

Where is the Beast of Andros?

The search for the elusive iguana, Cyclura cyclura cyclura

John Bendon

“We have to hope that there are many iguanas out there, undisturbed amongst the deepness of the brush of the cays in this vast, unexplored land of Andros, but we just don’t know...”

Port of Miami/22 June 1999

Some of the long-term readers of *Iguana Times* may remember a two page letter I wrote back in 1994 recalling the two years I spent sharing my apartment with a large iguana from the island of Andros in the Bahamas.

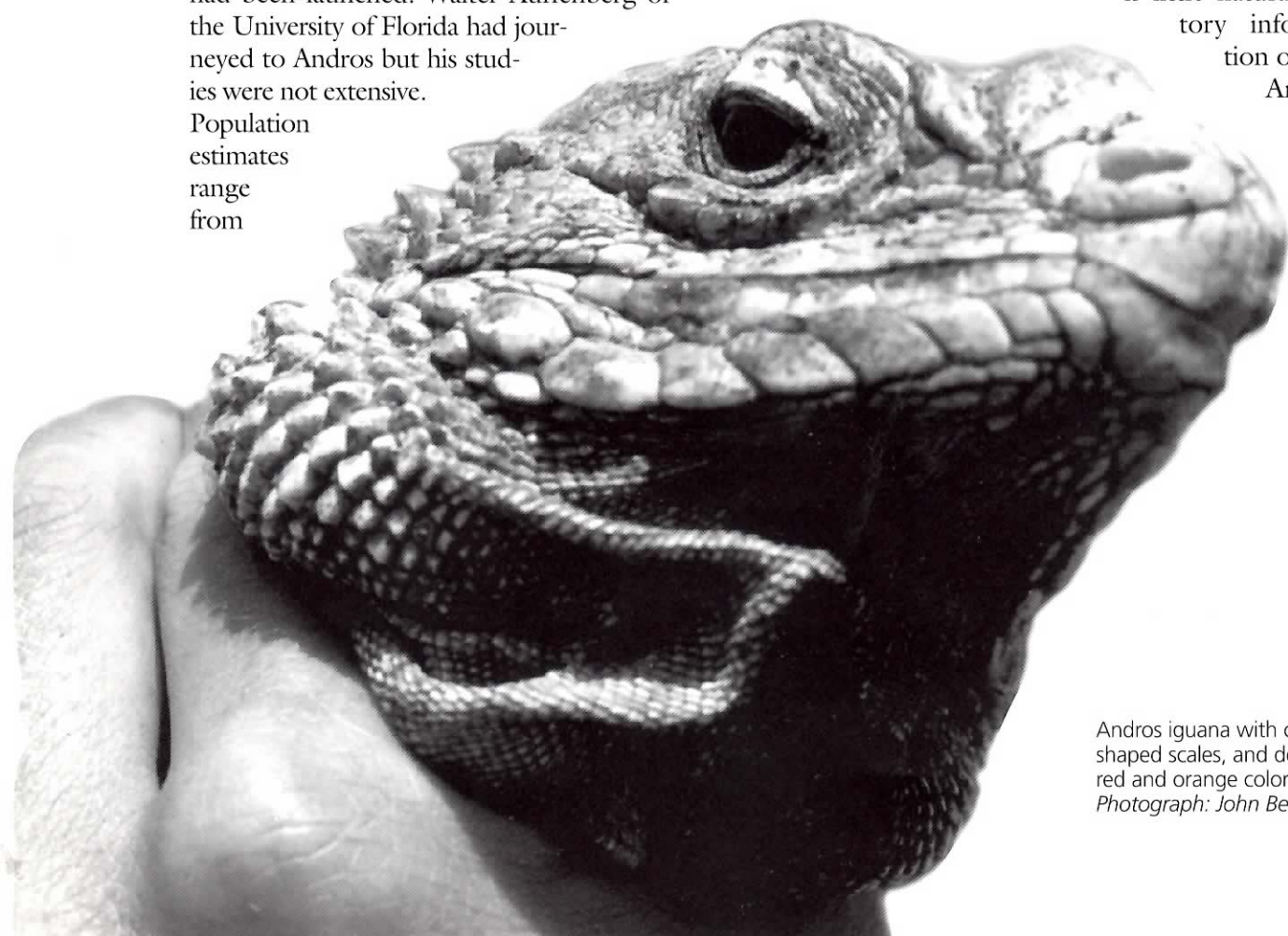
When the animal died in 1987, I vowed that one day I would visit his relatives in their homeland. I also vowed that, if this iguana species needed saving or protecting, I would be ready to help. At that time I inquired about the status of the lizard but no one could give an accurate answer as no expeditions had been launched. Walter Auffenberg of the University of Florida had journeyed to Andros but his studies were not extensive.

