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Observations on a captive colony of Quaker Parakeets

by Stephen T. Emlen
Ithaca, New York

Quaker Parakeets, *Myopsitta monachus* (also known as Monk Parakeets), are popular avicultural pets. But many owners may not be aware that "Quakers" are of special interest to behavioral biologists because of their unusual social and nesting habits in the wild. In their native habitats on the pampas of South America these birds are highly social, feeding in large flocks, and nesting together in huge communally built nests. Although other species of parrots flock and roost in large aggregations, "Quakers" are the only parrot known to build a communal, "apartment-house" nest.

In order to learn more about the social behavior of these fascinating birds, I established a captive colony at Cornell University in 1982. Birds were donated by the San Diego Zoo and the Woodland Park Zoological Garden of Seattle, Washington. With the aid of a research grant from the American Federation of Aviculture, I set about to study the nesting biology of these birds.

First, I had to establish a suitable, "naturalistic" environment. The birds were housed in a large, 400 square foot aviary room at the University. The room was equipped with running water and a large skylight. With the aid of several able-bodied colleagues, I transported the trunk section of a large oak tree, complete with several side branches, into the aviary room. The birds readily accepted this oak as their nesting tree and set about to construct their stick nest.

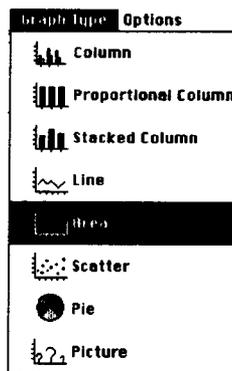
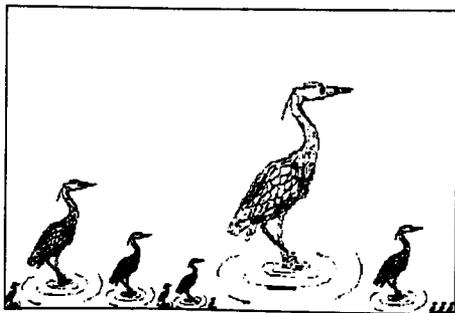
In order to interpret behavior interactions, it was necessary that I individually mark each member of the captive flock. Quakers are notoriously adept at removing plastic color bands from their legs, so I resorted to painting the birds with small dabs of color on their chests. Then, with the help from several undergraduate students, I began making regular observations of the birds. The room was equipped with a large window with one-way glass, making it possible to

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watch the parrots' goings-on without disturbing them.

One of our first findings was that the birds spent a tremendous amount of time constructing and modifying their nest. I provided the birds with fresh sticks (primarily hawthorn branches) every few days throughout most of the year. The birds began serious building approximately three months before breeding began. Sticks were wedged into cracks and crevices, and built into platforms wherever a branch extended from the primary trunk of the oak tree. Different groups of individuals concentrated their building activity at different locations, such that the tree soon looked as though six or seven separate nests were being built. But, slowly, the separate stick aggregations grew to the point where they merged. And, after about six weeks of building, the entire upper section of the tree was engulfed in a continuous bundle of sticks that measured approximately four feet in diameter and five feet in height. Birds were constantly adding new material to the structure, rearranging sticks near their "own" section of the communal nest, and frequently stealing sticks from other sections. From all of this activity there emerged an impressive structure that eventually contained five separate nesting cavities, each with its own entrance.

Breeding began in the spring of 1983. At that time the colony consisted of 18 birds, seven pairs and four unpaired individuals. Definite social bonds existed in addition to those linking male and female mates. We monitored these bonds by recording the frequency of allopreening and allofeeding between different individuals and also by noting which birds slept together in the different sub-chambers of the nest. In 1983, five social sub-groupings were apparent, ranging in size from two to six birds. At first we did not know what lay behind the composition of these groups. Certain subsets of the San Diego Zoo birds stuck together, as did

some from the Seattle Zoo. But, in later years, as the birds successfully bred in captivity, a pattern rapidly became apparent. Grown offspring remained closely linked to their parents and often continued to roost with them for as long as two years after fledging. Not all social associations can be explained on the basis of extended parent-offspring bonds. But we can say that one basic feature of Quaker Parakeet colonies is that they are composed of numerous, cohabiting, nuclear family groups.

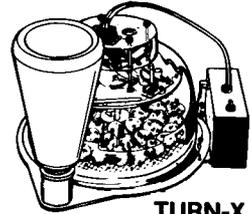
These social links extended to the point where non-breeding individuals acted as helpers at the nest. To my knowledge, this is the first report of cooperative breeding (helpers at the nest) in any species of parrot. We found that one- and two-year-old offspring frequently remained resident in the parents' chambers. Such grown young spent long periods of time sitting in the nest after eggs had been laid (presumably incubating, although we have no direct confirmation of this) and, later, bringing food which they regurgitated to the growing chicks. The frequency of the feeding contributions of such helpers was approximately one-third that of the breeders.

