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Wild birds of the Italian Middle Ages: diet, environment and society

Wild birds are intrinsically associated with our perception of the Middle Ages. They often feature in heraldic designs, paintings, and books of hours; few human activities typify the medieval period better than falconry. Prominent in medieval iconography, wild birds feature less frequently in written sources (as they were rarely the subject of trade transactions or legal documents) but they can be abundant in archaeological sites. In this paper we highlight the nature of wild bird exploitation in Italian medieval societies, ranging from their role as food items to their status and symbolic importance. A survey of 13 Italian medieval sites corresponding to 19 'period sites', dated from the 5th to the 15th centuries, reveals the occurrence of more than 100 species (certainly an under-estimate of the actual number). Anseriformes and Columbiformes played a prominent role in the mid- and late medieval Italian diet, though Passeriformes and wild Galliformes were also important. In the late Middle Ages, there is an increase in species diversity and in the role of hunting as an important marker of social status.

Keywords: wild birds, diet, environment, status, Italy, Middle Ages.

Introduction

Birds played a prominent role in the life of ancient populations. Throughout human history people have been interested and fascinated by birds well beyond their exploitation as a food source. In the Middle Ages, birds certainly had an important symbolic value, as they feature substantially in both iconographic and written sources (Masseti 2015). Falconry was the typical leisure activity for the secular and ecclesiastic elites of the medieval period (Galloni 2000).

The importance and complexity of the human-bird relationship has been demonstrated for some European countries (e.g. Albarella and Thomas 2002, Prummel 1997) but is still very poorly understood in Italy, where studies on the subject are few and expertise in the field limited. The few published studies about wild birds usually consist of a mere

list of species with minimum interpretation of the results (Bedini 2000, 2002; Clark et al. 1989; De Venuto 2013; Fatucci and Cerilli 2015). More attention has been dedicated to chicken remains, in particular to the introduction of the species in Italy (De Grossi Mazzorin 2005) and its exploitation in the Middle Ages (Corbino et al. 2017).

Bird bones collected from archaeological contexts, though fewer than those of mammals, can be significant for our understanding of past human societies. They can provide information about human diet, hunting activities, landscape modifications and many other topics. Although chicken usually dominates medieval bird bone assemblages, remains of other species are also frequently recovered. This paper focuses on the nature of wild bird exploitation in Italian medieval societies by investigating the role of birds as food items, environmental indicators and status symbols.

Materials and Methods

This study is based on the analysis of bird bones from 13 archaeological sites corresponding to 19 'period sites'[1]. Published data from seven sites and the re-analysis of assemblages from six more sites have been used[2] (Table 1). They are all dated to the Middle Ages, with chronologies ranging from the fifth through the fifteenth century CE. Although the majority of the sites are located in the Central Italian regions of Tuscany and Latium, assemblages from Veneto (in North-Eastern Italy), Campania, Basilicata and Apulia (in Southern Italy) have also been considered (Figure 1). Both sieved and

[1] A 'period site' is defined as the assemblage from a chronologically defined period; multiphased sites are therefore listed as multiple 'period sites'.

[2] The assemblages from Castiglione, Cencelle, Crypta Balbi, Palazzo Vitelleschi, Rocca di Campiglia and Santa Cecilia have been specifically re-analysed for the purpose of this paper. For more details about each site see Table 1.

hand-collected assemblages are included in this paper, though a likely recovery bias needs to be evaluated in the interpretation of the latter.

As many as 12,453 bird remains have been identified from those period sites and are discussed in this paper (Table 1). The majority of them represent chicken remains (10,286) while 2,167 bones belong to other birds. Only bone assemblages showing a considerable number of bird remains have been selected (Table 2), while those composed by fewer than 50 identified specimens have been excluded, as small assemblages may be unrepresentative of species diversity (Lyman 2008).

Bird bones from the re-analysed assemblages were identified using the reference collections of the Department of Biology at the University of Florence (Italy), the Department of Archaeology of the University of Sheffield (UK) and the Natural History Museum at Tring (UK), alongside published bone atlases (Cohen and Serjeantson 1986; Bocheński and Tomek 2009). Morphological differences in galliforms and anseriforms also relied on Bacher (1967), Erbersdobler (1968) and Tomek and Bocheński (2009). Remains of *Cygnus olor* (mute swan) and *Cygnus cygnus* (whooper swan) have been distinguished using the criteria proposed by Bacher (1997).

A specifically designed recording system was used for the re-analysed bird assemblages. The following selected parts of the skeleton (i.e. 'diagnostic zones') have been recorded when more than half of the specified area was present: articular end of the scapula, proximal and distal coracoid, proximal and distal humerus, distal radius, proximal ulna, proximal carpometacarpus, proximal and distal femur, proximal and distal tibiotarsus, proximal and distal tarsometatarsus and anterior articulation of the sternum. All elements or parts of elements that were not included as diagnostic zones were not used for quantitative analysis. However, those elements were recorded as

"non-countable" when rarer species, interesting butchery marks or abnormalities occurred (following Davis 1992).

The number of identified specimens (NISP) was employed to assess the relative abundance of different taxa. The frequency of non-chicken birds at each site was calculated out of the total number of birds. Chicken remains, which were a common occurrence at all sites, have been excluded from further elaborations in this paper because they are unquestionably from domestic birds. The distinction between domestic and wild forms of *Anser anser* (greylag goose), *Anas platyrhynchos* (mallard) and *Columba livia* (rock dove) was often impossible, due to their morphological similarities, but the probability that they include also domestic birds must be borne in mind. Due to the diversity of identified species, the relative frequencies of non-chicken birds through time and by context (rural vs urban) are calculated according to the order (Galliformes, Anseriformes, etc.). Attention was dedicated to the observation of butchery marks, which were detected through the use of magnifying lenses. The location of the marks on each anatomical element was also recorded.

