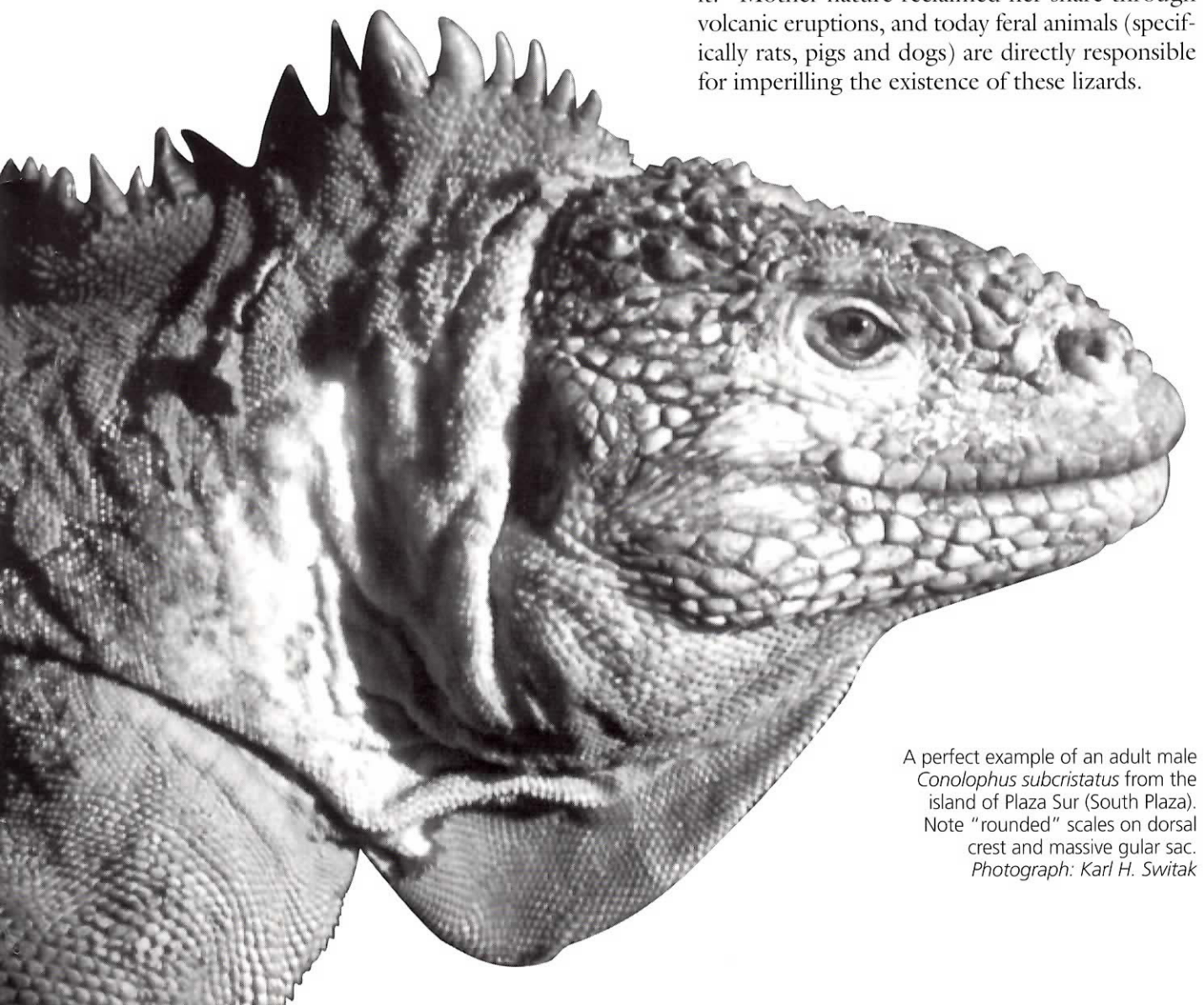
Galapagos Land Iguanas: Surviving in Peril