Population estimates range from

2,500 to 5,000 but no one has searched all of Andros.

You can imagine my delight when I discovered that the Shedd Aquarium of Chicago, the largest indoor aquarium in the world, was making an exploratory expedition to ascertain the status of these giant, scaly creatures. Depending on the outcome of the trip, a much longer expedition would be undertaken in the future. This trip was led by Chuck Knapp of the Shedd, who studies *Cyclura cyclura cyclura*, *C. c. figginsi*, and *C. c. inornata* (see *Iguana Times*, Volume 7, Number 3). There

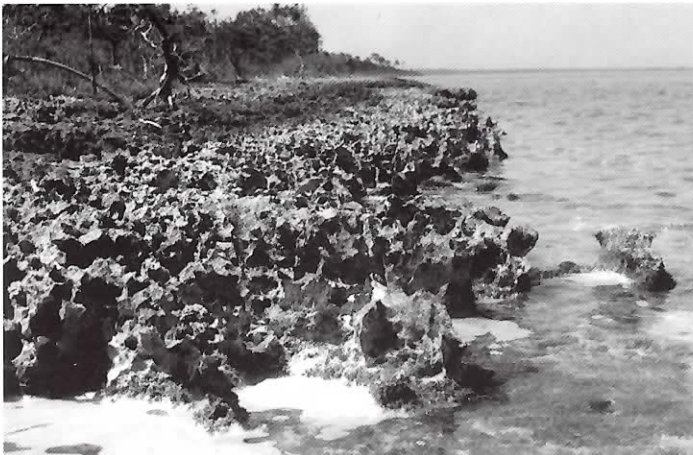
is little natural history information on the Andros



Andros iguana with conical-shaped scales, and deep red and orange colors.
 Photograph: John Bendon

iguana and the data collected will be passed on to the scientific community and the Bahamian government.

Andros Island, part of the Bahamas archipelago, is not a single island but rather a collection of several enormous islands and many satellite islands and cays. Much of the area is unexplored and the western portion is mostly uninhabited. The waterways that bisect the island are saline near the coast and become fresher inland. Andros possesses a fresh water table that supplies New Providence with supplementary fresh water. The interior is dense pine woodland, like the Florida Keys, particularly Big Pine Key. The cays are almost completely surrounded by mangroves and marsh. The ground is xeric limestone that is full of sharp-edged holes made by water dissolving away the substrate. It is definitely a very difficult terrain to traverse. There is very little soil on the cays we visited. Vegetation struggles to grow in the limestone holes that have accumulated humus over the decades.



Map: Andros Island.

Above: The xeric limestone shorelines of Andros made accessing the island quite treacherous. Photograph: John Bendon

Right: Mangroves growing around a cay perimeter. Photograph: John Bendon



The eastern coast is protected by the third largest barrier coral reef in the world. Ten thousand years ago the sea level was approximately 260 feet lower. All those small islands including New Providence, Eleuthera, Cat Island, Great Exuma, and Long Island were part of one landmass known as Paleoprovidence. Abaco and Grand Bahama made up another landmass. As the ice melted, the sea level rose and gave rise to the familiar Bahamas chain.

Taking this into consideration, we could assume that the iguanas known as *Cyclura cyclura figginsi*, *C. c. inornata* and *C. c. cyclura* were all one species in that era and later diversified into subspecies when they became stranded in their various locations as the sea level rose.

