

**Preliminary results from the investigation of the vertebrate remains from  
Castagna, Sicily (site code: CA94)**

by

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**Summary**

*This report gives preliminary results of the investigation of the vertebrate assemblage from Castagna, Sicily. As the assemblage is so small the results should be treated with due caution. The assemblage yielded little information about the occupation of the site. However, the assemblage contained an unusually high proportion of deer bones, of which three were possibly the first identifications of fallow deer (cf. Dama dama L.) remains from Roman Sicily (and one of very few from Italy as a whole). Deer hunting was perhaps a high status activity, which seems to contradict the evidence from the main domesticated species indicating (on very limited evidence) that this was a lower status producer site (i.e. farmstead).*

*In addition, a pit fill (Context E5) contained the remains of at least 99 individual amphibians (probably toad (Bufo sp(p).) of one age group, suggesting this was a naturally formed 'pit-fall trap' assemblage.*

**Keywords:** SICILY; CASTAGNA; ROMAN; 1ST - 6TH CENTURIES AD; OCCUPATION DEPOSITS; VERTEBRATE REMAINS; FALLOW DEER; RED DEER; AMPHIBIANS

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### **Introduction**

The site of Castagna in the *comune* of Cattolica Eraclea (province of Agrigento) lies on a gently rounded hill approximately 5 km east of the ancient Greek city of Heraclea Minoa. The site is thought to have consisted of a farmstead with some ancillary buildings covering little over a hectare. It is set in rich agricultural land overlooking the valley of the river Platani. The main building was thought to have been erected in the 1st century AD and altered twice before the roof collapsed in c. AD 180/200. The building evidence suggests that this was a comparatively low status farmstead but the finds, including a considerable number of higher status pottery sherds and artefacts, seem at odds with this interpretation (Wilson 1996).

The vertebrate remains discussed here comprised the assemblage recovered during the 1994 season of excavation. The dating of the deposits containing bone is as follows:

**Phase 3** - c. 50-100 AD, mostly occupation deposits associated with the second building.

**Phase 4** - c. 100-150 AD, mostly occupation deposits associated with the second building.

**Phase 5/6** - ?C5th-C6th AD, compacted layers above the destroyed building.

**Phase 6** - Late 5th - early 6th centuries AD, a large pit dug through the layers

sealing the building.

### **Methods**

All the vertebrate remains discussed below were examined by the author in the field, during the 1995 season. Semi-quantitative data were recorded regarding the amount of butchery, fresh breakage and burning. An overall record was made of the state of preservation, colour and appearance of the broken surfaces ('angularity') of the bones.

Fragments were identified to species, where possible, in the field. Any material for which species identification was uncertain was brought back to Britain for comparison with specimens in the reference collection at the Environmental Archeology Unit. For the separation of sheep and goats, the criteria set out by Boessneck (1969) and Payne (1985) were used in addition to comparative material. Fragments were recorded using the 'diagnostic zones' method described by Dobney and Reilly (1988).

Fragments not identifiable to species were grouped into categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal 1 (assumed to be caprovid, pig or small cervid) and medium-sized mammal 2 (assumed to be dog, cat, hare or similar sized animal).

All measurements were taken in accordance with the guidelines set out by von den Driesch (1976) and additional

measurements of caprovid bones were taken following guidelines given in Dobney *et al.* (Forthcoming). Withers heights for the sheep were calculated using the formulae given by Teichart (1975).

Age at death was calculated in two ways: (a) using dental eruption and attrition; and (b) epiphyseal fusion data.

Tooth wear stages were recorded according to Grant (1982) for pigs and cattle and Payne (1973, 1987) for caprovids, whilst age categories were calculated following O'Connor 1991. The state of epiphyseal fusion was described as fused, unfused, juvenile (unfused and porous) or neonatal (as juvenile but also of very small size). The fusion data were analysed using the categories set out by O'Connor (1984).

In addition, detailed evidence of pathology and butchery was recorded for each fragment, where present.

