Reclaiming the Past for the Future: Oral History, Craft, and Archaeology

Adel Yahya
in memoriam

edited by
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Even if we could, we wouldn't have been able to choose a better father, husband, brother, uncle and guardian. We did not expect our time with him to be so limited, or we would have told him more often how proud we are of him, and how lucky we felt to have him.

Adel's untimely departure opened our eyes to things that we didn't know about Adel: how much he tried to shield all around him from any harm, physical or emotional. He kept going despite the great pain, and he was the one working to uplift our spirits when it was supposed to be the other way around. He was concerned for all and wanted to help all, even when the logic suggested that all should be concerned for him and should have worked to help him. The good of the country was always at the center of his concerns and sometimes you felt he was in a hurry to help preserve its memories and to get people to know Palestine, its people and heritage so that they may learn to love it as he did. And for that he was always ready to put his time and energy, when most thought he should be pursuing more earthly endeavors. Adel's life wasn't an easy one, but he was a man with a mission and he always did his best to get it accomplished. That kept him busy most of the time but Adel always found the time to display his love to us all, and it was no surprise that most of the family children would go to him first, whenever they needed support, and he was always there for them.

Adel: we love you, we miss you and we are proud of you.

This book, along with all the heartfelt condolences that came in from all over the world upon his loss, is a testament of why we are so proud. We are also very grateful for everyone who helped make this book happen and for all the efforts devoted to it.

The Yahya Family

Adel Yahya

This book is dedicated to Adel, whose lifetime of devotion to the protection of heritage we want to celebrate and to remember.

Adel was born a refugee in his own homeland and lived under Israeli occupation for his whole life. He faced the many resulting hardships with determination and optimism, emerging as a pioneer in his field. He devoted most of his time to protecting and promoting Palestinian tangible and intangible heritage. His legacy today can be witnessed in the Palestinian Association for Cultural Exchange (PACE), which he founded and ran for more than two decades. Adel's most well known contribution, and perhaps his greatest passion, was his work in oral history – interviewing refugees to document the social history of Palestine.

This book is inspired by Adel and his work, seeking contemporary and ground-breaking insights within heritage studies in Adel's memory. We wish to thank the authors of this book and many other friends of Adel who were crucial in putting this book together, and express our thanks to Nilufar Reichel and Michael Rummel who helped with the formatting of the book, to Zeidan Kafafi for material support and to Hans Georg Gebel for his willingness to publish it in *ex oriente*. In the collected essays, the politics of heritage emerges as a main theme. This is a topic that has been intensely debated over the past 40 years, particularly the extent to which heritage professionals can be detached from political agendas and whether they should remain objective, distanced, and neutral in their approach. What is astonishing about Adel is that he did not shy away from grappling with the problem of how to merge political goals with scholarship. Most of his work was driven by a search for justice for the Palestinian people as a form of resistance to occupation. By documenting oral history, he worked towards protecting Palestinian heritage and at the same time supported traditional crafts. He challenged excluded pasts in school curricula and reintroduced Palestinian heritage sites to the tourist itinerary. Adel

did all of this with great integrity, not only by being open about his political activism, but also by following rigorous research methods and maintaining an intellectual scholarly approach of highest standards.

Adel's work captured a general mood within a Palestinian civil society that is concerned for its heritage. These concerns stem from Israel's political agenda, which reinforces a national narrative to justify its right to the land over that of the Palestinian people. Through his organization PACE, Adel gave a voice to Palestinian refugees, who were thereby able to tell their stories and counteract the otherwise single-sided interpretation of the past. Several Palestinian non-governmental heritage organisations followed in the footsteps of PACE, working towards challenging the power assumed by Israel to legitimize one culture over another, aptly described as the "Authorized Heritage Discourse" (AHD) by Laurajane Smith in her book *Uses of Heritage* (2006). These united efforts of Palestinians demonstrate a new form of resistance, an intellectual resistance to injustice through investigation, interpretation, and management of cultural heritage.

Adel worked under repression practiced by an authoritarian and discriminatory regime, yet his optimism overshadowed the grim present. He saw a better future through archaeology. He believed in the potential of archaeology to highlight cultural interaction throughout history in Palestine to celebrate universal values and a shared heritage of humanity. Adel held on to these moral grounds when he taught children about their past, when he led guided tours, and when he worked with other archaeologists towards safeguarding heritage.

The editors of this book wish to express their heartfelt thanks to all of the contributors for sharing their research and stories, which reveal the many beautiful sides of Adel - the archaeologist, the scholar, the host, and above all the guardian of Palestinian culture and heritage. Each of us has learned more from Adel than we can easily articulate. He has inspired us as a scholar and activist but also as a lovely person and a dear friend. We miss him greatly.

