A Naturalist in Florida

A Celebration of Eden

Archie Carr

Edited by Marjorie Harris Carr ◆ Foreword by Edward O. Wilson

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Archie Carr, 1909–1987

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To the next generation:
Jonathan, Jennifer, and Adam

Foreword

In the Florida experienced by Archie Carr there were "yet remaining scenes inexpressibly admirable and pleasing," as his esteemed predecessor William Bartram put it two centuries earlier. From the Apalachicola bluffs to the Florida Keys, across a career spanning fifty years, Carr became a uniquely qualified guide through the dwindling wildlands of the state, the world authority on turtles, and the South's greatest regional naturalist of his generation. He also traveled far afield—to Central America, the West Indies, East Africa—and he graced literature with works about these regions: *High Jungles and Low, The Windward Road, Ulendo,* and *So Excellent a Fishe.* But the core of his experience was gained in Florida. As a young man he absorbed this native Eden into his bones and tried to transmit his feel of it to others.

I will flatter myself here by claiming a spiritual kinship with the master naturalist and turtler. He was born in Mobile, Alabama, a city that produces fewer scientists of his rank than Mongolia does water skiers. I was born in Birmingham but spent part of my childhood in Mobile, where relatives on my father's side had lived for generations. Carr was raised in Savannah, Georgia, where as a boy he kept a small zoo of pets, including lizards, snakes, and turtles. In close parallel I grew up in Mobile, Pensacola, and small towns in Alabama, with a brief sojourn in Washington, D.C.; a large focus of my life as a teenager was the collection and study of snakes, salamanders, and turtles. I believe that in my formative years I experienced the natural environment of the Deep South in much the way Archie did and that perhaps I can speak of his work with a certain emotional authority.

The wellsprings of his inspiration were the richness of the southeastern fauna and flora and the recognition that it was still poorly known. The exploration of that biota therefore held some of the same enchantment for the ambitious field biologist as did journeys to far-off tropical lands. There were (and are) some forty species of snakes, one of the largest local faunas of these reptiles in the world. When the southern Appalachians are

included, the salamander fauna is the richest in the world. New species were still being discovered at a rapid rate when Archie and I were students, twenty years apart. On warm spring nights after heavy rains, you could (and can) hear choruses of frogs that rival those of the Amazon: the soft whistling of *Hyla avivoca*, the drumbeat of *Hyla gratiosa*, the trilling by *Pseudacris* cricket frogs (closely resembling the sound of a fingernail run along the teeth of a pocket comb), and the wailing of hundreds of spadefoot toads, the lament of hellbound souls.

And giants, real prodigies: bull sharks the size of canoes working their way up the Suwannee River and huge *Amphiuma* salamanders, called conger eels, two to three feet long, best hunted with nets in the shallow overflow of creeks after heavy rains. And Archie Carr's favorite, alligator snappers—North America's largest freshwater turtle, weighing up to a hundred pounds or more—together with real alligators and, south of Miami, saltwater crocodiles.

In this book Carr shows himself to be a Southern writer whose craft is disciplined by scientific knowledge. Most times he is a professor of biology, explaining such matters as the jubilees of Mobile Bay and the origin of the fishes of Lake Nicaragua. Then he adds a dash of the good old boy, a southern traditional, plain-spoken and wise. He also becomes a Hemingwayesque describer of people on the land, respectful of other cultures; and above all the naturalist so in love with the subject he must fight off the temptation of surplus detail. He is the enemy of the precious and artificial in language. He has no need of it; he has the real goods ready to deliver with scant embellishment. Yet the lyrical spirit is always there, and it breaks through pleasingly at intervals. Drawn by Florida's crystalline springs, he finds the best, Homosassa, "glowing in the dark hammock like a great, flat-cut jewel."

He fashions poetry out of sheer exuberance, and he animates natural history, like no other writer before him, in the vernacular names of the plants and animals of his chosen domain. They roll off the tongue, jolting, attention-getting, half science and half local color: gaff-topsail catfish, golden topminnows, pusselguts, hogchokers, bluegill bream, longnose gars, stumpknockers, spreading adders, gopher tortoises, chicken cooters, pignuts, mockernut hickories, pickerelweed, maidencane, striking cedars, and so on leisurely through the byways of Anglo-Saxon venery and folk botany: Archie Carr stock-in-trade.

No writer exceeds Carr in his ambidextrous handling of human and natural history. He flexes this talent in the classic essay on the Suwannee River, in which he blends history, geology, and biology—switching back

and forth between the 1774 narrative of William Bartram and his own observations, matching localities and plants and animals across time.

Like all major writers, Carr can be read at two levels. His stories are to be enjoyed straight and simple as adventure. But, more deeply, he speaks for the generation that saw its perception of nature profoundly change. When he was young, parts of Florida and much of the tropics seemed a secure wilderness. By his middle age the wildlands had been transformed into threatened nature reserves. Humanity has conquered the world, unfortunately, and saturated it. The primary forests have mostly fallen; tourists stand and play in crowds around his beloved springs. We cannot go back. Archie Carr understood that. I believe that part of the reason he wrote was to remember the way the world was before and never will be again, to help us carry some of the wonder over to the other side. It was indeed a fine sight, to use an Archie Carr expression, a fine sight. Let us turn to his essays to see it again.

Edward O. Wilson

Preface

This is a collection of the writings of Archie Carr completed over a span of fifty years. The writings reflect his ardent love for the landscapes of Florida, his growing knowledge of the intricate relationships of living things, and his entrancing ability to see humor in an amazing number of unlikely situations.

Archie spent his early boyhood in Mobile, Alabama, where his father, "Parson," was pastor of the Government Street Presbyterian Church. The family had a big yard and dogs, and Parson, a tall, thin, handsome man, often would ride his bicycle to the edge of town to hunt wild turkeys. He was a very successful hunter and usually came back with a turkey hanging from his handlebars. Some of Archie's earliest memories of the out-of-doors were of fishing trips, near Mobile, in a rowboat with his father.

The Carrs moved to Fort Worth, Texas, for several years, and hunting trips taken during that time made a deep impression on the young Archie. Often two or three families would go by wagon to camp beside a river. Archie's family loved the natural world and all it had to offer—including quail and dove. It was while the family was in Texas that Archie became enthralled by turtles. He never got over it.

The third major church served by Dr. Carr was in Savannah, Georgia. Hunting and fishing again were the main avenues into wilderness, though sailing with his high school friends in the coastal waters gave an additional dimension to Archie's knowledge of the natural world.

Archie came to central Florida with his family in the 1930s. He had the extraordinary good fortune of majoring in zoology at the University of Florida while pioneer ecologists Dr. J. Speed Rogers, Dr. Harley B. Sherman, and Dr. Theodore H. Hubbell were setting the guidelines and standards for their graduate students. Their charge to understand, in great detail, the natural surroundings of each animal resulted in a grand array of profiles of Florida animals. Through their students alone, Rogers, Sherman, and Hubbell made an enormous contribution to the rapidly developing

field of ecology. The utter reasonableness of this ecological approach was enthusiastically adopted by Archie. It was the only way to look at an animal, particularly if you were curious and felt a warm and deep affection for the other forms of life on earth.

In those days, the state of Florida was, in large part, undescribed by biologists; though many scientists visited the state—like the enthusiastic Albert Hazen Wright and Anna Allen Wright of Cornell University, who came each year to collect and photograph the frogs and toads. Each new graduate student in the zoology department adopted a different form of wildlife for study, and the enthusiasm of the group was unbounded. The natural areas around Gainesville were visited almost daily, and trips were made nearly every weekend to other parts of the state. The interaction of four or five young biologists—each with a different specialty—as they explored, say, the Econfina River or Pat's Island in the Big Scrub, gave each of them an extraordinary breadth of understanding of Florida wildlife in its natural setting. Over and over again they ranged the state, from Pensacola to Key West. In the beginning Archie was interested in fish, frogs, salamanders, snakes, lizards, alligators, and turtles. Later he specialized in turtles—but through the interests of his colleagues he was also familiar with the ways of mayflies, crane flies, crickets, spiders, water beetles, crayfish, round-tail muskrats, bobcats, and assorted birds.