## Results

The hand-collected bone assemblage amounted to a total of 2317 fragments, of which 1578 were identified to species or species group. However, this figure is artificially inflated by the fact that 1399 identifiable fragments of amphibians were recovered from a single pit. The numbers of fragments are given in Table 1. As this material is from one season's excavations only, and the assemblage is extremely small, little in the way of meaningful analysis could be undertaken. Detailed results are given in the Appendix.

### *Preservation*

Overall preservation was variable, most fragments being recorded as 'fair' or 'poor'. Colour was a uniform fawn and angularity (appearance of broken surfaces) slightly battered. Burning, butchery and dog gnawing were each present on less than 10% of the assemblage.

Fresh breakage was evident on 10-20% of fragments but some individual contexts had as much as 20-50%. This high incidence is most likely due to a combination of the brittleness of the fragments and the dry and firm nature of the deposits containing them.

### **The main domesticates**

The small size of the assemblage limits the value of any quantitative analysis. Thus only broad observations can be made. However, from Table 1 it can be seen that caprovid bones were the most abundant overall, with pig (*Sus f. domestic*), the second most frequent species.

Analysis of the skeletal element representation indicated that the remains of the major domestic species may represent a mixture of primary butchery waste and domestic refuse.

It has been assumed that the pig remains were from domestic stock rather than wild boars because all the bones were from small individuals. Determination of sex was undertaken on the nine pig canines recovered from Castagna. Three female and four male canines were identified together with two 'probable male' deciduous canines.

Age at death data were very limited but the material included juvenile, subadult and

adult individuals.

### *Biometry*

In total 27 fragments were measurable (see Appendix), mostly single fragments of any one species. As little directly comparable material has been published, discussion of the measurements is necessarily limited.

Eleven caprovid fragments were measurable and the values were similar to those for bones from Vaste (Albarella 1995). Estimated withers heights (Teichart 1975) were calculated for two bones and gave values of 56 cm from a goat metatarsal and 61 cm from a sheep metatarsal.

### **Cervidae**

A total of 19 cervid fragments was recovered from Castagna, mostly from Phase 4 (Table 1). Sixteen fragments could be identified to species, three as fallow deer (*Dama dama* L.) and 13 as red deer (*Cervus elaphus* L.). It is worth noting that the 'large mammal' category of unidentifiable material is also likely to include some cervid fragments. Analysis of the skeletal element representation showed that all the cervid fragments were from head and lower limb elements, indicating primary butchery waste (preparation of carcasses).

### *Age at death*

All cervid fragments (with the relevant zones present) had fused epiphyses. However, half (three) of the mandibles contained deciduous premolars. Assuming that cervid epiphyses fuse in approximately the same order as those of

domestic ungulates, all the fused fragments fall into the early and intermediate fusion categories, corroborating the age at death information gleaned from the mandibles. It appears therefore that only young individuals were represented.

### **Hare**

Fifteen fragments of hare (*Lepus* sp.) were recovered from Castagna, most from Phase 6. The 12 fragments from Context E5 may well be from one individual. The elements represented include humerus, metatarsals and phalanges. The humerus shows evidence of butchery in the form of a chop across the anterior surface of the shaft and knife marks around the distal end both anteriorly and posteriorly, which suggest that it was waste from food preparation.

### **Birds**

A total of six bird fragments was recorded. Four chicken (*Gallus* f. domestic) fragments were identified, together with a barn owl (*Tyto alba* (Scopoli)) and a small columbid (?Turtle Dove - cf. *Streptopelia turtur* (L.)). The identifications of two of the chicken fragments were not certain and these remains have been recorded as cf. *Gallus* f. domestic.

### **Amphibians and Reptiles**

A total of 1399 amphibian bones was recovered from a pit fill (Context E5). It is possible to distinguish between frog and toad bones using the ilium, and all 143 ilia in the assemblage were identified as toad (*Bufo* sp(p)). It is therefore presumed that

the remaining elements are also likely to be toad.

