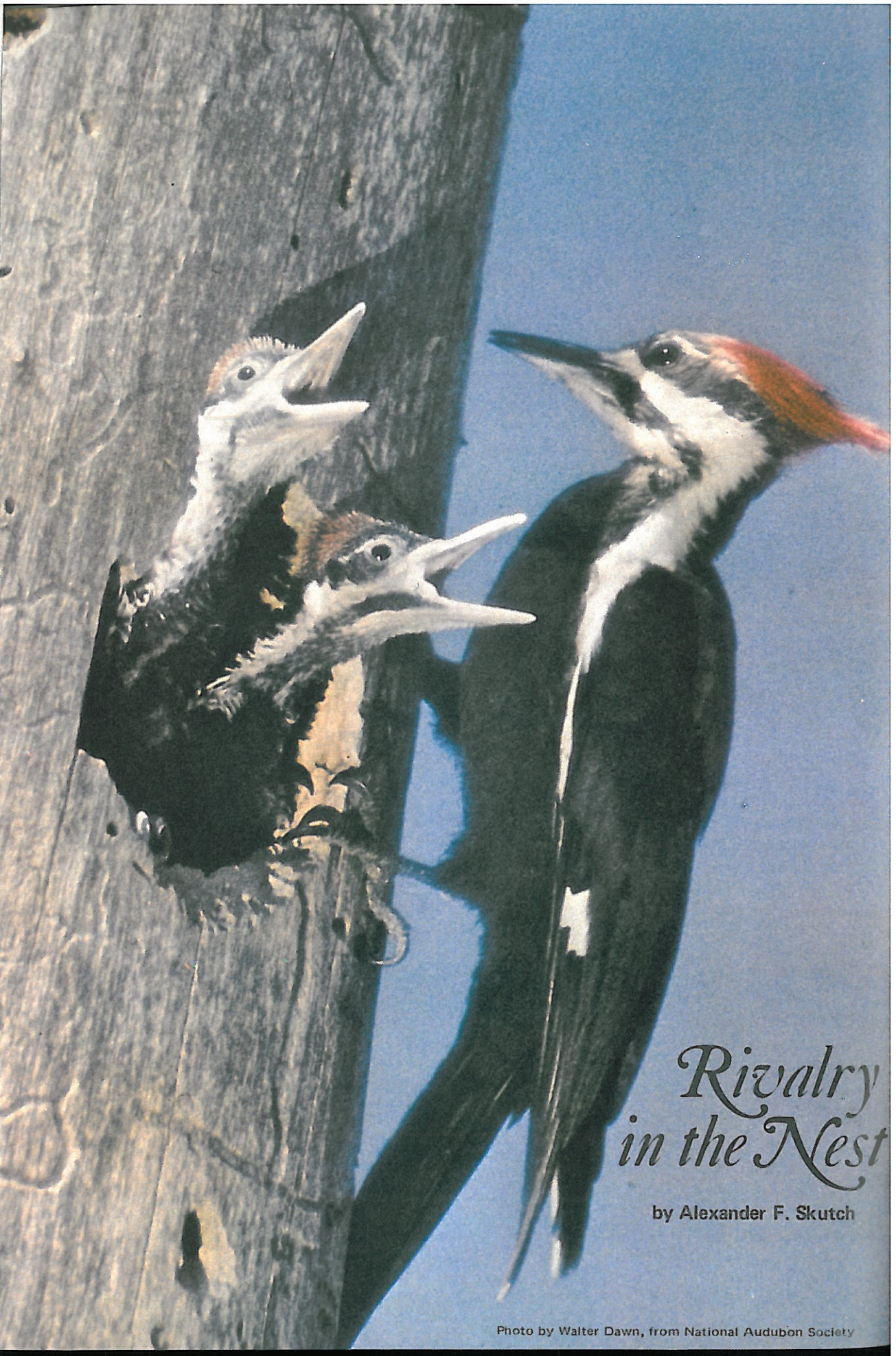

Rivalry in the Nest

by Alexander F. Skutch

Photo by Walter Dawn, from National Audubon Society

Nestling birds exhibit a lack of altruism that may seem deplorable, but which contributes to the survival of the species.

When people lived more simply, parents would sometimes reproach their quarrelsome children: "Aren't you ashamed? Little birds agree together in their crowded nest. Why can't you, who have so much more room in which to play, be as good as nestling birds?"