Karl H. Switak
Natural History Photography
Santa Rosa, CA 95409

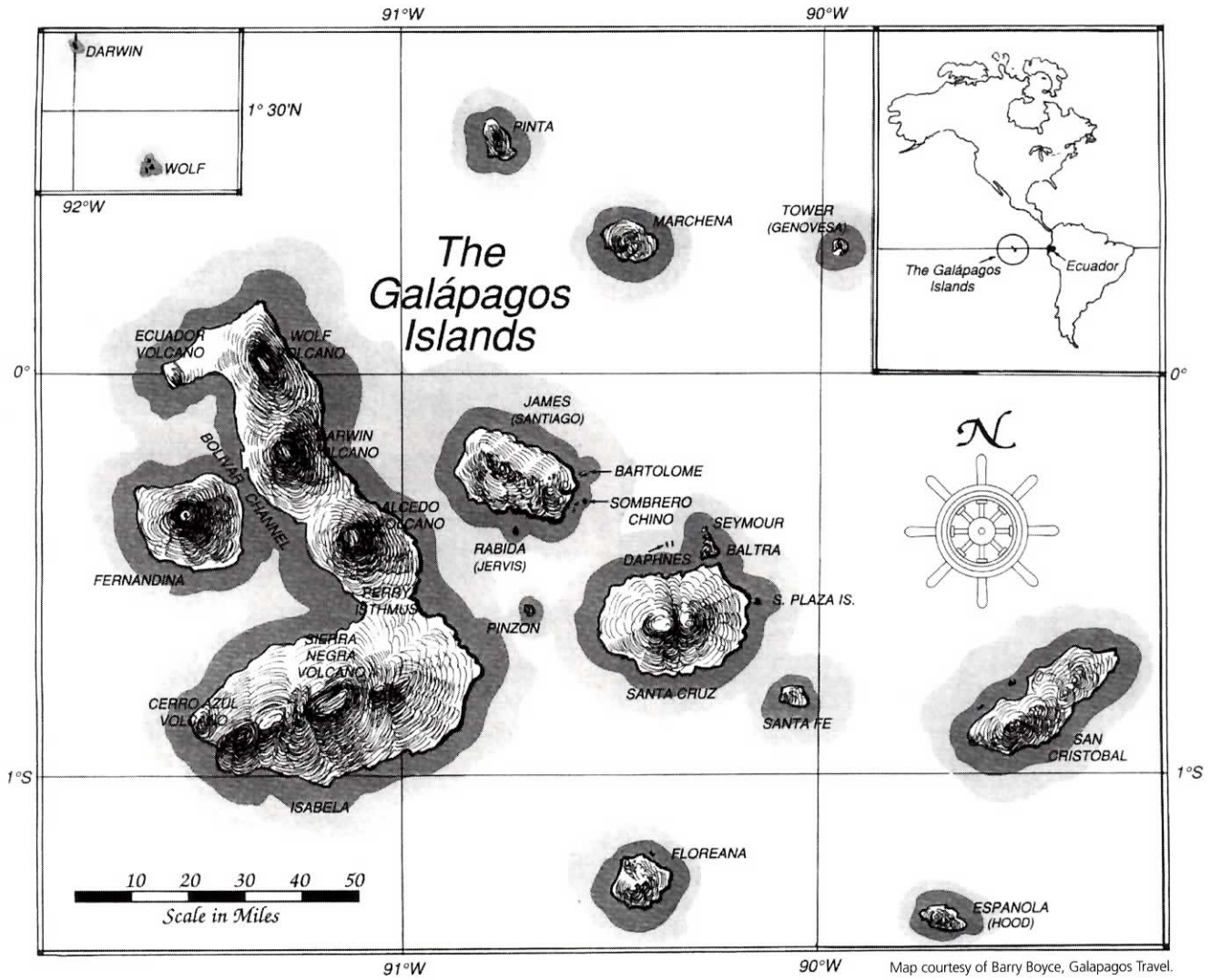
THEY ARE NOT AT ALL TIMOROUS: WHEN ATTENTIVELY WATCHING ANYONE, THEY CURL THEIR TAILS, AND RAISING THEMSELVES ON THEIR FRONT LEGS, NOD THEIR HEADS VERTICALLY, WITH A QUICK MOVEMENT, AND TRY TO LOOK VERY FIERCE: BUT IN REALITY THEY ARE NOT AT ALL SO...

