

Breeding the Crowned Hornbill at the Houston Zoological Gardens

by Ric Urban and Jerry Caraviotis, Bird Keepers
Houston Zoological Gardens, Houston, Texas

The Bird department of the Houston Zoological Gardens received a newly imported pair of Crowned Hornbills *Tockus alboterminatus* in October 1989. This arboreal species is a resident of southcentral and southeast African riparian, montane, and coastal forests. The birds are rather plain in appearance compared to some of the other *Tockus* hornbill species, however, they have their own appeal. The upperparts, head and neck are a dusky brown, with the feathers of the back of the head and neck shaggy and white-tipped; it is the appearance of this feathering which presumably gives them their common name. The breast is grayish, beneath this the rest of the underparts are snow white and

Photo by Jerry Caraviotis



Weighing a chick 27 days of age. Average weight, 200 g.

the tail is tipped in white (Fry, Keith, Urban, 1988).

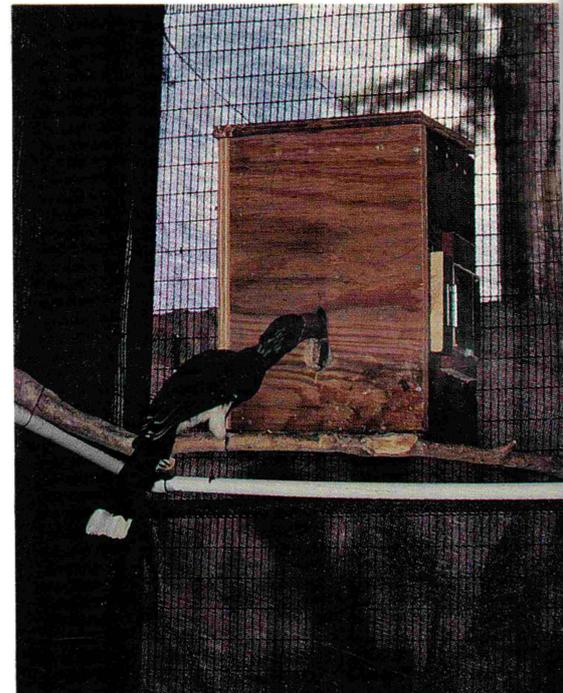
The birds can be sexed visually, primarily by their eye color. The iris of the males are red and the females a light yellow. Additionally, the male is a bit larger in overall size. The bills of both sexes are a translucent orange-red, with a narrow creamy yellow band at the base, with the male having a larger ridge or small casque atop his bill (MacLean, 1993).

After a thirty-day quarantine at the zoo the birds were housed in their own 12 ft. long, x 10 ft. wide x 7 ft. high exhibit in a row of outdoor aviaries where they remained for 17 months. Throughout this period they excavated wood shavings from a horizontal plywood nestbox and even began plastering food items and feces, with their bills, around its opening. The staff was very encouraged by this behavior as this is the beginning of the typical hornbill mode of reproduction. This type of behavior leads to the female being immured in the nest cavity with an opening reduced to only a narrow slit, through which the male feeds her

