

## FAUNAL REMAINS FROM THE 1994–1996 EXCAVATIONS AT THE TEMPLE MOUNT, JERUSALEM

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In 1994–1996, an area 70 m long and approximately 8 m wide was excavated along the southern part of the western wall of the Temple Mount in Jerusalem (map ref. OIG 17229–31/13145–52; NIG 22229–31/63145–52).<sup>1</sup> A stone-paved road that was in use during the later part of the Second Temple period (c. 50–70 CE) extended through the full length of the excavation (Fig. 1). Directly above the road, remains dating to the Late Roman–Byzantine periods were uncovered, and above them, remains of the Early Islamic period. Various discoveries from these excavations have already been published (Reich and Billig 2000a; 2000b; 2003). This paper focuses on the

faunal remains retrieved from all three strata, 3618 bones in total.

### CHRONOLOGY

Three chronological phases were identified:

- 1) Stratum 2: the Early Islamic period (seventh–eighth centuries CE);
- 2) Stratum 3: the Late Roman–Byzantine periods (second–sixth centuries CE);
- 3) Stratum 4: the Early Roman period (first century BCE and first century CE, up to the destruction of Jerusalem in 70 CE). Locally, this period is also known as the Late Second Temple period.



Fig. 1. An overview of the excavated area.

The chronology could be further refined for some of the loci of Stratum 4, the most substantial stratum on the site, and the following substrata were distinguished:

*Substratum 4a:* This substratum comprises one locus, L496, which is a layer of hard-packed earth, over 1 m thick. Locus 496 is part of the make-up of the stone-paved street and is sealed by it. The latest of the 15 coins found in this locus dates to Pontius Pilate (26–36 CE; Reich and Billig 2000c).

*Substratum 4b:* Several loci, the major one being L172, constitute this thin layer (3–5 cm thick), which accumulated over the flagstones once the authorities ceased to clean the street regularly (Reich and Billig 1998:90; 2000a:345). A considerable number of stray coins were found in this layer; the latest of them dates to the fourth year of the Jewish revolt (69 CE).

*Substratum 4:* This layer comprises all other accumulations of debris from among the stones of the large stone collapse that rests directly upon Substratum 4b. Unlike Substratum 4b, which accumulated on the surface of the road and reflects local activities in the street, or its close vicinity, the fills between the collapsed stones originated, at least in part, from the residential quarter of the destroyed Upper City to the west of the street.

#### METHODOLOGY

Animal bones were collected in all loci, by hand and by sieving through a regular coarse sieve of

5–7 mm mesh. No particular instructions were given to the workmen, who were untrained, but with some experience in archaeological work. The collection method clearly had a bearing on the quality of the results, and no doubt caused a bias in favor of the larger animals. It should be emphasized though, that the sampling method was uniform in all strata.

All the bones come from ‘clean’ loci that could be clearly related to a specific stratum or, in the case of Stratum 4, even substratum, and could be safely dated. Nevertheless, it should be noted that none of the bones comes from undisturbed occupation deposits upon floors, not even the assemblage from L172, the deposit just above the surface of the street itself (Reich and Billig 1998:90; 2000a:345). The bones in L172 are not *in situ*, but come from earth washed during the Early Roman period and deposited on the pavement together with many sherds of un-restorable pottery. We cannot say, therefore, whether the bones are solely from public areas of the city, or represent to some extent also the residential quarter to the west of the street.

The mammal and bird bones were identified to taxons/species, by Dalia Hakker-Orion, and the species frequencies in the various strata are presented in Tables 1–3 and Figs. 2–5. We accept the prevailing view that species frequencies based on the number of bones per species (NISP) are a more accurate means of establishing representation than the minimum number of individuals (MNI). This is certainly valid in the present excavation, where the

**Table 1. Frequency of Species (NISP; N = 2983) in Stratum 4 (Early Roman, First Century CE)**

Locus	Sheep/Goat	Cattle	Gazelle	Pig	Camel	Equides	Aves	Fish	Other
<i>Substratum 4a</i>									
496	238	84	2		4		18	1	1
<i>Substratum 4b</i>									
153	40	38	3				1		6
172	563	454	20	1	4	4	7	1	
213	18	3							3
548	89	65					1		

Table 1. (cont.)

Locus	Sheep/Goat	Cattle	Gazelle	Pig	Camel	Equides	Aves	Fish	Other
555	9	6					2		
556	74	41	5				4		
560	2	1					1		
561	2	1							
562	20						1		
565	21	1							
<i>Total</i>	838	610	28	1	4	4	17	1	9
<i>Substratum 4</i>									
141	148	89	1		1		12		
148	49	15					3		
161	80	34					5		21
174	26	21							2
181	20	6					1		
182	13	6			4				
186	22	1				1	2		
192	28	6			5		1		
229	31	6	1	1					
247	21								
264	9	5				3			
364	3	1							
372							1		
441	1	2							
468	8	14					1		
469	8	6					1		
470	4	3					1		
478	38	26					6		2
480	3								
481	7	1							
483	2								
511	2								
519	57	14						1	2
520	46	26							
527	37	2							
534	9	4							
541	6	1							
547	33	14							2
570	8					1			
573	3	2			4		1		
574	8		1						
<i>Total</i>	730	305	3	1	14	5	35	1	29
<i>Total</i>	1806	999	33	2	22	9	70	3	39
%	60.55	33.49	1.10	0.07	0.74	0.30	2.35	0.10	1.30

**Table 2. Frequency of Species (NISP; N = 263) in Stratum 3 (Late Roman–Byzantine Periods)**

Locus	Sheep/ Goat	Cattle	Gazelle	Pig	Deer	Aves	Other
61	31			25		3	3
67	26	4					4
83	61	6	2	3		4	4
87	36	4					
317	22	2					
385	9					1	
387	1	1					
514	3						
549	5				3		
<i>Total</i>	<i>194</i>	<i>17</i>	<i>2</i>	<i>28</i>	<i>3</i>	<i>8</i>	<i>11</i>
<i>%</i>	<i>73.77</i>	<i>6.46</i>	<i>0.76</i>	<i>10.65</i>	<i>1.14</i>	<i>3.04</i>	<i>4.18</i>

**Table 3. Frequency of Species (NISP; N = 373) in Stratum 2 (Islamic Period)**

Locus	Sheep/Goat	Cattle	Pig	Equides	Aves	Fish
5		10				
12	84	25			4	
16	13					
17	5					
36	12			1	2	
40	6					
43	151		4	2	3	1
59	35				2	
66	9	2	1		1	
<i>Total</i>	<i>315</i>	<i>37</i>	<i>5</i>	<i>3</i>	<i>12</i>	<i>1</i>
<i>%</i>	<i>84.45</i>	<i>9.92</i>	<i>1.34</i>	<i>0.80</i>	<i>3.22</i>	<i>0.27</i>

bones originated in various localities, and are in secondary deposition. Only four fish bones were found (see Table 10). They were identified by Omri Lerna, and discussed in detail below.

