

**ANIMAL BONES FROM EXCAVATIONS AT THE
CONSERVATORIUM SITE, 1998-99**

**Sarah Colley
School of Archaeology, A14
University of Sydney
NSW 2006.**

**Report to Casey & Lowe Associates for the NSW Department
of Public Works and Services.**

February 2000

1.0	INTRODUCTION	1
2.0	GUIDE TO THE ANIMAL BONES CATALOGUE (APPENDIX C) 1	
3.0	DISTRIBUTION OF BONES ACROSS THE SITE	4
4.0	FREQUENCY OF ANIMAL TYPES (WHOLE SITE)	4
5.0	DISCUSSION OF SELECTED CONTEXTS	4
5.1	Alluvial Deposits (#1004 & 1005) (c. 1800 - c.1815?)	5
5.2	Cistern (#603-611) (pre 1850s) and Garden Beds with Rubbish (#901-942) (c.1845-1894)	6
5.3	Rubbish Dump (#850) (c. 1850 -c.1900)	8
5.4	Rubbish Dump (#719) (early 20th Century)	8
6.0	BODY PART REPRESENTATION OF CATTLE, SHEEP AND PIG	8
6.1	Sheep Body Parts	9
6.2	Cattle Body Parts	11
6.3	Pig Body Parts	14
6.4	Summary of sheep, cattle and pig gross body parts analysis	14
7.0	SIGNIFICANCE OF THE BONES AND POTENTIAL FOR FURTHER RESEARCH	15
8.0	BIBLIOGRAPHY	16
9.0	TABLES	17
	Table 1. Catalogue Numbers Used	17
	Table 2. Conservatorium. Total number of bone fragments from each context	18
	Table 3. Conservatorium. Types of animal bones identified (whole site).	19
	Table 4. Conservatorium. Major types of animal present in main contexts.	19
	Table 5. Conservatorium. Relative representation of animal type for main contexts.	20
	Table 6. Conservatorium. Types of animals in #1004 and #1005.	20
	Table 7. Conservatorium #1004 & #1005. Main animals body parts.	21
	Table 8. Rank order of animals in Cistern & Garden Beds.	22
	Table 9. Conservatorium. Gross Body Part Composition - Sheep (% fragments).	23
	Table 10. Conservatorium. Gross Body Part Composition - Cattle (% fragments).	24
	Table 11. Conservatorium. Gross Body Part Composition - Pig (% fragments).	25

1.0 INTRODUCTION

This report presents and discusses data about 2969 fragments of animal bone which were recovered from Casey & Lowe's 1998-99 excavations at the Sydney Conservatorium of Music site (Casey & Lowe 2000). The bone data are presented in the artefact catalogue (Appendix C) and are also accessible in electronic form from Casey & Lowe Associates.

This report has the following aims:

1. To provide a guide to how the catalogue was produced to assist other researchers who may wish to access or use the data for further research
2. To present a general descriptive overview and discussion of the animal bones recovered from the site to highlight any interesting or unusual patterns in the data.
3. To outline the research potential of the animal bones from the site and further work that could now be carried out

2.0 GUIDE TO THE ANIMAL BONES CATALOGUE (APPENDIX C)

Animal bones from the Conservatorium were identified using faunal reference collections held by the department of Prehistoric and Historical Archaeology, University of Sydney. Sydney University students taking an undergraduate practical class (ARPH 2508 'Animal Bones') assisted with sorting and identification.

Data were recorded and coded using a system developed by Sarah Colley (see Appendix A) which allows for a wide range of potential information to be recorded for each bone fragment. However, only selected information was recorded about the bones from the Conservatorium based on the nature and significance of the particular archaeological context and of the bones themselves.

All bones from the site were examined and recorded as described below. For most Contexts, easier bones were identified by students as part of their class, while more fragmentary or unusual bones were identified by Sarah Colley. Peter White kindly assisted with the identification of less common birds and small mammals. Jo Thompson also helped greatly with managing the collections during the analysis and assisting Sarah Colley during the class. All data were checked by Sarah Colley before being entered onto the database.

Bones from the Cistern (Contexts #604 - 611, but excluding Context #603 at the top of the Cistern) were selected for more detailed analysis. With the help of the students all bone from these contexts were bagged individually and assigned a Catalogue Number. This facilitated sorting and detailed examination of bones by Type and Anatomy Code. For example, each student, or group of students, was asked to identify and record one type of bone (e.g. Cattle Tibias, Sheep Femurs) from the Cistern. This allowed similar bones to be easily compared with each other, and enabled even very small fragments to be more easily identified. It also reduced the risk of mixing bones up, or losing context information, given the large number of inexperienced students involved in handling the material. The considerable extra cost in time involved in writing out labels and placing each bone fragment in a separate bag was offset by the numbers of students available to carry out this work.

Students were also asked to examine their type of bone and draw and make notes about any obvious patterns in fragmentation, articulation or cut marks which might be related to butchery. These data will be used by Sarah Colley for further research into butchery patterns, in conjunction with further physical examination of the bones themselves.

Context Codes

The three fields (Context#, Area and Spit) are the same as those used for all material recovered from the site (see Casey & Lowe 2000).

Catalogue Number

It is common practice in Australian historical archaeology when studying non-faunal material (such as ceramics, metal, glass etc.) to give each individual item its own catalogue number. This requires that the catalogue number be marked on the item, or that each item be placed in a separate bag with its own individual label. Such a system allows individual finds to be easily and safely stored and/or physically compared with finds from other archaeological contexts without losing original context information.

The benefits to be gained by treating faunal remains (bones, shells) in this way are not normally justified by the considerable extra costs involved in time, materials and storage space. For the Conservatorium site, only some animal bones (as explained below) were given individual catalogue numbers and placed in separate bags with their own label. In most cases the bones from each context were removed from their original bag only to identify and record them. After recording, the individual fragment was returned to its original bag, together with all other bones from the same context, without assigning individual catalogue numbers. Thus for many contexts, bones are bagged by their archaeological context number only. Should anyone need to locate a particular bone from these contexts they would need to find the bag and sort through the contents to identify the particular bone fragment on the basis of data shown in the database. Some of the bags (those that were individually bagged in the cistern) were given catalogue numbers.

To facilitate further study of butchery patterns and less common animals, some bones from the Conservatorium site were bagged and labeled separately with their own individual catalogue Code/Number as listed in Table 1.

Number of bone fragments (Number Code/ Total Fragments)

This records a simple count of the number of bone fragments of each type.

Type, genus or species of animal (Type Code)

Bones have been identified as far as possible to species, genus or family. No attempt was made to identify goat, and it is possible, but unlikely, that some bones listed as sheep may in fact be goat.

Where a bone is listed as 'Unidentified' this indicates that it could not be identified to family, genus or species (as appropriate) given the limits of the reference collections. However it seems likely that such bones could be identified to type given more resources (e.g. better reference collections, access to specialist expertise).

Where a bone is listed as 'Unidentifiable' it is considered that the bone is so fragmentary that it is unlikely to be identified, even with more resources.

Anatomical element or body part (Anatomy Code)

Bones were identified as far as possible and practical to body part as listed in the Bone Coding System (Appendix A). While vertebrae were identified as far as possible to type (e.g. cervical, thoracic, lumbar) no attempt was made to assign these bones to their exact location along the spinal column (e.g. 1st, 2nd, 3rd etc). Likewise, no attempt was made to assign other multiple bones (e.g. ribs, phalanges, pig metapodials, carpals and tarsals) to their exact location. Such information may be relevant to detailed study of butchery practices (see below), but this was not

recorded at this stage. Bones from the Cistern have been separated into anatomy type, with each bone given a catalogue number and bagged separately, precisely to facilitate further study of this kind.

Which side of the body, if applicable (Handedness Code)

This information was not recorded for the Conservatorium bone. Such data is sometimes useful for calculating estimates of the Minimum Number of Individuals, which was not attempted here.