As all skeletal elements were represented in roughly the correct proportions (allowing for taphonomic factors adversely affecting the more fragile cranial bones), it is suggested that these 1399 fragments represent the remains of whole individuals. This suggests that the pit acted as a 'pitfall trap', once the toads had fallen in, they were unable to escape.

By measuring the dorso-ventral height of the iliac body immediately anterior to the acetabulum, it is possible to investigate the age structure of the sample (as outlined by O'Connor 1988). This measurement could be taken on a total of 135 ilia. The results (Figure 1) show one strong, but broad, peak between 3.0 and 3.8 mm and a tail below 2.8 mm, indicating that these individuals most likely belong to one broad (adult) age group.

Twenty one fragments of tortoise (*Testudo* sp.) carapace (not identified to species because comparative specimens were unavailable) were recovered from two contexts (20 from E5, 1 from F9). Four of these fragments were burnt. No fragments of tortoise other than carapace were recovered which is interesting in view of the fact that carapaces were sometimes used as containers. If this was the case at Castagna it may explain the burnt fragments; the carapaces were perhaps placed too near a fire whilst being used as a container.

## Discussion

The small size of the assemblage limits its interpretative value. Also, the assemblage

is likely to be biased towards the larger fragments as no sieving was undertaken on the site. However, some interesting points have emerged. Little can be said about the site whilst it was occupied since the amount of material recovered from deposits associated with occupation was extremely small. This may reflect the fact that rubbish was not usually disposed of within an inhabited building but at some distance from it.

The differing types of deposit from Phases 3/4 (occupation deposits) and 5/6 (post-abandonment) may explain differences in their animal bone assemblages, although again the numbers are too small for detailed analysis.

### *Preservation*

The overall uniformity of preservation suggests that the vertebrate remains are mostly from primary deposits, with little mixing or redeposition of material. However, the incorporation of the bones into the deposits was not necessarily rapid, as some degree of dog gnawing and battering of the fragments was observed.

### *Main Domesticates*

The assemblage from Castagna was composed chiefly of caprovids (both sheep and goats), with pigs, cattle and deer in lower frequencies. This is not unexpected as caprovids are well adapted to the climate and terrain of Sicily, whereas cattle are not suited to the hilly, dry conditions. Given that, during the Roman period, Sicily had more extensive forests (Scramuzza 1937), pigs would have also thrived.

In the Mediterranean region flocks of mixed sheep and goats are not unusual and the high proportion of goats in the assemblage perhaps suggests this was the case at Castagna. Given the lack of cattle, the sheep and goats may have been kept for their milk as well as a source of meat, hair and hide. Goats are also better browsers on scrub than sheep.

The presence of juvenile and subadult individuals and primary butchery waste suggests that this assemblage possibly represented a producer site i.e. a farmstead. However, the assemblage was too small to take this further.

### *Cervidae*

The deer remains at Castagna are interesting: deer were numerous at the site but are now extinct in Sicily (Chapman 1975, 61). This extinction of deer is probably a result of the extensive deforestation of the island that took place in the post-medieval period. During the Roman period Sicily was famed as a source of wood (Scramuzza 1937), so there was doubtless cover and food for deer.

Fallow deer may have been kept in parks since Roman times and there is some evidence this was the case in Sicily (Chapman 1975, 49). As was the case in medieval Britain fallow deer may have been a symbol of high status. One of the mosaics in the large Roman villa at Piazza Armerina depicts richly dressed, mounted, hunters driving deer (probably red deer) into a net, reinforcing the idea that deer hunting was a high status activity.

The cervid remains represent primary butchery waste, mostly from young

individuals. If venison was being imported as joints or dressed carcasses, the non meat-bearing parts of the carcass would not usually be found. This may suggest that the inhabitants of Castagna were butchering deer for consumption elsewhere, or were at least dumping the primary waste in a separate location to the domestic waste.