Darwin 1839

Land iguanas, like all other animals that abound within the confines of the Galapagos Archipelago, have struggled through centuries of turbulent times. In the past many were killed by visiting sailors and used as a food supplement, while others were shot "just for the sport of it." Mother nature reclaimed her share through volcanic eruptions, and today feral animals (specifically rats, pigs and dogs) are directly responsible for imperilling the existence of these lizards.



A perfect example of an adult male *Conolophus subcristatus* from the island of Plaza Sur (South Plaza). Note "rounded" scales on dorsal crest and massive gular sac. *Photograph: Karl H. Switak*



Map courtesy of Barry Boyce, Galapagos Travel.

Some interesting field notes recorded during the California Academy of Sciences expedition of 1905–06 read as follows:

> Sixteen or eighteen specimens were secured on South Seymour, two at Tagus Cove, Albemarle, and twenty-one on Narborough. [Author's note: by "secured" I assume they meant killed.]

> Land iguanas are common [South Seymour, Nov. 21, 1905], and are scattered all about, not living in colonies like those on Barrington Island. There are a few burrows, but most of the iguanas live in the broken lava. I saw one large male eating on a cactus, and our mate, Mr. Nelson, said that one came and drank the blood of a goat he had shot.

> April 6, 1906 [Narborough Island]. Land iguanas are common. They live in cracks in the lava. No colonies of burrows were observed. April 17, 1906—We made a landing on a slope of cinders and lava, over which we climbed to the top... Here we found iguanas scattered over the lava. They were wild and had to be shot.

> Oct. 20, 1905. Anchored on N.W. coast of Barrington, and went ashore and a mile inland to the iguana colony on a plateau at an elevation of about three hundred feet. The burrows resemble those of a ground-squirrel only larger. We found the iguanas common here. They were awkward in their movements but covered the ground at good speed. They are very vicious, seizing one another by the jaws and drawing blood. One

WE CAUGHT TORE THE WHOLE LOWER JAW OFF ANOTHER. JULY 10, 1906.

WE DID NOT SEE ANY YOUNG SPECIMENS. TEN EGGS WERE TAKEN FROM ONE FEMALE AND SEVEN FROM ANOTHER.

VAN DENBURGH & SLEVIN 1913. THE ACADEMY COLLECTION INCLUDES TWENTY-FIVE ADULT SPECIMENS IN ALCOHOL, AND SOME SKINS AND BONES. [AUTHOR'S NOTE: THE VARIETY REFERRED TO HERE IS *CONOLOPHUS PALLIDUS*, ENDEMIC TO THE ISLAND OF BARRINGTON.]

TAGUS COVE, ALBEMARLE ISLAND, MARCH 23, 1906. BECK REPORTS SEEING ABOUT SIX LAND IGUANAS, OF WHICH HE SECURED ONE. THEY ARE EXTREMELY WILD. HE NOTICED ONE VERY LARGE BRIGHTLY COLORED MALE. THE ONE TAKEN WAS A FEMALE IN THE ACT OF SHEDDING ITS SKIN. MARCH 24, 1906. I SAW ONLY ONE IGUANA TODAY. THEY ARE VERY RARE; PROBABLY ONLY SIX OR EIGHT ARE LEFT IN THE COLONY. JUDGING FROM THE NUMBER OF BURROWS ONE MAY SAFELY SAY THERE WERE AT ONE TIME AS MANY AS A THOUSAND IN THIS COLONY.