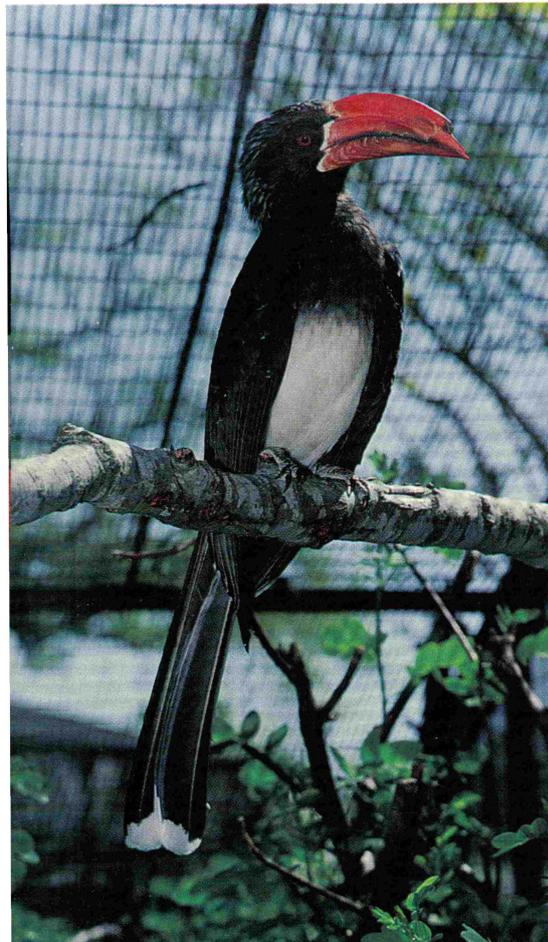
during the entire nesting period. However, while at this location the birds never progressed past this initial stage.

In April 1991, the pair was moved to a mixed species exhibit measuring 20 ft. long x 20 ft. wide x 12 ft. high in a new series of outdoor aviaries, The Fischer Bird Gardens. They were joined by a pair of White Headed Buffalo Weavers *Dinamellia dinamella* and a pair of Hottentot Teal *Anas punctata* as cagemates. The hornbills have always been fed small balls of *Nebraska Brand Bird of Prey Diet*, soaked dog, cat and primate chows and a chopped fruit mix (papaya, cooked sweet potato, apple, grapes, soaked raisins) and chopped greens. An assortment of live food was offered daily: mealworms, waxworms, crickets, furred and pinkie mice. The birds are also adept at catching a variety of wild insect prey on their own. In addition, the hornbills have been observed eating sunflower seeds and perhaps other seeds

Photo by Jerry Caraviotis



Male Crowned Hornbill at nest opening feeding female and chicks.



Male Crowned Hornbill at the Houston Zoological Gardens.

from the Buffalo Weaver's diet.

When we transferred the hornbills we moved their original nestbox (24 in. long x 12 in. wide x 13 in. deep into their new quarters. Shortly thereafter, two other nestboxes were added in the exhibit in case the first one was not to their liking. One was a vertical 37 in. long x 14 in. wide x 13 in. tall plywood box with a natural tree knothole having a six inch diameter opening attached near the top of the box as the nest entrance. The other was a 13 in. diameter hollow palm log, again placed vertically with the entrance near the top.

Over the course of the next two years our pair exhibited a variety of courtship and breeding behaviors. The male feeding the female, the male chasing the female, the male trying to lure the female to the nestbox with food and high-pitched calls, each bird entering the nestboxes and pulling woodshavings out, and again plastering around the nest openings. These are all typical hornbill behaviors. However, the birds never seemed to get "over the hump," their activity would increase for a while and then activity would taper off. The bird staff finally decided we had been patient long enough and began consulting a number of zoo professionals for advice.

These discussions resulted in two suggestions for the breeding of *Tockus* species in captivity. First, the nestbox entrance should be very small. The opening should just be wide enough for the birds to fit their bills through. Secondly, the nest entrance should be located toward the bottom of the box rather than the top of the box so that the female can reach the entrance from a brooding position. With these in mind, a 13 in. on long x 13 in. wide x 19 in. tall nestbox was constructed of half inch plywood. A teardrop shaped opening, four inches tall and two inches wide, was made on the lower third of the nestbox face. The box was equipped with a shelf in the upper third which allowed the female to jump to if frightened.

On July 29, 1993, the nestbox was installed in the night/winter shelter of the exhibit at a height of approximately seven feet. The male Crowned



Photo by Jerry Caraviti

Crowned Hornbill chicks in the nest after the female has broken out. The chicks are about five weeks old.