Four years in the highlands of Honduras in the 1940s sharpened his eye for the relationships of wildlife and wilderness. Here there were new landscapes and new associations of animals to understand. But pine-clad hills are typical of Honduras—their national anthem proclaims their beauty—and pine-clad flatwoods are typical of Florida. The similarities and the differences enhanced Archie's comprehension of ecology.

On his return to Gainesville and the University of Florida, Archie taught ecology, at that time a new and innovative discipline. The assignment suited Archie. Every week the class would be taken to a particular "landscape" in Florida after Archie had made an advance trip to see what was there. Visits into the wilderness were a continuing activity throughout Archie's lifetime. While he was working on *The Everglades* for Time-Life he made many trips into that mysterious and embattled area. I joined him on most of his trips around the state, and they were always exciting, interesting, and fun. "Adventure is a state of mind," he once said.

We lived on a two-hundred-acre farm near Gainesville. Well, twenty-five acres was "farm." The rest was woods of several kinds, sinkholes, lakes, swamps, and marshes. This was Archie's home base for more than forty years. Every day he spent some time roaming about the place, and with his uncanny eye—or luck—he saw many wonderful things. He named

our pond Wewa, and his familiarity with and love for the place is reflected in his writings.

In the late 1960s Archie started to write a book about Florida. By then he had published books about Africa (*Ulendo: Travels of a Naturalist In and Out of Africa* and *The Land and Wildlife of Africa,*) Central America (*High Jungles and Low*), reptiles (*The Reptiles*), the Everglades (*The Everglades*), and sea turtles (*So Excellent a Fishe* and *The Windward Road*). It was high time he wrote about Florida. I do not think I am biased when I claim that Archie knew more about Florida wildlife and wilderness than any other person, today or in times gone by. And yet the prospect of writing about modern Florida gave him pause. At that time Archie wrote:

> When I set out to write this book I immediately sensed a danger looming. It was that I was almost bound to fall into the trap of nostalgia and indignation, of turning this book into a diatribe against the passing of original Florida. Because to anyone who has known Florida as long as I have, and whose main interest in the place has been its wild landscapes and wild creatures, the losses have been the most spectacular events of the past three decades. Fifty years ago John K. Small wrote a little book about this passing. He called it *Eden to Sahara*. To Small, even in those days, the changes were so dismal he simply had to cry out against them. Thirty years passed, the changes continued, and then, twenty years ago Thomas Barbour found he could no longer stifle his emotion over the losses, and he wrote *That Vanishing Eden*. T. B. was a very good friend of mine. I absorbed from him a lot of sadness over losses even older than I have personally known; and since T. B.'s time the waning has gone on apace without relenting anywhere.
>
> So being a naturalist, living in the woods, and having the peculiar background I have, I am especially susceptible to the disease of bitterness over the ruin of Florida—over the partly aimless, partly avaricious ruin of unequaled natural riches of the most nearly tropical state. But in my case I decided simply, "What the hell, you cry the blues and soon nobody listens." And that made me see there was really no sense writing another vanishing Eden book at all. A garment-rending sort of book would simply not be read, and so be garment-rending in the dark, and a waste of time. The way to get my point across would be to talk mostly about what joy still remains in the Florida landscape and then just sneak in some factual tooth-gnashing every now and then when the readers might really be reading.

And actually, as great as the destruction has been, there is a great lot left. The organization of the old landscapes has been disrupted, but scraps of it remain, and if your eye is tuned to the country, any venture beyond the subdivisions will turn up good things to see.

What is really worth writing, then, is probably not how Florida once was or how it ought still to be—that is, not a nostalgic lament of things lost, or a jeremiad on the evil now afoot—but rather a catalogue of what remains of natural Florida for the discerning eye to see. So I decided to write a book on just the things in Florida that I know most about or that most interest me.

So here is Archie's book about Florida wildlife and wilderness. Enjoy it.

Marjorie Harris Carr

Acknowledgments

For the past two years it has been my great pleasure to have Beth Ramey to assist me in assembling and editing this collection of Archie's writings. She knew Archie, and so her work has been, in a sense, a labor of love. Beth and I have worked together on conservation matters for more than ten years, and I prize her many talents. My heartfelt thanks to Beth.

For the past three years my assistant in a long effort to save a Florida river, the Ocklawaha (a project of the Florida Defenders of the Environment), has been David Godfrey, a young man of exceptional abilities in the field of communications. Until he redrew the map for the endpiece for the reprint of Archie's book *High Jungles and Low* (University Press of Florida, 1992), he didn't know of his talents as a mapmaker. I am greatly indebted to him for the superb maps he conceived for this book. Our old and dear friend Larry Ogren—a turtle man and a naturalist who is sharp with the cartoonist's pen—very kindly drew the little sketches of fishes to illustrate Archie's outrageous "Subjective Key to the Fishes of Alachua County."

Throughout this period of editing I have harassed several people for corroborative information. I am particularly grateful to several members of the faculty of the University of Florida: Dr. Frank Nordlie, chairman, department of zoology; Dr. James Perran Ross, assistant scientist, Florida State Museum; Bruce Chappell, archivist for the Florida history collections, University of Florida Library; Drs. Donald W. Hall and James E. Lloyd, department of entomology and nematology. Dr. William T. Haller and Victor Ramey, Center for Aquatic Plants, have answered my questions with patience and forbearance. Dennis N. David, wildlife biologist and Statewide Alligator Management Program coordinator, and Paul Moler, biological administrator at the Florida Game and Fresh Water Fish Commission, have brought me up to date on alligators, crocodiles, and hard-backed cooters. All the Florida Park Service people have been enormously helpful. I particularly want to thank Susan H. Dougherty of the Homosassa

Springs State Wildlife Park and Kathy Nagler of the Ichetucknee Springs State Park for their cheerful assistance.

Most of the photographs in this book came from an album Archie began in 1921 when his family moved from Texas to Savannah, Georgia. For special pictures I want to thank our old friend William M. Partington, who always takes grand pictures (he never cuts off heads); William Stitt, a boyhood friend of Archie's; Lewis Berner, a colleague at the University of Florida; Herb Press, audiovisual media director of the University of Florida Information Services; and Jo Conner, a talented photographer. Over the years Jo has chronicled many of Archie's activities. Lisa and Carl Wattenbarger, owners of the Light Work Lab in Gainesville, have performed miracles in reproducing prints from old, small, faded photographs.

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I thank Susan P. Urstadt, my agent and an old friend, who guided the manuscript into the capable hands of Yale University Press and Jean E. Thomson Black, science editor. It has been a great pleasure to work with Jean, and I'd love to do it again.

As a matter of fact, throughout this endeavor everybody has been enormously encouraging, and I thank them. I particularly want to thank our children and their wives—Mimi, Chuck and Gail, Stephen, Tom, David and Peggy—for their love, support, and assistance. Mimi's help with proofreading and with the preparation of the index was invaluable.

