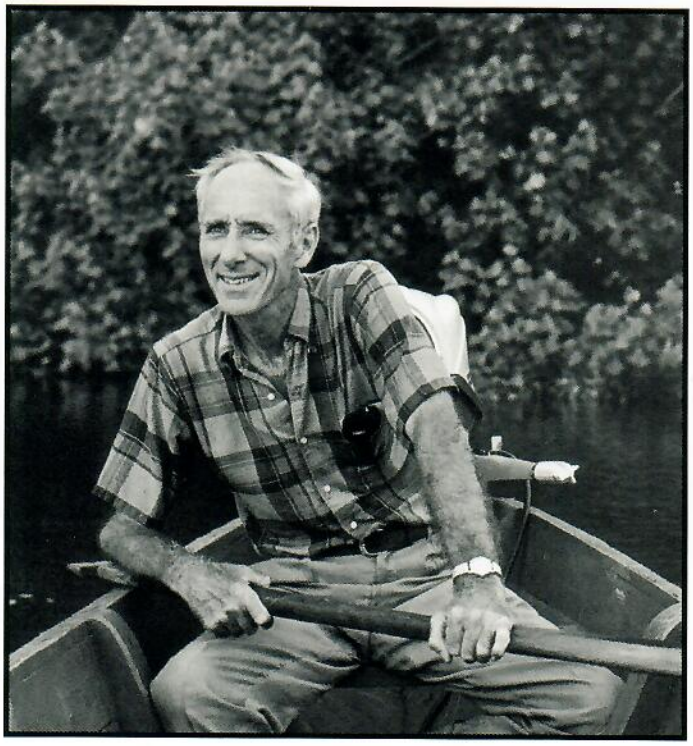
2

Archie Carr and Shefton Martinez use a wooden caliper to measure the shell of a turtle. The turtle was turned the night before and had been flailing about with its flippers digging a trench around its body. Turning was the traditional way to handle turtles, but as research progressed they found methods less stressful to the turtle to get the data they needed.

In the Beginning There was Archie Carr

Archie Carr did not go to Tortuguero to save the sea turtles. That would come later. He went because he wanted to know. He wanted to know where baby turtles go, how female turtles find their way to nesting beaches, and how these massive lumbering reptiles make their living. Newly hatched turtles make a beeline for the sea and swim hard—and remain concealed from human eyes and instruments until they are dinner plate size. By then they'd be yearlings, Carr guessed. Where do they go? The question nagged at him. At a diameter of about 10 or 12 inches, which was Carr's idea of "dinner plate size," they occasionally washed up on beaches or got entangled in fishing nets. Where did they spend their saucer-size days, and what was their final destination when



Archie relaxes in a boat belonging to the station. Motors were a welcome addition but were used sparingly as gasoline was always in short supply. Today, motorized boats are commonplace, and gas is shipped in from Limón in 50-gallon drums.

they finally began to show up? Were they world travelers, or did they spend their lives within a few miles of the beach on which they hatched and to which they would return to mate and lay their eggs?

As a zoologist, ecologist, and popular writer, Archie traveled the world studying many animal species. In Africa he wrote of lions, giant pythons, and tiny gnats. But he always came back to turtles. In the early 1940s, he was researching his first technical book, *The Handbook of Turtles*. He wanted to include both the freshwater turtles, which had first piqued his interest, and their giant cousins, the sea turtles. He found that no one knew much about these monsters of the sea. Dr. Carr was a naturalist driven by curiosity. He would have to find out for himself.

He went to Honduras to interview prominent educator Wilson Popenoe about sea turtles. As it turned out, Popenoe knew little about turtles, but Archie fell in love with the people, jungles, and tropical climate of Honduras. In 1945 he took a leave of absence from the University of Florida and accepted a position teaching at the Escuela Agricola Panamericana (Panamerican Agricultural School). The school, recently opened by Popenoe for the United Fruit Company, accepted students from all over Central America. Archie moved his family there and became part of the community. He talked about sea turtles to everyone—students, other teachers, and local residents.

