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## **Falconry and the birth of science between East and West. Adelard of Bath**

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### **ABSTRACT:**

The main topic of the presentation is the transfer of knowledge in the Mediterranean in the Middle Ages. The transmission of falconry skills as a specific competence occurred not only at the Sicilian court of Frederic the Great, the emperor that became famous as a falconer and an early researcher interested in birds. The precedent had already been created before by some scholars traveling across the Mediterranean, such as Adelard of Bath (1080-1152).

Falconry inspired a new approach towards nature that had progressively emerged since the 12<sup>th</sup> century. In the eyes of a northern scholar such as the Englishman Adelard, falconry was an important part of the *Arabica studia* (the “Arabic studies”), an attractive inspiration for the new *scientia naturalis* (the “science of nature”), as this new knowledge was called in the Christian world. The importance of Adelard's treatise, *De cura accipitrum* (“The care of birds”) is thus to be seen not only in the narrow context of the falconry history, but also as a part of a larger process of the birth of science, to which the Arabic world gave a substantial contribution, also through falconry. It became a kind of early empirical paradigm based on careful observation and interaction with nature that fostered the medieval beginnings of the modern science. So we can say that the falconry was a small seed for a huge tree we see today.

My intention is to take you back to the 12<sup>th</sup> century to speak about one particular falconry treatise, but also to situate the falconry as a particular cultural phenomenon in a larger context that we might call the transfer of knowledge around the Mediterranean, transfer of knowledge between two worlds we often conceptualize as separate, even opposed to each other: East and West, the world of Islam and the world of the Christianity.

Falconry has always served as a bridge between cultures and civilizations. At least since the birth of Islam and its early relationships with the Byzantine world, the exchange of falconry knowledge has been intense. The manuscripts concerning birds of prey had been circulating even at this early period and the knowledge about falconry was increasing. What I would like to stress in this presentation is the fact that falconry is a very special kind of knowledge, – a very modern kind of knowledge, because it's based on practice, on interaction between man and the bird, on empirical attitude, on close observation, not only of the bird and its behavior, but also of many other elements of the natural world connected to this central interaction of man and bird.

This is why falconry played such an important role in the birth of science. It's very well known that Frederic II, the Holy Roman emperor and the king of Sicily had developed such a great interest in falconry that he decided to promote the first conscientiously planned research program to answer many questions that are more general than falconry itself: do eggs really need to be incubated by the bird, or maybe they can also hatch with the heat of the sun? Can birds sniff and perceive smells? And many similar. If he maintained at his court up to fifty falconers at a time, it was not only in order to take care of his birds, but also to search for the answers and for new knowledge. This is why his book *De arte venandi cum avibus* ("The art of hunting with birds") is important not only as a practical book for falconers, but also as one of the first truly scientific books, based on observation and experimentation. That was something new and revolutionary.

But why do I stress so much this aspect of observation and experimentation? Isn't it obvious? Well, it is important to understand what was considered as knowledge in the Western world before that date: it was knowledge based on written sources, on books, not on interaction with the reality, not on asking critical questions. Of course we might say that the science started already in the Greek and Roman Antiquity, but the beginning of Christianity signifies an essential break in the attitude of man towards the reality. This is the result of the Christian vision that looks up to the divine Revelation, looks up to the other world we shall enter after the death. The reality of this world was seen partially as something to be despised, something not important, and partially also as something to be dismissed, because the world is the field of action of the devil. This is why the reality cannot be trusted, cannot be the source of any stable truth or knowledge.

The Christianity in the early medieval times lived with the general idea that the end of the world is very close. This is why it was not essential to study nature – the essential endeavor was to

think about the future reality, beyond death and the Judgment day. The most interesting book for people leaving in 9<sup>th</sup>, 10<sup>th</sup> century was not a falconry treatise; it was the commentary on the Apocalypse, explaining the end of the world, the end of history, and of course also the end of nature.

This attitude started to change for the first time at the beginning of the 12<sup>th</sup> century, a hundred years before the times of Frederic II I've just mentioned. And its very curious to observe that the very beginning of this new attitude based on experiment and observation was also connected to another falconer, Adelard of Bath, the man often called “the first English scientist”.