M. H. C.

Photographs from the Life and Times of Archie Carr

Captions by Marjorie Harris Carr

A young friend of Archie's, May 13, 1921. James Henry Lee, Billy's Island, Georgia. (Photo by Archie Carr)

Archie at age ten with turtles, 1919. He is in a friend's backyard near his home in Fort Worth, Texas. (Photo by William Stitt)

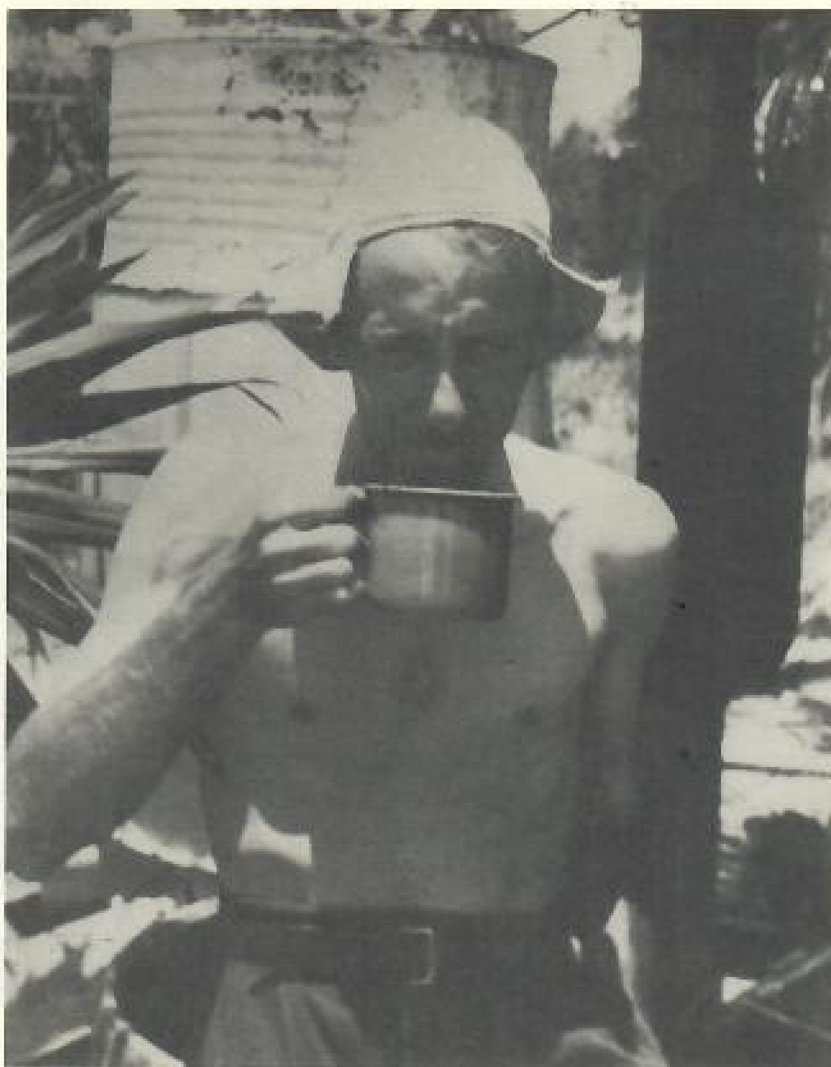
Archie at age sixteen with two friends. They are sailing in the *Capermacon* on the Wilmington River near Savannah, Georgia. Archie is at left.

University of Florida biology majors at Paynes Prairie, 1930s. The students are rolling hyacinths up onto the bank at Haille's Siding on the north shore of the prairie. Scratching through the rolled-up plants was a favorite method of collecting small aquatic vertebrates and invertebrates. *From left:* Frank Young, Archie, and John Kilby.

Archie, a senior at the University of Florida, 1932. He is prepared for a collecting trip on Newnans Lake, near Gainesville.

Touring car equipped for collecting in Florida in the 1920s and 1930s. In those days Florida was as much a mecca for field zoologists as the West Indies and Central America are today. Dr. Albert Hazen Wright and his wife, Anna Allen Wright, specialists in amphibians at Cornell University, drove to Florida in this car many times. Archie and other graduate students were their enthusiastic field assistants, and Dr. Wright was probably the first conservation activist Archie knew. During the 1920s and 1930s, when plans to dig the Cross-Florida Ship Canal (also called the Ocklawaha–Withlacoochee Canal) were coming to a head, Wright published "The Atlantic-Gulf or Florida Ship Canal," a small booklet that pointed out the environmental hazards posed by the canal. Work on the canal stopped after only six months, mainly because of lack of money, but Wright's report played a significant role in the project's suspension. Archie, who contributed to Wright's early publication, was still working in 1987 to save the Ocklawaha from the ravages of the Cross-Florida *Barge* Canal.

Thomas Barbour, J. Speed Rogers, and Archie, Gainesville, 1942. Dr. Barbour, known as T. B., longtime director of the Museum of Comparative Zoology at Harvard University, had an enormous zest for life and an intense appreciation of the natural wonders of Florida. He would spend springs in Gainesville, and we spent summers in Cambridge for several years. He was a grand raconteur and larger than life in every dimension—a wonderful man. Speed was head of the department of biology and geology at the University of Florida between 1922 and 1946. He and his close friend and colleague Dr. Theodore H. Hubbell were chief architects and practitioners of the ecological approach to the study of animals. They had incalculable influence on Archie and numerous graduate students, who spread the word throughout the nation about this approach. Archie is holding our dachshund Zep.



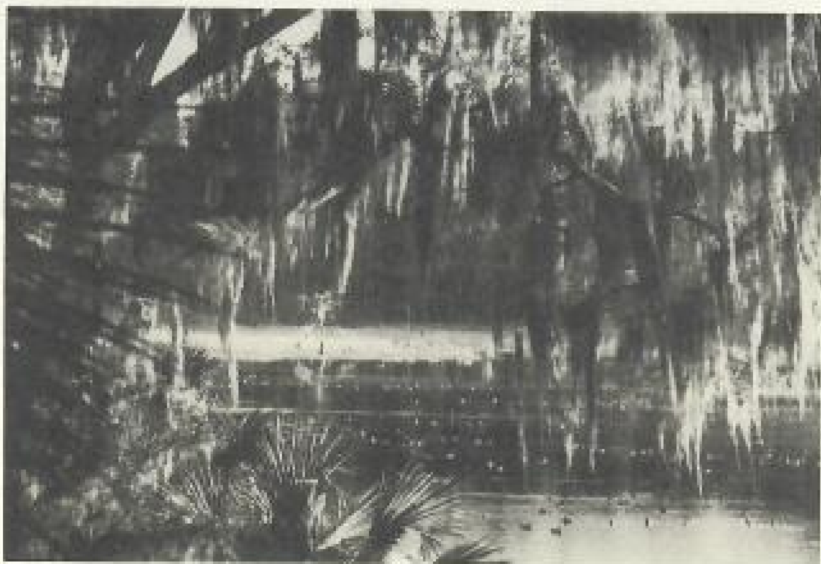
Archie taking a break while looking for crocodiles in Madeira Bay, Florida, 1940. At that time little was known about the status of the crocodile in Florida. Today crocodiles are much better understood and are fairly safe in the seven-thousand-acre Crocodile Lake National Wildlife Refuge.

Opposite, field trip to the River Styx, February 1966. For more than twenty years Archie taught ecology at the University of Florida. Weekly field trips to different Florida landscapes were the highlight of the course. Top, Archie with students on the floodplain of the river. Center, Archie dredging for small aquatic animals in the roots of stranded hyacinths. Bottom, the class examining the booty; David Ehrenfeld is facing the camera. (Photos by William M. Partington)

Archie with student on Snake Key, 1968. The key is so named because it is home for a large population of cottonmouth moccasins that live in a mutually beneficial association with the nesting water birds. (Photo by Jo Conner)

Archie and his son Stephen watching fishermen landing sturgeon on the Suwannee River, 1976. In 1985 the state of Florida designated the sturgeon as a "species of special concern" and prevented any further harvest. Starting in 1975 Archie collected information about sturgeon in the Suwannee and Apalachicola rivers. All of his sons took part in this project, and since 1985 Stephen has been tagging and following the movements of sturgeon in the Suwannee with amazing success.

The whole family lined up for a Christmas picture, Micanopy, 1954. From left: Tom, Archie, Mimi, Stephen, Chuck, Marjorie, and David.