Finding a Home

One exceptional student, known to his friends as Billy, was Don Guillermo Cruz. Billy Cruz shared with Archie his knowledge of sea turtles and his enthusiasm for his home country of Costa Rica. As Central America stretches southward to connect North and South America, the land narrows, drawing the oceans close together. Costa Rica, a wild land of jungles and volcanoes, is part of that narrow band

of land. This small country separates two great seas and could provide an opportunity to study the turtles of both the Pacific and the Atlantic/Caribbean.

Costa Rica was known for the huge "arribadas" of olive ridleys, and for smaller numbers of leatherbacks and other turtle species that arrive regularly on the Pacific coast. *Arribada*, the Spanish word for 'arrival,' is used to describe the mass influx of thousands upon thousands of ridley sea turtles, all coming to the same beach to lay their eggs. To the east across the mountains, little was known about the muggy rainforests and isolated beaches of the northern Caribbean coast. But Carr heard tantalizing rumors of great fleets of green turtles and, incredibly, there were hints of a turtle that fit the description of the Kemp's ridley, one of Carr's pet subjects. He had studied the turtle in Florida, but no one knew of even one nesting location for the species. In fact, many turtle fishermen doubted that Kemp's ridley nested at all. They called it the bastard turtle and thought that it, like the mule, was the sexless product of interbreeding between two species. Archie didn't buy the bastard theory and was excited by the idea that the miles of isolated beaches of the Central American coast might be hiding the secret of the Kemp's ridley.

Billy Cruz

"Indispensible" is the word that is most often attached to the name of Guillermo Cruz, an executive with the Republic Tobacco Company. Known as Billy, the businessman lived in San José, where he was always available to extend a helping hand to the turtle project. Larry Ogren says "He did anything we needed, from a ride to or from the airport, to using his political connections to obtain the permissions and permits we needed." As the first vice president of the newly formed CCC, he took the message of sea turtle conservation to the top levels of the Costa Rican government. He used his influence to bring high-ranking officials to the beaches of Tortuguero. In addition to arranging for the visit of Don Pepe Figueres, the president of Costa Rica, Billy introduced Mario Boza and Alvaro Ugalde to Tortuguero and to the plight of the sea turtles. Boza and Ugalde were later responsible for launching the Costa Rican national park system. In 2004 Guillermo Cruz was awarded the Archie Carr Lifetime Achievement Award. He died in June 2013, leaving friends worldwide to cherish memories of his accomplishments and friendship.

Carr's position as a UF graduate research professor gave him freedom to focus on research rather than classroom teaching. He could travel as needed, as long as funding could

be found, and through UF he was awarded a long running National Science Foundation grant. He traveled around the Caribbean searching for the ideal place to base his research and finally followed local turtle lore to the coastal village of Tortuguero, Costa Rica. Turtle Bogue, in the northern part of Limón province, was in a largely unexplored region of Costa Rica's Caribbean coast near the Nicaraguan border. After an exploratory trip along the coast, Carr settled on the tiny village as a base for his turtle studies and a tagging program. He had identified this beach as the only remaining major nesting site for green turtles in the western Caribbean. A smaller number of leatherbacks and hawksbills also nested there.

Calipee drying in the sun. The dried product is light and easy to transport.

From this research camp he hoped to learn not only where the hatchling turtles went, but where the big turtles came from. Surely the incredible number of turtles that showed up here to lay their eggs didn't live and feed right off the coast of Tortuguero. Fishermen of the Bogue were sure that turtles traveled great distances to reach the breeding beach, but there was no scientific evidence to back up this belief. Carr hoped that by putting some kind of identifying mark on the turtles, he could learn not only where they went after nesting but whether they returned to the same beach to nest again. He began his

RIDDLE OF THE RIDLEY

The Kemp's ridley was such a worrisome item for Archie Carr that he titled the first chapter of *The Windward Road* "The Riddle of the Ridley." As the years went by, he gleaned some insight into the life of the smallest of the sea turtles, but no hint about where they went to reproduce. He did learn that they were known for their belligerence when captured: "The ridleys is always mad," one turtle man told him.

