



ARCHAEOZOOLOGY OF THE NEAR EAST

V

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archaeozoology of southwestern Asia and adjacent areas

edited by

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Preface

When I participated in the IVth International Conference of ASWA, held in the summer of 1998 in Paris, I was gratified to learn that the Scientific committee had unanimously agreed to hold the next meeting in Jordan. Thus, on 2 April 2000, the Vth International Conference of the Archaeozoology of Southwest Asia and Adjacent Areas was held for the first time within the region at Yarmouk University in Irbid, Jordan after being held on the past four occasions in Europe.

The themes of this conference were divided into five areas including:

- Paleo-environment and biogeography
- Domestication and animal management
- Ancient subsistence economies
- Man/animal interactions in the past
- Ongoing research projects in the field and related areas

I wish to thank all those who helped make this conference such a success. In particular, I would like to express my appreciation to the Director of the Institute of Archaeology and anthropology at Yarmouk University. Special thanks are due to his excellency, the President of Yarmouk University, Professor Khasawneh, who gave his full support and encouragement to the convening of this conference at Yarmouk University and to all those who contributed the working papers which made the conference possible.

I also wish to thank members of the organizing committee who worked very hard for many months in preparing the venue for this conference.

Abdel Halim Al-Shiyab
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Note from the editors:

The editors wish to thank Dr. László Bartosiewicz for his excellent assistance in preparing and checking the contributions to this volume.



Participants at the 5th ASWA Conference, held at the Yarmouk University in Irbid, Jordan, 2000

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FLYING A KITE AT THE END OF THE ICE AGE: THE POSSIBLE SIGNIFICANCE OF RAPTOR REMAINS FROM PROTO- AND EARLY NEOLITHIC SITES OF THE MIDDLE EAST

Keith Dobney¹

Abstract

A re-interpretation of the animal bones from numerous sites in the Near and Middle East may push the evidence for the antiquity of falconry deep into prehistory, perhaps to the end of the Pleistocene. In this paper, it is argued that the taming and possible training of birds of prey may even have been one of the first steps for humans on the road to the domestication of animals.

Résumé

Une réinterprétation d'ossements animaux de plusieurs sites du Proche et du Moyen-Orient permet d'appuyer l'ancienneté de la fauconnerie loin dans la préhistoire, peut-être depuis la fin du Pléistocène. Dans cet article, on argumente le fait que l'approvisionnement et éventuellement le dressage d'oiseaux de proie aurait même pu constituer pour l'homme les premières étapes sur la voie de la domestication animale.

Key Words: Birds of prey, Falconry, Hunting, Domestication

Mots Clés: Oiseaux de proie, Fauconnerie, Chasse, Domestication

Introduction

Epstein (1943:497), in his seminal review of the antiquity of falconry, states that "The origin of falconry, both geographically and chronologically, is still hidden in darkness, and it seems doubtful whether we shall ever discover the cradle of this ancient sport". Despite this somewhat negative statement, he goes on to support the traditional view which considers that the first use of tame birds of prey for hunting game probably occurred somewhere in the Central Asian plateau (in a region between China, Japan and Korea) perhaps during the 1st or even 2nd millennium BC. The practice then supposedly extended westwards through subsequent trade and contact.

It is, therefore, puzzling that perhaps the earliest artistic evidence of falconry comes not from central Asia or the far East, but from central Anatolia. Here, several Hittite bas-reliefs (dated circa 1,500 BC) show very stylised representations which include a large bird (possibly a raptor) on the fist of a human figure (Colonel Kent *Carnie pers. comm.*). Grasped in the same fist is the figure of a hare (presumably the quarry) held by the back legs. However, traditional interpretations of this scene suggest a purely religious or symbolic one, and not evidence of falconry at all.

