

## FALCON BREEDING AS A CONSERVATION TOOL IN ARABIA

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### ABSTRACT

An account is given of the recent breeding of Peregrine and other falcons in Arabia as part of a programme to provide falcons for hunting.

### INTRODUCTION

Falcons have been kept by Arab hunters for perhaps 2000 years. Desert nomads depended on trained birds to catch the scarce game encountered in their wanderings. Modern life has freed these people from dependence on the land, but their love for hunting with falcons has persisted.

Falconry has been a significant element of many cultures, from the Mongol hordes of Asia to the courts of mediaeval Europe. But only in the countries of the Arabian Peninsula has falconry retained its traditional place of importance. The Bedouin of inland Saudi Arabia trapped migrating Saker Falcons (*Falco cherrug*) as they passed through in the autumn. Peregrine Falcons (*F. peregrinus*) were less commonly seen, and then only along the coasts. The Saker was preferred, owing to its ability to subdue large quarry such as hare and Houbara Bustard (*Chlamydotis undulata*). Peregrines, with their more delicate nature, did not fare well on the irregular diets and were kept in insignificant numbers.

In contrast, the Arabs of the old Trucial States along the south-east coast of the Arabian Gulf commonly trapped Peregrine Falcons and trained them to catch Houbara and Stone Curlew (*Burhinus oedicnemus*). Over the years a trade in falcons developed among Arab people and Bahrain became a primary centre for buying falcons for the Gulf. Twenty years ago, Sakers sold for about £15 Sterling. Peregrines were called 'small change' as they were thrown in with a purchase of several Sakers to 'make up the difference'. All this has changed with the coming of the oil. Today more birds are kept and with the advent of air conditioning and the ability to buy food, Peregrines are in greater demand. Although kept in far fewer numbers than Sakers, they command a higher price because of their superior flight.

Peregrines and Sakers are still trapped along both sides of the Arabian Gulf, but the majority of falcons used by Arabs are purchased from Pakistan and Syria. I estimate that about 3000 trained falcons participate in the hunt each autumn. Less

than 1000 are kept for subsequent seasons, the rest being lost during the hunt or released in the spring. Of the approximately 2000 falcons removed from the migrating population, virtually all are females and 80 to 90 percent are Sakers, the remainder being Peregrines.

Since 1977, falconers and conservationists throughout the world have followed a unique experiment in the Middle East. This was the creation of the Sulman Falcon Centre by H.H. Shaikh Hamad bin Isa Al-Khalifa, Crown Prince of Bahrain. Its purpose is to produce hunting falcons in Arabia for Arab falconers.

On 18 April 1980, as the call to morning prayers came from a nearby mosque, the first successful hatch of captive falcons in Arabia began. That year, seven eggs were laid by a pair of Peregrines obtained from Melbourne Zoo. All seven hatched: four in April and three in May, and six males and females were successfully raised to fledging. Each spring since then has seen the successful rearing of falcons of three species—Prairie Falcon (*Falco mexicanus*), Peregrine (*F. peregrinus macropus*) and Saker (Table 1).

Table 1: Breeding results.

Year	Number of pairs laying	Eggs	Fertile eggs	Hatched	Fledged
1980	2	12	7	7	6
1981	4	24	18	16	13
1982	3	29	16	16	15

## HISTORY

In 1975, the Peregrine Fund of Cornell University was contacted by H.H. Shaikh Hamad. As a keen falconer, he was interested in the Fund's pioneering success with falcon breeding, and sought its help in the establishment of a similar effort in Bahrain. Dr Tom Cade, Director of the Fund, visited Bahrain and provided valuable guidance. By 1977, I had finished my training at Cornell and took over the development of the Falcon Centre.

Early in 1978 the facility was finished. It is a cement block building with seven two-story high breeding chambers in its northern half measuring 6.2m × 6.2m. Each of these houses a pair of falcons. Each room has a barred window 3.6m × 4.6m. Guests look through small windows fitted with one-way glass in the back of the rooms. Each room has air conditioning and artificial lighting to simulate the falcons' cooler, more northerly, nesting grounds. The southern half of the building is a single-story row of support facilities. These are for incubation of eggs, food preparation, offices, a workshop, a library and a clinic for treating sick and injured hunting falcons.

In December 1977, six pairs of Sakers that were wild-caught hunting falcons (some several years old) and a pair of Prairie Falcons furnished by the Peregrine Fund, were placed in the chambers. The Sakers proved disinclined to court. Other breeders have found that wild-caught falcons do not generally breed: success comes from pairs raised in a breeding chamber.

By 1980 the Centre had replaced the wild-caught birds with a pair of Australian Peregrines, two pairs of fledgling Sakers from Germany, a pair of fledgling Gyrfalcons from the Peregrine Fund and a pair of Sakers from China. The Chinese birds were confiscated by the Hong Kong Government upon their illegal entry from China. Upon hearing of the Centre's interest, they sent them to

Bahrain. I am pleased that no falcon has been removed from the wild for use in the Centre.

## BREEDING SEASONS

In 1980 two pairs were sexually mature, the Peregrines and the Prairies; however, only the Peregrines produced young. In both 1979 and 1980 the Prairies laid eggs without copulating. The male would not court the female who became very aggressive towards her mate.

In 1981 the Peregrines again produced seven young. They laid three clutches of three eggs each. (Of the nine eggs, one was infertile and one chick died at pip.) The Chinese Saker laid two clutches of four eggs each; two of the first and three of the second were fertile, all of which hatched and fledged.