#### COMPARATIVE MATERIAL

Most of the reports of faunal remains from excavated sites in Israel pertain to early sites (prehistoric through Iron Age). Publications of the Hellenistic period and onward are so far few, although the situation is improving. Comparative material for the faunal remains presented here is therefore limited.

The relatively few reports of faunal remains that were published from the large number of excavations carried out in Jerusalem provide only a partial corpus of comparative material (Bouchnik, Bar-Oz and Reich 2004; 2006; 2007; Bouchnik et al. 2006; Horwitz and Tchernov 1989; 1996; Horwitz 1996; Horwitz and Lerna 2003; 2006; Reich, Shukron and Lerna 2007). Some of these studies are devoted to strata that predate the present finds (Reich, Shukron and Lerna 2007), the sample in others is statistically too small to draw conclusions (Horwitz and Lerna 2003; 2006). Nevertheless, a number of recent studies

**Table 4. City of David, Stratum 6 (Early Roman Period)**

	Sheep/Goat	Cattle	Gazelle	Pig	Equides	Deer	<i>Aves</i>	Fish	Other	Total
N	688	284	0	0	1	7	48	13	5	1046
%	65.8	27.1	0	0	0.1	0.7	4.6	1.2	0.5	100

**Table 5. City of David, Stratum 3 (Byzantine Period)**

	Sheep/ Goat	Cattle	Gazelle	Pig	Equides	<i>Aves</i>	Fish	Cat	Other	Total
N	18	2	0	0	2	2	1	9 <sup>i</sup> (1)	1	35 (27)
%	51.4 (66.7)	5.7 (7.4)	0	0	5.7 (7.4)	5.7 (7.4)	2.9 (3.7)	25.7 (3.7)	2.9 (3.7)	100

<sup>i</sup> This figure clearly distorts the picture. We suspect that all nine bones belong to a single animal, and adjusted the figures accordingly. The adjusted number of bones—one cat and 27 bones in total—changes the proportional representation (%) of each species considerably (all substituted figures given in parentheses). The substitute percentages were used in Fig. 5.

**Table 6. Faunal Remains from the Jerusalem City Dump (Late Roman Period)<sup>i</sup>**

	Sheep/ Goat	Cattle	Gazelle	Pig	Equides	<i>Aves</i>	Fish	Other	Total
N	440	72	0	0	1	76	21	19	629
%	70.0	11.5	0	0	0.2	12.0	3.3	3.0	100.0

<sup>i</sup> The table combines the information of the two first-century CE assemblages from the city dump.

(Bouchnik, Bar-Oz and Reich 2004; 2006; 2007; Bouchnik et al. 2006) help to elucidate one of the periods under discussion here, namely the Early Roman period. We hope that the present study will contribute further in this respect.

We expanded our comparanda by reference to three sites outside Jerusalem: Ḥorbat ‘Eleq and Ḥorbat Sumaq on Mount Carmel, and Khirbat Burnat, in the low hill country east of Lod. We indicated above the shortcomings of our bone-collecting methods. It should be emphasized that some of the comparative assemblages consulted below (e.g., Ḥorbat ‘Eleq and Ḥorbat Sumaq) were collected at an even lower level of resolution, without sieving. The following studies were consulted:

### *Jerusalem*

*Excavations near the Temple Mount.*— Most of the animal bones that were published by the former expedition on the same site—directed by Binyamin Mazar—dated to late Iron Age II, and were therefore irrelevant. The assemblage from the Early Roman period was very small (N = 38; Horwitz and Tchernov 1989:144–145) and comparison proved impossible.

*City of David, Shiloh Expedition* (Tables 4, 5).— The Shiloh expedition published detailed faunal reports (Horwitz and Tchernov 1996; Horwitz 1996). The remains of two periods are used here as comparative material: the Early Roman period (Shiloh’s Stratum 6; Table 4) and the Byzantine period (Stratum 3; Table 5).

*City of David, The Jerusalem City Dump* (Table 6).— The eastern slope of the southeastern hill of Jerusalem, identified with the City of David, is covered with a thick mantle of debris. Reich and Shukron (2003) suggested that this is in fact the city dump of Late Roman Jerusalem. A detailed quantitative study was conducted subsequently on a large sample of this debris, excavated about 150 m north of the Giḥon spring (Reich and Bar-Oz 2006; Bar-Oz et al. 2007). The faunal remains of this sample were discussed by Bouchnik, Bar-Oz and Reich (2004), as were the faunal remains retrieved from the excavation near the spring itself (Bouchnik et al. 2006). Since both assemblages belong to the same city dump, and date to the first century CE, they are considered as one below.

*The Jewish Quarter*.— The finds published from Nahman Avigad’s excavations, although of interest, are too few to contribute to the discussion (Areas A, W and X2, 16 items

altogether; Area E, 2 items; Horwitz and Lerna 2003; 2006).

#### *Rural Settlements*

*Khirbat Burnaṭ* (Table 7).— Khirbat Burnaṭ is an Early Roman rural settlement east of Lod (Lydda). Its faunal remains were examined and compared to those of the Jerusalem city dump (Bouchnik, Bar-Oz and Reich 2006). Two assemblages were published, and their combined figures are summarized in Table 7.