Another (albeit somewhat later) example comes, once again, not from the far East, but from Northern Mesopotamia. Depicted on an Assyrian bas-relief from Khorsabad (dated to the period of Sargon II - 722-705 BC), is a small bird of prey on the wrist of a man (see Epstein 1943). What is most significant about this relief is that there appear to be 'jesses' (leather thongs used to secure the bird to the human fist) tied to the bird's feet, which appear to pass between the thumb and forefinger of the falconer. This early relief may suggest that the sport (and its paraphernalia) was well developed by the 8th century BC in the Middle East. As with the Hittite examples, others have placed an alternative religious or symbolic interpretation on this scene. However, if these examples do indeed depict hawking, then the sport must be at least 3,500 years old in Western Eurasia.

Direct archaeological evidence for early falconry is, not surprisingly, hard to find. However, the zooarchaeological record can perhaps throw further light on the antiquity of the taming and use of birds of prey for

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hunting and, perhaps more importantly, provide important clues to the stimulus behind its initial development?

Numerous excavations of substantially earlier human settlements in Israel, Jordan, Syria, Iraq, and Iran (of later Palaeolithic and proto/early Neolithic date – circa 10,000-8,000 BC.) have shown the remarkably consistent presence of the bones of birds of prey (raptors). They have usually been interpreted as the remnants of food remains of the humans living at those sites, or as elements of their totemic or religious activities. Could there, however, be an alternative explanation? For example, do these fragile remains represent evidence for the earliest management and training of living birds of prey and the possible first faltering steps towards falconry?

In order to explore this idea further, we need to:

- understand the significance of other animal bones from these early sites
- briefly explore the historical and modern ethnographic record of peoples who still practice falconry
- place these data within the environmental and cultural context of the early Holocene.

Changing economics of the late Pleistocene-early Holocene transition (circa 12,000-10,000 BP).

Apart from the variety of raptor species usually present in assemblages from sites of this period from the Middle East, (see Table 1), another of their major characteristics is the broad and diverse range of other vertebrate species apparently exploited by humans (e.g. Table 2). Analysis of animal bone (and to some degree lithic) data appears to indicate a shift in the economic focus of hunting at a number of already permanently settled human settlements in the Middle East from a reliance on larger mammal species, towards a broader dietary spectrum. This relatively short-term phenomenon, first called by Flannery (1969) ‘the broad spectrum revolution’, is perhaps best characterised by a greater reliance by humans on smaller animal species.

Although much subsequent debate has continued over the nature (and even existence) of this phenomenon (e.g. Cohen 1977; Redman 1977; Davis 1977, 1981 & 1982; Bender 1978; Price and Brown 1985; Edwards 1989; Bar-Yosef and Belfer-Cohen 1989 & 1991; Rosenberg 1998; Dobney *et al.* 1999; Munro 1999), these sites can be broadly categorised by their apparent common reliance on specific mammal genera (particularly *Gazella*, *Vulpes* and *Lepus*), as well as a range of game birds (e.g. *Pterocles*, *Ammoperdix*, *Francolinus* or *Alectoris*), and in some cases fish. Hunters must have been both skilled and versatile in order to capture large enough numbers of these less rewarding species to support the nutritional requirements of the group, and would have needed to develop and employ a variety of techniques (e.g. trapping, netting, digging and poisoning). Could the bird of prey remains identified at these sites also represent evidence for an additional hunting strategy employed to catch smaller, prey species? In other words, was falconry first developed and employed as one of the hunting strategies of the proto and early Neolithic of the Middle East?

Quite clearly, the association of both predator and prey species in the same deposits is hardly conclusive evidence for the existence of falconry in the past. However, evidence for its existence at some European medieval and even Roman sites has been proposed (and largely accepted) purely on that basis (e.g. Prummel 1997 and Murphy *et al.* 2000). In order to explore this hypothesis further, therefore, we must turn to the more recent use by man of actual raptor species themselves for further possible clues.

Which birds were used?