Again the Prairies conducted a one-sided courtship, the female maintaining a scrape and the male keeping his distance. A drastic step was decided upon. Under the direction of Paul Goriup the male was implanted with 25mg of crystalline testosterone (available from Intervet International, P.O. Box 31, 5830AA Boxmeer, Holland). A pellet was placed subcutaneously in the back of his neck where it was slowly absorbed (Collar & Goriup 1980). After ten days, courtship began; copulation was seen fourteen days after the implantation. Five fertile eggs were subsequently produced. One was lost to a fungal contamination but four hatched. A second clutch was produced but was infertile; no copulation was seen after the first clutch was laid.

Both males of the Saker pairs from Germany were also implanted with testosterone. Although they were only 22 months old, a definite change in behaviour was seen after 14 days. Both pairs maintained scrapes and transferred food. One pair laid two eggs, but copulated only after the eggs were laid. No ill effects were noted in the treated birds.

In 1982 the male Prairie Falcon was not implanted and did not court his mate.

Another form of inducement that I used had an effect. Several breeders stimulate courting pairs by presenting live food. This becomes even more effective if only the male is allowed to take the food. I hold small quail at the food port so that my hand is hidden. If the female approaches, the quail is withdrawn; if the male comes, it is dropped. This reinforces the male's natural role as provider. By using young quail, feeding can occur seven or eight times a day. Adult quail are regularly given to ensure proper calcium intake by the female.

## INCUBATION

The manipulation of adults, eggs and young generally followed methods developed by the Peregrine Fund (Cade 1980). Each pair was allowed to lay an entire clutch. This was removed seven days after completion. The eggs were placed in Marsh Farms Roll-X incubators set at 99°F (37.2°C). Three incubators were operated, each at a different humidity. The eggs were weighed every third morning and shifted to the appropriate humidity to produce the required weight loss. Researchers have determined that for an egg to hatch successfully, it must lose between 12 and 18 percent of its weight between the time of laying and the first cracking of the shell (pipping) (Rahn & Ar, 1974). The fertile Peregrine and Prairie Falcon eggs were manipulated to meet this criterion and all hatched normally. It proved difficult to get the proper amount of weight loss from the

fertile Saker eggs. The chicks could not hatch normally: some had to be extracted from their shells and two had unretracted yolksacs.

## HATCHING AND FEEDING

At pipping, the eggs were transferred to a hatcher set at 98°F (36.6°C), with 70 percent relative humidity. As a hatcher I used a still air incubator in 1980 but preferred a forced air one in 1981 and 1982. A faint calling by the chicks began about 24 hours after pipping. This became more vigorous and the crack became a hole a few millimetres across. Fifty to seventy hours after pipping began, the chicks broke free. An antibiotic was applied to the umbilicus and the chicks' down was fluffed when dried off. After the second day, they were moved to a brooding unit that was lowered to room temperature as they grew.

I have used several types of brooders patterned after other projects but all with some misgivings. I was pleased with a fibreglass tray with pea gravel for a substrate and an infrared lamp as a heat source. The tray was 600mm square with 300mm sides. The chicks could move in and out of the heat as they desired. By discarding the gravel and washing the tray with disinfectant, odour and contamination were minimized.

About ten hours after hatching, the young were given a few bites of ground quail breast and liver. This was repeated every three hours for the first three days. The diet was then changed to ground quail lacking only feathers and feet. All food received an avian vitamin plus mineral supplement and was mixed with a sterile saline solution (9%). This produced an easily digestible slurry that was fed to the chicks by use of blunted forceps. After about eight days of hand feeding, they fed themselves from a bowl.

The chicks were returned to their parents at two weeks of age. There was some risk in this, as captive parents have been known to kill their young. A single young was placed in the nest to test the response. The Peregrines accepted their young. Unfortunately, both Prairies and Sakers attacked their young upon reintroduction. One chick, a male Saker, was killed.

The Saker parents proved to be model parents the next year. They were allowed to incubate their second clutch until the eggs pipped. The eggs were then substituted with dummy eggs while the chicks were helped from the eggs and fed for 24 hours, following which they were loosely taped into larger eggs painted to resemble Saker eggs and put back with the mother. In a matter of minutes the eggs 'hatched' and were accepted by the parents. Their acceptance of the young was probably owing to the parents having heard the young calling at pip two days before.

## FLEDGLINGS

All fledglings are left in large chambers until autumn when they are removed and given to Arab falconers. Any thoughts that the Arabs may have had about captive-bred falcons being inferior to wild-caught ones were quickly dispelled. With each step of the training, the tradition-bound handlers became more and more enthusiastic about their young 'Bahraini Falcons'. These birds have shown no hesitation in attacking and subduing cock Pheasants and Houbara.

## PERSONAL FEELINGS

The successful breeding of hunting falcons is not a rare event in the world fraternity of falconry. The satisfaction I took from the fruits of four years' labour has been felt by breeders elsewhere. What is perhaps unique about the breeding of falcons here is that it is being done in a setting where the trained falcon has been revered for centuries yet its natural history is unknown to its admirers. The creation of the Sulman Falcon Centre by His Highness has opened a window to unimagined vistas of falcon behaviour, biology and development.

## ACKNOWLEDGEMENTS

I wish to congratulate H.H. Shaikh Hamad Bin Issa Al Khalifa for his foresight and perseverance in this project. Al Areen Wildlife Park and Reserve supplied quail and the maintenance needs of the facility. Thanks also goes to the Peregrine Fund of Cornell University for their advice and two pairs of breeding stock.

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