Wewa Pond, 1968. Wigeons, gadwalls, blue-winged teal, ring-neck ducks, and green-winged teal came by the thousands that year to feast on—of course—duckweed. (Photo by Archie Carr)

Archie with Ben, 1970s. Ben is examining a young green turtle—not an inhabitant of Wewa Pond.

Wewa's alligator, 1980. The gator is guarding her nest, the grassy mound to the left. She has shared Wewa Pond with us for more than forty years. (Photo by Archie Carr)

Jasper, an alligator snapping turtle, 1964. Jasper was given to us by a fisherman from Jasper, Florida. After he lived for a few months in a small pool, we placed Jasper in Wewa Pond. He became quite tame and would come when called. Here David is offering him a piece of catfish. (Photo by Archie Carr)

Archie at the visitors center of Paynes Prairie State Park, 1976. Paynes Prairie is fifty square miles of level plain formed by the collapse of the limestone bedrock. It drains into a large sinkhole, Alachua Sink, which used to clog up from time to time, causing the prairie to become a shallow lake. When dry, the prairie is a superb natural pasture, and the Seminole Indians maintained large herds of cows and horses there in the late eighteenth century. (Photo by Herb Press)

Archie in the Fahkahatchee Strand in southwestern Florida, 1972. The Fahkahatchee, a strip of wilderness some twenty-five miles long and seven miles wide, includes samples of almost every landscape found in the big cypress swamp. Here, air plants cover the branches of the pond cypress and other host trees.

A Dubious Future

If the world goes on the way it is going, it will one day be a world without reptiles. Some people will accept this calmly, but I mistrust the prospect. Reptiles are a part of the old wilderness of Earth, the environment in which man got the nerves and hormones that make him human. If we let the reptile go it is a sign we are ready to let all wilderness go. When that happens we shall no longer be exactly human.

One of the awesome enigmas of today is how to slow the ruin of the natural earth while our breeding continues. There is no more need to multiply with the old fever. Breeding is good business, but it is herding our race toward a tragic impasse. When this is clearly seen and the reproduction is slowed down it will be because thoughtful people have taken charge; and these people will look about for what has been left of old values. One of the values is what the human spirit gets from wilderness—from all kinds of wild original landscapes and beings. The way we are going, what we keep of the old Earth will not be enough to save our honor with our descendants.

Writing this, I felt one of the qualms you cannot keep down when in your mind you weigh new industries against rough country empty of all but unused beasts and vegetables. I have no real doubts myself, mind you, but to many others in the world, especially the Florida world, to question the complete goodness of population growth is a perverse and sinister sort of iconoclasm that probably should be investigated by a committee. Thinking that way, I scared myself a little, and to get over it I called off the writing for a spell and went over to Lake Alice. Lake Alice is one of the solid assets of the University of Florida.[1] It is a sinkhole lake with tree-swamp at one end and open water at the other, and all through it a grand confusion of marsh creatures and floating and emergent plants. The place is a little relic of a vanishing past, and, incredibly, it lies on the campus of a university

Adapted from *Life Nature Library: The Reptiles*, by Archie Carr and the Editors of Time-Life Books. Copyright © 1963 Time-Life Books, Inc.

with thirteen thousand students and less than half a mile from where I am writing now. It is there to go to when euphoria spreads through the press over some new gain the state has made in people.

I went this time to where an alligator called Crooked-Jaw has her nest beside a wire fence at one edge of the swampy end of the lake. I stopped the car and walked over to the nest and looked at it closely. I had taken a picture of it the day before, and I could see that Crooked-Jaw had made some changes during the night. They were not drastic—only small, fastidious adjustments to show she knew the heap was warming a new generation of her kind. A root-mass of buttonbush had been added, along with a few live switches of *Decadon* and some scooped-up slush of coontail from the bottom. On the top of the pile was a single balled-up pink paper towel; and though it seems unlikely, I am sure I had seen this lying six feet to one side of the nest the day before. I can say that because I was aroused at the sight of it, at the idea of anybody defiling with pink the premises of an alligator nest. Crooked-Jaw clearly failed to share my resentment. There is no accounting for tastes. The nest did not look as good to me with the paper towel on it, but the matter was not in my hands.

The alligator was not in her usual station, her lying-in pool, as it were—the little dredged-out hole of water a mother gator waits in for eggs to hatch. She was off somewhere among the floating islands, and I started croaking—*eer-rump, eer-rump*—like a little gator. A long way out through the flooded willows a floating island began to quake; and then all at once water surged out from the frogbit raft beside the waiting pool, and Crooked-Jaw came up looking at me. A gallinule whined from a bonnet patch, and in the high haze to the west, the sandhill cranes were bugling. I croaked some more, but the alligator had lost interest. She sank into the water till her chin rested on the mud, and only the bumps of her eyes and nose and the big scales of her back stuck out.

Looking at her there in her fragment of a doomed landscape, I was sure again that the saving of parts of the primitive earth has got to be done, and that it has got to be done without trying to justify it on practical grounds. Species and landscapes must be kept because it pleases people to contemplate them and because freer men of future times will be appalled if we irresponsibly let them go. Not facing that fact seems to me the great weakness in the outlook for wilderness preservation today.

It will take resolute people to put abstract values in place of material progress. In testing the mettle and conscience of recruits for the work, the reptile—particularly the unloved, legless snake—may serve as a sort of shibboleth. A man who feels in his bones that snakes must be kept in the woods will be proper stuff for the struggle coming.

Snakes are probably disappearing at a more rapidly rising rate than any other group of vertebrates. Besides the widespread antipathy they get from man, marshes are drained, country is reforested in pure stands of unsuitable cover, poisons spread abroad kill off the food supplies of the creatures snakes eat and even kill the snakes themselves. But the most spectacular thing happening to snakes is the onslaught of cars on the roads. In his book *That Vanishing Eden,* Thomas Barbour spoke of the passing of snakes before cars on the roads of Florida, but he never saw the big change. It came with the many-laned highways of the fifties and sixties.

The worst snake traps are the causeways across marshes and the streams of cars that cross them. Snakes are lured to them to enjoy the warm pavement or to escape flooded habitat, or they encounter them merely in the course of their foraging. I remember a vast dying of snakes on the road across Paynes Prairie decades ago, when man and weather chanced to move together against the creatures of the marsh. On October 18, 1941, a hurricane moved in from the Gulf and spun in the vicinity for thirty-six hours, bringing fourteen inches of rain during five days. The prairie changed from a marsh to a lake, and the water rose so high that only the tips of the tallest grasses showed. On the twenty-fifth some students brought in two hundred snakes they had caught along the road-fill and told of a great hegira of snakes and of congregations of buzzards squabbling over the ones mashed by passing cars. There was clearly something extraordinary going on, and four of us from the biology department went out to investigate. We started at the northern edge of the prairie and walked abreast down the road with flashlights, one of us at each guardrail and two along the middle of the pavement. The road over the marsh was two miles long. We counted every snake dead or alive between the guardrails, which in those single-lane days were twenty feet apart. We picked up 723 snakes in the two miles, about two-thirds of them dead or injured.

As an accumulation of several days, this number of casualties would not have been unprecedented. But these were the accumulation of no more than the four hours or so since sundown. During the daylight hours buzzards—black vultures and turkey vultures—had been attracted to the killing by the hundreds and had carried the dead snakes away almost as fast as they were run over. So the snakes we counted had been killed after dark. The tally was: 284 red-bellied snakes; 200 ribbon snakes; 85 green water snakes; 64 banded water snakes; 55 garter snakes; 19 Allen's mud snakes; 6 brown snakes; 4 cottonmouth moccasins; 3 horn snakes; 3 king snakes.