The fact that the bones of *Falconiformes* are less often found at these early sites, compared to larger *Accipiters* (eagles, buzzards and vultures) and *Strigiformes* (specifically *Bubo bubo*), would in itself be enough to convince most traditional falconers that the inhabitants of these early sites were not practising falconry.

Table 2. Species list from the site of Qermez Dere, Northern Iraq. (* = present but not quantified)
Note the high numbers of foxes and hares, and the range of bird of prey remains

Species	Common name	NISP
cf. <i>Pernis apivorus</i>	?honey buzzard	1
<i>Neophron percnopterus</i>	egyptian vulture	6
<i>Buteo spp</i>	buzzard	1
<i>Buteo buteo</i>	common buzzard	5
cf. <i>Buteo rufinus</i>	?long-legged buzzard	12
<i>Aquila rapax</i>	steppe eagle	9
cf. <i>Alectoris chukar</i>	?chukar partridge	1
<i>Alectoris chukar</i>	chukar partridge	3
cf. <i>Ammoperdix griseogularis</i>	?see-see partridge	5
cf. <i>Francolinus francolinus</i>	?black francolin	1
<i>Francolinus francolinus</i>	black francolin	1
cf. <i>Anthropoides virgo</i>	?demoiselle crane	1
<i>Chlamydotis undulata</i>	houbara bustard	26
<i>Otis tarda</i>	great bustard	2
<i>Pterocles sp</i>	sand grouse	57
cf. <i>Pterocles alchata</i>	?pin-tailed sand grouse	225
cf. <i>Pterocles orientalis</i>	?black-bellied sand grouse	24
<i>Bubo bubo</i>	eagle owl	2
<i>Corvus corone/frugilegus</i>	carion crow/rook	3
Alaudidae	Lark sp.	11
Total bird		396
<i>Hemiechinus auritus</i>	Long-eared hedgehog	*
<i>Meriones sp</i>	Jird	*
<i>Tatera indica</i>	Indian gerbil	
<i>Lepus capensis</i>	cape hare	552
<i>Vulpes vulpes</i>	red fox	1677
<i>Meles meles</i>	badger	6
<i>Felis silvestris</i>	wild cat	43
<i>Equus hemionus</i>	onager	3
cf. <i>Equus hemionus</i>	?onager	1
<i>Bos primigenius</i>	wild cattle	12
<i>Gazella cf. subgutturosa</i>	?goitred gazelle	1174
<i>Ovis orientalis</i>	wild sheep	42
Caprovid	sheep/goat	38
Ovis/Capra/Gazella	sheep/goat/gazelle	639
Total mammal		4187

Both today, and in the recent past, a relatively select range of raptor species are generally used by man for hunting small game. These are mainly the larger bird-killing falcons (such as the *Falco peregrinus*, *Falco biarmicus*, *Falco cherrug* and sometimes *Falco rusticolus*) as well as *Accipiter gentilis*, *Accipiter nisus* and *Falco tinnunculus*. Most eagles (particularly the smaller ones) and some buzzards are considered by many purists as unsuitable for falconry, since they are mainly opportunistic scavengers and carrion feeders, and will hunt small live prey only occasionally. Other species like the vulture, although easily trained to fly to the fist, cannot apparently be made to kill quarry.

However, all birds of prey can be easily tamed and trained, and there is plenty of evidence from past and present day Central Asia, India, and even Europe that a whole host of larger raptors have been trained to fly to the fist and (more importantly) hunt; some more successfully than others. Golden eagles, for example, can be trained to catch a range of medium-large prey, including something as large and formidable as a wolf. It is a bird which is well equipped to hunt in open flat country, although it has the disadvantage of being heavy to carry and requires some precaution in managing properly (Harting 1970). In central Asia, it is rarely carried on the fist; more generally on a crutch of bent wood resting against a girdle, and supported by a leather strap over the left shoulder, or on a perch fixed to the saddle. There are various references to their training: "*Training begins by getting the bird used to man and to feed on the fist (fed with small pieces of lean meat). Next lures are made of stuffed fox,*