Arwa Badran, Reinhard Bernbeck and Susan Pollock
May 2018

A Selected List of Adel Yahya's Writings

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The Faunal Remains from Khirbet et-Tireh, Palestine

SALAH H. AL-HOUDALIEH AND MOHAMMAD A. AL-ZAWAHRA

ABSTRACT

This article presents the bones recovered from the 2014 and 2015 excavation campaigns at Khirbet et-Tireh. The materials studied cover the period from the 1st century BCE. through the 8th century CE. The bones were first examined in order to identify their species and then analyzed by calculating the frequency of occurrence of each species. The animal bone assemblage from the khirbet represents mainly the "food consumption refuse" taphonomical group, that is, it is the result of supplying meat for the human inhabitants. These requirements were met by utilizing both domestic and wild animals. Meat was primarily provided by domestic animals (sheep/goat, pigs), but fish and fowl were also exploited in the diet. Sheep and goats dominated among the food animals, followed by pigs. Gazelle and camel are also represented in the sample. The presence of dogs and rodents, on the other hand, is reflected in the sample only by the gnawing marks detected on some bones.

Keywords: Khirbet et-Tireh, animal bones, faunal analysis, zooarchaeology

INTRODUCTION

Khirbet et-Tireh is situated some 1.5 km west of the historic center of the West Bank city of Ramallah and approximately 16 km northwest of

Jerusalem.[1] Three excavation campaigns have thus far been conducted at the site under the direction of the first author, and by the end of the third campaign a total area of approximately 1600 square meters had been excavated. In most of the excavated squares, soundings reached the level of sterile soil or bedrock. The total thickness of cultural deposits and constructions, from sterile soil or bedrock surface to the top of the overlying remains, ranged from 0.5-2.7 m. The cultural material is dated for the most part to the Byzantine and Umayyad periods. Few Hellenistic and Roman remains were identified. The relative paucity of this older material could indicate that cultural deposits pre-dating the Byzantine era were removed in order to level the ground to the bedrock surface, thus providing a more solid footing for the Byzantine constructions. Afterward, some of the earlier deposits were also used to fill in between the stones of the new buildings.[2]

The surviving architectural remains at the Khirbet include a system of fortifications, a Byzantine monastery, two Byzantine-era churches, a rock-cut reservoir, a cistern, water channels, a rock-cut olive press complex, several burial caves, a street, and several dry-stone terrace walls.[3] The sequence of exposed cultural remains across the site can be divided into four strata. The designations for these occupational strata proceed from bottom to top, starting with the oldest cultural stratum as number 1. Stratum 1 has been dated to the Roman period. Stratum 2 is dated to the Byzantine-Umayyad period and is further divided into two main occupational phases, Phases 1 and 2; Phase 1 (Byzantine period) was in turn assigned two sub-phases, a and b. Stratum 3 starts with the beginning of the Abbasid period. Finally, Stratum 4 represents the beginning of the Ottoman era up to modern times.

The three main aims of this paper are: (1) to present the results of the analysis of the animal bones recovered from the 2014 and 2015 excavation campaigns at Khirbet et-Tireh; (2) based on these results to explore the diet, consumption behaviors, and animal husbandry practices at the site from the Roman through the Early Islamic period; and (3) to identify the preferred animal species and to discover the relation-

1 al-Houdalieh 2014.

2 al-Houdalieh 2016.

3 al-Houdalieh 2016.

ship between cultural context and the purposes for which the animals were used, thereby revealing dietary habits, possible socioeconomic differentiation, the nature of the subsistence economy, as well as the ecology of Khirbet et-Tireh environment throughout the first millennium CE.

Zooarchaeology

Zooarchaeology (also known as archaeozoology) studies faunal remains from archaeological sites. These remains are derived mainly from hard body structures such as the bones, teeth, and shells of animals eaten in antiquity. Thus zooarchaeology is basically the study of the animal-based portion of the meals of ancient people. Some animals that were used for other purposes, such as for transport or that coexisted with the inhabitants, are also found. In a few instances, some softer parts of animals, such as hair, wool, and nails, are preserved.[4]

Zooarchaeology contributes significantly to the study of our human ancestors' way of life. For one thing, it is critical in dating the emergence of the earliest humans, by documenting their activities and impacts on their environments. Moreover, it is a key to identifying and dating the food-producing revolution—the change from a primary emphasis on hunting wild animals to the herding of domestic livestock—which (along with the shift to settled agriculture) is known as the "Neolithic Revolution." The domestication process whereby wild animals came to be raised domestically is one of the main topics that zooarchaeology deals with.[5] The domestication of animals was one of the most important developments in human history, one that took place over 11,500 years ago.[6]

