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Cover: Harlequin poison dart frog, *Oophaga histrionica*. Photograph of a captive specimen by Tim Ness.

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Portrait of a Herpetologist as an Older Man—Chapter 7: The Galápagos Islands

James B. Murphy
3100 Connecticut Ave NW, #431
Washington, DC 20008
jbmurphy222@gmail.com

Some parts of this article have been presented elsewhere, but are included again here to produce continuity.

Introduction

The late Ray Ashton worked for an ecotourism company some years ago and asked me to lead some trips. One such opportunity involved two visits to the Galápagos Islands. Usefully, on the first trip the passenger seated next to me on the plane from Quito to the Archipelago was a British scientist who was studying marine iguanas. He explained that the population was plummeting, especially among juveniles and hatchlings, due to loss of marine algae—owing to El Niño effects—upon which the lizards feed.

The El Niño Southern Oscillation (ENSO) is one of the most important climatic phenomena on Earth. El Niño and La Niña are opposite extremes of the ENSO, which refers to cyclical environmental conditions that occur across the Equatorial Pacific Ocean. These changes are due to natural interactions between the ocean and atmosphere. Sea surface temperature, rainfall, air pressure, atmospheric and ocean circulation all influence each other. An El Niño condition occurs when surface water in the equatorial Pacific becomes warmer than average and east winds blow weaker than normal. El Niños typically occur every 3 to 5 years. The opposite condition is called La Niña. During that phase of ENSO, the water is cooler than normal and the east winds are stronger.

There are several main sea currents in the Archipelago that have an influence on its wildlife and plant communities. Perhaps the most important is the Humboldt Current. This is a cold South Equatorial Current which comes into the Galápagos waters from the west. This current runs up the whole coast of South America, heading north from the cooler waters of Antarctica, and when it gets to the Equator it heads west. The second current with an influence is the Panama Current. This comes in from the north and brings warmer waters to the Galapagos Islands. Finally, the Cromwell Current is a deep-sea current, and it runs from the west. This drives nutrients up from the lowest levels to the surface.

On my first trip, the naturalist overseeing the tour turned out to formerly have been the top sports medical doctor in Belgium. He spoke English, German, French, Spanish, and his native tongue, Flemish. One evening, I asked how he ended up in the New World so far from his home; the tale he told was amazing and totally unexpected.

The game of soccer in Europe is highly competitive; there have been a number of times where the attendees were so highly charged with emotion that riots occurred, resulting in deaths and serious injuries. In his case, he was expected to be on site for all sporting events in Belgium, to address emergencies.

One day in 1985, two rival teams were so competitive that there were a number of fights between players and fans (see Figure 1). The vociferous crowd was so inflamed that fans ran onto the field and began pummeling their opponents with such vigor that many were injured and 41 persons died. All available police and medical workers (doctors, nurses, ambulances etc.) were called and an emergency room was set up in the basement so doctors could amputate limbs and perform life-saving surgery.

The scene was so traumatic that it was remindful of a battlefield in war. After the chaos, the naturalist did not return home to be with his wife and two sons, but rather went immediately to the airport and caught a flight to Ecuador. Since he was a polyglot and medical doctor, he easily found employment as a naturalist on the Galápagos Islands.

He was a mentor to me. After adapting to the cool waters, we dove to collect spiny lobsters for dinner. He taught me how to position myself in the water to watch flightless cormorants and Galápagos penguins pass by searching for fish prey. Surprisingly, there are internet and newspaper reports of cormorants aggressively attacking divers. He took me to spots where the surf was calm enough to watch marine iguanas feeding underwater on sargassum algae. The poor condition of these lizards was unmistakable—ribs visible, hind limbs smaller than normal, bony pelvis, sunken tails, and overall starved appearance. Recruitment was nonexistent—I saw only one subadult and no neonates—and I thought back to what my seatmate had said about El Nino.

The Galápagos Hawk (*Buteo galapagoensis*) is a large, rare raptor endemic to the islands. This beautiful bird is known for its fearlessness towards humans. The males are smaller than the females, as with many birds of prey. Their young appear differ-

RIOT: 41 Killed, Hundreds Hurt at Soccer Game
41 Killed as British, Italian Soccer Fans Riot

MAY 30, 1985 12 AM PT
ASSOCIATED PRESS

BRUSSELS — Forty-one people were killed and hundreds were injured in a riot Wednesday night between fans of British and Italian teams about to play the Super Bowl of European soccer. Most of the victims were trampled to death or crushed under a wall that collapsed, said Louis Wouters, president of the Belgian Soccer Federation, who reported the death toll.

Officials said the riot started in the crowd of more than 50,000 when British fans broke into an Italian section. Television crews set up for the game broadcast it to millions of fans watching worldwide.

A brick wall collapsed as the clash began, and mangled bodies piled on top of one other. Broken metal crowd-control barriers were used as stretchers to carry the victims out of Heysel Stadium.

Figure 1. Headline and first few paragraphs of an article that appeared in the *Los Angeles Times* in 1985.

ent from adults because they are darker and have camouflage which aids them in remaining protected from potential predators until they are fully grown.

I saw several perched on large rocks but never witnessed a predatory event. The diet includes insects such as locusts, and giant centipedes, as well as lava lizards, snakes, rodents and carrion. They will also take marine and land iguanas, sea turtles and tortoise hatchlings. These predators steal birds' eggs as well as their young.

Grapsus grapsus is one of the most beautiful crabs along the western coast of the Americas. It is known as the red rock crab, or, along with crabs such as *Percnon gibbesi*, as the Sally Lightfoot crab. It is common where it feeds on algae and carrion.

The Galápagos mockingbird (*Mimus parvulus*) is a species of bird in the family Mimidae. *Mimus p. parvulus* is found on Santa Cruz, North Seymour, Daphne Major, Isabela and Fernandina. When we stopped to have a drink of bottled water, these birds mobbed all of us to get a sip. One landed on my head, clung to my hair with its claws, and bent down to join me as I was sipping. The naturalist cautioned us to prevent the birds from drinking as it was interfering with normal behavior.

I was disappointed that I saw no snakes on either trip to the islands. The Galápagos snakes are among the most beautiful reptiles of the archipelago. The latest taxonomy recognizes nine species endemic to the Galápagos, all in the genus *Pseudalsophis* (Zaher et al., 2018; Arteaga et al., 2019). All inhabit the dry zones of the islands; however they are not found on all of the islands. Commonly these snakes are known as "racers" as they can move very rapidly. I have seen videos of these snakes in a group chasing newly hatched marine iguanas and they are often successful in capturing them. Galápagos snakes are quite small, only measuring 2–3 feet long. They are brown with yellowish longitudinal stripes. The snakes are presumed to have arrived on the islands by vegetation rafts. Galápagos snakes can be slightly venomous to humans and may use venom to kill their prey. They first catch the prey with their mouths and mainly kill by constriction.