The islands of the Galapagos are known by two names, one being English, the other Spanish (several by three names). Older literature (journals, etc.) uses only the English names. I have used the current Spanish names under the specific distribution section and include the English versions in parentheses. Most present day writers use only the Spanish names, making it difficult to cross-reference material from days gone by (Darwin, *et al.*).

Today, at the near closure of the twentieth century, land iguanas frequent the more arid regions on seven of the islands in the archipelago. There are two recognized species: *Conolophus subcristatus* and *Conolophus pallidus*. The former occurs on the islands of Santa Cruz (Indefatigable), Plaza Sur (South Plaza), Isabela (Albemarle), and Fernandina (Narborough). In years past *C. subcristatus* was introduced onto Seymour (North Seymour) and was recently repatriated on Baltra (South Seymour). *Pallidus* is endemic to the island of Santa Fe (Barrington). They are extinct on Santiago (James).

For ease of identification, or for placing a specific land iguana within a given locale, I decided to establish two separate common names. The

Habitat for *Conolophus subcristatus* on Plaza Sur (South Plaza) Island. Ground cover is *Sesuvium*, tall cactus is *Opuntia*. *Photograph: Karl H. Switak*

Barrington Land Iguana, *Conolophus pallidus* (found only on Santa Fe) and the Galapagos Land Iguana, *Conolophus subcristatus,* found elsewhere in the archipelago.

Land iguanas are large and robust reptiles. They range in size from 0.91 m to 1.07 m (3 to 3 ½ feet), with males attaining greater proportions. Jackson (1993) estimates them to grow to more than a meter, weighing as much as 13 kg (28.7 pounds). The latter was a huge specimen brought to the Darwin Research Station from North Seymour Island, which has since bred successfully in captivity. Sprackland (1992) estimates the size up to 1.1 meters (3.6 feet) and a weight of 4.5–6.8 kg (10–15 pounds).

I have personally observed land iguanas on the islands of Isabela, Plaza Sur, and Santa Fe, starting in 1986. The largest iguana was encountered in January of 1991 at Urvina Bay on the west side of Isabela very near the ocean. Two of the specimens observed on Santa Fe, both males, were also of considerable size. During my April 1995 visit I also found a large male on Plaza Sur that must have exceeded 1.1 meters in total length. Males are distinguished from females by having a much more pronounced dorsal crest of "rounded" scales, a larger head with bulky jowls, and a larger gular fold that is extended during territorial and/or courtship displays. In April of 1995, on Plaza Sur, we found land iguanas of mixed sizes, but no juveniles. One young individual, perhaps 35 cm (14 inches) in length, was seen running from one bush to another in late afternoon. But nothing is more impressive than the sight of an adult male. With gular sac fully extended, the forward part of his body raised high off the ground, and a pair of powerful eyes reflecting the golden hue of a setting sun, he certainly exemplifies the definition of prehistoric origin.

Conolophus feed on a great variety of plant species, such as *Sesuvium, Portulaca, Scalesia,* plus the fruit, stem and spinose pads of *Opuntia* cactus—just to mention a few. Harris (1996) writes that caterpillars and grasshoppers are commonly eaten, and that young land iguanas will jump into the air to catch grasshoppers on the wing. Beebe (1924) made some noteworthy observations regarding the feeding habits of this species.

Large adult female *C. subcristatus* on Plaza Sur, resting in the shade of a tree-like *Opuntia* cactus. *Photograph: Karl H. Switak*

Galapagos land iguana, *C. subcristatus,* at the edge of a hundred foot cliff on Plaza Sur (South Plaza). *Photograph: Karl H. Switak*

Adult *Conolophus pallidus* from the island of Santa Fe (Barrington). This individual, an adult, was quite skittish. This island boasts some of the tallest *Opuntia* cactus in the world. Iguanas are found very near the water's edge and far inland. *Photograph: Karl H. Switak*