*Ḥorbat ‘Eleq* (Table 8).— Ḥorbat ‘Eleq is a farmhouse on Mount Carmel; the earliest phase of occupation there dates to the Early Roman period. A fair amount of animal bones from this phase was published by Horwitz (2000:512, Table 1).

*Ḥorbat Sumaḡ* (Table 9).— Ḥorbat Sumaḡ is a small village on Mount Carmel, which was settled in the Late Roman and Byzantine periods. The population was Jewish, as attested

**Table 7. Faunal Remains from Khirbat Burnaṭ (Early Roman Period)**

	Sheep/Goat	Cattle	Gazelle	Pig	Equides	Aves	Fish	Other	Total
N	186	124	0	0	0	1	2	2	315
%	59.0	39.4	0	0	0	0.3	0.6	0.6	100.0

**Table 8. Faunal Remains from Ḥorbat ‘Eleq (Early Roman Period)**

	Sheep/Goat	Cattle	Gazelle	Pig	Camel	Equides	Deer	Dog	Aves	Fish	Other	Total
N	130	215	3	8	9	13	1	9	6	2	18	414 <sup>i</sup>
%	31.4	51.9	0.7	1.9	2.2	3.1	0.2	2.2	1.5	0.5	4.4	100

<sup>i</sup> Note that the calculated total of items (414) slightly differs from the published figure (409).

**Table 9. Faunal Remains from Ḥorbat Sumaḡ (Late Roman/Byzantine Periods)**

	Sheep/Goat	Cattle	Gazelle	Pig	Deer	Aves	Fish	Other	Total
N	72	58	0	1	1	0	1	1	134
%	53.7	43.3	0	0.75	0.75	0	0.75	0.75	100

by the synagogue excavated on site. A small quantity of animal and fish bones was retrieved (Horwitz, Tchernov and Dar 1990).

RESULTS AND DISCUSSION

Tables 1–3 summarise the mammal and bird bones according to period. Single items of cat, dog, rodents and wild animals are listed as ‘Other’. Horse and donkey bones are grouped under ‘Equides’. Quantification results are according to number of identified species (NISP). Four fish bones were found, three of them could be identified to species. They are presented in Table 10. Figure 2 is a comparative summary of these tables, presenting the

frequencies of the different species in each period.

Tables with data from the excavations that were used for comparison, are presented where available.

BONE FREQUENCY: SHIFTING PATTERNS

*Stratum 4: Early Roman Period* (Tables 1, 10; Figs. 2–4)

The Early Roman-period assemblages to consider are L496 below the stone pavement of the street—the single locus of Substratum 4a; and those loci that lie directly above the stone pavement and constitute Substratum 4b (Loci 153, 172, 213, 548, 555, 556, 560, 561, 562

Table 10. Details of the Fish Vertebrae from the Temple Mount

Taxonomic Identification	Estimated Length (cm)	Locus	Period (CE)	Context
<i>Lates niloticus</i>	70–80	496	Early 1st century	Packed layer of soil underneath the pavement of the stone-paved street
Family Mugilidae	40–50	172	66–70	Upon the pavement of the street, underneath collapse
Unidentified		519	66–70	Same
Family Mugilidae	28–32	43	Late 7th century	Fill below white mosaic floor of Umayyad room, Palace IV

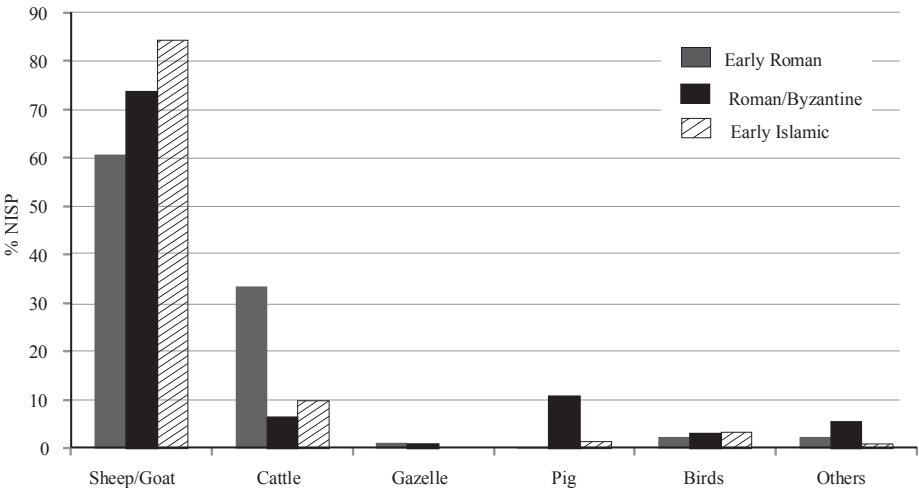


Fig. 2. Faunal remains from the excavation at the Temple Mount, Jerusalem, by strata and NISP; the figure focuses on subsistence-economy species.

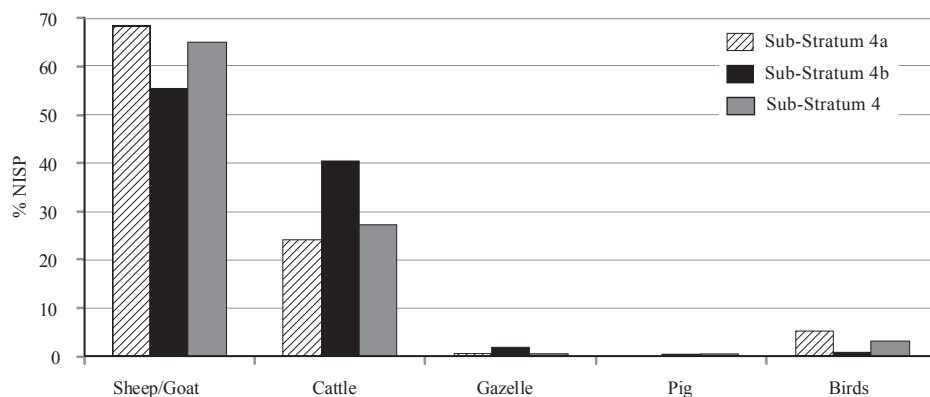


Fig. 3. Faunal remains from Substratum 4 (Early Roman, first century CE).