wolf and gazelle skins and meat fastened to the eye sockets. Once it has overcome its fear and is feeding from the head, the lure is pulled along on foot and the eagle allowed to fly at the lure. Then caught live animals (usually young foxes) with their mouths gagged have meat tied to their heads are released and caught by the eagle" (Anonymous 1938: 11), and to their effectiveness against a variety of prey: "When flown at a hare or fox on being cast off, it rises to a fair height and then comes down plump upon it and, in the event of a miss, again takes wing to pursue it. If a stoop be true it can split the skull of a fox at one blow (Haller, pers. comm. in Harting 1970)."

There are peoples in Asia who, until recently, depended upon golden eagles for a significant proportion of their livelihood (Fig. 1), particularly "Turkish and Mongol people of the steppes east of the Volga...the classic country has always been the high plateau of the Tien Shan [the celestial mountains which form the border between Kyrgyzstan and Kazakhstan] (Anonymous 1938: 10). They hunted hares, foxes and wolves, the pelts of which were sold during the lean winter months (Brown & Amadon 1968: 69). Eagles were generally flown at Corsack foxes (*Vulpes corsack*), roe deer (*Capreolus capreolus*), the gazelle (*Gazella subgutturosa*), wolves (*Lupus lupus*) and sometimes at hares (*Lepus* sp.), "A good bird, in one season, can catch 30-50 foxes for its master. One eagle called "Alagym" who in 1923, aged 12, took 14 wolves in one days hawking. Although the wolves of Turkestan are much feebler than those of eastern Europe or Siberia, the score is nevertheless remarkable (Anonymous 1938: 12)". Fell (1916: 216), during his travels amongst the Khyrgyz nomads, states that..... "In a good season, he [the golden eagle] may secure for his master 200 roubles' worth of furs". Various early and more recent travellers in Central Asia also described the use of eagles for hunting large quarry. Marco Polo allegedly participated in a hunt using eagles with the great Kubilai Khan and commented.... "He has also a great multitude of eagles which are very well trained to hunt; for they take wolves and foxes and buck and roe deer, hares and other small animals... (Moule and Pelliot 1938)". Jenkinson (1559 issued for 1885) saw Tartars using "haukes" (probably golden eagles) to hunt wild horses (probably Kulan or onager) and states that ... "...they are used to bewilder the hunted animal". Lieutenant D. Carruthers (1949: 159) provides details of some of the species taken by trained eagles in Central Asia: "Quarry consists mostly of foxes, gazelle, wolves and in earlier days saiga antelope. It is said that a good eagle can kill a wolf unaided [but Carruthers never saw this]. Occasionally larger game, such as deer (hinds and calves for choice) form the quarry. Generally speaking larger game is not flown at unless it is in conjunction with men and dogs. In these cases the eagle is not employed to kill but to fluster the quarry in order to bring it to bay and bag (as the Bedouin fly their sakers, in conjunction with greyhounds, at ibex and gazelle". He also described the use of eagles by the natives of Tarim to corner wild pigs in order that the hunters can close in and club the victim to death: "...the eagle plays little more than nuisance value, but it is sufficient to confuse the quarry in order to bring it to bay and bag (Carruthers *op. cit.*:159). "