The naturalist took me to several colonies of magnificent frigatebirds (*Fregata magnificens*). With body length 89–114 cm (35–45 in), it is the largest species of frigate and has the longest bill. The adult male is all black with a scarlet throat pouch that can be inflated like a balloon in the breeding season. We watched them chase terns, blue-footed boobies and other seabirds until their food was dropped. The frigatebird is sometimes called the "man-o-war bird" because it harasses other birds until they regurgitate recently captured food, which the frigatebird usually snatches in midair.

The Galápagos sea lion (*Zalophus wollebaeki*) is a species that breeds on the Galápagos Islands and, in smaller numbers, on Isla de la Plata (Ecuador). They are the smallest sea lion species. Being fairly social, they are often spotted sun-bathing on sandy shores or rock groups or gliding gracefully through the surf and they are popular with visitors to the islands. He showed me how to help our clients get close enough to photograph seal lion colonies without being attacked by the highly aggressive male beach masters. Dozens of lava lizards crawled over their bodies snapping up flies. In one instance, an adult female in prime condition had her rear fins entirely removed, probably by a shark, and yet was able to maneuver in the sea.

Lava lizards (*Microlophus* spp.) are the most abundant reptiles on the islands. Lava lizards have a relative lack of fear of humans and can be observed quite closely. Several times, these lizards climbed up my body to snatch insects. Lava lizards can grow up to a foot in length, but are usually about 5–6 inches long. Colors vary and some can be quite beautiful, from mottled gray to speckled copper or black with gold stripes. The male lava lizard looks quite different from the female; it is larger in size and more brightly colored. The male's throat is black and yellow and the female's throat is mostly red. There are ten different species of lava lizard on the islands. On an island where only one species of lava lizard is present, individuals may be a grayish yellow color on the beach, but further up among the black lava rocks, the same species may be much darker. Lava lizards play an important role in controlling populations of insects such as the painted locust. They are predators of invertebrates and will quite often eat each other (cannibalism). Lava lizards also eat vegetable matter, particularly during dry spells.

The naturalist spent much time pointing out Darwin's finches and describing the varied beak morphology and feeding differences among the 13 taxa. Darwin's finches, named due to their role in Charles Darwin's theories on evolution, are ostensibly the most renowned land birds of the Galápagos. Fascinated with diversity found among the 13 species and the speed with which they evolved from a common ancestor to adapt to the varied supply of food available on individual islands, Darwin discovered that these adaptations mainly showed up in the shape and size of beaks. They are not very remarkable looking. Endemic and typically easy for visitors to spot, it takes an expertly trained eye to differentiate the 13 species that scientists believe descended from a shared ancestor. The differences in distribution, plumage, feeding habits, body size, beak size and shape helped inform Darwin's theories.

The naturalist owned a horse-breeding farm on Santa Cruz Island, where the horses munched grass along with tortoises (probably *Chelonoidis donfaustoi*); it was a peculiar picture. He had a large garden where he had planted a suite of native plants from most islands; he used it to collect seeds for global botanical institutions without cost and as a hedge against volcanic eruptions. He was particularly upset by the illegal collection of marine sea cucumbers and other protected fauna by collectors and alerted authorities surreptitiously whenever he encountered them; he was a true conservationist.

As a special treat, he took the group to the Charles Darwin Research Station where herpetologist and director Linda Cayot took us behind the scenes to photograph Lonesome George, a male Pinta Island tortoise (*Chelonoidis abingdonii*) and the last known individual of the species.

As we traveled between islands, I was surprised by the large number of sharks and dolphins that followed our boat, possibly expecting a meal with table scraps thrown overboard. The naturalist expressed concern about the large number of giant cruise vessels, disgorging dozens of passengers on this fragile ecosys-

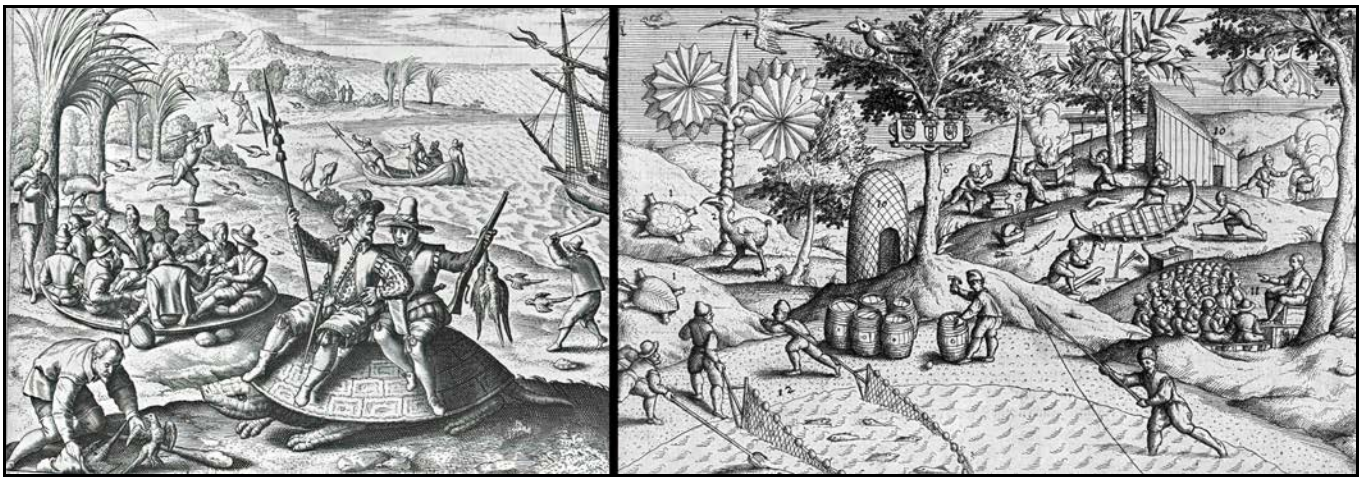

Figure 2. Woe to the poor turtle. Etchings by Johann Theodor & Johann Israel de Bry depicting the plight of giant tortoises, dodos, parrots and other creatures at a Dutch colony on the shore of the island of Mauritius in the Indian Ocean, circa 1595.

tem, and large amounts of trash attracting these creatures.

Humans and Tortoises

"PITIABLE SEEMS THE CONDITION OF THIS POOR EMBARRASSED REPTILE: TO BE CASED IN A SUIT OF PONDEROUS ARMOUR, WHICH HE CANNOT LAY ASIDE; TO BE IMPRISONED, AS IT WERE, WITHIN HIS OWN SHELL, MUST PRECLUDE, WE SHOULD SUPPOSE, ALL ACTIVITY AND DISPOSITION FOR ENTERPRIZE . . . THE MOTIVES THAT IMPEL HIM TO UNDERTAKE THESE RAMBLES SEEM TO BE OF THE AMOROUS KIND: HIS FANCY THEN BECOMES INTENT ON SEXUAL ATTACHMENTS, WHICH TRANSPORT HIM BEYOND HIS USUAL GRAVITY, AND INDUCE HIM TO FORGET FOR A TIME HIS ORDINARY SOLEMN DEPORTMENT."