Results

Taxonomic diversity

In total, 112 bird species have been identified from the 2,167 bone fragments of non-chicken birds. The list of the identified bird species divided by order is presented in Table 3. The frequency of non-chicken bones ranges from 9% to 35% (Table 2). Such variation does not seem to be obviously linked with site type, time period, or social status. A slight increase of non-chicken bird frequencies can be detected from the early to the late Middle Ages, but there is no chronological trend as the lowest frequency occurs in the mid-medieval period.

In the overall sample, Anseriformes (45%) and Columbiformes (22%) are the best represented orders, but we need to consider that many goose, duck and pigeon remains may have belonged to domestic forms. Therefore, these percentages cannot entirely be taken to represent wild avifauna.

The analysis of the relative frequencies of bird orders by period has revealed some noticeable differences through time (Figure 2). In the **early medieval** period most bones, except for those of raptors and perhaps some naturally-accumulated passerines, probably derive from birds that were consumed. Remains of Accipitriformes, 52 in total, have been collected only from Carminiello ai Mannesi. Fifty of them belong to an almost complete skeleton of a goshawk, while two are from buzzard. To avoid over-representing the goshawk on the basis of only one individual, the bones from this individual have been counted as one in terms of NISP. Falcons were found at Carminiello ai Mannesi and San Giovanni di Ruoti (a kestrel, at this latter). A large number of Passeriformes (425 specimens) was found at San Giovanni di Ruoti (Eastham 2002), mostly belonging to sparrows. Galliformes are dominated by the grey partridge, but other species such as red-legged partridge, quail and capercaillie are also present. Of utmost interest for tracing the introduction and diffusion of the pheasant in Italy are the three remains of this species found at Carminiello ai Mannesi (Rielly 1994). Bittern, heron and woodcock also occur in this period.

The **mid-medieval** period sees an increase in the frequency of Columbiformes and the occurrence of Gruiformes, not represented in the previous period. Anserifomes and Columbiformes are present at all period sites, while the other orders turn up sporadically. Galliformes and Charadriiformes, though not always present, are quite frequent and feature at four of six mid-medieval site periods. The former are represented by grey partridge, quail and pheasant, and the latter by lapwing, woodcock

and sandpiper. A number of Passeriformes come from Castiglione, Rocca di Asolo and Colosseum. Birds of prey are rare but include Accipitriformes and Falconiformes. A white-tailed eagle, a kite and a falcon come from Castiglione, two buzzard remains were identified at Colosseum, while a bone fragment of a hobby was recovered from Rocca di Asolo. Ciconiiformes and Gruiformes appear only at one site each, respectively a grey heron at Castiglione and a crane at Vaccarizza (10th-11th cent.).

The **late medieval** period is characterised by a greater diversity of taxa and substantial changes in their frequencies. The occurrence of Anseriformes is considerably reduced, while there is an increase in Passeriformes and birds of prey; Strigiformes, Apodiformes and Otidiformes make their first appearance in our record. The Passeriformes are composed by a great number of species, with corvids the most frequent. The Galliformes are dominated by the grey partridge, especially at Palazzo Vitelleschi, although rock partridge, quail and pheasant are also present. Birds of prey are represented by several species, with vulture, eagle, red and black kite, marsh harrier, buzzard, sparrowhawk and goshawk all occurring, among the Accipitriformes. Kestrel, lesser kestrel, peregrine falcon and merlin represent the Falconiformes. Even the Strigiformes feature with several species: scops, little, tawny and barn owl. Most bones of the birds of prey come from Campiglia, Cencelle and Palazzo Vitelleschi, while Strigiformes are mainly from Campiglia and Santa Severa.

Several Charadriiformes have also been identified in late medieval assemblages; these include grey plover, wood sandpiper, black-tailed godwit, whimbrel, woodcock and snipe. A handful of gull bones, from Santa Severa and Palazzo Vitelleschi, may constitute a natural presence due to the location of both sites close to the sea (gulls are well-known scavengers and may have been commensal to human habitations). The remains of Gruiformes, identified at Santa Cecilia and Palazzo Vitelleschi, belong to

crane and coot, while those of Ciconiiformes consist of grey heron and white stork, respectively from Santa Severa and Palazzo Vitelleschi. The little bustard is the only otidiform found in the analysed assemblages; it occurs at Santa Cecilia and Palazzo Vitelleschi.

Anseriformes are the most frequent order in all periods, though marginally so in the late Middle Ages. They are mainly represented by greylag goose and, to a lesser extent, mallard bones. Their frequency decreases considerably from the early to the late medieval period. In the mid-medieval period, this reduction seems to correspond to an increase in Columbiformes, which are dominated by the *Columba* genus. In the late Middle Ages, however, their reduction is a consequence of a contemporary increase in bird bones across the range of different orders. Non-chicken Galliformes increase in frequency through time, though they remain less common that Columbiformes. The large variation in the presence of Passeriformes by site and period could be due to recovery bias, which may have been worse at some sites. Overall, there is an increase in taxonomic diversity in the late Middle Ages.

Butchery evidence

In general, butchery evidence is infrequent on bird bones. The reason is that, unlike most mammals used as food, the size of the bird body is generally not large enough to require much dismemberment in preparation for cooking for the table. In the reanalysed assemblages, butchery evidence is infrequent also on chicken bones (Corbino et al. 2017). However, the low representation of butchery marks may also be a consequence of the fact that a systematic analysis of the bone surface under a microscope was not undertaken. This could have potentially revealed further cut marks.

