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STOCK ECONOMIES IN MEDIEVAL ITALY:
A CRITICAL REVIEW OF THE ARCHAEOZOOLOGICAL EVIDENCE

Although animal bones from medieval deposits in Italy have been studied scientifically for almost fifteen years, it is only recently that a significant amount of data has been produced. At the same time there has been a deepening of the questions asked of the data, as attempts are made to go beyond subsistence reconstruction. As Ginatempo (1984: 37) has pointed out, much of the material available at first was derived from urban contexts. Therefore, only a part of the production-distribution-consumption network was being illuminated. Samples have now been studied from a range of contexts, including rural, urban, military and monastic. With the notable exception of that from Tuscania, the early samples were small in size. That is not to say that size need be a major indicator of the validity of a sample. However, a larger sample size may allow clearer patterns to emerge from the data, and interpretation may have greater validity in statistical terms. The material recovered at Brucato, Crypta Balbi, Farfa Abbey and Tarquinia (Palazzo Vitelleschi) increases considerably the amount of data available.

THE POTENTIAL OF ARCHAEOZOOLOGY

The information which may be obtained from fauna material has been listed and discussed by various researchers (for example, Barker 1978a; Clark 1988; Ginatempo 1984; Grigson 1978). I shall summarise here the categories of evidence, not to provide an exhaustive account of what basic information should be obtained, but rather to show the ways in which some data may be studied in greater depth in order to reveal details related to the subsistence economy in general as opposed to the stock-raising strategy per se.

1. The nature of the sample. The proportion of the sample identifiable to species and to bone may reveal much about the degree of fragmentation of a sample, as well as about the presence or absence of bones of the main body of the animals. Observations upon the frequency of weathering and gnawing upon bone surfaces may be indicative of disposal practices.

2. The species present. The bones present in a sample will reveal some, if not all, of the animals which existed within the environment of the site, or which were exploited elsewhere and introduced to the site. It must be stressed, however, that man may not have caused the presence of all species, and all animals present
need not have had some role in the economy. For example, the presence of sheep/goat is most likely to be a consequence of human selection, whilst the presence of rat may be an indirect, rather than direct, result of man's activity. Indications of seasonal exploitation may be gained from the presence of bones of some (wild) species. Evidence for the import of animals may be seen in discrepancies between the species present and the contemporary environment of the site.

3. *The proportion of the species.* In assessing the relative presence of each species, one must take care: for one is rarely dealing with the sample from an entire site. The sample may be of a particular context which determines in some way the relative proportions of the species present. For each site and context one is not dealing with the total amount of material once there – the deposits usually represent only a part (often perhaps small) of the original sample. It would be rash to reconstruct the economy of a whole site on the basis of the analysis of a sample from a part of it. Moreover, an important point, which is often overlooked, must be stressed: absolute numbers of individuals can be totally misleading – it is the _yield_ of each animal (whether as milk, wool or meat, for example), that is the crucial factor. The calculation of the proportion of the potential meat yields may throw light on, and should always be considered with, the other relative counts. Therefore, although estimates of the relative proportions of various species should be calculated and are of much general use, too much emphasis should not be placed upon variations without careful consideration of the context of the sample.

4. *Age of the animals at death.* This may reveal the primary strategy behind the raising of an animal. It may be possible to tell whether an animal was kept for its meat alone, or if it was raised principally for its secondary products (such as milk, wool, energy), although ultimately representing a source of meat. In addition the intensity of a regime may be assessed, a critical aspect of more complex economic systems. Further information may be gained from such mortality data. For example, the presence of the bones of animals killed at a young age, when they should have attained an optimal body weight, may indicate a degree of affluence on the part of the human group with whose refuse one is dealing. A careful examination of the ages at death may reveal the position of the site as an importer or exporter of animals, this interpretation being based upon the viability and realism of the herd/flock structure (see Clark 1987a for further details).

5. *Size and stature of the animals.* In addition to describing the physical appearance of animals, such figures may be indicative of the general well-being of the herd/flock and of the success of the regime. Size may also be important in
identifying different species and breeds, and in isolating the sexual structure of the animal population through the detection of sexual dimorphism.