### *Context E5 - pit fill*

The pit, dug and filled in after the building was abandoned, suggests that human activity was still occurring at, or near, the site of the former buildings. The pit was filled in fairly rapidly, but for the short time it was open, human activity in the area must have been minimal as the amphibian assemblage appears to have formed naturally.

The pit must have been open for several months for a minimum number of 99 toads to accumulate. As there is no peak corresponding to younger individuals it is suggested that the pit may have been open in late winter/spring, trapping toads wandering to their breeding sites, but must have been filled in prior to autumn before many of that year's offspring had metamorphosed and grown large enough for the bones to survive or breeding was unsuccessful.

## **Recommendations**

The present assemblage is too small for further analysis to be of any value. However, the vertebrate remains recovered from previous season(s) excavations should be recorded in detail in order that

more meaningful results can be produced.

The identifications of the deer fragments need to be rigorously checked and confirmed before any further conclusions can be drawn. The toad and tortoise fragments should (if possible) be identified to species level using comparative material from collections at other institutions.

Research is required to try to elucidate further the significance of the deer remains. The bones from Castagna could provide valuable information into the introduction and extinction of cervids on Sicily and their role in the Roman economy.

## Archive

All material is currently stored in the Museum at Heraclea Minoa, Sicily. Paper and electronic records pertaining to the work described here are stored at the Environmental Archaeology Unit, University of York, England.

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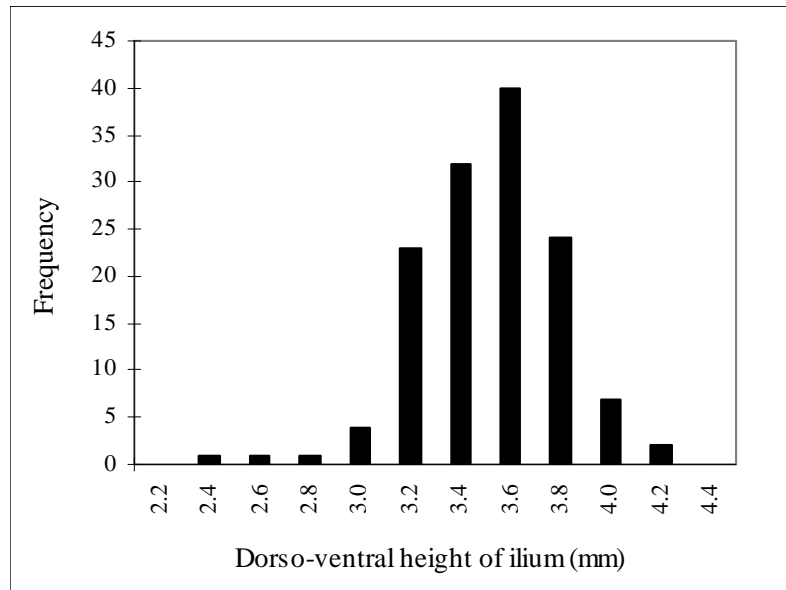
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Table 1. The vertebrate remains by phase from Castagna, Sicily.