In total, non-chicken bird bones from the re-analysed period sites display butchery

marks on only 38 specimens. They were detected mostly on larger birds, with a sporadic occurrence on those of medium size. The majority is located on bone epiphyses of Anseriformes. They were found on a whooper swan tibiotarsus, two mallard humeri and 19 bones of the genus *Anser*, mainly greylag goose. Butchery marks on goose bones have been recorded on mandible, coracoid, humerus, ulna, femur, carpometacarpus and tibiotarsus. They likely resulted from the separation of the coracoid from the humerus, humerus from ulna and femur from tibiotarsus. Light knife marks on the ventral facet and the external ligament attachment of two proximal carpometacarpi from Rocca di Campiglia (14th cent.) may be associated with a purpose other than consumption. Puzzling are also the butchery marks on two birds of prey: cut and chop marks on two distal humeri and a proximal coracoid of a spotted eagle from Rocca di Campiglia (14th cent.), as well as a chop mark on a griffon vulture ulna from Palazzo Vitelleschi, which removed the diaphysis from the epiphysis.

Although cut marks are even rarer on medium size birds, some have been detected. Eight grey partridge bones from Palazzo Vitelleschi show this evidence. They are represented by an ulna, six tibiotarsi and one tarsometatarsus. At the same site pigeon and little bustard also show some butchery evidence. Cut marks were also noticed on a wood pigeon distal humerus from Rocca di Campiglia.

Most butchery marks are located around the epiphyses, as they were probably aimed at the portioning of carcasses. The only evidence of defleshing derives from a goose femur collected at Castiglione.

The role of wild birds in the medieval diet

Most of the birds found in the assemblages discussed in this paper may have potentially been eaten. Accipitriformes, Falconiformes, Strigiformes and corvids, however, are less

likely to have contributed to human diet. According to written sources, the meat of these birds was poorly valued in the Italian Middle Ages (e.g. Davidsohn 1956-68; Mazzi 1897). Therefore, the butchery evidence identified on spotted eagle and griffon vulture may have been aimed to other forms of exploitation, rather than consumption.

Butchery marks on Anseriformes, Galliformes, Columbiformes and Otidiformes are more likely to indicate use as food. Many such birds were prized for the quality of their meat. The general low frequency of butchery suggests that the birds were typically cooked whole, and the meat was removed from the skeleton after cooking. Ciconiiformes, Gruiformes, Charadriiformes and Passeriformes are also likely to have been part of the medieval diet, though no butchery evidence has been identified on their bones.

Apart from the Anseriformes, all orders of non-chicken birds are most common at rural sites in the early medieval period (Figure 3). In the mid- and late medieval periods the highest percentages and diversity of non-chicken birds is generally found in urban contexts. Anseriformes are also proportionally more frequent at urban sites both in the mid- and late Middle Ages, although they are present at rural sites too. The increase in relative frequencies of Columbiformes through time, in particular at urban sites, could be related to the gradual spread of pigeon breeding and consumption in Italy. At the end of the 13th century, Prato (Tuscany) had about 250 dovecotes, potentially hosting more than four thousand pairs of pigeons inside the city walls. In this city there were specific laws to prevent the increase in price of these birds (Faldi 2012). In the rest of Europe, pigeons became more common from the 11th century onwards, particularly in the upper- and middle-class diet (Serjeantson 2009, 307).

In the late Middle Ages, goose and duck consumption was clearly appreciated in Italy.

Individuals of both sexes and different age classes of goose and duck frequently feature in written sources reporting on high-status diet (Mazzi 1897). At that time, both domestic and wild birds were considered elite food. Nigro (1997) reports that, while wild mammals gradually lost their high-status value, in particular in Italy, wild birds became more important status symbols. Birds were largely available through urban markets (Nigro 1997). In Florence, there were specialized sellers called *pollaioli* (men) and *pollaiole* (women), who sold chickens (*polli* in Italian), but also pigeons, doves, geese, ducks, capons, and wild birds, such us partridges, quails, turtle doves, wild ducks and small birds likely hunted with arrows or traps. The use of the latter was, however, forbidden in Florence from 1325 (Davidsohn 1956-68).

Bird species included in the diet of high-status people in the late Middle Ages are also listed by Mazzi (1897) in *La Mensa dei Priori di Firenze*. This is based on 14th-century daily food accounts of the highest magistrates of Florence. In 1344 an important contribution to the Priori's meals was represented by the meat of wild species such as partridges, *starnoni*, larks, pheasants, plovers, turtle doves, quails, and *chappi*; this latter term is likely to indicate small birds caught with traps. Domestic birds listed in these accounts include chickens, pigeons, peacocks, geese and ducks. This list is largely consistent with the birds identified from high-status and military contexts dated to the late medieval period. Wild birds must have been really appreciated at that time, though their presence in the zooarchaeological record is probably underestimated. This is likely due to the fragility of their bones, post-depositional processes and, particularly, recovery bias.

Hunting was a well-known pastime of the medieval upper class. However, in Italy, wild animal meat provisioning relied mostly on specific groups of people. In 12th century Lucca (Tuscany) there were companies specialized in game hunting. Furthermore, in the

Registri di Gabelle of Volterra (Tuscany) - early 15th-century books reporting the taxes of all items imported to or exported from a town - several wild species exported to Florence and other cities are mentioned; these include pheasants, grey partridges and doves (Pinto and Zazzeri 2005). Grey partridge and dove bones have been found at several late medieval archaeological sites, while pheasant occurs rarely.