Which part and proportion of the whole bone survives (Fragmentation Code)

Directional nomenclature follows von den Driesch (1976:15, Figure 3).

Erosion, burning etc (Condition Code)

Most of the bone from the site was in excellent condition. This information was only recorded in those rare instances where the condition of the bone was in some ways unusual (e.g. burned, very eroded).

Number of fragments with obvious cut marks and/or location and type of cut mark (Number Butchered & Cut Marks Code)

The 'Number Butchered' or the 'Cut Mark Code' column of the database has been used to record the presence (C) or actual number of obvious cut and/or chop marks on each bone. These data simply flag the presence or absence of obvious cut marks on the bones.

The Bone Coding System allows for more detailed recording and coding of the location, direction and type of visible cut marks on a bone. However this information has not been systematically recorded at this stage. The material from the Cistern has been selected for further detailed research into recording and interpretation of cut marks and butchery patterns and it was therefore considered premature to attempt a detailed butchery recording at this stage. The research aims to further refine methods of recording and interpreting butchery patterns on bones from historic sites in the Sydney area, using the Conservatorium as an example.

Epiphyseal fusion (Epiphyseal Fusion Code)

This was recorded in all cases where it was possible to do so, to provide a rough indication of whether mature or immature animals were killed. However further research would be needed to make more precise statements about the age of death of the animals, and this is not considered to be warranted at this stage given the context and significance of the material (see below).

Tooth Wear - Age information (Tooth Wear Code)

Making meaningful statements about the age of animals on the basis of tooth eruption and wear requires large samples of fairly complete jaw bones. Such bones were very rare at the Conservatorium, and these data were not recorded as the results would have little meaning.

Weight

Bones were weighed separately by Robyn Stocks. In most cases the weights are for the total number of bones from each context, rather than for individual fragments.

Comments (Comments Column)

This field was used to record any other relevant information that could not be coded in the other fields (e.g. conjoins, tentative identifications of less common animals).

3.0 DISTRIBUTION OF BONES ACROSS THE SITE

A total of 2969 fragments of animal bone were recovered from approximately 60 separately recorded archaeological contexts. This represents less than half the number of contexts on the site. Bone derived mostly from rubbish dumps, the fill of various structures and features, and alluvial and other deposits (Table 2).

The quantity of bone recovered varied between contexts. For the purposes of this discussion some contexts have been grouped together, namely Contexts #603-611 (which all derive from the fill of the Cistern) and Contexts #901-942 (which are all Garden Beds). Taken together Cistern Contexts #603-611 produced the largest bone sample (1689 fragments) while the Garden Beds (#901-942) produced the next largest (512 fragments).

Only three others contexts (#1004, #1005 & #719) produced more than 100 bone fragments each. A further two contexts (#850 & #684) produced over 50 fragments. Over twenty contexts produced 10 fragments or less.

Some differences in the quantity of bone recovered from different contexts will reflect the way bones were thrown away and/or were moved around and redeposited by subsequent activities on the site. Other differences reflect excavation and recovery methods. For example, most contexts were hand-excavated which is likely to have resulted in loss of many smaller and less obvious bone fragments. Only the Cistern was sieved. In general the bones from most contexts were well-preserved with very little sign of erosion, so differential preservation and weathering is probably not a significant factor in inter-site spatial patterning of bones in this case.

4.0 FREQUENCY OF ANIMAL TYPES (WHOLE SITE)

Table 3 lists the types of animal bones identified from the whole site (by fragment number and percent). Overall, the bone assemblage is dominated by fragments of sheep (39.5), then cattle (25.7), and unidentified mammal (20.2) which between them comprise over 85% of the sample.

The 'unidentified mammal' category probably comprises mainly fragments of the bones of the most common animals (cattle, sheep and pig) which were too small to be identified further.

The next most common categories are 'Less Common Animal' (4.3) and pig (4), bird (including chicken) (2.2) and fish (1.6). All other identified groups comprise less than 1% of the total assemblage.

5.0 DISCUSSION OF SELECTED CONTEXTS

Preliminary analysis of the bone data has been conducted with the following aims:

- To highlight any particularly significant or interesting aspects of the bones from major contexts.
- To comment on differences, if any, between bones from the Cistern and the Garden Beds.¹
- To comment on the presence or absence of commonly edible meat portions in different contexts which might reflect differences in activities, diet or social status.²

¹ These were two contexts possibly specifically associated with the use of the Stables by its occupants and which related to their disposal of rubbish. They also provided a reasonable sized collection of bone. (Information from Mary Casey).

² This links into two of the research questions. Firstly the early period deposits (1004, 1005) may assist in addressing questions about the foodways, diet and technological strategies of the first colonists (Research Question 3) through the analysis of archaeological evidence for food production in the early colony. The

The following contexts are considered to merit individual discussion due to their archaeological significance, and/or the fact they produced a reasonable number of bone fragments:

- Alluvial deposits #1004 & #1005
- Cistern #603-611
- Garden Beds #901-942
- Rubbish Dump #850
- Rubbish Dump #719

Table 4 shows which types of animals are present in each of these contexts, while Table 5 shows actual numbers of bones (fragments and).

The bones of the following animals occur in all these contexts: cattle, sheep, bird (including chicken, other domestic fowl and other bird) and fish (snapper and other types) and 'unidentified mammal'. Pig occurs in all contexts except #850.

Of less frequent types, dog and rabbit only occur in the Cistern, while rat is only present in the Garden Beds. Cat bones were found in three contexts (Cistern, Garden Beds, and Rubbish Dump #719).

While the much wider range of animal types present in both the Cistern (13/17) and the Garden Beds (14/17) could reflect real differences in behaviour and/or dumping activities, but they are more likely to reflect the larger sample sizes from these contexts and differential preservation,

5.1 Alluvial Deposits (#1004 & 1005) (c. 1800 - c.1815?)

The bones from these two contexts (Table 5) are interesting because the deposits are thought to date to the initial period of European settlement (Phase 2) and to derive from the Bakehouse (c.1800 - c. 1815). They are both alluvial deposits (meaning the material in them has been moved from elsewhere by water). They are currently presumed to have been re-deposited from within the immediate vicinity.

All of the deposits from #1004 and #1005 were dry sieved through 5 and 2.5mm sieves and excavated within a 1 m square grid.

Unfortunately the small number of bones recovered from these contexts (#1004 - 147 fragments and #1005 - 137 fragments) limits the conclusions which can be drawn. In #1004 the commonest bones are sheep (54), unidentified mammal (27) and cattle (11). Pig is less well-represented (4). Chicken, unidentified fish and less common animal are represented by one bone each.

This pattern is slightly different in #1005 where the main type is unidentified mammal (38) followed by sheep and pig (24% and 23% respectively). The next most common animal is fish (snapper and unidentified - many of which could be snapper) at 10%. Cattle is the least common type (5).

later period deposits should help address Research Question 5: to analyse archaeological evidence to 'understand the lifeways of the Stables and Government House occupants which should shed light on how this hierarchy was maintained and mediated through material culture. The evidence for hierarchical behaviour should be understood in the context of the defining of Australia in the late nineteenth century as an egalitarian and prosperous society'. (Information from Mary Casey).

The most significant features of the bones from these contexts is the relatively high percentage of unidentified mammal (#1005 - 38% and #1004 - 27) compared to other contexts on site. Only the Cistern (#603-611) - discussed below - comes anywhere near these figure (at 25.2). This suggests that the bones from these contexts are more fragmentary and broken up (and therefore cannot be so easily identified) than bones from other contexts.

This conclusion is borne out by the kinds of body parts which were recovered in #1004. As shown in Table 7 the most commonly occurring skeletal parts for cattle, sheep and pig are teeth, small long bone fragments and unidentified fragments. Other skeletal parts are represented in only very small numbers. Because they are made of dentine and enamel, teeth survive much longer in the ground and in adverse preservation conditions, than any other bones. Most other cattle, sheep and pig bones have been broken into small fragments. This pattern points to poor preservation conditions for #1004.

