When I arrived in Fort Worth in early December, 1991, the female of the 1985 pair was displaying an interest in the pile of hay placed by the side of their pool, and on December 17, laid her first egg. The second was noted December 21, and the third the day after. On Christmas Eve, Keeper I, Lisa Weedn, discovered egg number four, and the fifth was found the day after Christmas. Lisa began to have some concern by the 28th, when the 6th egg was discovered, and was, in fact, relieved when nothing followed the seventh egg laid December 30, 1991. Our Keeper III, Rick Tucker, recently arrived from Oklahoma City Zoo, had in the meantime, braved parental wrath, and penciled a number on each egg as it appeared.

As January came and went, the female steadfastly sat, through sleet and snow and rain, and a night when the temperature fell to 17°F. The little pool this pair occupied is right next to the Zoo's main cafe, so they were the subject of constant scrutiny and comment from our staff at coffee breaks and lunch, not only bird people, but Mammals, Herps, and Concessions as well.

Although I was appointed Keeper II, to manage the finches and softbills in the “World of Primates” (which opened April 4), and the associated off-exhibit breeding facility, in January, the wonderful collection of African finches had not yet arrived (and would then spend a month in quarantine), and no birds were yet released in the monumental new ape house. Thus, my first several weeks at Fort Worth Zoo were spent learning the other sections in the bird department. Late January found me doing “Birds of Prey”, which included not only the forty-year old Harpy Eagle and her mate, the King Vultures, the Andean Condors, and the testy Bald Eagles, but 46 Roseate Spoonbills, the world’s largest captive flock (housed with herons, ibises, storks and gulls, in smelly winter quarters in the Indian One-horned Rhinoceros Barn), the Laughing Gulls, Night Herons, Silver Pheasants, and assorted ducks then occupying the spoonbill’s summer aviary, and the flock of 27 Chilean Flamingos (whose enclosure includes the Black-necked Swan Pool) as well.

Feeding the swans while the female was incubating was not the easiest task. I never observed her leaving the nest to eat, therefore lettuce leaves were thrown around the nest. The nearby food pan had to be filled twice daily, as what the swans did not eat was greedily consumed by the Zoo’s resident population of Great-tailed Grackles. This had to be done with caution, as the male did not appreciate interference with this object, and was quite ready to attack anyone attempting to fill it with gamebird pellets. Frank Todd (1979) observes that the legs of the Black-necked Swan are further back on the body than any other swan's, resulting in a greater facility in water, and a corresponding clumsiness on land. Clumsy or not, a charging Black-necked Swan is no joke, and on more than one occasion I found myself breaking into a run. The worst occasions were while I was putting the 27 Chilean Flamingos to bed. During the winter, these birds are accustomed to retiring to a building towards the end of day, requiring only a little prompting from their keeper, who, standing first here, then there, then following them into their night house, can usually put them up, without incident, the main requirements being patience and attention. During the incubation, however, this procedure was repeatedly rudely disrupted by the sudden appearance of the male swan, charging over the crest of a hill. The only option was to allow the flamingos to reassemble and begin the whole thing all over again. It should be noted that this aggression was always directed against the keeper. Although Todd (1979) cautions that Black-necked Swans may attack and even kill flamingos, I have never observed any problems with our birds, nor have I seen more than mild aggression.
These Black-necked Swans hatched in February, 1992 at the Fort Worth Zoo. The cygnets are approximately five months old in this photo.

against the free-ranging Demmoiselle Cranes that spend most of their time in this paddock.

On February 1, 1992, the first cygnet was seen, a tiny, light-grey head peering from beneath its mother. By February 3, all seven had hatched, and while the male was restrained in a pet-carrier and the female held back by Chris Brown and Rick Tucker, I gathered all of them into a towelled bucket and brought them to our veterinarian, Doug Pernikov, and veterinary technician Ellen Lancaster, who proceeded to vent-sex them, then pinion them, indicating their sex by the wing thus altered. While participating, I was impressed by the very thick dense down covering these birds, and their ridiculously tiny wings. There was something strongly reminiscent of penguins.

The cygnets were then returned to their parents, but that afternoon, it was decided to relocate parents and offspring to one of the rooms in the Chilean Flamingo night house. Despite the close quarters, and proximity to crowded, honking flamingos, the cygnets thrived, eating lettuce by February 5, and “Layena” Chick-starter with hard-boiled egg the day after. The main problem was to avoid enraging the male while taking food into the room or changing soggy mats, for fear he might injure babies while threatening or attacking.