The pheasant was introduced to Italy from the eastern Mediterranean, probably in multiple events (Masseti 2003, 94). In the Roman period it features in mosaics from northern Africa and Syria. The Roman writer Pliny the Elder (*Naturalis Historia*, X, 67), also reports that pheasants from the Colchis area (eastern shores of the Black Sea) were present in Italy in the 1st century AD, while there is no mention of this species in Columella's *De Re Rustica*, dated to the same period. Probably, at the time of these two writers, the pheasant was still regarded as an exotic curiosity. Although it was introduced and managed, the late medieval written sources refer to this bird as wild. In the archaeological record, pheasant remains have been identified at Carminiello ai Mannesi (5th - 6th cent.), Vaccarizza (10th – 11th cent.) and Santa Severa (13th – 14th cent.). Further evidence was collected from the 14th century contexts of Rocca Ricciarda (Corbino 2009), a small military settlement located in Tuscany and excluded from this study due to its small sample size. The Italian evidence indicates that the pheasant did not spread widely during the medieval period. Small breeds of pheasants were probably introduced and kept in game reserves, to provide meat for the upper class. From the end of the 15th century onwards, pheasantries are reported at several European royal palaces (Masseti 2003, 98).

Environmental indicators

The Italian medieval contexts have revealed the occurrence of sedentary as well as migratory birds. These latter can be associated with seasonal hunts, assuming that the migration patterns were the same as today. A number of Anseriformes, Ciconiiformes, Gruiformes and Charadriiformes - particularly the whooper swan remains collected at Castiglione and Palazzo Vitelleschi - indicate autumn or winter hunting. The whooper swan breeds in remote areas in the far north and, already at the beginning of the 20th century, it occurred rarely in Italy, in autumn and winter (Arrigoni degli Oddi 1904, 687). It is, however, likely that the hunting of other birds occurred throughout the year, with a probable peak in the migration periods, when the overall number of birds would have increased, due to Italy's key geographic location along migration routes.

The birds identified archaeologically indicate that hunting occurred in a variety of environments, ranging from littoral areas, to mountains, wetlands and open lands. Such diversification means that a great range of wild species could make their way to the medieval table. Of interest is the occurrence of birds that have today become rare. A capercaillie bone was identified from Crypta Balbi (Rome) (7th cent.) (Minniti 2005), tentatively suggesting the possibility that this species once occurred in the Apennines, beyond its current Alpine distribution. The specimen identified is a large size galliform sternum fragment. Having re-analysed the piece, the authors, however, think it may equally belong to a very large chicken.

Remains of little bustard were found at Palazzo Vitelleschi (14th cent.) and Santa Cecilia (12th-13th cent.), both in Latium. The meat of the little bustard must have been valued in the Middle Ages; it features in the famous falconry treatise *De Arte Venandi cum Avibus* by the emperor Frederick II (1194-1250). A considerable number of bones

of this species have been also collected from Apulian prehistoric sites (Cassoli and Tagliacozzo 1997). Nowadays, some individuals still live in Apulia and Sardinia, but the species has completely disappeared from other Italian regions. The archaeological evidence suggests that the little bustard occupied a much broader geographic range in the past, which included the littoral area of northern Latium.

Remains of grey partridge occur at all late medieval sites, and with a high frequency at Palazzo Vitelleschi. Although this bird is still present throughout the year in central and northern Italy, current populations represent the product of the introductions of birds from southern and eastern Europe that occurred in the 1960s and 1970s. Intense hunting pressure and landscape modifications led to the decline and eventual extinction of the native Italian subspecies (*Perdix perdix italica*) (Masseti 2003, 83).

Another interesting occurrence is represented by the remains of a white-tailed eagle from Castiglione (11th cent.). At the beginning of the 20th century, this mainly wintering bird was already regarded as rare in Italy (Arrigoni degli Oddi 1904, 45). As a breeding species this bird is now extinct, with the latest nesting episode recorded in Sardinia in 1956 (Brichetti 2002). Nevertheless, it can still be seen sporadically in Veneto and Sicily during the winter. Urban expansion and landscape modifications, as well as direct persecution, are probably the main causes for the decline of this species in Italy.

Remains of the spotted eagle were found at Cencelle (13th -14th cent.) and Campiglia (14th cent.). This is also a wintering bird, today present only in the Po valley and the northern part of the Adriatic coast. In the early 20th century, however, it could still be found throughout the Italian centre-north, in particular in Liguria. Juveniles were observed more frequently than adults, probably indicating dispersal events (Arrigoni

degli Oddi 1904, 41).

The cranes come from Palazzo Vitelleschi (14th cent.) and Vaccarizza (10th-11th cent.). Currently it is a rare species in Italy, which occasionally occurs during migrations, while a few individuals can winter in Sardinia. Archaeological remains of crane are also known from Italian prehistoric sites (Albarella 1997; Corbino 2017; Tagliacozzo 1993), thus demonstrating a long and well-established history of this bird in the country. Historical sources indicate that in the Middle Ages, crane meat was featured in aristocratic banquets in England, and the bones of this species are not uncommon in high-status sites of the period (Albarella and Thomas 2002). In Italy, it may have enjoyed the same social status. Over-hunting, especially during the Middle Ages, likely depleted the Italian crane population, as suggested for other countries (Serjeantson 2010).

Markers of social status

As already mentioned, the consumption of birds represented itself a marker of social status in the late Middle Ages. However, not only edible birds but also birds of prey, owls and corvids increase in frequency considerably in the Late Middle Ages.

The greater presence of bones of Accipitriformes and Falconiformes (Figure 2) could be associated with the spread of falconry, an elite activity in the medieval period. One of the most famous books about hunting with birds, the *De Arte Venandi cum Avibus*, was written in Italy in the mid-13th century. Birds of prey also feature in several 15th-century Italian paintings (Masseti 2015, 98-106) and in Lorenzo de' Medici's poem *Uccellaggione di Starne* , where the hunting of grey partridges with the aid of a sparrowhawk is described.