In 1957 Carr and his family drove from San José to their home in Gainesville, Florida with a stop-over on the eastern coast of Mexico to investigate rumors about nesting ridleys. They found a man in Veracruz who said that on rare occasions, a single ridley would be seen nesting. There was no reason to doubt the veracity of this claim, but these few sightings could not account for the number of ridleys observed by coastal people and marine biologists. Mass nestings must be happening somewhere, but where? In 1961 that question was answered. Carr tells the story at length in *The Sea Turtle: So Excellent a Fishe*. It seems that the location of a huge ridley nesting beach had been known not long ago, perhaps by many. The proof was in a film made in 1947—and then lost. In 1961 a marine scientist based in Texas, Dr. Henry Hildebrand, came into possession of the footage shot by a Colombian, Andres Herrera. Hildebrand, who was scheduled to present the material at a meeting of the American Society of Ichthyologists and Herpetologists, invited Carr to come to Austin for a preview.

The informal documentary shows an estimated 40,000 Kemp's ridleys on the beach at Rancho Nuevo, Tamaulipas on Mexico's Gulf coast, going about the business of laying their eggs and doing it in broad daylight! No other marine turtle nests during the day. Though Kemp's ridleys sometimes nest singly on Mexican and Texas beaches, validating the information Carr had received in 1957, Rancho Nuevo is the only significant nesting beach for the species.

turtle tagging operation there in 1955—the summer before he brought Larry Ogren to the village to run the program.

Harvest Time

Turtles were a mainstay of Tortuguero's economy. The meat was popular with locals, but most of the turtles were shipped live to restaurants in the United States, or canned in Nicaragua for shipment to England and Germany. Green turtle soup, favored by Winston Churchill, was considered even more of a delicacy than the meat. The calipee, or cartilage from the turtle's bottom shell, formally known as the plastron, produced a thick, gelatinous broth that was the key ingredient of green turtle soup. Turtle shells were also valuable in some markets, especially hawksbill shells. The hawksbill has a beautiful translucent shell that was used to make tortoiseshell jewelry and combs prized by women all over the world. Turtle eggs were also harvested. They were good for eating and baking and were believed to have aphrodisiac properties.

During the green turtle season there was a frenzy of activity. Veladors turned the females and attached the buoys for later pickup by the boats. Both adults and children raced to dig up the eggs before dogs, peccaries, sand crabs, and other predators beat them to the nests; and the boat crews gathered the buoy-marked females. To increase their catch, the boat crews harpooned male turtles—it was their only opportunity to capture adult males, which never return to land after leaving the nest as hatchlings. But, like the females, male green sea turtles are drawn irresistibly to the waters off of Tortuguero, where mating occurs at intervals over several months. For a short time, males, females, and eggs are all together in one place. For thousands of years this gathering provided a rich but sustainable harvest for both humans and wild predators.

Female sea turtles usually nest every second or third year; each individual produces several clutches of approximately 100 eggs in a nesting season. After a couple of

months of unattended incubation, the hatchlings make their way out of the sand. Somehow timing their eruption from the nest for after dark, they avoid many of the diurnal predators such as birds and sand crabs. But even at night, predators lurk on the beach, hoping for a feast of baby turtle. The hatchlings that successfully enter the sea find marine predators waiting with open jaws. For millennia, the large number of eggs laid by each female turtle provided food for many other creatures,

Harry Hirth measures a turtle's head as Archie takes notes and Larry looks on. An unidentified man watches in the background

while assuring that enough of the newborns survived to maintain the turtle population. There were enough eggs to sustain a stable turtle population and to provide a protein feast for many predators, including humans.

Archie Carr enjoyed a good turtle stew or turtle fin soup as much as the next man. And in the early 1950s, there was still an abundance of turtles. He saw turtle products

as a sustainable resource if they were harvested responsibly. Every year, the turtles arrived right on schedule. After the nesting season, they disappeared. But the next year turtles again appeared by the thousands to nest on the beaches of Tortuguero and other beaches around the world. It had always been so.

These men likely came down from Barra del Colorado or possibly Nicaragua to hunt the hawksbills that hung out on the rocky bottom around Tortuguero. Hawksbills were not eaten, but were taken for their valuable shells.