### Adelard of Bath



(Image taken from the manuscript of his book *Regule abaci*, conserved in Netherlands: Leiden, Bibliotheek der Rijks universiteit, Scaliger 1, fol. 1)

It is also very curious to observe that the science is actually born between the East and the West, it is born from a long distance travel in search of knowledge. In the writings of Adelard of Bath we can find a very touching moment, when he establishes a kind of agreement with his nephew. He proposes the nephew to study the French knowledge, while Adelard himself would travel throughout the Mediterranean region in search of the knowledge gathered by the Arabs. And in fact Adelard learned Arabic language, read Arabic books and translated some of them into Latin, including the most important mathematical book belonging to the heritage of ancient Greece: the *Elements* of Euclid. The Arabic version of this treatise was the only one that existed in the world; at that time you could read it only in Arabic, there was no other way. But Adelard didn't concentrate

on the Greek knowledge uniquely; he studied also Islamic contribution to the mathematics and translated al-Khwarizmi.

So you can see he was really a serious man, a real scientist. And among all those serious works, he wrote a treatise *On birds*. Here you have a short story of this text to know how it reached our times and how you can find it if you want to read it in detail. [...]

c. 1126-1135:

### *De avibus tractatus*

C. 1200:

*De avibus tractatus* – a manuscript in the National Library, Vienna (no. 2504).

A shorter version of the same treatise is preserved in a collection of falconry texts in Cambridge (MS Clare College, Cambridge 15).

13<sup>th</sup> century:

*Bel oncle cher* - a fragment of the Adelard's treatise is translated in French as a poem

*Bel oncle cher jo le sai pur veir  
ke en bon oisel ad riche avoir...*

1937:

*De cura accipitrum* – the edition of this text by the Dutch scholar A. E. H. Swaen (in Latin).



1998:

*On Birds* – an English translation by Charles Burnett included in the book *Adelard of Bath: conversations with his nephew* (Cambridge University Press, 1998).



Adelard interest for falconry might be seen as just a hobby, a marginal thing in the context of his very serious work. Many researchers treated it like this. The treatise *On birds* is also very short, it has only 8 pages! You might say that's nothing, that's not really worth talking about. Maybe it's just a curiosity that may captivate some attention on an occasion like ours, here in Abu Dhabi, among people who are really interested in falconry and they want to know even the tiniest details. But its not quite so. I believe this small treatise is really important, not only among falconers. It shows a new attitude, marks a revolutionary breakthrough. It also shows how falconry as a specific competence, a very narrow skill of dealing with birds, becomes a key element of a larger construction of knowledge. This process can be traced in the bigger work by Adelard, *Quaestiones*

*naturales* (“The questions of nature”). Even at this early, medieval stage, it illustrates the way how science always proceeds: from a close study of a very tiny detail to a great generalization that explains the laws of the universe. In *The questions of nature*, Adelard deals with big problems that may seem much more important than falconry, such as f. ex. the connection between the moon and the maritime ebbs or tidal patterns, or the connection between rivers and the sea. If the rivers flow down into the sea, there must also be some subterranean rivers that rise from the sea, he says. If the water in the rivers is not salty, the subterranean rivers must somehow deposit the salt in the earth, and so on. Of course, most of these problems are too difficult for him to solve and it will take centuries to elucidate such questions, which are far more general for the early, medieval researcher. This is why the early scientist must concentrate in a very small portion of the reality and study it carefully in order to obtain any real control over the processes that are going on.

Dealing with falcons actually became in the Middle Ages such a small parcel of the reality man could manage to study in depth, a first fully controlled experimentation field. This is why in the culture of the 13<sup>th</sup>, 14<sup>th</sup> century falconry in general becomes such a powerful symbol of reason controlling the unreasonable or the wild element such as a bird of pray. It's like the first triumph of man over nature.

If we want to understand fully its importance, we should reflect for a moment on something you, the falconers, know very well. How does the falconer control the bird, which is in the air, which can fly – something the man himself cannot do? How is falconry possible? Well, you know how it's possible: by patience, by cleverness, and first of all by shaping the interaction between man and the bird, by observation and reacting to what we do notice. For sure not by sheer strength; man has no such strength nor power to overwhelm the bird. He might overwhelm a dog, perhaps a horse, but not a falcon. You cannot force the falcon to do what you want him to do. I'm sure you know very well what I mean.

This is how falconry became a great lesson in the history of culture, a great lesson of certain virtues and attitudes that enable man to build up, progressively, the scientific knowledge and the scientific form of control over nature.