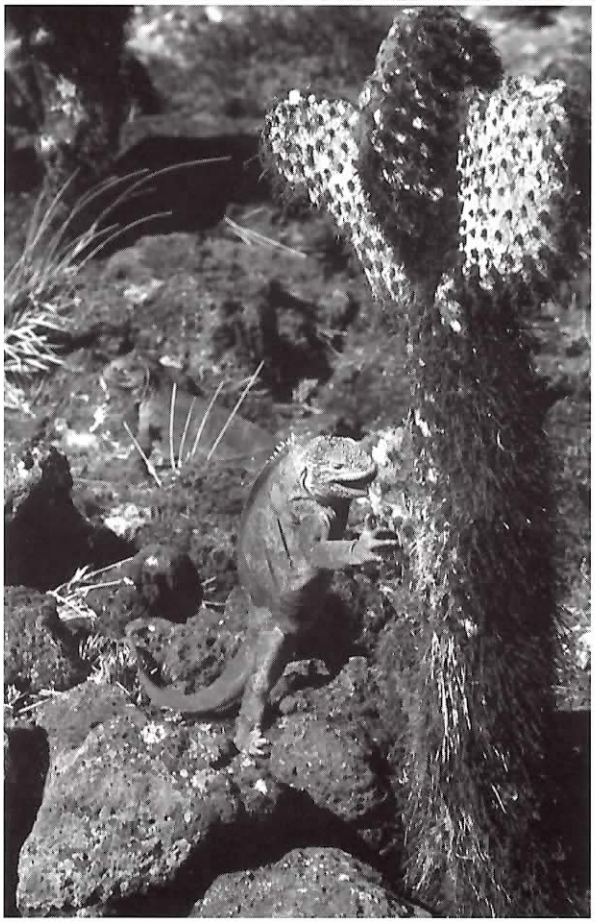
IN THE STOMACHS OF TWO WHICH I EXAMINED WERE ENORMOUS QUANTITIES OF THE LEAVES OF SEVERAL PLANTS, ESPECIALLY *CORDIA* AND *MAYTENUS*, AND MANY FLOWERS OF THE FORMER. ONE HAD SWALLOWED WHOLE FIVE CACTUS FRUITS AND ANOTHER THREE. TWICE I SAW *CONOLOPHUS* GETTING THE CACTUS FRUIT WHICH THEY SEEMED TO LOVE. TO MY SURPRISE IT WAS A DELIBERATE ATTEMPT—THE NEAREST TO AN INTELLIGENT ACTION WHICH I HAVE EVER OBSERVED IN ANY REPTILE. TWO WERE CLOSE TOGETHER AT THE BASE OF AN *OPUNTIA*, AND ONE STRETCHED UP AND STRUCK THE SPINY BASE SLOWLY, BUT REPEATEDLY WITH ONE FOOT. NOTHING HAPPENED AT FIRST, BUT FINALLY TWO FRUITS FELL AT ONCE. THE SECOND LIZARD RUSHED UP AND GULPED DOWN BOTH, SPINES AND ALL WITHOUT A SECOND'S DELAY OR MASTICATION.

I SAW CIRCUMSTANTIAL EVIDENCE OF THESE LIZARDS ACTUALLY EATING THE PADS OF *OPUNTIA*, SPINES AND ALL, BUT I COULD HARDLY BELIEVE THIS, UNTIL, IN A NUMBER OF CASES, FOLLOWING THE CAPTURE OF THOSE WHICH I TOOK ON BOARD THE NOMA, I FOUND THEIR DROPPINGS TO BE A MASS OF FULL-LENGTH SPINES. HOW IT IS POSSIBLE FOR ANY CREATURE TO SWALLOW SUCH NEEDLE-LENGTH AND STEEL-HARD SPINES AND NOT PERISH, I CANNOT CONCEIVE.