Hornbill showed immediate interest in the new nestbox, making a gurgling vocalization at the box and even making false plastering motions at the opening with an empty bill. On August 6, we discovered that the birds began plastering around the entrance with Bird of Prey diet, and they excavated some of the wood shavings out of the nestbox. On August 8, the female was sitting in the nestbox and the entrance was beginning to get smaller. Later that day, the male was observed carrying live food

back into the night shelter, presumably to feed her, as he would have to continue to do throughout the remainder of the nesting period. Several days later the nest opening was reduced to a half of an inch wide and three inches tall. The male began offering pieces of bark from an old nest log and pieces of bamboo screening to the female as well as food items. The bark, bamboo and female's own feathers were later discovered to be the lining of the nest.

On September 17, the male had

Grubco Live Pet Foods

Mealworms Available in 5 sizes including giant size

Fly Larva Raised on mixture high in protein

Wax Worms Soft bodied grub light in color

Superworms Try this latest Grubco product

Over 40 Years experience!

Call! 800-222-3563
Call toll-free to place your order and to receive your free brochure.

Our Customers Know..

Grubco Scientifically-raised live foods are rich in nutrition. Nutritional analysis is available.

And Crickets! Preferred by birds & reptiles. Our crickets are nutritious containing almost 24% protein.



Grubco Quality & Nutrition

Order by FAX:
24-hours daily
513-874-5878



KNOWN FOR QUALITY AND SERVICE.
Box 15001 Hamilton, OH 45015 U.S.A.
<http://www.herp.com:80/grubco/>

AMERICAN FEDERATION OF AVICULTURE

The Mission of the AFA is to Promote the Advancement of Aviculture.

1996 OFFICERS

LAURELLA DESBOROUGH, President 510-372-6174 / fax 510-372-0306 • ROBERT J. BERRY, Executive Director 713-434-8076 / fax 713-433-3731
RICK JORDAN, 1st Vice President 610-683-5701 / fax 610-683-9333 • GARY CLIFTON, 2nd Vice President 602-830-4920 / fax 602-995-1707
JIM HAWLEY, JR., Chief Financial Officer 602-838-4770 / fax 602-987-3389 • JAMI KENNEDY, Secretary 805-252-0437
GARY LILIENTHAL, Legal Counsel, Vice President, AFA office, P.O. Box 56218, Phoenix, AZ 85079-6218 602-484-0931 / fax 602-484-0109
MEMBER NATIONAL & INTERNATIONAL ORGANIZATIONS: JERRY McCAWLEY, Specialty Regional Vice President Phone / fax (717) 560-7978
American Budgerigar Society • Amazona Society • American Cockatiel Society, Inc. • American Lory Society
Asiatic Parrot Society • Avicultural Society of America • International Parrotlet Society
National Cockatiel Society • National Finch & Softbill Society • Pionus Breeder Association • Waxbill Parrot-Finch Society

MEMBER CLUBS

NORTHEASTERN REGION

Linda S. Rubin, regional v.p.
617-469-0557 fax 617-469-0368

CONNECTICUT

State coordinator:
Bob Sunday 203-525-8338
Connecticut Association for
Aviculture, Inc.

MAINE

State coordinator:
Margaret Fisher 207-935-3732
Maine State Caged Bird Society

MASSACHUSETTS

State coordinator:
Kathleen Viewig 617-739-2733
Aviculturists of Greater Boston, Inc.
Birds of a Feather Aviculture
Society

Exotic Cage Bird Society of New
England

Massachusetts Cage Bird Assn.
Northeastern Avicultural Society

NEW HAMPSHIRE

State coordinator:
*
Birds of a Feather Avicultural
Society
New Hampshire Avicultural Society

NEW YORK

State coordinator:
Kristine Amantea 914-355-2473
Big Apple Bird Association
Broome County Caged Bird Club
Central New York Caged Bird Club
Finger Lakes Cage Bird Association
Great Rochester Hookbill Assoc.