Although a majority of birds of prey come from high-status and military sites, not all raptors were used for hunting and the increase of some opportunistic and potentially commensal species (e.g. kites, buzzard, white-tailed eagle) (cf. Mulkeen and O'Connor 1997), may be linked to increased urbanization and intensified exploitation of the countryside.

The identified raptor species have been divided into two groups: 'Falconry' and 'Others' (Table 4). Spotted eagle, goshawk, sparrowhawk, kestrel, hobby, peregrine and merlin have all been included in the list of species potentially used for falconry. Sparrowhawk and kestrel are the most frequent species of raptors in the zooarchaeological record and in the late medieval iconographic representations related to falconry. Among the group of 'Others' are those species that are more likely to have been scavengers or have occupied human settlements. Overall, in the late medieval period, the frequency of raptors potentially used for falconry is considerably higher.

The occurrence of exostoses on a red kite (proximal carpometacarpus) and a female sparrowhawk (proximal femur) from Palazzo Vitelleschi (14th cent.) could suggest tamed individuals. Females, which in raptors are considerably larger than males, were the favoured sex for falconry due to their ability to hunt larger preys (Prummel 1997). The use of the falconer equipment, that included jesses, and the intense training of birds might have potentially caused bone pathologies (Serjeantson 2009, 323). Similar pathological evidence identified on an almost complete skeleton of a goshawk (on both proximal ulnae and a proximal carpometacarpus) from Carminiello ai Mannesi (5th-6th cent.) (Rielly 1994) is especially noteworthy, as it could represent the earliest archaeological evidence of falconry in Italy.

Cut and chop marks on both distal humeri and a proximal coracoid of the spotted eagle

from Rocca di Campiglia (14th cent.) suggest the removal of the wings from the body of the bird. The humeri were the only wing bones of this almost complete skeleton of a spotted eagle to be found. Probably the fore wings were removed for the use of feathers or to be displayed as a trophy, or perhaps as a sign of affection of the owner for its once precious companion.

Though we cannot entirely rule out natural accumulation, the increase in corvid and owl remains in the late medieval period could be linked to falconry too. Trained raptors would hunt birds, such us corvids, which were unpalatable to humans but desirable to the predators themselves. These became part of the raptor's meal after the hunt (Prummel 1997). Strigiformes, on the other hand, were used as decoys in hunting activities, to attract preys that would then be caught by raptors (van Wijngaarden Bakker 2010).

Two complete carpometacarpi of greylag goose with light cut marks on the proximal end from Rocca di Campiglia (14th cent.) are likely to indicate the removal of primary feathers from distal wings, to be used as pen quills. Similar evidence was identified by Serjeantson (2002) on a number of carpometacarpi from a 13th -14th century context from Winchester (southern England). Although quill feathers may have been employed for several uses, the evidence from Winchester was linked to the production of pen quills. Literacy was not common in the Middle Ages, as only high-status people and monks received relevant training.

A further potential indicator of social status is represented by the distal ulna of a griffon vulture from Palazzo Vitelleschi (14th cent.). This species became virtually extinct in Italy (except Sardinia, where it merely declined), though it has now been re-introduced in some areas. The bone fragment shows cut marks aimed to separate the diaphysis from

the distal epiphysis. In Spain, vulture ulna shafts are known to have been used to make musical instruments (Moreno García et al. 2005).

Conclusions: the importance of wild birds in medieval Italy

From the 12th century on, important changes occurred in Europe. In Italy, particularly in the central regions, the expansion of craft manufacturing, trade and bank activities led to the emergence of a new privileged urban class (Goldthwaite 1984), for whom a diversified diet became a means of social differentiation. Rural settlements where the aristocracy and military garrisons were set were also involved in this social process.

In the late medieval period meat consumption alone had become an insufficiently strong marker of status (Albarella and Thomas 2002); therefore, birds became an important component of the late medieval high-status table, contributing to a more diversified meat diet. Late medieval sources emphasise a widespread consumption of chicken, together with wild and other domestic birds, among the upper class, and this is supported by the archaeological evidence presented in this paper. Wild species were likely more prized and the general increase in the diversity of birds is related to the inclusion of a larger number of species in the diet. Indeed, as already stated for England, in Italy "the importance of wild birds in the medieval diet is not to be found in their contribution to subsistence and economy, but rather in the meaning that the consumption of wild birds implied" (Albarella and Thomas 2002, 26). The greater representation of wild birds on high status sites in Italy is indeed indicative of their significance as symbols of wealth and social prominence.

The provisioning of wild birds, available also through urban markets, likely relied on the improvement of bird hunting techniques. Birds were hunted throughout the year, with a possible peak during the migration period, as indicated by the presence of species

that, at least nowadays, do not breed in the country. Nets and traps were largely used for this purpose. The overall evidence suggests that falconry intensified in Italy in the late medieval period especially at high-status and military sites, thus becoming an increasingly more important component of the hunting activities of the upper class, likely aimed to guarantee the presence of wild birds on their tables. However, birds of prey could also be exploited to obtain wildfowl for the markets. As we have seen more birds of prey are found in the later medieval archaeological record. Pathological and butchery marks on raptor bones are also indicative of the intimate relationship existing between humans and these birds.

The intense predation and/or persecution of some birds from that period onwards caused also the decline and disappearance of some species from their original geographical ranges. Little bustards, cranes and grey partridges – for example – all eventually vanished from large sections of the Italian countryside.

In this paper we have shown how the study of wild birds from archaeological sites, particularly when integrated with historical and iconographic sources, can contribute significantly to our understanding of medieval society. The evidence strongly points to the fact that the use and consumption of wild birds represented a potent symbol of high status, whose significance increased during the Middle Ages.