Another contribution that faunal remains make is in reconstructing the past environment. For example, certain animals require a very specific habitat in order to sustain themselves; pigs, fish, and certain kinds of shellfish are notable in this regard. These kinds of understandings lead to a better understanding of the natural environment of geograph-

4 Davis 1987.

5 Horwitz et al. 1999; Dobney, Rowley-Conwy and Albarella 2005.

6 Larson and Fuller 2014.

ical areas of special importance in terms of human development. Zooarchaeology contributes to an understanding of the vegetation cover and the prevailing climatic patterns in an area over time.[7]

Patterns of exchange between various regions can also be detected from the remains of "exotic" species sometimes found within the cultural layers of archaeological sites. For example, when remains of fish from the Red Sea, the Nile, and the Mediterranean are found in archaeological sites located outside the natural distribution range of these species, they indicate that the fish were transported as items of trade or exchange.[8]

Research Methodology

Faunal remains were collected manually as a matter of course throughout the duration of the excavations. However, in order to recover small finds, including tiny bones, dry sieving with 2-mm mesh screen was carried out selectively. All the bones were collected in plastic bags or cartons and placed initially in a storeroom before receiving any kind of dry or wet cleaning. At the commencement of this study, we cleaned the bones using soft toothbrushes and needles or pins; in the case of well-preserved bones we used tap water and soft toothbrushes.

In order to identify the skeletal elements and species of the animal bones from Khirbet et-Tireh, we used the atlas of animal bones, the Modern Animal Bone Comparative Collection, as well as other similar literature. Furthermore, an ovicaprid (O/C) category was used to represent the indistinguishable sheep/goat bones.

Due to the high proportions of fragmented bones, we also used certain more general categories, defined according to animal size, to sort the otherwise unidentifiable fragments:

LM: large ungulate mammals, horse/cattle size
MM: medium mammals, sheep/dog size
SM: small mammals, rabbit/rat size
Indet: indeterminate fragments

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7 Uerpmann 1987.

8 Van Neer et al. 2004.

An accurate reconstruction of the true quantitative composition of the original thanatocoenoses can never be achieved using any single method, most of which have shortcomings in actual use. For example, due to the saline nature of the soil, the weight method (the weights of bones of the various species that found) was excluded for our purposes. Instead, two other analytical tools were employed, namely the Minimum Number of Individuals (MNI)[9] and the total Number of Identified Specimens (NISP).

All measurements were made according to the standards devised by von den Driesch, and the abbreviations from that standard were adopted.[10] Measurements were taken by means of slide calipers and a measuring box, and all are expressed in millimeters unless otherwise indicated.

Two main methods were available for estimating the age of an animal at its time of death. The first method involves noting the state of tooth eruption and also analyzing the degree of dental wear.[11] The second method examines the state of epiphyseal fusion in the postcranial skeleton, mainly the long bones.[12] For our purposes, the second method is less reliable because of taphonomic effects on the skeletons. This can be seen especially in the bones of immature individuals, in those particularly rich in marrow, and also in pieces containing a high proportion of spongy materials, such as the proximal and distal parts of the femur and humerus in fatty animals such as pigs. Furthermore, since the unfused epiphyses of the long bones tend to be softer and more porous than fused ones, the use of the epiphyseal method for determining age usually overestimates the presence of older animals in a sample. Complete mandibles are preferable for estimating age based on the stage of tooth eruption. This method can give an accurate age up to the point at which all the teeth have erupted. After that, one has to depend on the state of tooth wear to estimate the age of an individual. Due to the high degree of fragmentation within the sample, few man-

9 Chaplin 1971.

10 Von den Driesch 1976.

11 Silver 1969; Payne 1973.

12 Silver 1969.

dibles were found, and only some of them had teeth in place. Therefore, we also relied on single teeth to estimate the age of some species.

The sex of the archaeological specimens can only be determined when sexual dimorphism is visible in the skeleton. Dimorphism is obvious in a small number of bones.[13] In sheep, goats, and cattle, sex was determined based on the horn cores.[14] Sexing of pigs was carried out based on the morphology of the canine teeth and on the canine roots.[15]

The withers heights (that helping in identifying wild and domestic animals based on their size) could be estimated by measuring the length of certain long bones. These measurements were multiplied by specific factors as compiled by von den Driesch and Boessneck.[16]

Presentation of the faunal remains

The 265 bones that are the subject of this study were collected from 42 loci in 20 different squares during the 2014 and 2015 excavation campaigns. Of these, 12% come from layers dating to the Roman period, 36% from the Early Byzantine period, and 52% were collected from layers dated to the Late Byzantine-Early Islamic period (Table 1).