This pattern of skeletal part representation is not obvious for #1005. 13 fish bones were recovered from #1005 and 2 from #1004, which may also reflect slightly different preservation conditions between the two contexts. Surprisingly, very little bone (c. 20 fragments in total) from either #1004 or #1005 was noticeably eroded.

The only other notable feature of these contexts was that all 32 pig bones from #1005 were head bones (21 teeth, 3 jaw and 8 skull fragments). No other body part was represented. Further inspection of the bones and the data would be needed to determine if these bones all originated from the same pig's head.

Summary of #1004 and #1005

- **Relatively small sample sizes limit conclusions**
- **Very high proportion of 'unidentified fragments' in both contexts indicates poor preservation**
- **High proportion of teeth, small long bone and unidentified fragments in #1005 also indicates poor preservation**
- **All pig bones from #1005 are from the head (teeth, jaws, skull) and may be one pig's head (but needs further work to confirm)**
- **Cattle has an unusually low occurrence in #1005**

5.2 Cistern (#603-611) (pre 1850s) and Garden Beds with Rubbish (#901-942) (c.1845-1894)

These two contexts will be discussed together as useful comparisons can be made between them, as discussed above.

The Cistern (Contexts #603-611) appears to have been infilled by 1845 by which time the building was being used as the Government Stables. It is significant as one of the few deposits with large quantities of artefacts, and additionally was one of the few that had expensive ceramics that may have been used by the Governor and his family.

Contexts #901-942 were a group of Garden Beds dated between 1845 and c.1894, which are thought to have been contemporary with each other. They produced quantities of domestic refuse which may have been dumped there by the occupants of the Stable. By this time the beds were located behind, and screened from public view by, a garden wall built by 1841. This presumably enabled the area to be used for more domestic activities (such as dumping rubbish) than when it had previously been open to public view by people walking in the Domain.

All soil from the Cistern fill was sieved through 2mm and 5mm meshes and bones sorted from the residues. Bones from the Garden Beds were recovered by hand-excavation.

These contexts contained the largest quantities of bone from the site (Table 4) with 1674 fragments from the Cistern, and 512 fragments from the Garden Beds.

The Cistern and the Garden Beds both contained a much wider range of animal types than any other contexts (Table 4). In Table 8 these types are listed in rank order of frequency for the Cistern and the Garden Beds. The commonest type of bone in both contexts is sheep, followed by cattle and then unidentified mammal. In this respect the bones from the Cistern and the Garden Beds are similar, except for the unusually large quantity of unidentified mammal fragments in the Cistern (422 - 25.5) compared to the Garden Beds (31 - 6.1). This pattern has probably arisen because bones from the Cistern were recovered by sieving, which usually results in the recovery of a much higher percentage of small unidentified fragments. Bones from the Garden Beds were excavated by hand with the result that smaller bones and unidentifiable fragments are more likely to have been missed.

Another notable difference between the Cistern and the Garden Beds is the high proportion of bones categorised as 'Less Common Animal' in the Cistern. Of 129 'Less Common Animal' bones identified from the whole site, 114 (or around 88) were recovered from the Cistern. The Garden Beds only produced 8 fragments (1.6) in this category.

The category 'Less Common Animal' consists of a range of bones which could not be identified with the available reference collections. They are thought to be mostly small mammals (which could include native Australian fauna) and birds. Most of the bones were complete or near-complete post-cranial elements, for which no match could be found. Twenty-six small mammal metapodials from the Cistern currently classified as 'Less Common Animal' are probably rabbit (as indicated in the 'Comments' column of the database), but as the available rabbit reference skeleton had no feet bones, it was not possible to confirm this identification. Three large bird femurs (BR36, 37 & 38) are thought likely to be goose (*Anser anser*), but this cannot be confirmed without checking against a goose skeleton, which was not readily available.

The high proportion of these bones in the Cistern compared to the Garden Beds and other contexts probably relates to recovery methods (eg. sieved vs. unsieved) and to the larger sample size of bones from the Cistern which is therefore more representative of the range of animals which were eaten or died and were buried at the site.

Given that the 'Less Common Animal' category contains a range of different small bird and mammal species, the Cistern therefore contains a much wider overall range of animal types than do the Garden Beds. The Cistern also contains much more chicken than the Garden Beds (or any other context) and it is the only context which contained rabbit and dog. The Cistern therefore represents a much richer and more varied collection of animals than the Garden Beds (or any other context). The Garden Beds in turn contain a richer and more varied collection of animal types than any other context. European rat is only found in the Garden Beds.

Differences between the Cistern and the Garden Beds in cattle, sheep and pig body-part representation (which may relate to meat processing and consumption) are discussed separately below.

Summary (Cistern & Garden Beds comparison)

- **These contexts produced the largest bone samples from the site (Cistern - 1674 fragments; Garden Beds - 512 fragments)**

- **In both contexts the commonest animals were sheep, then cattle, then unidentified mammal (probably sheep/ cattle/ pig)**
- **The Cistern had an unusually high quantity of unidentified mammal bone - probably because the soil was sieved to recover bone**
- **Both contexts contained a much wider range of animal types than any other contexts**
- **The Cistern contains a much richer and more varied collection of animals than the Garden Beds or any other context (when 'Less Common Animals' are taken into account)**
- **The Cistern contains more chicken than the Garden Beds**
- **Rabbit and dog only occur in the Cistern (and no other contexts)**
- **European rat only occurs in the Garden Beds**
- **(Cattle, sheep and pig body part comparisons - see below)**

5.3 Rubbish Dump (#850) (c. 1850 -c.1900)

This was a large rubbish dump associated with the occupation of both Government House and the Stables, dated to the second half of the 19th century. It produced 61 bone fragments (Table 5), which while larger than many other contexts on site, is still a relatively small sample from which it is impossible to draw many conclusions. The commonest bone type was sheep (37 fragments - 61) followed by cattle (18 fragments - 30). No pig was recovered at all and only a few fragments of other types (2 unidentified mammal, 2 unidentified fish, 1 unidentified bird and 1 'Less Common Animal').

Summary of #850

- **Conclusions limited by small sample size**
- **Sheep then cattle predominate**
- **No pig recovered, and only a few other bones**

5.4 Rubbish Dump (#719) (early 20th Century)

This was a large rubbish dump dated from late 19th to 20th century. It is only significant in that it contained more bones (105 fragments) than most other contexts (Table 5). Again the sample is dominated by sheep (55 fragments - 52) and cattle (37 fragments - 35). Three fragments of pig were collected, and a few other bones. The main research value of the bones from this context is to provide a comparative 'late' collection of animal bones against which to compare and hopefully characterise 'earlier' collections in the development of more efficient approaches to further study of animal bones from sites in urban Sydney (see below).

Summary of #719

- **Late date and small sample size mean the main value is for further methodological research**
- **Sheep then cattle predominate**

6.0 BODY PART REPRESENTATION OF CATTLE, SHEEP AND PIG

Most of the bones from the site presumably represent a mixture of butchery and food waste (eg. cattle, sheep, pig, chicken and other fowl, fish and possibly rabbit). Many of the bones of the major domesticates (cattle, sheep, pig) have clearly visible cut marks indicating they were butchered. Other bones (eg. dog, cat, rat, less common animals) presumably represent pets or wild animals, the remains of which have become incorporated into archaeological deposits either because they were deliberately buried or died there.

A comprehensive study of butchery and meat cuts is beyond the scope of this report. However data for cattle, sheep and pig body parts have been analysed in a preliminary way, following a system devised by Dominic Steele in his discussion of animal bones excavated at Orange Court House (1999) where he grouped anatomical elements into five basic body parts. The bone recording system used here allowed the Conservatorium bone data to be re-grouped in the same way (as shown in Appendix A - Anatomy Codes).

While Steele's categories are too broad to reflect more subtle details of early colonial butchery and meat consumption practices, they nevertheless provide a quick and easy indicator of the relative economic and dietary rank of the bones which indicates where further research effort could be usefully directed.

