

THE EUROPEAN SPARROW-HAWK—BREEDING IN CAPTIVITY

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From various motives, increased attempts have been made recently to induce captive birds of prey to breed. A report is given below on the breeding in captivity of European Sparrow-hawks (*Accipiter nisus*).

Parent birds. After obtaining an injured adult male bird (two or more years old) in January 1968, I succeeded in healing it and manning it to a certain degree. Eventually I found that the bird was unable to use its left wing perfectly, and so it must still be kept in captivity. In March of the same year, on my request, the Swiss Ornithological Institute, Sempach, provided me with a female Sparrow-hawk, whose broken wing and leg had healed but who was almost incapable of flying.

In these two birds, both unable to live in freedom but who were otherwise healthy, I found the necessary conditions for a breeding attempt. At the present state of our knowledge and possibilities in the breeding of birds of prey, the reflection may be justified, not to commence with the sensitive and quick-reacting Sparrow-hawk but to experiment first with a more "favorable" species. But by chance, the two birds came into my hands so I had no choice and on the grounds of some 12 years' experience of Sparrow-hawks, it seemed to me that I should seize the opportunity and, above all, not let such a chance go by without having tried every means possible within my capabilities. Suitable Sparrow-hawks fly only seldom into my house and then only one by one. Even if an attempt to breed with two tame nestlings might have been more rewarding, it seemed that the choice of two adult birds who had possibly already bred in freedom, might give more promise of success. I could also imagine that young birds, in continual contact with their keeper, might find difficulties in becoming familiar with another of their own kind.

Aviary. Since the male could fly quite adequately if at times for short periods only, but the female could only manage a short flight of about 1 meter, I had to consider using elder for the perches when equipping the aviary (2.10 m long, 1.50 m broad and 1.90 m high). I was able to make a perch for the male which was out of reach of the female. The feeding board is inside the door at a height of 70 cm. The floor space is half-filled with spruce twigs. The front of the area

consists of upright laths, and wire-netting is nailed on the outside. The exceedingly shy female, who resisted all attempts to tame her, fluttered around wildly every time a human being appeared so that I was compelled to erect a screen of wire-covered frosted glass about 1 meter outside the laths. On the solid side-wall, on the other side of which is a window-less small space, firmly nailed forked branches are to constitute the basis for the future nest. Immediately above the branches, I fixed a so-called spy-glass in a 10 x 20 cm opening as an observation window. From daylight until dark, the glass served as a mirror, from the dark space it is transparent and ensures a view into the aviary without the knowledge of the inmates.

Marquart (1967) favors cages with plastic net sides, a wire-netting roof and a floor which is as thickly covered as possible. This arrangement ensures enough light, is sufficiently screened off externally, and the inside temperature is favorable. The existing space available for my Sparrow-hawks probably represents the minimum; the dimensions, however, are adequate for two birds whose flight is limited. The vertical laths at the front prevent head injuries when the birds attempt to fly—they are recognized as an obstacle and parried with the claws—in contrast to wire netting. The transparent, hard plastic roof, built subsequently, ensured light, but the solid boarded walls made the interior so dark that a lamp was necessary. I used elder perches on account of the rough bark and ready availability and took care that the branches varied in thickness. These were fixed at different angles to ensure a change of position and to avoid the same continuous strain being placed on the feet. Dry spruce needles cover the floor lightly; they absorb dirt and are less dusty than peat. The rear half of the floor is covered with green pine brushwood to a height of about 10 cm. Food remainders falling from the feeding place disappear amongst the twigs and are inaccessible for the birds.