Roman period, Stratum 1	Early Byzantine period Stratum 2, sub-phase 1a	Early Byzantine period, Stratum 2, sub-phase 1b	Late Byzantine-Early Islamic period, Stratum 2, phase 2	Total
30	85	11	139	265

Table 1: The distribution by period of the number of animal bones from Khirbet et-Tireh.

The sample for this study includes bones from mammals (both domestic and wild), birds, reptiles, and fish. Of these, 58% have been identified to skeletal element and also to the lowest taxonomic level each specimen would allow. The remainder (42%) could not be attributed to

13 Schmid 1972; Grigson 1982.

14 Grigson 1982.

15 Schmid 1972.

16 Von den Driesch and Boessneck 1974.

taxa due to their degree of fragmentation. Most of the identified bone fragments originate from domestic mammals that could be identified to either species or family (Table 2). The unidentified bone fragments are classified only according to animal size, as large or medium-size mammal.

Taxa	Periods				Total
	Roman period, Stratum 1	Early Byzantine period, Stratum 2, sub-phase 1a	Early Byzantine period, Stratum 2, sub-phase 1b	Late Byzantine-Early Islamic period, Stratum 2, phase 2	
Pig (*S. s.* f. *domestica*)	1	32	0	13	**46**
Sheep (*O. a.* f. *aries*)	0	1	1	4	**6**
Goat (*C. a.* f. *hercus*)	1	0	1	8	**10**
Sheep/goat	6	9	6	33	**54**
Cattle (*B. p.* f. *taurus*)	0	0	0	1	**1**
Camel (*C. f.* f. *dromedarius*)	0	0	0	1	**1**
Chicken (*G. g.* f. *domestica*)	4	2	0	5	**11**
Total Domestic	**12**	**44**	**8**	**65**	**129**
Fish	1	11	1	8	**21**
Gazelle	0	1	0	1	**2**
Total Wild	**1**	**12**	**1**	**9**	**23**
Total identified to taxa	**13**	**56**	**9**	**75**	**153**
Large-sized mammals	1	3	0	7	**11**
Medium-sized mammals	15	27	2	58	**102**
Total identified to size	**16**	**30**	**2**	**65**	**113**
TOTAL					**265**

Table 2: The number and distribution of animal remains of Khirbet et-Tireh by species and occupational period.

The physical condition of the bones is good, showing many cultural modifications over time, mainly in the techniques of butchering as revealed in cut and chop marks. Cut marks could be further identified as either from dismembering, segmentation, or filleting. Some bones display marks of gnawing and burning, while one bone has traces of pathology (Table 3). The modified bones constitute 21% of the sample; of these, 23% derived from the Roman period and the rest (77%) from the Byzantine through Early Islamic periods. Approximately 82% of the

marks identified on the bones derive from butchering, while all other marks account for 18%.

Marks	Roman period, Stratum 1	Early Byzantine period Stratum 2, sub-phase 1a	Early Byzantine period, Stratum 2, sub-phase 1b	Late Byzantine-Early Islamic period, Stratum 2, phase 2	Total
Cut	1 s	2 o/c, 1 s		1 c, 1 o/c	6
Chop	2 lm, 8 mm	6 mm, 1 o/c, 1 o, 6 s	2o/c	1c, 1g, 5 mm, 3 o/c, 4s	40
Gnawing	2 o/c	1 gl, 1 s		1 o	5
Burnt			1 o/c	1 lm, 1 mm, 1 o/c	4
Pathology			1 o		1
Total	13	19	4	20	56

Table 3: Distribution of modified animal bone specimens from Khirbet et-Tireh according to occupational period and type of marks. S: *Sus*, o/c: *Ovis/Capra*, c: *Capra*, o: *Ovis*, g: *Gazella*, gl: *Gallus*, lm: large mammal, mm: medium mammal.

The Identified Taxa

The domesticated animals dominate the assemblage, differing in their relative frequency according to taxa and occupational period (Table 2).

Domesticated Animals

A total of 129 specimens belonging to domestic animals were recovered from Khirbet et-Tireh. Approximately half of them were found in the Late Byzantine—Early Islamic contexts (Table 2). They include pig (*Sus scrofa* f. *domestica*), sheep (*Ovis ammon* f. *aries*), goat (*Capra aegagrus* f. *hircus*), sheep/goat, cattle (*Bos primigenius.* f. *taurus*), camel (*Camelus f.* f. *dromedarius*), and chicken (*Gallus gallus* f. *domestica*). Sheep and goat bones dominate among the domestic animal remains across all periods represented at the site, followed by pigs as the second major domestic animal group.

Pig (*Sus scrofa f. domestica*)

Suids are represented by 46 bones, found mostly in the contexts of sub-phase 1a of the Early Byzantine period. from cutting and chopping (Figs. 1-2). The majority of the bones are unfused. Some have butchering marks. The study of the suid bones shows that 50% of the pigs were slaughtered in their first year,

while the rest were killed between the ages of one and 2.5 years. All of the pigs were killed by the time (or shortly after) they achieved maximum weight, around two years of age. This pattern is typical for meat production from pigs throughout history.