Rochester Cage Bird Club

RHODE ISLAND

State coordinator:
Diane Patalano 401-885-0267

VERMONT

State coordinator:
Peter Lowry 802-754-6494

MID-ATLANTIC REGION

Kayla Snyder, regional v.p.
412-369-0908
fax 412-338-7862

DELAWARE

State coordinator:
Nancy Selz 302-798-8625
DISTRICT OF COLUMBIA

State coordinator:
Tom Marshall 703-777-3252

MARYLAND

State coordinator:
Debora Ready 410-838-9418
Southern Maryland Caged Bird Club

NEW JERSEY

State coordinator:
Dan Lanetti 609-386-1435

Central Jersey Bird Club

Real Macaw Parrot Club

Ruffled Feathers

PENNSYLVANIA

State coordinator:
Lorraine Smith 215-348-7423

Central Pennsylvania Cage Bird Club

Chester County Avian Society

Delaware Valley Bird Club

Erie Cage Bird Club

York Area Pet Bird Club

VIRGINIA

State coordinator:
Dawn Kopf 703-594-3841

Commonwealth Avicultural Society

National Capital Bird Club

Parrot Breeders Association of
Virginia

Tri-State Bird Club

WEST VIRGINIA

State coordinator:
Alexis Selfert 304-866-3433

SOUTHEASTERN REGION

Wanda Elder, Regional v.p.
901-853-9988 fax 901-853-7030

ALABAMA

State coordinator:
Katherine Levine 205-881-4809

Central Alabama Aviculture Society

Rocket City Cage Bird Club, Inc

GEORGIA

State coordinator:
Sherrie Miller 404-396-7938

CSRA Exotic Bird Association

KENTUCKY

State coordinator:
Jerry T. Clarke 502-935-5440

Central Kentucky Cage Bird Club

Feathered Friends Society

MISSISSIPPI

State coordinator:
Nancy S. Speed 601-673-8100

Central Mississippi Bird Club

Greater Memphis Bird Club

NORTH CAROLINA

State coordinator:
Greg Bacot 919-766-3766

Charlotte Metroline Cage Bird

SOUTH CAROLINA

State coordinator:
Beth Rowan 803-862-2852

Aiken Bird Club

Palmetto Cage Bird Club of Anderson

TENNESSEE

State coordinator:
Renea Adams 901-854-9696
Greater Memphis Bird Club

FLORIDA/P.R. REGION

Dwight Greenberg, regional v.p.
407-631-9800 fax 407-632-4338

FLORIDA (CENTRAL)

State Coordinator:
Richard Long 813-644-0086

Central Florida Bird Breeders

Greater Brandon Avian Society

Imperial Bird Club

Sunshine State Cage Bird Society

Treasure Coast

FLORIDA (NORTH)

State coordinator:
Kay Boyer 904-454-1635

Emerald Coast Avian Society

Gainsville Bird Club

Florida West Coast Avian Society

West Pasco Exotic Bird Club

West Florida Avian Society

Jacksonville Bird Club

FLORIDA (SOUTH)

State coordinator:
Kathleen Szabo 305-258-2377

Aviary & Cage Bird Society of
Southern Florida

Tropical Cockatiel

South West Florida Avian Society

Gulf Coast Bird Club

Panhandle Aviculture Society

West Florida Avian Society

PUERTO RICO

Coordinator:
David Negrón 809-251-1153

Organi Puertorriquena de Aves

Exoticas, Inc.

VIRGIN ISLANDS

State coordinator:
*

MID-EASTERN REGION

Janis Clark, regional v. p.
517-486-3921

ILLINOIS

State coordinator:
John Petty 815-962-8224

INDIANA

State coordinator:
Nicole Vander Heyden, DVM
317-786-1826

Central Indiana Cage Bird

Michiana Bird Society

MICHIGAN

State coordinator:
Dave Bowman 616-381-5779

Ann Arbor Cage Bird Club

B.E.A.K.S.