If wise in the ways of birds, the children might ask: "Which nestlings do you wish us to copy, Mother?" To which the ornithologically informed parent might reply: "Songbirds, of course, you silly children, not birds of prey."

I have never seen nestlings of songbirds, flycatchers, hummingbirds, or pigeons fight with each other, no matter how tightly packed in the nest they were. Yet despite the concord among the members of a brood, the older nestling, which are often somewhat larger and stronger than those that hatched a little later, make no sacrifices for them. As long as the parents can bring enough food for all, the whole brood thrives. But if provisions are scarce, the more vigorous nestlings usually manage to obtain most of it by raising their gaping mouths more promptly or higher when a parent arrives, or by monopolizing the position that will ensure their being fed first. Deprived of adequate nourishment, the smaller nestlings may waste away.

This lack of altruism will surprise no one who reflects that even human children rarely display it until they are a few years old and have been prompted by their parents. In nestling birds, it would have to be developed by the evolutionary process, which could hardly promote it, for the simple reason that a few vigorous nestlings contribute more to the survival of the species than a larger number of weak ones destined to succumb soon after fledging.

After a nestling woodpecker grows older, it climbs to the top of the nest hole and waits for its food with its head in the doorway, which often is wide enough for just one. Young woodpeckers of certain species have been known to fight furiously for this privileged position, which ensures receipt of the next meal. The yellow-shafted flickers that Althea Sherman watched so long and carefully in Iowa fought "like little demons" only during a few

Alexander F. Skutch is a naturalist and ornithologist who lives in Costa Rica. He has made extensive studies of Central and South American birds.

Behavior in the nest varies with the species. With the pileated woodpecker (opposite), the competition is often fierce, with the nestlings fighting for the privileged position at the nest hole to be first to receive the next meal. Guanay cormorant nestlings (below), on the other hand, have been known to offer food to a nest-mate.

Photo by William G. Conway

Photo by William G. Conway

If the two eggs of the great skua hatch within one to three days, the second chick has a chance to survive. However, if the interval is longer, the younger chick may be driven from the nest, and to its death, by the elder's repeated attacks.

days in the fourth week of their lives. In the more sociable tropical American woodpeckers that I have studied, I have noticed no discord among nest-mates, which changed places at the doorway rather frequently and seemed all to receive their fair share of food.

Among raptorial birds, recently hatched nestlings frequently attack and kill their nest-mates. Such infantine fratricide, which is often followed by cannibalism, has been recorded by Collingwood Ingram in large number of eagles, hawks, and owls, including the red-tailed hawk, Swainson's hawk, marsh hawk, golden eagle, bald eagle, long-eared owl, great horned owl, barn owl, and others. It is not invariable, for some of these raptors may rear two or more young together. Short-eared owls, which breed on the ground in open places, deposit surplus food a few inches from the nest's edge, so that, if they grow hungry during their parents' absence, the nestlings may reach and eat the dead vole or mouse instead of a younger brother or sister. Nevertheless, an observer in a blind has seen them cap fratricide by cannibalism.

Hatching time is critical

This unbrotherly conduct is promoted by disparity in the ages of the brood members, which in turn results from the parents' starting to incubate before all the eggs have been laid. Although songbirds usually delay effective incubation until the last egg in their set has been deposited, so that all hatch within a short interval, raptors and many other birds start much sooner. The nine or ten eggs that a snowy owl may produce in a favorable year in the Far North sometimes hatch over an interval of two weeks, with the result that the oldest nestling is well grown before the youngest escapes from the shell, with a poor prospect of surviving.

How can we account for innate behavior that is not only abominable by human standards but defeats the parents' efforts to rear a larger family? The explanation sometimes offered is that it helps to adjust the size of the brood to the food supply. The amount of food available to birds feeding their young fluctuates from year to year, with the vagaries of the weather and, in the case of northern birds that prey upon rodents, with the well-known cycles of abundance and scarcity of these small animals. Of course, birds about to lay eggs cannot foresee what the food situation will be weeks or months later, when the demands of their offspring will be greatest, so they lay and incubate their usual number of eggs. If food turns out to be adequate, they may rear all the young that they hatch. If it becomes scarce, the hungry older nestlings may eliminate their younger siblings, with the probable result that the parents will rear one or a few well-nourished, vigorous young rather than a larger number of under-nourished, weak ones, or perhaps none at all.