The animal we are concerned with is known as *Cyclura cyclura cyclura*. The name tells us that it was the first type of the species to be recognized and identified. The misspelling of the species name most likely occurred as an accident but is now standard because original spellings remain the same in scientific literature unless they change taxonomic categories. Cuvier originally described the animal as *Iguana cyclura* in 1829.

The Expedition Begins

We spent the first night on the boat in Miami and the next day made our way towards Bimini to clear Bahamian customs. The boat, Research Vessel *Coral Reef II*, is maintained and run exclusively by the Shedd Aquarium. Miami is its base and it travels all over the Caribbean taking parties

of schoolchildren, students or researchers to different locations for marine and reptile study and observation. It is a comfortable boat, capable of sleeping sixteen people.

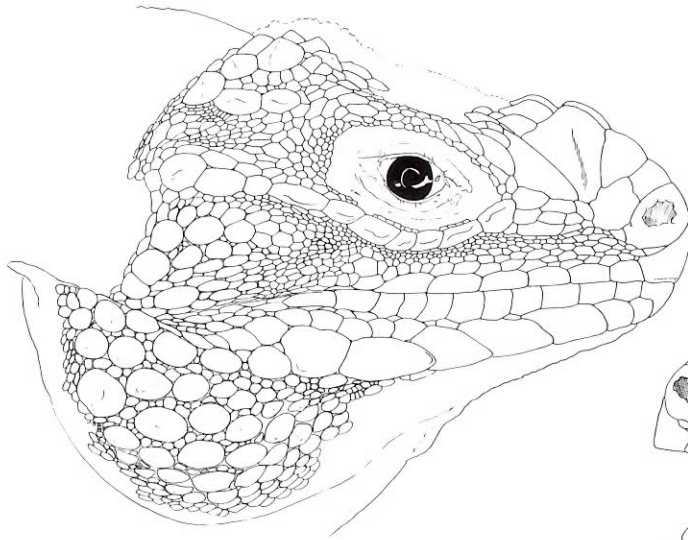
We travelled the second day and night and dropped anchor in the Middle Bight of Andros early the next morning. We awoke to the blue tongue of the ocean and a good breakfast. This was Thursday 24th June, and a local guide accompanied us to show us the cays he thought would be best for finding iguanas.

We had three small boats to transport everyone. Skimming over the flat sea we found ourselves accompanied by two bottle-nosed dolphins, who played and swam under our boat. We saw flying fish and, upon landing at the first cay, two lemon sharks lazily swam in the shallow, clear waters. We were all very excited and set about searching for our first iguanas. After an hour and a half, we were pleased to find our first iguana, a small animal about 2 years old. Later, we went to

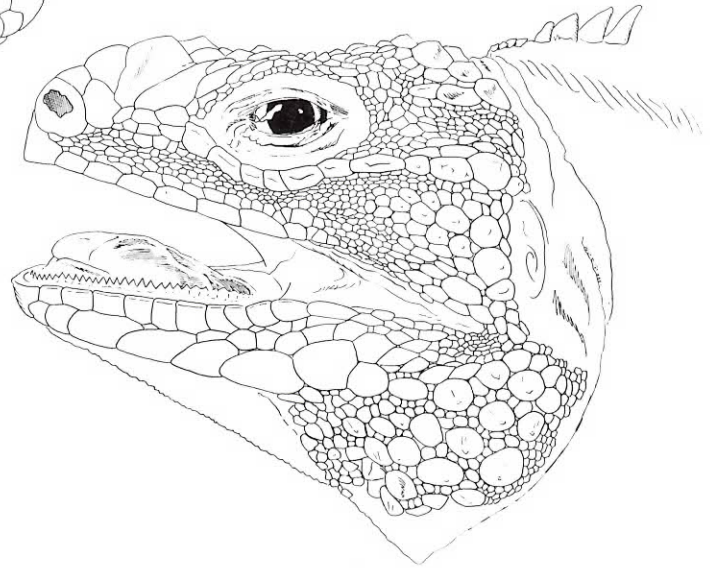


Above: A two year-old Andros iguana, *Cyclura cyclura cyclura*, the first iguana captured during the trip. Photograph: Kim Hasselfeld

Left: After being weighed, measured, and having blood drawn, the iguanas were marked with white paint for future identification. Photograph: John Bendon



Left: Dome-scaled, adult *Cyclura cyclura*. Below: Dome-scaled adult *Cyclura cyclura*. Illustrations: John Bendon



a second and third cay but caught no more lizards that day.

