



Photos by Liz Hicks

On the perch at nine-and-a-half-weeks of age. The female parent is crouched over.

Parent-reared Major Mitchell's Cockatoos at the Birmingham Zoo

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Everyone in aviculture is likely to be familiar with the exquisite beauty of the Australian Major Mitchell's Cockatoo *Cacatua leadbeateri* also called the Leadbeater's Cockatoo. This cockatoo's extensive range covers the largest portion of the inner arid region of continental Australia. The Major Mitchell's extreme beauty make it a prized specimen in aviculture, but due to its captive rarity the birds remain pricey.

I have had the exciting opportunity to work with this species at the Birmingham Zoo, Alabama. The pair has been exhibited in the collection for five years. The male, a family pet, was originally purchased in Tasmania in 1982, and went through a port quarantine station to enter the United States shortly thereafter. He was donated to the zoo in 1992.

This bird was likely pulled from a nest in the wild and hand-reared or entered captivity at a very young age given its tameness and level of imprinting. His age is estimated to be nearly 20 years.

The female was hand-reared and purchased from the Riverbanks Zoo, Columbia, South Carolina in 1993. Since that time the birds have been exhibited in various areas of the zoo. Two years ago they were placed in the outdoor bird area where they are exhibited alongside Eclectus, Green-

winged and Hyacinth Macaws, and across from Cinereous Vultures.

The Major Mitchell's exhibit aviary is a peaked structure, resembling a house, three meters square (approx. 10 feet sq.). The birds have access to the concrete aviary floor where they are often seen rummaging about for food, a busy part of their day in wilds of Australia. The indoor portion of the aviary is a one meter square flight cage accessed through a clear-plexiglass guillotine window, 18 inches square, from the outdoor aviary. When the guillotine door is closed the birds are completely sealed within this indoor flight cage safe from marauding nocturnal predators such as rats, mink, cats, and raccoons found on many zoological properties. During the colder months, when outdoor temperatures drop to well below freezing, a gas heater maintains the indoor temperature between 70 and 80 degrees F. The birds spend a considerable amount of time outdoors in cool weather but are locked indoors during the severe cold.

We decided to begin offering the Major Mitchell's breeding stimuli during the late fall of 1996 in preparation for the upcoming spring. A 10 foot (3 meters) tall Sweet Gum tree trunk was added to the outdoor exhibit, running from floor to ceiling, hollow from bottom to top and filled with landscaping

pine bark. A four inch diameter entrance hole was made, facing public viewing, seven feet from the ground.

The perching in the exhibit was also changed to create a more natural setting. Large branching tree trunks running from the floor of the exhibit to the ceiling were added. These "vertical" trees forced the birds to fly from different parts of the aviary rather than simply walking along horizontal perching. A five foot tree trunk (1.5 meters) was also placed in the aviary. This short open-topped trunk mimicked the nesting logs described by Australian cockatoo breeders Stan Sindel and the late Robert Lyn in their book *Australian Cockatoos*.

A nestbox was constructed of one inch plywood measuring 12 inches square and 30 inches deep, with a 4 inch entrance. This box was hung on the outside of the interior flight cage.

Next we were to improve the pairs diet. Before a concentrated effort was made to breed the birds, they were fed strictly Lafeber pellets. While Lafeber's is a good staple diet, the birds would need fresh fruits and vegetables to simulate the availability of the foods necessary to rear their young. Daily additions to the diet included corn on the cob, carrots, oranges, and apples. Grapes and peanuts were fed on rotation throughout the week. No additional supplementation was given. This diet was fed at approximately 9:00 A.M. every day when all of the exhibit aviaries were cleaned and serviced.

Our Major Mitchell's were obviously quite bonded. The pair spent most of their time in close contact with each other and no squabbling, other than for a favorite food item, was cause for concern. The female had a tendency to crouch low and flutter her wings, as many tame birds do, whenever approached by her care giver. The male solicited attention by whistling or talking. At this time I felt that the birds might be too imprinted on humans to successfully breed and rear their young. We decided to keep all human interactions with the birds to a minimum. This did not cause any noticeable changes in either bird's behavior.

The birds showed interest immediately after the tall hollow log was installed. They were never observed to

enter this nest until they had enlarged the entrance a great deal. The interior diameter of this log was less than 10 inches with the walls being over two inches of hard wood. The birds whittled this very solid tree from the entrance hole to the ceiling within a matter of days. We felt that the birds had chosen this tree for their nest site. They also spent time chewing the shorter open-topped log but were never observed descending within.

The plywood nestbox in the shelter appeared to be ignored. Most of this behavior was documented during the early part of January at which time Alabama was experiencing extended periods of freezing temperatures. The birds were locked in for several days and nights for nearly three weeks allowing them access to only the interior plywood nestbox.

It wasn't until 2 February that the birds were observed copulating (more than five weeks before they actually laid an egg). Much of their time was spent investigating both the tall hollow tree on exhibit and the indoor plywood nestbox. The birds were then documented frequently copulating at nearly the same time, 1:30 in the afternoon, each day. The last recorded copulation was recorded on 10 March.