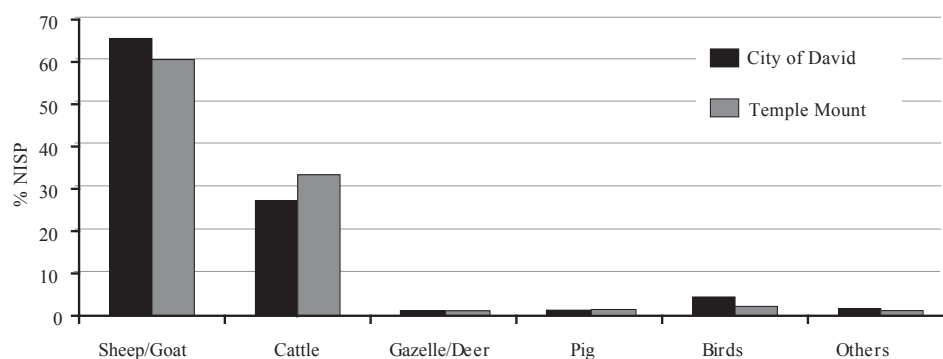


Fig. 4. Faunal remains from the Early Roman period at the Temple Mount (Substratum 4) and the City of David (Shiloh's Stratum 6).

and 565). The paving was most probably laid in the days of Agrippa II (the 50s of the first century CE), and the very thick bedding for the pavement is composed of debris and rubbish that seem to represent the second quarter of the first century CE. The debris upon the paving is waste material that accumulated on the street during the five years of the Great Revolt against Rome (66–70 CE). The two assemblages of animal bones are therefore approximately 25–50 years apart.

From Substrata 4a to 4b we see a decline in sheep/goat bones, from 68.4% to 55.4%, and a parallel ascent in the amount of cattle bones from 24.1% to 40.3% (Fig. 3). This shift seems

to represent the apex of cultic activities in the Temple Mount and in the city, when cattle offering and consumption reached its peak.

In the later Substratum 4, the proportion of cattle bones seem to decline again, to 27.2%. This may be because a considerable part of the debris, which is associated with the big stone collapse that forms Substratum 4, originated in the 'Upper City'.

Unfortunately, only a small number of bird bones could be identified, but a decrease from Substratum 4a to Substratum 4b and a subsequent increase to Substratum 4, is nevertheless visible. The percentages of all other animals is significantly smaller; pig



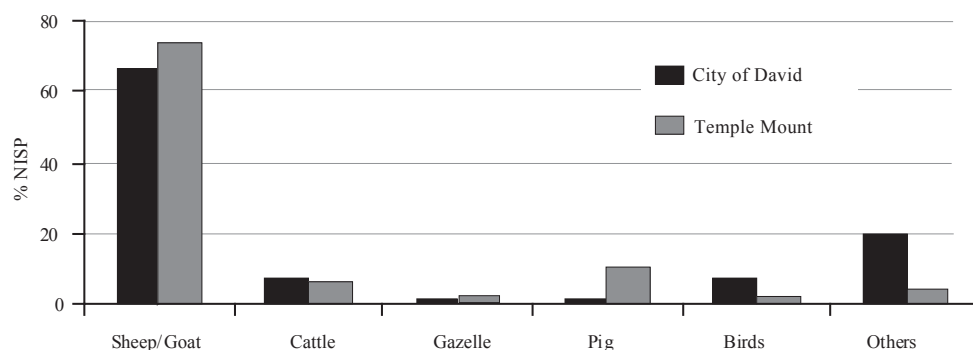


Fig. 5. Faunal remains from the Late Roman period, at the Temple Mount (Stratum 3) and the City of David (Shiloh's Stratum 3; figures adjusted according to comment for Table 5).

and fish bones will nevertheless be discussed in detail, because of their significance for the interpretation of the site.

*Stratum 3: The Late Roman–Byzantine Periods* (Table 2; Figs. 2, 5)

Figure 2 and Table 2 show a considerable fall in cattle consumption—from 33.49% in the Early Roman period to 6.46% in the Late Roman–Byzantine periods. This change is balanced by a moderate increase in sheep/goat bones, from 60.55% to 73.77%, and the first significant appearance of pig bones (10.65%), in sharp contrast to their near absence (0.07%) in the Early Roman period.

*Stratum 2: The Islamic Period* (Table 3; Fig. 2)

Figure 2 and Table 3 show a decline in pig consumption during the Islamic period, almost back to the level of the Early Roman period. Obviously, this change is related to ethnic/religious shifts in the city's population, from Jewish to pagans and Christians, and then to Muslims. The decrease in pig bones is compensated by the increased proportion of sheep/goat bones, from 73.77% to 84.45%.

When the three strata are viewed together, there is a distinct difference in the proportion of sheep/goat to cattle bones. In the Early Roman period the proportion is 60.55% to 33.49%; in

the Late Roman–Byzantine period, 73.77% to 6.46%; and in the Early Islamic period, 84.45% to 9.92%.

COMPARISON WITH CONTEMPORARY ASSEMBLAGES IN JERUSALEM

Faunal assemblages from two excavations at the City of David are relevant to the discussion of the Temple Mount material in the Early Roman and Late Roman–Byzantine periods: The City of David excavation of Shiloh, Strata 3 and 6 (Tables 4, 5), and the Jerusalem city dump (Table 6).

Comparison of the data from the Early Roman period with the City of David excavations Stratum 6 shows a resemblance (Fig. 4). This is not quite the case for the Late Roman–Byzantine periods (Fig. 5). Noteworthy is the absence of pig bones in the City of David in this period. The reason is most probably the small size of the sample: only 35 bones out of the total of 3871 that were examined came from Stratum 3.

Interpretation of the results should take into account the location of the area involved—abutting the Temple Mount in Jerusalem. This renders the site unique in matters concerning the handling of animals and meat consumption in two of the three periods (Strata 2 and 4), as is well-documented in the historical record.