On the second cay we initially saw tail drags and lizard scat which caused us to remain optimistic. During our search we heard a loud rumbling in the bush and one participant saw a large iguana at a distance but that was the closest that we came to an iguana. That afternoon we went back to the *Coral Reef* wondering just how many of these beasts there were, and whether we would be able to find them.

On Friday we went to a cay where iguanas were known to have lived in the 1960's. Sixteen people spent a total of 40 man-hours combing the eastern end of the cay with no results. Later we landed at the other end of the cay and videotaped a large specimen. There were no further sightings that day. Chuck captured one iguana on Saturday, a gravid female of 750 grams that had a snout-vent length of 27cm*. The female was captured next to a termite mound where she was preparing to excavate a nest burrow. Throughout the study we observed many female iguanas resting by their termite mounds and guarding them from other opportunistic females. This unique behavior is displayed because the islands are devoid of suitable nesting substrate and the iguanas are forced to use the mounds for egg incubation. Walter Auffenberg

first reported this behavior and our experience served to confirm his observations.

In the evenings, the group would discuss the plight of this elusive animal. Was it headed toward extinction, decimated by hunters and filling up the stew pots of Andros locals? It is known that the local people hunt iguanas for supplemental food. One day I wore a T-shirt bearing a large line drawing of an Andros iguana head. During an evening foray into a local village, three different men pointed to my shirt and mentioned how tasty iguanas were. Some locals still hunt and eat the animals just as their fathers and grandfathers did. Perhaps time and an integrated educational program will raise awareness of their unique reptilian neighbor. At present, we have only an idea of how many animals might remain undisturbed amongst the dense brush but we cannot know for certain without searching the whole island.

That evening we weighed anchor and headed south hoping for better fortune. The moon was full and its image fell on the churning waves behind the vessel before breaking into fragments of rippling creamy-colored liquid. We travelled

*Editor's note: the date of the Shedd Aquarium's 2000 Andros trip has been scheduled six weeks earlier to minimize negative impacts on nesting females.

throughout the night until we were approximately halfway down the island. We rose early, ate breakfast and departed for the first cay at 8:30 a.m. Sunday was our lucky day. As we approached the shore, someone cried out "I see an iguana on the beach!" We all disembarked the small boats and came ashore with our nets, cameras, food and water, prepared for an exciting morning's work. Since we had been able to spot an iguana so quickly, there just had to be more.

Our method of catching the iguanas made use of large nets and teamwork. Once surrounded, the animals would eventually run into someone's net. It was tricky at first because they are fast and run an erratic course. Within the hour, three had been caught, tagged, and released. The lizards are always released in the exact same place that they were captured in order to minimize stress on the animal.

To capture iguanas, people ventured into the bush in pairs or trios. Periodically, someone would be spotted in the distance with a pillowcase slung over his shoulder and walking slowly toward our temporary camp. By the end of that day, we had captured and tagged 11 iguanas. The largest iguana of the expedition (6.45 kg) was caught that day.

The large iguanas were very strong and difficult to handle. It required great care and practice to hold an iguana while it was being measured. One of the Shedd personnel was bitten during the measuring process. Luckily, he was fine and no other incidents occurred during the trip.

While roaming the cays, we discovered that the iguanas eat the large crabs that hobble over the shore. Some iguanas such as *C. carinata bartschi* on Mayaguana are known to eat scraps of conch but here, we found scat containing crab claws. These lizards are obviously opportunistic and will consume food items that are convenient. Other known food items include guanaberry and seagrape.

