



FALCO

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MEFRG Objectives:

To provide:

A **central body** for the co-ordination of research activities related to falcons and falconry.

A common forum for the exchange of information and for promoting collaborative research programmes.

To promote:

Research on health and disease in falcons, falcon moulting in the Middle East, falcon nutrition, domestic breeding.

Field studies on falcon migration, taxonomy, morphometrics, reproductive biology and behaviour.

Improved management conditions for captive falcons through educational awareness programmes.

Greater understanding of falconry as a part of Arab cultural heritage.

To Hold:

Regional and International workshops and conferences on veterinary aspects, falcon biology topics, falconry and conservation issues.

To publish:

Papers on aspects of falcon conservation, falcons and falconry.

A **biannual newsletter/journal** containing contributions on medical, biological and conservation topics of common interest, new developments and recent medical advances.

Membership:

Membership is open to any veterinary surgeon, biologist, conservationist or falconer working in the Middle East or any other person interested and contributing in the fields of medical, biological and conservation aspects of falcons and falconry worldwide.

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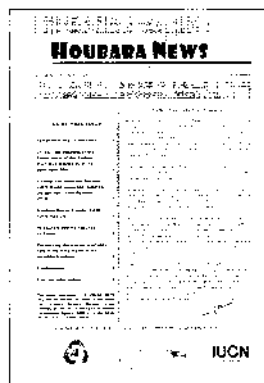
FALCO online

Previous issues of FALCO can be referred to at:

www.falcons.co.uk/MEFRG/



Houbara News



Issue No. 3 has been printed and distributed in April 2001. This issue is produced by the Environmental Research & Wildlife Development Agency (ERWDA), Abu Dhabi, UAE.

The main highlights of this Issue are:

- Resolutions for CITES and the IUCN World Congress
- Houbara breeding success in China and estimation of annual mortality rates via satellite tracking
- List of recent publications

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Editorial



This Autumn will see the opening of the Emirates Falconers Association based at Abu Dhabi Falcon Hospital. The idea was put forward several years ago and it is good to see the building phase completed. The Association itself is in its infancy and will require a lot of hard work to achieve the anticipated results. Under the direction of Mr Majid Al Mansouri, Assistant Secretary General of ERWDA, the Association will provide a meeting place for falconers to exchange and develop ideas on Middle East falconry.

Both falcons and prey species require management in captivity and in the wild. The hunting grounds must remain suitable for prey species to overwinter in, while the breeding grounds must remain undisturbed to ensure sufficient production of young. Sustainable use is what we are trying to achieve, but it is up to us to set the right kind of example. Many groups of falconers from different countries go hunting every year. The Emirates Falconers Association, as a large group of dedicated falconers should implement strategies to limit the number of prey being hunted as well as reducing the numbers of wild-caught falcons being used.

The Association will need to represent the United Arab Emirates internationally. It should collaborate with CITES to ensure its local and regional implementation and have a representative on the board of the International Association of Falconers which will promote the Emirates as a responsible country that prioritises the sustainable use of falcons and their prey. A regular newsletter will be published on the Association's activities. The position of the Association next to the falcon hospital provides ideal opportunity to learn about and discuss aspects of health care and disease prevention. Without exchange of information, education and actual implementation by the Association's Arab falconers, for Arab falconers, it will not achieve its goals. The Association has available to it the advice of researchers, veterinarians and policy makers from many countries, and it must work as a group if it is to move forward. The foundations are now in place and we must continue building for a secure future.

Fieldworkers from NARC and ERWDA are studying falcons in many countries. This season saw the start of a new project with the Chinese Academy of Science. China is an enormous country with reputedly many wild sakers, however the country has not yet been surveyed in detail. Preliminary results suggest that Saker Falcons may not be

as numerous as previously thought. In which case, trapping and exports need to be monitored closely whilst assessing the current state of the population. In the next issue we hope to bring you a report on progress in China.

News from the news

This year has seen several departures from the U.A.E. all of which I am sure will be greatly missed. Dr. and Mrs. J. David Remple have retired since establishing the Dubai Falcon Hospital almost 20 years ago. 'We are looking forward to enjoying our new home in Colorado and the Rocky Mountains and look forward to the great outdoors and a return to falconry on a full time basis..... we hope to maintain relationships with the Dubai Falcon Hospital and never to be out of raptor medicine. As a new diplomate of the European College of Avian Medicine and Surgery, Dave anticipates being in Europe often and looks forward to seeing some of you at meetings. We wish to extend an invitation to you all to visit us in Colorado or our Wyoming grouse camp. Masalama'.

Also leaving after eight years with NARC and ERWDA are Tom and Theri Bailey who have been with the organisation since the beginning and who have both seen many changes during that time. Dr Tom Bailey has encouraged and promoted many aspects of veterinary and ecological research in houbaras and falcons during his time in the UAE. His enthusiasm will be difficult to replace. He will continue as co-editor of FALCO until the end of the year and we thank him for his hard work and contributions over the years. Theri has been the driving force behind many of the education programmes and public relations activities. She especially encouraged Arab nationals to be more aware of their environment and spent valuable time igniting a wildlife interest in children of all ages. They are returning to the UK and expecting their first child in the Autumn so we wish them both well.

Conference proceedings

The proceedings of the International Conference on Saker Falcon and Houbara Bustard held in Ulaan Baatar, Mongolia 1-4 July 2000 are at the printers and should soon be ready for distribution. Details on how to order copies will be published

in the next issue of FALCO. Many thanks are due to Dr Eugene Potapov for his hard work in bringing together the papers in this volume. The publication is in English with extended abstracts in Mongolian and Russian.

The Editors



ERWDA in collaboration with British Airways World Cargo helps conserve wildlife

The National Avian Research Center (NARC), of the Environmental Research and Wildlife Development Agency (ERWDA), in association with British Airways World Cargo transported ten illegally imported birds to the National Birds of Prey Centre in United Kingdom. The birds, which originated in Somalia, were confiscated from a consignment of illegally trapped raptors at Sharjah Customs Department in September 2000 as they had no accompanying documentation and it was presumed that they were illegally trapped for sale in the UAE.

The confiscated birds comprised 19 Eastern Chanting Goshawks (*Melierax poliopterus*) and one Grasshopper buzzard (*Butastur rufipennis*). The birds were passed on to the Environment and Protected Areas Authority (EPAA) of Sharjah and they were initially housed at Sharjah Wildlife Park. Subsequently in October 2000 the birds were passed on to NARC as it is the official avian rescue and rehabilitation centre in the UAE.

The EPAA and ERWDA signed a MoU that formalise the collaboration between the two organisations, with a special emphasis on enforcing CITES (Convention on the International Trade in Endangered Species) regulations in the UAE and rehabilitating confiscated animals.

Since their transfer to NARC in October, the birds were maintained in the Quarantine Centre near Sweihan, where they received comprehensive health screening against avian infectious diseases. They also received medical treatment for a variety of infected injuries, a direct result of trapping and the poor conditions that they had been subjected to during transportation from Somalia.

The International Union for the Conservation of Nature (IUCN) group, which is based in ERWDA, and provides, amongst its many other duties, international guidelines and advice to organisations dealing with confiscated wildlife such as these birds, is confident that returning these birds to Somalia is not a viable conservation option.

An alternative solution was found in co-operation with the IUCN Re-introduction Specialist Group. The National Birds of Prey Centre, in the United Kingdom, a reputable and internationally renowned captive-breeding institution with experience in breeding raptors, was contacted to see if they would be interested to receive ten donated birds that were certified healthy and had passed through medical screening at the NARC quarantine unit. They agreed to take some of the birds wishing to initiate captive breeding projects of the chanting goshawks.

British Airways Abu Dhabi was contacted by ERWDA to lend its support to ensure that the birds were safely transported to the UK, and the airlines' cargo division gladly offered its assistance. ERWDA is most grateful to British Airways for providing free flight for the birds.

Majid Al Mansoori, ERWDA's Acting Secretary General said "We are pleased to be able to report a positive end to this story and find this solution which will enable the genetic and educational awareness potential of the birds to be harnessed, as well as demonstrating the UAE's commitment to preventing the illegal trade in wildlife through its borders."

He also added that the happy ending for this consignment of birds shows that collaboration between UAE agencies, such as EPAA in Sharjah and ERWDA in Abu Dhabi is essential if UAE is to succeed in implementing CITES regulation.

Wassim Phillibbos, Area Manager of British Airways World Cargo said, "British Airways is always keen to provide help in environmental species. We are happy to assist in rescuing these birds of prey to a protected environment".

"It is crucial to provide the birds with ideal travel conditions. Backed by our many years' experience in transporting live animals, we are capable of ensuring utmost caution in creating a safe and conducive environment during the flight", he said.



Reflections on Kleinschmidt's raptor work

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Otto Kleinschmidt (1870-1954) is remembered as one of Germany's most active ornithologists. He was a protestant pastor and despite ornithology being more of a hobby, he has made lasting contributions in this field. He was also an accomplished artist having an eye for shape and proportions and through his paintings in various books and publications he more easily promoted his ideas on species theory. Kleinschmidt is remembered mostly for his association with Kleinschmidt's falcon (formerly *Falco kreyenborgi* Kleinschmidt 1929) which is now recognised not as a separate species (Ellis and Garat 1983) but as a light morph of the south American peregrine (*Falco peregrinus cassini*). He also contributed to the *Hierofalco* (*hieros* - strong, handsome, sacred) discussions and the position of *Falco altaicus*. Nowadays his 'Formenkreis Theory' on species characteristics is very much forgotten.

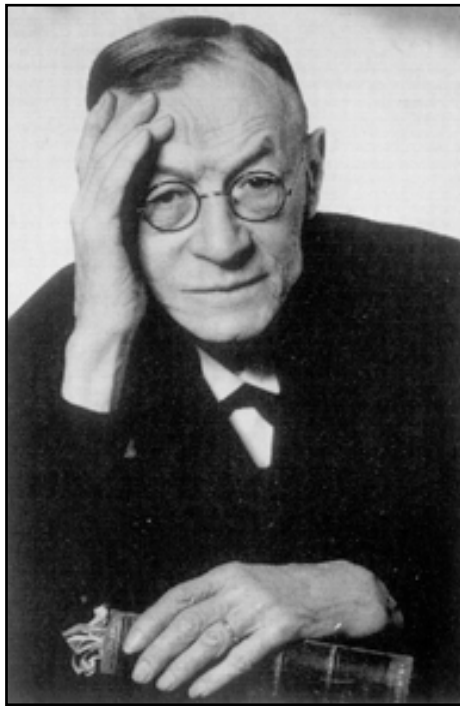
The 'Formenkreis' or 'form circle'

In the 'form circles' which he described, he saw self-contained unities, unchanging and without transition which behind the external features of colour and shape have a hidden nature or 'essence'. The state of knowledge on the objective reality of the species is still unsatisfactory and answers remain to be found even nowadays. When a problem of such relevance remains unsolved for decades, the reasons are often due to searching for concepts in the wrong direction. On the occasion of the 100th anniversary (2000) of the 'Formenkreis' definition, it is appropriate to renew a discussion and re-examine the facts leading to Kleinschmidt's Formenkreis Theory.