Figure 1: Pig skull, interior, with chopping marks to extract the brain (photo by the authors).

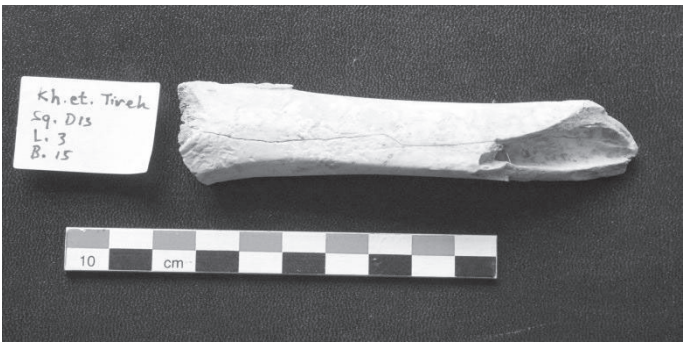

Figure 2: Pig tibia with chopping mark on its distal end (photo by the authors).

SHEEP (*Ovis ammon f. aries*) AND GOAT (*Capra aegagrus f.hircus*)

The bones of sheep and goats dominate the domestic animal remains, with goat bones outnumbering those of sheep by a ratio of 10:6. Due to the similarity between their bones, the separate "sheep/goat" category

was used for the indeterminate specimens. The bulk of the bones were attributed to this sheep/goat category. The great majority of the "medium mammals" category could be attributed to either sheep or goats (Table 2).

The distribution of sheep/goat elements was roughly the same for all occupational periods. All of their anatomical elements are represented in the sample, but cranial elements (teeth, skull, and mandible), limb bones (radius and tibia), and ribs dominate among the sheep/goat specimens. The limb bones were most numerous, followed by the cranial fragments.

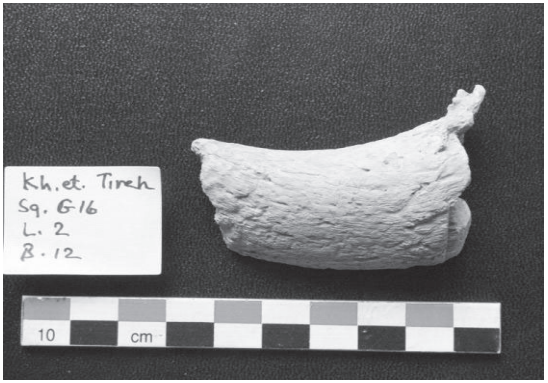

Figure 3: Horn core of a domestic sheep with a chopping mark (photo by the authors).

Seventeen of the sheep/goat bones show butchering marks (cutting and chopping). These butchered bones make up 24% of the total number; of these, 76% bear chopping marks. The various butchering traces could be categorized according to their types or to the related human activities. They can be further broken down into marks of killing, dismemberment, segmentation, and tongue removal, reflecting various parts of the process of slaughtering, skinning the animal, and finally dividing the carcass into smaller units in order to be consumed or cooked. The primary butchering marks are also represented. They are detected on the base of the horn cores and on the adjacent frontal parts of the cranial elements to which the core bases are attached (Fig. 3). The

presence of whole elements of the animal body plus the practice of primary and secondary butchery techniques[17] constitutes evidence for the killing and consumption of whole animals on-site. Some sheep/goat elements have burning traces and others gnawing marks. One o/c radius shows pathological marks of abnormal bony growth on the radius proximal head, indicating a joint infection (Fig. 4).

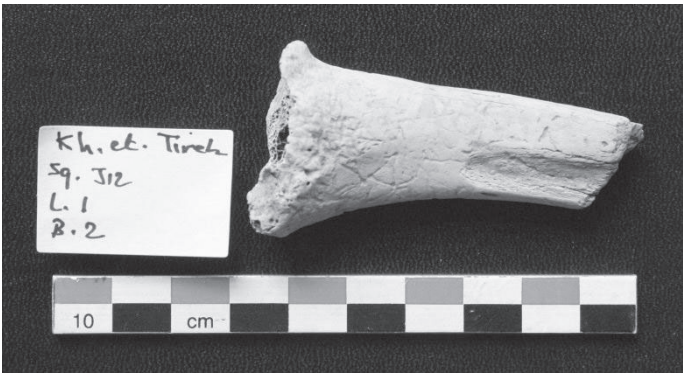

Figure 4: Pathological traces on a sheep proximal radius (photo by the authors).