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Site name	Municipality and County	Region	Reference
Carminiello ai Mannesi	Naples	Campania	Rielly 1994
Castel Fiorentino	Foggia	Apulia	De Venuto 2013
Castiglione	Rieti	Latium	Re-analysed
Cencelle	Civitavecchia, Rome	Latium	Re-analysed
Colosseum	Rome	Latium	Bedini 2002
Crypta Balbi	Rome	Latium	Re-analysed
Palazzo Vitelleschi	Tarquinia, Viterbo	Latium	Re-analysed
Rocca di Asolo	Treviso	Veneto	Bedini 2000
Rocca di Campiglia	Campiglia Marittima, Grosseto	Tuscany	Corbino 2010; Re-analysed
San Giovanni di Ruoti	Potenza	Basilicata	Eastham 2002
Santa Cecilia	Rome	Latium	Re-analysed
Santa Severa	Santa Severa, Rome	Latium	Fatucci, Cerilli 2015
Vaccarizza	Foggia	Apulia	De Venuto 2013

Table 1: List of sites discussed in this paper (for location see Figure 1)

	Site name	Chronology	Site type	Period	%W	NISP
Early Medieval	Carminiello ai Mannesi	5th-6th	urban	EM	15	929
	San Giovanni di Ruoti	5th-6th	rural	EM	23	2223
	Crypta Balbi	7th	urban	EM	9	270
	Crypta Balbi	8th	urban	EM	9	103
	Crypta Balbi	9th	urban	EM	25	57
				EM (mean)	**16**	**3582**
Mid-medieval	Vaccarizza	10th-11th	urban	MM	16	788
	Castiglione	11th	rural-military	MM	11	977
	Castel Fiorentino	11th-12th	urban	MM	11	168
	Rocca di Asolo	11th-13th	rural	MM	10	330
	Vaccarizza	11th-13th	urban	MM	10	183
	Colosseum	11th-13th	urban	MM	22	220
				MM (mean)	**13**	**2666**
Late Medieval	Santa Cecilia	12th-13th	urban-religious	LM	11	485
	Rocca di Campiglia	13th	rural	LM	11	228
	Cencelle	13th-14th	urban	LM	10	363
	Santa Severa	13th-14th	rural	LM	18	696
	Rocca di Campiglia	14th	rural-military	LM	35	327
	Palazzo Vitelleschi	14th	urban-nobles	LM	19	3238
	Rocca di Asolo	14th-15th	rural	LM	12	599
	Castel Fiorentino	14th-15th	urban	LM	24	269
				LM (Mean)	**18**	**6205**

Table 2: Relative percentages of non-chicken birds (%W) at medieval Italian sites. EM = early medieval. MM = mid-medieval. LM = late medieval. Means for each period correspond to the average of the percentage values per period. The NISP represents the number of identified bird bone specimens for each site period, chicken included.

Anseriformes			
Cygnus olor	*Anser anser*	*Anas acuta*	*Aythya fuligula*
Cygnus cygnus	*Branta sp.*	*Anas penelope*	*Aythya cf. ferina*
Anser albifrons	*Anas platyrhynchos*	*Anas crecca*	*Bucephala sp.*
Anser fabalis	*Anas strepera*	*Anas querquedula*	*Mergus serrator*
Galliformes			
Alectoris graeca	*Coturnix coturnix*	*Tetrao urogallus*	
Perdix perdix	*Phasianus colchicus*		
Ciconiiformes			
Botaurus sp.	*Ardea cinerea*	*Ardea purpurea*	*Ciconia ciconia*
Accipitriformes			
Gyps fulvus	*Milvus migrans*	*Buteo buteo*	
Haliaeetus albicilla	*Milvus milvus*	*Accipiter gentilis*	
Aquila clanga	*Circus aeruginosus*	*Accipiter nisus*	
Falconiformes			
Falco tinnunculus	*Falco subbuteo*	*Falco columbarius*	
Falco naumanni	*Falco cf. peregrinus*		
Gruiformes			
Fulica atra	*Grus grus*		
Charadriiformes			
Pluvialis squatarola	*Limosa limosa*	*Scolopax rusticola*	*Rissa tridactyla*
Vanellus vanellus	*Numenius arquata*	*Gallinago gallinago*	
Tringa glareola	*Actitis hypoleucos*	*Larus argentatus**	
Otidiformes			
Tetrax tetrax			
Columbiformes			
Columba livia/oenas	*Columba palumbus*	*Streptopelia turtur*	
Strigiformes			
Strix aluco	*Tyto alba*	*Athene noctua*	*Otus scops*
Apodiformes			
Apus apus	*Apus melba*		
Piciformes			
Picus viridis	*Dendrocopos medius*		
Passeriformes			
Alauda arvensis	*Turdus merula*	*Garrulus glandarius*	*Passer domesticus*
Melancorypha calandra	*Muscicapa striata*	*Corvus monedula*	*Fringilla* sp.
Hirundo rustica	*Cyanistes caeruleus*	*Corvus frugilegus/corone*	*Chloris chloris*
Saxicola torquata	*Parus major*	*Corvus corax*	*C. coccothraustes*
Turdus philomelos	*Lanius minor*	*Sturnus vulgaris*	
Turdus iliacus	*Pica pica*	*Oriolus oriolus*	

Table 3: List of identified species and/or genera for each bird order. The Larus argentatus (Pontoppidan, 1763) (European herring gull) listed in this table should presumably be re-named as Larus michahellis (Neumann, 1840) (yellow-legged gull), according to new taxonomy, which confines the term Larus argentatus to the Atlantic form, unlikely to have occurred in Italy and probably osteologically indistinguishable from Larus michahellis. The Passer identification is reported as from the original

publication (Eastham 2002), though osteological identification of Passer to specie level is very difficult to achieve.