Sir John Chardin, in his "travels in Persia" first published in the 17th century (version translated by Penzer, 1927), mentions large "Muscovite Hawks" being used to hunt a range of prey: "I must not pass by a bird of prey which comes from Muscovy,... being almost as big as an eagle. Those birds are very rare and the King has all those that are in his kingdom." "... the Muscovite Hawks and Hawks of mount Caucasus are so much valued... They teach those birds by setting them at cranes or other birds... and once taught, they take first, all passing birds, eagles, cranes, wild ducks, geese, partridges and quails. Secondly, the rabbit and the hare; they teach them likewise to hold any wild beast except the wild boar (Penzer *op. cit.*: 180-181)". He also witnessed these large trained "hawks" (which may have been golden eagles) flown at large prey. He states that "they hunt the beast till it's tired, then they let the bird go; he sits on it's head, beats the eyes of it with his wings, and pricks it with its talons and with his bill, which so stuns the timorous beast, that it falls down and gives the hunters time to come to it. When tis a large beast, they let go several birds, which torment it one after another. "...some have been taught to assault men; that was common in the beginning of the last age... (Penzer *op. cit.*:181)."

T.W. Atkinson (1858: 487) saw eagles used for hunting in Chinese Tartary. Elsewhere (1860: 58) he states that he accompanied the Sultan Basapasihan on an eagle hunt where he saw the Berkut kill a large deer and antelope (probably saiga). He was told that many foxes and even wolves, wild goat and lesser kind of deer were taken in this way. He indicated that no dogs were used, since the eagle would also attack them.



Fig. 1. Recent Khryghyz falconer hunting red fox with a golden eagle (from Dementiev 1936).

Capt. John Biddulph, one of a party of British army officers led by Colonel T. E. Gordon, provides an account of sport he witnessed with trained eagles during their travels in Central Asia. While on a march from Kashgar to Maralbashi he describes these eagles killing gazelles and foxes (Gordon 1876). During the envoys tour in Artush district, Colonel Gordon also saw wild boar hunted by Berkut [golden eagles]: "*It is flown at the hog and generally succeeds by its sharp and powerful attack in bringing the animal to bay* (Gordon *op. cit.*:191)."

Guillaume Tardif, of Puy en Vellay (1483-1498) refers to different species of eagle used for falconry and indicates an oriental source of information by giving the Arabic and Syrian names for them. He states that the best are those which are “white on the head” (presumably the imperial eagle) - their quarry being hare, fox and gazelle. He mentions a smaller eagle (presumably the steppe eagle) which will take cranes and other birds (Tardif 1492: 168-169).

Eagles were not popular in Europe as hawking birds due to their great weight, their great power of fasting and the trouble of training them unless taken young (Harting 1970). Harting (*op. cit.*: 173-175) describes how an eagle - brought by M. Benoit Maichin, an acquaintance of Harting, from Turkestan (bought from a Kyrgyz nomad) - easily caught foxes and hares with skill. A description of this eagle, aided by a visit with Harting to the Natural History museum bird gallery, confirmed the bird as a young imperial or steppe eagle. He also visited another French Falconer (M. Edmond Barrachin of Beauchamp) who flew two Bonellis eagles. He saw them being used to hunt rabbits (not as successfully as the Goshawks also out at the same time. *Ibid*: 176).

A Russian correspondent with Harting (Mr Consantine Haller) wrote to him stating that the Kyrgyz also train white-tailed eagle (*A. albicillus*) and the white-crowned eagle (*H. leucoryphus*). Like the golden eagle, these were trained to take wolf, fox, hare, saiga antelope, and sometimes bustard.

Schafer (1959) states that the golden eagle was the species most commonly used by the Tang emperors in the 6th century AD, although the Imperial eagle, the steppe eagle and the spotted eagle were also used.

Of particular significance are the comments of Aelian (writing in *circa* AD 220) who supposedly quotes the writings of one ‘Ctesias the Cnydian’ writing in the early 5th century BC (quoted in Epstein 1943). Ctesias was court doctor to the Persian King Artexseis II (Mnemnon) and in his early treatise on falconry describes the country and customs of the ‘pygmies’, a mysterious people inhabiting some part of Central Asia. He states that “...they hunt hares and foxes with crows, yellow-breasted marten cats and with cornices and eagles (*other translations suggest crows, kites rooks and eagles were used*). ”

Ctesias also provides details of how these unlikely species were trained to catch hares and foxes: “...they catch young eagles and also the young of ravens and vultures, bring them up and train them for hunting. The procedure is as follows: They hang meat on a tame hare or a tamed fox and let it run; then they send the birds after them and permit them to take hold of the meat. The birds try this with all their might, and when they have caught up with the one or the other, they may take the meat as a prize and this for them is a great lure. When they have been brought to precision in this type of hunting, the Indians let them loose on mountain hares and wild foxes. In hope of the usual meal, they chase after the prey which appears, and catch it very quickly.”