6. Sex of the animals. Although not obtained easily, this information is important in identifying the stock-raising strategies and in detecting import and export situations.

7. Parts of the skeleton present. From a detailed study of the spatial distribution of the various anatomical elements or parts of the skeleton, it may be possible to identify activity areas, such as those used for butchery, cooking and eating, or rather, in many instances, the areas in which the refuse of such activities was placed. The presence or absence of bones typical of each activity may illuminate the function of a site or an area. For example, it may be possible to see whether animals were butchered at some other location, or at the site itself (and in the latter case, whether the processing was dispersed or centralised). The import and export of meat may be identified tentatively from the presence and absence of certain anatomical elements. Two different situations must be considered for the export side of the system as they could result in markedly different faunal samples: firstly, prepared or partially prepared carcases may be moved from the producing unit to the distribution-consumption unit; secondly, the animals may be moved on the hoof. In the former case the raising of meat animals for an external market would be indicated by a large amount of material typical of refuse produced during the butchery of animals. There are greater problems in identifying the movement of animals on the hoof (Clark 1984b, 1985). Inferences may also be made about the general social standing of the group whose refuse is being studied. With some knowledge of what were considered, at the time of deposition, as superior and inferior cuts of meat, an impression of the affluence of the group may be gained from an analysis of the parts of the skeleton present.

8. Modification of the bone. From the patterns of breakage of the bones the general techniques of butchery and dismemberment may be deduced. Burning may also give information upon butchery and cooking processes.

9. Pathology. The presence or absence of traces of disease may give an impression of the well-being of the animal populations and of pressure upon resources.

Stock-raising in medieval Italy

Before going on to discuss the archaeozoological evidence available for stock-raising in medieval Italy, two points must be emphasised. This paper deals almost exclusively with animals and animal products as they exist through the archaeological record. Stock-raising is but one aspect of a much larger and
complex system (as has been discussed in some detail by Ginatempo 1984 and as I have discussed elsewhere (Clark 1984b), and ultimately should not be considered in isolation. However, by examining in some detail this one category of data, a greater understanding of the economy and diet in general may be gained. Archaeological evidence is, in addition, just one source of information upon medieval stock-raising. Details are contained also in documentary sources such as catasti, mezzadria contracts, tax documents, family and institutional accounts, urban and rural statutes, and books of menus. The relationship between the archaeological and historical evidence will be discussed elsewhere (Clark forthcoming a). The sites discussed in this paper are listed in appendix 1.

Medieval communities exploited both wild and domestic species. Some animals may have been meat resources, some may have been exploited for their secondary products and physical properties, others may have been kept as pets. The major domesticated animals present were sheep/goat, pig, cow, dog, chicken and various forms of equid. These animals are present in most samples. A range of wild animals is represented, although there is much variability between sites in the presence and absence of bones of these animals and in the particular animals present. In the early medieval deposits at Farfa Abbey the bones of four domestic species (sheep/goat, pig, cow, canid) are present whilst in the medieval deposits there are remains of domestic (pig, sheep/goat, cow, equid, cat) and wild (roe deer, red deer, hare/rabbit, bear) animals. At Colle Castellano no bones of wild mammalian species were found. The sample from Brucato is notable for the wide variety of animals present: sheep/goat, pig, cow, equid, red deer, roe deer, ass, cat, chicken, fallow deer, boar, fox, wolf, rabbit, rat, hedgehog, pheasant and tortoise. Other animals present were wild cat (San Valier), beaver (Tarquinia), badger (Tarquinia) and porcupine (Scarlino, S. Caterina della Rosa). No particular chronological differences may be seen in the presence of the major wild animals (red deer, roe deer and hare/rabbit) at most sites, although some differences do seem to have occurred throughout the occupation of one site, Brucato. The presence of the other species is too small for valid chronological patterns to be detected. Geographical factors also appear to have had little significance in determining the absence or presence of each animal: this may be seen in differences between samples of diverse periods from the same site. Marked differences do not seem to exist between sites in northern Italy (for example, Stufels, San Valier) and central/southern Italy (for example, S. Maria in Civitâ). However, it should be remembered that many of the samples being discussed are small. It may be that bones of a wider range of species are not present in a particular group of material, rather than being absent from a site entirely. Bones of wild animals are present in material from urban and rural sites (for example, Tarquinia and Anguillara). The extent to which the households
Stock economies in medieval Italy