Changing Viewpoint

Carr's initial goal had been to unravel the secrets of the life of the sea turtle. But, after seeing the slaughter and talking to old-timers about the declining numbers of turtles, his focus changed. He wanted to teach people to harvest responsibly, so that turtles could continue to be a source of food and income for those who lived near nesting beaches. In *The Windward Road* and *The Sea Turtle, So Excellent a Fishe*, Carr talks about the historical importance of turtle meat to sailors and to the development of the Caribbean. Not only are sea turtles a major source of protein, but they play an important role in the culture, religion, and mystical beliefs of Caribbean people. He respected these traditions and wanted to find ways to sustain them.

However, as the population numbers continued to drop, his focus turned to simply saving sea turtles from extinction. These massive reptiles, which had roamed the seas since before the time of the dinosaurs, were rapidly disappearing.

The native people of Tortuguero and other nesting places could not grasp the idea that the turtles could disappear. They had always been there. Villagers such as Sibella Martinez, who cooked for the biologists in the camp, were incredulous when Archie told them that the turtles might not always be there. He wrote in the preface to the 1979 reprint of *The Windward Road*:

> In one important way the wisdom of the Caribbean people seems to go unaccountably awry. That is in the wide spread belief that the green turtle is an inexhaustible resource. My first season at Tortuguero, when I asked Sibella how long the turtles could stand the slaughter then going on at the nesting beach, she said, "Dey never finish Don Archie. The tel-tel never finish. . . . Dey *can't* finish."[5]

Carr knew that the turtles could finish, because human predation had upset the age-old natural balance. When feeding the village people was no longer the only reason for hunting them and the turtles had become a commodity to be traded internationally, their populations began to decline. The same was happening on turtle nesting beaches around the world. Carr witnessed the magnitude of the slaughter and the egg harvesting during one nesting season after another and knew that at these rates, the turtle was doomed. In his research Archie Carr relied on a resource that many scientists disdained—he talked to the local people, especially the old-timers. In fluent Spanish, he prodded them to tell him about their culture, to share their history and their turtle stories. He learned that although the number of turtles nesting on the beach seemed large to him, it was much lower than it had been in the past. Year by year the numbers had dwindled. After establishing the research station, Carr and his students saw the numbers continue to decline. It was clear to them that sea turtles were in serious trouble.

Carr's quest for understanding the sea turtles became a mission to save them, so that future generations could know them. Through his writing, his research, his position as a visiting professor at the University of Costa Rica, and his contacts within Costa Rica's political system, he would strongly

influence the country's growing environmental awareness and conservation efforts. By 1970 some wildlife protection laws had been passed, but poachers were ignoring them with impunity.

A slaughtered turtle awash in the waves of Tortuguero Beach. After the turtle harvest became illegal, poachers took only the precious calipee, leaving the rest to spoil.

In 1975, to make a case for preserving the green turtle and protecting the lush Tortuguero jungle, Carr and Billy Cruz invited a small group of people to visit Tortuguero. The group included José (Don Pepe) Figueres Ferrer, president of Costa Rica, and his wife. One of Carr's graduate students, David Ehrenfeld, later wrote about the visit:

> It was Don Pepe's first visit to the legendary Tortuguero—we had been watching a green turtle nest, also a first for him. El Presidente, a short, Napoleonic man with boundless energy, was enjoying himself enormously. Both he and Archie were truly charismatic people, and they liked and respected one another.

As they continued their walk down the beach the two men chatted, and Don Pepe questioned Carr about the status of the green turtle and the importance of protecting the species. Then, near the waterline, they spotted a disturbing sight. A turtle was pulling herself along the beach, trailing something behind her. The group hurried to investigate. They were horrified to see that the struggling turtle was dragging her own intestines

and marking her path with a scattering of eggs. Poachers had cut away her plastron to get the precious calipee and flipped her back over to suffer a slow death. Ehrenfeld remembers the moment:

> Dr. Carr, who knew sea turtles better than any human being on earth and who had devoted much of his life to their protection, said nothing. He looked at Don Pepe, and so did I. It was a moment of revelation. Don Pepe was very, very angry, trembling with rage. This was his country, his place. He had risked his life for it fighting in the Cerro de la Muerte. The turtles were part of this place, even part of its name: Tortuguero; . . . She was home, laying her eggs for the last time.[6]

Later the same year, President Figures established Tortuguero National Park. The biologists who were with him on the beach that night believe that the sight of the dying turtle, trailing eggs and intestines, was a turning point in Don Pepe's dedication to preserving the environment and wildlife of his homeland.