GILBERT WHITE (1789) DISCUSSING HIS PET GREEK TORTOISE, TIMOTHY.

The history of giant tortoises (and other species as well) is interesting and sometimes saddening (Figures 2–6). Feral island invasives introduced by humans include dogs, cats, pigs, donkeys, goats, black rats, and blackberries. As an aside, cats were impossible to eliminate on the rocky islands in New Zealand

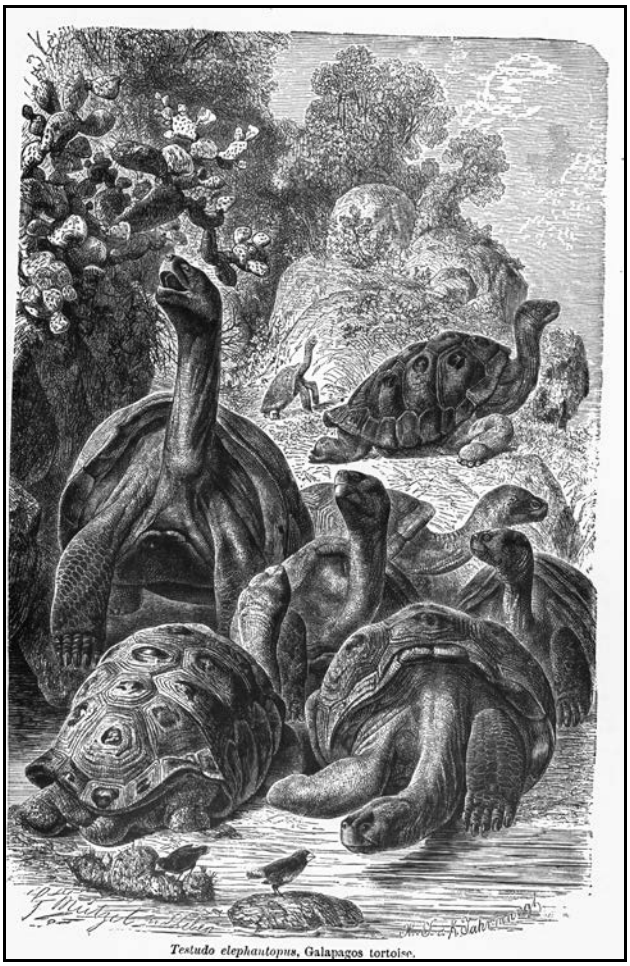

Figure 3. From *The Riverside Natural History. Volume III. Lower Vertebrates* in 1888 by Alfred Brehm.

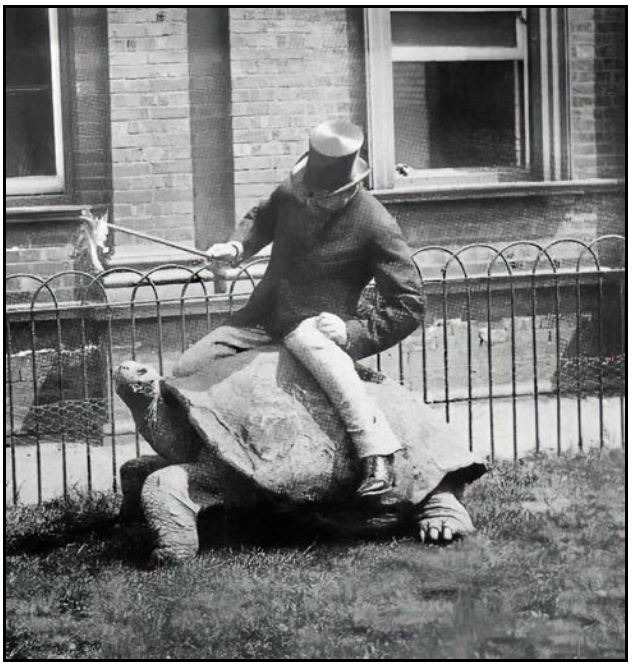

Figure 4. The Honorable Walter (later 2nd Baron) Rothschild riding his giant tortoise Rotumah in front of London Zoo reptile house circa 1898. He was certainly well dressed. Notice the food extended on a stick to entice the animal to move forward. He developed a private zoological museum called Walter Rothschild Zoological Museum in Tring, which opened to the public in 1892. The collection was transferred to the nation in 1937 and is overseen by the Natural History Museum in London. The name was changed in 2007 to Natural History Museum at Tring. Courtesy of John Edwards.

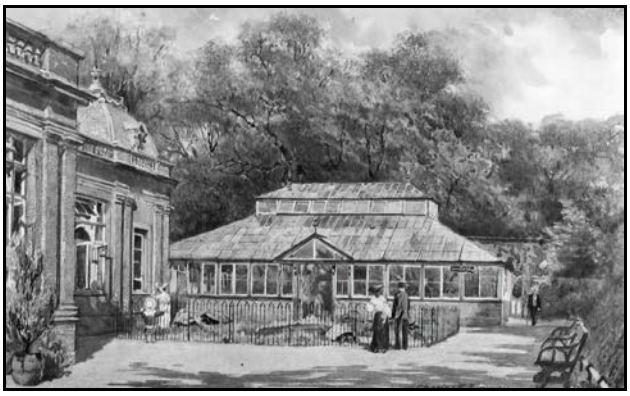

Figure 5. Tortoise House at London Zoo circa 1900. The structure was constructed three years earlier for a cost of approximately £465, later became a Tropical House and was demolished in 1985. Image from H. Schrerren's *The Zoological Society of London* in 1905. Courtesy of Smithsonian Institution Libraries, Washington, D.C.

supporting tuataras and other endemics. Everything was tried to trap them—nothing worked until one of the wildlife biologists suggested baiting the traps with sandboxes—every cat was caught!

Between 1831 and 1868, whalers traveled by sea to the Galápagos Islands to collect tortoises for food and oil. Charles Haskins Townsend, director of the New York Aquarium, examined 79 logbooks and discovered that 151 ships made 189 visits, leading to a conservative estimate of 13,013 tortoises removed (Townsend, 1925) "What a contribution could be made to the world's food supply if the otherwise unimportant islands where, unknown to primitive man, the tortoises reached such an amazing development, could be cleared of the pests introduced by civilized man and the original conditions restored! This is now unfortunately impossible on the Galapagos. The only remaining hope for the race is the establishment of survivors elsewhere."

In 1928, Townsend himself collected almost 200 mostly juvenile tortoises from Albemarle Island, which he distributed to

Figure 7. Galapagos tortoise being weighed at Bronx Zoo in 1946. In 1928 Charles Haskins Townsend, director of the New York Aquarium, was so concerned about the future of these tortoises, he collected over 200 from Albemarle Island to develop assurance colonies at zoos. Photograph provided by John Behler, courtesy of Wildlife Conservation Society, headquartered at Bronx Zoo.