in whose refuse the bones were found had personally hunted the animals is not clear at present. The animals represented in a sample may have been determined by the local environment of a site (for example, the absence, presence and abundance of woodland) and by human need for particular resources (such as meat, antler, skins) at certain times of the year.

It would be surprising if a medieval faunal sample was analysed which was not dominated by three domestic species: sheep/goat, pig and cow. That is not to say that such a situation cannot exist, as for example, at a hunting camp or fishing site, but it would be clear that a very particular phenomenon was being observed. In two cases (Castel Delfino, Monte Zignago a) high proportions of red deer bones were found. Given that most of the bones at both sites were complete, it seems that these animals were not butchered in the same manner as the other main food animals. The analysts see the high presence of red deer at Castel Delfino as a reflection of extensive woodland (BIASOTTI and ISETTI 1981: 246). Whilst abundant woodland would explain the presence of red deer, it is not clear why this should result in such high figures. Too much emphasis should not be placed in these cases upon this phenomenon, for the samples are very small in size and may not be indicative of the general economies of the sites.

The relationship between sheep/goats, pigs and cows is extremely variable. The number of fragments is perforce the unit which is discussed here for figures have been presented rarely for the minimum number of individuals present, and even when figures have been presented comparison is still difficult due to different methods having been used to arrive at the figure. The data are summarised in appendix 2. It will be noted that at two sites (Genova – S. Silvestro, Monte Zignago a) there are no cow bones present. This may be due at least in part to the small sample size. However, in the case of Monte Zignago it may be significant that at the nearby site of Castellaro di Zignago the presence of cow is very slight (although cow bones are found in reasonable numbers in the small sample from Monte Zignago b). Therefore it may be that local conditions were unfavourable for cow rearing. At some sites one particular species is dominant. For example, at Tuscania sheep/goat form 71.5% of the sample for the period c. 1350 and 81.6% for the period 1250-1300; at Scarlino pigs form 79.4% of the early medieval sample; and at Tarquinia pigs provide 62.8% of the sample for the period late 12th-mid 14th centuries. In terms of the number of fragments, cows rarely dominate the sample. They are perhaps most numerous at Stufels and Vacchereccia, forming 48.9% and 48.4% respectively of the samples. However, the enormous potential yield of cows compared to sheep/goats and pigs should be recalled. In some instances one particular species may be poorly represented: pigs, for example, at Stufels and S. Valier. The number of fragments of each animal may be broadly similar, as at Luni
Can any patterns be observed in these data? Some general trends do seem to be visible. Sheep/goat were more consistently of greatest numerical significance in the later periods (that is 13th-15th centuries). The exceptions to this are Farfa and Scarlino. At both these sites the composition of the stock population established in earlier periods seems to have continued. The increase in the importance of sheep/goat was primarily at the expense of cows. Cows seem to have been of greater importance in the main medieval period, the figures being higher than for the preceding and subsequent periods. The presence of pigs seems to have been extremely variable and no chronological trends can be detected easily.

Geographical and environmental factors may have been critical in determining the relationship of the three species. Details upon the general and specific ecological context of each site are not easily obtained. Caution must also be taken in assessing the environment of a site: for circularity of argument may easily occur. That is, a large number of pigs may be used to infer the presence of woodland; the presence of woodland may be used to explain a large number of pigs. The high number of cows at Stufels and San Valier in the Alps and Torretta and Torcello on the Po plain/delta supports the traditional impression of a flourishing cow raising system in the alpine region and on the Po plain from later prehistoric to recent times (Clark 1984b; Cole and Wolf 1974; Columella; Dumont 1957). Pigs are of comparatively slight importance at San Valier and Stufels, this probably being a result of the mountainous environment to which pigs are not well adapted. Environmental factors may therefore be a major factor in allowing the predominance of cows and causing the scarcity of pigs. Variations in the relationship of sheep/goat and pig may only with difficulty be related to environmental factors: the major difference between the requirements of the two is in the nature of the local vegetation of the site and the amount of woodland and open pasture. It is extremely difficult to reconstruct so precisely the past environment of a site.

