



*Creating the Nation's first BioPark*

National Zoological Park · Smithsonian Institution · Washington, D.C. 20008

Letter from the Desk of David Challinor  
September 1, 1991

The herds of zebra, wildebeest and various antelopes, impressively large as they graze together on the east African plains, are a mingling of different animals, each appearing to eat the same grass species. This panorama seems at first sight to refute the long-held thesis that only one species can occupy a food niche at a time. However, after long and close observation my friend Lee Talbot, now at the World Resources Institute, and his collaborators learned that even though these separate animal species were indeed eating the same species of grass at the same time, they were eating different parts of the plant and at various stages of plant growth, thereby supporting the original hypothesis.

Zoos have successfully exhibited mixed groups of animals, but only after exhaustive preparation. I described in a previous letter the lengthy time it took to introduce Nancy, the African elephant, into an enclosure with two female Indian elephants. Other mixtures have been easier; for example, a pair of marabou storks share the large paddock outside my office window with four bongo, and next to them five or six male muntjacs (terrier-sized Asiatic deer) cohabit with a pair of black and white Malayan tapirs.

The National Zoo used to keep an old zebra stallion in the same enclosure with four wildebeest, but in time he became so aggressive towards the antelopes that he had to be removed. Unfortunately, zoo paddocks are not large enough for the subdominant animal, such as the wildebeests, to keep a safe distance. Thus, the size of the enclosure can be as important a factor as the species mix when a multi-species exhibit is planned.

An extreme example of an exhibit in which subdominant animals cannot withdraw to safety is the 2500 gallon coral reef tank at the National History Museum. After 3 years of experimenting with light regimes and artificial wave machines, and determining the ideal salinity, museum scientists finally succeeded in keeping a wide range of coral species alive and growing. The next step was to add fish and invertebrates. Numerous specimens of both were collected in the Caribbean and flown in the former Smithsonian-owned Grumman Albatross to Washington. When the new fish and other animals were first released into the tank, they began a



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life or death game of musical chairs. The biggest, fastest, strongest, etc. occupied the vacant niches of the artificial coral reef first. Naturally, some individuals were left out, and lacking a place to hide from the more predatory fish, they succumbed. Eventually the tank reached a balance as all the vacant niches were filled. The problem, of course, was that there were no potential recruits cruising up and down the reef waiting for a niche to become vacant, as would be the case on a natural reef. Therefore, the large tank at the museum has to be restocked periodically as the original niche occupants become old and die.

A similar condition exists in the Zoo's indoor tropical flight enclosure in the Bird House. A majority of the niches are occupied by the most adaptable birds. We have to be very selective about the bird species we release into these multispecies exhibits to avoid including ones that are too aggressive. Among those which might seem threatening are not only aggressive birds, but also intrusive humans. The visitors have to look closely to see the birds because the latter must have an escape route if they feel people are getting too close to them. The birds, therefore, tend to move in and out of the bushes, but the patient visitor can be rewarded by seeing virtually all the birds in the room after watching quietly for 5 or 10 minutes.

When pairs of birds have established their territories, they tend to defend them. Thus, when well-meaning visitors release a pet canary or parakeet into the exhibit, the newcomer is so harrassed by the established residents that it seldom lives for more than a day. Fortunately, word has now spread of the fate of these released pets, and we have not had such incidents in the indoor exhibit for a long time.

The large outdoor flight cage at the National Zoo has been renovated and will soon be ready for occupancy. This enclosure is 130' in diameter and 85' high and was filled with a wide variety of birds. Even tropical species survived outside all winter because infrared lamps in the horizontally-laid, artificial hollow logs kept bananas, meal worms, raisins, etc. from freezing and thus available as food.

Outdoor flight cages were the latest zoo vogue 30 years ago, but their weaknesses have now been fully assessed. For example, the mesh which encloses the flight cage has to be strong enough to support itself over a span of cage, but still allow snow to fall through. Unfortunately, the mesh is thus large enough to allow sparrows to enter, and they not only eat the food left for the exhibited birds, but they can introduce disease as well.



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To solve these problems and present a non-traditional exhibit, the zoo's current plan for the renovated flight cage is to use it to teach the visitor about flight. One species of bird in particular used to take advantage of the large flying space, and that was the Inca tern, an elegant, small seabird from the coast of Peru and northern Chile. The terns, which fly gracefully and agilely, will be used as models for bird flight, and from an elevated platform the visitor can look up, at eye level, or down at the terns as they fly. Graphics and audio recorders will explain to the visitor what to look for, and on entering the flight cage, visitors will be able manually to flap artificial wings to see what strength is needed to fly. An added bonus to concentrating on terns is that they are fish eaters, and thus their food is less tempting to sparrows. The entire exhibit will demonstrate the principles of flight -- lift, drag, wing design, power-weight ratio, fuel efficiency, etc. -- in as many innovative ways as we can devise.

Just as we are learning today in the Soviet Union, Yugoslavia, Lebanon, Ireland, etc. how difficult it is for humans of different cultural, religious or ethnic backgrounds to live together, so we can appreciate the difficulty of mixing different animals together in a relatively confined exhibit. The "Peaceable Kingdom" does not exist in nature, but by careful planning zoos can achieve pleasing and non-lethal mixtures of birds, plants and animals.