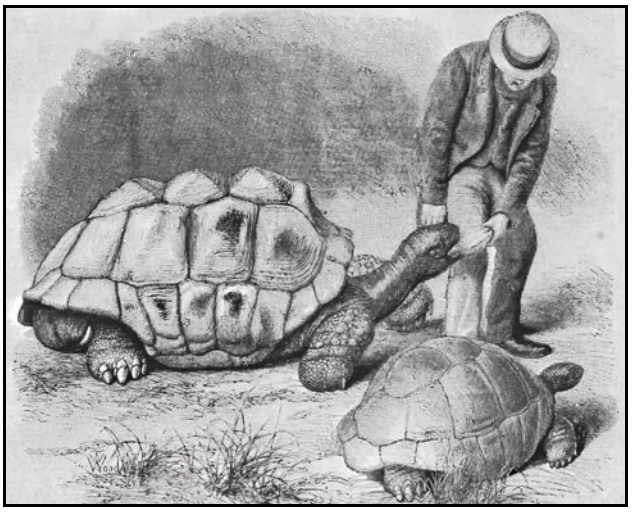

Figure 6. Giant tortoises at Regent's Park. *The Field*, 4 September 1875. Courtesy of Smithsonian Institution Libraries, Washington, D.C.

zoos to develop captive breeding programs (Figure 7). Pritchard (1996) describes the fates of some of Townsend's tortoises; a figure on page 24 shows a large male that was exhibited at Houston Zoo. Pritchard (op. cit.) also covers successful captive reproduction: "Some individuals from the original 1928 collection still survive in US institutions, and in recent years there has been excellent captive reproduction, e.g., at the Gladys Porter Zoo in Brownsville, Texas, and at Life Fellowship Facility in Seffner, Florida (where 85 hatchlings were produced in 1988–89, with some females nesting five times in a season)."

In 1928, Townsend published a paper that told of finding the remains of numerous giant tortoises that had died after being trapped in a cave on Charles Island (now Isla Floreana). Broom (1929) described those remains and estimated that the Charles Island species (see Figure 8) had disappeared by 1850. In 1931 and 1937, Townsend published two papers on growth and age in zoo tortoises, generated from eight institutions in Florida, Texas, California, Louisiana, Hawaii, Arizona and Sydney, Australia. Grant (1947) described Townsend's life and scientific contributions, and included a bibliography of his publications and a list of herpetological taxa named in his honor.

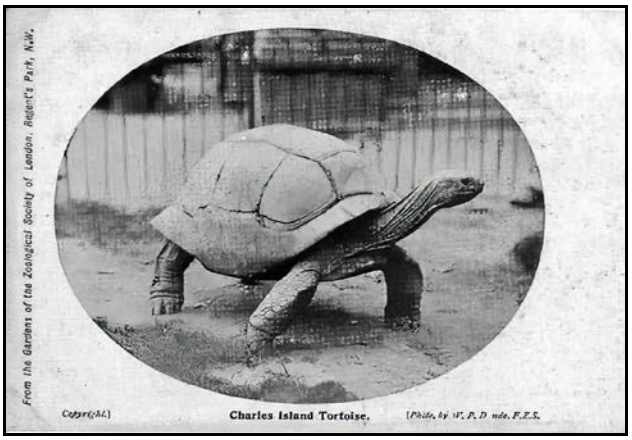

Figure 8. Charles Island (now Floreana) Tortoise (*Chelonoidis niger*). Official Zoological Society of London postcard from series in 1904. Photo by W. P. Dando. This reptile is believed to have become extinct in the wild in the mid-1800s. Courtesy of John Edwards.

Figure 9. Abingdon (Pinta) Island Tortoise (*Chelonoidis abingdonii*), photographed by F. W. Bond on 20 January 1914 at London Zoo. This male was purchased on 12 January 1914. This species is now extinct after the death of Lonesome George on 24 June 2012. Courtesy of John Edwards.

A female Galápagos Tortoise named Harriet lived at the Queensland Reptile Park, now the Australia Zoo, until her death on 23 June 2006. This tortoise was said to have been collected by Charles Darwin on 17 August 1835 on James Island (Isla San Salvador or Isla Santiago), and taken back to England in 1836 on the H.M.S. Beagle (Coote, 2001). A detailed history of this tortoise, speculated to have lived more than one-and-a-half centuries, is beyond the scope of this article but see Coote (2001), Thomson et al. (1998), Powell and Caccone (2006), and Bauer and McCarthy (2010).

The most famous tortoise was "Lonesome George," discovered on Pinta Island in 1971. The Wikipedia entry on George is extensive and includes several photographs. The taxon *Chelonoidis abingdonii* was thought to have gone extinct around 1920, but this last representative was brought to the Charles Darwin Research Station in the Santa Cruz Island for captive breeding (see Cayot et al. [1994] for a history of the station). The tortoise lived up to its name, rejecting even closely related females until its passing on 24 June 2012. George had great press coverage with a whole book written about his life (Nicholls, 2006). His remains are mounted for display at American Museum of Natural History (Sachs, 2014). A photograph from the London Zoo in 1914 depicts another specimen from Pinta (Figure 9).

"The taxonomy of giant Galapagos tortoises (*Chelonoidis* spp.) is currently based primarily on morphological characters and island of origin. Over the last decade, compelling genetic evidence has accumulated for multiple independent evolutionary lineages, spurring the need for taxonomic revision" (Poulakakis et al., 2015).

There have been attempts to reconstruct lineages in captive Galápagos Islands tortoises worldwide using DNA analyses: Claudio Ciofi (pers. comm.), Burns et al. (2003), Milinkovitch et al. (2004), Russello et al. (2007), Poulakakis et al. (2008), Ciofi et al. (2009), Russello et al. (2010), Benavides et al. (2012) and Edwards et al. (2013).

Two zoos have returned their rarest tortoises to the Islands—an adult female Duncan Island Tortoise in Bronx Zoo in 1972 [collected by Townsend in 1928] and an adult male Hood Island Tortoise, which lived at San Diego Zoo for over 40 years, in 1977 (Pritchard, 1996).

Pritchard (1996) provides a sobering overview of the pressures faced by these tortoises: "But the spread of mankind over the face of the globe, more than any other factor, has plunged the giants into ignominious retreat. The opportunistic, ingenious new predator, literally as omnivorous as a pig and much more dangerous, proved too much for tortoises beyond a certain size."