Adelard of Bath probably grew up with falconry or rather with some form of hawking. Since the earliest period in his life, he inherited the north-European tradition of dealing with the birds of pray. Later on, he integrated this knowledge with everything he learned through his contacts with

the Islamic world. To prepare this presentation, I've read many scholarly articles on Adelard and I've seen how the scholars often remain perplexed on one point: does this treatise reflect the local, north-European hawking tradition, or rather some larger sum of knowledge? They remark there is no clear trace of Arabic influence in this text, and it's puzzling them, because it seems hard to believe such an inquisitive person as Adelard might remain unaware of the development of falconry in the Mediterranean region and in the Middle East. In this small treatise there is no explicit praise of the Arabic knowledge, as it appears more than once in *The questions of nature*. This is why it may seem Adelard owes nothing to the Arabic falconry, or at least he doesn't acknowledge his debt to the Arabs. Yet I believe it seems like this, because the falconry knowledge Adelard transmits in his treatise is so much integrated through practice that the source of different pieces of information doesn't really matter any more. Writing about falconry in a very concise, time-saving manner, Adelard doesn't bother to say where did he learn things. It's not important who invented this or that, who claims this or that works, there is no place to say: this is the Arabic usage and that is the Christian usage, because there is always a reason behind and the efficiency is the clue. This degree of integration of knowledge is very characteristic for science. It is one system that gathers the proceedings of many people, many times, many places, many cultures, and builds up something that has no nationality, no cultural identity, and becomes a common heritage of the humanity. Just like falconry.

Adelard doesn't follow any specific tradition just because it is a tradition he identifies with. His general attitude is to try everything and to adopt reasonable, efficient ways of doing things – always asking: why? Perhaps the most famous quotation from his treatise seems to prove the contrary. At the very beginning of his treatise, he says the falconer should be sober, patient and chaste, and his mouth shouldn't be smelly. This seems to be something not quite reasonable. Yet there is a very strict logic behind. If the falconer is not chaste, he sleeps with ladies, with prostitutes, who are not very clean, and he has plenty of lice and other parasites that he can transfer to the falcon. Of course, maybe this logic is not very valid for today, but probably it was a perfectly valid reason in the medieval times. Adelard might also be not quite right about the smelly breath, but he believes the ugly smell brings disease somehow. We would say today it transfers the germs, the bacterias. So maybe he is not quite wrong in this aspect neither.

Adelard writes a lot about the glove, the proper way of taking the falcon from the perch to

the gloved hand. In general terms, he seems to advise not to touch the falcon with bare hand. He advises to stroke the chest of the falcon with a special stick, which is contrary to the Middle Eastern usage, but parallel to the Occitan tradition (southern France, where the chest of the falcon was stroked with a wing of a pigeon) – and also, surprisingly, the Japanese one. The glove seems to appear in this context as something more than just the way of protecting yourself from scratches. Of course, there is no exact idea of germs or bacterias in the medieval times, but somehow Adelard seems to anticipate our contemporary knowledge that the human being could be a source of bacteriological and parasitic contamination. Somehow I believe we might see in this notion of the importance of the falconry glove a distant ancestor of our contemporary latex glove used in the laboratories.

Perhaps it's either a huge anachronism or a far-flung metaphor to take it in these terms. Yet Adelard seems to anticipate many ideas that actually took proper shape hundreds of years later. Such impression has crossed my mind many times while reading this early treatise. But let's see what other things Adelard remarks. He passes quickly over all the obvious aspects of keeping a bird in captivity, such as the appropriate place or what he calls the house for the falcon, the appropriate food, and so on. The main part of this treatise is dedicated to diseases and health problems that appear when the bird remains in captivity. This is not just a simple, basic manual of hawking, but rather an advanced, specialized book on veterinary medicine, gathering quite a lot of information concerning botany, i. e. the science of medicinal plants. Adelard discerns many specific problems, most of which he is unable to designate or describe in great detail. He doesn't have the instruments for this; evidently, in the 12<sup>th</sup> century, he must remain at the level of what he is able to see with the naked eye; the magnifying glass or lenses will develop in England and Italy in the 13<sup>th</sup> century, but Adelard doesn't have them yet. Yet he discerns different types of parasites infesting the bird's feathers. And not only he notices there is more than one type, he tries to adopt specific methods or remedies against those different problems. He also notices there are two different types of frounce, which is, as we know, a highly contagious infection in the falcon's beak, caused by a kind of microscopic yeast or fungus attacking the bird's beak. Adelard calls it “dry” frounce and “wet” frounce. While the first one may be just removed mechanically, in case of the wet frounce he advises to use a special remedy: a mixture of wine and mellicratum (alcoholic drink prepared with honey). Perhaps he gets the hint that this disease requires to get disinfected somehow – once again

without knowing the exact notion of what disinfection really is –, and of course the basic means he has at his disposal is alcohol present in the wine. Another, quite strange remedy against frounce may perhaps hurt our sensibility, as it did for Adelard himself. Nonetheless he describes the practice. The meat for the falcon should be soaked in some of the milk regurgitated by a human suckling baby. The recipe seems strange at the first glance, but who knows, perhaps it could be read once again as yet another early hint concerning the balance at the microbiological level that should be preserved, if the falconer is keen to keep his bird in a good health. Regurgitated milk may probably contain all the richness of enzymes and a healthy bacteriological flora flourishing in the organism of a suckling baby. This is at least a risky interpretation that I make of this strange piece of advice that would otherwise appear as quite absurd. Even at the present stage of scientific development, we are still very far from having the complete picture of the interactions between the microorganisms and more complex organisms.