Another of our findings was that severe competition as well as cooperation occurred within our Quaker colony. We kept careful records of which individual birds supplanted which others at the feeding tray. From this information, we were able to construct dominance hierarchies for all birds in the colony. It turns out that Quakers live in a socially stratified society. A linear dominance hierarchy existed in each year of the study. There was only a weak sex bias to the hierarchy. A male generally held the top, or alpha, position; but high ranking females were not far behind and were dominant over many of the lower ranking males.

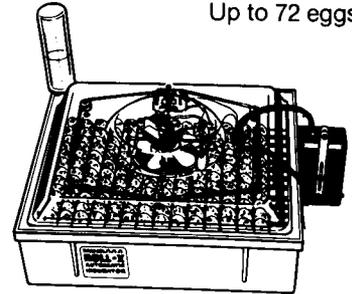
Position in this dominance hierarchy had an important reproductive consequence. In each of the three years in which we studied nesting

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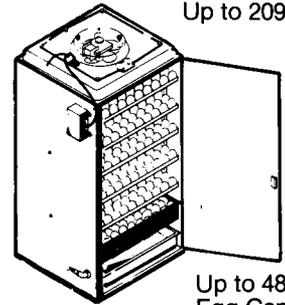
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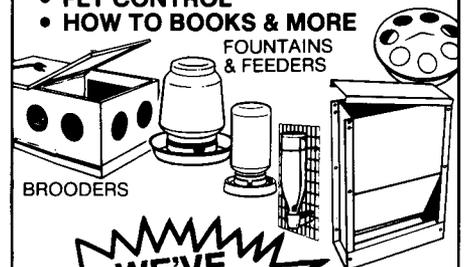
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success, we found that not all of the pairs of birds actually bred. Which individuals did and which did not was closely correlated with their position in the dominance hierarchy. For example, in 1983, only four out of seven pairs of birds actually laid eggs and only three fledged young. The identical numbers were true in 1984. In the fall of 1985, there were eight pairs of birds but only five initiated breeding. Birds near the bottom

of the dominance hierarchy simply did not reproduce. Furthermore, the highest ranking pairs were those that initiated breeding first.

Behavioral suppression of breeding (often called "psychological castration") is a widespread phenomenon in many mammals; behavioral interactions produce changes in circulating hormone titers which, in turn, render subordinates physiologically unable to reproduce. There are, how-

ever, very few reports of reproductive suppression among birds. Although many more data are needed before we can state that it is the behavioral presence of dominant individuals that is responsible for the failure of subordinates to breed, our results are suggestive. If confirmed, the existence of such behavioral suppression could have important implications for persons interested in captive breeding. For species such as Quaker Parakeets, housing birds in overly-crowded conditions, or in colonies of large size, might actually lead to a reduction in the production of young.

Whenever one studies the behavior of animals in captivity, one cannot be certain whether one's findings accurately describe what occurs in nature or whether one's results are an artifact of the artificial conditions of captivity itself. I would speculate, however, that both suppression of breeding and helping at the nest are part of the normal behavioral repertoire of Quaker Parakeets in the wild. I base this speculation on the fact that similar results are beginning to emerge from field studies of other species of birds and mammals. Helping at the nest has been reported for a large number of tropical species of birds. In almost every case, helping involves younger, subordinate individuals remaining with and helping their parents in later breeding seasons. And suppression of breeding, coupled with helping, has been reported in a Colonial Kingfisher as well as in mammals such as red foxes and African wild dogs.

So the findings from our captive colony of Quaker Parakeets have parallels in other species of cooperatively breeding birds and mammals. Quakers are unique in being the only parrots that build communal apartment house nests. Our results indicate that they also have helpers at the nest and that subordinate pairs may be behaviorally inhibited from breeding. Both behavior patterns are probably natural consequences of the competition, and the opportunities, that arise as an inevitable consequence of highly gregarious, apartment-nest living. ●

Editor's Note: The Quaker Parakeet is considered an agricultural pest in several states in the U.S., most notably CA, MA, PA, NY and MD. Within these states, this species is illegal, and not allowed to be kept in captivity for fear they will escape, establish feral colonies, and damage certain crops. If you are not sure about your state regulations for this species, call your state Fish & Wildlife Dept.

Clever and industrious, the Quaker demonstrates more dexterity than many other small and even some larger sized parrot types.



Part of the study colony of Quakers in their aviary room at Cornell University. The Quaker is unique among the parrot world in that they build communal nests in the wild. Their nesting society is quite complex. It includes previous offspring and other birds to aid in the feeding and care of young.

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