From 8 March the birds were frequently observed visiting the interior nestbox and just as frequently chewing

on the outdoor nest log. The birds did very little chewing of the interior plywood nestbox and we feel that they acquired most of their nest preparation chewing stimulus from the outdoor nest log and found the interior plywood nestbox to be more to their size and liking. On 14 March the birds laid their first egg. Subsequent eggs were laid on 16 and 18 March.

Before the eggs were laid and throughout the incubation period the male of the pair was very aggressive toward the keepers. The male was always incubating the eggs at 9:00 A.M. and the female took over at about 4:00 P.M. each day. On the sixth day of incubation the eggs were candled. Two eggs were visibly fertile with the third showing no development. On 9 April after 24 days of incubation the first egg hatched with the second following on 10 April.

The third egg, believed to be infertile, began to pip on the 11th, with the baby completely leaving the egg on the 13th. Both adult birds spent the entire first hatch day in the nestbox only leaving occasionally to feed.

During incubation it was the female that would leave the nest upon hearing the approach of the keeper, while the male could be coaxed out of the box when attempting to attack any fingers or hands that came within close proximity of the nest entrance. At

these times the eggs or chicks could be examined while the pair was distracted outside of the nestbox.

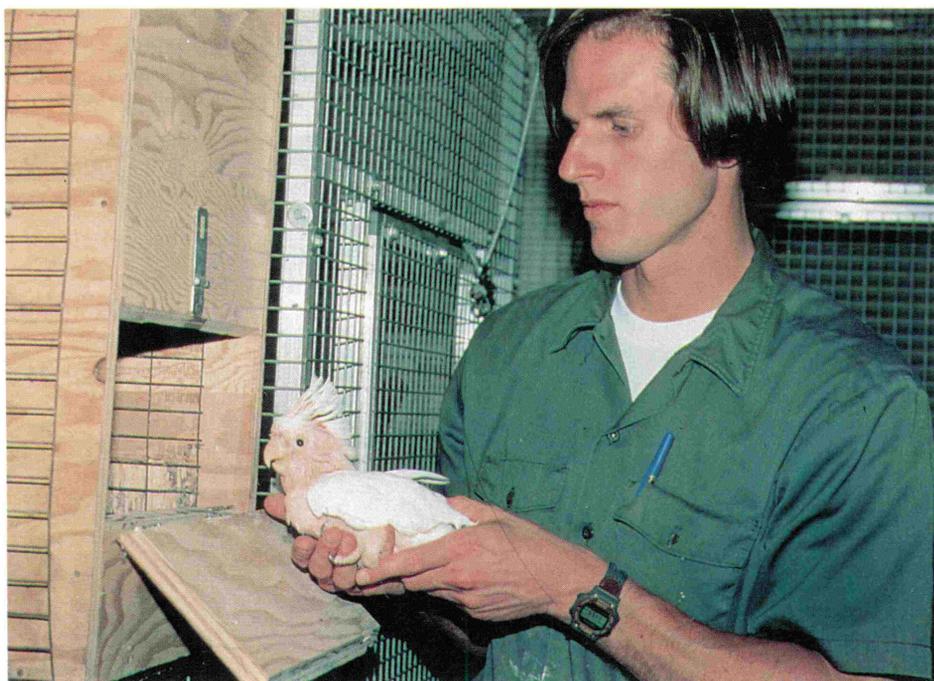
After the second chick had hatched, and the first chick was just over 24 hours old, neither of the parents had begun to feed them. Though we knew that it was not necessary for the chicks to be fed until the internal yolk sac is absorbed, frantic telephone calls were made to cockatoo breeders across the country. Most of the advice given was "pull those chicks now or you may lose them."

By the time the third chick had hatched it was obvious that the older two chicks feeding responses were waning. The parents were brooding properly but not feeding the chicks. Because I desperately wanted to prevent pulling the chicks for hand rearing (producing imprinted birds), I decided to attempt handfeeding them in the nestbox hoping that the parents would catch on and begin to feed. I began to coax the adult birds away from the nestbox in order to give the chicks an electrolyte solution (Pedialyte), to prevent dehydration and reenergize them.

By late afternoon of the third day we decided to continue coaxing the adult birds away from the nestbox and begin feeding the chicks Exact handfeeding formula. Feelings of despair followed as the parents continued to neglect feeding their young although they were very possessive and continued to brood them.

The chicks were fed Exact every three hours for three days. The third day into handfeeding (the two oldest chicks being five days old) a "light went on" and I began to add a quality Cockatiel seed to the adult cockatoos diet — just as I do with my own breeding birds at home (half pelleted diet, half Cockatiel seed along with their regular fruits and vegetables). On this fifth day seed was added to the diet in the early morning, by 11:30 A.M. all of the chicks' crops were full of seed. The chicks began to grow slowly but steadily.

Throughout the chick-raising process it was noted that the female began to show the food-soiled feathers beneath her lower mandible. We feel that it was likely that she began feeding and caring for the chicks because



The author and a six-week-old chick.



