humboldt penguins

husbandry at the Washington Park Zoo

by
Helen Moore, Bird Keeper
Portland, Oregon

The Humboldt or Peruvian penguin (*Spheniscus humboldti)* is one of the most commonly exhibited penquin species, but until recently has bred in captivity with limited success. At the turn of the century, it thrived by the hundreds of thousands in the cold water of the Humboldt current off the coastline of Peru and Chile. But today, with the harvesting of its guano deposits for fertilizer and subsequent loss of suitable nesting habitat, the species is clearly endangered.

Exhibit:

At the Washington Park Zoo, twenty-six Humboldt penguins and two Guanay cormorants (*Phalocrocorax bougainvilla)* share a glass-enclosed circular exhibit twenty meters in diameter. Because these birds originate from a temperate climate, a coastal desert in fact, the Penguinarium is heated to 72⅞F. The air is sterilized primarily to eliminate the occurance of aspergillosis. Water surrounds two large island which are accessable to the keeper by a land bridge from the kitchen area. These islands offer a variety of substrates to the birds including rock ledges, concrete and sand, but primarily indoor-outdoor carpet which is removed and replaced daily with clean, dry sections.

In areas which the birds have chosen, I have placed square or rectangular plywood nestboxes. Sometimes the penguins have selected unlikely spots in which to nest, even when there were more suitable sites available, but they were still offered nestboxes to prevent their building a nest and laying eggs in the open. The design of the nestbox is unimaginative, but functional, usually a twenty inch square with a removable hinged top and four inch high lip on the lower front. The bottom is lined with a piece of the carpet and filled with fifty to seventy five pounds of sand up to this lip. Although the penquin pairs utilize the same boxes from year to year, I have seen promiscuity, death, divorce and fighting erupt within, and between, the pairs, as well as pairs defending two nestboxes, so it is essential to maintain flexibility in the positioning and location of the boxes. Moreover, three of our unpaired adult penguins have their own boxes. This has dissuaded them from disturbing other nesting birds and has encouraged them to form their own pair bonds, since two of the three have selected mates from our seven juveniles, and the third has paired up and produced three chicks with a female who was rejected by her former mate.

Photo by Marianne Yeutter

The author weighing a parent-raised chick.

Diet:

The average daily fish consumption for each penguin is one and a quarter kilograms of thawed herring and smelt. The colony is fed three times a day. At 8:00 A.M. they receive their vitamin supplements stuffed in the gills of the smelt. These consist of one Pet-Form tablet, one salt (10 grain), and one thiamine (125 mg.), with a vitamin E (100 IU.) added three times a week. Each penguin usually receives one of these vitamin fish daily, or several if he/she is feeding a chick(s). Many of the adults willingly accept hand feeding and the others eat when the fish is thrown in shallow water between the two islands. At 11:00 A.M., the penguins are fed the remainder of the smelt, and at 3:00 P.M. are fed again an equal amount of 5 to 7 inch herring. Their preferences for both fish are equal.

When chicks have been hand raised, their diet for the first two and a half weeks consisted of an adapted version of a formula developed at Sea World in San Diego. At two and a half weeks, or when the penguins weighed 500 grams, they were offered small strips of herring fillets before feeding the formula. When the chicks reached four and a half weeks of age, or weighed about 1500 grams, the formula was discontinued and the chicks were able to consume small whole fish with adult vitamin supplements. The chicks dictated the number of fish they wished to consume.

Once the chicks were reintroduced to the Penguinarium at two and a half months, teaching them to be self-feeding presented no difficulty; by lowering the fish into the water and moving it around to catch their attention, the chicks learned both how to pick up fish in the shallow water from a standing position and to retrieve fish at a greater depth while swimming.

Breeding History:

The Washington Park Zoo acquired its Humboldt penguin colony in 1976. All birds are presumed to have been wild caught. They have been sexed via observations of their breeding behavior (since I have seen all the penguins breeding or being bred) and have been banded accordingly with color-coded flexible plastic hospital identification wrist bracelets. Males are banded on the right wing, females on the left wing. Males and females of each pair have been banded the same color.

Initial nest building activity began in the late winter, 1977, with two pairs nesting in March, 1978, but it was not until early 1979 that the two pairs each produced a chick. Both chicks died within a week of hatching, but post-mortem revealed that they had been fed by the parents. The third pair to nest successfully hatched two chicks in March, 1980, after laying one infertile egg in 1979. To ensure each chick a better chance of survival, the youngest was removed on day one for handrearing. Unfortunately, the parent raised chick died four days later at the age of eight days. In February, 1981, the first two pairs each hatched two chicks. One of each clutch was removed for handrearing, and one was left with the parents. The third pair subsequently layed two eggs again in April, 1981, but they were allowed to raise both their

Photo by Janet Baer

The author holding a two week old chick.

chicks when they hatched. All six chicks survived.