Kleinschmidt was not the first person to recognise that phenotypically similar 'forms' or species occur in separate geographic regions and mutually exclude each other but Kleinschmidt intensified discussions on this subject. All geographic representatives of a certain 'type' (as he comprehended it) showed common, unchanging features in their body proportions. On the other hand colour and markings can be very variable. A good example are the large falcons or *Hierofalco* which vary according to their environmental surroundings (white and grey in the Arctic, brown in the steppe, conspicuously coloured in the south etc - Kleinschmidt 1901, 1923-1937). Since it has not been possible to describe their nature or 'essence' in terms of evolutionary theory, such ways of looking at the problem inevitably resulted in Creationist and anti-evolutionary interpretation. To this day the existence of 'types'

is generally disputed, even without looking back at the material and using it as a basis offered by Kleinschmidt in his Formenkreis Theory.

It was at this time that the subgenus of *Hierofalco* was suggested. Also the taxonomic position of some 'forms' changed, as later happened with the Kleinschmidt falcon. Such was the case with the 'Altai Falcon' upon which Kleinschmidt attached great importance in it being a link between Gyrfalcon and Saker Falcon. In its proportions, the Altai falcon is similar to *Hierofalco*. It is similar in shape to the saker and only in the mountain form does it share plumage features with the Gyrfalcon. There is no reason to see the Altai Falcon as an intermediate species. According to its proportions it is a saker, a dark morph of the central Asiatic Saker *Falco cherrug milvipes* (Dementiev and Shagdarsuren 1964, Baumgart 1978). Plumage features should be viewed cautiously when using them for systematics interpretation.



The details of the Formenkreis also show that it generally has many similarities with the superspecific concept.

Analogies between Formenkreis 'form circle' and later used superspecific concepts

The large falcons which were used by Kleinschmidt as an example of the Formenkreis, play an analogue role. As a superspecies, defined by Mayr (1975) as a monophyletic group of closely related and to a large extent even totally allopatric species, Cade (1982) and White *et al.* (1994) recognised the *Hierofalco* (*Falco mexicanus*, *F. jugger*, *F. biarmicus*, *F. cherrug*, *F. rusticolus*) as being analogous to Kleinschmidt's Formenkreis. The 'form circles' of Peregrines, Hobbys (*F. subbuteo*) and Kestrels (*F. tinnunculus*) correspond similarly to superspecies

The 'zoogeographic species' also described as the 'geospecies' is a further superspecific concept nowadays often used. It embraces in the definition of Mayr and Short (1970) all spatially representative population groups, which have been shown to be a transformation of an original form. Once again the *Hierofalco* serve as a prime example.

When we consider the 'geospecies' of buzzards (*Buteo [lagopus]*) consisting of *Buteo hemilasius*, *B. lagopus*, *B. rufinus*, *B. regalis*) Eck (1991, 1992) explains that such empirical evolutionary groups contain species which:

- 1) geographically exclude each other
- 2) are extremely similar in their ecological requirements
- 3) have morphological differences which are relative

They are intermediate stages in the evolutionary process

with grades of differentiation in ecology and genetics. Bock and Farrand (1980) portrayed the 'geospecies' as a 'polytypic superspecies', the final extent of diverging population groups.

Kleinschmidt's Formenkreis from an ecofunctional and molecular genetic aspect

Whilst morphological features can be more accurately explained in terms of functional relationships, it was accepted that environmental factors were the cause of similarities in phenotype between species which were not closely related. With the advent of genetics and molecular phylogeny (Wink 1996, Wink *et al* 1998) systematics based on phylogenetics have been corrected with sometimes spectacular results. In the *Hierofalco* group there is a close degree of relatedness between *F. rusticolus*, *F. jugger*, *F. biarmicus* and *F. cherrug*. Much more surprising was the finding of a close relatedness between a Saker genotype and the Peregrine as well as the Prairie Falcon (*F. mexicanus*) with the Peregrine. In the Peregrine group, *F. peregrinus* and *F. pelegrinoides* are genetically identical suggesting sub-species status.

Now that molecular studies have shown many relationships based previously on phenotypic similarities not to be true, it provides good opportunity to examine further the ecofunctional explanations. The large falcons in Kleinschmidt's 'form circles' for *Falco Hierofalco* and *Falco peregrinus* have already been described and studied in great detail in terms of their morphology, genetics, taxonomy, ecology, form and function and so provide an ideal model.

The large falcon Formenkreis as a model

1) Morphological features - Kleinschmidt separated both large falcon form circles purely on the basis of morphological characters and primarily on the basis of body proportions, especially the tail/wing index. He suggested there are two general groups of large falcon, the compact short-tailed peregrines where the index is always below 50% and another group of large, slender, long-tailed falcons, the *Hierofalco*, in which the index is always more than 50%. Further significant differences are to be found in the skeletal structure, feather structure and quality, moult sequence and others. They are not mutually exclusive in their occurrence. If two large falcons occur sympatrically in a region, one of them will be a Peregrine and the other a *Hierofalco*.

2) Ecology - all *Hierofalco* occur in several kinds of open landscape across different geographic zones (tundra, steppe, desert) and feed mainly on small mammals (ground squirrels, voles and susliks etc) and moorland birds such as grouse. From these habits the group has more recently taken on the name of 'desert falcons' (White 1996, Eastham and Nicholls 1998). An ecological classification of the peregrines is virtually impossible. As an almost exclusive predator of avian prey it has a cosmopolitan distribution.

3) Hunting space and ecofunctional position - for active hunting raptors such as the large falcons the basic flight characteristics are endurance, speed, acceleration and

manoeuvrability. The hunting space itself determines the relationships between these parameters and determines their ecofunctional positions. On the basis of their ecofunctional positions there are two groups:

Peregrines and species with similar body proportions such as *Falco deiroleucus*, *F. fasciinucha* and *F. hypoleucos*) which are all pursuit hunters in the free air space. Whilst hunting they show endurance, they are extremely fast but with only moderate acceleration (for which reason they utilise gravitational acceleration in the 'stoop') and have restricted manoeuvrability.

The *Hierofalco* (*F. rusticolus*, *F. cherrug*, *F. biarmicus*, *F. jugger*, *F. mexicanus* and *F. subniger*) are pursuit hunters close to the ground in open habitats. In prolonged flights they are not as fast but in level hunting attacks they have faster acceleration and are more manoeuvrable.

In subsequent FALCO Newsletters we hope to bring you more on the taxonomic status of the *Hierofalco*, the peregrine group, the Altai falcon and recent developments in species theory which have been made since Kleinschmidt first formulated his hypotheses. Kleinschmidt was an excellent observer and his Formenkreis Theory provided us with much usable information which nowadays, with the advancement of molecular genetics, can be tested more thoroughly.

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Saker Falcon in Dagestan

Evgeny Victorovich Vilkov

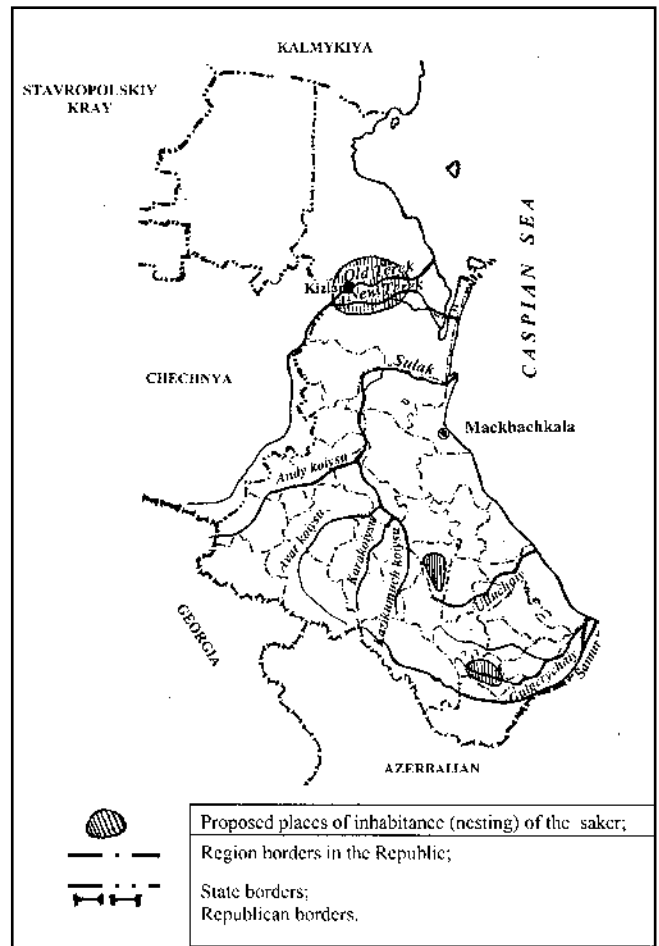
Junior research assistant of Dagestan Scientific Centre, Russian Academy of Sciences, Chairman of Dagestan branch of Russian Bird Conservation Union (RBCU), Head of scientific ornithological association of pupils "Berkut" (Golden Eagle)

Saker - *Falco cherrug* (Gray, 1834) - Presumed nesting, migratory, sometimes wintering bird of Dagestan.

In 19th and first half of 20th century the Saker was a common species in the lowlands of the republic. M. N. Bogdanov (1879) notes that this species is rather common in a valley of the river Terek. L. B. Boeme (1925, 1935, 1950) describes the Saker as a common bird in the steppe below Kizlyar and notes seeing them on Temirgoiskiye lakes. S. S. Turov, Krasovsky (1933) and V. N. Ter-Vartanov with the co-authors (1954) reports about a specimen from the lower reaches of Terek and Sulak. Y. V. Pishvanov specifies sightings of passage and wintering birds in foothill and lowland areas of the republic.

During migration the birds follow the migration corridor (arranged on a type of "bottle neck") along the Caspian coast. During migration the birds adhere to the ridges of East Caucasus and only some individuals migrate along the sea coast. In particular, one bird I observed on 15.10.98 was flying in the area of Sulakskaya lagoon located 17 kms to the north-west of Makhachkala.

