

HISTORICAL PERSPECTIVE

Notes on Iguanids and Varanids in a Mixed Exhibit at Dallas Zoo¹

James B. Murphy

Supervisor of Reptiles, Dallas Zoo, Dallas, Texas, USA

Numerous attempts are made by zoological gardens to display resident populations of iguanids and varanids, but often these meet with little success. Many species of the two families are imported annually; yet surprisingly, few exhibit the characteristic alertness and activity associated with wild specimens. After a few months in captivity, their lethargy and obvious lack of health is depressing even to the casual zoo visitor.

Since November 1966, we have maintained an exhibit centered around these two families. Rhinoceros Iguanas *Cyclura cornuta*, Andros Island Iguanas *Cyclura b. baealopha* [*Cyclura cyclura cyclura*], Exuma Island Iguanas *Cyclura b. figginsi* [*Cyclura cyclura figginsi*], Cayman Island Iguanas *Cyclura macleani caymanensis* [*Cyclura nubila caymanensis*], Green Iguanas *Iguana i. iguana*², and the Mexican False Iguana *Ctenosaura hemilopha* live in complete harmony with a large Water Monitor *Varanus salvator* and a Lace Monitor *Varanus varius*. They are exhibited in a large glass-fronted display area, measuring 4.6 x 2.4 x 3 m, the top being screened with wire. A concrete pool, 2.4 x 1.2 m, is in the centre of the cage. The monitors are often seen swimming or resting in the water.

Because the natural temperature of the area is only 27 °C (80 °F), an auxiliary heat source is needed so that normal metabolic functions can proceed. A bank of six 250-W/110-V Infrared Heat Lamps (Ken-Rad) and two 275-W/110-V 'Sun Lamps' (Ken-Rad) are directed to a 'hot spot' at the front of the cage where the temperature reaches 41 °C (106 °F). The value of these lamps cannot be underestimated, for the lizards are most

healthy when they are in operation. Common or Green Iguanas *Iguana iguana* with paralysed hindlimbs and in generally poor health are often brought in as donations. In many cases, their condition has improved after a few months under the sun lamps.

For a natural effect, plastic foliage, rocks, and tree limbs are used. The plants must be chosen carefully to withstand the constant prowling and climbing of the lizards. The limbs are arranged at an angle one meter from the ground, so the lizards may retire to them during the heat of the day. Gravel that will pass through a 1-cm screen is used for the substratum, as this tends to hold the warmth well. It also gives a firm footing for the constantly scurrying lizards, which seem to feel insecure if placed on material that gives way under their weight.

To ensure the health of the saurians, a proper diet must be offered and they are fed three times a week. Two large aluminium trays are filled with diced fruits and vegetables. Oranges, apples, bananas, grapes, lettuce, spinach, kale, tomatoes, beets, carrots, papaya, and cantaloupe are used according to season. Once a week, strips of lean horsemeat and freshly killed mice are included in the tray. A multiple vitamin preparation (Pervinal) and steamed bone meal or oyster shell flour are the only additives. Care is taken to avoid overfeeding, and we judge this by observing the girth of the hind limbs and proximal portion of the tail.

The photoperiod and temperature remain relatively constant day by day and the relative humidity is about 40%. The lights are turned on at 0800 hours, and the lizards begin to emerge almost immediately. Usually, after basking in the heat for the first 30 minutes or so, they begin to leave the 'hot spot' and return only periodically to maintain their temperature level. They are fed between 1500 and 1600 hours. After the meal they return to the 'hot spot' and remain there for some time. This apparently aids digestion. The lights are turned off at 1700 hours, and this is the period of greatest activity. Flattening themselves dorsoventrally, they remain on the 'hot spot' area until it cools. During this time, the sunlight that shines through the sky-



¹ This article is adapted with the kind permission of the *International Zoo Yearbook* (*International Zoo Yearbook* 9: 39–41; 1969), which is published by the Zoological Society of London. Additional information about the IZY can be found at <http://www.blackwellpublishing.com/journal.asp?ref=0074-9664&site=1>.