Overall, the fragmentation ratio was very high among sheep and goat bones, the result of several factors, both natural and cultural: the original butchering of the animals, as seen in the cut/chop marks; disturbance of the bones by agricultural work over the centuries; and plant root acids that degraded the bones' surface and structure.

Isolated teeth were numerous among the ovicaprid remains, whereas most of the mandibles lack their teeth. Thus, for the estimation of sheep and goat slaughtering age, the fusion rates of long bones were mostly used. However, the few mandibles found with their teeth intact were also employed in determining age (Payne 1973). The fusion rates

[17] Primary butchery marks result from the removal of the head and horns, skinning the animal, and cuting off the lower limb parts (metapodials) in order to prepare the animal body for farther butchering (secondary). Secondary butchery marks are those of dismemberment and segmentation, reflecting various steps of dividing the carcass into smaller units in order to be consumed or cooked.

of the long bones show that in general most of the sheep and goats were killed (or otherwise died) between their first and second years. Immature animals in their first half-year of life, plus those over four years of age, were found at lower ratios. This killing pattern represents a typical meat production economy, where sheep and goats were utilized to provide the inhabitants with meat.

Cattle (*Bos sp.*)

Only one bone fragment could be identified as cattle. It is the distal part of the proximal phalanx (Fig. 5) and belongs to a mature animal, found in a cultural context of the Late Byzantine—Early Islamic period.

Figure 5: Cattle proximal phalanx, distal end (photo by the authors).

Camel (*Camel f. f. dromedarius)*

One camel mandible fragment was found in a layer dated to the Late Byzantine - Early Islamic period. It is the horizontal ramous of the left mandible. Its Goc length is 85.4 mm. Both cut and chop marks are found; the cut marks appear on the base of its condoyle process on its external face, while the chop marks are seen laterally of its coronoid process (Fig. 6).

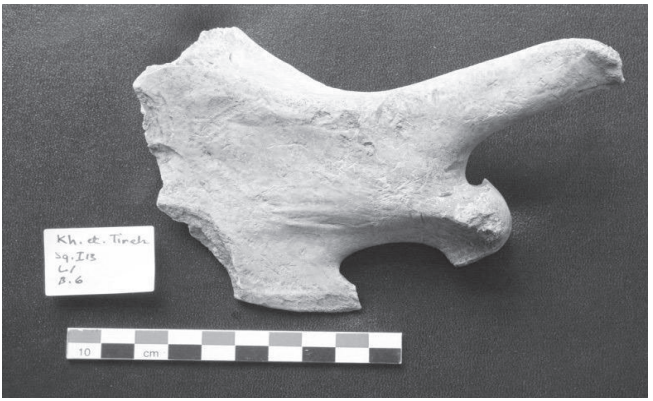

Figure 6: Camel left mandible (photo by the authors).

CHICKEN (*Gallus gallus*)

Eleven bone fragments (Table 3) could be identified as belonging to domestic fowl, *Gallus gallus* f. *domestica*, with about half coming from the Late Byzantine—Early Islamic period.

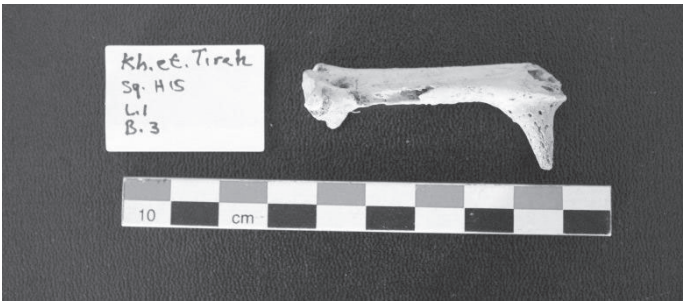

Figure 7: The spur bone of the male chicken (photo by the authors).

Chicken bones were inspected for the formation of secondary bone, the medullary bone. The medullary bone is a specialized form of secondary bone that serves as a calcium store for the production of eggshells during the laying period (Lentacker& Van Neer 1996). Its presence is thus limited to female individuals (hens) during a specific time of the year, and it has been discussed frequently in the histological literature.

Species that are reported to produce medullary bones do this in almost all skeletal elements, and elements with a good blood supply and an open medullary cavity, such as the femur, tibiotarsus, and ulna, accumulate the greatest quantity of medullary bone. One specialized chicken bone, a metatarsus with spur, was found, representing a male animal (Fig. 7). This sex-related additional bone has a reproductive function, as the male uses it during the fertilization process.