The various vulture species found at many of these early sites present somewhat of a problem when considering the falconry hypothesis. By their very nature, vultures in the wild are carrion feeders and will not hunt and kill live prey naturally. However, if the remarkable evidence from Ctesias can be believed, vultures appear to have been trained to catch hares and foxes in the 5th century BC. As outlined above, they can certainly be easily tamed and trained to fly to hand, particularly *Neophron percnopterus*, which is flown today at several bird of prey centres around Britain. Even if vultures weren't actually used for hunting, like the tame fox or hares quoted by Ctesias above, they may have equally been used by falconers as lures to train smaller birds of prey to hunt larger raptors, a common practise described in the historic literature: “If it is intended to train a *charkh* (saker falcon) to take eagles, it should first be given the necessary “trains” by hand, and then entered to wild quarry by being flown a few times at young scavenger vultures [or black or yellow buzzards] in the dark immature plumage (Phillott 1868:35)”, ...the *shikra* [another term for saker falcon] used to be trained in the Karputhala State to take the egyptian vulture. The young *shikra* was entered by being fed on a live vulture with seeled eyes, meat being tied on the back of the head” plumage (Phillott *op. cit.*: 111). ”

The identification of the bones of the eagle owl (*Bubo bubo*) at many of these sites may add another interesting dimension to the falconry hypothesis. Like the other species of large raptor already mentioned, this extremely powerful bird can also be trained to hunt a range of prey. It is not particularly fast, usually only hunting ‘still’ prey and is therefore not considered particularly useful for hunting quarry that's been flushed out during a hunt. It may, however, have been used to hunt at dusk or even at night where it is particularly effective. In a Persian treatise on falconry (the Baznama-Yi Nasiri, translated by Lt Col. D. C. Phillott in 1868: 21), it is stated that: “Nestlings of this species [the eagle

owl] are frequently taken by fowlers, reared by hand, and then trained for the sport of 'owling'. As soon as Autumn commences and the weather begins to cool, i.e. as soon as the birds of prey and other birds have commenced their in-migration from the hills and other summer quarters, the nestling owl is fitted with jesses, carried on the fist, sparingly dieted, and "manned" just like a young hawk in training...what the golden eagle is to the day, the eagle owl is to the night. Hares and foxes fall an easy prey to it."

Several authors (MacPherson 1897; Schilling 1968) have also described how eagle owls, (along with other owl species), have been used by humans to lure other large raptors to the ground, where they can themselves then be captured or killed. MacPherson (1897:165) states that ..."*Of the birds of prey, the species which evinces the strongest aversion to the "Uhu" [eagle owl] is the rough-legged buzzard. Accordingly, this species is killed in great numbers in east Germany...*"

Other species which were easily captured using the eagle owl as a lure or "stale" were rooks and crows, kites, the honey buzzard, golden eagle, sea eagle, goshawk and peregrine. This method works very well, particularly if the owl is left disabled or tethered on the ground where they will invariably be attacked and mobbed by other birds of prey.

Falconry and religion

A religious, totemic or symbolic explanation has also previously been proposed to explain the presence of numerous raptor remains at late epipalaeolithic and early Neolithic sites of the Near and Middle East. Solecki and McGovern (1980) used historical and ethnographic data (perhaps the most famous being that of the Plains Indians of North America) to highlight the ritualistic and symbolic importance of birds of prey to various human cultures. The vast majority of their examples are based upon cultural or religious rituals where wild birds of prey are captured and then killed.

