

CAINISM IN THE GREATER SPOTTED EAGLE *Aquila clanga*

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A number of species of raptors, cranes, gannets, skuas, penguins and cockatoos normally lay two eggs and produce two chicks, but as a rule rear only the first one to hatch. Among eagles the term "Cainism" has been coined to describe this unusual and remarkable procedure, derived from the Old Testament story of the murder of Abel by his brother Cain, since the death of the second chick is directly or indirectly brought about by its elder.

Among eagles of the genus *Aquila* cainism is most pronounced in the largest species, the Black Eagle (*Aquila verreauxii*) (Gargett 1990: 194-214). With this bird no single case is known in which the second chick has been naturally reared and fledged. In the same way the second-hatched chick of the Lesser Spotted Eagle (*Aquila pomarina*) almost inevitably dies, a fact borne out by Meyburg's detailed investigations in Slovakia (1970, 1974 a, b, 1978 a, b), when in one instance the female was clearly seen to feed the second, dead chick to its older sibling. With this species only a very few exceptions to this rule are known (e.g. Danko 1986). Hardly any information exists with regard to this problem in the closely related Greater Spotted Eagle (*Aquila clanga*). According to Galushin (1980), with this species the second chick, with only rare exceptions, also dies. Out of 50 nests in the Oka Reserve, 200km south-east of Moscow, this leading authority on the Greater Spotted Eagle met with only one case when two young eagles fledged (V. Galushin, pers. comm.). Glotov (1959) gives an account of the development of a brood of two chicks (weight, wing and tail measurements), in which the second chick was still present four days after hatching but two days later had disappeared.

To promote conservation of the Lesser Spotted Eagle, a method was developed as long ago as 1968 to prevent the death of the second chick and thereby double the breeding success (Meyburg 1968, 1971, 1977). This method was adopted particularly in Hungary (Janossy 1985; L. Haraszthy pers. comm.), but also in Slovakia and Mecklenburg (D. Minnemann & C. Scharnweber, pers. comm.).

On 23 June 1990 the nest of a Greater Spotted Eagle in East Poland contained two downy chicks weighing 1050g ("Cain") and 310g ("Abel") respectively. Based on its weight and on its date of fledging on 29 or 30 July, it could be reckoned that Cain was about 26 days old and must have hatched around 28 May. Glotov's data on the rate of growth formed the basis for this calculation. This resulted in a nestling period of around 63 days for Cain, in line with the 60-67 days cited in the literature. Abel must have hatched at least 5-6 days later. It was clear that Abel had absolutely no chance of surviving. Cain was displaying towards it the typical aggressive behaviour commonly observed with the Lesser Spotted Eagle. Abel had plainly been receiving insufficient food for a long time, had in contrast to his brother a completely empty crop, and begged ceaselessly for food. These calls for food were audible from a hundred yards away in the forest.

In order to save it from certain death, Abel was accordingly taken from the nest, to be reared in captivity. In order to imprint it as far as possible on eagles, it was placed in an artificial nest in an aviary in company with a Lesser Spotted and a Steppe Eagle. These two eagles did not, however, feed or care in any other way about the eagle.

Priklonskij (1968) pointed out that the data in the literature on the colouring of the Greater Spotted Eagle chick's downy plumage were contradictory. According to Stegman the initial down is pure white, whilst according to Dementiev it is russet-grey, the second coat (towards the end of the second and beginning of the third week) being, according to Stegman, extremely thick, woolly and pale grey, and according to Dementiev greyish-white. Priklonskij (1968) identified both variations in two pairs in the Oka Reserve. The young of one pair were pure white in the first down and whitish-grey in the second; the chicks of the other pair were to begin with covered with dark reddish-brown down and later uniformly grey. From this it can be concluded that with the chicks of the Greater Spotted Eagle there are several (not less than two) variations in the colouring of the down, which explains the differences in the descriptions given by Stegman and Dementiev.

With the Polish brood in question, both chicks were a uniform (relatively dark) grey, clearly in accordance with Priklonskij's second pair. The statement in the "Handbuch der Vögel Mitteleuropas" (Glutz von Blotzheim 1971: 598), that the second growth of down is white, is thus clearly incorrect, a fact which it is difficult to understand, since Glutz cites Priklonskij's findings and clearly appreciated them.