The categories are as follows:

Extremity

- metapodials, carpals, tarsals, sesamoids, astragalus, calcaneus and phalanges
- limited dietary value
- primarily butchery waste

Cranial

- skull fragments, horn cores, mandible, maxillae, loose teeth and hyoid
- low dietary value
- primarily butchery waste

Trunk

- vertebrae, ribs and costal cartilage
- medium to high dietary value

Forequarter

- scapula, humerus, radius and ulna
- high dietary value

Hindquarter

- pelvis, femur, patella and tibia
- high dietary value

Tables 9, 10 and 11 show these gross body parts for cattle, sheep and pig for all major contexts. Similar data from Steele's analysis of an c.1890s cess-pit deposit at Orange Courthouse have been included for comparison (Steele 1999). Contexts #1004, #1005, Cistern and Garden beds have been selected for further discussion at this stage and results for these contexts are presented in graphical form in Figures 1, 2 and 3.

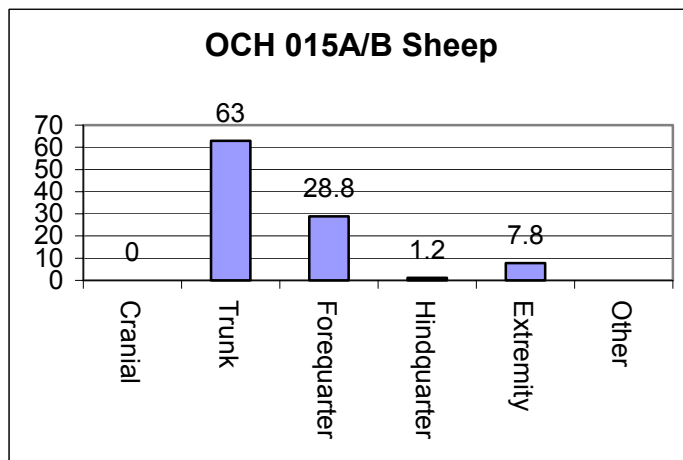
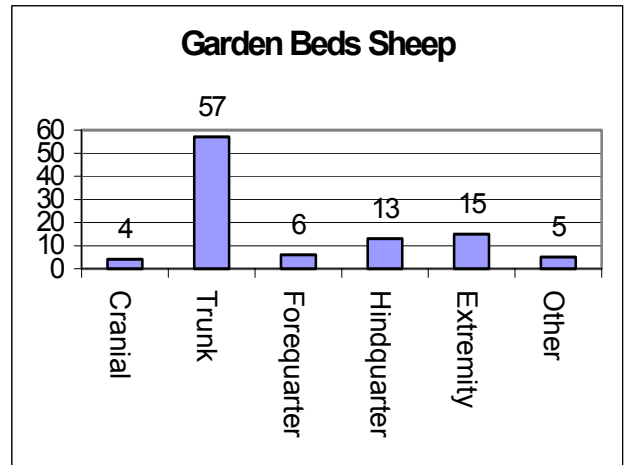
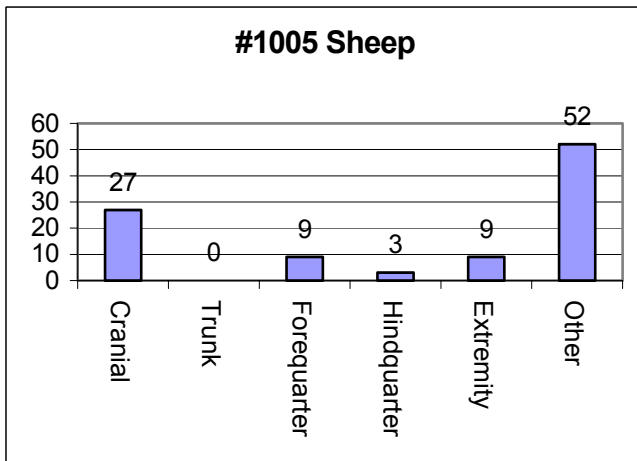
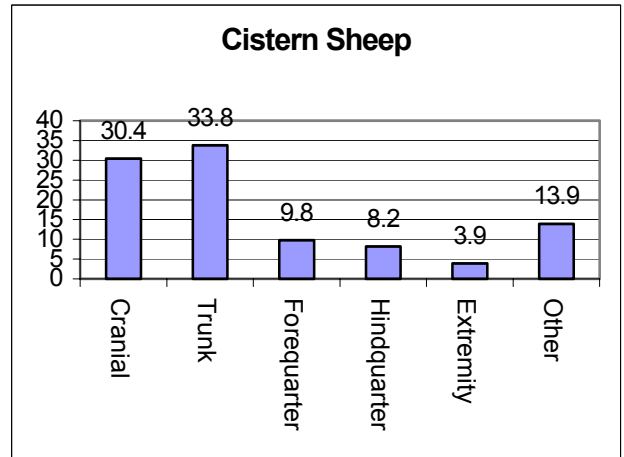
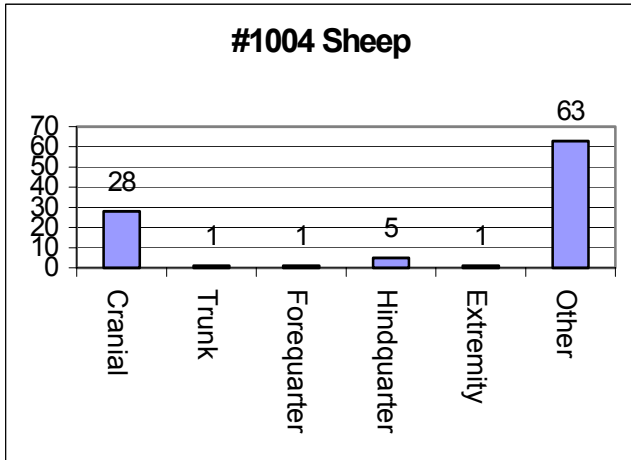
6.1 Sheep Body Parts (Table 9, Figure 1)

The pattern of sheep body parts varies noticeably between contexts.

#1004 and #1005 are basically very similar, with Cranial and Other (mostly unidentified fragments) bones predominant. As discussed above, this pattern probably reflects small sample sizes and poor presentation conditions rather than being a direct indicator of people's behaviour or consumption patterns.

The Cistern and Garden Beds both contained bones from all parts of the sheep skeleton, indicating that a wide range of mutton and lamb meat cuts were dumped there.

Figure 1. Sheep gross body parts



A high proportion of Cranial bones occurs in the Cistern deposit. These represent butchery waste and/or low-quality meat. In contrast, sheep head bones are very rare in the Garden Beds.

Extremity bones (mostly feet bones from butchery waste and/or low quality meat cuts) are very rare in the Cistern (3.9% of total fragments), and slightly more common in the Garden Beds (15% of total fragments).

There is a very high proportion of Trunk bones (ribs and vertebrae) in the Garden Beds (57% of all sheep bones). Trunk bones are also well-represented in the Cistern (33.8). As vertebrae and ribs occur more frequently in the sheep skeleton than most other bones, and because they are usually fragmented or cut into smaller sections, this pattern is not so surprising, but it may genuinely indicate a preference for a limited range of meat cuts (see discussion of cattle below).

These patterns are slightly different to those observed by Steele at Orange Courthouse where in a comparatively large sample of 4164 sheep bones from the 015A/B Cess Pit, not a single Cranial bone was found, and only 1.2 % of the sample were Extremity (feet) bones.

6.2 Cattle Body Parts (Table 10, Figure 2)

Body part representation varies between contexts, and differences are more marked than for sheep.

The sample size for #1004 (7 fragments) and #1005 (16 fragments) is so small as to make discussion of any patterns meaningless.

Bones from every major area of the cattle body were found in both the Cistern and the Garden beds, but there are notable differences in their relative proportions .