On the other hand, Adelard's treatise is full of different plants and herbs he proposes to use in a very precise way against very precise problems, f. ex. in order to clean the feathers from mites or other parasites. Probably some of these methods might be useful even today. But as a specialist in text, I should warn you: there is a big difficulty in recuperating this knowledge, which is connected to the fact that we have today only an imperfect insight into the medieval botany. We cannot be sure what plants Adelard really meant. First of all, we don't have the original text written by his hand. We have only two copies written by other people, who obviously committed some mistakes while copying, and who probably understood the original in quite an imperfect way. So they simply distorted many words, specially the difficult terms they didn't know. On the other hand, the standardized designations of different plants obviously didn't exist at that time; such a clear system of designations as we know it today was created by Linnaeus in the 18<sup>th</sup> century, about six centuries after Adelard! In the Middle Ages, people had many local names for each plant. This is why it is often beyond any contemporary expertise to establish precisely the meaning of many names of plants. We can only speak about more or less probable interpretations and confront the hypothesis of the linguists and the philologists (researchers dealing with ancient texts) with the knowledge we possess today. Certain plants mentioned by Adelard are considered medicinal also today and they are still in a widespread use, both for humans and for animals. Other remedies seem less credible.

For example, Adelard suggests that the spindletree has a good effect, if we want to clean the

feathers from mites. Also the usage of aloe seems quite likely, because we know today that it is indeed a powerful medicinal plant. But the suggestion that the duckweed may cure the falcon's "fever" is based largely on a guess of the Dutch researcher Adriaan Swaens who edited the Latin text for the first time in 1937. The word *lenticula* that appear in Adelard's text means "lentils", but it doesn't make much sense to speak about water or spring lentils, as Adelard does, because we know this plant doesn't grow in water. This is the reason why the researcher started to build up a deduction (described in an extensive footnote added to his edition of the Latin text) that finally led him to suppose the "spring lentils" are the plants we call *lemna* or duckweed in English, and *Wasserlinse* or "water lentils" in German.

There is a lot of guess or interpretation, as you could see in my presentation. This is why the direct utility of the medieval treatises in the falconry practice today is reduced. For sure these texts might contain some hints for a contemporary research, even if we possess today incomparably more powerful and more sophisticated means than those that Adelard had. Yet I seriously doubt if any recipes may be taken from them directly and put into practice as they are. So why is Adelard important today? I think there is something more than just practical hints we might find in such texts. I believe Adelard offers us an insight in the beginnings of science as a transnational, transcultural, transcivilizational reality. Crossing the frontiers of ethnic, cultural or religious identities, it creates in itself a new form of identity. The interest in falconry brings us close to those beginnings. This is why I consider that to promote it is a very wise strategy for the leaders. It is indeed a type of heritage that opens unexpected horizons.

On the other hand, the falconers and all those for whom falconry is a cause that matters should be able to explain to the general public, to the society as a whole, what values are hidden behind falconry, what kind of meanings come with it. It's not just our hobby, it's not just about hunting. It's something that provides an inspiration across centuries of human history. Also today, it inspires us to seek creative solutions for the problems we deal with today, many kinds of them: topics of scientific research, but also identity problems, the challenge to build a transcultural society. For all these problems, the heritage of the Middle Ages and the heritage of the falconry may bring many hints.

## Some Adelard's pieces of advice

- The falconer should be sober, patient, chaste and his breath should smell nice.
- The bird should be stroked not by hand, but with a special stick, half a foot in length.
- The best food for the falcon during the annual moult are mice and shrews.

## Some diseases or other problems Adelard tries to address

- *Tineosos* – birds become infested with parasites. Adelard distinguishes various types of parasites and prescribes different plants or herbs.
- *Fungus* – frounce (white spittle gathers about the hawk's bill). He sets apart dry and wet frounce and prescribes different means.

## Adelard's remedies

- *Fusenum* – against the mites that consume the feathers



Spindle tree, مضاض

## Adelard's remedies

- *Aloe* – for the inflammation in the feet (mixed with the white of an egg)



Aloe, صبر

## Adelard's remedies

- *Lenticula fontis* - against the symptoms of "fever" (such as: the bird's eyes are closed, it "sleeps")



Duckweed, Lemna