The highly pneumatic elements, such as the humerus, would contain less medullary bone, since the central bone cavity is filled with air sacs. As mentioned, the formation of medullary bone occurs in cycles, developing in chickens approximately 1-2 weeks before the first egg is laid. Then, once the breeding season is over, a gradual resorption of the remaining medullary bone takes place over a period of 1-3 weeks. The noted absence of this bone from the chickens identified among the Khirbet et-Tireh bones indicates that our sample is composed either of male chickens or of females that were killed outside the egg-laying period. No medullary bone could be identified among any of the Khirbet et-Tireh bones. Almost all of the bones are derived from adult individuals, and all the tarsometatarsal bones belong to female chickens. This may indicate that these bones are mainly from hens that were killed after finishing their egg laying or before the medullary bone formation.

Wild Animals

Two types of wild animals were identified among the bone assemblage, specifically gazelle and at least three fish species.

Fish remains

Fish remains are very poorly represented at the site, due in part to our limited sieving of excavated deposits. Twenty-one fish bones were recovered from the site (Table 2), most of them encountered in layers dated to the Late Byzantine - Early Islamic period. Fish elements are mostly those of the pectoral spines. Most of the fish bones are identified as the fresh-water Nile catfish, *Clariesgariepinus*. Sparidae and tilapia fish species also were also present (Fig. 8).[18]

[18] Personal communication, Wim Van Neer, 2015.

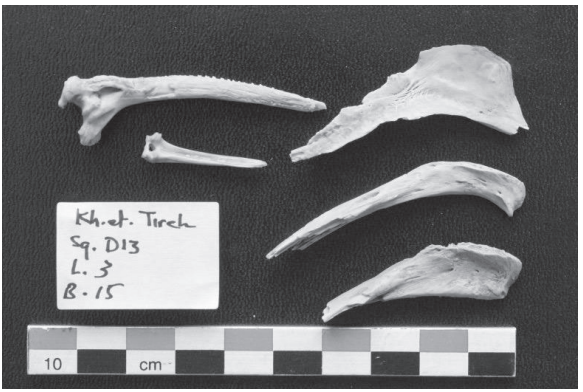

Figure 8: Sparidae and tilapia fish species found at Khirbet et-Tireh (photo by the authors).

GAZELLE (*Gazella gazella*)

Two bones could be identified as gazelle. They were recovered from Late Byzantine—early Islamic contexts, and form 0.2% of the entire sample (Table 2).

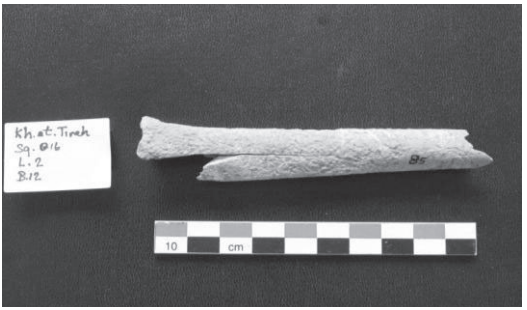

Fig. 9: Gazelle proximal metatarsal showing effects of plant root acids (photo by the authors).

The first fragment is a metatarsal bone, the second a horn core. The latter has evidence of chop marks. This reflects the primary butchering ac-

tivity, where horns are chopped away from the skull in order to cook the head of the animal. The morphological anatomy of the core points to an identification as mountain gazelle (*Gazella gazella*) (Figs. 9-10)

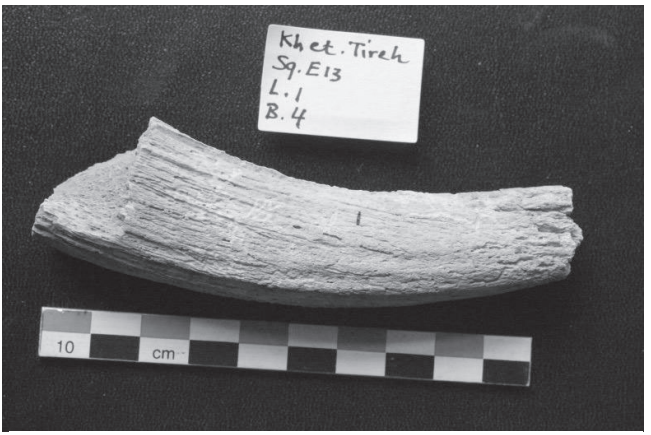

Fig. 10: Gazelle horn core with chop mark in the center (photo by the authors).

Reptiles and Rodents

The reptile remains, like the other micro-fauna, are very limited due to the nature of the collecting techniques, i.e. our limited use of sieving. These specimens could represent intrusive animals following the abandonment of the site. Rodent bones are not found among the animal bone sample; however, the presence of these animals was ascertained by the gnawing marks visible on a few of the bone surfaces (Figs. 11-12).