Chicks at six weeks of age.

after the seed was added she would leave the nest to hurriedly eat and then promptly return to the nest (this behavior was not observed before the seed was added to the diet).

After the chicks were 11 days old the female reluctantly left the nestbox if a keeper was in the service area, making nestbox inspections more difficult. The pair was fed twice a day from the day the first chick hatched to the time the chicks were completely weaned. The oldest chicks eyes were completely opened at 14 days old with the other two soon following. When the chicks were nearly four weeks old their parents began to spend more and more time out of the nestbox. By this time the chicks were hissing and scrambling away when the nestbox was inspected.

When the chicks were just over five weeks old the parents were feeding at less frequent intervals. Many times nestbox inspections revealed the chicks crops to be empty by early afternoon. Because the parent birds were fed at 9:00 A.M. it was assumed that by 10:00 A.M. all of the chicks should be full, but this was not the case. Not until late afternoon, between 3:30 and 4:30 P.M. were the chicks crops full. We did not feel that the chicks were being fed consistently. Because the chicks did not appear to be cold or weak, we did not heed the warnings from other breeders telling us to pull the chicks. We were hoping that the parents knew what they were doing. Again luck and nature were with us.

The oldest chick was seen sitting in

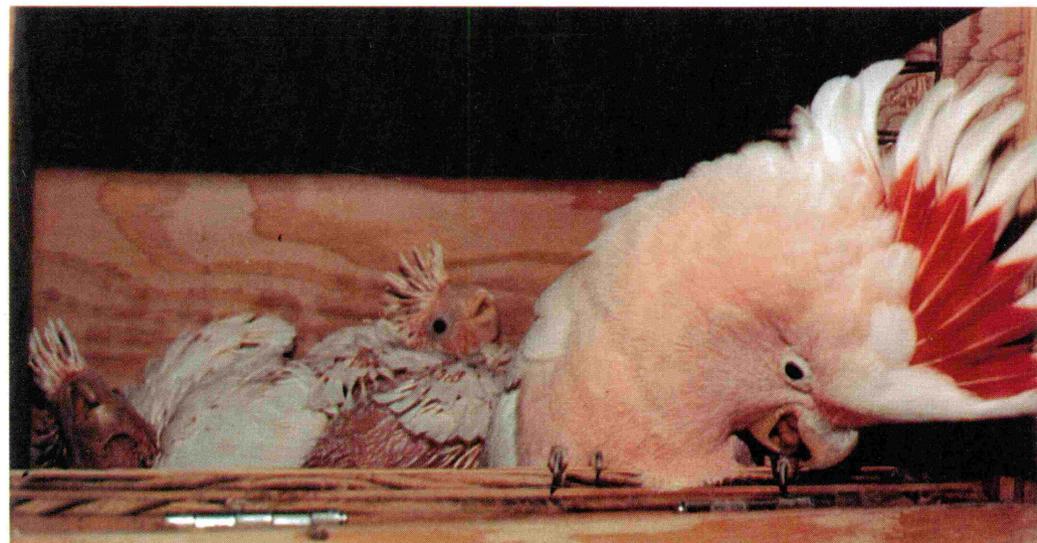
the nestbox entrance at seven weeks old. At exactly eight weeks of age this chick left the nestbox. Within four days all three chicks had left the nest, with the two younger birds returning to the box on occasion throughout the day. None of them had trouble maneuvering through the window into the outdoor exhibit and all were quite agile flyers. The adult birds were very excitable at this time, the male "wolf whistling" to the chicks when he approached them and attacking the keeper when the empty nestbox was approached.

All of the chicks possess the broad band of yellow in their crest, similar to the female's. The amount of pink suffusion of the chest and abdomen varies among the chicks but all have pink necks and heads like the parents. The chicks appear as petite versions of their parents but have been gaining weight and are presently, at 14 weeks,

nearing the robust size of their parents. Both the male and the female are frequently observed feeding the begging chicks on exhibit. The chicks have been observed eating out of the feed bowls from the age of 13 weeks. The nestbox was removed at 16 weeks to prevent the adult pair from nesting again and becoming potentially dangerous toward the chicks. No aggression has been observed between any of the birds. The chicks are amazingly calm, stepping up on a stick so that they can be moved indoors each night to avoid predators and "night frights."

Observing these glorious cockatoos throughout their breeding cycle has been tremendously exciting. The acute levels of stress these birds have caused me, from handfeeding the newly hatched chicks in the nest for the first five days, the inconsistent parent feeding when the chicks were five weeks old, and then keeping a watchful eye to see that the male did not become aggressive toward the young when they left the nest, have diminished. The outcome was well worth the effort. I can't help but feel a deep sense of pride every time I pass the aviary with the new five-member Major Mitchell's Cockatoo family. Pride in my effort to allow the parent birds the opportunity to raise their own chicks even when there seemed to be a slim glimmer of hope for success, and pride in the the birds and their species for proving themselves capable. 

Greg Bockheim has moved from the Birmingham Zoo and is now Keeper of Birds at the Disney World collection in Florida.



The protective male with four-week-old chicks.