**Table 1. Increase in weight of the young Greater Spotted Eagle *Aquila clanga*
Gewichtsentwicklung des jungen Schelladlers *Aquila clanga***

23.06.1990	310g	when second-hatched young taken from the nest als zweitgeschlüpftes Junges aus dem Horst genommen
24.06.	340g	
27.06.	540g	
3.07.	1050g	
6.07.	1200g	
11.07.	1500g	
16.07.	1800g	
23.07	2000g	
30.07.	2150g	fully feathered and returned to nest voll befiedert in den Horst zurückgesetzt

The young Polish eagle thrived well in captivity and by the end of July was fully feathered and weighed over two kilograms. On 31 July it was put back in its parents' nest after being ringed and fitted with a small radio transmitter, so that its future movements could be monitored by telemetry. The elder young eagle had already fledged one or two days previously, but after the installation of Abel it returned to the nest, where the two could be observed together. On 8 August Abel was perched on a bough about 3m above the nest, where it was again observed on 14 August by G. Maciorowski. On 16 August the same observer watched a feeding by the female a short distance from the nest. Both young eagles were seen with their parents in the vicinity of the nest for a long time after they had flown. Unfortunately, due to a fault in the transmitter, it proved impossible to follow further movements by telemetry. There can be no doubt, however, that the attempt to save the second young was successful. Neither with this pair, nor with any other of the few pairs left in Poland, so far as is known, have two young ever fledged naturally from the same nest.

For the Spanish Imperial Eagle (*Aquila (heliaca) adalberti*), with which a similar method for saving the last-hatched chicks has been practiced (Meyburg & Garzon Heydt 1973), Heredia *et al.* (1987) have established by means of transmitters fitted to young eagles that birds thus reared in captivity have, after reintegration into the wild population, shown a normal rate of survival.

In order to ensure the long-term survival of the remaining pairs of this extremely rare species in Central Europe, it is of vital importance to carry out deeper research into its biology and ecological requirements and thereafter to preserve the relevant habitat under strict protection. At the same time attention should also be paid to the phenomenon of Cainism and its prevention. The species is also very rare in neighbouring Byelorussia (Nikiforow *et al.* 1989), and the prospect of any population increase

throughout the whole of the Soviet Union is so bleak that Pererva (1989) has proposed that it be included in the Red Data Book of Threatened Species.

ZUSAMMENFASSUNG

Kainismus beim Schelladler *Aquila clanga*

Schelladler *Aquila clanga* brüten meistens zwei Junge aus, das zweitgeschlüpfte Küken kommt jedoch, wie auch bei einigen anderen Adlerarten, in der Regel im frühen Nestlingsstadium um. Für diesen Vorgang hat sich in der Fachliteratur der Ausdruck "Kainismus" eingebürgert.

Beim biologisch sehr nahe verwandten Schreiadler *Aquila pomarina* wurde bereits 1968 eine Methode entwickelt, den Tod des zweiten Jungen zu verhindern und damit den Reproduktionserfolg fast zu verdoppeln. In ähnlicher Weise wird die Jungenzahl z. B. auch beim Spanischen Kaiseradler *Aquila heliaca adalberti* und beim Steinadler *Aquila chrysaetos* in der Slowakei systematisch erhöht.

Beim Schelladler ist die Problematik des Kainismus noch sehr wenig erforscht. Versuche ihn zu verhindern waren nicht bekannt. Ausserhalb der Sowjetunion kommt die Art brütend heute nur noch in ganz wenigen Paaren in Polen vor.

Ein Schelladlerhorst in Polen enthielt am 23. Juni 1990 zwei Dunenjunge, die 1050 und 310 g wogen. Es war offensichtlich, dass der kleinere Jungadler keinerlei Überlebenschance hatte. Er wurde daher aus dem Horst genommen und vorübergehend in einer biologischen Station in Polen aufgezogen. Am 31. Juli wurde der inzwischen voll befiederte und über 2 kg schwere Vogel wieder in seinen Horst zurückgesetzt. Beide jungen Schelladler und ihre Eltern konnten auch nach dem Ausfliegen noch längere Zeit zusammen beobachtet werden. Soweit bekannt ist, flogen damit erstmals zwei Junge aus einem Schelladlerhorst in Polen aus.

Um das langfristige Überleben des Relikt-vorkommens dieser seltenen Art in Mitteleuropa zu gewährleisten, ist es unbedingt notwendig, ihre Biologie und Lebensraumansprüche näher zu erforschen und den entsprechenden Habitat zu erhalten und unter Schutz zu stellen.

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The brood of the Greater Spotted Eagle on 23 June 1990 just before removal of the second chick by a Polish forester. The older eaglet showing typical aggressive behaviour towards its sibling. – Die Schelladlerbrut am 23. Juni 1990 kurz vor der Entnahme des zweiten Jungen durch einen polnischen Oberförster. Das erste Junge ist seinem sehr viel kleineren Geschwister gegenüber sehr aggressiv.



The second young eagle at the end of its period in captivity at the research station of the Polish Hunting Association. – Der junge Schelladler am Ende seiner Aufzucht in der wildbiologischen Forschungsstation des polnischen Jagdverbandes einen Tag vor dem Zurücksetzen in seinen Horst.

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