Indeterminate Fragments

A total of 113 bone fragments out of the entire sample (42.5%) could not be identified to species or family. They were sorted according to the animal's general size, as "large" or "medium" mammals. Most of this indeterminate group belongs to the medium-sized mammals (mm) and came from layers dated to the Late Byzantine - Early Islamic period (Table 2). This relatively high ratio of unidentified bones is a result

of the high degree of fragmentation due to a variety of reasons, but especially the consumption of the animals as food.

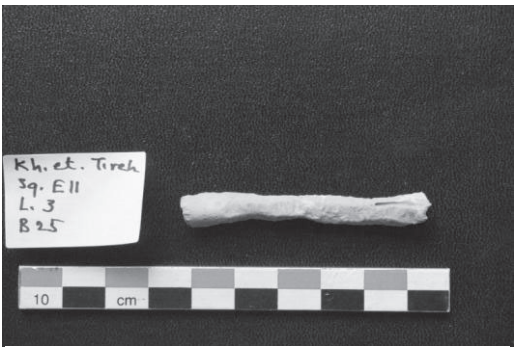

Figure 11: Ulna of a chicken, with rodent gnawing marks (photo by the authors).

Figure 12: Sheep/goat scapula, with dog gnawing marks (photo by the authors).

DISCUSSION

Gautier used the concept "taphonomic group" to bring together all the animal remains that went through the same taphonomic history or path.[19] This path begins[20] (Lyman, 1994) from the moment of the ani-

19 Gautier 1987.

20 Lyman 1994.

mals' death up until the discovery of their remains. As in most archaeological assemblages, the majority of the animal remains represent the refuse of food consumption. Many bones show butchering or cut marks denoting skinning, dismembering, and defleshing activities. Other bones show chopping marks related to brain and marrow extraction.[21] This indicates that the majority of Khirbet et-Tireh animal bones can be considered as belonging to the "food consumption refuse" group. Dog and rodent gnawing marks are among the nonhuman modifications of the sample. This indicates that the bones were left exposed for a considerable time after their disposal, which enabled these animals to eat them.

The supply of meat for the inhabitants was provided mainly by domestic animals, with the primary production and exploitation focused on sheep/goats, pigs, and chickens. Of these, sheep and goats clearly played the major role in the inhabitants' economy at Khirbet et-Tireh, mainly for providing meat. Cattle and camel bones are also found.

Pigs are represented in significant numbers and they would seem to have made a large contribution to the diet of the population of the site during all occupational periods, especially during the Byzantine and Early Islamic eras. The presence of pigs at the Khirbet during the Early Islamic period, coupled with much other archaeological evidence, indicates that a Christian community was present at the site. The pig bones are generally unfused, which means that they were killed young. So, pigs were raised and killed at the site for meat.

Generally, the bulk of the domestic animal bones are fragments and show cut marks, which indicates that they represent food consumption refuse. The presence of nearly all of the skeletal elements of the food-producing species in the sample shows that these animals were raised and consumed at the site.

Relatively few fish remains have been recovered at Khirbet et-Tireh, mainly the Nile catfish, *Clariasgariepinus*.[22] Their presence indicates trade/exchange between the inhabitants and other regions to the north or with those to the west as far as Egypt.

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21 Binford 1981; Lyman 1982; Hesse and Wapnish 1985.

22 Personal communication, Hamilton-Dyer, 2015.

SUMMARY AND CONCLUSION

The sample studied from Khirbet et-Tireh includes bones from mammals (both domestic and wild), reptiles, birds, and fish. The majority of the bone remains from the site come from domestic species. Bones of domesticates are dominant throughout all represented occupational periods, and comprise 84.3% of the total number of identified bone. Sheep, goat, and pig are the most common species in the sample, which covers the span of human occupation of the site from the 1st century B.C to the 8th century CE. The majority of studied faunal remains are fragmented, show many taphonomical modifications, and clearly represent food refuse.

The faunal remains of Khirbet et-Tireh indicate an almost complete dependence of the inhabitants on domestic mammals, mainly on sheep and goats. The chief use of these animals was for their meat. Pig bones are generally unfused, thus the majority of them were killed younger than two years and likewise exploited for meat production. Domestic chicken remains were also recovered. No medullary bone was found, which means that hens were killed outside the egg-laying season to provide meat. The high ratio of fragments with butchering marks indicates that these excavated animal remains constitute the food refuse of the inhabitants of the site. Bones of sheep, goat and pigs have the highest proportion of butchering marks.

Hunting appears to have played a very minor role in the accumulation of the faunal remains. The wild fauna consists only of fish and gazelle, represented by just a few bones. Both animals would have provided an occasional variant to the usual diet rather than a regular supply of meat. The presence of Nile catfish at the site indicates trade/exchange between the inhabitants of the site and other regions, especially with Egypt.

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his help in identifying the fish bones found at the khirbet. We dedicate this work to the soul of our dearest friend Adel Yahya.

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