Light. In the course of the summer of 1968, I found my views confirmed in the works of Marquart (1967) and later, Koehler (1968), inasmuch as the aviary indicated for Sparrow-hawks is too dark. I then replaced the wooden roof by corrugated clear plastic and 5 cm under this, I stretched transparent plastic sheet to protect the male, should he eventually fly against the roof. The aviary was thus much lighter. Later, I placed a 100-watt lamp in such a position in the corner between the screen wall, side wall and roof, that it illuminated the whole interior. From the middle of January until the end of March 1969, the lamp always burned from 6:45 until 7:45. In the evening, it was switched on at first at 17:00. (With increasing daylight and on clear days, correspondingly later.) In January, the light was switched off at 19:00, in February at 20:00 and in March, towards 21:00. Say once a week probably, there was no light on

account of my absence.

Getting accustomed to each other. At the beginning of April, 1968, when I put the two birds, now accustomed to each other to some extent, into the aviary, the year was too far advanced to count on their breeding. It was, therefore, essential to keep the pair in a healthy condition until breeding time, 1969.

At the beginning, the male, weighing 140 grams, fled from his heavier partner (260 grams). In the course of a few weeks they became accustomed to each other and today, after breeding, it is the female who is shy rather than the reverse.

When I received the female, the male was so much at home with me, that I was able to hold him on a bow perch on jesses with elastic leash. At first, the female was put in a roomy packing case with vertical bamboo laths at the front. The case and the bow perch were so placed that the two birds could see each other. After a week, the female also had a bow perch but her behavior was not good as she was too shy. I had put the male into the aviary some days before the female so that as regards becoming familiar with his new quarters, he would have the advantage and be able to assert his mastery from the beginning. In the present case, it may have helped to contribute to success that the female was hindered as regards flying to a greater extent. With birds whose flight is not handicapped and in a species where there is a marked difference in size between the sexes, the advisability of "braking" the female should be considered. This is done by binding some of the flight feathers lightly with adhesive tape. In the confined space of an aviary, it is impossible for the male to keep the desired distance. In the stage of getting accustomed to each other and pairing, the continual feeling of threat could prejudice the desired course of events.

Food. Twice or three times daily, I fed newly-killed mice after skinning and removal of stomachs and intestines. According to outside temperature, time of year and age of the mice, daily requirements of the two birds together varied between 90 and 100 grams. At times, I fed them small birds, recently killed by accident. Water was rarely required—probably my Sparrow-hawks bathed and drank less than once per month.

For the bird-hunting Sparrow-hawk, mice constitute a substitute food. In feeding them freshly killed mice, then at the expense of regular food, a larger proportion of hair is consumed (although I had earlier kept Sparrow-hawks who plucked their mouse clean in 1-2 hours) and at times, the birds could have hardly had sufficient food. Reminders of mouse skin on the head and legs suffice for the formation of castings. I had, moreover, still a further reason to skin the mice: in the case of eventual success in breeding, the young birds

with their white down in the nest and the white, furry food would be similar in appearance—I did not want to run any risks! When consuming a mouse whole, the Sparrow-hawk usually rejects the stomach and intestines. It is less troublesome for me if I remove the intestines etc. immediately than if I have to collect these food remainders at night from the floor.

Behavior and maintenance. As soon as the birds established a sitting distance of 20 cm on the same branch and remained there overnight, I re-arranged the branches in such a way that from now on, they were all accessible for the female. As her fear of humans and noise was still on the increase, I showed myself to the birds as little as possible and laid their food on the feeding board through a small, push-opening in the door. Thereupon the male bird always took the mouse on the left side (as he saw it) and devoured it on the highest branch. It was only then that the female took her share and devoured her meal on the middle branch.

Preparation for breeding. In the second half of March 1969, the call of the male increased frequently, both before and after feeding and likewise, more frequently, the female uttered varying small cries as soon as she had taken her food. During the last days of March I was absent. On the 1st of April, I discovered that the female either did not fetch her food or, then only after a delay of 5-10 minutes. By day, the male did not fly up to his usual eating place with his mouse but, calling continually, consumed the head somewhat awkwardly on the ground with frequent interruptions and then offered food to the female who was standing on the middle branch. She approached with lowered head and tried to take the food with her beak, but at the last moment, the male took refuge on the floor. Then the female sprang after him and took the food he had relinquished when he took refuge on a higher branch. From now on, the female never fetched her food from the feeding board: everything had to be offered to her by the male.