The slaughter had no noticeable effect on the levels of snake populations in the prairie. For a decade afterward the road remained a mecca for snake collectors, and they kept coming from distant places to walk along

it with bag and stick. But in recent years the prairie snakes have declined. Although the roadside was made a wildlife sanctuary, and the snakes in it are now immune to people who used to take them away in sacks, the cars keep going by, and snakes have no immunity to them.

No significant preserving of nature can be done with slight sacrifice. The true test will come when great sacrifices are needed, when it becomes necessary to fight the indifference of most of the world and the active opposition of much of it, to surmount man's ingrained determination to put the far future out of his mind in matters of current profit.

Besides the inherent technical difficulties of wilderness conservation, the effort to save original nature faces a whole constellation of other kinds of problems. The easiest obstacle to recognize is the opposition by people who for material reasons oppose the keeping of wilderness. There is another block of humanity that simply does not care and an unsorted lot made up of those who think of themselves as conservationists—and who in one way or another are, but who are not facing the really tough obligation at all. I refer to all people who think of saving nature for meat, water, timber, or picnic grounds for the future; and to the hunters who hope their grandsons will get red blood by shooting things; and to the reverence-for-life cultists who are foredoomed to inconsistency; and to the biologists who resist the loss of material for study; and to keepers of zoological gardens who preserve nature in cages. Putting this mixture of motives and aspirations together under the label conservation has made, in some cases, a temporarily stronger front. But it has muddied the real issue, hidden the dimensions of the long job and kept everybody from articulating the awful certainty that the hard saving has got to be done for the sake of abstract values.

For several years I have been involved in a preservation program that has been atypically feasible. This is a campaign to rehabilitate the green sea turtle, *Chelonia mydas*, in the Caribbean Sea, where its once extensive nesting range has been reduced to only two rookery beaches.

In the Caribbean, the way things were going a short while ago, the green turtle was facing complete extirpation. Now I believe there is no such danger. The change in outlook was made possible by a combination of circumstances such as cannot be counted on in most preservation projects. In the first place, the suspected migratory feats of green turtles focused scientific interest on them and brought support from research foundations—the National Science Foundation and the Office of Naval Research—for studies of their basic natural history. A major factor that has greatly eased the way for preservation is the lucky circumstance that the single nesting beach remaining in the western Caribbean is located at Tortuguero, on the

coast of that gem of a small nation, the Republic of Costa Rica. In former times exploitation of the Tortuguero colony brought Costa Rica a steady small revenue in the form of a fee paid by the concessionaire, who parceled out the beach to the turtlers and sold their catch to the Cayman schooners or sent it away as deck-loads on freight boats going back to Florida. But in 1957 the government closed the beach to exploitation. The move saved the green turtle for the western Caribbean, but it also deprived Costa Rica of all profit from its green turtles because there is no good turtle pasture along the Costa Rican shore and no turtles go there except during the breeding season. The refuge will repopulate the pastures from Colombia to Mexico and will increase the yield of the turtle grounds of the Nicaraguan Miskito Coast to schooners turtling for the markets of New York and Europe. For Costa Rica itself there is only the satisfaction of having faced the choice between quick gain and a better future—and having chosen with characteristic wisdom.

In 1955, when the first of a series of grants from the National Science Foundation was made, a tagging camp was established at Tortuguero. The information accumulated helped stimulate the founding of the Caribbean Conservation Corporation, a nonprofit undertaking dedicated to restoring the Atlantic green turtle in American waters.[2]

The world is responsible for reptiles. The inadvertent saving of scraps will never keep off the ruin of the earth. The only way is to name the real obligation clearly, to say without hedging that no price can be set for the things that have to be preserved. Basically, what must be done are the harder jobs, like justifying a future for snakes, which have no legs, hear no music, and badly clutter subdivisions. Bore through to the core of what is required and you see that it is an aggressive stewardship of relics, of samples of original order, of objects and organizations of cosmic craft. This work will take staunch people, and the reptile can be the shibboleth by which they pass.

To get the real feel of the problem, I conjure up a man of some far future time walking in a last woods lying unruined among launching pads of a planetary missile terminal and coming astounded upon the last of all living individuals of *Crotalus adamanteus,* the great unruly diamondback rattlesnake. It is a full-grown female snake that I see, two yards long, stern of face, and all marked off in geometric velvet. It is the sort of being that always, inadvertently and without malice, has been a thorn in the flesh of Americans, one of the novel terrors the land held for humans whether they came in caravels or wandered down into the New World out of the snake-free Siberian cold. Seeing the man, this last diamondback begins readying the steel of its coils, and they ebb and flow behind the thin neck holding

the broad head steady and still, except for the long tongue waving. By the girth of her I judge that this is a pregnant snake, heavy with some dozens of prehatched perfect little snakes the same as herself, all venomous and indignant from the start, all intractable and, like their mother, unable to live except as free snakes.

The snake that confronts the imagined man is a moving thing to see. It is not easy to understand all the feelings aroused by such a sight, and the snake I think forward to is the last in all the pabulum agar culture of the purified world. The coils of her body rise and fall in slow spirals, the keen singing of her rattle sounds, and she waits there, testing with the forks of her tongue the whole future of her kind. In my thought the man then stoops with an old urge and picks up a stick. It is almost the only stick left lying in the eastern half of North America, and the man takes it up and moves in closer to the wondering snake. He raises the stick, then somehow lowers it as if in thought, then halfway brings it up again. And then the conjuring fails for me, and the snake song falls away, like the song of cicadas losing heart, one by one. The woods grow dark and fade off into distant times.

Notes

Prepared by Marjorie Harris Carr

Jubilee

1 Harold Loesch, "Sporadic mass shoreward migrations of demersal fish and crustaceans in Mobile Bay, Alabama," *Ecology* 41 (April 1960): 292–98.

2 Archie Fairly Carr, Jr., *A Contribution to the Herpetology of Florida*, Biological Science Series, no. 3 (Gainesville: University of Florida, 1940).

3 William Bartram, *Travels Through North and South Carolina, Georgia, East and West Florida* (Philadelphia: James and Johnson, 1791; New York: Penguin, 1988). See also Francis Harper, *The Travels of William Bartram* (New Haven: Yale University Press, 1958), 120.

4 Homosassa Springs is today the centerpiece of the Homosassa Springs State Wildlife Park—155 acres of some of Florida's loveliest landscapes, including marshes, swamps, hammocks, and spring runs. For many years the springs were privately owned and operated as a high-class tourist attraction. A floating underwater observatory allowed visitors to watch the myriad fish at close range. The state of Florida purchased Homosassa Springs in 1989 and continues to operate the observatory. The objective of the park is to provide a showcase for native Florida wildlife and endangered species. For more information contact Homosassa Springs State Wildlife Park, 9225 West Fishbowl Drive, Homosassa Springs, FL 32646; telephone, (904) 628–2311.

5 Since 1977 the St. Johns River has been under the care of the St. Johns River Water Management District, one of five water management districts in the state. Each district has taxing authority, so funds are available for innovative restoration, as well as maintenance. Years ago the headwaters of the St. Johns were drained for agricultural use. Now nearly 200,000 acres have been purchased and returned to the original marshland state. In addition, the district has undertaken the restoration of the Ocklawaha River, the largest tributary of the St. Johns. Lake Apopka, one of the headwater lakes of the Ocklawaha, had been in an advanced state of eutophication for many years; now it is rejuvenating. The floodplain of the upper Ocklawaha had been drained and dredged, and sections of the river were channelized. These mucklands are now being bought up and returned to the marshlands characteristic of the floodplain. Restoration is slow process—and the slowest part is getting people to take the initial step. Once nature is given a free hand, the process takes place with startling rapidity. For more information contact John Hankinson, Director of Planning and Land Acquisition, St. Johns River Water Management District, Box 1429, Palatka, FL 32077; telephone, (904) 329–4500.