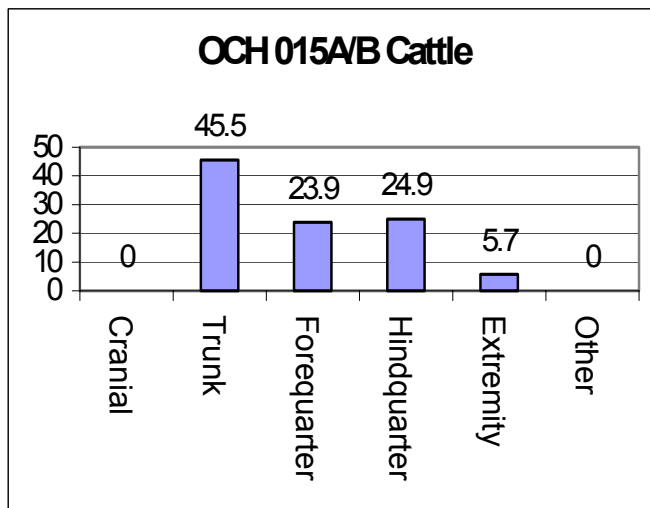
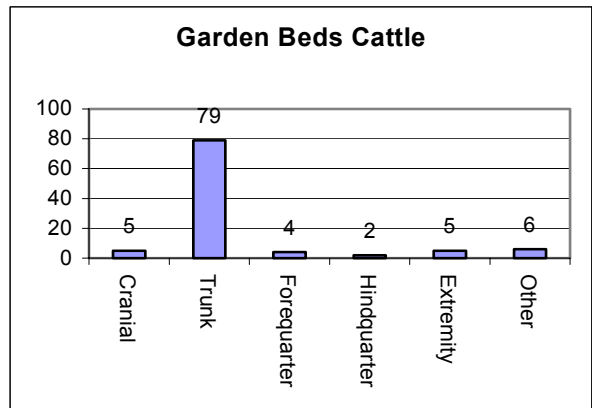
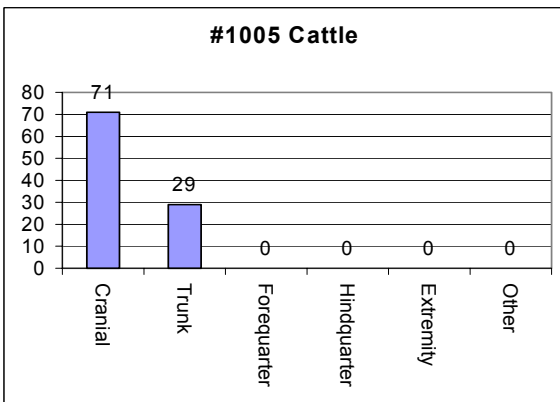
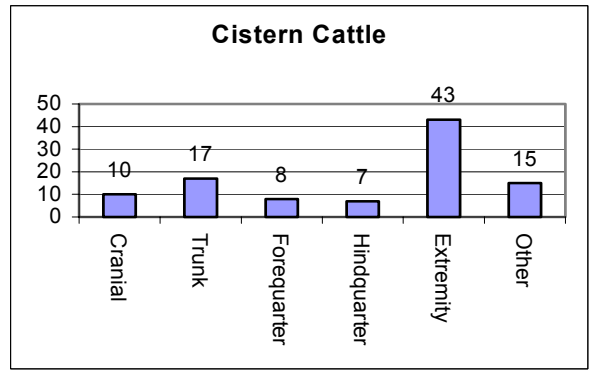
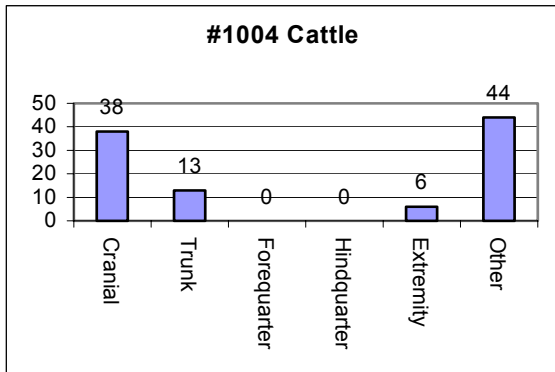
The most frequent cattle bones in the Cistern are 'Extremity' (i.e. carpals, tarsals, phalanges and metapodials) from the feet. Such bones contain almost no meat and today would be regarded as classic butchery waste. Cattle feet bones are a source of gelatine and can be used to manufacture glue, and in the past they were cooked and eaten in various ways. A large number of cattle feet bones was recovered from a privy in the First Government House North Outbuilding (the fill of which is thought to date to the early 19th century) (Colley 1987:12; Proudfoot *et al* 1991:168-9). These and other similar data could usefully be compared further with the Conservatorium Cistern data to see whether this is a consistent patterns indicative of early 19th century beef production and consumption.

The vast majority of cattle bones from the Garden Beds were Trunk (70) (i.e. ribs and vertebrae). While small numbers of bones from other body parts were also found, the pattern suggests the deposit primarily contains butchery waste from a specific and limited range of beef meat cuts. There is no particular evidence that much if any butchery waste was deposited in the garden beds.

Further detailed analysis of the exact bones involved (eg. which particular type of vertebrae and ribs from which portion of the skeleton), together with any visible cut and saw marks, would allow more to be said about exactly which types of meat were eaten. In traditional modern British butchery practice, for example, there is considerable variation in the way butchers divide a carcass into individual portions of beef and exactly which bones are involved (Gerrard 1950:239-40). The category 'Trunk' is simply too broad to say more at this stage.

The pattern of cattle gross body parts in the Garden Beds share some similarities to that for the Orange Court House cess-pit in that the assemblage is dominated by 'Trunk' elements. However in the OCH case there are no cattle cranial bones at all, and Forequarter and

Figure 2. Cattle gross body parts



Hindquarter bones are much more strongly represented than in the Garden Beds. This highlights a different pattern of diet between the two sites, which is hardly surprising given their very different nature. This could usefully be investigated further.

6.3 Pig Body Parts (Table 11, Figure 3)

In general, far fewer pig bones were found at the site than either sheep or cattle and the small sample sizes in many individual contexts limits the inferences that can be drawn.

Gross body part patterns for pig are very similar for #1004 and #1005. As discussed above, all 32 pig bones from #1005 are from the head (including teeth) and may represent a single animal, although further research needs to be done to confirm this.

As only 14 fragments of pig bone were recovered from the Garden Beds, no reliable conclusions can be drawn. Bones from all parts of the body were represented with Extremity (feet bones) the most common.

Bones from all parts of the pigs body were also found in the Cistern, with Cranial and Extremity bones most common. Pig have more feet and toe bones than either cattle or sheep so their relatively high frequency in the sample is to be expected. More interesting is the relatively low proportion of Trunk bones (ribs and vertebrae) compared to Forequarter and Hindquarter bones. These butchery and consumption patterns merit further detailed study.

6.4 Summary of sheep, cattle and pig gross body parts analysis

Pig

- Too few pig bones were found to make reliable statements about butchery at this level of analysis
- Pig bones from the Cistern (the largest sample - 59 fragments) derive from all major areas of the skeleton, with head and feet bones most common.