After a successful day, the participants were optimistic that iguanas may still exist in decent numbers. There are many isolated cays on Andros and it will take years to cover them all. Perhaps we surveyed the wrong cays? Still, we must be cautious in our speculation because cays that had previously been inhabited by iguanas no longer appeared to sustain great numbers.

Monday proved to be less productive. We surveyed a very small cay and observed a juvenile iguana, which made a quick dash down a solution



A young adult *C. c. cychlura*, with conical-shaped scales. Photograph: John Bendon



Left: Chuck Knapp (Shedd Aquarium) and Roger Cogan (Phoenix Zoo) insert a microchip into one of the captured iguanas. Photograph: John Bendon

Below: The captain of the *Coral Reef II* holds the largest *C. c. cyclura* caught during the expedition. Photograph: Kim Hasselfeld



hole. A larger cay was nearby so we turned our attention to surveying the interior. We captured a large female (3.75 kg) by a termite mound where we suspected she had recently deposited her eggs, as her belly skin was loose and her tail somewhat thin.

We moved to another cay and continued our search, capturing a first-year juvenile. The fourth cay of the day was quite large with the north coast 10 km away. Here, we captured four additional iguanas. It had been an exhausting day and I remember that night everyone went to bed very early except Chuck Knapp who was writing up notes while I was making maps. It didn't seem to matter how tired we were because we were too excited about the week's findings.

The next day was the last and it turned out to be informative and interesting as we revisited the cay where we had previously captured 11 iguanas. We searched a different area of the cay that was separated from our old position by a narrow waterway. Of the three captures we made that day, the first was the largest. This animal struggled so much that he had to be held in place by Lou Roth, one of the *Coral Reef* captains. Lou is a big guy and the iguana still looks big compared to him.

This was the cay where I discovered (by making maps and asking the others where they caught their animals) that all the nests were around the perimeter. Nothing was found beyond 16 meters from the beach and all were found near termite

mounds. It also appeared that eating landcrabs was a regular pastime for the iguanas. We often saw the crabs walking through the wood.

On that last day, I went off with three other people in the opposite direction from the rest of the party. We were determined to catch a large animal that had been spotted earlier by John, a young student in the party who was very good at diving into the bush. The four of us spent 12 man-hours searching for the elusive lizard. During our search, we spotted a couple of very young juveniles, and some adults but we couldn't seem to catch anything. Then, suddenly, a large iguana appeared, apparently the one John had seen earlier. It was surrounded and eventually bolted for the beach where it ran into the net of a very surprised woman of the party, Marcia. "I got one, I got one!" she exclaimed, and when I crept out of the woods, sure enough she had. It was her first, and she was ecstatic. It was the last iguana to be caught on the trip. John carried it back to camp to be processed. It also turned out to be the largest female caught, measuring 49.5 cm from snout to vent, and weigh-