North Oakland Cage Bird Club

Saginaw Valley Bird Club

Town & Country Feathered Friends

OHIO

State coordinator:
Dianne Holloway 419-636-3882

Classic Feathers

Golden Crescent Cage Bird Club

Great Lakes Bird Lovers Club

Miami Valley Bird Club

Mid-American Exotic Bird Society

Northwest Ohio Exotic Bird Club

WISCONSIN

State coordinator:
Gloria Scholbe 414-496-1441

Avian Insights Bird Club

Cream City Feathered Friends

Kenosha Exotic Bird Club

Wisconsin Cage Bird Club, Inc.

NORTH CENTRAL REGION

James McCabe, regional v.p.
612-753-5241
fax 612-753-6772

IOWA

State coordinator:
Monica Suds 712-642-4578

Beakers

Mid America Cagebird Society

MINNESOTA

State coordinator:
Steve Estebo 612-432-4758

Minnesota Companion Bird
Association

NEBRASKA

State coordinator:
*
Greater Omaha Cage Bird Society

NORTH DAKOTA

State coordinator:
*
SOUTH DAKOTA

State coordinator:
Royce King 605-393-1720

Black Hills Cage Bird Club

SOUTH CENTRAL REGION

Richard Hazell, regional v.p.
316-942-8864 fax 316-942-9030

ARKANSAS

State coordinator:
Jim McGuire 501-965-2427

KANSAS

State coordinator:
Bill Rider 816-452-9310

B.E.R.D.

Kansas Avicultural Society, Inc.

Northeast Kansas Cage Bird Club

Sunflower Bird Club

LOUISIANA

State coordinator:
Jeanne C. Murphy 504-833-4241

Acadiana Bird Club

Bayou Bird Club

Capitol Area Avicultural Society

Louisiana Aviculture Society

Gulf South Bird Club

MISSOURI

State coordinator:
Paddy Lambert 314-962-8186

Gateway Parrot Club

Greater Kansas City Avicultural
Society

Missouri Cage Bird Association

OKLAHOMA

State coordinator:
Gary Blankenbiller 405-691-3553

Central Oklahoma Bird Club

Oklahoma Avicultural Society

TEXAS (NORTH)

State coordinator:
Linda Smith 817-790-8015

Cleburne Bird Society

Dallas Cage Bird Society

Fort Worth Bird Club

Cen-Tex Bird Society

TEXAS (SOUTH)

State coordinator:
*
Alamo Exhibition Bird Club

Capitol City Cage Bird Club

Coastal Bend Cage Bird Club

San Antonio's Feathered Friends

Triangle Bird Breeders Club

NORTHWESTERN REGION

Natalie Frumin-Weiss,
regional v.p.
206-927-6983

fax 206-952-6983

ALASKA

State coordinator:
Michelle Keener 907-242-8994

Alaska Bird Club

IDAHO

State coordinator:
Margie Loewen 208-378-8201

MONTANA

State coordinator:
Laura Lee Neva 406-322-4444

Great Falls Cage Bird Society

OREGON

State coordinator:
Dottie Sheffield 503-564-9179
Mid Oregon Bird Club
Northwest Bird Club
Rose City Exotic Bird Club

WASHINGTON

State coordinator:
Jeri Wright, legislative liaison
206-838-9802

Avicultural Society of Puget Sound
Avis Northwest Bird Club
Cascade Canary Breeders Assoc.
Northwest Exotic Bird Society
South Sound Exotic Bird Society

WESTERN REGION

Kelly Tucker, regional v.p.
505-384-5490
fax 505-384-5441

ARIZONA

State coordinator:
Michelle Rietz 602-973-9282
Arizona Avian Breeders Assoc.
Arizona Aviculture Society
Arizona Seed Crackers Society
Avicultural Society of Tucson
Tropical Bird Fanciers
Yuma-Imperial Exotic Bird Club

COLORADO

State coordinator:
Heidi Hopkins 303-421-3344
Front Range Avian Society
Rocky Mountain Society of
Aviculture, Inc.