Iguanas betwixt land and sea

PEOPLE OFTEN ASK, "WHAT GOOD ARE LIZARDS?" TO WHICH WE RESPOND WITH "WHAT GOOD ARE PEOPLE?" SUCH ANTHROPOCENTRISM IS ABHORRENT. LIZARDS HAVE AS MUCH OF A PLACE ON THE PLANET AS ANY LIVING CREATURE, INCLUDING HUMANS. INDEED, THEY HAVE SUCCESSFULLY INHABITED EARTH FOR MUCH LONGER THAN HUMANS HAVE—LIZARDS WILL UNDOUBTEDLY PERSIST LONG AFTER HUMANS AND MOST OTHER MAMMALS HAVE GONE EXTINCT. LIZARDS ARE SPECTACULAR PRODUCTS OF NATURAL SELECTION AND HAVE DIVERSIFIED TO FILL AN AMAZING VARIETY OF ECOLOGICAL NICHES. THEY ARE EXTREMELY GOOD "MODEL" ORGANISMS FOR STUDY, AND UNDERSTANDING THEIR ECOLOGY AND DIVERSITY CAN BE EXCEEDINGLY INFORMATIVE. WHAT WE HAVE LEARNED ABOUT LIZARDS IS APPLICABLE TO NEARLY EVERY CONCEPTUAL AREA IN MODERN BIOLOGY; INDEED, IN MANY CASES DEVELOPMENT OF ENTIRE FIELDS OF BIOLOGY HAD THEIR ORIGINS IN THE STUDY OF LIZARDS. BECAUSE MANY LIZARDS ARE QUITE BEAUTIFUL, THEY ARE VERY POPULAR AS PETS AMONG HERPETOCULTURISTS AROUND THE WORLD, AND SOME PEOPLE MAKE THEIR LIVING BY BREEDING MANY SPECIES OF LIZARDS IN CAPTIVITY FOR RESALE.

PIANKA AND VITT (2003)

C. B. "Si" Perkins, curator of reptiles at San Diego Zoo, and G. Allan Hancock, mounted trips in 1932 and 1933 to the Galápagos Islands to study and collect animals for the zoo. Hancock's ship was the state-of-the-art *Velero III*, nearly 200 feet in length. He was a bit of a prig, insisting that his fellow passengers—a group of scientists including Perkins—dress for dinner and moreover, cease smoking and drinking. For those of us who are not focused on the latest in apparel and enjoy a bit of whiskey and strong cigarettes in the evening, this trip would have been unendurable. The notation "No cocktails tonight." appeared daily in the Perkins diaries (Campbell, 1978).

During the first trip, Hancock and Perkins decided to move 40 Galápagos land iguanas (*Conolophus subcristatus*) (Figure 10) from Baltra Island (known also as South Seymour Island) to North Seymour Island which contained no iguanas. As Perkins wrote in his diaries, their reason: ". . . in a few years come down and see if anything has happened. A good idea, I believe" (Campbell, 1978). Twenty more iguanas were translocated on the second trip.

Baltra became an American airbase during World War II in the 1940s and several thousand military and support personnel

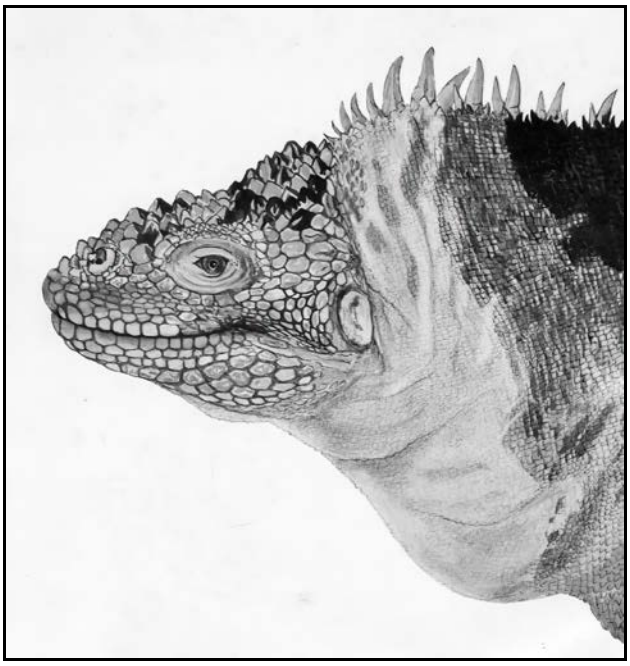

Figure 10. Curator Si Perkins from San Diego Zoo moved 60 Galápagos Land Iguanas (*Conolophus subcristatus*) from Baltra Island (known also as South Seymour Island) to North Seymour Island, which contained no iguanas in the 1940s. Had this not been done, this species would now be extinct, thanks to human activities. Image from Beebe (1924).

were stationed there, in part to guard the Panama Canal. Several factors contributed to the disappearance of these lizards—habitat destruction, introduction of feral animals, and using the lizards for target practice.

There appeared to be virtually no successful reproduction or recruitment on North Seymour for the subsequent 47 years, so a pair of adults was brought to the Charles Darwin Research Center on Santa Cruz Island to begin a captive colony; additional iguanas were included in this potential breeding group later from Baltra (Cayot et al., 1994). These iguanas reproduced and survived, particularly because feral cats and dogs had been reduced on Baltra. In June 1991, 35 five-year-old iguanas were repatriated to Baltra and 24 were released the next year. This head-starting program was truly an accomplishment deserving praise, thanks to Perkins and Hancock.

A new species, the Galápagos Pink Land Iguana (*Conolophus marthae*), was described in 2009 from Isla Isabela. The taxonomy of Galápagos land iguanas is incomplete and this may represent a further threat to the persistence of all species in the group (Gentile et al.; 2009).

Ray Pawley (1965, 1966, 1969, 1971) from Chicago Zoological Park (Brookfield Zoo) described a self-sustaining colony of Marine Iguanas (*Amblyrhynchus cristatus*) (Figure 11) in a large exhibit in the reptile building. I visited the zoo on a number of occasions and was impressed by the overall health and activity of these lizards. This species is challenging to maintain successfully in captivity and one of his saurians lived for over six years.

My Second Trip

On my second trip to the Galápagos our guide had been born in Quito and became a guide in the Archipelago in his teens. He

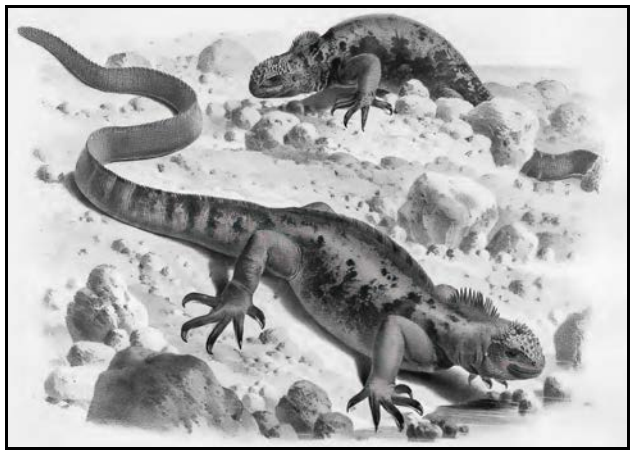

Figure 11. Marine Iguanas (*Amblyrhynchus cristatus*). This species was successfully kept at Brookfield Zoo in Chicago. Image from Steindacher (1876).

was very competent. One day, he asked the clientele if any wanted to do some underwater viewing of flora and fauna; most jumped at the chance. One older woman, who had never been underwater, purchased a complete set of equipment—fins, wetsuit, goggles, air tank, weight belt, and so on; she was very excited. As she flipped backwards over the side of the boat, she sank like a stone; we hadn't noticed that she was wearing her weight belt. Our guide immediately saw what had transpired and pulled her to the surface, coughing, stuttering and terrified. That was her first and last experience.