According to some gamekeepers, hunters and birdwatchers migrating birds were seen in the autumn period on Kuma and Sulak. There is no recent proven nest record of Saker in Dagestan. However on the basis of the available information it is possible to assume probability of Saker nesting in floodplain forest (so called tugai shrub) of northern Dagestan located in the territory between Terek and Sulak (see map). Also birds were observed during the breeding



period in foothill districts of southern Dagestan (in a high-altitude zone from 850-1200 m) - Kurakhsky and Akushkincky (see map). By our estimation the estimated number of nesting Sakers in Dagestan could be as high as 5-6 pairs. Recent numbers counted during migrations were 25-30 individuals.

A catastrophic reduction of Sakers has taken place in this region in 1960s, when the intensive development of soils of

Terek-Culak lowland began. Nowadays there is a tendency for a change in nesting distribution of Sakers in Dagestan. It is caused by the military action in Chechnya and regions bordering on the Republic. The restoration of former nest area is improbable, though is possible under condition of reduction of anthropogenous influence on natural habitat. Nowadays a serious danger for Sakers (and also for other predatory birds - Peregrine, Golden Eagle etc.) is represented by the businessmen-trappers that catch and export rare species of raptors, including Saker (in particular to the United Arab Emirates, Turkey, Iran and other countries where falconry is popular).

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Eagle training in Mongolia - a western perspective

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A Kazakh Eagler

The Kazakhs of Kazakhstan, northern China, and Mongolia have trained Golden Eagles for hundreds and possibly thousands of years. Trained Golden Eagles from “the North” appear in Chinese paintings dating as far back as the 7th Century (Schaefer, 1963.) Good western accounts of falconry with eagles appear as soon as Westerners make contact with Central Asia. Marco Polo mentions eagles trained to kill wolves, as does Atkinson (Atkinson, 1859.)

I spent the month of February, 1998, in Bayaan Olgii Aimag, in westernmost Mongolia, and returned there for the month of October 2000, in order to learn and record the Kazakh methods of eagle training. I hunted with three eagle trainers and observed three more fly birds, and interviewed all of them at length. The report that follows is a brief overview of how Kazakh eagle-training resembles and differs from methods used in the West.

All the birds currently flown in Mongolia are “Berkuts,” Golden eagles of the subspecies *Aquila chrysaetos daphanaea*. These are large birds; a Kazakh eagler told me, his bird weighed 8 kilograms when fat, although I never saw a scales. The older Kazakhs divide the birds into types or races according to their looks, although these appear to have little taxonomic reality. “Breeds” mentioned include the “Altai White Shoulder,” the “Hovd Yellow,” and the “Valley” or “Oil” Black. One octogenarian told me that there were also “Blue” eagles and “Cross” eagles, which were half vulture! Several of the older falconers remember sakers (“shunkar”) being flown at hares and occasionally, ducks. On my second trip, my guide and friend Canat Cheryasdaa told me that the young man at the Olgii mosque was now flying a shunkar. I heard no evidence of trained goshawks.

The primary quarry of Kazakh falconers are two species of fox, *Vulpes vulpes* and *Vulpes corsac*. Their skins are used to make the typical Kazakh hats. Hares are also taken but not considered prestigious; one falconer asked me whether I would rather hang a hare or a fox from my saddle. They are used as eagle food, along with the typical diet of sheep meat.

Wolves are taken regularly and although I never saw one flown at, I saw several skins. All but one were of partly grown, young individuals. Although some eagles can kill full-sized wolves, Manai, an accomplished falconer, warned me that: "If you want to let your eagle go in ten years" [see below] "don't hunt wolves!" It might be worth noting that he had the largest wolf skin I saw in Bayaan Olgii. I heard from several eaglers in 1998 about an eagle who had flown at a snow leopard and was killed earlier that winter.

More of the birds flown in Bayaan Olgii are eyasses, young taken from nests, than passage or pre-breeding young adult birds. This seems to be a matter of preference, as it is in the West. Eyasses are considered "braver" and are more likely to take large quarry such as wolves. All the eyasses "scream" or food-beg, although "scream" exaggerates their rather quiet (compared to a falcon) voices. This is considered an asset, not a vice, as it enables the falconer to keep track of the bird (no bells are used.) A common cause of mortality among falconers' birds is catching the jesses between rocks; if the bird is not found, it will starve. Canat mentions finding several dead birds over the years. Obviously, a bird that calls is easier to find. The only falconers I met who regularly fly passage birds were Manai and his apprentices. They cited the better "manners" of the less-dependent birds. These were among the best-behaved trained birds of prey I have seen in almost forty years of falconry. Not only Manai but his young sons could hood, unhood, "pet," and even hug these enormous birds without any signs of aggression or defensiveness, despite the fact that one had killed a wolf.

All the Kazakhs preferred the larger female eagles exclusively for hunting. The late R. Suleiman said dismissively that males were good for "mice." Manai said they were also useful for children to learn with, and to bait females into a "jealousy trap" when tethered near a dead hare.

Kazakh equipment differs somewhat from the western type. Jesses are braided, often with hammered metal loops at the rear end, and attach to broad cuffs, often lined with sheepskin. They "unlace" to fit over the bird's foot, so they can be taken on and off and transferred easily.

Gloves are right-handed, sheepskin lined, and very thick.



They extend as far as the elbow.

Hoods are sized exactly to each bird's head. Paper patterns exist and are traced onto leather. The hoods are adorned with a feather-shaped loop of leather which is used, as in the west, as a handle. There are no braces or straps; the hoods fit well enough to make these superfluous. Sometimes a strip of cloth is wound around the piece that fits under the bird's "chin" to tighten the fit. Another ingenious modification is a sort of wooden throat latch hanging below the bill on some hoods, which is used to compress the bird's throat if it is calling when the eagler is waiting for or calling a fox. Canat calls it the "silencer." The better hoods are often adorned with silver medallions.

Lures usually consist of dead hares, or facsimiles of hares or foxes. One I saw was made of marmot skin fitted out with a fox tail and stuffed with hare meat. In contrast to simple lures, the equipment pouch, carried tied to the falconer's belt, is often quite elaborate, and embroidered in colorful traditional Kazakh designs.

When riding the falconer's right arm is supported by a Y-shaped crutch called a "baldach." A thong that attaches to its base lies across the falconer's right knee and is tied to the saddle ring, acting as a shock absorber. In the coldest regions such as the westernmost and northern parts of Olgii, the more traditional eaglers may outfit their birds with mittens and even "sweaters" of sheepskin to help keep them warm.

Eagles may be tethered to almost any kind of perch, including tyres or anvils, but the traditional perch is a sort of three-legged stool made from a tree stump. After February, when lambing season begins, the eagles are fed up and moulted. They are usually tethered "in a pleasant place, such as under a tree, near a river, on a longer leash. They are taken up again in late August and fed washed meat (mutton) to condition them.

Training methods are brisk and straight forward. Newly-

trapped passage birds are still perched on a swinging rope about 3 or 4 meters long with half a metre of wooden stick in the center.” The swinging motion tires the eagle and breaks down its resistance. The eagle is never fed anywhere but from the falconer’s hand. When it will come immediately to a lure, it is simply taken out and flown at quarry.

Most Kazakh eagles wear plumes of eagle-owl (“Ukhu”) feathers tied with thread to their wing coverts, as a symbol of power. Kazakhs believe that an eagle owl can kill an eagle. Two additional methods of conditioning were observed. Fat eagles could be dosed with black tea and sugar through a rubber tube inserted into their mouth, which would cause them to vomit and, theoretically, become sharper. Or, in winter, they would be made to eat three or four small pieces of ice before hunting. Some Western observers in Kazakhstan and Kirghizstan have alleged that eagles are kept in very low weight and “sharp set,” and so are weak and only flown “downhill” at easy quarry. In Bayaan Olgii this is manifestly untrue. All eaglers I met were adamant that any good bird would fly out ahead of its quarry and attempt to attack from in front in order to control its prey’s jaws. I saw this on several occasions. On one flight (October 2000) Manai’s new passage female flew into a headwind to a height of approximately 50 meters, pulled ahead, and then stooped head on into a *corsac* fox. The eagles I observed were well-muscled with a lot of flesh on their sternums.

Theoretically, Kazakhs release their eagles after about ten seasons so that they can breed. If an eagle is kept this long the falconer may attach flags of white cloth to her wings so that he can keep track of her. While there is a certain amount of mortality because of dangerous quarry and caught jesses, this is an encouraging instance of traditional conservation.

Although many changes are coming to the Kazakh coun-

try, it appears that the eagle hunter’s tradition is alive and strong. Many young falconers are taking up the sport, and at least one eco-tour company (Boojum Expeditions) now employs Canat to take small parties of hardy trekkers to see the eagles fly. September 2001 will mark the third annual Bayaan Olgii Eagle Festival. It is heartening to see this survival of one of the oldest falconry methods in its traditional home.

A Brief Glossary (phoenetic only)

| | | |
|-----------|------------|----------------|
| tomaga: | hood | |
| bialeye: | glove | |
| eyechabo: | jess | |
| jimdorba: | pouch | |
| baldach: | | crutch for arm |
| khoyan: | hare | |
| karsac: | corsac fox | |
| tulki: | red fox | |

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Falcon Facility assists in production of new cell lines for virus isolation

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In the last few decades the increase in captive-breeding programmes and falconry has highlighted an increased awareness of the health aspects related to these activities. Most species of birds are thought to be susceptible to certain viral infections, it has been reported that at least 254 species can be infected with Newcastle disease virus alone. In the last few years several new viral diseases, as well as the detection of well established viral infections, have been reported in raptors. Influenza virus from a falcon and paramyxovirus 2 from Martial Eagle (*Polemaetus bellico-*



sus) and Crested Eagles (*Lophaetus occipitalis*) have not been documented before but were isolated from clinically sick birds in different countries.

It recent years it has become apparent that the possibility of increasing the isolation rate of viral pathogens in raptors would be useful and beneficial when screening prospective breeding birds, imported species and sick or diseased birds. Using cells from the same host can increase the isolation rate of viruses. This is due to the cells being more susceptible to the viruses and their ability to replicate in the host cells. With this in mind it was decided that, in conjunction with the Falcon Facility in Wales, U.K., the production of a falcon cell culture could enhance the chances of finding specific viruses and raise the possibility of isolating viruses not previously reported before in raptors and particularly falcons.