NEVADA

State coordinator (acting):
Joanne Edwards 702-436-0110
Las Vegas Avicultural Society
Reno Area Avian Enthusiasts

NEW MEXICO

State coordinator:
Sandi Brennan 505-281-7729
New Mexico Bird Club

UTAH

State coordinator (acting):
Steve Long 801-647-3653
Wasatch Avian Education Society

WYOMING

State coordinator:
Lloyd Bailly 307-468-2871

NORTHERN CALIFORNIA REGION

Donna Tondreault, regional v.p.
916-642-9050

fax 916-642-0874

CALIFORNIA (NORTH)

State coordinator:
Diane Grindol 408-384-6548
Aviary Association

Butte County Bird Club
Capitol City Bird Society
Central California Avian Society
Central Coast Avicultural Society
Contra Costa Avian Society
Foothill Bird Fanciers
Gold Country Aviculture Society
Gold Country Bird Society
Golden Gate Avian Society
Model Aviculture Program
Monterey Bay Cage Bird Club

Redwood Empire Cage Bird Club
Redwood Exotic Bird Society
Santa Clara Valley Bird Club

HAWAII

State coordinator:
Joe Baker 808-966-6966
Hawaii Parrot Fanciers Inc.

SOUTHERN CALIFORNIA REGION

Aletta M. Long, regional v.p.
Phone/fax 310-596-7429
CALIFORNIA (SOUTHERN)

SAN DIEGO AREA:

State coordinator:
Marty Muschinske 619-468-3201
Finch Society of San Diego County
Hookbill Hobbyists
North County Aviculturists

CALIFORNIA (SOUTHERN)

LOS ANGELES AREA:

State coordinator:
Jami Kennedy 805-252-0437
Antelope Valley Bird Society
Aviary Association of Kern
East San Gabriel Valley Bird Society
Hemet Valley Bird Society
Long Beach Bird Breeders
Norco Valley Bird Breeders
Orange County Bird Breeders
Santa Barbara Bird Club
South Bay Bird Breeders
South Bay Bird Club
South Coast Finch Club
Valley of Paradise Bird Club
Ventura County Bird Club
West Valley Bird Society

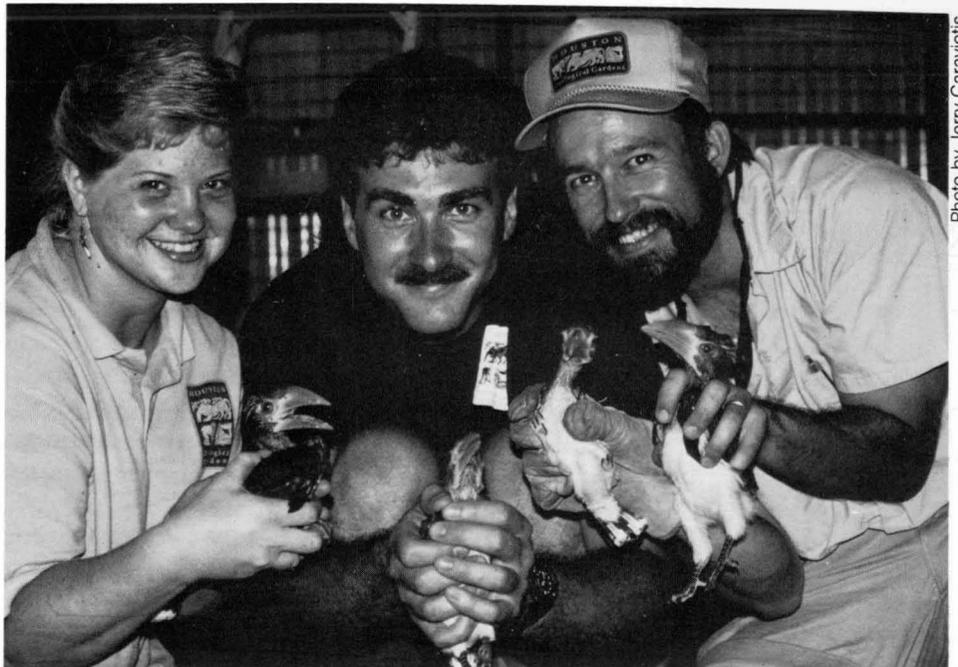
*Position open: contact regional vice president if interested