The type of site and its function may affect a sample or a part of it. At Scarlino differences were noted in the relationship between the material on the inside and outside of the castle. In the deposits of the 11th-13th centuries differences existed between the material on the inside and outside of the castle. Inside, the noble families had a richer diet, including more beef. In the subsequent period differences can also be seen with a greater consumption of lamb/mutton by the military garrison inside the walls. The relationship of the species at Ponte Nepesino may have been affected by the import of meat to the military garrison. As a general point, it should be noted that any import or export of animals could seriously affect the relationship of the three major
domestic species.

Differences in the ways in which animals were exploited are critical to understanding medieval stock economies. One needs to know if animals were being raised primarily for their meat, or if they represented a source of meat only when their yields of milk, wool and energy had begun to decline. Does the age structure imply import or export of meat? Difficulties are encountered in assessing the mortality data, given different methods of presentation and interpretation. Wherever possible, the researchers interpretation is used. Where data are given but no explanation, the following criteria have been used (based upon age assessments given by Silver 1969): evidence of intensive meat production is shown by a high number of deaths of subadults (2-2 1/2 years for cow, 13-16 months for sheep/goat, 17-22 months for pig); evidence of dairy production and of exploitation of sheep for wool is shown by a high number of deaths of adults (3 1/2-4 years for cattle, 2 1/2-3 1/2 years for sheep/goat). The sheep/goat present in the samples at, for example, Tarquinia (main period), Farfa Abbey (10th-12th centuries), Grosseto and Gubbio had been killed as young animals, presumably to obtain good quality meat. In contrast, the animals at Stufels, Pavia, Torcello, Luni, Tuscania and Tarquinia (early period) had been raised primarily for their live products and killed once yields had begun to decline. At some sites a generalised strategy prevailed with no particular peaks being noted in the data, animals having been killed at various ages (for example, Colle Castellano, S. Maria in Civitá, San Valier, Tortoreto). For pigs the major distinction which can be made is between intensive and non-intensive exploitation. Examples of an intensive system may be seen at Colle Castellano, Tarquinia (main period [excluding context 180]), Ponte Nepesino, S. Maria in Civitá, San Valier and Grosseto, and of an extensive regime at Tuscania, Torcello and Gubbio. A policy of intensive beef production can be identified at relatively few sites: Farfa Abbey, Grosseto, Genova - S. Silvestro (1170-1472). The importance of cattle as working animals is clear at S. Maria in Civitá, San Valier, Pavia and Casalrotto. Dairy products seem to have been important considerations at Stufels, Torcello, and Tarquinia (early period). However, at most sites, although a particular goal may have been slightly to the fore, a generalised strategy was also apparent.

Some very general chronological trends may be tentatively identified. The intensive raising of sheep/goats for meat and the culling of them at an early age seems to have occurred primarily in the medieval and late medieval periods. Evidence for such a policy in the early medieval period is lacking. There appears to have been more specialisation through time in the sheep/goat raising. No particular chronological trends can be detected in the raising of pigs, for at all times non-intensive exploitation seems to have taken place. In marked contrast
to the situation observed for sheep/goats, the raising of cows seems to have become less specialised through time. Whilst at many earlier sites the animals were raised for dairy products and work, at the later sites a portion of the herd had been raised, and killed, specifically for meat.