Traveling the Windward Road

There is no doubt that Dr. Carr had a profound effect on conservation in Costa Rica and on the preservation of sea turtles globally. In the preface to *The Windward Road*, his humorous and perceptive story of his travels around the Caribbean, he describes how the book came to be written:

> The appeal of marine turtles for me thus had several facets, and I decided to learn everything I could about them. *The Windward Road* was just a compulsive recounting of things I saw and pondered, including the fascinating Caribbean people I consorted with during the first exciting years of that quest after Chelonia [the taxonomic name of the order containing all turtles].[7]

The book began to build a following before it was published. The last chapter, "The Passing of the Fleet", was presented at the

annual meeting of the American Society of Ichthyologists and Herpetologists in 1954. Another chapter, "The Black Beach," was published in *Mademoiselle* magazine and won the O. Henry short story award. An even more momentous event would come from the book. Carr tells the story in the preface to the 1979 reissue of the book:

> But before that a portentous thing had happened to *The Windward Road*. Joshua B. Powers, a New York publishers' representative, happened to read it. . . . He sent copies of the book to twenty influential friends who he hoped would share his interest. They did and the Brotherhood of the Green Turtle was promptly formed with the aim of "restoring green turtles to their native waters, and insuring to Winston Churchill his nightly cup of turtle soup.[8]

The original members of the Brotherhood included Tallahassee, Florida, resident John H. Phipps (known to his friends as Ben) and Jim Oliver, then director of the American Museum of Natural History, in New York City. The group was organized in a spirit of good fun, but with a serious purpose. Archie Carr was named Grand Admiral of the Fleet. Ben provided financial stability, and Jim later helped bring in the participation of the U.S. Navy in a major research and conservation effort called Operation Green Turtle. The group also helped secure grants from the American Philosophical Society for staffing the seasonal turtle tagging camp—the John H. Phipps Biological Research Station—at the Tortuguero nesting ground.

The Brotherhood incorporated in 1959 as the Caribbean Conservation Corporation (CCC) with Ben Phipps as its president. On June 16, 2010—Archie Carr's birthday and World Sea Turtle Day, the Caribbean Conservation Corporation changed its name to Sea Turtle Conservancy (STC). Though the organization had been long respected as the CCC, the name gave no hint of its focus on sea turtles. In this age of electronic communication, it is important for an organization to be easily identified by online search engines.

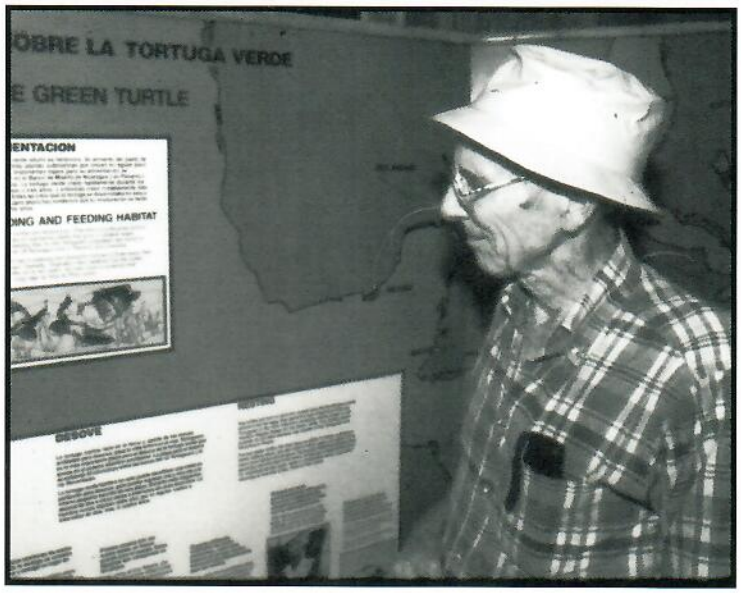
In addition to the research station in Tortuguero, the STC has headquarters in Gainesville, Florida, an office in San José, Costa Rica, and a research base in Panama. The tagging program established in Tortuguero in 1956 is still operating and still presenting us with new knowledge about sea turtles.