Taxon	Taxon	Phase 3	Phase 4	Phase 5/6	Phase 6	Total
Hare	<i>Lepus</i> sp.	-	3	-	12	15
Horse	<i>Equus</i> f. domestic	-	1	-	-	1
Pig	<i>Sus</i> f. domestic	2	20	-	12	34
Deer	Cervid	1	2	-	-	3
Red deer	<i>Cervus elephus</i> L.	-	12	-	1	13
Fallow deer	<i>Dama dama</i> L.	-	1	1	1	3
Cattle	<i>Bos</i> f. domestic	1	-	8	9	18
Sheep/goat	Caprovid	2	19	4	23	48
Goat	<i>Capra</i> f. domestic	-	1	-	9	10
Sheep	<i>Ovis</i> f. domestic	-	2	-	5	7
?Chicken	cf. <i>Gallus</i> f. domestic	-	1	1	-	2
Chicken	<i>Gallus</i> f. domestic	-	1	-	1	2
Barn owl	<i>Tyto alba</i> (Scopoli)	-	1	-	-	1
?Turtle dove	cf. <i>Streptopelia tutur</i> (L.)	-	-	-	1	1
Frog/toad	Anura sp.	-	-	-	1399	1399
Tortoise	<i>Testudio</i> sp.	-	-	1	20	21
<b>Subtotal</b>		<b>6</b>	<b>64</b>	<b>15</b>	<b>1493</b>	<b>1578</b>
Large mammal		10	45	6	34	95
Medium sized mammal 1		14	179	27	67	287
Medium sized mammal 2		-	-	-	4	4
Unidentified		3	25	-	325	353
<b>Subtotal</b>		<b>27</b>	<b>249</b>	<b>33</b>	<b>430</b>	<b>739</b>
<b>Total</b>		<b>33</b>	<b>313</b>	<b>48</b>	<b>1923</b>	<b>2317</b>

Figure 1. Histogram of the dorso-ventral height of toad ilia.



## Appendix

Table A1. Skeletal element representation for the major taxa from Castagna, Sicily.

Element	Cattle	Caprovid	Pig	Deer
Horncore/Antler	-	1	-	2
Cranium	-	-	4	-
Mandible	1	4	7	6
Maxilla	-	-	2	-
Teeth	8	30	11	1
Atlas/Axis	-	1	-	-
Scapula	-	3	2	-
Humerus	2	3	4	-
Radius	-	3	1	1
Ulna	-	2	-	-
Metacarpal	1	1	-	2
Pelvis	1	-	-	1
Femur	-	-	-	-
Tibia	1	6	1	-
Calcaneum	-	2	-	1
Astragalus	1	1	-	-
Metatarsal	-	3	-	-
Metapodial	2	-	1	-
Carpal/Tarsal	-	3	-	1
Phalanx 1	-	1	-	3
Phalanx 2	-	1	-	1
Phalanx 3	1	-	1	-
<b>Total</b>	<b>18</b>	<b>65</b>	<b>34</b>	<b>19</b>

Table A2. Pathology.

Context	Species	Element	Notes
E12	Caprovid	Maxillar molar	slight calculus deposits
E12	Pig	Mandibular M2	Severe caries cavity, the two cusps had been separated by the cavity

Table A3. Butchery.

Context	Species	Element	Notes
E5	Cattle	Humerus	chopped diagonally through the distal condyle
E5	Cattle	Tibia	juvenile shaft with 4 knife marks on the posterior surface
E5	Caprovid	Axis	chop and knife marks on ventral surface
E5	Hare	Humerus	chop across anterior shaft, knife marks around distal condyle

Table A4. Epiphyseal fusion data for cattle, caprovid and pig fragments from Castagna, Sicily. Age categories after O'Connor (1984).

Taxon	Early		Intermediate 1		Intermediate 2		Late		Total
	Fused	Unfused	Fused	Unfused	Fused	Unfused	Fused	Unfused	
Cattle	1	1	1	2	N/A	N/A	-	1	6
Caprovid	3	-	2	-	4	8	1	3	21
Pig	2	1	1	1	-	-	-	-	5

Table A5. Age categories for caprovid mandibles and isolated teeth. Age categories after Payne (1973). Tentative assignments in brackets.

Age Category	Suggested Age	Number fragments
B	2-6 months	1
C	6 months - 1 year	1 (1)
D	1-2 years	(1)
E	2-3 years	1 (1)
F	3-4 years	1
E-G	2-6 years	(5)

Table A6. Age at death based on cattle teeth. Age categories after O'Connor (1991).

Tooth	Suggested age / age category
DP4	2.5-3 years
M1/M2	Adult or Elderly

Table A7. The skeletal element representation for Amphibians from Castagna, Sicily.