Volcanic islands may have deep sinkholes, and tortoises can accidentally fall to the bottom and die. George Zug (pers. comm.) told me that many of the islands have such lethal traps, littered with tortoise remains. The guide asked if any in the group would like to rappel down the side 40 feet on a rope to see the pile of skeletons. Only one person did and he was in his late 80s in age; I was worried that this experience would be far too strenuous and dangerous for him. He said that he had dealt with far worse; in WWII he had been a paratrooper.

The guide tied two ropes together but the knot did not seem secure; I was told not to worry so I tied the rope under the arms of the old gentleman and began lowering him. About half-way down the knot loosened and he fell the floor and remained immobile with arms and legs akimbo. I was sure that he was dead so I rapelled down the now 20-foot rope, bloodying my fingers on the rough wall as I continued the descent; he was just beginning to stir as I hit bottom. This time we checked the rope and hauled him up to the edge of the hole. I called the tourism company and told them about the incident—the client did not sue as he said that we had warned him about the danger and he had insisted on going anyway.

We saw a significant number of male Green Sea Turtles (*Chelonia mydas*) circling what I assumed to be females but since the Humboldt Current is quite cool, I did not dive into the sea to see male penises for a positive identification. Other sea turtles observed in smaller numbers included Hawksbill (*Eretmochelys imbricata*) and Olive Ridley (*Lepidochelys olivacea*). Leatherbacks (*Dermochelys coriacea*) were not seen.

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What's in a Name? The Egg-eating, Histrionic, Harlequin Poison Dart Frog of El Chocó

Tim Ness
906 Belmont Road
Grand Forks, ND 58201
timness58201@gmail.com

Harlequin poison dart frogs live in one of the wettest regions on Earth, the lowland rainforest along the west coast of Colombia and Ecuador known as El Chocó. On a warm, humid day their calls echo from the clearings in the forest like the rapid quacking of ducks. These brilliantly colored frogs must compete with the others to attract a mate. So in order to stand out from the rest of his kind the male puts everything he can into his song, until at last a female appears

Harlequin poison dart frog, *Oophaga histrionica*. Photographs by the author.

Courtship is a two- or three-hour study in amphibian touching. One of the frogs may circle the other while shaking its head or kicking out its feet. The other frog will bow deeply in response. Now they have chosen each other as mates. It is time for them to lay their eggs and raise their young.

The scientific name of this species is *Oophaga histrionica* (pronounced Oh-ah-fuh-guh hiss-tree-ahn-ee-kuh). The word *Oophaga* is a combination of the Greek words for "egg" and "eater," and refers to the frogs' specialized way of feeding their young.

Tadpoles in the trees

At mating time the female selects a leaf as her laying spot. She deposits the eggs, and the male fertilizes them. Then he guards the territory while she tends the eggs. When they hatch, the tadpoles swim up out of the egg mass and onto their mother's back. Since the young frogs still breathe through gills, they must remain in water at this stage of their development. Their mother now distributes the young among bromeliad plants, relatives of the pineapple. These plants catch and hold water in their whorls of leaves. She places only one tadpole into each small puddle. Then she visits the spots periodically, laying unfertilized eggs. These eggs will be the tadpoles' only food until they lose their gills, absorb their tails, and start breathing air. They will then be ready to feed on insects and to set out to explore their rainforest home.

Showing off for the good of the species

The second part of the harlequin poison dart frog's name, *histrionica*, comes from the Latin word *histrio*, meaning actor. The English word histrionic describes someone who expresses emotions in an exaggerated fashion. In scientific names the word is often used to describe animals whose brightly colored markings are reminiscent of a type of clown from 16th-century Italian

comedy. These actors, known as Harlequins, wore gaudy, diamond-patterned costumes, and like all clowns, they were histrionic, a word which calls up images of the frogs' behavior as well.

The males express themselves with an elaborate display of color and song. The faster, louder, and longer their calls are, the more impressed are the females and the greater the pair's mating success. Since their vocalizations get more complicated with the age of the singer, the females end up mating with older frogs. These males do more than put on a good show. The eggs from these matings have higher hatching rates and produce healthier tadpoles. The fact that they have lived so long proves that they and their offspring can survive the dangers of the rainforest. The best way for them to provide a secure future for their descendants is to keep increasing the rhythm and the pace, ensuring that the strongest individuals survive to sing their songs for future generations.

Harlequin poison dart frogs are capable climbers.

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A Probable Case of Sandhill Crane Predation on a Northern Watersnake

Dreux J. Watermolen
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921
dreux.watermolen@wisconsin.gov

Abstract

Northern watersnakes (*Nerodia sipedon*) have a broad range of natural enemies, including several known or suspected avian predators, but published reports of predation on watersnakes have been limited. Here, I describe an observation of a Sandhill Crane (*Antigone canadensis*) likely preying on a northern watersnake in central Dane County, Wisconsin in June 2022.

Successful conservation efforts require a comprehensive understanding of species life histories and recognition of the interactions that animals have with others in their habitats. Northern watersnakes (*Nerodia sipedon*) have a broad range of natural enemies including various species of fish, frogs, reptiles, birds, and mammals. According to Ernst and Ernst (2003), and literature cited therein, known and suspected avian predators of northern watersnakes include "rails (*Rallus longirostris*), bitterns (*Botaurus lentiginosus*), egrets (*Egretta* sp.), herons (*Ardea herodias*), vultures (*Cathartes*, *Coragyps*), hawks (*Buteo jamaicensis*, *B. lineatus*, *Circus cyaneus*), and gulls (*Larus argentatus*)." In addition, Wynn and Armitage (2021) list American Robins (*Turdus migratorius*) and Common Crows (*Corvus brachyrhynchos*) consuming neonate watersnakes, and Barred Owls (*Strix varia*) and Double-crested Cormorants (*Nannopterum auritum*) as "not so selective" predators. Here, I discuss an observation of a Sandhill Crane (*Antigone canadensis*) likely preying on a northern watersnake.

The 140-acre Madison Metropolitan Sewerage District Wildlife Observation Area, a unit of the Capital Springs Recreation Area[1] on the south side of Madison, Wisconsin, is managed to attract and support migrating shorebirds. Formerly used to store biosolids produced at the Nine Springs Wastewater Treatment Plant, the utility decommissioned and reconstructed the lagoons in the area to provide wildlife habitat and recreation. The eastern part includes a mix of open water and emergent wetlands. In the western part, water is pumped from the ponds during spring and fall migrations to expose expansive mudflats, providing an abundant food supply for a variety of shorebirds. Approximately three miles of hiking trails traverse the area, making it popular with local bird watchers and wildlife photographers.