Nest. During the night, I hastily built up foundations for the nest with green pine cones, radiating from a center and a few dry larch twigs. Additionally, I threw several handfuls of dry larch and pine twigs on to the floor. On the following morning, the 4th of April, about 20 small twigs were to be found all mixed up together on the foundation. In the evening, among them, I found a broken egg on the floor, which had apparently fallen through holes in the loosely built nest platform. The next night, I built a solid Sparrow-hawk nest from dry twigs, bound the ends firmly with florists' wire and threw two handfuls of pieces of spruce bark into the hollow.

In the course of propagation, the nest-building Sparrow-hawk

must play his part—a task spared the falcon who lays its eggs on the bare gound of a ledge on a cliff-side, or who uses an eyrie already built by another bird. Some time ago, I had a female Sparrow-hawk for seven years who regularly built a nest and “bred” in it without having laid a single egg. It was not my wish to deprive my Sparrow-hawk pair the pleasure of nest-building which should be a phase in natural procedure. This, however, was practically impossible, very likely on account of the flight disability of the female. She was not able to hold a long twig and then spring up to the nest, and when she wanted to carry a twig in her beak, it usually proved impossible. I arranged the artificial nest as a rather flat hollow on the nest foundations, bound the edges firmly and threw in a few bits of bark, gathered up from the forest, as I had seen in two Sparrow-hawk nests.

Egg-laying. In these days I often heard excited cries, from which I deduced that pairing had taken place. I was an eye-witness of such an act at midday on the 7th of April. On the 14th of April, a new egg lay in the nest and I noticed a large bare patch on the female. She brooded, however, only infrequently and for hours on end, sat on a branch or on the edge of the nest so there was no possibility that this egg would be hatched. On the 20th of April at 8:30 a.m., a second egg lay in the nest and from now on, the female brooded continually.

Brooding. Intervals from brooding in order to feed lasted from 8-10 minutes; in this connection I never noticed that the female was away from the nest. The now closely guarded feeding place was on the floor amongst the pine twigs in the furthest right-hand corner of the aviary (*i.e.* the furthest possible distance from the nest). It was here that the male consumed first the head of his prey, then, on the floor, less often on the lowest branch, gave the body to the female and then fetched the second mouse for himself. From this too, he took the head, either on the floor in the immediate vicinity of the female or then on the highest branch (up to now his feeding place). If the female consumed her portion, then the male gave her his remainder. Very often, she did not consume this completely but left it and then the male took the remainder again. On the 5th of May, I found the first egg which had been laid, in a crushed state; probably when turning it cracked against the second egg. Whilst the Sparrow-hawks were eating on the floor, unobserved, I removed it from the nest through the spy-glass. It was rotten and nothing could be deduced regarding the embryo.

Moulting. The two birds showed a different process. The female shed the first three flight feathers left and right before the 30th of April, the eighth left on the 28th of June, the ninth left on the 1st of

July. Tail moulting commenced between the 26th of April and the 3rd of May. As regards the large feathers, moulting came to an end at the beginning of July but owing to my absence, I could not check this. The male shed his first flight feathers before the 22nd of April, the two last on the 29th of August and the 4th of September respectively. Tail moulting commenced between the 6th and 8th of May and ended on the 4th of September. From these scanty dates, it would appear that in the female, the moult commenced with the start of actual breeding (second egg onwards) and the plumage changed during the period when she was closely confined to the nest. On the other hand, in the male, the moult commenced about the same time, proceeded slowly and was concluded about the time the young bird became self-supporting. In addition, this breeding in captivity had shown that the moulting process in the Sparrow-hawk stands in the closest connection with the division of duties between the species during propagation.