² Note that subspecies of Green or Common Iguanas (*Iguana iguana*) are, for the most part, not currently recognized. Extensive studies of genetic relationships among populations from different regions are underway (e.g., see "ISG Reports" in *Iguana* 13(2): 127–128).

Editor's Remarks

This is the complete, edited text (e.g., capitalized formal common names, insertion of current scientific names when they differ from the original) of the first major publication by James Murphy of the Dallas Zoo, whose profile appears elsewhere in this issue. Although relatively recent compared to other studies we have highlighted in this section, this article was an important milestone.

Zoos used to be dismal places. They began as places of entertainment, and animal welfare, conservation, and research were not a part of their missions. That eventually began changing, but reptile departments were not at the forefront of this process. The 9th issue of the International Zoo Yearbook (IZY), in which this article appeared, was the first to have a herpetological focus. Other articles examined thermal requirements of captive reptiles (following on the work of Cowles and Bogert, which we featured in *Iguana* 13(1): 53–61), reported on lighting and humidity, and described captive reproduction and incubation techniques. Species covered were primarily large: crocodylians, tortoises, constrictors, iguanas, and monitor lizards. Most articles were shorter than Murphy's, and few had references. Zoos were beginning to emphasize scholarship, and Murphy was a leader in applying this to herpetological collections.

Things have changed dramatically over the ensuing decades. The IZY has had a number of herpetologically themed issues over the years, and these reflect the increasing sophistication of zoo research. Some leading zoos (including the Dallas Zoo, whose herpetological publications can be seen at <http://www.dallaszoo.com/oth/oth.asp?page=spubs#reptiles>), now include studies of natural habitats and their conservation in their mission. This modest paper led that change.

Gad Perry
Texas Tech University

light above the cage gradually fades. The only variation in this routine is during the introduction of new animals when, if they are shy and feeding diffidently, the lights will be left burning after visiting hours so they will emerge and feed.

Newly acquired animals are quarantined in fibreglass holding cages for at least 30 days. Upon arrival, they are washed in a prophylactic solution of oxytetracycline hydrochloride (Cosaterramycin) for 24 hours. Food is presented daily until a pattern of feeding can be determined.

Maintenance of the exhibit is remarkably uncomplicated considering the number of reptiles involved. Daily, the keeper enters the cage before the lights are turned on, drains the pool and scrubs it with a disinfectant (Roccal), cleans faecal matter from the gravel, and polishes the glass. The cage is completely dismantled bi-monthly and the gravel and walls are thoroughly disinfected. The plastic plants, rocks, and gravel are also cleaned and disinfected.

Rudimentary 'grooming' by the Exuma Island Iguana has been observed. As the lizards shed their superficial epidermis in fragments, pieces adhere to the body. Individuals of the same species will investigate the body of the shedding lizard and consume the skin whenever possible. Not only are the dorsal and lateral areas checked, but the shedding iguana will lift its leg and allow the others to pull the skin from beneath the leg. Occasionally, more than one 'grooming' lizard will be involved in this process.

Hopes for future successful breeding with this arrangement are based on the numerous copulations we have observed; although, unfortunately, the only eggs discovered were broken. The male iguanas display vigorously in typical head bobbing fashion and territories are rigorously defended. For such a large and varied population, the mortality in the cage has been remarkably low. Since its inception, only one Nile Monitor *Varanus niloticus* has died.

Readers should recognize that combining different species in one enclosure is a risky proposition. Behavioral triggers that cannot be anticipated may result in aggression leading to injury or death of some animals. With very few exceptions, such practices are not recommended.

Products mentioned in the text: Ken-Rad, Owensboro, Kentucky, USA; Pervinal, US Vitamin and Pharmaceutical Corporation, Veterinary Products Division, New York, USA; Cosa-tetracycline, Charles Pfizer and Company Inc., New York, USA; Roccal, Winthrop Laboratories, New York, USA.