Sticky Heels

1 Archie Carr, *Handbook of Turtles: The Turtles of the United States, Canada, and Baja California* (Ithaca, N.Y.: Cornell University Press, 1952). Archie started work on this book in 1944 before we moved to Honduras for a four-year stint with the Escuela Agricola Panamericana, an agricultural school for Central American boys that was sponsored by the United Fruit Company. He completed the book after we returned to Gainesville in 1949.

2 J. T. Nichols, "Data on size, growth and age in the box turtle, Terrapene carolina," *Copeia* (March 1939): 14–20.

A Florida Picnic

1 Rudyard Kipling, *The Jungle Book* (1894; reprint, Harmondsworth, England: Penguin, 1961). The story of the mugger of Mugger Ghat appears in the chapter titled "The Undertakers." The mugger also said, "Respect the aged!"

All the Way Down upon the Suwannee River

1 William Bartram, *Travels Through North and South Carolina, Georgia, East and West Florida* (Philadelphia: James and Johnson, 1791; New York: Penguin, 1988). See also Francis Harper, *The Travels of William Bartram* (New Haven: Yale University Press, 1958).

2 Archie Carr, *Ulendo: Travels of a Naturalist In and Out of Africa* (New York: Knopf, 1964; Gainesville: University Press of Florida, 1993).

3 Thomas B. Thorson, "Movement of bull sharks, *Carcharhinus leucas*, between Caribbean Sea and Lake Nicaragua demonstrated by tagging," *Copeia* (July 1971): 336–38.

4 Apparently the Suwannee chicken, *Pseudemys concinna suwanniensis*, is holding its own. Paul Moler, biological administrator with the Florida Game and Fresh Water Fish Commission, thinks that as our society becomes more urban the habit of eating off the land decreases. That is good news for the Suwannee chicken, and it probably is a help to the gopher tortoise, though loss of habitat is the main difficulty for the gopher.

5 Ichetucknee Springs State Park continues to be one of the loveliest and most popular places to visit—particularly on a hot summer day. The Park Service has sought a balance between people tubing and the fragile aquatic plants in the spring run. They have found that the level of wear and tear on the plants is acceptable if only 750 people per day are permitted to tube the entire length of the run. In addition, tubing is only allowed June 1 to Labor Day. Canoeing, however, is permitted year round. For more information contact Ichetucknee Springs State Park, Route 2, Box 108, Fort White, FL 32038; telephone: (904) 497–2511.

also Francis Harper, *The Travels of William Bartram* (New Haven: Yale University Press, 1958).

3 Edwin D. Cope, "On the snakes of Florida," *Proceedings of the United States National Museum* (1888): 381–94.

4 Einar Loennberg, "Notes on reptiles and batrachians collected in Florida in 1892 and 1893," *Proceedings of the United States National Museum* (1894): 317–39.

5 Clement S. Brimley, "Records of some reptiles and batrachians from the southeastern United States," *Proceedings of the Biological Society of Washington* (1910): 8–18.

6 The Fall Line is where the coastal plain meets the Piedmont upland of the Appalachian highlands. Where streams that traverse the older and harder rocks of the uplands enter the younger sediments of the coastal plain, falls or rapids occur. The Fall Line was of enormous importance in the development of the eastern seaboard because the falls in the rivers marked the upper end of uninterrupted navigation and also provided water power for mills. Looking south from I-10, east of Tallahassee, one can easily see the Fall Line as a marked dip in the terrain. The white-water rapids of the Suwannee River near Ellaville are another indication of the Fall Line in Florida.

7 Charles Schuchert, *Historical Geology of the Antillean-Caribbean Region* (New York: Riley, 1935).

8 E. P. St. John, "Rare ferns of central Florida," *American Fern Journal*, 1936, no. 26: 41–55.

9 This refers to personal conversations held in the 1940s with Dr. T. H. Hubbell and Sidney Stubbs of the University of Florida biology department.

Florida Vignettes

1 It is thought that the gopher tortoise may no longer exist outside of protected areas by the year 2000. That's a shame and a needless loss of one of the state's most attractive, mild, and amenable animals.

Some steps are being taken. The state has designated the gopher tortoise as a "species of special concern," and methods are being tested and evaluated for relocating gopher colonies caught in the path of construction. Although it takes a little effort, gophers tortoises can live in close proximity to development, according to Elizabeth Knizley, secretary of the Gopher Tortoise Council (formed in 1978) and an effective friend of this gentle animal. She tells me that "innovative land developers are setting aside areas for gophers within communities. When communities cannot set aside adequate areas, potential restocking sites, such as reclaimed mining lands and public water supply wellfields, may possibly serve as home sites for displaced gophers. Beyond relocation, increased protection at the legislative level, protection of gopher habitat in the form of preserves, and public education are required to reverse the gopher's alarming decline."

To help the gopher contact the Gopher Tortoise Council, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611.

2 James E. Lloyd, "Aggressive mimicry in *Photuris*: Firefly femmes fatales," *Science*, 1965, no. 149: 653–54.

3 Archie F. Carr, "A key to the breeding songs of the Florida frogs," *Florida Naturalist*, 1934, no. 7: 19–23.

Suwannee River Sturgeon

1 James A. Huff, "Life history of Gulf of Mexico sturgeon, *Acipenser oxyrhychus desotoi*, in Suwannee River, Florida," *Florida Marine Research Publications* (November 1975): 1–32.

2 It has been difficult to determine where the sturgeon spawn. Since 1985, Stephen Carr, with support from the Phipps Florida Foundation, has diligently monitored the sturgeon each year. In 1988 the Fish and Wildlife Service of the United States Department of the Interior initiated a program designed to restore sturgeon to their former waterways. Stephen places beepers on big female sturgeon, then follows them day and night. He thinks they spawn near spring outflows. Sure enough, in June 1993 eggs were found near the Alapaha Rise far up the Suwannee, and in August sturgeon fry were found there.

An Introduction to the Herpetology of Florida

1 Jacques Le Moyne de Morgues, a Huguenot artist, accompanied René Goulaine de Laudonnière to Florida in 1564–65. Laudonnière's narrative of the events in Florida, illustrated with forty-two engraved reproductions of the drawings Le Moyne made while in Florida, were published in Germany after Le Moyne's death. (The translator changed the name Jacques to Jacob.) These are the earliest known pictures of Indians of North America. On how the expedition came about see David I. Bushnell, Jr., "Drawing by Jacques Le Moyne de Morgues of Saturioua, a Timucua chief in Florida, 1564," Smithsonian Miscellaneous Collections, vol. 81, no. 84 (1928). According to Bushnell, the English translation of Le Moyne is as follows:

> Charles IX, King of France, having been notified by the Admiral de Chatillon that there was too much delay in sending forward the re-enforcements, needed by the small body of French whom Jean Ribaud had left to maintain the French dominion in Florida, gave orders to the admiral to fit out such a fleet as was required for the purpose. The admiral, in the mean while, recommended to the king a nobleman of the name of Renaud de Laudonnière; a person well known at court, and of varied abilities, though experienced not so much in military as in naval affairs. The king accordingly appointed him his own lieutenant, and appropriated for the expedition the sum of a hundred thousand francs. . . . I also received orders to join the expedition, and to report to M. de Laudonnière. . . . I asked for some positive statements of his own views, and of the particular object which the king desired to obtain in commanding my services. Upon this he promised that no services except honorable ones should be required of me; and he informed me that my special duty, when we should reach the Indies, would be to map the seacoast, and lay down the position of towns, the depth and course of rivers, and the harbors; and to represent also the dwellings of the natives, and whatever in the province might seem worthy of observation: all of which I performed to the best of my ability, as I showed his majesty, when, after having escaped from the remarkable perfidies and atrocious cruelties of the Spaniards, I returned to France."