**Indicated 2 year term has been fulfilled. If no new interested party comes forward and indicates a desire to serve, incumbent remains in position.

For information about contacting any of these member clubs, please call that club's state coordinator.



1996 AFA CONVENTION
CONCORD, CA
(near San Francisco)
AUGUST 5-9



Keepers (L-R) Denise Brucchieri, Jim Dobberstine and Ric Urban weighing chicks, the oldest 30 days.

become unusually aggressive or agitated by the normally acceptable presence of the keeper near the nestbox. Alarm calling and swooping towards the head of the keeper was a sure clue something was going on. With caution the nestbox was visually checked through the slit in the entrance. The keeper discovered a calm, brooding female and one pink, naked and really ugly chick and at least one more egg. Later in the day, vocalizations of at least two chicks were heard and confirmed by a visual check. A third egg hatched four days later, as confirmed by a visual check through the access door on the side of the box.

The regular diet was increased to satisfy the insatiable appetite of the residents of the nestbox. A fresh diet was offered twice daily. Live foods were increased and dusted with calcium powder. The chicks were very vocal when the male came to the box with food. Sometimes the feeding sessions sounded very aggressive. When the chicks were around 11 days of age, the male began supplementing the prepared diet with other types of live foods. This was discovered by looking closely at the debris below the nestbox. Pieces of roaches, moths and bees were found among the feces and bark pieces. At 15 days of age, the box was opened for the

first time since the chicks hatched. They were plump and their eyes were open. The nestbox was lined with bark pieces, pieces of bamboo screening and molted feathers from the female.

On October 22, 1993, after 76 days of confinement in the box, there were signs that the female was breaking out. As the female was chipping away at the plaster, the chicks were trying to reseal the entrance. The chicks were 36 days old at this time. Twelve days later, the nest entrance began to widen once again. The first chick came out of the nestbox 49 days after hatching. The other two immediately plastered the entrance. Chick 1 weighed 214.2 grams at 7:15 A.M. on November 5. Chick 2 emerged at day 50, November 6, 249.0 grams in weight at 8:36 A.M. The final chick emerged November 9, around 1:30 P.M. at 247 grams in weight. The most amazing sight to see was a chick struggling to emerge from its secure domicile and to be able to fly immediately into the waiting world outside. The next most amazing sight was seeing five Crowned Hornbills flying together throughout their exhibit.

The chicks look like the adults when they emerge except for the eye color and casque shape and size. The eyes are gray in color and the casques are not developed yet. Three

weeks out of the box early visual signs for sexing the young become clear. A characteristic of sexual dimorphism is throat skin coloration. Female hornbills have been described as having greenish yellow throat skin; while the male hornbills have been described as having dark red or black throat skin (Fry, Keith, Urban, 1988). Chick 1 was beginning to show a carolina-blue skin patch just behind the lower mandible or throat skin. Although the throat skin was not greenish yellow we accepted this as a female characteristic. Chick 2 was showing male throat skin; and chick 3 was still hard to tell, possible male.

Forty days after the chicks emerged from the box, there was again plastering activity at the entrance. The female was vocalizing quite a bit and the male was taking food to the nest entrance and making a gurgling vocalization in an attempt to lure the female back to the nest. The activity lasted just a day.