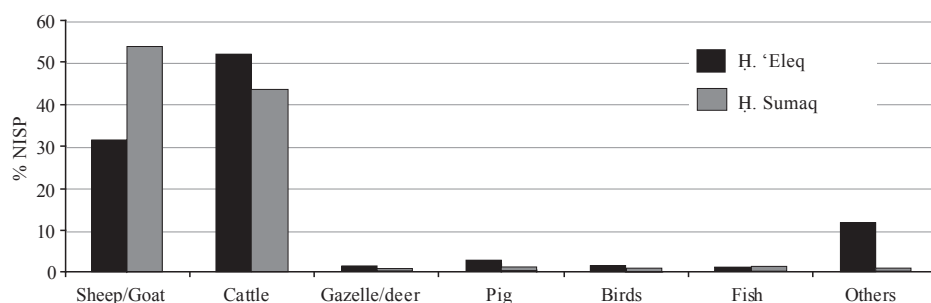


Fig. 6. Faunal remains from the Hasmonean and Early Roman periods at Ḥorbat 'Eleq and Ḥorbat Sumaq.

## CONSUMPTION

In the following discussion of the finds according to species, we shall refer to three sites outside Jerusalem: Early Roman period Khirbat Burnat and Ḥorbat 'Eleq, and Late Roman–Byzantine Ḥorbat Sumaq. The faunal assemblages of these sites are summarized in Tables 7–9 and Fig. 6.

### *Mammalia*

*Ovis aries/Capra hircus* (Sheep/goat) and *Bos taurus* (Cattle).—In all three periods, the bulk of the bones are attributed to sheep/goat and cattle (Fig. 2). Altogether they constitute 94.04% of the bone assemblage of the Early Roman period (Stratum 4), and an almost identical 94.37% of the Early Islamic assemblage (Stratum 2). In the Late Roman–Byzantine periods (Stratum 3), their percentage drops to 80.23%, a drop which is compensated by the rise in the proportion of pig bones (see below).

The unusually high percentage of cattle bones during the Early Roman period indicated above is noteworthy. These high values may be related to the method of retrieval, since the large fragments of cattle bones are far easier to observe than the small birds and fish bones, but since the same method was applied to all three strata, the value differences seem to be valid. A higher frequency of cattle against sheep/goat bones was identified also in the Early

Roman stratum in the City of David (Horwitz 1996:312), but no explanation was offered.

In the contemporary faunal remains excavated at Ḥorbat 'Eleq (Mount Carmel), Horwitz found an even higher percentage of cattle to sheep/goat bones: 53% to 30% (sample size 409 bones; Horwitz 2000:512). Horwitz (2000:517) explains that “The predominance of cattle in Ḥorbat Eleq assemblages may be a reflection of wealth and status rather than of particular environmental or topographical factors”. However, no particular objects of prestige which can support such a suggestion were found at the site. A similarly high percentage of cattle was also found in nearby Ḥorbat Sumaq, which was occupied in the Late Roman and Byzantine periods. It seems more likely that the sites on Mount Carmel made their living by raising cattle. A major urban market was very close at hand, namely the city of Caesarea Maritima. Yet another settlement with a similarly high proportion of cattle to sheep/goat bones (27% to 66%), and most probably for the same reason, is Kh. Burnat, a Jewish rural settlement near Lod (Lydda; Bouchnik, Bar-Oz and Reich 2006). In the metropolis of Jerusalem, on the other hand, the historical records indicate that there were very few, if any, inhabitants who made their living by herding or agriculture.

Animals for sacrifice and animals for ordinary consumption were most probably

supplied to Jerusalem by the many farmhouses that surround the city (Baruch 1998), and by the pilgrims themselves.

Returning to the data from the Temple Mount excavation, the frequency of cattle bones is three to four times more in the Early Roman period than in later ones, and this requires an explanation. The answer seems quite obvious, since this is the period when activity in the Temple of the God of Israel at the Holy City of Jerusalem is at its zenith. A large number of animals were offered on the altar on a daily basis, with peaks marking the principal holy festivals, the main one being *Pessah* (Passover). Although the primary animals of sacrifice were sheep and doves, cows were also sacrificed, depending on the occasion, the means of the person presenting the sacrifice, and the religious regulation.

On some occasions, the sacrificed animals were totally burnt on the altar. On others, particular parts of specific types of sacrifices were given to the priests on duty, or to members of their family residing in the city who could come to the Temple Mount and help themselves to these priestly offerings that were then consumed at home. Finally, certain parts of particular offerings were the due of the worshipper for private consumption, provided it was done within the city boundaries (e.g., Mishnah *Zebahim* 5, 6–7; 14, 8).

It is likely that in such an urban and rich community, consumption of beef on a regular and secular basis (*Hullin*) would be higher from the outset. The unprecedented high percentage of cattle is therefore of no surprise.

*Sus scrofa* (Pig).— The presence or absence of pig bones in excavations in Eretz Israel has always drawn much interest, due to the implications regarding the question of ethnicity. In a study devoted to this question, Hesse and Wapnish concluded that before the Hellenistic period “It is evident that there is no clear singular relation that ties either pig bone abundance or its absence to social identity that we can use as a marker, because other

factors can produce similar results” (Hesse and Wapnish 1997:253). However, from the Hellenistic period onward the situation changed (Hesse and Wapnish 1997:262), and a correlation was established and maintained. Recent studies by Bouchnik, Bar-Oz and Reich (2006; 2007) have reconfirmed this observation. This correlation is supported by the present finds, as can be expected in an area that is not only inside Jerusalem, but adjacent to the Jewish Temple Mount, and later, to the Muslim Ḥaram al-Sharif. Under both Jewish and Muslim rule, the consumption of pork was prohibited on religious grounds.

Among the bone fragments examined, 34 were identified as pig, 25 of them from one Late Roman–Byzantine locus, L61. The locus is a fill that constituted the foundation of a floor. A considerable amount of coins, all small *minimmi*, were also found in this particular locus. The coins were scattered throughout the earthen fill; hence, they were not a hoard. The entire fill—earth, bones and coins—seems, therefore, to have come from a dump close by.

One pig bone was found in L229, which is one of the loci of fill between the collapsed Herodian stones. It may be an intrusion from a later Roman locus. One other pig bone was found in an Early Roman context, L172, a locus that covers the paved street. This single bone that violates the expected abstinence from pork in the period may have been dropped by non-Jews who frequented the Temple-City, a Roman soldier for example, or a foreign merchant.