Throughout the spring, summer and fall, visitors to the Wildlife Observation Area regularly observe Sandhill Cranes feeding on land or in the shallow marshes. On the evening of 19 June 2022, a companion and I encountered a pair of Sandhill Cranes with two colts foraging in an area of mowed vegetation adjacent a cattail (*Typha*) marsh. One of the adult cranes poked at something on the ground, repeatedly thrusting its beak into the low vegetation. As we approached, the crane took flight with a snake dangling from its bill. Viewed with binoculars, the easily visible pattern of dark dorsal blotches and alternating lateral bars, along with a cream-colored venter marked with rusty blotches, confirmed the snake was a northern watersnake (Walley et al., 2012), a species that I have observed previously in the Wildlife Observation Area. I estimated the watersnake to be approximately 18–20 inches long, judging its size relative to the adult crane. Although the crane landed only a short distance away, we were unable to make additional observations of its behavior with the snake as the emergent wetland vegetation (sedges and bulrushes) obscured our view.

That a Sandhill Crane might prey on a northern watersnake would not be particularly surprising. The distributions of the two species overlap in several places in the eastern U.S. (Walley et al., 2012; Gerber et al., 2020), and the two species co-occur in various wetland habitats. Sandhill Cranes forage opportunistically and consume a seasonally variable diet of plant and animal foods including leaves, seeds (especially agricultural grains), berries, tubers, earthworms, mollusks, arthropods, and occasionally small vertebrates (Hamerstrom, 1938; Harvey et al., 1968; Lewis, 1975; Mullins and Bizeau, 1978; Reinecke and Krapu, 1986; Rucker, 1992; Davis and Vohs, 1993; Ballard and Thompson, 2000; Roessingh, 2012; Krapu et al., 2014). Animal prey generally comprises a low percentage of the Sandhill Crane's overall diet but probably provides essential amino acids, phosphorus and calcium, particularly during years when the availability of more typical foods may be limited (Reinecke and Krapu, 1986; Geluso and Harner, 2013).

To my knowledge, watersnakes have not previously been reported in the diets of Sandhill Cranes. However, a Sandhill Crane appeared to catch what was believed to be a striped crayfish snake (*Regina alleni*) in a Florida marsh (Dye, 1982), and another Sandhill Crane was observed attempting to consume a juvenile eastern box turtle (*Terrapene carolina*) in Michigan (Tetzlaff et al., 2018). In addition, the closely related Whooping Crane (*Grus americana*) has been observed consuming a gulf saltmarsh watersnake (*Nerodia clarkii clarkii*) (Geluso and Harner, 2013). Whether the crane I observed consumed the snake remains unknown. It is possible that cranes represent an important predator of watersnakes, but I suspect this was more likely an opportunistic predation attempt. Regardless, this report adds to the depauperate literature on watersnake predators (Ernst and Ernst, 2003; Gibbons and Dorcas, 2004).

1. The Dane County Parks Department, Wisconsin Department of Natural Resources, and Friends of Capital Springs Recreation Area cooperatively manage the Capital Springs Recreation Area. The area is located at the east end of the Lewis Nine Springs E-Way, a 7-mile environmental corridor that includes many points of natural and cultural interest <https://parks-lwrd.countyofdane.com/NaturalResourceArea/LewisNineSprings>.

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Herpetological Art at Zoo Atlanta—June 2022

Photos and story by
Roger Carter
625 Lakeview Dr
Zionsville, IN 46077
drymarchonzz@hotmail.com

The 44th International Herpetological Symposium was held in Atlanta, Georgia, on June 8-11, 2022. Just one of the highlights of the symposium was a bus trip to Zoo Atlanta in historic Grant Park, for a private behind-the-scenes tour of the herpetarium. This took place after the zoo was closed to the public and we had a nice dinner at the conference center.

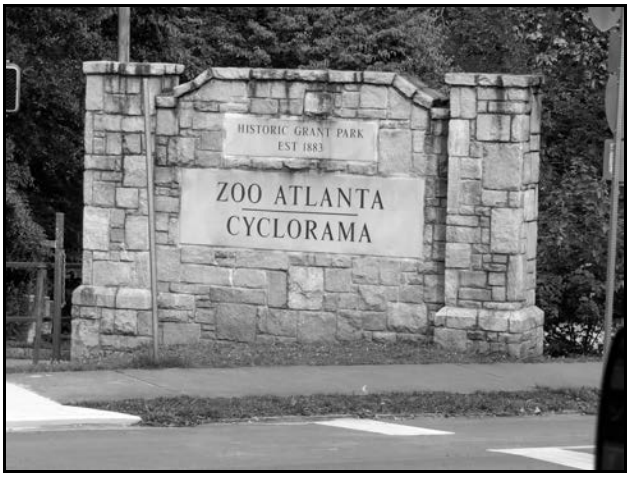
Near the front entrance of the zoo is a "picture" (maybe four feet square) of a red-eyed treefrog, *Agalychnis callidryas*, made from Lego® bricks. There is a sign that says "NUMBER OF LEGO® BRICKS: 18,432 bricks. TOTAL HOURS TO BUILD: 36 hours." This was not a true statue with bricks stacked on top of each other, but this had the bricks laid out side by side. The colors were accurate for this species.

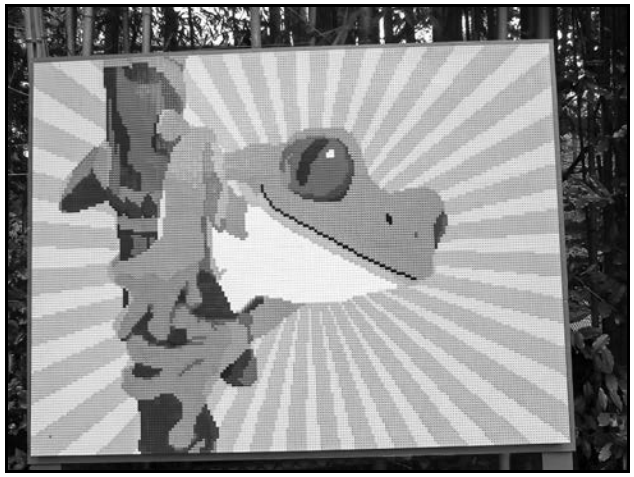
Farther along in the zoo there is a Lego® statue of a Galapagos tortoise made of all red bricks. It is, maybe, twice the size of a real tortoise. There is a sign that says "NUMBER OF LEGO® BRICKS: 21,976 bricks. TOTAL HOURS TO BUILD: 106 hours" and "Typically colored to match its mud-colored surroundings the Galapagos tortoise rendered in bright red draws attention to its domed shape and massive size."