Eggs produced from a Saker female and a Gyr/Saker male at the Falcon Facility were transported to the Avian Virology Unit at the Veterinary Laboratories Agency (Weybridge) in an attempt to produce the falcon cell culture. Embryonic fibroblast cells were prepared by an established method and incubated at 37°C to form a monolayer of cells in plastic tissue culture flasks. The primary falcon cells were sub-cultured and aliquots from various passage levels were placed in liquid nitrogen (approx -194°C) for future use. By doing this an aliquot can be thawed and cultured for use when samples are received from material submitted from falcons or raptors. Preliminary results indicate that the cells remain viable when stored in liquid nitrogen and are capable of supporting viral growth when taken out of the nitrogen and placed for incubation at 37°C.

Confluent monolayers of cells can then be infected with sterile preparations of homogenised tissues or from cloacal and tracheal swab material in an attempt to produce a cytopathic effect (CPE) in the cell layer. Some viral isolates fail to produce a detectable CPE in infected cell cultures even though



virus particles can be visualised by electron microscopy (EM) but multiple passages may also be required before CPE is observed and viral replication is detected.

Preliminary identification of the isolated viruses can be obtained by EM examination of the concentrated cell culture fluids. Haemagglutination/haemagglutination inhibition and virus neutralisation tests using specific sera can also be helpful in making a preliminary identification of the isolated viruses.

To date the new falcon cell cultures have supported the growth of herpesviruses, influenza viruses and Newcastle disease virus. Further work to evaluate the susceptibility of these falcon cells to known and unknown viral infections will be carried out as an ongoing project as and when samples from these birds are received.



Case Study: Episodic Epileptiform Seizures in Peregrine Falcons in Dubai, UAE

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The following peregrine falcons developed episodic epileptiform seizures in a falcon-breeding establishment, Dubai.

No. 1: *Falco peregrinus africanus*. Two yrs old, first breeding season, imprinted for crossbreeding purposes, trained and flown to stimulate muscle development, but not hunted. Clinical signs started on 14/3/00.

No. 2: *F. p. africanus*. Ten yrs old, poor egg laying history; one or two eggs per season over the last five yrs, excellent foster mother, imprinted for crossbreeding purposes, used successfully as a hunting falcon for three years in South

Africa before entering a breeding project there, and since 1998 in the UAE. This bird had a noticeably poor feather quality. Clinical signs started on 15/3/00.

No. 3: *F. p. calidus*. Three yrs old, intermewed passage falcon, first season used for hunting, moulted poorly and was kept in a moulting room the next year under artificial light (neon), still poor feathering after that. Since February 2000 kept in a secluded, artificially lighted moulting room. Thus for >18 months she experienced no significant outside/sunlight periods. Clinical signs started on 23-4-00.

All birds were in a fat, breeding/moulting condition and No.'s 1 & 2 displayed all the desired interest in and activities with the breeder upon whom they were imprinted, when this condition developed. Appetite remained good throughout the period of affliction, all three were fed on the same diet as approximately 100 other breeding falcons

of various species and origins in this establishment, i.e. fresh and defrosted whole quail, occasionally defrosted pigeon breast/shoulder, supplemented with a Vitamin/Mineral mixture ("Vita hawk"®). Water was provided *ad lib* at all times in aluminium pans. The breeding chambers are individual "imprint pens" that allow interaction with the breeder through an opening/feeding ledge to the service aisle, the whole building is environmentally controlled by an air-conditioning system and a manipulated lighting programme using neon tubes in each pen. A similar system is used in the moulting rooms.

As the unknown cause of the condition held potentially serious implications for the rest of the breeding falcon population, it was decided to try and determine the origin(s) rather than merely suppress the clinical signs with tranquilisers e.g. Diazepam (Valium®).

Clinical signs:

No.'s 1 & 2 were immediately taken from the imprint pens and blocked in different rooms. When relaxed, (most of the time), both would appear 100% normal, but as soon as they noticed an observer and they became attentive, they would display disorientation, opisthotonus and torticollis and rapidly develop violent epileptiform seizures. This typically occurred during the daily treatments, but the thrashing around could sometimes also be heard from outside the room after no apparent stimulation. No 2 developed a superficial conjunctivitis, probably due to foreign body (sand) irritation of the eyes during these seizures; this reacted favourably to Gentamycin (Garamycin®, Shering-Plough) eyedrops. No.3 showed opisthotonus on 23/4/00, epileptiform fits on 24/4/00, and was placed in an outside, free-flight pen on 25/4/00, without any medical treatments whatsoever.

Discussion:

Only those differential diagnoses applicable are mentioned in the interest of space, this is by no means a complete list. See Further Reading for more information.

Infectious causes: Viral - Newcastle Disease Virus (NDV). When the brain is affected with this virus patients show constant nervous affliction of a variable nature, not episodic, that are typically progressive ending after a few days in death. This possibility is of importance in the Middle East due to the perceived common occurrence of NDV. However, only about 33% (i.e. 61/186 submissions) of NDV isolation attempts from falcons displaying "typical NDV symptoms" were successful over a 10 year period at the Central Veterinary Research Lab, Dubai (Wernery, 2000). This suggests that improved detection techniques are needed, possibly PCR technology, as well as greater circumspection from clinicians when a falcon displaying nervous signs is presented. Many of these are not NDV, and should not be summarily euthanased. Do we need "infectious wards" in our falcon hospitals?

Infectious causes: Bacterial - *Clostridial* toxæmia. Faecal examination of No. 1 by Gram stain revealed only

Gram + rods, resembling *Clostridia* morphologically. Both No. 1 & 2 received a course of potentiated piperacillin (Tazodin®, Lederle) @ 200mg/kg (BID, i/m) for the next five days to cover this possibility. Bird No. 1 also received 2ml of bovine multivalent *Clostridium* antiserum (Rhone Merieux) and 1ml of 10% DMSO (once, i/v) against possible brain oedema and to assist the other treatments crossing the blood/brain barrier. No changes noted.

Infectious causes: Parasitic - Aberrant nematode or cestode larval migrans. Described in ratites, with the procaenoid nematode *Baylisascaris* sp. in North America, (Kazakos et al, 1991) and also recent histological evidence from pigeons in Dubai with nervous signs, that had parasitic encephalomyelitis. (Personnel communication, Dr Joerg Kinne, CVRL, Dubai). No treatment was initiated.

Toxic causes: Heavy metals - Pb, Zn, Al (?). Radiological examination of No.1 showed no abnormalities. Both plasma Pb and Zn levels were within normal limits, but even so both birds received a course of Ca EDTA chelation therapy for 5 days @ 50mg/kg (BID, i/m). No changes were noted. The aluminium waterpans were removed and replaced with plastic ones.

Nutritional: Thiamin and/or Vit B6 deficiency. Causes a rapidly responding condition characterised typically by severe opisthotonus. Both No.'s 1 & 2 were treated with a multivitamin B/Co preparation (OID for 3 days, i/m) after the antibiotic and chelation courses were finished. No. 1 received a high dose, calculated to deliver Vit B1 @ 50mg/kg, while No. 2 received a low dose, calculated to deliver Vit B1 @ 25mg/kg. This approach was chosen as direct Vit B1 determination by HPLC revealed 1042 µg/l for No.1 and 14144 µg/l for No. 2.

Nutritional: Ca/Phosphorus/VitD3. Transient hypocalcaemia in breeding females due to possibly excessive hormonal fluctuations in imprinted individuals? Blood analysis revealed Ca values of 11.2 mg/dl and 14.2 mg/dl for No.'s 1 & 2 respectively, and P values of 4.3 mg/dl and 5.6 mg/dl. These were judged to be high/normal rather than low.

Metabolic:- Hypoglycaemia All 3 fat and in good breeding/moulting condition, maybe ketosis?

Metabolic: Hepatic encephalopathy. Hepatic lipidosis or mycotoxicoses (?). No.1 was examined by laparoscopy and the liver appeared to be abnormally pale, with rounded edges, and the following plasma enzyme levels were determined:

| | | No.1 | No.2 |
|-----|-----|------|------|
| CK | U/l | 6144 | 505 |
| LDH | U/l | 1990 | 789 |
| GOT | U/l | 346 | 67 |
| GPT | U/l | 295 | 45 |
| GGT | U/l | 3 | 1 |

A wedge biopsy was collected. Microbiological culture (including *Salmonella* selective media) was negative. Histology revealed moderate fatty liver, +/- 40% of cells affected, which may be physiologically normal for breed-

ing falcons, and several microgranulomas. Biotin-responsive Fatty-Liver-Kidney Syndrome is well known in fast-growing broiler chickens and has been described in merlins (Forbes & Cooper, 1991) causing acute deaths. No.1 was treated for the next three days with a multivitamin preparation (Hemo-15 ® Sanofi) high in biotin @ 0,2 mcg biotin (OID, i/m). No effects were observed.

Idiopathic/Psychogenic: Birds possess the ability to distinguish the discontinuous light emitted by normal neon lamps (approximately 50 on/off switches per second = Hz) as a stroboscopic effect, as they can discern up to 160 frames per second. Humans perceive neon light as continuous. In addition, such lights do not emit UV-light, essential for the final step in the Vit D3 activation cascade. If suboptimal Vit D3 is available, disruptions in the Ca /P metabolism could occur in breeding or fast growing birds. (Korbel, 1999; Ritchie *et al*, 1994). Both No.'s 1 & 2 were observed to constantly "hide" beneath their nesting or feeding perches, for a considerable time before these nervous symptoms appeared. Their pens were equipped with the oldest "standard" neon lights in the whole breeding facility, with almost all other pens equipped with high frequency neon lamps, which have a frequency of about 28 000 Hz, to allow dimming. It was also noticed that these specific old lamps often visibly (to human eyes) "flickered" for a long time before lighting up properly, or even constantly. This was also noted in the moulting room of No.3. Faced with no progress in No.'s 1 & 2 after ten days of various therapies, it was decided to place them on blocks outside where they would receive direct morning and evening sun



but be shaded most of the day. This was done on the 24/3/00, and within two days No. 2 was 100% normal and No.1 experienced only mild symptoms, after one more day she was also 100% normal! No.3 also displayed no nervous signs after 2 days outside, in fact she killed one of her pen-mates on the second day outside.

On the 4-4-00, No. 2 was returned to her old breeding pen, where nothing had been changed, in an effort to allow the epileptiform seizures to develop again. No abnormal behaviour has been observed until the present (April 2001). Both No.'s 1 & 2 are interacting with the breeder as if nothing happened.

The possible concomitant effects of reproductive/moulting hormone activity, disruptions in the Ca/P/VitD3 metabolism through lack of UV -light exposure and the psychogenic effects of standard, but deteriorating/stroboscopic neon lights causing epileptiform seizures in falcons seems an attractive explanation in these cases, but remains conjecture!?