Overall variation between contexts in body parts found

- In general, the pattern of sheep body part representation across the site is more consistent than for cattle (where the pattern varies more markedly between contexts)

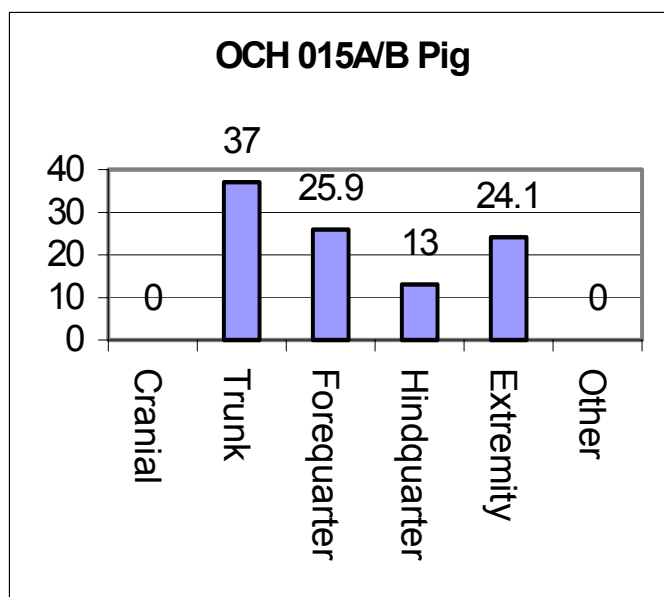
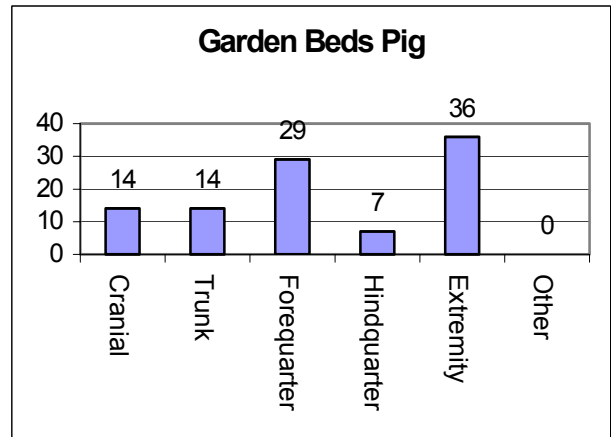
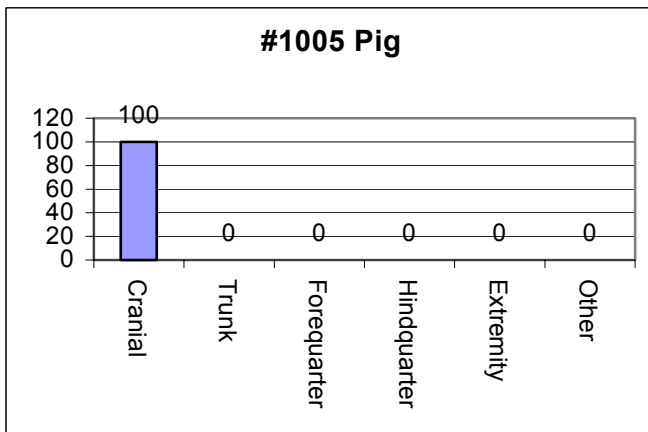
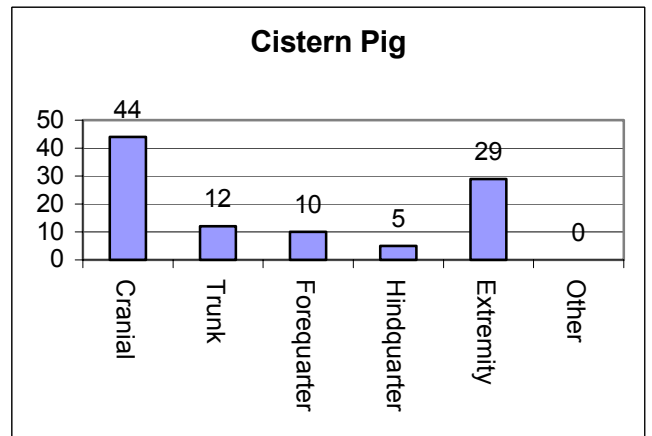
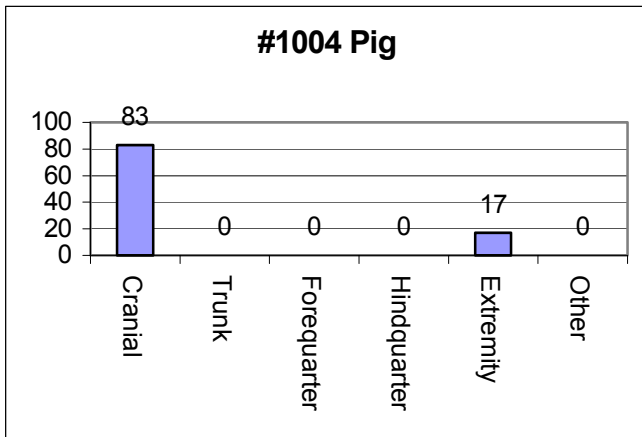
Contexts #1004 & #1005

- Sample sizes for Contexts #1004 and #1005 are too small to interpret sensibly. The kinds of sheep parts found in these two contexts is broadly similar (heads and feet predominate), probably caused by poor bone preservation.

Cistern

- The Cistern contained bones from all parts of the sheep and cattle carcass, indicating consumption of a wide range of lamb and beef meat cuts.
- The Cistern contained a very high proportion of sheep head bones (indicating butchery waste and/or low quality meat).
- The Cistern contained very few sheep feet bones (also indicative of butchery and or low quality meat). This seemingly contradicts the high number of head bones and merits further investigation.
- The Cistern contained a very high proportion of cattle feet bones, indicative of butchery waste and/or low quality meat. This merits further comparison with similar finds from First Government House.

Figure 3. Pig gross body parts



Garden Beds

- The Garden Beds contained bones from all parts of the sheep and cattle carcass again indicating consumption of a wide range of meat cuts, but there are indications that some cuts were favoured over others.
- Very few sheep head bones were found in the Garden Beds, although 15% of the total fragments were feet bones. Again this apparent discrepancy between heads and feet merits further investigation.
- The very high proportion of Trunk elements (ribs and vertebrae) for both cattle and sheep compared to other body parts may indicate a preference for particular meat cuts and merits further investigation.

7.0 SIGNIFICANCE OF THE BONES AND POTENTIAL FOR FURTHER RESEARCH

To state that the people who lived at the site of the Sydney Conservatorium ate beef, mutton, pork and chicken supplemented by fish and a few other meats is hardly remarkable. We already know, in very general terms at least, what kinds of meat people ate in 19th and early 20th century Sydney, what kinds of pets they kept, and what other animals were common around Sydney harbour at that time.

Selected bones are valuable for public education and display as they can be used to illustrate aspects of day-to-day life at the site of the Conservatorium. Bones provide tangible evidence of butchery activities, scraps from meals, people's pets and other animals which lived (and died) around the site.

The main research value of the animal bones from the Conservatorium, in conjunction with study of other significant collections and further documentary research, is to gain greater understanding of the development of animal husbandry, butchery practices, diet and environmental conditions in urban Sydney than can be obtained from study of historical records along.

Compared to Europe and North America very little systematic research has been conducted into animal bones from historic archaeological sites, and even less has been published. The Conservatorium collection and the data in the catalogue has real value for developing better ways of studying this kind of material and making more sensible decisions about what kinds of bone collections merit further detailed research, and which are not so important and need only be recorded in a very superficial way, if at all.

It is clearly not worth studying animal bones simply to make broad statements about 18th-early 20th century diet which we already know from historical evidence (eg. that people ate beef, mutton and some pork, fish and chicken). Or at least, such statements can be made by a very quick and cursory examination of bone assemblages, and do not require detailed, time-consuming and expensive quantification of hundreds of bone fragments. The interest of historic sites animal bones lies in the detail, for example in butchery patterns which reflect the development and increasing regulation of meat production, marketing and consumption (reflecting increasing urbanisation), in the continuing use of wild resources in increasingly urban areas, and in dietary differences related to class and ethnicity.

Such a study requires additional research input which is beyond the scope of the current project. Nevertheless the bone database from the Conservatorium presented here offers a valuable resource with which to pursue these research agendas.