So far this year, we have six more chicks, none of them handraised, with two belonging to another pair who had never successfully raised a chick before. The most exciting development has been the increased frequency of egg laying. Last year all three pairs which hatched two chicks each in February, 1981, layed a second clutch of two eggs again in April and May, 1981, as soon as the first chicks fledged. Throughout incubation the fledged chicks continued to be fed by their parents and sleep in the box at night with them. Eventually, all six eggs proved to be infertile, but this year one pair, still feeding a four month old chick, is now raising and feeding two new chicks. These parents still protect and indulge the oldest, preening and feeding it often. Moreover, no aggression has occurred between the two generations of chicks; in fact, I often see the four month old brooding one of the new chicks. The parents do not seem at all fatigued by feeding three at once.

Another remarkable incident occurred in January, 1982, after we lost our first

Photo by Helen Moore

Four month old chick crying at its father to feed it. The mother is in the nestbox incubating two eggs.

Photo by Helen Moore

The larger chicks need handling with leather gloves and are placed in a bucket for weighing

The adult male on the left and the one-year old hand-raised juvenile have become an inseperable pair. The juvenile will acquire the adult black and white plumage in the second summer.

Photo by Jill Mellen

adult penguin to egg peritonitis the day she was due to lay her second egg. Rather than remove the first egg from the male for artificial incubation, I was curious to see if he would accept hand feeding in the box and incubate the egg by himself. To my surprise, he began to accept fish readily after a few hungry days and incubated the egg continuously without leaving the box for over forty days. Unfortunately, the egg was infertile and discovered broken on the forty-first day, but I believe that with plenty of fish offered him, he could have successfully raised a chick alone. Aside from slightly soiled plumage, he did not seem the worse for wear afterwards.

Our Humboldt penguins now have a continuous breeding season, with nest building and copulating beginning in the autumn soon after the summer molt, and continuing until the following year's molt in July. The penguins are provided with sticks, sphagnum, and dried leaves for nesting material, but they will also eagerly deposit pebbles, molted cormorant feathers and fish in their nestboxes and rob the boxes of their neighbors. The sand is also excavated from the rear of the nestboxes and usually two greenish-white eggs are laid four days apart in the depression. These become increasingly caked with slime and are brown when about to hatch. Incubation begins when the first egg is layed, is shared equally by both sexes and lasts from thirty-nine to forty days. The two chicks hatch asyncronously three to four days apart, are completely defenseless, and covered with a velvety grey coat of down. By the second week of development, their eyes are open. From the first day of hatching, the young can be heard faintly crying for food but are continuously brooded and difficult to see. Both parents share in the feeding of the young by regurgitating fish. At hatching, the chicks weigh about ninety grams; weight growth for hand and parent-raised chicks is so rapid that the chicks shed the skin on their feet after a week. After the first three weeks, the chicks lose the dense short grey down and acquire a still grey but coarser down. This down stays with them until they molt into the sleek waterproof plumage at two to two and a half months. The down on the wings is molted first, next on the chest, then on the back and finally on the head. The chicks enter the water always with some down left on their head but return to the nestbox when ever hungry or tired. At this time, all nesting materials are removed and the boxes are cleaned and filled with new sand.

Remembering that hand raised chicks eat whole fish at five to six weeks, by comparison the weaning of parent-raised chicks is a surprisingly slower process. At sometime, the parents cease to feed mushy digested fish and regurgitate whole fish to their chicks. But I have observed a four month old chick spit out a whole fish, and I assume this happens often, because I see many fish strewn around the boxes when the chicks are this age. Parents are still feeding their chicks at six months but eventually these chicks become curious about fish, poking them around in the water, then eating them and ceasing to beg for food altogether.

Most zoos advocate removing parent reared young at about fifty days and force feeding them to ensure that they accept fish readily, to break the bond with their parents, and to eliminate interference by hungry juvenile penguins when their parents attempt to lay again. I have found this unnecesary, since our adults continue to lay eggs and incubate a second clutch, despite the persistent cries of a hungry chick, and are able to feed two generations successfully at once. The parent-chick bond does break eventually, but by waiting for it to break naturally, I have observed an unexpected variability in its duration. Several of our year old penguins, still sexually immature, have already paired up with adults. However, the bond may last longer because other juveniles of the same age still sleep in the nestbox with their parents. No chick yet has appeared unhealthy, weak, or underfed, in need of force-feeding.

Humboldt penguins seem hardy in captivity, provided their specialized needs are met. I attribute our success over the last several years to having provided them all with permanent nestboxes, nesting materials, a spacious heated exhibit enclosed from the public, and contact with only a few keepers whom they come to know. Because the behavioral repertoire of parent-reared chicks is undoubtedly more typical of the species than that of hand raised chicks, I am particularly pleased that all our adult breeding pairs know how to raise their own young. Nonetheless, I remain optimistic that hand raised chicks, particularly those raised with others, will also reproduce in captivity in a few years, when they become sexually mature. •

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Products mentioned in text:
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