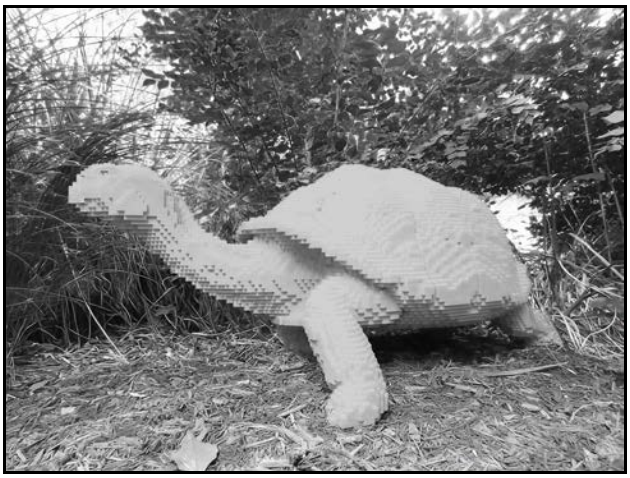
Near the herpetarium is a courtyard with six concrete benches large enough for two people to sit on each one. There are two benches shaped like a frog, two that are shaped like a crocodilian and two that are shaped like a tortoise. In the sidewalk there is the image of a slender snake that is approximately three feet long. I don't know if someone sketched that into the wet concrete or if they used a plastic or rubber replica to press it into the wet concrete.

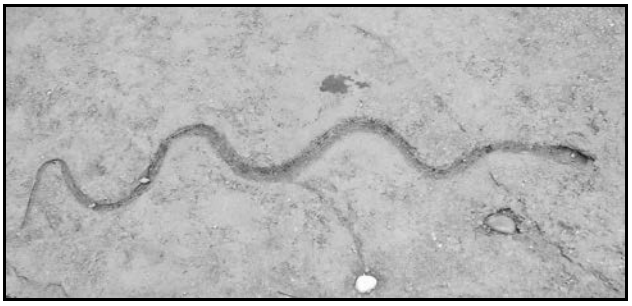
In the conference center where we had dinner there is a ceramic tiled wall that has several copper tiles depicting Galapagos tortoises and armadillos. These tiles were perhaps four inches square.

Other non-herp Lego® art included a large "picture" of a monarch butterfly with the colors accurately portrayed, and a large "picture" of a garden spider with the correct colors. Statues include two human gardeners (yellow bricks) with a lawnmower (green bricks), a mother pangolin (yellow bricks) with a baby pangolin (orange bricks) on mom's back, a zebra with black and white horizontal stripes and a red bow tie (a nearby sign says "This tongue-in cheek rendering . . . "), a large statue of a woodpecker (cyan bricks) hanging on a "tree trunk" (red, yellow and orange bricks), a large statue of a terrier dog (pink bricks) and many large rabbits in bricks of many colors (green, yellow, blue, red, white, yellow and blue, white and light blue and dark blue).









Minutes of the CHS Board Meeting, August 16, 2022

A virtual meeting of the CHS board of directors via Zoom conference video/call was called to order at 7:30 P.M. Board members Stephanie Dochterman and Kyle Houlihan were absent. Minutes of the July 26 board meeting were read and accepted.

Officers' reports

Treasurer: Rich Crowley read through the July financial report. Donations have increased over last year.

Membership secretary: Mike Dloogatch read through the list of those whose memberships have expired. We must restore the ability to receive membership dues online.

Sergeant-at-arms: Tom Mikosz reported 18 attendees in person at the July 27 meeting, plus 11 online.

Old business

The next general meeting will take place at 2:00 P.M. on Sunday, September 18. All future meetings will begin at 2:00 P.M. on the third Sunday of the month.

New business

John Archer reported that Northeastern Illinois University is anxious to have ReptileFest back, we really need a chairperson to lead 'Fest. We need to be able to use our own caterer to afford feeding the volunteers.

John spoke about the need to find candidates for next year's board.

The meeting adjourned at 8:40 P.M.

Respectfully submitted by recording secretary Gail Oomens

Advertisements

Answers to Last Month's Herp-Acrostic

The quotation was taken from page 140 of *Veld and Vlei* by Walter Rose (1929):
"The idea is prevalent that all snakes, in addition to being deadly poisonous, are filled with a perpetual and irresistible desire to exercise their venomous properties on anyone who comes within their view."

A. Walter Innes
B. Autolysis
C. Losos
D. Tongue worm
E. Exuviation
F. Rectilinear
G. Reptilia
H. Ophioid
I. Shake
J. Eastern newt
K. Venom
L. Epiphyte
M. Life with Ionides
N. Death adder
O. Asphodel
P. Neonate
Q. Disperse
R. Vibrate
S. Lithic
T. Eros
U. Inbred

UPCOMING MEETINGS

From now on the monthly meetings of the CHS will be held in the afternoon on the third Sunday of each month. The meetings will begin at 2:00 P.M. The first such meeting will take place on September 18. Please try to join us online or *in person* at the Notebaert Nature Museum, 2430 N. Cannon Drive, Chicago..

The program for the October 16 meeting has not yet been confirmed.

Please check the CHS website or Facebook page each month for information on the program. Information about attending a Zoom webinar can be found here:
<https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee->

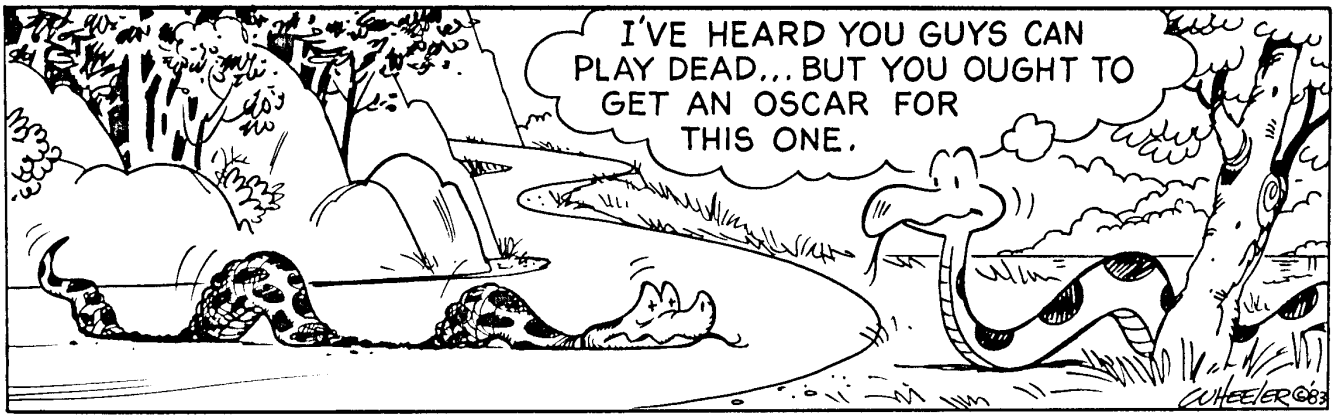
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? The next board meeting will be held online. If you wish to take part, please email: jarcher@chicagoherp.org.

REMINDER

When you shop AmazonSmile and select the Chicago Herpetological Society as your charity, Amazon will make a donation to the CHS. <https://smile.amazon.com/>

THE ADVENTURES OF SPOT



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