Clear patterns in the exploitation strategies which may be linked to geographical and environmental factors are not immediately apparent. The type of site may be fairly critical, however. For example, meat orientated sheep/goat raising strategies were noted for Farfa (10th-12th centuries), Tarquinia (main and later periods), Gubbio and Ponte Nepesino. Each of these sites has been identified as having a fairly precise role: an abbey (to which payments would be due), an affluent urban household, and garrison sites (to which supplies were probably taken) respectively. Here one is viewing the consumption rather than the production side of a system. Variations in social status/affluence may also affect samples. The main deposits at Tarquinia contain material (pottery, glass, for example) which is indicative of an affluent family. The food debris associated with this material is primarily from animals killed at a young age, specifically for meat: that is, it is high quality food. In the earlier deposits the material is less rich: correspondingly the refuse is of lower quality food, from animals killed once their productivity was declining. At Filattiera a high number of young sheep/goat is seen as being indicative not of a meat orientated local production but of the fact that the owners of the tower were relatively successful in economic terms and could procure high quality food.

Detailed attention is rarely paid to the anatomical composition of the sample. Taphonomic factors must always be assessed in examining these data because pre- and post-depositional processes may have seriously affected the sample. However, despite these problems, the potential of these data may be enormous. Situations involving the import and export of meat in various forms may be identified and activity areas may be isolated. Some if not most of the butchery of the animals at Tarquinia took place within or in the very close vicinity of the urban household, as is indicated by the presence of bones of the limb extremities and of the head. However, certain elements of the skeleton are relatively poorly represented: that is, there is a paucity of the bones associated with the lesser cuts of meat, and of those often discarded at the cooking stage of food processing. In discussing the material, it was tempting to suggest that these lesser cuts of meat were taken away and consumed by the household servants, or by the less privileged in general. However, it was emphasised that there was no positive proof for this hypothesis. Another explanation could be that the refuse generated in the kitchen during cooking was disposed of differently. At Ponte Nepesino off-site butchery of some sheep/goats and cows was suggested on the basis of an absence of bones of the limb extremities and a comparative scarcity.
of cranial and dental elements. Some sheep/goats and cows were butchered on site, as were most, if not all, pigs. The evidence points to dispersed rather than centralised butchery. Similarly at Gubbio off-site butchery and the import of cuts of meat is inferred from the low number of bones from the limb extremities. In contrast, on-site butchery is indicated at Torretta and Anguillara. At S. Maria in Civita it was noted that although bones of the limb extremities and head were present (normally implying on-site butchery), the main meat bearing bones dominated the sample. It may be, therefore, that some cuts of meat were being imported to the site. A rather similar situation was observed for Colle Castellano, primarily for cows although to a lesser extent for sheep/goats. For cows there was a large number of bones of the upper parts of the fore and hind limbs: that is, those bones with which first class meat is associated. For sheep/goat there was a low number of bones of the limb extremities although cranial and dental elements were not uncommon. Such a phenomenon is not easily explained (given that it is not due to poor recovery levels).

The policies behind the stock-raising strategies may be illuminated further by evidence of the sexual structure of the herd/flock and of the relationship between sheep and goat in the case of sheep/goat. It was noted above that the sheep/goat at Stufels and Torcello had been raised for their live products. From the greater number of sheep it is clear that it was wool which was of enormous importance. From the sexual structure of the pig herds at Ponte Nepesino, Anguillara and Colle Castellano it may be inferred that there was selective killing of young males, with a breeding herd being kept within the vicinity of the site rather than at the site. The importance of cows for their dairy products at Torcello is emphasised by the predominance of females.

A study of the size and stature of animals represented in medieval samples is at a very preliminary stage. It is clear that much variability exists. However, it is not possible at present to relate this to chronological, environmental or economic factors.

Discussion

From this examination of the faunal data available at present from medieval sites in Italy, some general patterns emerge, both in terms of the animals which were raised and of the ways in which each was exploited. Diachronic trends may be detected in the importance of each of the three major domesticated species (that is, sheep/goat, pig and cow). Sheep/goat seem to have attained greater importance in the late medieval period, being numerically dominant at a greater proportion of sites than in the earlier periods. In contrast, cows were more significant in the medieval period than in the earlier and later ones.