The rise in the consumption of pork in the Late Roman–Byzantine period is quite in accordance with the beliefs and dietary habits of the population that was initially pagan and later Christian.

In the subsequent Early Islamic period, there is again a decline in pork consumption, in accordance with the Muslim religious code. The few pig bones discovered may easily have been retrieved from the earthen fills which were dug up from the earlier Late Roman–Byzantine stratum (e.g., L43, an earthen fill which served as a foundation for a mosaic floor).

*Gazella gazella* (mountain gazelle).— The presence of gazelle bones in the Early Roman period is remarkable. Gazelle is identified with *zevi* (צבי) in the Rabbinic literature. It is considered to be pure and therefore, sanctioned for consumption (i.e., *kosher*) by the *Halakha* (religious law), although it could not be sacrificed at the Temple, or brought there as a firstling (בכור).

During the Second Temple period, as in other periods, gazelles were not raised on farms but hunted. The following selection of mishnaic texts will demonstrate their presence as part of everyday life.

“... if a gazelle bought with Second Tithe (*ma'aser sheni*) died, it must be buried with its hide. Rabbi Simeon says: It must be redeemed. If it was bought alive and slaughtered and then contracted uncleanness, it may be redeemed...” (Mishnah, *Ma'aser Sheni* 3, 11).

“The main classes of work are forty save one: ... hunting a gazelle, slaughtering or flaying or salting it or curing its skin, scraping it or cutting it up, ...” (Mishnah, *Shabbat* 7, 2).

“If (on a Sabbath) a gazelle entered into a house...” (Mishnah, *Shabbat* 13, 6).

“...If a man is suspected of breaking the law of Firstlings, none may buy of him the flesh of gazelles or untanned hides” (Mishnah, *Bekhorot* 4, 7).

It should be noted that no bones of the Mesopotamian fallow deer (*Dama mesopotamica*), which is identified with the biblical יהמור were found.

Outside Jerusalem, hardly any deer and gazelle bones were found in either Ḥorbat Sumaq or Ḥorbat 'Eleq (Fig. 6), which is peculiar. Ḥorbat Sumaq is located in the low mountainous rural area where these animals lived in the wild and were hunted; the estate of Ḥorbat 'Eleq is similarly located in a rural mountainous forested area. More game bones would therefore be expected, and their absence leads to the conclusion that hunting was not popular, perhaps because beef was readily available due to the population's occupation as discussed above.

#### *Aves* (birds)

Bird bones are the fourth most abundant type of bones (2.35%) found in Early Roman-period assemblages. Unfortunately we have no breakdown into species such as chickens, pigeons etc. More disturbing is the overall amount, which seems significantly smaller than expected, considering the fact that the impression given by *halakhic* texts is that pigeons were the most frequently sacrificed animal. This apparent bias may be attributed to two reasons: (1) the inadequate method of retrieval, as specified in the introduction, and (2) the poor preservation of bird bones, which are considerably smaller and more fragile than mammalian bones.

The avian bones published for the City of David (Horwitz and Tchernov 1996:299) included four pigeon bones from a Hellenistic-period locus, which constitute 5.6% of all bird bones retrieved in the excavation (Shiloh's Stratum 7). Pigeon bones are totally absent from the loci of the Early Roman period (Shiloh's Stratum 6). Pigeons were extensively raised since the Hellenistic period, and their consumption must have risen constantly until the destruction of Jerusalem in 70 CE. Their absence in the City of David may therefore be attributed to the same causes as at our site.

This bias was corrected by recent studies of the fauna from the city dump of Early Roman Jerusalem (Bouchnik, Bar-Oz and Reich 2004; 2006; Bouchnik et al. 2006). The proportion of bones of small-sized animals was considerably higher in this study (12% birds, fowl; 3.3% fish; see Table 6), with a corresponding reduction in the proportion of the bones of ovicaprines and cattle. Although the sample is smaller, the study seems to represent more accurately the consumption of meat in this particular period.

Outside of Jerusalem, the situation is similar. Although a certain construction at Ḥorbat 'Eleq was identified as a dove-cote (columbarium), no pigeon bones are reported. This shortcoming is almost certainly due to the rough manner of the sieving, as well as to bone preservation.

*Pisces* (Fish)

The assemblage of 3618 animal bones presented here produced only four vertebrae of fish. There is little doubt that this is in part due to the lack of fine sieving. Note, for example, the large number of fish bones retrieved in recent excavations at the City of David (Reich, Shukron and Lernau 2007). All four vertebrae belonged to the posterior region of the spinal column. One bone was poorly preserved and unidentifiable.

Two vertebrae belonged to the family Mugilidae (Mulletts). They could not be identified to the level of species. Mulletts are marine fish, and were probably brought to Jerusalem from the Mediterranean coast, a distance of about 50 km to the west as the crow flies. There are several species of Mulletts in the eastern Mediterranean, the more common being *Mugil cephalus* (Linnaeus 1757; flat-headed gray mullet) and *Liza ramada* (Risso 1829; thin-lipped gray mullet). The larger of the two is *M. cephalus* which may attain a maximum length of about 70 cm and a maximum weight of 8 kg. It feeds on plankton and decayed organic matter at the sea bottom (Goren 1983), and can be caught rather easily in coastal waters with fishing lines, nets and seines. Mulletts have always been highly esteemed for their taste, and their remains were found in many ancient sites (e.g., Reich, Shukron and Lernau 2007; Fradkin and Lernau 2008).

One vertebra was poorly preserved and belonged to a mullet with an estimated standard size—about 45 cm long and weighing about 900 g—was found in L172, a thin layer of soil that covers the stone-paved street underneath the collapsed stones from the upper part of the western wall of the Temple Mount. This layer could be closely dated to the period between 66–70 CE (Reich and Billig 2000a).

The second mullet vertebra was found undamaged below a white mosaic floor of the Umayyad building that dates to the end of the seventh century CE (Palace IV). The estimated length of the fish was approximately 30 cm, and it weighed about 300 g. These fish were

probably brought to the city, processed, dried and salted, or smoked.