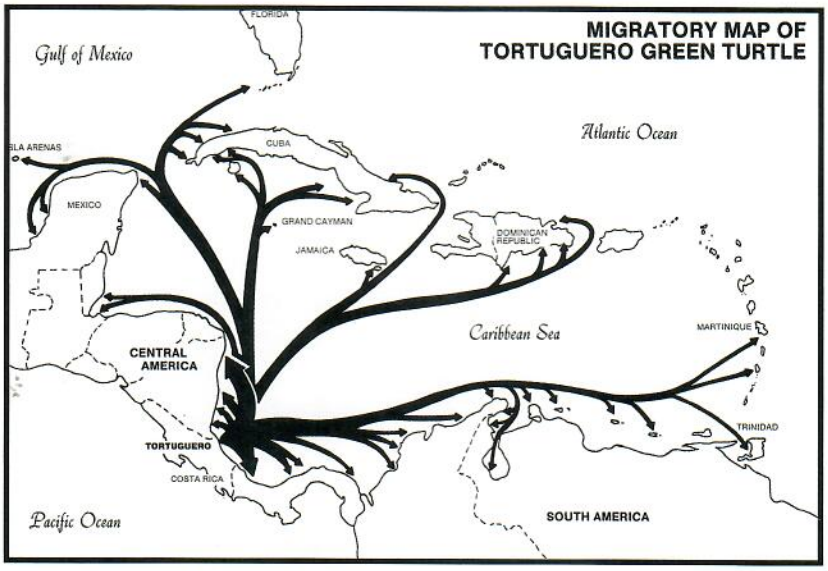
Carr, always a naturalist, took biology out of the laboratory and into the fields and streams and onto the beaches. He wanted to know not just how many scutes made up a turtle shell, but how the animal lived, what it ate, how it bred, and how it spent its day. And he wanted to assure its continued existence. He was practicing conservation biology long before it was the vogue, and he was an important influence in Costa Rica's developing conservation policies. Carr and the STC encouraged the establishment of the national park in Tortuguero. In 1975 President Figueres set aside more than 77,000 acres of Tortuguero's wilderness land as a national park. Costa Rica's conservation efforts have set an international example, and today over 27 percent of the country's land has protected status in categories including national park, wildlife refuge, and forest preserve.

Global Recognition

The future of sea turtles began to look a little brighter in 1966 when Peter Scott of the International Union for the Conservation of Nature and Natural Resources (IUCN) invited Dr. Carr to join the organization's Survival Services Commission, now called the Species Survival Commission. Scott asked Carr to establish a group to study marine turtles, to serve as its chair, and to appoint its members. Over the 18 years that Carr chaired the new Marine Turtle Specialist Group, it consisted of 15 to 30 members from around the world, including his friend and associate Larry Ogren. Participation in this group provided a tool for drawing attention to the plight of sea turtles internationally. Over the years the group has expanded to approximately 200 members from more than 50 countries in a dozen geographic regions.

As the turtle station grew, it acquired a name, The John H. Phipps Biological Research Station, and gained structures including a large display board to tell visitors about its mission.