	EM	MM	LM
"Falconry" Total NISP	4	1	40
"Others" Total NISP	1	3	22
Number of site periods	5	6	8
% of sites with raptor bones	40	50	88

Table 4: Remains of species likely used for ‘Falconry’ (spotted eagle, goshawk, sparrowhawk, kestrel, hobby, peregrine and merlin) are contrasted with the ‘Others’ (white-tailed eagle, kites, marsh harrier, common buzzard and lesser kestrel). All site types have been considered.

Figure 1

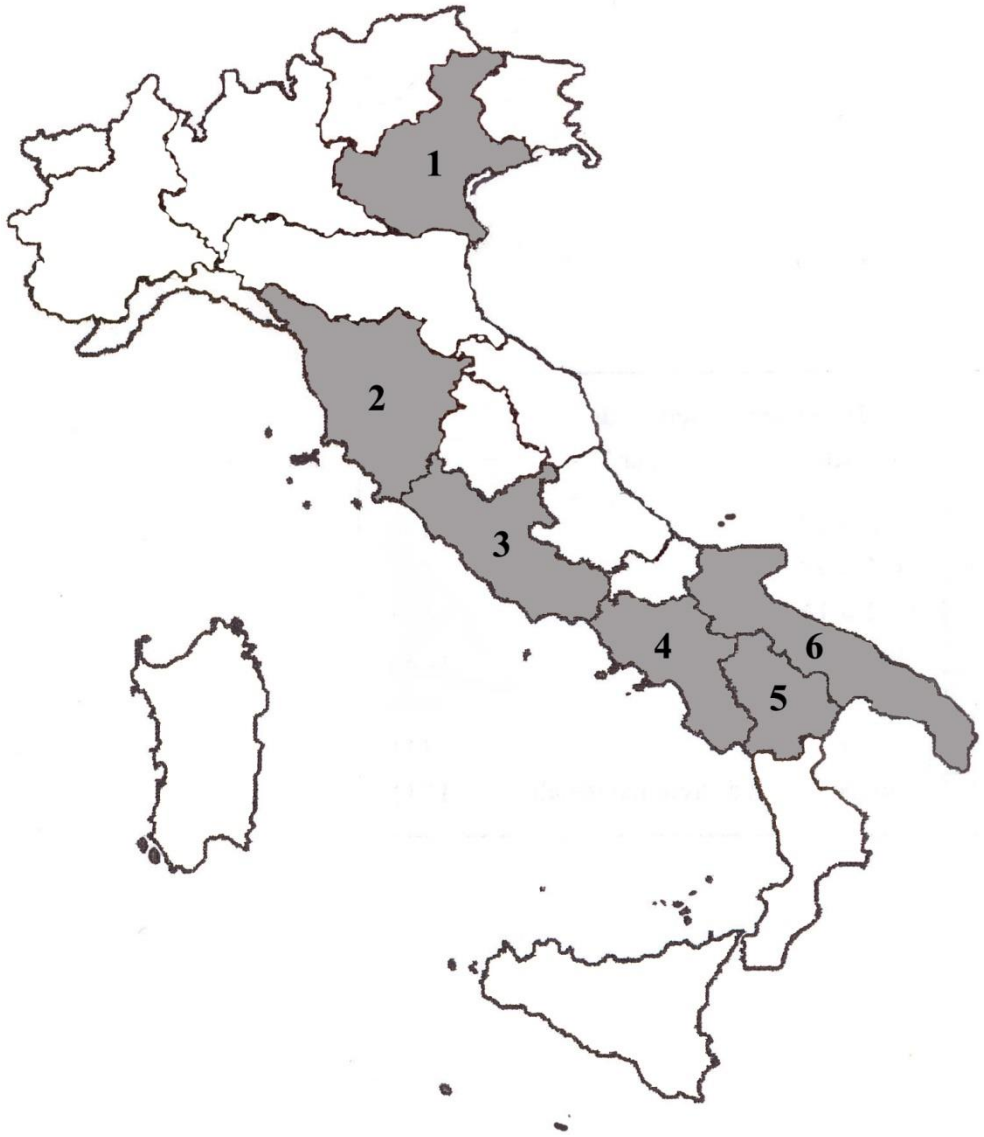
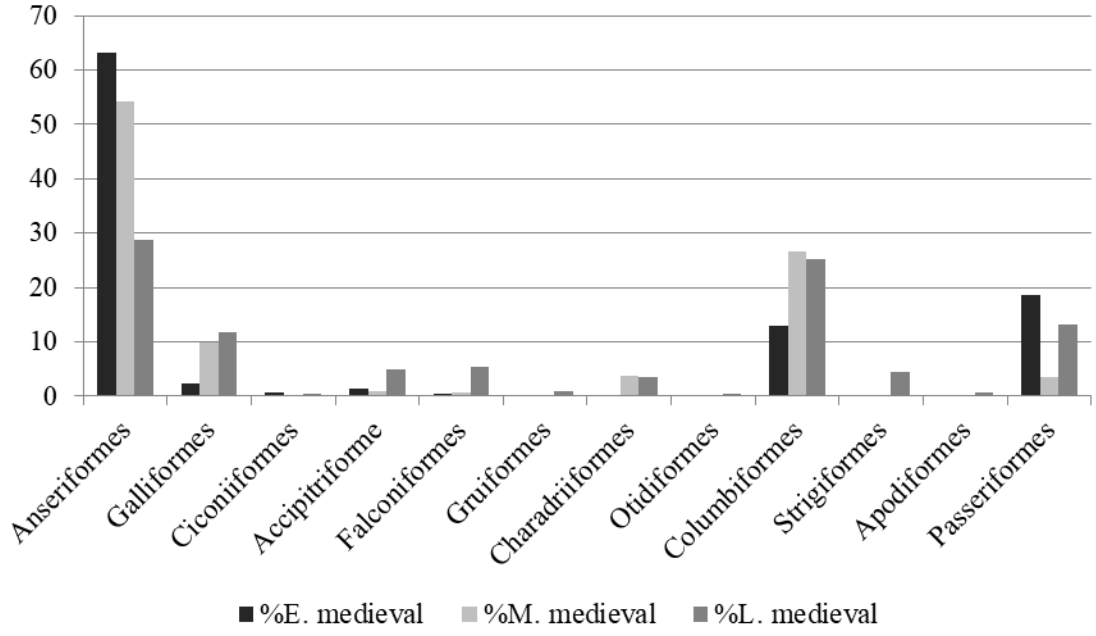