[BEEBE (1924) GOES ON TO WRITE...] *CONOLOPHUS* IS ESSENTIALLY HERBIVOROUS, BUT THAT IT OCCASIONALLY PARTAKES OF ANIMAL FOOD I CAN ATTEST TO, FROM FINDING ONE AND THREE GRASSHOPPERS RESPECTIVELY IN THE STOMACHS OF TWO INDIVIDUALS. THIS IS VERY UNUSUAL, AND I QUESTION THE ACCURACY OF THE STATEMENT MADE BY THE MATE OF A VESSEL, THAT THEY WERE SEEN DRINKING THE BLOOD OF A SLAIN GOAT.

Personally I have no problem whatsoever with the fact that *Conolophus* is not a strict herbivore, nor that it might lick up the blood from a slain goat. Rather, I believe these lizards to be opportunistic feeders, consuming mostly plant and occa-

"Active" burrow for *C. subcristatus* on Plaza Sur (South Plaza); plant is *Sesuvium*. *Photograph: Karl H. Switak*



When feeding on *Opuntia* cactus, Galapagos land iguanas also ingest the needle-sharp and steel-hard spines. However, given a choice, they prefer the softer fruit of this cactus species on the island of Plaza Sur (South Plaza). Note marine iguana in the background (out of focus). *Photograph: Karl H. Switak*

sional animal matter as dictated by providence. After all, hunger has forced both man and beast to prey upon that which isn't considered normal. In April of 1995 our group, consisting primarily of Chapman University students and their guru Dr. Fred Caporaso, was fortunate to observe the non-botanical feeding habits of a land iguana on the island of Plaza Sur.

...THE TIME WAS 1430 WHEN I SPOTTED A LAND IGUANA LEISURELY WALKING OVER THE SMOOTH AND RATHER FLAT ROCKS NEAR THE OCEAN'S SHORE. THE SMOOTHNESS OF SAID ROCKS WAS PRIMARILY SEA LION ACTIVITY, OF WHICH MANY ABOUNDED WITHIN CLOSE PROXIMITY. FIRST THE LIZARD INVESTIGATED A NUMBER OF BROWN SPOTS (DRIED SEA LION URINE) AND PIECES OF FECAL MATTER. EACH SPOT WAS CAREFULLY "TASTED" WITH TONGUE AND NOSTRILS, TWO PIECES OF FECAL MATTER WERE PICKED UP, BUT NEITHER INGESTED.

AFTER SOME TWENTY FEET OF STROLLING AND CONTINUOUSLY TASTING THE GROUND, THIS IGUANA CAME UPON A DEAD SEA LION. FROM ITS APPEARANCE, PARTIALLY MUMMIFIED, I SUSPECTED THIS PINNIPED TO HAVE DIED AT LEAST TWO WEEKS PRIOR. NOT MUCH FLESH ADHERED TO THE ALREADY BLEACHED OUT BONES AND THE REMAINING SKIN COULD BEST BE DESCRIBED AS BEING THE CONSISTENCY OF PARCHED LEATHER.

AS SOON AS THE IGUANA MADE CONTACT WITH THE DEAD SEA LION, IT STARTED TEARING AWAY AT THOSE DRIED-OUT REMAINS. USING ITS SHARP AND SERRATED TEETH, PLUS A SET OF EXTREMELY POWERFUL JAWS, IT BIT OFF PIECES OF SKIN AND TORE AWAY AT THE MAMMAL'S EXPOSED RIB CAGE. EVEN WITH ALL THAT ADEQUATE EQUIPMENT, THE LIZARD'S JOB WAS AN ARDUOUS TASK. BUT IT PREVAILED. SEA LION WAS ON THE MENU, AND SEA LION IT WOULD HAVE!

This feeding spectacle consumed at least ten minutes, and none of our group's movements deterred the iguana from its primary objective. A short while later, after everyone except myself had wandered off to investigate other animal activities, I observed this same iguana feeding on the plant *Sesuvium* within the splash zone of the ocean. With no fresh water on this island, except for accumulations during excessive downpours, *Conolophus* obtains bodily moisture from the plants it consumes. I suppose that after several mouths full of that dried-up sea lion carcass, that juicy *Sesuvium* went down like proper dessert.