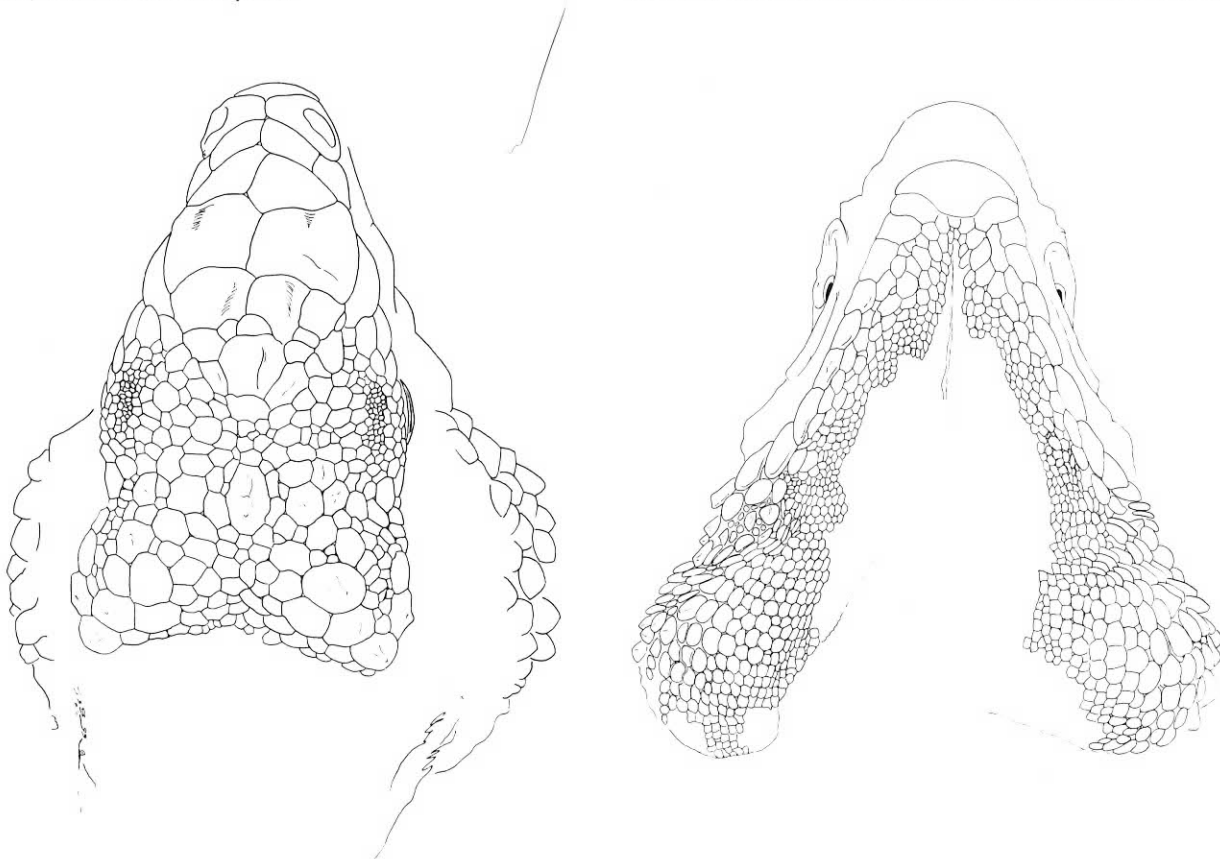
ing 4.75 kg. During the procedure, while sexing the animal, someone remarked that it couldn't be a female as they were smaller than that. "The ones we've seen so far have been smaller," I replied, "but now we know different." This particular animal reminded me of my own Andros iguana, Pinky. She had the same coloring and the same eyes. When I held her, she did not struggle but instead seemed to relax. It was uncanny, as if the creature knew me. Before leaving the cay, I scratched an 'X' on a rock to mark the spot where I had come face to face with Pinky's relatives. I had achieved my goal. I had indeed gone to Andros to make sure they were still alive and running around, and had taken part in something that was the beginning of a project which will go on for years and which will protect and conserve the habitat of these amazing lizards. We all felt sure that there were many more of them on this particular cay. We had crawled through dense brush teeming with mosquitoes and walked for miles. We had been bitten, soaked and exhausted by the sun but despite all that, we were elated that we had found all these iguanas. I, for one, will return next year.

So that was the end of our wonderful experience. Most people spent Wednesday relaxing as the *Coral Reef II* cruised back to Miami. We all departed and went our different ways with a feeling of achievement. I often still think of this very special trip where all the participants had one love in common—those iguanas—and the memories of those ten days will take a long time to fade. Good luck to you, *Cyclura cyclura cyclura*. There are many good people looking after your welfare so I hope your future will be secure.