2 William Bartram, *Travels Through North and South Carolina, Georgia, East and West Florida* (Philadelphia: James and Johnson, 1791; New York: Penguin, 1988). See

"The Florida alligator program is dwarfed by a similar program in Louisiana, where more than 130 farms produce sixty thousand to seventy thousand skins annually. Altogether the U.S. alligator industry produces more than one-third of the legal crocodile skins in trade worldwide. The majority of these skins are exported to Italy, France, and Japan. Meat consumption is evenly divided between domestic sales and exports, largely to Taiwan."

The Alligator Management Program also monitors statewide alligator population trends and sponsors programs to educate the public about the important role the alligator plays in Florida's wetland ecosystems. The educational programs are supplemented by the distribution of brochures about the life history and biology of alligators and how Floridians can safely coexist with them.

A flaw in this elaborate and meticulously carried out program is the emphasis on the monetary value of hides, meat, and "sport hunting" permits in defining the value of alligators. In an effort to increase the tangible—monetary—value of alligators, the commission in 1993 encouraged sport hunting of alligators. Hunters armed with .357 magnum spears were chasing around in shallow lakes at night in airboats! I think the whole approach is wrong. The alligator is not here to provide meat, skin, and joy of hunting for man. That arrogant assumption is out of date. Today we recognize the important role the alligator plays in molding and maintaining the wetland landscapes in the South. Living in harmony with this big predator will take some doing. But our brains are bigger than the gators' are, and we should be able to come up with a plan to accommodate both people and alligators in Florida. If it appears that the gator population needs to be reduced in any given lake, the game commission personnel should carefully assess the problem. If necessary, let them kill the extra gators and sell off the hides and meat. If there is no market for these items, let them bury the alligators. There is no exucuse for sport hunting. I also think it would help if the commission dropped the word *resource* and called the animals *alligators* instead. For more information contact Alligator Management Program, Wildlife Research Laboratory, Florida Game and Fresh Water Fish Commission, 4005 South Main Street, Gainesville, FL 32601.

2 Jacob Le Moyne, "Indorum Floridam provinciam inhabitantium eicones," in Theodore Bry, ed., *Voyages en Virginie et en Floride* (Liège, 1591; reprint, Paris: Ducharte et Van Buggenhoudt, 1926). See also "An Introduction to the Herpetology of Florida," n. 1.

3 William Bartram, *Travels Through North and South Carolina, Georgia, East and West Florida* (Philadelphia: James and Johnson, 1791; New York: Penguin, 1988). In the 1950s Francis Harper retraced many of Bartram's travels. In 1958 he published a naturalist's edition of *The Travels of William Bartram* (New Haven: Yale University Press, 1958), edited with commentary and an annotated index. While we luxuriated in referring to our own copy of the second edition of Bartram it was Francis Harper's edition that we depended on. I find our copy filled with little pieces of paper with Archie's notes on them. It's a grand book and a proper tribute to that marvelous naturalist William Bartram. A side note: The zoology department of the University of Florida is housed in two connected buildings; one is William Bartram Hall, and the other is Archie Carr Hall. This gives me great pleasure.

4 William Bartram, *Travels Through North and South Carolina, Georgia, East and West Florida* (Philadelphia: James and Johnson, 1791; New York: Penguin, 1988). See also Francis Harper, *The Travels of William Bartram* (New Haven: Yale University Press, 1958).

5 R. H. Chabrek, "The movements of alligators in Louisiana," *Proceedings of the Southeast Association of Game and Fish Commissions*, 1965 (1966): 102–10.

6 Edward Avery McIlhenny (1872–1949) made an enormous contribution to the understanding of the behavior of the alligator. McIlhenny lived on Avery Island, Louisiana, which, according to McIlhenny, "is a series of hills rising about two hundred feet above the coastal plain of south Louisiana and is located about halfway between New Orleans and the Texas line." Avery Island is where that marvelous and unique McIlhenny's Tabasco Sauce is produced. It also happens to be the center of the greatest abundance of Louisiana alligators. McIlhenny, a layman, made meticulous observations on the engaging behavior of alligators and reported his findings in a charming little book, *The Alligator's Life History* (Boston: Christopher Publishing House, 1935). Before his death he was instrumental in establishing more than 175,000 acres of wildlife sanctuary in the marshlands of southern Louisiana. In 1976 McIlhenny's book on the alligator was republished by the Society for the Study of Amphibians and Reptiles, Miscellaneous Publications, Facsimile Reprints in Herpetology, with a foreword by Archie Carr and an index to recent literature by Jeffrey W. Lang. In summing up McIlhenny's contribution to understanding the alligator, Archie states: "This patient and redoubtable man contributed vastly in the only ways we know to save beleaguered wild species: by studying their biology and by setting aside wild landscapes in which they are safe from human depredations."

A Subjective Key to the Fishes of Alachua County, Florida

1 In the fall of 1936, when I first met Archie, I had a job as a wildlife technician with the Resettlement Administration in Welaka, Florida. One of my tasks was to identify the fish of the area. Archie gave me this key and assured me it would work. It did, indeed—but I wept with frustration while using it. In 1941 the American Society of Ichthyologists and Herpetologists (ASIH) held its annual meeting in Gainesville. The key was printed and distributed at that time as an issue of *Dopeia* (the name of the journal of the ASIH is *Copeia*), published by "The American Society of Fish Prevaricators and Reptile Fabricators." I want to thank Dr. Brooks Burr, editor of *Copeia* (1993), for permission to reprint the key.

Carnivorous Plants

1 Durland Fish and Donald Hall, "Succession and stratification of aquatic insects inhabiting the leaves of the insectivorous pitcher plant, *Sarracenia purpurea*," *American Midland Naturalist*, 1978, no. 99: 172–83.

2 Durland Fish, "Structure and composition of the aquatic invertebrate community inhabiting epiphytic bromeliads in South Florida and the discovery of an insectivorous bromeliad" (Ph.D. Diss., University of Florida, Gainesville, 1976).

The Moss Forest

1 Tony Jensen was a most observant man who cared a great deal about the forests in Florida. Tony, who died in 1985, was a neighbor of ours in Micanopy. He and Archie had many conversations about trees in general and live oaks in particular, and Archie put great store in what Tony had to say about the growth rate and age of live oaks.

2 San Felasco Hammock State Preserve was one of the first areas purchased by the state of Florida with the Environmentally Endangered Land Fund in the early 1970s. It is made up of sixty-five hundred acres. There are hiking and horseback trails, and the preserve is open to the public year round. For more information contact San Felasco Hammock State Preserve, Devil's Millhopper State Geological Site, 4732 Millhopper Road, Gainesville, FL 32601; telephone, (904) 336–2008.

3 Archie Carr, *Ulendo: Travels of a Naturalist In and Out of Africa* (New York: Knopf, 1964; Gainesville: University Press of Florida, 1993), xix.

Water Hyacinths

1 James O'Hara, "Invertebrates found in water hyacinth mats," *Quarterly Journal of the Florida Academy of Science*, 1967, no. 30: 73–80.

2 Florida has finally come to terms with water hyacinths. No longer does it wait until a lake or river is clogged with plants and then spray with massive doses of herbicides. Today the objective is to maintain hyacinths at the lowest possible level, knocking them back with spray before they get out of hand. This policy has reduced the amount of spraying—and the cost. In addition, three insects have been introduced that like to eat hyacinths. In 1972 two weevils, *Neochetina bruchi* and *Neochetina eichhorniae*, were released; in 1977 a moth, *Sameodes albiguttalis*, was added to the arsenal. After about ten years the three insects are well established, and though their effectivness is hard to assess, they must play an important role in the management of hyacinths.

Triple-Clutchers

1 Archie Carr, *Handbook of Turtles: The Turtles of the United States, Canada, and Baja California* (Ithaca, N.Y.: Cornell University Press, 1952).