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Herpesvirus infection in falcons in the UAE

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Forbes *et al.* (2000) recently reported falcon herpesvirus infection in 2 raptors in the UK. The authors brought these cases to veterinarians' attention because in 18 years only 3 cases of this infection had been reported in the UK. The Central Veterinary Research Laboratory in Dubai, UAE, has observed a remarkable increase of herpesvirus infection in hunting falcons since 1999 (Table 1).

Table 1: Herpesvirus isolated from falcons in the UAE over the last decade (1990-2000)

| Year | Species | Numbers |
|--------------|---------------------------|-----------|
| 90 | - | 0 |
| 91 | - | 0 |
| 92 | Gyr | 1 |
| 93 | Gyr | 1 |
| 94 | Saker | 1 |
| 95 | Gyr | 1 |
| 96 | Gyr | 1 |
| 97 | Gyr 2 Peregrine 1 | 3 |
| 98 | Gyr-hybrid | 1 |
| 99 | Gyr-hybrid 5 Unknown 1 | 6 |
| 2000 | Gyr 5 Gyr-hybrid 1 | 6 |
| Total | | 21 |

Gierse (2000) described in his thesis that 16 falcons (0.51 %) of 3157 falcons tested at CVRL died from herpesvirus infection. Herpesvirus infection in the UAE was highest in Gyrfalcons (5 of 310 = 1.61 %) followed by Gyrfalcon hybrids (6 of 472 = 1.27 %), Saker falcons (2 of 1052 = 0.19%) and Peregrine falcons (1 of 625 = 0.16 %). It is believed that the increase of this disease in falcons in the

UAE runs parallel with the increase of Gyrfalcons and Gyr hybrids used for falconry (Gierse, 2000). Johannknecht *et al.* (2000) have recently shown that herpesvirus isolates from pigeons were indistinguishable from falcon herpesvirus isolates. Gierse (2000) reported that herpesvirus was only isolated from pigeons, not from houbaras, stone curlews or quails tested at CVRL.

Wernery *et al.* (1999) have established an attenuated falcon herpes vaccine which has been used in kestrels. The authors are currently performing a similar herpes vaccine trial on Gyr hybrids, the results of which will be published later.

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A historical introduction to a common falcon foot disease

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The social status of falconry being the sport of kings in the Orient and Occident between the 8th and 19th century generated an interest in the falcon and its medical problems that has continued until today. One focus of medical attention during the past 1200 years has been diverse clinical picture of bumblefoot. The first hints of this raptor foot disease can be traced back to the Arabian-Persian region - home to the leading scholastic centres of the Medieval Orient (KRAENNER 1925; TJERNELD 1945; MÖLLER and VIRÉ 1988). The medical findings entered the West European Medieval literature by translations of the original manuscripts or their transcriptions (MODUS 1379/1975; LATHAM 1615/1976) as "..... until the 18th century the European hunting literature can be compared to a

chart-house as author after author is relying on previously published works of authors before his time" (LINDNER 1955). In this context the falcon foot disease bumblefoot can be traced back to the 8th century AD via historical tractates (AL GITRIF 8th cent., acc. to MÖLLER and VIRÉ 1988). Extracts from these tractates can still be found in commentaries and texts of the European hunting literature until the 19th century (HAMMER-PURGSTALL 1840; CZAPALLA 1936; SWAEN 1937; LINDNER 1962a, 1962b; TURBERVILLE 1575/1969; HANDS 1975; GESNER 1669/1981). The doctors of the Middle Ages and the early modern times used to name well-known diseases in terms of their own time, but without further definitions. This may indicate a general knowledge of these diseases and their different forms at that time which were named in prescription collections "by their symptoms" (VON DEN DRIESCH 1983) and can be traced back on the falconers' observation.

Causes:

In the historical manuscripts the possible bumblefoot causes have been related to species as swollen feet and podagra can be found “specially in sacres more than in any others. For they be of their owne nature very heauie hawkes and haue grosse feete.” (TURBERVILLE 1575/1969; WOLFF 1584, acc. to CZAPALLA 1936; D’ARCUSIA 1617/1980). The bird’s age as well as to an extensive training load (TURBERVILLE 1575/1969; LATHAM 1615/1976) played their part in the development of bumblefoot. Skin abrasions caused by too tight jesses (D’ARCUSIA 1617/1980; LASCELLES 1892/1986; KRAENNER 1925; TJERNELD 1945) and bating of falcons tethered on blocks (LATHAM 1615/1976; GAH-I-SHAUKATI, acc. to HARCOURT 1968; LASCELLES 1892/1986; TJERNELD 1945) were highlighted as specific problems of husbandry. Furthermore injuries caused by thorns and prey are mentioned as bumblefoot causes (TURBERVILLE 1575/1969; MIRZA 1868, acc. to PHILLOTT 1968). HAMMER-PURGSTALL (1840) notices a connection between parasite burden and the development of bumblefoot - observations that were reiterated with regard to tissue migration of *Serratospiculum* by BRÜLL (1937/1993).

Bumblefoot Symptoms:

Swollen feet

The first reference to the symptom “swollen feet” dates back to the 8th century AD and can be found in the manuscript of AL GITRIF (8. cent., acc. to MÖLLER and VIRÉ 1988). MIRZA (1868, acc. to PHILLOTT 1968) relates this clinical picture with a more precise symptomatic description to the Arabic terms “Mikhak” as well as “Hafa” for swollen feet caused by bruises without signs of discoloration being still in use today. DEMETRIUS (13. cent., acc. to KRAENNER 1925) regards harsh snow and rough jesses as the cause of swollen feet whereas in the Occident this medical term was introduced in falcon medicine by King MODUS (1379/1975). TURBERVILLE (1575/1969) introduced the term “swollen feet” for the first time as a unique clinical picture and stated that exogenous pathogenic causes included extensive hunting and training as well as old or newly acquired injuries caused by prey and thorns. In addition to ill humours, LATHAM (1615/1976) regarded excessive hunting and exercise usage of the falcons and the influence of cold weather (“taking cold”), swelling and abrasions originating in injuries as major causes of swollen feet.

Warts, holes and furuncles

MOAMIN (1240/41, acc. to TJERNELD 1945) postulates that warts (“veruche”), furuncles and holes contribute to a swelling of the foot sole as soon as the wart starts bleeding. This reaction is provoked by manning and jumping of the falcon.

Fluids in the feet

MOAMIN (1240/41, acc. to TJERNELD 1945) regards pedal swelling as sign of bodily fluids (“emorosites”) in the avian foot thus manifesting the idea of the humoral theory formulated by the hippocratic doctors and completed by Galen (VON DEN DRIESCH 1989; SCHAEFFER 1985).

Eschar (scab) and inflamed feet

“*Contra porros in pedibus*”, i.e. scab as medical foot problem in falcons has been historically mentioned for the first time by ADELARDUS. No explanation was given on appearance and localisation. He also referred to an inflammation of the falcon feet only as a term when mentioning “*si pedes inflammaverint*” (ADELARDUS ca. 1250, acc. to SWAEN 1937).

Tumour on the feet



The term “tumour on the falcon feet” (Germ.: “Geschwulst an den Falkenfüßen”) has been used for the first time in falcon medicine by King MODUS (1379/1975) as headline of a drug prescription. HAMMER-PURGSTALL (1840) is the first to mention the symptoms of a foot tumour. When characterising this illness as swelling and soreness of the feet from where ‘yellow water’ (Germ.: “gelbes Wasser”) runs down. In addition to increased foot shaking the bird becomes unable to hold anything

(HAMMER-PURGSTALL 1840).

Pin

TURBERVILLE (1575/1969) clearly defined the pin as a foot disease that grows into the falcon’s foot pads similar to sharp nails. Consequently the falcon is unable to catch its prey, feed itself or stand on its perch. LATHAM (1615/1976) links the pin development to bating of nervous and tethered falcons during their moulting period leading to foot abrasions and bruises. Resulting inactivity by falcons afraid of further pain and abrasions lead to the desiccation of the bleeding wounds.

Corn

HAMMER-PURGSTALL (1840) introduced the term “Leichdorn” (Engl.: “corn”) into German falcon medicine without further precise definition. It is used until today. In the Orient GAH-I-SHAUKATI (acc. to HARCOURT 1968) used the term “corn” at the same time also without further clarifications. In contrast LASCELLES (1892/1986) defines “corn” as small tumours occurring in different areas of the foot. They slowly find their way to the surface and consist of a hard, up to hazelnut-sized nucleus. After reaching the foot surface these tumours burst open and release a nucleus of hardened pus.

Therapeutic methods

They comprise herbal tinctures, ointments, dressings and plasters. Additionally steam therapy, cauterisation and early methods of surgery at the avian foot are used. Remedies with exclusively ineffective content as well as prescription ingredients that can neither be defined nor are heard of today will not be considered below.

General conditions of husbandry

During convalescence from falcon foot diseases LASCELLES (1892/1986) favours a padded perch or a turf hill, whereas MIRZA (1868, acc. to PHILLOTT 1968) advises to keep the falcon on a rough stone or rock instead of a bar. In addition LASCELLES (1892/1986) recommends to dress the bird in very soft and loose jesses, whereas D'ARCUSIA (1617/1980) and GAH-I-SHAUKATI (acc. to HARCOURT 1968) propose to take them off completely. The falcon shall not hunt (HAMMER-PURGSTALL 1840) and be kept quiet (D'ARCUSIA 1617/1980, LASCELLES 1892/1986). GAH-I-SHAUKATI (acc. to HARCOURT 1968) recommends to lock living prey in the chamber to feed the falcon as well as to stimulate the bird's urge to chase its food. In contrast HAMMER-PURGSTALL (1840) favours the feeding of sparrows, pigeons or chicken meat with nut-oil as soon as the foot disease "nail" (Germ.: "Nagel") occurs. According to MIRZA (1868, acc. to PHILLOTT 1968) the falcon suffering from "Hafa" shall be carried daily on the fist as well as trained on the lure in order to increase its condition and circulation. Emperor FRIEDRICH II of Hohenstauffen (acc. to WILLEMSSEN 1991) recommends the cutting of the claws when taming the falcon.