At three months of age the chicks

seem to be old enough to visually sex. Even though the eye colors at first glance appear to be gray, there is a hint of color when the lighting is right. The more significant sign seemed to be the throat patch. Chick 1 was a female, and Chicks 2 & 3 were male. The chicks were very inquisitive, investigating every little nook and cranny of the exhibit, snatching insects from the wire and bamboo, and dismantling the buffalo weaver nest to get to whatever was in the nest chamber. By the fourth month of age, the chicks appeared mature enough to sex by eye color in good light. The female's eyes (Chick 1) were a lighter gray, almost yellow; while the males' eyes (Chicks 2 & 3) were a grayish red. The throat skin was a very distinguishable mark, once seen never forgotten.

The time arrived to finally test the theory of usually determining sexes by eye color and throat skin. On February 4, 1994, 141 days since the first egg hatched, the birds were taken to the zoo veterinary clinic to be laproscoped. At this visit they were measured, weighed, banded with metal bands and bled for routine testing. The veterinarian confirmed the visual sexing: a female and two males. The female proved to be the smaller bird weighing 30 grams less than the males. The bill was also slightly smaller and less developed.

The Crowned Hornbill is one species which is rarely represented in collections in North America. They do not look as flashy as their larger counterparts but they still carry the same attributes aviculturists look for when selecting from the Bucerotidae Family. Crowned Hornbills enhance a mixed species exhibit with their size and graceful flight. However, these hornbills will not allow any other species to raise young in the same exhibit. Eggs and chicks of other residents quickly become part of a Crowned Hornbills' diet when discovered. The staff of the Bird Department of the Houston Zoological Gardens will continue to collect data on the captive reproduction and management of this species and apply the information to the continuing work with both Asian and African Hornbill species.

Acknowledgments:

Jerry and I would like to acknowledge staff members from the past and present who have had daily exposure to our infatuation with this species. Dave Grubbs, Woodland Park Zoo, Seattle, WA and Chris Eckart, Olinda Endangered Species Facility, Maui, HI, both who have moved on to greener pastures. Present staff members include: Curator-Chelle Plassé, Senior Keepers-Trey Todd, Lee Schoen and Danny Brooks and Keepers-Martha Wade, Tim Steinmetz, Brent McRoberts, Joe Barkowski, Denise Brucchieri, Christy Sky, Oren Dorris, Kay Oria, Melissa Thorton, Roberta Hejna, Jim Dobberstine and Jim Dunster, many of whom reviewed the work in progress or participated in the daily discussions on this subject. Thanks to Wendy Worth, Peter Luscomb and Peter Shannon, each upon individual visits to our facility were engaged in discussions on the general management of hornbills in captivity. Thanks to Randall Herron, who upon my visit to the San Diego Zoo, took time to show me management techniques and diets used at his institution.

Literature Cited

- C. Fry, S. Keith, E. Urban. 1988. *Birds of Africa, Volume III*. Academic Press/HBJ. pp. 396-398.
 MacLean, G.L. 1993. *Roberts' Birds of Southern Africa*, sixth edition. CTP Book Printers. pp. 396-397.

Products Mentioned

- Nebraska Brand Bird of Prey, Central Nebraska Packing, Inc., North Platte, NE 69101
 Primate Dry Biscuits, Hill's Pet Products, Topeka, KS 66601

Crowned Hornbill

Tockus alboterminatus

Comparison Bill Data and Fledge Weights

Bill Length	64.6	66.65	72.4
Bill Width	13.7	16.2	19.98
Bill Depth	28.7	30.6	30.6
Fledge wt.	214.2	249.0	247.0

November, 1993

Bill Length	72.1	72.35	66.1	79.52
Bill Width	28.1	29.1	18.0	16.1
Bill Depth	32.3	32.6	39.4	39.6
Fledge wt.	220.0	250.0	195.0	216.0

July, 1994

AMAZONS



call BOB
(713) 579-6868

one of the
 best collections
 for sale

- Mostly proven or bonded pairs
- Outside Texas permits needed for some species
- Proof of funds required prior to inspection of collection