Present population densities of both *Conolophus pallidus* and *subcristatus* may be directly associated with favorable or adverse weather conditions of any given season. During drought years, such as witnessed in 1990–91, when plant species are at low productivity, the iguanas tend to diminish in numbers. While investigating the population status of *C. subcristatus* on the small island of Plaza Sur in January of 1991, we found the iguana colonies to be quite low in numbers and the vegetation of sparse distribution. An adult iguana was found mummified near the downward slope of the island. Others, few in number, were of meager appearance. Then, in April of 1995, the story had changed dramatically. Vegetation was plentiful and so were the lizards. During our walk across part of Plaza Sur we encountered no less than 50–60 iguanas, most of which were sub-adult or adult size, including several "brutes." The animals were in excellent condition and from all indications this promised to be a very good year for *Conolophus* on Plaza Sur. It has been estimated by some that during such an obliging year this island (a mere .13 square kilometers in size) may support as many as 300 land iguanas.

Whalers and buccaneers ceased using land iguanas for food long ago, and scientists no longer need to collect specimens to fill those infamous formaldehyde bottles. These, plus the control of feral animals (particularly rats, pigs and dogs), and the repatriation program by the Charles Darwin Research Station and Ecuador's National Park Service, all add up to a bright future for a truly magnificent beast. We must never stop our vigil to protect and nurture a heritage that can never be

Conolophus subcristatus feeding on the leathery remains of a dead sea lion on the island of Plaza Sur (South Plaza). The immediate presence of live sea lions didn't bother this lizard at all. *Photograph: Karl H. Switak*

This adult female *Conolophus subcristatus* was photographed on Plaza Sur (South Plaza) in 1986. *Photograph: Karl H. Switak*

replaced. Extinction is forever. The process cannot be reversed!

Conclusion

It goes without saying that visiting the Galapagos Islands is much like traveling to paradise. Although reptiles have always been the primary purpose for seeking out these enchanted isles, and I suppose always will be, I cannot help but wonder how so many animal species live in such harmony. And to this end I must once again quote from the works of the person who really sorted out the lot.

> ...WHEN WE REMEMBER THE WELL-BEATEN PATHS MADE BY THE MANY HUNDRED GREAT TORTOISES, THE WARRENS OF THE TERRESTRIAL *AMBLYRHYNCHUS* [=*CONOLOPHUS*], AND THE GROUPS OF THE AQUATIC SPECIES (REPTILES) BASKING ON THE COAST-ROCKS, WE MUST ADMIT THAT THERE IS NO OTHER QUARTER OF THE WORLD WHERE THIS ORDER REPLACES THE HERBIVOROUS MAMMALIA IN SUCH EXTRAORDINARY A MANNER.
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> *Charles Darwin 1839*

References

Beebe, W. 1924. Galapagos: World's End. Putnam's Sons, New York & London. 443 pp.

Darwin, C. 1839. Voyage of the Beagle (Journal of Researchers, London). Penguin Books, London, 1989. 423 pp.

Harris Jr., L.E. 1996. Lizards lost in time: Galapagos land iguanas. *Iguana Times,* Vol. 5, No. 2.

Jackson, M.H. 1993. Galapagos: A Natural History. Univ. of Calgary Press, Canada. 315 pp.

Slevin, J.R. 1959. The Galapagos Islands: A history of their explorations. Calif. Acad. Sci., San Francisco, CA. Occasional papers no. 25, 150 pp.

Sprackland, R.G. 1992. Giant Lizards. TFH Pub., Neptune City, N.J. 288 pp.

Van Denburgh, J. & Slevin, J.R. 1913. The Galapagoan lizards of the genus *Tropidurus;* with notes on the iguanas of the genera *Conolophus* and *Amblyrhynchus.* Proc. Acad. Sci., San Francisco, CA. 4th series, 2:133-202.

Editor's Note: The West Indies also had giant tortoises and a tremendous biological diversity, many species of which were extinct by Darwin's time.