In order to avoid disturbance as much as possible, I only went into the aviary by night, at intervals of about a week and by the light of a very small torch, to collect the discarded flight and tail feathers. This explains the inexact dates.

The male during incubating activity. It was never possible to observe the male incubating. If he consumed his prey more quickly than the female, he flew to the edge of the unoccupied nest, observed the eggs, nodded and continually moved his beak towards the crop and breast (intention-movements to turn eggs?) trotted about on the spot and rocked on his heels (intention-movements to sit on the eggs?). Once he placed his rear toe under the front toe, exactly as the female folds her toes under when she sits on eggs or the young bird. When the female returned to the nest, the male disappeared immediately.

Hatching. On the 25th of May, the female remained on the nest for a remarkably long time in the morning until she left it to feed. I then discovered that on the longer side, the egg was damaged. On removing it from the nest, I immediately noticed a moving embryo through a tiny hole but could not hear anything. Quickly, I returned the egg to its place. At 17:30, an already dry, young bird lay in the nest, after an incubation period of 35½ days.

Care of the young bird. For the first food, after hatching, the male brought a mouse into the nest without hesitation, something which had never occurred before. The female took the mouse and in tiny morsels, tried to feed it to the young one. The first nine attempts, however, were unsuccessful on account of the still misdirected head movements of the young bird. Finally, he snatched

at three small pieces and, exhausted, fell asleep immediately. The female continued eating on the edge of the nest and offered all the little pieces of boneless meat which could be torn out of the food to the sleeping bird before she swallowed them herself. In the following days, as a rule, the male brought all the food to the nest, often directly to the youngster and only took the remainder for himself after the other two were satisfied. As soon as the female heard me putting food onto the feeding board, she stood erect and grumbled, remaining standing on the edge of the nest and no longer flying onto the lower middle branch as had been her habit before breeding time.

On the morning of his second day in the world, after three unsuccessful attempts, the youngster received 18 mouthfuls, at midday 19 and in the evening, 22. On the 6th day, the young bird already consumed a meal of 92 mouthfuls! At the beginning, the female sat on the nest continually but as the young bird grew, she gradually ceased.

Comparison can be made with the figures in the adult male of which, in three feedings during February 1968, I counted 180, 370, and 460 mouthfuls (swallowed) of an 18 gram heavy skinned mouse. With a good appetite, even under pressure of fear that the female could quarrel with him over the food, large morsels were swallowed: the same quantity of food represents about 70 mouthfuls.

Disturbance. From the 10th of June onwards, handing over the food gradually developed into a wild tussle. Even when a surplus was placed on the feeding board, the male would neither give up his prey on the floor nor on the nest and the female was not ready to serve herself independently from the feeding board. In the resultant pursuit, the mad chase led at times over the nest and I began to fear for the youngster. On the 13th of June, I removed him from the nest. Within a few days, the behavior of the adult male became normal as it was prior to breeding. I then brought up the young bird, a male, and looked after him until he convinced me that he could look after himself. After ringing him, on the 7th of August, I set him free.

Bibliography. Reports on birds of prey in captivity are found in the following works:

- Prestwich, A. A. (1955), Records of Birds of Prey bred in Captivity.
 Marquart, J. J. (1967), Reproduction des Rapaces diurnes Européens en Captivité (in: *Lien Ornithologique d'Alsace*, (Octobre).
 Koehler, A. (1968), Ueber die Fortpflanzung einiger Greifvogelarten in Gefangenschaft (in: *Der Falkner*).

In addition, the annual records of various organizations of falconers give accounts of breeding attempts and successful breeding,

especially of large falcons. Very valuable contributions to this subject are found in the reports of the "Raptor Research Foundation" (USA), which reached me only in the summer of 1969. Prestwich (1955) quotes a report on the Sparrow-hawk from the year 1899, where it was claimed that the species "have bred in captivity." Marquart doubts the correctness of this assertion and presumes that in this case, the Sparrow-hawk was confused with the Kestrel.