The third identifiable vertebra belonged to a large freshwater fish of the family Centropomidae: *Lates niloticus* (Boulenger 1907, Nile perch). It is a caudal vertebra, about the twelfth along the spinal column. The estimated size of this fish is c. 80 cm, weighing approximately 5.5 kg. It was found in the soil underneath the stone pavement of the street, which contained coins of the late first century BCE and the early first century CE, down to the time of Pontius Pilate (Reich and Billig 2000b).

The Nile perch is a voracious predator of small fish, confined to the African continent. It is the largest fish in the Nile, and may attain a length of up to 200 cm (Greenwood 1976). It was imported from Egypt, probably dried or smoked, either by boat through one of the coastal cities, or by caravans using the main coastal road. Remains of this fish have been found in many excavated sites in the Levant (Van Neer et al. 2004), from the Chalcolithic age to the Early Islamic period. They attest to ongoing commercial relations with the Nile Valley in terms of commonplace foodstuffs. The Nile perch has been identified in several other excavations in Jerusalem: in the Iron Age strata at the City of David (Lernau and Lernau 1992; Reich, Shukron and Lernau 2007) and at the Temple Mount (Lernau and Lernau 1989); in the Jewish quarter of the Early Roman period (Horwitz and Lernau 2003); and in an Armenian monastery dated to the seventh century CE (Horowitz, pers. comm.).

The Jewish dietary laws pertaining to fish were considerably fewer than those concerning the consumption of meat, and were certainly adhered to in the Second Temple period (e.g., Mishnah *Bekhorot* 1, 2; *Hullin* 8, 1). The small number of bones in this assemblage stands out clearly against the large number of fish bones dating to Iron Age II that were retrieved in the City of David, even allowing for the meticulous wet-sieving of the latter assemblage (Reich, Shukron and Lernau 2007).

In the decorative motifs of the Early Roman period, representations of fish are also very rare.

Only a single occurrence has been recorded so far in Jerusalem, carved on a stone tabletop in the Upper City (Avigad 1983: Fig. 185:4). In this respect the popularity of fish is also far greater in Iron Age II, when the motif is far more abundant. On personal seals typical of the Iron Age alone, fish appear more than a dozen times (Avigad and Sass 1997: Nos. 25, 35, 53, 153, 202, 215, 238, 246, 386, 549, 553 and 589; Reich, Shukron and Lerna 2007: Fig. 8).

### CONCLUSIONS

In the Early Roman period, Jerusalem was a big metropolis, a Temple-City that attracted large numbers of pilgrims, the one and only city of its kind in the country. The city was also distinct with respect to the occupation of its population. The urban nature of the private houses that were excavated implies that the inhabitants were not engaged directly in agricultural activities, an assumption supported by the silence of the historical records. The repertoire of animal bones retrieved in excavations within the city boundaries has therefore no relation to herding or any other rural activity within the city. Provisions were supplied by numerous small farmsteads and some villages, which were scattered in a wide radius around the city. A great many of these were excavated in recent years (Baruch 1998). The faunal remains found in the city reflect, however, not the suppliers (the farmers), but the demand of the customers in a metropolis and Temple-City. The faunal remains are part of the large amounts of waste created by the various populations in the city. These included the resident population, in the order of magnitude of several tens of thousands, augmented by a pilgrim population, of about the same magnitude, during several short peak-times through the year. Foreign visitors (Jews and non-Jews), as well as soldiers of the Roman army, added their own waste. While faunal remains retrieved from private houses reflect only the local Jewish population, the assemblage discussed here represents all

frequenters of the city, with a predominance of the Jewish pilgrims and the local population.

The dramatic transition from the Early Roman to the Late Roman period, caused by the destruction of the city in 70 CE, changed the ethnic identity of the population. The Jewish inhabitants were slain, exiled, or just fled from the city, and were replaced by a modest number of people related to the Roman army, and their followers. This transition is clearly manifest also in the faunal remains which reflect the dietary and cultic habits of the population. The demand for cattle dropped significantly, as there was no temple and there were no worshippers who occasionally sacrificed cows. Since the new population did not abstain from pork, this replaced, in part, the large amounts of beef consumed previously.

The excavated and examined loci did not permit a distinction between the Late Roman and the Byzantine periods. The city and its population grew steadily through this long period; however, the site under discussion was at the periphery, as the center of the city moved from the Temple Mount to the western part. At a certain time, the population of Jerusalem, like the entire country, adopted Christianity. This change probably had no bearing on the dietary and other habits of the population regarding the use of animals. Hopefully, a site will present itself in the future, in which the strata of these periods are better separated.

At the outset of the Early Islamic period, the larger part of the local population not only witnessed the gains made by Islam, but underwent conversion to a new faith. The center of the city moved again, back to the Temple Mount. The transition from the Byzantine to the Early Islamic period is clearly manifested in a significant drop in the consumption of pork, in accordance with the rules of Islam.

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## NOTE

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were processed by Dalia Hakker-Orion and Omri Lernaü.