Eaglets fight in nest

Unfortunately, this neat explanation is by no means always applicable. In years of scarcity, the pinch should come after the young grow larger and need more nourishment, not in the first days after hatching, when the whole brood can hardly consume what one of them will later need. Yet the raptor's fratricidal and cannibalistic impulses are often manifest at an amazingly early age, as E. G. Rowe and his African assistants saw at a nest of Verreaux's eagle. When the second eaglet hatched, the first was already three days old and about one half bigger. Two minutes after the mother rose in the nest and revealed the newly hatched nestling, the older one squatted on its back and sat on its head while itself being fed. The younger one had to fight at least half a dozen times before it could take its first meal. Many of its later feedings were

cut short by its truculent nest-mate; it rarely got a full meal unless the older one was sleeping. By repeated savage attacks, by deliberately squatting on and smothering it for intervals that sometimes exceeded half an hour, and by reducing its meals, the older eaglet caused the death of the younger one when it was six days old. The observers did not learn what happened to the corpse. The killer had been amply fed by the parent eagles, which did nothing to stop the brutal attacks.

In another predatory bird, related to the jaegers and gulls rather than to the raptors, the situation is somewhat different. The two eggs of the South Polar skua hatch with an interval of one to three days, rarely more. If the interval is short and the first chick weighs only from two to seven grams more than the second when the latter hatches, both, as Ian Spellerberg showed, are likely to live until they fledge, unless they succumb to starvation, hard weather, or predation by adults of their own kind. If the inverval between hatchings is longer and the difference in weight of the two chicks is eight grams or more, the younger has a very poor prospect of survival.

Skua chick flees

What happens to the unfortunate second skua chick was earlier revealed by E.R. Young. When it is a few days old, its elder sibling starts to persecute it, usually at a time when the chicks are temporarily short of food. Stretching up to its full height with raised wing stumps and uttering a shrill, challenging call, the older chick attacks the younger with vicious pecks on the head and back. Without trying to defend itself, the younger one flees over the rough Antarctic ground. It cannot return to the nest without inciting a fresh attack. At first the parent skuas try to stop the persecution by brooding the chicks or coming between them, but such is the pugnacity of the elder that they soon abandon the attempt to keep peace. Obviously perturbed by the behavior of their offspring, they repeat alarm calls and may engage in displacement scrape-making.

Sometimes the evicted younger skua chick settles on a different part of the parental territory, where one parent attends it while the other parent takes care of the first chick. Occasionally the displaced chick wanders into the territory of a neighboring pair and is accepted by them. This has dire consequences, for if the adopted chick is older than the foster parents' own chicks, it fights with them and ultimately causes their death.

It has long been known that boobies of several species lay two eggs but rear two young only rarely, in years when food is exceptionally abundant. Brown boobies and white boobies start to incubate as soon as they lay the first egg, which may hatch as much as five days before the second egg. The younger chick nearly always dies or vanishes soon after its birth. The parents do not discriminate between their chicks but preen both by turns. What happens to the second chick?

Sibling rivalry

To clear up this mystery, D. F. Dorward placed a newly hatched booby in the same nest with one six days old. Each time the brooding parent stood up, the latter pushed the involuntary intruder with its head. Sometimes with its bill, it gripped the smaller one's neck or wing and pushed with its feet, but it seemed to lack strength to force the baby out of the nest. When a small chick was found outside, the parent never tried to retrieve it, as it does an egg that has rolled from the nest. Evidently the elder chick is responsible for the loss of its younger sibling.

The warm tropical seas surrounding the isles where boobies nest are poorer in marine life than the cooler waters, richer in dissolved oxygen, at

Photo by William G. Conway

Penguins are an example of nestlings which are mutually helpful, preening each other and sometimes the parents as well. At right, a partially albino Magellenic penguin rests in a burrow with its young.

higher latitudes. Boobies, which forage by plunge diving, are rarely able to catch enough fishes or squids to nourish two young, and in lean years the majority fail to rear even one. Why, then, do they persist in laying two eggs? This may be an inheritance from former ages, when breeding boobies could depend upon a more adequate food supply. Another explanation is that the second egg increases their chances of raising a single young. If they laid only one egg, and this was broken or taken by a predator, they would have to repeat from the beginning the time-consuming process of forming an egg, laying it, and incubating for six or seven weeks. With two eggs, they might lose one and still leave progeny.

If brothers and sisters do not always provide the example of fraternal concord that we expect of nestling birds, how is it when one of the nestmates is an intruding parasite? Nestling cowbirds seem not to persecute the proper offspring of their

After young bald eagles hatch, there is much antagonism in the nest, and the weaker is often killed or starves to death. This is not universal, however, and sometimes two, or even three, young are reared.