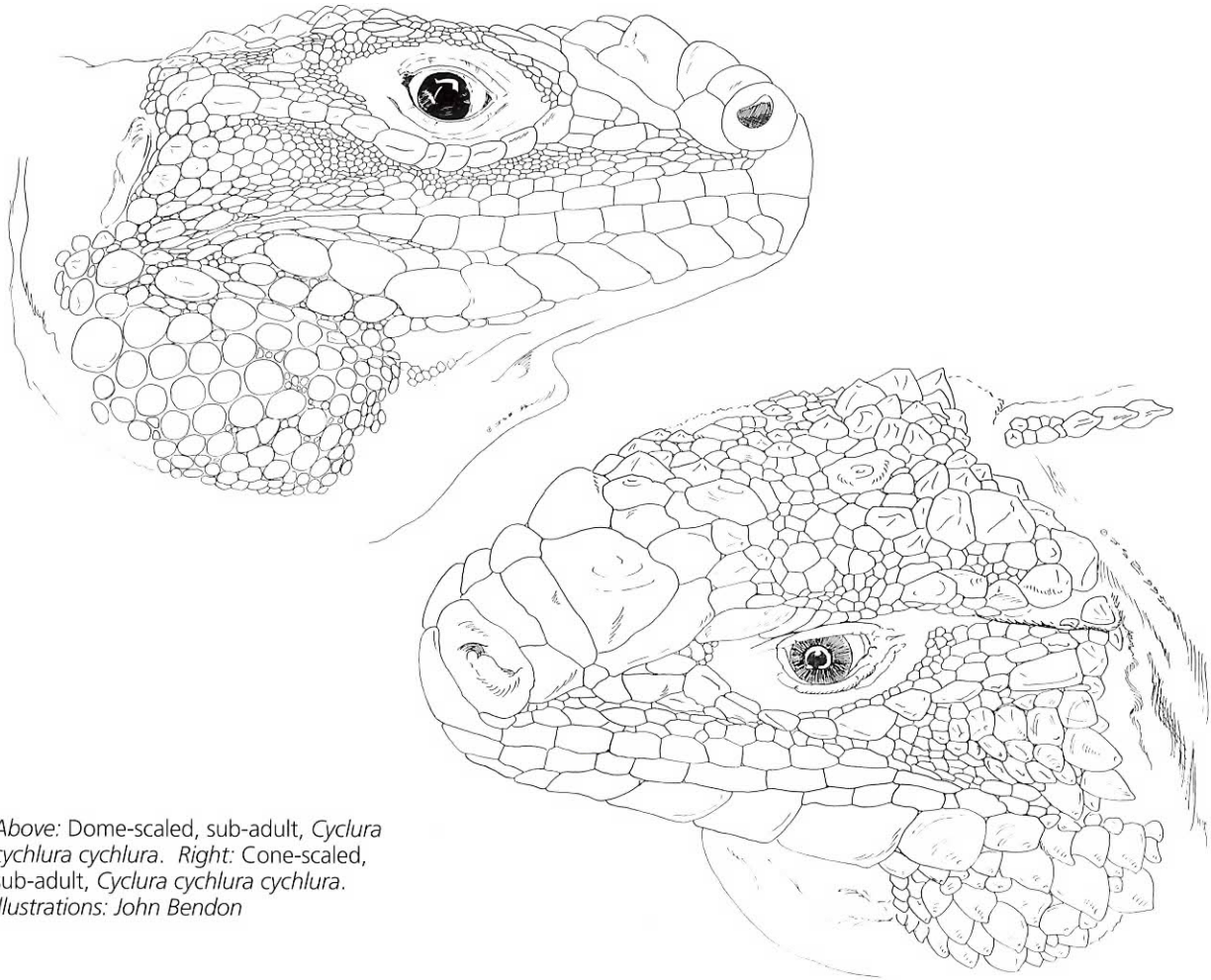
On Morphological Variations

Having now closely observed and photographed 23 Andros iguanas of varying sizes and ages, I can say that there seem to be two distinct scale formations amongst the lizards in the area that we surveyed. All the animals observed have scales in the same configuration on the head but some lizards have dome-shaped scales while others have conical-shaped scales.