Steam therapy and foot bath

Steam therapy may be used for foot weaknesses, podagra and foot tumours as it helps to soften tissue hardening and simplifies the penetration of medical ingredients through the skin. Dried clover (HAMMER-PURGSTALL 1840), the milk of a black goat (GAH-I-SHAUKATI, acc. to HARCOURT 1968) or a mixture of horse-radish, *Foenum Graecum*, camomile, melilots and parsley (HAMMER-PURGSTALL 1840) are supposed to be boiled in a pot above the fire. That pot shall then be covered with a cloth or a sieve where the falcon is put onto with his ill feet. It must sit there until the skin is softened. Following the two-hour steam therapy HAMMER-PURGSTALL (1840) continues in case of podagra with anointing the ill falcon foot with honey until the tumour is softened. Then the tumour is cupped until blood and yellow water run out. During steam therapy HAMMER-PURGSTALL (1840) recommends feeding the patient with wild sparrows in nut-oil, pigeon meat in almond-oil or warm herbs with anise. In case of "swollen feet with black spots" GAH-I-SHAUKATI (acc. to HARCOURT 1968) bathes the falcon in a mixture of flour-sized old ground bricks having been soaked in vinegar for 24 hours. According to MIRZA (1868, acc. to PHILLOTT 1968) the disease "Hafa" can be cured with a thirty minute, lukewarm foot-bath of camel urine and crushed green isphagul.

Powder

Not only in the Orient but also in the Occident powders are applied externally against podagra as well as inflamed and swollen food pads. In the Dankus tractate (ca. 1490-1510, acc. to GERDESSEN 1956) a powder mixed of immortelles and roses is spread on the inflamed and swollen footpads until they heal. GAH-I-SHAUKATI (acc. to HARCOURT 1968) treats inflamed footpads by using a powder of ground lime and ginger for three days. In the case of podagra the tractate MOAMIN (1240/41, acc. to TJERNELD 1945) recommends rubbing a mixture of powdered lime and the white of an egg on the ill foot, whereas D'ARCUSIA (1617/1980) puts the falcon on a bag filled with pulverised plantain and salt.

Liquid drug preparations

LASCELLES (1892/1986) treats the early stage of "corn" with a tincture that has been mixed of brandy, vinegar and parsley being applied on the falcon foot for three days with the help of a small sponge. In contrast to this HAMMER-PURGSTALL (1840) treats "corn" with a tincture of night-shade and amaranth mixed with pulverised lime and orange juice. Apart from a reduction of the food by one third D'ARCUSIA (1617/1980) tries to cure the swollen feet with the help of a strong vinegar and plantain water mixture. GAH-I-SHAUKATI (acc. to HARCOURT 1968) needs the "blood of a young black hen" for the tincture against the swelling of the foot pads with black spots. This tincture will be mixed with onion juice, the juice of white peas, the white of egg and gum arabic in addition to the hen blood which is poured on the affected falcon foot. WOLFF (1584, acc. to CZAPALLA 1936) describes a treatment for swollen feet made of eggs, bacon, ox marrow, sugar, saffron, vinegar and rose-water. This tincture is anointed on the foot already preconditioned with wall-rue. In cases of footpad inflammation in falcons GAH-I-SHAUKATI (acc. to HARCOURT 1968) uses a mixture of human urine, carbonate of soda, salt, turmeric and *Rottlera Tinctoria*.

Ointments

One of the major therapies can be seen in ointments of vegetable and animal ingredients that are heated and melted over the fire. The preservation of these cremes is done in closed pots made of glass, wood or clay. One of the most famous medieval oriental ointments is the panacea "Byzantine Cream" consisting of dried milk, goose-fat, egg yolk, white wax, vinegar and incense (AL GITRIF 8th cent., acc. to MÖLLER and VIRÉ 1988). In the Medieval Occident a wide-spread and often copied ointment preparation against podagra was made of butter, olive-oil and aloe. This mixture is applied on the falcon foot four times daily for three days. Additionally the avian patient has to sit in the sun and eat cat meat (GESNER 1669/1981; DANKUS ca. 1490-1510, acc. to GERDESSEN 1956; DANKUS, acc. to TILANDER 1963; ALBERTUS MAGNUS, acc. to LINDNER 1962a). In the Orient saffron, the white of egg and blood are used apart from clarified goat butter and aloe for producing an ointment against this disease. If this ointment seems to fail AL GITRIF (8th cent., acc. to MÖLLER and VIRÉ 1988)

then proposes to add to its ingredients the blood of a black, fat and fleshy hen of the same year (Germ.: “schwarzen, feisten Huhns vom selben Jahr”). On top of it Arabian box thorn juice has to be spread. Furthermore AL GITRIF (8th cent., acc. to MÖLLER and VIRÉ 1988) smears a cream that is based on goose grease, egg yolk, coarse meal, male incense and white wax, on the foot swellings caused by fractures and dislocations.

In the 13th century ADELARDUS (ca. 1250, acc. to SWAEN 1937) recommends a different ointment. Ash-tree, fruit-tree and sloe-tree barks are cooked together with young acorns. After becoming cool this brew is mixed with old soap and rubbed on the feet and perches of the falcon. DANKUS (ca. 1490-1510, acc. to GERDESSEN, 1956) feeds butter and linseed-oil together with mice as dietary therapy against podagra. In Byzantium DEMETRIUS (13th cent., acc. to KRAENNER 1925) treats this disease with a remedy of liquid pitch, yellow wax and crushed centaury. Dankus (ca. 1490-1510, acc. to GERDESSEN 1956) treats swollen feet with the help of an ointment made of melted butter and cotton whereas DEMETRIUS (13th cent., acc. to KRAENNER 1925) uses wax, chicken grease and juice of the balsam-bush as ointment ingredients. In King MODUS's (1379/1975) book a mixture of Armenian soil (*Bolus orientalis*) and Terra sigillata soaked in rose-oil is described as cure for swollen feet. Another effective medicine against this particular foot disease in the Middle Ages seemed to be a cream composition of soft soap, freshly baked white bread, Armenian soil (*Bolus orientalis*), chicken grease and white wine. TURBERVILLE (1575/1969) recommends an ointment made of vinegar, rose-water and the white of egg which is also the basis for another formula with Terra sigillata, acacia powder and the juice of night-shades. DEMETRIUS (13th cent., acc. to KRAENNER 1925) mixes a salve made of acacia juice, ammonia salt, aloe, sea-leek, strong glue, drop incense and Celtic hellebore which should cure falcon's foot gout. In his opinion another highly effective remedy is the cream mixture of gall-apples, genuine myrrh, acacia and wine vinegar. In King Modus' piece of work a composition of rosemary ashes, rancid rose-oil and chicken grease is described. This mixture should be rubbed on the foot tumour (MODUS 1379/1975).

Foenum Graecum = *Trigonella foenum graecum* = Fenugreek (HUNNIUS 1993)

Melilot = *Melilotus officinalis* = Common melilot (HUNNIUS 1993)

Honey contains amongst others enzymes and inhibins which have a bacteriostatic effect (HUNNIUS 1993).

Isphagul = *Plantago Ispaghula Roxb* = *Plantago ovata* (DRAGENDORFF 1967) = *Indian Plantago* (HEILPFLANZEN 1997)

There are white or purple and yellow immortelles. white or purple immortelles = *Antennaria dioica* yellow immortelles = *Helichrysum arenarium* (HUNNIUS 1993)

The term “plantain” is not defined precisely in

the historical manuscripts. Whether it is ribwort/plantain = *Plantago lanceolata*, plantain = *Plantago maior* or another *Plantago sp.*, cannot be said beyond doubt.

Amaranthus spinosus and *Amaranthus sp.* (DRAGENDORFF 1967) belong to the *Amaranthaceae* (HUNNIUS 1993).

Arabian gum = *Gummi arabicum* is created naturally or after cutting the bark of *Acacia senegal* as well as *Acacia karroo*, because it is understood that cellulose is gumming due to bacteria (HUNNIUS 1993).

Rottlera tinctoria = *Mallotus philippinensis* (HUNNIUS 1993) = Kamala (PAHLOW 1993). Hairs and glands of these fruits growing on this Asian tree species are used (DRAGENDORFF 1967).

Dried milk is produced by steaming of water out of the milk. The left over substance is to be dried on a spread out cloth (MÖLLER and VIRÉ 1988).

Under the term “white wax” candle wax (MÖLLER and VIRÉ 1988) or bee wax being treated with bleaching agents (peroxide, chrome acid) or adsorbents (coal) is to be understood (HUNNIUS 1993).

Male incense is gained from *Boswellia carteri* and is regarded as one of the best incense qualities (MÖLLER and VIRÉ 1988).

Fluid pitch is a synonym for tar that has been gained by dry distillation of beech wood (*Fagus sylvaticus*) and is called beech tar (*Pix fagi*). Moreover there exist other kinds of tar (HUNNIUS 1993).

Under yellow wax bee wax is to be understood (HUNNIUS 1993).

Armenian Soil (*Bolus orientalis*) is an iron containing clay with anti-toxic qualities (MÖLLER and VIRÉ 1988).

Terra sigillata are stamped clay tablets similar to Armenian Soil (HUNNIUS 1993).

Gall-nuts are proliferations at the branches of the gall-oak (*Quercus infectoria*) caused by the stitches and egg-laying of the gall-wasp (*Andricus gallae tinctoria*) (HUNNIUS 1993).

Above article is a modified abstract from the English translation of the thesis: Müller M.G (1999): Studien über Sohlenballengeschwüre bei zur Beizjagd genutzten Falken in den Vereinigten Arabischen Emiraten. (Engl: Studies on bumblefoot in falcons used for hunting in the United Arab Emirates). Vet. Diss. München.

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Letters to the Editor

Dear Sir,

You may be interested to know that I am initiating a study of vultures, especially *Gyps*, in East Africa. This is partly in response to the suggestion - put forward by Munir Virani and others at the Pan-African Ornithological Congress in September 2000- that the "disease" that has decimated vulture populations in India may pose a threat to birds in Africa and elsewhere. The project will be based at Makerere University (Department of Wild Animal and Resource Management), Kampala where Margaret and I teach, and will be in close collaboration with colleagues in Uganda, Kenya and Tanzania. The study will comprise:

1. Collation of data on current status of populations.
2. Surveillance of the health of East African vultures, initially by means of observation (some of which is already in progress), non-invasive monitoring (laboratory examination of faeces, dropped feathers, etc) and opportunistic sampling - for example, if a vulture is found dead or has to be handled for some reason.
3. In due course, if considered desirable and approved by the relevant authorities, trapping of vultures in order to take blood and other samples.

I thought it important that you should be aware of this project. Your comments and advice would be appreciated. I already have a substantial database of references and information on African vultures (and some "baseline" pathological specimens) but access to other material would be welcome.