## REFERENCES

- Avigad N. 1983. *Discovering Jerusalem*. Nashville.
- Avigad N. and Sass B. 1997. *Corpus of West Semitic Stamp Seals*. Jerusalem.
- Bar-Oz G., Bouchnik R., Weiss E., Weissbrod L., Bar-Yosef Mayer D. and Reich R. 2007. "Holy Garbage": A Quantitative Study of the City-Dump of Early Roman Jerusalem. *Levant* 39:1–12.
- Baruch E. 1998. The Economic Hinterland of Jerusalem in the Herodian Period. *Cathedra* 89:41–62 (Hebrew; English summary, p. 197\*).
- Bouchnik R., Bar-Oz G. and Reich R. 2004. Animal Bone Remains from the City Dump of Jerusalem from the Late Second Temple Period. In E. Baruch and A. Faust eds. *New Studies on Jerusalem* 10. Ramat Gan. Pp. 71–80 (Hebrew; English summary, p. 50\*).
- Bouchnik R., Bar-Oz G. and Reich R. 2006. Faunal Remains from the Late Second Temple Period: A View from the Village of Burnat and Jerusalem City Dump Assemblages. In E. Baruch and A. Faust eds. *New Studies on Jerusalem* 12. Ramat Gan. Pp. 109–122 (Hebrew; English summary, p. 16\*).
- Bouchnik R., Bar-Oz G. and Reich R. 2007. Jewish "Fingerprint" on Animal Bone Remains from the Late Second Temple City-Dump of Jerusalem. In E. Baruch, A. Levy-Reifer and A. Faust eds. *New Studies on Jerusalem* 13. Ramat Gan. Pp. 73–85 (Hebrew; English summary, pp. 21\*–22\*).
- Bouchnik R., Bar-Oz G., Shukrun E. and Reich R. 2006. More Bones from the City Dump of Jerusalem from the Late Second Temple Period. In E. Baruch, Z. Greenhut and A. Faust eds. *New Studies on Jerusalem* 11. Ramat Gan. Pp. 175–185 (Hebrew; English summary, pp. 40\*–41\*).
- Fradkin A. and Lernaü O. 2008. The Fishing Economy at Caesarea. In K.G. Holum, J.A. Stabler and E.G. Reinhardt eds. *Caesarea Reports and Studies: Excavations 1995–2007 within the Old City and the Ancient Harbor* (BAR Int. S. 1784). Oxford. Pp. 189–200.
- Goren M. 1983. *Fresh Water Fishes of Israel: Biology and Taxonomy*. Tel Aviv.
- Greenwood P.H. 1976. A Review of the Family Centropomidae (Pisces, Perciformes). *Bulletin of the British Museum (Natural History) Zoology* 29(1):78–81.
- Hesse B. and Wapnish B. 1997. Can Pig Remains be Used for Ethnic Diagnosis in the Ancient Near East? In N.A. Silberman and D. Small eds. *The Archaeology of Israel: Constructing the Past, Interpreting the Present*. Sheffield. Pp. 238–270.
- Horwitz L.K. 1996. Faunal Remains from Areas A, B, D, H and K. In D.T. Ariel and A. De Groot eds. *Excavations at the City of David 1978–1985 Directed by Yigal Shiloh IV: Various Reports* (Qedem 35). Jerusalem. Pp. 302–317.
- Horwitz L.K. 2000. The Animal Economy of Horvat 'Eleq. In Y. Hirschfeld. *Ramat Hanadiv Excavations: Final Report of the 1984–1998 Seasons*. Jerusalem. Pp. 511–526.
- Horwitz L.K. and Lernaü O. 2003. Animal Remains. In H. Geva. *Jewish Quarter Excavations in the Old City of Jerusalem Conducted by Nahman Avigad 1969–1982 II: The Finds from Areas A, W and X-2; Final Report*. Jerusalem. Pp. 493–495.
- Horwitz L.K. and Lernaü O. 2006. Animal Remains. In H. Geva. *Jewish Quarter Excavations in the Old City of Jerusalem Conducted by Nahman Avigad 1969–1982 III: Area E and Other Studies; Final Report*. Jerusalem. P. 315.
- Horwitz L.K. and Tchernov E. 1989. Subsistence Patterns in Ancient Jerusalem: A Study of Animal Remains. In E. Mazar and B. Mazar. *Excavations in the South of the Temple Mount: The Ophel of Biblical Jerusalem* (Qedem 29). Jerusalem. Pp. 144–154.
- Horwitz L.K. and Tchernov E. 1996. Bird Remains from Areas A, B, D, H and K. In D.T. Ariel and A. De Groot eds. *Excavations at the City of David 1978–1985 Directed by Yigal Shiloh IV: Various Reports* (Qedem 35). Jerusalem. Pp. 298–301.

- Horwitz L.K., Tchernov E. and Dar S. 1990. Subsistence and Environment on Mount Carmel in the Roman-Byzantine and Medieval Periods: the Evidence from Kh. Sumaqa. *IEJ* 40:287-304.
- Lernau H. and Lernau O. 1989. Fish Bone Remains. In E. Mazar and B. Mazar eds. *Excavations in the South of the Temple Mount: The Ophel of Biblical Jerusalem* (Qedem 29). Jerusalem. Pp. 155-161.
- Lernau H. and Lernau O. 1992. Fish Remains. In A. De Groot and D.T. Ariel eds. *Excavations at the City of David 1978-1985 Directed by Yigal Shiloh III: Stratigraphical, Environmental, and Other Reports* (Qedem 33). Jerusalem. Pp. 131-148.
- Reich R. and Bar-Oz G. 2006. The Jerusalem City Dump in the Late Second Temple Period: A Quantitative Study. In E. Baruch and A. Faust eds. *New Studies on Jerusalem* 12. Ramat Gan. Pp. 83-98 (Hebrew; English summary, pp. 14\*-15\*).
- Reich R. and Billig Y. 1998. Jerusalem, Robinson's Arch: The Archaeological Park of the Second Temple Period. *ESI* 18:88-90.
- Reich R. and Billig Y. 2000a. Excavations near the Temple Mount and Robinson's Arch, 1994-1996. In H. Geva ed. *Ancient Jerusalem Revealed* (reprinted and expanded ed.). Jerusalem. Pp. 340-352.
- Reich R. and Billig Y. 2000b. A Group of Theatre Seats Discovered near the South-Western Corner of the Temple Mount. *IEJ* 50:175-184.
- Reich R. and Billig Y. 2000c. Jerusalem, Robinson's Arch. *ESI* 20:135\*.
- Reich R. and Billig Y. 2003. Another Flavian Inscription near the Temple Mount of Jerusalem. *'Atiqot* 44:243-247.
- Reich R. and Shukron E. 2003. The Jerusalem City-Dump in the Late Second Temple Period. *ZDPV* 119:12-18.
- Reich R., Shukron E. and Lernau O. 2007. Recent Discoveries in the City of David, Jerusalem. *IEJ* 57:153-169.
- Van Neer W., Lernau O., Friedman R., Mumford G., Poblome J. and Waelkens M. 2004. Fish Remains from Archaeological Sites as Indicators of Former Trade Connections in the Eastern Mediterranean. *Paléorient* 30/1:101-148.