On February 8, the family was returned to its pond (which held no other waterfowl). For the next two days I never saw the female or cygnets out of the water. Initially, the cygnets spent most of their time riding their parents – tucked into their backs and under their wings. Sometimes the parents had the babies well divided, other times, all seven would pile on the female, looking for all the world like a pile of white socks. It was especially funny when the male would fiercely patrol the perimeter of his pond, a tiny second head sticking incongruously out of his back.

Each day, in addition to replenishing the adults’ food pan, I would appear first thing each morning, and late that afternoon, with a plastic cafeteria tray spread with “Layena”, mashed hard-boiled egg and chopped Romaine lettuce. Positioning this tray took several steps. First, having set the tray on the railing, I would wait until the male was at the other shore. Then I heaved off the large rock holding down the old tray. At this point the male would usually hurtle across the pond, exploding out of the water like a Leopard Seal or Bull Sea Lion, while I beat a hasty retreat. Then I quickly set down the new tray. Finally, when the male had again gone away, I replaced the stone to keep the tray from sliding into the water. I usually had a much-
entertained audience observing this performance. During these twice- 
daily occurrences, the male would 
usually several times give a low, 
melodious and mournful multi- 
syllabic call, generally followed by a 
threat display, where he reared out of 
the water, beating his wings, 
exposing ugly-looking bare pink 
knobs on their inner surfaces. I have 
it on the authority of my fellow keep- 
ers that these knobs can leave even 
uglier-looking bruises on the shins of 
the uncautious.

Black-necked Swans spend more 
time carrying their cygnets than any 
other swan (Johnsgard, 1978, Todd 
1979). This, of course, coincides with 
their being the most aquatic of 
swans, their peculiarly set-back legs 
(Todd, 1979) being mentioned earlier. 
Though only rarely found in 
entirely salt-water environments, 
they do occur in brakish marshes and 
estuaries more than other swans, 
especially in the subantarctic Falk- 
land Islands. In mainland South 
America, where they breed in Para- 
guay, Uruguay, Argentina and Chile, 
and winter to the three southern 
provinces of Brazil, north to the tropic 
of Capricorn (Johnsgard, 1978), 
they are more of a freshwater bird.

The highly aquatic habits, the 
defensive aggressiveness, and 
especially the pronounced carrying behaviour 
appear to have evolved in response to 
the selective pressure of predatory 
birds. In the Falklands, the Kelp, 
Dominican or Southern Black-backed 
Gull Larus dominicanus, the 
prevailing gull of the south polar zones, is a 
significant predator of Black-necked 
Swan eggs. (Johnsgard, 1978, Todd, 
1979).

By the third week of February, the 
seven cygnets were spending far less 
time on their parents' backs. A week 
later, they were displaying sudden 
bursts of activity, racing crazily 
around their pond, flapping their still 
tiny wings and throwing water in 
every direction. At the same time, 
their necks seemed to lengthen over 
night, so that they suddenly lost their 
compact appearance, and steadily 
thereafter took on an increasingly 
scruffy appearance. As I write, in 
imid-April, they are decidedly stereo- 
typically 'ugly ducklings,' approaching 
the size of their parents, with 
long heads and necks, but still amus- 
ingly undersized wings. They are still 
covered in down, though their tail 
feathers and primaries are starting to 
come in. Their heads and necks are 
quite blackish, in contrast to their 
pale breasts, but there is yet no indica-
tion of the vivid red caruncles of 
the adults. Johnsgard (1978) esti-
mates this species' fledgling time to 
be around 100 days, longer than any 
other swan except the black of Aus-
tralia.

<table>
<thead>
<tr>
<th>Location</th>
<th>Years Hatched</th>
<th>Total Hatched (Number of dead juveniles)</th>
<th>Yearly Average Clutch (Number of dead juveniles)</th>
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<td>New York Zoological park</td>
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<td>White Oak Plantation, Yulee, FL</td>
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* = exact number listed only for 1981
** = exact number listed only after 1963

Fort Worth Zoo's other pair of Black-necked Swans, the male 
hatched here in 1990, and the female 
received in exchange the same year, 
live in the main waterfowl pond 
which, with its land area, covers a lit- 
tle less than three quarters of an acre, 
and contains a diverse collection of

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