Yours sincerely,

Professor John Cooper
Wildlife Health Services
PO Box 153
Wellingborough
UK

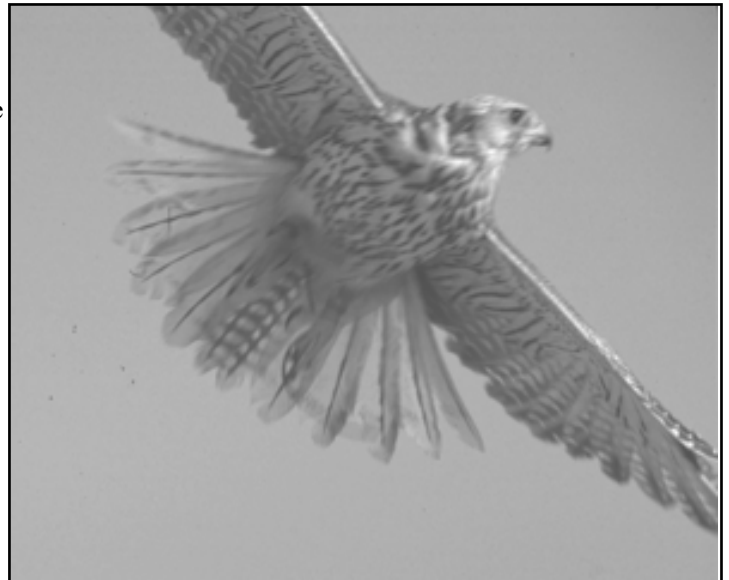
Dear Sir,

A juvenile, female, saker falcon was presented for routine clinical examination. The main clinical signs included reduced appetite, general weakness, progressive weight loss and green-coloured urates. Radiology revealed the presence of a lead pellet in the gizzard and the blood lead level was 60ug/dl thus confirming lead toxicosis. Immediate steps were taken to remove the lead pellet by gastric lavage. During this procedure, five small worms were flushed out together with the lead pellet and some casting material. The worms were approximately 25 mm long and very active. These specimens were immediately fixed with a mixture of ethanol and glycerine and sent to Dr Lynda Gibbons at the Royal Veterinary College, London for identification. The worms were identified as spirurid nematodes belonging

to the genus *Procyrnea*. The main species which seems to be reported from falcons is *P. leptoptera* (Rudolphi, 1819). However, there were some differences between this species and the specimens submitted. Further studies are underway to confirm the identification of the species. To my knowledge, nematodes of the genus *Procyrnea* have never been previously reported in the Middle East.

Yours sincerely,

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Dear Sir

In the most recent edition of British Birds there is an alarming report of Saker mortalities in Kazakhstan from badly insulated pylons. The letter from Ross McGregor states that "in casual observations during a ten-day period we recorded at least a dozen dead Saker Falcons." He goes on to say that "this risk is minor in comparison to threats from habitat change and collection for falconry" but this to me seems a bit optimistic. A falcon per day dead seems drastic. Although now it has come to light something can be done about it, so at least it is easier to repair than habitat loss etc.

Anand Prasad

What's new in the literature ?

Barton, NWH & Houston, DC (2001) The incidence of intestinal parasites in British birds of prey. Journal of Raptor Research. 35: 71-73.

During a study of feeding ecology and digestion in raptors, the incidence of gut parasites was noted during routine post-mortems. 583 individuals from 23 species of Falconiformes and Strigiformes were examined during the study. Numbers and kind of parasite were noted and discussed in terms of body condition, mortality and food preferences.

Gierse, S. (2000) Die wichtigsten Infektionskrankheiten bei Falcken (Falconidae) und der Bedeutung der Beutevogel als Überträger (The principal infectious diseases in falcons (Falconidae) and the importance of avian prey species as vectors). Doctoral Dissertation, Ludwig-Maximilians University, Munich, Germany.

Contact: Dr. med. vet. Sven Gierse, Aurbacherstr. 4, 81541 Munich, sven.gierse@web.de

This work describes the occurrence of the principal infectious diseases in falcons (Falconidae) in the United Arab Emirates and the importance of avian prey species as their pathogen vectors. It is based on the analysis of the patient files of 5696 falcons and 752 members of avian prey species, which were examined at the Central Veterinary Research Laboratory, Dubai (CVRL) between 1987 and 1999.

The literature chapter offers a summary of the historical and present conditions for falconry in the United Arab Emirates. Following on from that, the principal infectious diseases in falcons are described, with special emphasis on epidemiology and pathogenesis: Newcastle disease, hepesvirus infection, pox, chlamydiosis, mycoplasmosis, clostridiosis, infection by *E. coli*, salmonellosis, pasteurellosis, infection by *Pseudomonas spp.*, bumblefoot and aspergillosis.

The results show that, besides bumblefoot (in 40,51% of the falcons with clinical report) infections by *E. coli* (11,13%), chlamydiosis (4,75%) and infections by *Pseudomonas spp.* (4,31%) were of the greatest importance. Furthermore there was an occurrence of clostridiosis (3,20%), aspergillosis (2,98%), Newcastle disease (2,60%), pox (0,82%), salmonellosis (0,76%), herpes (0,51%), mycoplasmosis (0,35%) and pasteurellosis (0,35%).

Mostly there were single birds being affected by disease. Epidemic courses of disease were of no great importance. The appearance of disease is commonly associated with seasonal events such as the beginning of the hunting season, the return from hunting trips or the extreme climatic conditions of summer. Factors such as species, age, sex and keeping conditions may influence susceptibility to infectious diseases in falcons.

Based on the species-related and seasonal occurrence pattern of pathogens in avian prey, conclusions for risks of infection in falcons are drawn. It has been seen that the results mentioned in the literature cannot be uniformly applied to the special conditions of any country, but need

to be adapted to the local circumstances.

The present discussion in Germany on the advantages and disadvantages of the use of hybrids in falconry may profit from the results of this work.

The proportion of resistant *S. aureus* und *E. coli* strains to the antibiotics Enrofloxacin, Piperacillin, Ticarcillin und Amikacin increased during the period of this study.

Hawkins, M.G. et al. (2001) Atypical parasitic migration and necrotizing sacral myelitis due to *Serratospiculoides amaculata* in a prairie falcon (*Falco mexicanus*). Avian Diseases 45: 276-283.

An adult, wild-caught, female prairie falcon (*Falco mexicanus*) was presented with the chief complaint of anorexia. Radiographic findings included increased densities within the air sacs, and coelomic endoscopy revealed numerous slender worms within the air sacs and on the serosal surfaces of the ovary, oviduct, liver, proventriculus, and ventriculus. The bird seemed to improve for a short period of time with antiparasitic therapy (ivermectin and fenbendazole) and supportive care. Twenty-one days after initial presentation, the bird became recumbent with increasing pelvic limb neurologic deficits and was euthanized. On histopathologic examination, mature nematodes and larvated eggs identified as *Serratospiculoides amaculata* were found within the subdural space of the distal thoracolumbar and synsacral spinal cord and within the coelomic cavity. This case suggests that *S. amaculata* can cause clinically significant lesions in its falconiform host with potentially fatal results.

Lanzarot, M.D. et al. (2001) Hematological, protein electrophoresis and cholinesterase values of free-living nestling peregrine falcons in Spain. Journal of Wildlife Diseases 37: 172-177.

Protein electrophoresis, hematological and cholinesterase values were determined in 32 nestling free-living peregrine falcons (*Falco peregrinus*) (15- to 27-days-old) in order to establish normal reference values for this population. The following values (mean +/- SD) were observed: prealbumin 0.31 +/- 0.04 g/dl, albumin 1.25 +/- 0.06 g/dl, alpha (1) and alpha (2)-globulin 0.23 +/- 0.02 and 0.16 +/- 0.02 g/dl respectively, beta -globulin 1.02 +/- 0.05 g/dl, gamma -globulin 0.060 +/- 0.08 g/dl, total protein 3.79 +/- 0.18 g/dl, 21.26 +/- 1.30 white blood cells/mul (1 x 10³), 2.17 +/- 0.07 red blood cells/mul (1 x 10⁶), packed cell volume 37.58 +/- 0.82%, hemoglobin 20.96 +/- 0.29 g/dl, heterophils 61.14 +/- 2.50% and cholinesterase 1,184 +/- 75 IU/L. There were no difference in any of these parameters among males and females. The hematological values obtained could be considered as representative values in free-living nestling peregrine falcons.

Lierz, M. (2001) Evaluation of the dosage of ivermectin in falcons. Veterinary Record 148: 596-600.

Twelve groups of falcons, each containing three female gyrfalcon-peregrine falcon hybrids (*Falco rusticolus x Falco peregrinus*) were injected intramuscularly with

a single dose of ivermectin ranging from 0.2 mg/kg to 11 mg/kg bodyweight, and a control group was injected with water. Doses of ivermectin between 0.2 and 5 mg/kg failed to produce clinical signs of illness in the birds. Four birds which received either 6, 7 or 8 mg/kg showed slight clinical signs, and all the birds receiving 9 to 11 mg/kg showed more or less severe clinical signs of anorexia, apathy and sedation. Slight changes in the mean plasma activities of aspartate aminotransferase. Alanine aminotransferase and alkaline phosphatase (AP) were detected in the group dosed with 5 mg/kg. And higher dosages caused marked changes in these enzymes as well as in the mean plasma activity of lactate dehydrogenase. The mean activity of AP decreased, and the activities of the other enzymes increased. A dosage of 2 to 3 mg/kg ivermectin is recommended as a safe and effective antiparasitic drug for falcons and it has been used successfully to treat infestations of *Serratospiculum* species.

Martinez, J.A. & Zuberogoitia, I. (2001) The response of the Eagle Owl (*Bubo bubo*) to an outbreak of the rabbit haemorrhagic disease. Journal Fur Ornithologie 142: 204-211.

The eagle owl (*Bubo bubo*) is a generalist predator that in Mediterranean areas feeds mainly on rabbits (*Oryctolagus cuniculus*). At the end of 1997, a local outbreak of the rabbit haemorrhagic disease (RHD) decimated rabbit populations in the area of Alicante (eastern Spain) so that rabbit numbers in 1998 crashed to almost nil. Prior to the outbreak we had found 19 occupied Eagle Owl territories, and the owls had been feeding mainly on rabbits. After the RHD epidemic, we found only six occupied territories and the owls were still feeding mainly on rabbits. Diet composition was very similar between the periods, indicating that the owls did not diversify their diet in response to main prey scarcity. No significant differences in the proportion of rabbit in the diet were found between the periods, suggesting that the impact of predation on rabbits may be independent of the density of rabbit populations (type I functional response). This response is not typically associated with generalist predators. In the territories that were still occupied after the outbreaks, the owls took substantial numbers of Hedgehogs (*Erinaceus europaeus*) and Red-legged Partridges (*Alectoris rufa*). Rats (*Rattus spp*), a common alternative prey, were not taken in the study area. Six breeding attempts were recorded before the RHD, and none after the RHD. This leads a to believe that only the combination of Hedgehog and Red-legged Partridge availability with the readier availability of sick rabbits allowed a small population of owls to survive in the area, but did not allowed breeding. The predator-prey system formed by eagle owls and rabbits in Mediterranean regions is more fragile than previously thought.