8.0 BIBLIOGRAPHY

- Casey & Lowe Associates 2000 *Archaeological Investigation, Conservatorium of Music site 1998-2000*, for the NSW Department of Public Works and Service.
- Colley, S.M. 1987. *Analysis of Bones from First Government House*, Sydney. Report to Heritage and Conservation Branch, NSW Department of Planning.
- Gerrard, F. 1950. *The Book of the Meat Trade*. London: Caxton Publishing.
- Proudfoot, H. A. Bickford, B. Egloff & R. Stocks, 1991. *Australia's First Government House*. Sydney: Allen & Unwin & NSW Department of Planning.
- Steele, D. 1999. *Archaeology at Orange Court House. A Report on the Faunal Evidence*. Report for Dana Mider Consultant Historical Archaeologist. Dominic Steele Consulting Archaeology, 64 Newington Road, Marickville, NSW 2204.
- von den Driesch, A. 1976. *A guide to the measurement of animal bones from archaeological sites*. Peabody Museum Bulletin 1. Harvard University: Peabody Museum of Archaeology and Ethnology.

9.0 TABLES

Table 1. Catalogue Numbers Used

The following major body parts from cattle and sheep from Cistern Contexts #604 - 611 (but excluding Context #603 at the top of the Cistern) were assigned catalogue Code/Numbers as follows:

Cistern Cattle Bones Catalogue Number Codes:

CA (Metacarpals)
 CB (Metatarsals)
 CC (Metapodials)
 CD (Humerus)
 CE (Femur)
 CF (Tibia)
 CG (Pelvis)
 CH (Calcaneus/ Astragalus/ Patella)
 CI (First Phalanx)
 CJ (Second Phalanx)
 CK (Third Phalanx)
 CL (Scapula)
 CM (Carpal/ Tarsal)
 CN (Hyoid)
 CO (Vertebrae)
 CP (Radius)
 CQ (Ulna)
 CR (Rib)
 CV (Skull/ Jaw/ Teeth)

Cistern Sheep Bones Catalogue Number Codes:

A (Radius/ Ulna)
 B (Humerus)
 C (Tibia)
 D (Skull)
 E (Astragalus/ Calcaneus/ Carpal/ Tarsal)
 F (Jaw)
 G (Ribs)
 H (Pelvis)
 I (Vertebrae)
 J (Femur)
 K (Scapula)
 L (Metarsus/ Metacarpus/ Metapodial/ Distal Epiphysis Metatarsus/ Distal Epiphysis Metacarpus/ Distal Epiphysis Metapodial)
 M (Loose Teeth)
 N (Phalanges)

Other less diagnostic skeletal elements from the Cistern (eg. fragments, long-bone fragments) were not assigned an individual catalogue number but were bagged by Context Number only.

For all contexts (including the Cistern) individual bone fragments of the following types of animal were also given a catalogue Code/Number as follows:

BR = Bird	PG = Pig
CT = Cat	RA = Rabbit
DG = Dog	RT = Rat
F = Fish	LC = Less Common Animal (Not further identified)

Table 2. Conservatorium. Total number of bone fragments from each context.

Context No	Total Fragments	Context Name	Area	Phase Number	Phase Description
603-611	1689	Cistern	B	5	c.1860s?
901-942	512	Fill of garden beds	West	4.2	Garden beds 1845-c1894
1004	147	Alluvial deposit - dark grey	VH	3.1	Stables construction
1005	137	Alluvial deposit - yellow sand	VH	3.1	Stables construction
719	105	Fill - rubbish dump	C	5?	Pre - 1917
850	61	Rubbish dump	Rlwy	5	Late 19th to 20th
684	56	Fill of trench outside fenced area	D	5	
670	46	Fill - Fill of box drain	A	3.2	
1034	44	Deposit - ash layer	VH	6	c1913
601	23	General unstratified - imported into site, sample of diagnostics kept.	A,B,C	6	20th century - 1917
662	22	Surface - Road deposit throughout Area B	B	3.1, 3.2	Road 2
672	16	Fill of rock cut channel in SW corner of Road 2	B	3.2	Road 2 - construction
721	14	Deposit	B	4?	
876	13	Deposit - general number initially given for black deposit	West	4.2	
666	11	Deposit slope - black deposit beneath dish drain	B	3.1	c1821 - Fill stage 1
898	10	Soil from prehistory test trenches deposit = to 666	C	3.1	
1011	8	Fill in well in 1007 (Courtyard well)	VH	5/6?	?
657	7	Deposit - Black silty sand	A	3.1	c1821 - Fill stage 1
720	7	Red sand - in spoon drain	B	3.2	
971	7	Fill of 972 (Cut - linear trench)	West	4.2	Garden beds 1845-c1894
830	6	Deposit - red sand	G	4?	Post - c.1845?
874	6	Deposit - mixed fill underneath footpath - unstratified	West	US	
621	5	A1 Horizon	C	3.1	c1821 - Fill stage 1
790	2	Deposit - black above cut garden beds	A	3	Pre - c.1845
1029	2	Deposit - black ash	VH	3.1	Site clearing
1053	2	Deposit	VH	6	Con. construction c1913
1027	2	Deposit	VH	3?	Post-Bakehouse/Stables construction
801	1	Fill of 802 (Cut - Garden Terrace 3)	A	3	Pre - c.1845
623	1	A1 Horizon	C	3.1	c1821 - Fill stage 1
1003	1	Courtyard packing	VH	3.3	Stables 1817-1821
963	1	Fill of 967 (Fill of 968 - Cut Linear Trench)	West	4.2	Garden beds 1845-c1894
1046	1	Deposit - rubble	VH	?	?
1024	1	Deposit	VH	2/3.3	Post-Bakehouse/Stables construction
1001	1	Deposit	VH	3.1?	
646	1	Deposit - Redeposited red sand	A	5/6?	Fill - Stage 2
962	1	Test Trench	West	TT	
Total	2969				

Table 3. Conservatorium. Types of animal bones identified (whole site).

Common Name	Scientific Name	No. Frags	%
Mammals			
Cattle	<i>Bos sp.</i>	764	25.7
Sheep	<i>Ovis sp.</i>	1172	39.5
Pig	<i>Sus scrofa</i>	118	4
Dog	<i>Canis domesticus</i>	1	0
Cat	<i>Felis sp.</i>	8	0.3
Rabbit	<i>Oryctolagus sp.</i>	16	0.5
European Rat	<i>Rattus sp.</i>	24	0.8
Unidentified Mammal		599	20.2
Unidentifiable Mammal		11	0.4
Birds			
Chicken	<i>Gallus sp.</i>	51	1.7
Domestic Fowl (not chicken)		7	0.2
Unidentified Bird		9	0.3
Fish			
Snapper	<i>Chrysophrys auratus</i>	11	0.4
Unidentified Fish		25	0.8
Unidentifiable Fish		12	0.4
Unknown			
Less Common Animal		129	4.3
Unidentified Animal		12	0.4
Total		2969	99.9

Table 4. Conservatorium. Major types of animal present in main contexts.

Common Name	Alluvial Deposit #1004	Alluvial Deposit #1005	Cistern #603-611	Garden Beds #901-942	Rubbish Dump #850	Rubbish Dump #719
Cattle	✓	✓	✓	✓	✓	✓
Sheep	✓	✓	✓	✓	✓	✓
Pig	✓	✓	✓	✓		✓
Dog			✓			
Cat			✓	✓		✓
Rabbit			✓			
European Rat				✓		
Unidentified Mammal	✓	✓	✓	✓	✓	✓
Unidentifiable Mammal				✓		
Chicken	✓		✓	✓		✓
Dom. Fowl (not Chicken)			✓	✓		
Unidentified Bird			✓	✓	✓	
Snapper		✓	✓	✓		
Unidentified Fish	✓	✓	✓	✓	✓	
Unidentifiable Fish						
Less Common Animal	✓		✓	✓	✓	
Unidentified Animal				✓		✓
Total Bone Frags	147	137	1674	512	61	105

Table 5. Conservatorium. Relative representation of animal type for main contexts.