Photo by Karl W. Kenyon, from National Audubon Society

foster parents. Often the young of the parasitic and the host species grow up together – Margaret Nice watched a nest in which five song sparrows fledged along with one brown-headed cowbird. Frequently, however, the intruding cowbird is bigger than the nestlings of its host, takes more food, and causes the death of the latter by starvation or smothering. Several studies have shown that for each young cowbird that they raise, the parents lose, on average, one of their own nestlings. Similarly, the African parasitic weaverbirds or whydahs grow up along with the proper nestlings of their hosts, the grassfinches or waxbills.

With cuckoos, the situation is quite different. Except those few species that foist their eggs upon crows and jays, the young parasite seems never to be raised with one of the host's own nestlings. The reason for this is that the young cuckoo, as has long been known in the case of the common European species, begins shortly after hatching to move restlessly in its nest until it has maneuvered a nest-mate or an unhatched egg onto its slightly concave, sensitive back, where it is supported between the cuckoo's upstretched wings. Then, with an effort that one would never expect of a blind, naked hatching, it climbs backward up the side of the nest and heaves the nestling or egg over the rim, exercising all its skill to avoid tumbling out

Photo by Harry Engles, from National Audubon Society

Photo by William G. Conway

Photo by Helen Cruickshank, from National Audubon Society

Among some birds of prey, such as the red-tailed hawk (above, left), recently-hatched nestlings will frequently attack and kill their nest-mates.

A cowbird hatches first in the phoebe nest where its parasitic mother laid her egg (above, right). Although the nestling cowbird may not persecute the phoebe chicks, it is larger and requires more food, which often results in death for the proper offspring of the foster parents.

Three young Hammond's flycatchers share a nest without incident (at left). The oldest chick will make no sacrifices for the younger siblings, however, and it is up to the parents to provide enough food if all are to survive.

Photo by NYZS, Herndon G. Dowling

Several species of boobies lay two eggs, yet only rarely are two young reared. The younger chick nearly always dies or vanishes soon after hatching. The parents will attempt to retrieve an egg that rolls out of the nest, but do not retrieve a chick that wanders or is forced away.

along with its victim. The young cuckoo never rests until it remains the sole occupant of the nest.

The recently hatched lesser honey-guide of southern Africa is no more tolerant of companions than the young parasitic cuckoo. But, hatched in the deep chamber that its foster parents, a pair of barbets or, less often, woodpeckers, have carved in a trunk or stout branch, it cannot so easily cast them out. Instead, it uses the sharp hooks at the tips of both its upper and lower mandibles, which are evidently modified egg-teeth; woodpeckers, to which honey-guides are related, have these little white shields on the ends of both mandibles to help them break out of the eggshell. With these formidable weapons, the blind, naked young honey-guide ferociously worries and bites the baby woodpeckers or barbets that share its nest hole, until they die and it remains alone, to claim all the food that its foster parents bring. Before fledging, it sheds the hooks from its mandibles. The savagery of certain hatching birds, especially raptors and nest parasites, reminds us of St. Augustine's views on the sinfulness of the newborn.

Peaceful coexistence

We began by considering nestlings that lie peaceably in their nests, neither harming nor helping each other, as is true of most small birds. Then we passed to some examples of young birds that harass, evict, or murder and even eat their siblings. Let us end on a more pleasing note, by glancing at certain nestlings that are mutually helpful, performing, within their very limited abilities, small services for each other.

Rarely, a nestling, doubtless one that is no longer hungry, offers to a nest-mate food that a parent has brought to it, as has been recorded of cormorants and hornbills. Perhaps more often, unfledged birds preen each other. Although the eggs of herons and egrets hatch at intervals, with the result that the members of a brood differ conspicuously in size, they appear on the whole to agree well together. From time to time they squabble, but they alternately preen their siblings' plumage and their own. Chicks of rails and coots likewise preen each other.

On an island near Australia, John Warham watched chicks of the little blue penguin preen each other, and they also received this attention from their parents. Young rockhopper penguins preen their parents, as well as being preened by them. Such reciprocal grooming is an important service, because it takes care of feathers, especially on the head and neck, which no bird can reach with its own bill. Human parents who wish their children to follow the example of birds might well exhort them to be as kind and helpful to each other, and to their parents, as young penguins are.