Samour, J.H. & Naldo, J. (2001) Serratospiculiasis in captive falcons in the Middle East: A review. Journal of Avian Medicine and Surgery 15: 2-9.

Serratospiculiasis is a parasitic disease produced by filarial nematodes of the genus *Serratospiculum* in the subfamily Dicheilonematinae. This genus comprises at least 9 different species grouped according to the length of the spicules. In the Middle East, *S seurati* has been the only species of this genus positively identified to date in captive falcons.

Serratospiculum seurati has an indirect life cycle, like other filarioids. In a previous study, the larval life cycle of *S. seurati* was replicated in 5 different species of beetles. More recently, 2 additional invertebrate species (a beetle and a wood louse) that occur where falcons are maintained were added. *Serratospiculum seurati* is transmitted in captivity by ingestion of infected beetles. After beetle ingestion, the L3 larvae are released from their capsule and penetrate the wall of the proventriculus and ventriculus. Histopathologic evidence suggests that the migration to the air sac system is direct. After reaching the air sacs, the L3 larva undergoes 2 molts to produce the L5 or immature adult filarial worm. Adult parasites breed and produce large numbers of embryonated ova, which are coughed out through the trachea to the mouth, swallowed, then excreted in the feces. Histopathologic findings in infected birds normally demonstrate the presence of adult filarial worms, larvae, and embryonated ova within tissues. Numerous parasitic stages in the lung periphery are associated with mild focal hemorrhages, focal necrosis, and mild to moderate macrophage infiltration. Adult filarial parasites are commonly observed on both sides of the collagen-muscle fiber layer immediately below the epithelial or mesothelial section of the air sacs. In several birds with severe infections, *S seurati* was associated with pneumonia, airsacculitis, and early lesions of aspergillosis. Ivermectin has been routinely used at the dosage of 1 mg/kg SC repeated 1 or 2 weeks later without observing any detrimental effects. Currently, the anthelmintic agent moxidectin, administered in tablet form, is undergoing trials for the control of *S seurati* infections in captive falcons.

Schettler, E. et al. (2001) Seroepizootiology of selected infectious disease agents in free-living birds of prey in Germany. Journal of Wildlife Diseases 37: 145-152.

Four hundred forty-eight blood plasma samples from free-living birds of prey from Berlin and the Brandenburg area in eastern Germany were tested for antibodies against New-castle disease virus (NDV), falcon herpesvirus (FHV), owl herpesvirus (OHV), and *Chlamydia psittaci*. Antibodies to NDV were detected in 6 (2%) of 346 tested diurnal birds of prey, whereas none of the owls (n = 55) was positive. The positive samples originated from two common buzzards (*Buteo buteo*), three ospreys (*Pandion haliaetus*) and one marsh harrier (*Circus aeruginosus*). Titers varied between 1:8 and 1:32. Of 253 birds of prey one osprey (<1%) tested positive for antibodies to FHV with low titer of 1:6. This is the first detection of antibodies against FHV in an osprey. Furthermore, antibodies against OHV could be found in one tawny owl (*Strix aluco*) and one common buzzard (2 of 253, 1%) with low titers of 1:6. Of 422 birds of prey 267 (63%) tested positive for antibodies to *Chlamydia psittaci* with titers varying between 1:5 and 1:256 which reflects the ubiquitous occurrence of *Chlamydia psittaci* in these birds of prey.

Volf, J. et al. (2001) Experimental transmission of *Caryospora kutzeri* (Apicomplexa : Eimeriidae) by rodent hosts. *Folia Parasitologica* 4: 11-14.

Four laboratory-hatched European kestrels *Falco tinnunculus* were fed on laboratory mice and common voles *Microtus arvalis* Pallas previously inoculated with different doses of sporulated oocysts of *Caryospora kutzeri* Boer, 1982. Two kestrels that were fed infected mice shed *C. kutzeri* oocysts 6 days after ingesting murine tissues. To compare direct and indirect transmissions, two of the kestrels were subsequently directly inoculated with 10 (5) sporulated *C. kutzeri* oocysts and became patent on

days 8 and 9 and shed caryosporan oocysts up to day 25 post inoculation. Additionally, four mice were inoculated with 10 (6) oocysts in order to examine mouse tissues for the presence of developmental stages of *C. kutzeri*. No coccidian stages were found in the tissues of inoculated mice. The experiment showed that developmental stages of *C. kutzeri* are able to survive in mouse tissues and cause infection of suitable host after their ingestion.



Book Reviews

Raptor Biomedicine III including Bibliography of Diseases of Birds of Prey

Edited by J.T. Lumeij, J. David Remple, Patrick T. Redig, Michael Lierz, John E. Cooper

Once each decade, the accessible knowledge in the field of raptor biomedicine takes a quantum leap as a result of the International Raptor Biomedical conference. Raptor Biomedicine III, an extraordinary, full-color, hardbound reference text, is the latest addition to this knowledge. With contributions from 89 renowned international authors, the 550 pages cover:

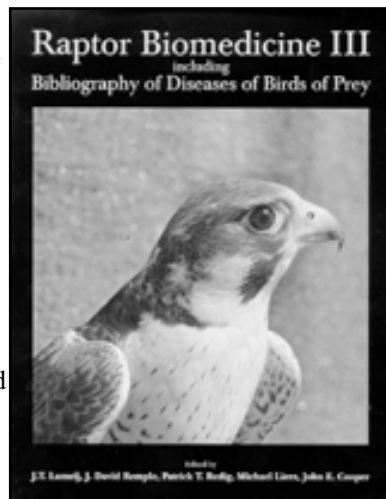
- o Microbiology
- o Parasitology
- o Pathology and Poisoning
- o Medicine and Surgery
- o Veterinary Management
- o Rehabilitation and Telemetry
- o Resolution

The bibliography contains over 4000 entries and is also provided in digital format as an accompanying CD. ISBN: 0-9636996-1-X 2000.

“This publication has much to be recommended. It is essential for anyone interested in avian surgery and injured wild bird rehabilitation, and is a state-of-the-art reference on birds of prey.”

Reviewed by Greg J. Harrison, DVM, Dipl ABVP-Avian, Dipl ECAMS

Raptor Nutrition



Edited by Neil Forbes FRCVS and Colin Flint

This 58 page, A5 soft back format booklet is written by Neil Forbes and Colin Flint. The booklet comprises three main parts. Firstly a literature review of the nutritional requirements of raptors, together with historic analysis of the nutrient composition of commonly available commercial diets. Secondly a section which gives new independent analytical results of commonly available commercial raptor diets in the UK. These results are based on, for example, 200 day old chicks, 100 vitamin E enhanced quail, 75 rats, 200 mice. This data contrasts with many previous results, which were based on 3 - 18 individuals and hence may not have been statistically reliable. The book finishes with an extensive section on practical raptor feeding, in which specific risks involved with a variety of different diets are discussed. This is a very useful, informative and in many parts original work.

The booklet is very competitively priced at £ 5.00 plus postage. The book is sold in aid of ‘The Campaign for Falconry’ and is available from:

HoneyBrook Farm Animal Foods, Shinehill Lane,
South Littleton, Evesham.
Worcs. WR11 5TP.
Tel 44 1386 830089. Fax 44 1386 834393
E mail info@honeybrookfarm.com

or

Neil Forbes FRCVS, Avian and Exotic
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Email birds@lansdown-vets.co.uk



Video Reviews - The Bird of Prey Management Series.

www.falcons.co.uk/faraway/FFP/

In Arabia there are still many problems relating to falcon management, with a high rate of disease and accidents. Although there is now much information about falconry and falcon management available, most of this is unavailable to the Arabian falconer. The same applies to the Spanish speaking nations such as Spain, Mexico and South America where falconry is popular but the standards are poor because of lack of proper teaching.

A video unit was recently established at the Falcon Facility, UK and it has since produced several films, including one on NARC's Falcon Conservation Programme, one on The Saker Project in Mongolia (in Mongolian, Russian and English) and it is now working on a more ambitious project to produce **The Bird of Prey Management Series**.

This is an educational course with up to 15 video titles provisionally planned and currently being filmed. It is written and produced by a team of raptor specialists with expertise in all areas of raptor management. **Each video is a course module and comes complete with instructional handbook.** It is aimed at falconers, breeders, veterinarians, rehabilitators and biology graduates. Its purpose is to improve the standards of falcon and raptor management. The first two videos in the series, Nutrition and Basic Training are already available.

Nutrition has been produced in PAL and NTSC. A PAL version in Arabic is available through the UAE Falconers Association at the: Abu Dhabi Falcon Hospital
P.O. Box 45553,
Abu Dhabi
United Arab Emirates

and there are English and Spanish versions in PAL available from:
The Falcon Facility,
P.O. Box 19,
Carmarthen, UK
SA33 5YL.

NTSC English versions are available through The Falcon Facility.

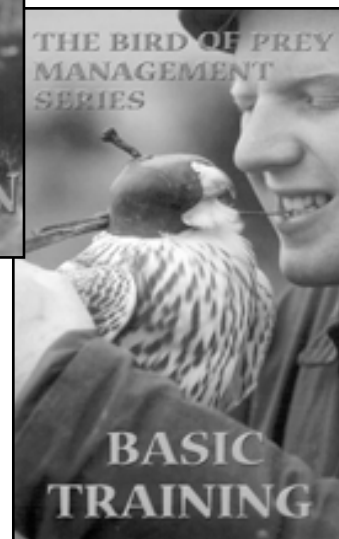
Basic Training is currently available only through The Falcon Facility. There are PAL and NTSC versions in English and there should be a Spanish version sometime soon. At the moment there is no Arabic version.

choice of diets for captive raptors, digestion, measuring the crop, rangle, casting, washed meat, vitamin supplements, diets for baby raptors, feeding invalids, risks in feeding wild food and much more !

BASIC TRAINING covers hacking, sources of birds, hooding, fitting equipment, progress charts and follows the training of a Peregrine, Saker and Harris Hawk from hack to flying free.

Further titles:

In Winter 2001 we should have the next title completed - **Anatomy**. This will be followed by the first dealing with veterinary aspects of raptor management - **Health Care**.



Other provisional titles:

- Health Care 2
- Health Care 3
- Captive Breeding 1
- Captive Breeding 2
- First Aid
- Fitness Training
- Entering
- Equipment and housing

NUTRITION covers diets of wild raptors,