Figure 2


70
60
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Anseriformes
Galliformes
Ciconiiformes
Accipitriforme
Falconiformes
Gruiformes
Charadriiformes
Otidiformes
Columbiformes
Strigiformes
Apodiformes
Passeriformes
%E. medieval
%M. medieval
%L. medieval

Figure 3

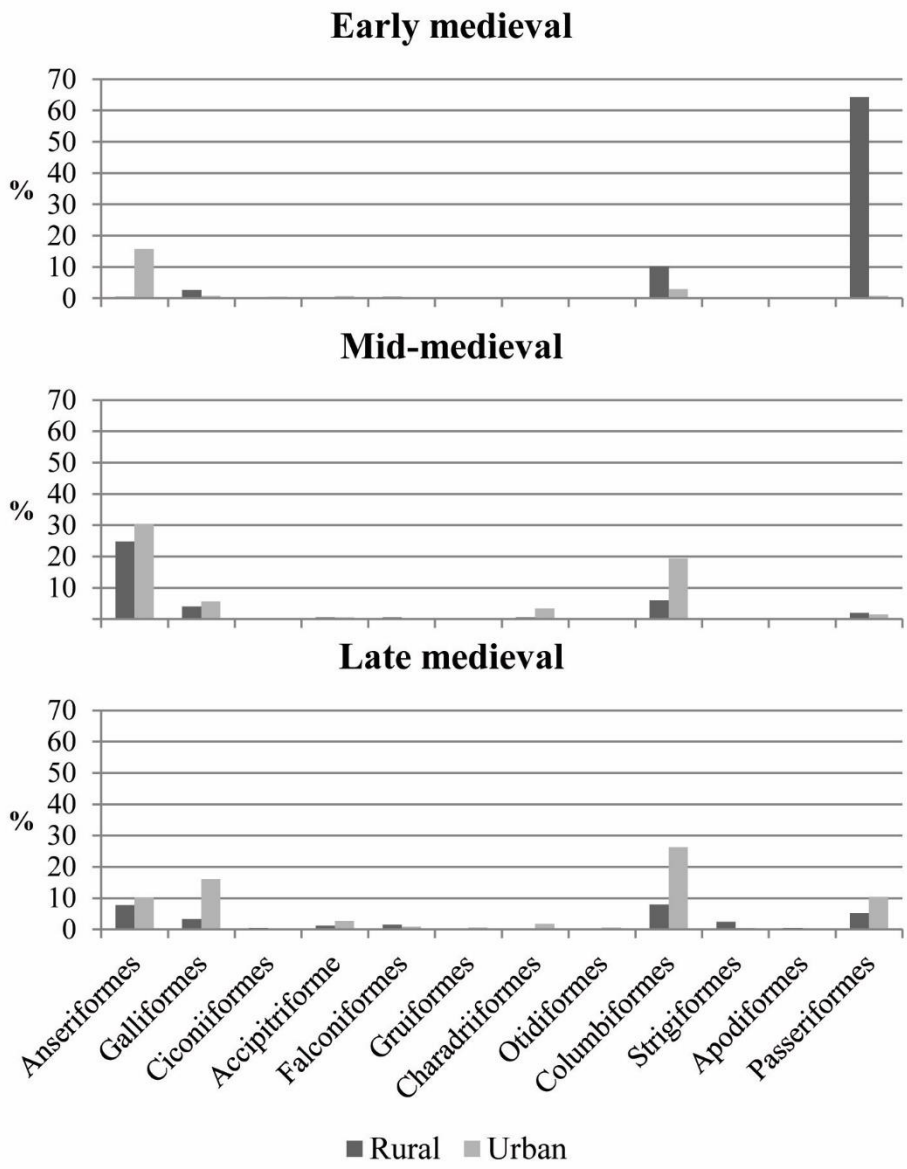
Early medieval
Mid-medieval
Late medieval
%
70
60
50
40
30
20
10
0
Anseriformes
Galliformes
Ciconiiformes
Accipitriforme
Falconiformes
Gruiformes
Charadriiformes
Otidiformes
Columbiformes
Strigiformes
Apodiformes
Passeriformes
Rural
Urban

Figure 1: Map of Italy showing the location of the regions discussed in the text. 1=Veneto, 2=Tuscany, 3=Latium, 4=Campania, 5=Basilicata, 6=Apulia. See Table 1 for further details about the location of each site.

Figure 2: Relative frequencies of the identified bird orders by period. The chart plots the mean of the order percentages for each period site per period.

Figure 3: Relative frequencies of bird orders at rural and urban contexts. The charts plot the percentages of each bird order per period and by site type. The 100% of birds per period correspond to the sum of all bars in each chart. Difference in the frequency of bird orders between urban and rural sites is statistically significant for all three periods. According to a chi-square t-test, this difference is very highly significant ($p<0.1\%$) for the early and late medieval periods, and highly significant ($<1\%$) for the middle medieval period, for which we have slightly smaller sample.