After viewing video footage of an iguana that was not captured, I believe that there is a third variation where the head is much whiter overall with



Left: Dome-scaled, adult *Cyclura cyclura cyclura*, lateral view of head. Right: Dome-scaled, adult, *Cyclura cyclura cyclura*, ventral view. Illustrations: John Bendon



Above: Dome-scaled, sub-adult, *Cyclura cyclura cyclura*. Right: Cone-scaled, sub-adult, *Cyclura cyclura cyclura*.
Illustrations: John Bendon

black tinges in places on the snout. The Andros iguana that I had at home in the '80s was pale pink and white-faced with black tinges similar to the aforementioned lizard. This might actually be a sign of ill health or age. Certainly my own animal was not a healthy creature. Since we covered only a fraction of the total landmass of Andros it is possible to speculate that there may be further variations.

There was an old, large female Andros iguana at Ardastra Gardens, Nassau, which also seemed different. Her head scales were mostly pale orange and flat. She had access to natural sunlight and was fed a diet of fruit and vegetables as well as some greens and a supplement containing meat. Perhaps this incorrect diet accounted for the color or, alternatively, this could be a fourth variation.

Since all the animals with conical scales and an increased degree of red and orange coloration were considerably smaller and most likely younger

than the other iguanas, another possibility suggests itself. Iguanas, unlike other lizards, have a certain degree of ontogeny. They are not born as tiny reproductions of full adults but actually have infantile proportions, which change as they mature. As we have not seen these *Cyclura* at all stages of development from hatchling to adult, one might hypothesize that the animals with conical-shaped scales are merely at an earlier stage of development than those with dome-shaped scales. Once the blood samples have been analyzed, any genetic differences will show up. If all the data is cross-checked with photographs and cay locations, it might be possible to establish that one type came from one cay and the other type from another. This would show divergence from cay to cay. If two types came from one cay this would lend credence to the growth development theory. More trips are needed to study more specimens.

Another variation I noticed is that dome-scaled lizards have a scale count of 7, 8, or 9 on the very large scales of the lower jaw. The conical-scaled iguanas had 7 or 8 lower jaw scales. An instance of 9 scales was observed in one photograph and 10 scales were counted in one young specimen. This young iguana had dome-shaped scales and a pinkish white head. (This conflicts with my idea of younger animals having conical scales). I have seen these variations in many examples of Cuban iguanas (*Cyclura nubila nubila*) and, indeed, the jowl scales of the Cuban iguana vary substantially.

Can these animals swim from cay to cay? Isolation is an important point in island biogeography. The more isolated groups of the same species are, the more likely they will vary genetically. Gigantism is another point. With unlimited food, space, and sunlight, and a lack of predators, reptiles never really stop growing. The two *Geochelonia* species of tortoise, from Aldabra and from the Galapagos Islands are a good example. Predators now include man and as the larger tortoises are destroyed, the smaller ones remain, telling an incorrect tale that the race is smaller in body size than it really is. We have only seen iguanas up to a certain size. There are stories, or mutterings, from the locals on Andros concerning monster iguanas from four to six feet in length. I have no doubt that, in some totally unexplored part, with the right

conditions, huge, pink-headed creatures may live out long and peaceful lives.

Can iguanas swim from cay to cay? There are certain factors involved: the temperature of the water, the body mass of the iguana and the proximity of the next cay. Komodo Dragons (*Varanis komodoensis*) are known to swim 6 km between islands where they live. A study a few years ago, where the exhaled breath of Komodos was blown into balloons and tested, revealed that they are partly warm blooded. This was linked to the size of the animal. Logically, if there are large iguanas, extra-warm water and cays within 1500 meters, it could be possible to swim the distance without losing too much body heat. Losing heat causes the reptiles to be too slow and stiff to complete their journey. In a small lizard, too much heat is lost too quickly (Newton's second law of thermodynamics) and the trip is not feasible. The other question, of course, is why would they even bother to swim to another cay. They wouldn't be able to see one and wouldn't know that it was there. So the answer is yes, the larger ones can probably do it if conditions are right but, no, they probably don't, unless carried by accident by some floating object or hurled by a hurricane-force wind (probably resulting in death). It is open to speculation.

I eagerly await the results of the blood samples so that we may see if we have a *C. c. cyclura*, which is different from the one with which I am already familiar.



The research vessel, *Coral Reef II*, with all the participants. Photograph: John Bendon

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