Element	Number of fragments			%
	Left	Right	Indeterminate	
Cranium 1	-	-	21	1.5
Cranium 2	-	-	12	0.8
Cranium 3	-	-	86	6.1
Mandible	-	-	5	0.4
Scapula	-	-	17	1.2
Shoulder girdle	-	-	4	0.3
Humerus	83	71	7	11.5
Radio-ulna	37	41	24	7.3
Last vertebra/pelvis	-	-	13	0.9
Ilium	71	72	-	10.2
Femur	99	84	11	13.9
Tibia	-	-	211	15.1
Vertebrae	-	-	72	5.1
Epiphyses	-	-	40	2.9
Metapodials/phalanges	-	-	247	17.7
Unidentified shaft	-	-	71	5.1
<b>Total</b>	<b>290</b>	<b>268</b>	<b>841</b>	<b>100</b>

Table A8. Biometrical archive for Castagna, Sicily.

Element	Species	Phase	Context	Measurements			
<b>Cattle</b>							
Astragalus	Cow	3	E33	Bd=49.8	DI=42.0	GLI=73.9	
<b>Horse</b>							
Tibia	Horse	4	F10	Bd=60.3	Dd=40.4		
<b>Caprovid</b>							
Scapula	Caprovid	4	E12	GLP=29.4	ASG=17.1	SLC=17.2	
Humerus	Goat	4	F10	BT=29.6	HT=18.5	HTC=15.1	
Humerus	Sheep	6	E5	BT=27.5	HT=17.5	HTC=13.8	
Tibia	Sheep	4	F15	Bd=26.3	Dd=20.0		
Tibia	Goat	6	E5	Bd=28.4	Dd=24.0		
Calcaneum	Goat	6	E5	C=10.6	C+D=21.4	DS=18.1	
Calcaneum	Goat	6	E5	C=12.0	C+D=23.7	DS=20.2	
Astragalus	Goat	6	E5	Bd=19.8	DI=16.0	GLI=31.1	
Metacarpal	Caprovid	6	E5	Bp=23.5	Dp=17.3	SD=16.0	
Metatarsal	Goat	6	E5	GL=124.2	Bp=22.0	SD=13.3	Bd=27.2
				Dd=16.4	Dem=9.6	Dvm=16.4	Dim=13.7
Metatarsal	Sheep	6	E5	GL=135.0	SD=13.6	Dd=14.4	Dem=10.2
				Dvm=14.4	Dim=13.1		
<b>Cervid</b>							
Metacarpal	Red deer	4	E12	SD=22.4	Bd=38.0	Dd=24.9	
Calcaneum	Fallow deer	5/6	E6	GL=84.1	GB=27.3		
<b>Pig</b>							
Scapula	Pig	4	E12	GLP=31.1	SLC=20.2		
<b>Hare</b>							
Scapula	Hare	4	F15	GLP=11.7	SLC=6.8	BG=9.2	
Humerus	Hare	4	F39	SD=6.5	Bd=11.2		
Humerus	Hare	6	E5	SD=6.9	Bd=11.4		
Radius	Hare	4	F15	GL=98.1	Bp=8.1	SD=4.4	Bd=8.8
Metatarsal2	Hare	6	E5	GL=50.4	Bd=5.4		
Metatarsal3	Hare	6	E5	GL=51.5	Bd=5.2		
Metatarsal4	Hare	6	E5	GL=49.5	Bd=4.9		

<b>Element</b>	<b>Species</b>		<b>Context</b>	<b>Measurements</b>			
Metatarsal5	Hare	6	E5	Bd=4.6			
<b>Birds</b>							
Carpometatarsus	Chicken	4	E12	GL=36.2	Bp=10.7	Did=7.4	
Femur	?Chicken	5/6	F9	Bd=14.3	Dd=11.2		
Femur	Barn owl	4	E12	GL=50.6	Bp=9.3	Dp=5.3	SC=4.0
				Bd=9.6	Dd=8.3		