Common Name	Cistern #603-611	Rubbish Dump #719	Rubbish Dump #850	Garden Beds #901-942	Alluvial Deposit #1004	Alluvial Deposit #1005
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
Cattle	439 (26.2)	37 (35)	18 (30)	105 (20.5)	16 (11)	7 (5)
Sheep	562 (33.6)	55 (52)	37 (61)	291 (56.8)	79 (54)	33 (24)
Pig	59 (3.5)	3 (3)	-	14 (2.7)	6 (4)	32 (23)
Dog	1 (0.1)	-	-	-	-	-
Cat	1 (0.1)	1 (1)	-	6 (1.2)	-	-
Rabbit	16 (1)	-	-	-	-	-
European Rat	-	-	-	24 (4.7)	-	-
Unidentified Mammal	422 (25.2)	6 (6)	2 (3)	31 (6.1)	40 (27)	52 (38)
Unidentifiable Mammal	-	-	-	5 (1)	-	-
Chicken	45 (2.7)	1 (1)	-	3 (0.6)	2 (1)	-
Domestic Fowl (not chicken)	1 (0.1)	-	-	5 (1)	-	-
Unidentified Bird	6 (0.4)	-	1 (2)	2 (0.4)	-	-
Snapper	6 (0.4)	-	-	3 (0.6)	-	1 (1)
Unidentified Fish	2 (0.1)	-	2 (3)	3 (0.6)	2 (1)	12 (9)
Unidentifiable Fish	-	-	-	-	-	-
Less Common Animal	114 (6.8)	-	1 (2)	8 (1.6%)	2(1)	-
Unidentified Animal	-	2 (2)	-	12 (2.3)	-	-
Total	1674 (100%)	105 (100%)	61 (101%)	512 (100%)	147 (100%)	137 (100%)

**Table 6. Conservatorium. Types of animals in #1004 and #1005.
Alluvial Deposits #1004 & #1005 - Types of animals found.**

Common Name	Scientific Name	#1004 No	#1004 %	#1005 No	#1005 %
Cattle	<i>Bos sp.</i>	16	11	7	5
Sheep	<i>Ovis sp.</i>	79	54	33	24
Pig	<i>Sus scrofa</i>	6	4	32	23
Dog	<i>Canis domesticus</i>	-	-	-	-
Cat	<i>Felis sp.</i>	-	-	-	-
Rabbit	<i>Oryctolagus sp.</i>	-	-	-	-
European Rat	<i>Rattus sp.</i>	-	-	-	-
Unidentified Mammal		40	27	52	38
Unidentifiable Mammal		-	-	-	-
Chicken	<i>Gallus sp.</i>	2	1	-	-
Domestic Fowl (not chicken)		-	-	-	-
Unidentified Bird		-	-	-	-
Snapper	<i>Chrysophrys auratus</i>	-	-	1	1
Unidentified Fish		2	1	12	9
Unidentifiable Fish		-	-	-	-
Less Common Animal		2	1	-	-
Unidentified Animal		-	-	-	-
Total		147	99	137	100

Table 7. Conservatorium #1004 & #1005. Main animals body parts (No. of Fragments)

#1004	Teeth	Frag s	L. Frag s	Other	Total
Cattle	6	7	-	3	16
Sheep	20	39	10	10	79
Pig	5	-	-	1	6
Total	31	46	10	14	101

#1005	Teeth	Frag s	L. Frag s	Other	Total
Cattle	5	-	-	2	7
Sheep	4	7	10	12	33
Pig	21	-	-	11	32
Total	30	7	10	25	72

Key: Frags = unidentified fragments. L. Frags = fragments of long bones (not further identified).

Table 8. Rank order of animals in Cistern & Garden Beds.**Cistern - Rank order (%)**

Common Name	No	%
Sheep	562	33.6
Cattle	439	26.2
Unidentified Mammal	422	25.2
Less Common Animal	114	6.8
Pig	59	3.5
Chicken	45	2.7
Rabbit	16	1
Unidentified Bird	6	0.4
Snapper	6	0.4
Dog	1	0.1
Cat	1	0.1
Domestic Fowl (not chicken)	1	0.1
Unidentified Fish	2	0.1
European Rat	-	-
Unidentifiable Mammal	-	-
Unidentifiable Fish	-	-
Unidentified Animal	-	-
Total	1674	102

Garden Beds - Rank order (%)

Common Name	No	%
Sheep	291	56.8
Cattle	105	20.5
Unidentified Mammal	31	6.1
European Rat	24	4.7
Pig	14	2.7
Unidentified Animal	12	2.3
Less Common Animal	8	1.6
Cat	6	1.2
Unidentifiable Mammal	5	1
Domestic Fowl (not chicken)	5	1
Chicken	3	0.6
Snapper	3	0.6
Unidentified Fish	3	0.6
Unidentified Bird	2	0.4
Dog	-	-
Rabbit	-	-
Unidentifiable Fish	-	-
Total	512	101

Table 9. Conservatorium. Gross Body Part Composition - Sheep (% fragments).

	#1004	#1005	Cistern	Garden Beds	#850	#719	OCH 015A/B
Cranial	28	27	3-.4	4	-	9	-
Trunk	1	-	33.8	57	5	36	63
Forequarter	1	9	9.8	6	32	27	28.8
Hindquarter	5	3	8.2	13	49	18	1.2
Extremity	1	9	3.9	15	14	4	7.8
Other	63	52	13.9	5	-	5	-
TOTAL	99	100	100	100	100	99	100
No. of Frags	79	33	562	291	37	55	4164

#1004 = Alluvial Deposit (c.1800 -c.1815?)

#1005 = Alluvial Deposit (c. 1800-c.1815?)

Cistern = #6-3-611 (c. 1850s)

Garden Beds = #9-1-942 (c.1845-c.1894)

#850 = Rubbish Dump (c.1850-1900)

#719 = Rubbish Dump (late 19th-early 20thC)

OCH -15A/B = Orange Court House (Cess Pit - c.1890s)

Table 10. Conservatorium. Gross Body Part Composition - Cattle (% fragments).

	#1004	#1005	Cistern	Garden Beds	#850	#719	OCH 015A/B
Cranial	38	71	10	5	11	-	-
Trunk	13	29	17	79	44	46	45.5
Forequarter	-	-	8	4	22	16	23.9
Hindquarter	-	-	7	2	22	8	24.9
Extremity	6	-	43	5	-	8	5.7
Other	44	-	15	6	-	22	-
TOTAL	101	100	100	101	99	100	100
No. of Frags	16	7	439	105	18	37	215

#1004 = Alluvial Deposit (c.1800 - c.1815?)

#1005 = Alluvial Deposit (c. 1800 - c.1815?)

Cistern = #6-3-611 (c. 1850s)

Garden Beds = #9-1-942 (c.1845-c.1894)

#85- = Rubbish Dump (c.1850 -1900)

#719 = Rubbish Dump (late 19th-early 20thC)

OCH -15A/B = Orange Court House (Cess Pit - c.1890s)

Table 11. Conservatorium. Gross Body Part Composition - Pig (% fragments).

	#1004	#1005	Cistern	Garden Beds	#850	#719	OCH 015A/B
Cranial	83	100	44	14	-	-	-
Trunk	-	-	12	14	-	-	37
Forequarter	-	-	10	29	-	33.3	25.9
Hindquarter	-	-	5	7	-	33.3	13
Extremity	17	-	29	36	-	33.3	24.1
Other	-	-	-	-	-	-	-
TOTAL	100	100	100	100	-	99.9	100
No. of Frags	6	32	59	14	-	3	55

#1004 = Alluvial Deposit (c.1800 - c.1815?)

#1005 = Alluvial Deposit (c. 1800 - c.1815?)

Cistern = #6-3-611 (c. 1850s)

Garden Beds = #9-1-942 (c.1845-c.1894)

#85- = Rubbish Dump (c.1850 -1900)

#719 = Rubbish Dump (late 19th-early 20thC)

OCH -15A/B = Orange Court House (Cess Pit - c.1890s)