Recent and historical evidence from the Kyrgyz nomads of Central Asian Steppe shows that falconry played a major role in the religious beliefs of the region. The tame eagle was believed to be the ancestor of the shaman – the priest who used magic to heal the sick and control the future. Since shamans were believed to be the first hunters, all hunters were also considered to be saints. When a pregnant woman experienced difficulty in childbirth, shamans thought an evil spirit caused her suffering. A strong brave *berkhut* (tame golden eagle) was therefore brought to her bedside, since the evil spirits were thought to be afraid of its eyes. The killing of a fox by the *berkhut* was also perceived to be a symbol of fertility (Cunningham 1995).

The hunt itself was also subject to set rituals...."*The night before the hunt, the berkutcheu (eagle falconer) washes himself, abstains from any sexual involvement or alcohol and the berkut is fed only white meat washed to rid it of blood*" (Cunningham *op. cit.*: 60).

The significance of the raptor remains from these early sites, therefore, does not have to reside in a single explanation, nor do the various hypotheses have to stand in mutual exclusion of one another. The fact that live birds may have been tamed managed and even possibly used for hunting certainly does not preclude their importance as symbolic or totemic icons. The birds may just as equally have been revered for their strength, grace and hunting prowess. It is thus not inconceivable that falconry (the management and training of live birds of prey) may have served a dual spiritual and utilitarian role at these early sites.

Falconry, foraging and farming

How can a study of the antiquity of falconry possibly contribute to our understanding of human society and culture at the end of the Pleistocene? As previously mentioned, during this same period it is perhaps no coincidence that we also see a radical change in the economic and social dynamics of human groups in the Near and Middle East, possibly strongly influenced by major environmental change associated with the end of the last glaciation. It is the time when the archaeological record testifies to one of the most significant events in human history - the shift from a nomadic life of hunting and gathering wild resources to a settled one of farming, where the first domestication of crops and livestock occurred.

The so-called 'broad-spectrum' sites of the Near and Middle East are, therefore, extremely significant in that they are thought to indicate human groups with rapidly declining food resources, perhaps the result of their over-exploitation within a diminished and probably fixed hunting territory. This seems to be a plausible explanation for the apparent shift towards smaller, less rewarding, species and was perhaps the driving force that funnelled many of these groups down the road towards agriculture as their only alternative survival strategy.

But how do the bones of raptors contribute to this debate? What is perhaps most intriguing about the idea that birds of prey were being used for falconry this early, is the temporal proximity of this activity to the appearance of the first domestic animal - the domestic dog - which may also have served as a possible hunting aid. Thus the origins of falconry, developed as an additional hunting strategy (with possible spiritual or religious dimensions), may have been influenced by, or even led to, the earliest domestication events.

If the bird of prey remains at these sites do indeed represent evidence of experimentation with falconry, then they may in fact take their place (along with the dog) as one of the earliest tamed and trained animals. More importantly, both must have been extremely influential in setting the scene for the subsequent domestication of the later economically important species - i.e. sheep, goat cattle and pigs.

Conclusions

On the basis of all the available evidence, the significance of bird of prey bones recovered from numerous late Epipalaeolithic and early Neolithic sites in the Middle East remains very much open to debate. Whether they simply represent domestic food refuse, symbolic artefacts, or the remains of tamed and managed birds, is still far from clear. Recognising direct evidence of falconry from vertebrate remains recovered from archaeological sites is likely to be all but impossible. It is, therefore, only through the critical evaluation of further archaeological evidence and more circumstantial evidence, such as that outlined above, that further insight can be made. The idea that birds of prey were semi-domesticated before the advent of agriculture, and may have even contributed to its beginnings, is an intriguing one. However, it must, at present, remain a theory worthy of further, more critical consideration.

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