over an open fire. Cuts on the bones can be related to butchering activities.

Cattle bones from the curtain wall contexts demonstrated the most evidence of the kind, which was also more varied than the set from the domestic structure investigated in the test trench by the east curtain wall. Traces of butchering and cutting of meat into smaller pieces were also noted. Of interest is a piece of scapula from a horse or donkey with evidence of cutting. Naturally, the purpose of butchering this particular animal cannot be determined.

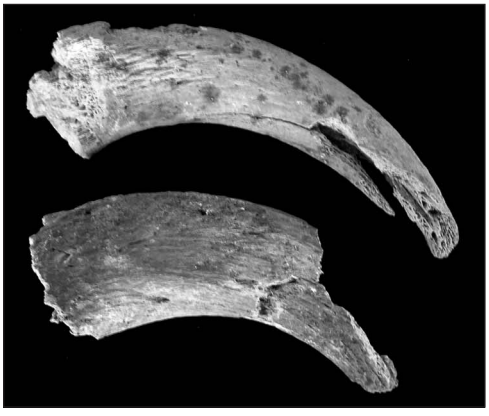

*Fig. 2. Corneal processes from Banganarti (Photo M. Osypińska)*

## CONCLUSIONS

### MEAT CONSUMPTION

An analysis of the species composition of animal remains from the Banganarti complex has left no doubt that the four mammal domesticates, namely cattle, sheep, goat and pig, constituted the main source of meat for consumption. Cattle was represented in the greatest abundance, indicating a preference for beef both among the residents of Banganarti and the pilgrims. Much more beef was consumed relative to mutton, goat meat and pork and this result is uniform for all contexts and most of the chronological phases of the complex. It is also consistent with the picture of meat consumption developed for the palace in Dongola (Osypińska 2004), in the early and mature periods of the history of the kingdom of Makuria.

Cattle carcasses were used by consumers to the full. The better parts were quartered into smaller pieces, but also big cuts were roasted over fires as indicated by burning of the bone epiphysis. An analysis of anatomical distribution demonstrated that near the kitchen consumption concerned all parts of the carcass, while the better cuts of meat,

such as, leg and ham, were carried to locations farther out on the curtain wall.

Beef came mainly from mature individuals, but veal is also represented. The importance of cattle in the diet grew over time, a trend also noted for Dongola.

Mutton and goat meat occupied second place in the ranking of preferences, with mutton topping goat meat slightly, considering that among the precisely identified bones, sheep remains were more abundant than those of goat.

Pork was third on the list of eating preferences and gradually lost popularity with time. Young pigs were consumed in relatively large proportions in the domestic area tested in the trench by the eastern curtain wall, a situation not recorded for contexts on the curtain wall. It means that the pork that was consumed there came mostly from mature individuals. Since pig breeding is largely unidirectional, meaning that they are bred exclusively for consumption, then keeping pigs until maturity must have been connected directly with specific consumptional benefits. Adipose tissue is the latest to develop, at a stage in the animal's development when the meat starts to lose its value. Long breeding of pigs is aimed at obtaining pork fat. This conclusion is corroborated by the presence in the material of both male and female individuals, indicating that there was no selection in this direction.

The diet included, but extremely seldom, meat of gazelle (*Gazella dorcas*) and Nile catfish (*Synodontis batensoda*).

## DOMESTIC ANIMAL BREEDING

In reconstructing the breeding evidence for Banganarti it should be kept in mind that local consumers were probably not breeders. The meat consumption model depended on one hand on supply, that is, the available assortment reflecting current animal breeding strategies, and on the other hand on demand which is a factor of affluence as well as culinary tastes of the consumers among other things.

Animals bred in Banganarti and its neighborhood included primarily cattle, seconded by the small ruminants. Pig breeding was of lesser importance. Donkeys and horses, as well as dogs, were also kept. The occurrence of camel bones in the curtain-wall contexts should be linked with the late period or perhaps even modern times. The evidence from Banganarti concurs with the results from earlier analyses from Old Dongola, demonstrating a clear peak in cattle breeding with a simultaneous drop in the keeping of pigs. No significant changes can be observed in the breeding of ovicaprids; substantial growth is not recorded before the terminal phase of the kingdom of Makuria.

The cattle that was bred and consumed in Banganarti during the existence of the sacral complex belongs to the short-horned variety (Lasota-Moskalewska 2005), the same variety that continues to be bred in the southern Dongola Reach even today.

Small ruminants belong to the horned varieties, resembling in size the animals bred today, that is, the Sudan Desert sheep and the Sudanese Nubian goat (Epstein 1971). The pigs raised in Banganarti were characterized by large size and primitive, that is, wild boar, characteristics [*Table 3*]. It is more than likely that they were allowed to roam free instead of being kept in pens of any kind.

The apparent importance of cattle breeding in the region of Dongola and Banganarti suggests good pastures in the vicinity. It should be kept in mind that cattle is a relatively demanding species in terms of breeding conditions and cannot be bred successively without good pastureland. Considering that butchering concerned mainly mature individuals, it should be assumed that live animals were

used in other functions, foremost as beasts of burden and to a lesser extent as a source of milk. Sheep and goat must have been used in a similar capacity, that is, as sources of milk and possibly also wool.

The results of the analysis of the osteological asemblage from Banganarti falls within the frame of current knowledge on the subject of animal breeding and meat consumption in the kingdom of Makuria. The first of three general conclusions to be drawn based on this study is that the animal economy in the neighborhood of Banganarti contemporary with the sacral complex was based primarily on cattle breeding. Its role as a source of meat and for other purposes grew over time with a simultaneous drop in the importance of pig. This demonstrates a growing demand for high quality meat, the wealth of the consumers as a class and an evolution toward a village model of the economy.

Secondly, the results of the archeozoological analysis of the material from Banganarti are consistent with the current state of knowledge on animal breeding in Makuria in early and classic times.

Thirdly, the processes taking place in animal breeding and economy in the times of the kingdom of Makuria were gradual and continuous in nature. There seems to be no evidence for any violent changes or influence of foreign types of animal breeding.

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