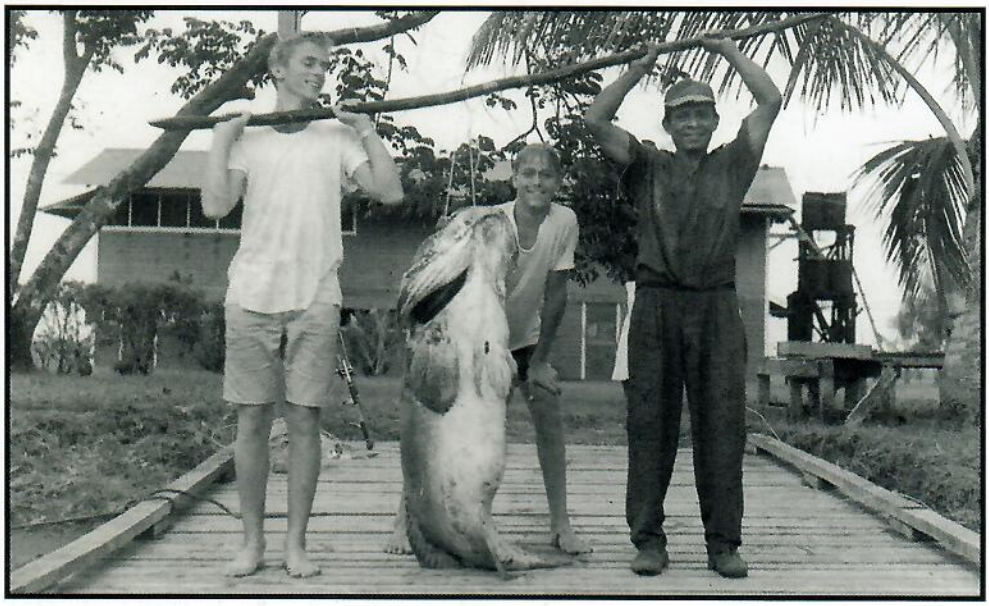
The migration chart shows where Tortuguero turtles have traveled. Initially, turtles could be tracked only by their tags. Today the travels of some turtles can be continously monitored by satelite transmitters.

In 1983 biologists came from around the globe for the first Atlantic Sea Turtle Symposium in Tortuguero. (PIctured roughly L-R) Mario Hurtado, Edward Standora, Colin Limpus, George Balazs, Chuck Carr, Harry Hirth, Njoman Nuitja, Leo Brogersma, Ada Fowler, Merry Camhi, Robert Brundner, Larry Ogren, David Ehrenfeld, Charles Webster, Nicholas Mrosovsky, Jacques Fretey, Willem Roosenberg, Perran Ross, Georges Hughes. Also attending: Archie Carr, Karen Bjorndal, Anne Meylan, Rene Marquez, Peter Pritchard.

A Legacy Left

Dr. Archie Fairly Carr Jr. died in 1987. His curiosity, humor, compassion, and thirst for knowledge touched many lives and lit flames that illuminated the world of conservation biology. His wife, Marjorie Harris Carr, also a biologist, was well known in Florida as an environmental advocate. Carr felt comfortable bringing his children to the village or sending one or more of his sons along with Larry Ogren or Harry Hirth, a graduate student biologist, for extended stays. Tom Carr says he started going to the village when he was seven. Sometimes he came alone and sometimes with one of his brothers. On one of his first visits he stayed with Larry in Leo's house. He remembers Larry as "everyone's favorite" among the biologists.

Carr's sons and many of his students have gone on to build international reputations in sea turtle research and in other fields



Fishing was good in Tortuguero. With the help of an unidentified man, Steve (left) and Tom Carr (center) display a Goliath grouper they just caught.

of biology. James Spotila, a noted turtle biologist and popular author, wrote:

> Archie provided a model for others to follow and a legacy of followers to carry on his work. Most sea turtle biologists trace their roots, either directly or indirectly, to Archie Carr. The older ones were his students or worked with him during their careers. The younger ones studied or worked with Archie's academic offspring. Now the world is filled with Archie's academic grandchildren and great-grandchildren.[9]

The station and the village have changed with passing years, but Larry, Harry, Carr's sons, and others from the first years at Tortuguero still cherish the memories of those early days. Archie Carr's example taught them to be tough and adaptable and to respect not only the natural world but, especially, the wisdom and integrity of the local culture in which they carried out their work. They lived the life of the village and formed friendships and memories they would carry for a lifetime.

Archie and an assistant weigh a green turtle. Methods in Tortuguero were makeshift but they produced a massive amount of data on the life history of sea turtles. More importantly, dissemination of the data awakened global concern for the sea turtles and other declining species. Conservation biology was born here.

With Larry Ogren at the helm, Archie and Marjorie Carr motor down the Tortuguero lagoon.

TURNING TURTLES IN TORTUGUERO

For George Balazs,
An intrepid sailor
bound for Tahiti with
his bride who stopped
for provisions in
Hawaii and never left!
The green turtles
were very happy.

Jamy Ogren

Turning Turtles in Tortuguero

Stories From the Origins of Sea Turtle Conservation

Anne Ake

Larry Ogren consultant

Foreword by Dr. Archie Carr III