2 Peter C. H. Pritchard, *Encyclopedia of Turtles* (Neptune, N.J.: T. F. H. Publishing, 1979).

A Dubious Future

1 After some years of pushing and pulling, the University of Florida realized that Lake Alice was indeed a solid asset, and today it remains a beautiful little wild lake on the campus. For a while, there were fears regarding too-aggressive alligators, but the construction of two small islands for the alligators to bask on and the posting of signs prohibiting their feeding has resulted in a mutually beneficial relationship.

2 For more than three decades the Caribbean Conservation Corporation (CCC) has carried out a green turtle tagging program at Tortuguero. The program is the longest-running study of its kind in the world. Since 1987 Archie's work has been continued by the CCC, whose executive director is David Carr, and by the Archie Carr Center for Sea Turtle Research at the University of Florida, whose director is Dr. Karen Bjorndal, one of Archie's former graduate students. The two groups coordinate the International Cooperative Tagging Project, which assists tagging efforts of sea turtles throughout the world.

In Costa Rica, the CCC has implemented a comprehensive zoning plan for the last remaining stretch of unprotected rain forest in order to protect the sea turtle rookery at Tortuguero. To educate and interest the forty-seven thousand visitors who now come to Tortuguero each year, CCC is in the final stages of building an environmental interpretation and extension center. The center includes educational exhibits on sea turtle biology and the coastal environment, a training program for tour guides to the nesting beach, and a program to involve the local community in ecotourism. Local folks who once hunted turtles now guide a growing number of ecotourists along the nesting beach.

In Nicaragua, the CCC is developing a management plan for the five-thousand-square-mile Miskito Coast Protected Area, one of the largest resident green turtle feeding grounds in the world. This magnificent, essentially untouched area contains some of the richest coastal and marine environments anywhere in the hemisphere. It supports a diverse abundance of aquatic and terrestrial wildlife, including manatees, dolphins, and rare water birds. An essential part of the plan is the integration of environmental and economic interests and the promotion of cooperation between indigenous people and the national government.

In Central America, the CCC is involved with the Wildlife Conservation Society (formerly the New York Zoological Society) in a bold regional conservation initiative called Paseo Pantera—"path of the panther." Archie Carr III (often called Chuck), regional coordinator of Mesoamerican Programs for the society, developed the idea for this elegant project, which strives to preserve biological diversity and enhance wildlands management on the Central American isthmus by linking a chain of parks and protected areas across seven countries from Guatemala to Panama, creating a protected corridor connecting North and South America. The goal of Paseo Pantera is to provide the methods, tools, and knowledge for the nations of Central America to work together toward conservation. The seven presidents of the region already have signed a Central American Biodiversity Treaty calling for the corridor.

In Florida, the CCC has been instrumental in helping to establish the country's first national preserve for sea turtles—the Archie Carr National Wildlife Refuge. This twenty-mile stretch of beach near Melbourne is the nesting site for the largest population of loggerhead turtles in the Western Hemisphere (about sixty thousand) and the largest green turtle rookery in the United States (about one thousand).

Through a new program, the Sea Turtle Survival League, the CCC is working to implement stricter government regulations to protect U.S. sea turtle populations, including a ban on certain commercial fishing activities, limits on coastal development and pollution, and beach lighting ordinances. The group is also working to raise public awareness of sea turtle conservation issues.

For more information about sea turtle conservation or the Paseo Pantera contact the Caribbean Conservation Corporation, P.O. Box 2866, Gainesville, FL 32602-2866; telephone, (800) 678-7853.

Eden Changes

1 John Kunkel Small, *From Eden to Sahara: Florida's Tragedy* (Lancaster, Pa.: Science Press, 1929); and Thomas Barbour, *That Vanishing Eden: A Naturalist's Florida* (Boston: Little, Brown, 1944).

2 Jacob Rhett Motte, *Journey into Wilderness: An Army Surgeon's Account of Life in*

Camp and Field During the Creek and Seminole Wars, 1836–1838, James F. Sunderman, ed. (Gainesville: University of Florida Press, 1953).

3 For an explanation of cut-bait fishing, please see "All the Way Down Upon the Suwannee River," p. 69.

4 Marjorie Kinnan Rawlings, *The Yearling* (1938; reprint, New York: Macmillan, 1986).

5 Florida has continued a vigorous program of setting aside unique landscapes before they are developed or priced out of the reach of public purchase. In 1979 the Conservation and Recreation Lands Act (CARL) was passed with funding from mineral extraction severance taxes amounting to $15 million to $40 million annually. Save Our Coasts, a $275 million bond program, was passed in 1981. In the same year a program called Save Our Rivers, under the aegis of the Water Management Districts and funded by documentary stamps amounting to $30 million to $40 million annually, was approved by the voters in Florida. In 1987 funding for the CARL program was increased by bonding. Realizing that time to purchase prime landscapes was running out, the state in 1990 passed the Preservation 2000 Act, which provides $300 million for land purchase in the next ten years. In response to public demand, Florida has one of the finest public lands programs in the nation. For information concerning Florida's magnificent state parks, contact the Florida Department of Environmental Protection, Division of Recreation and Parks, 3900 Commonwealth Boulevard, Tallahassee, FL 32399; telephone, (904) 488–9872.

A Naturalist in Florida

A Celebration of Eden

Archie Carr

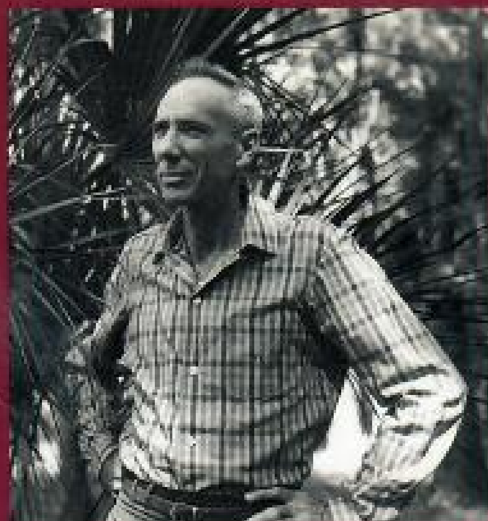
Edited by Marjorie Harris Carr

Foreword by Edward O. Wilson

"From the Apalachicola bluffs to the Florida Keys, across a career spanning fifty years, Carr became a uniquely qualified guide through the dwindling wildlands of the state, the world authority on turtles, and the South's greatest regional naturalist of his generation. . . . No writer exceeds Carr in his ambidextrous handling of human and natural history."
—Edward O. Wilson, from the Foreword

Archie Carr (1909–1987) was an eminent naturalist, writer, conservationist, and world authority on sea turtles. Throughout his life he wrote on many aspects of natural history, but he was particularly entranced by the wildlife and ecosystems of Florida, where he lived for more than fifty years. This captivating book—a collection of some of his most enchanting essays on Florida—provides memorable details and anecdotes about the flora, fauna, and humans that have inhabited this colorful landscape.

Carr describes the eating rituals of the snakebird; the personality, courtship, and copulation of box turtles; the way skinks (a type of lizard) use their tails when foraging; and the characteristics of Spanish moss. He ponders why fish migrate to create "jubilees" in certain streams, the effects of disappearing ponds on the plants and animals that live in them, and the captivating activities of alligators and alligator snapping turtles. Carr's essays, some of



which appeared earlier in such magazines as *Audubon*, *Field and Stream*, and *Wildlife Conservation*, are a kind of testimony to and celebration of an exuberant natural world that is now seriously threatened.

Archie Carr was graduate research professor of zoology at the University of Florida, Gainesville. During his illustrious career he won numerous awards and honors, including the Daniel Giraud Elliott Medal of the National Academy of Sciences, the O. Henry Memorial Award for short-story writing, the Hal Borland Award of the National Audubon Society, and the designation of Eminent Ecologist by the Ecological Society of America. His many books include *Ulendo: Travels of a Naturalist In and Out of Africa*, *So Excellent a Fishe*, and *The Windward Road*, which won the John Burroughs Medal for nature writing.

Jacket illustration:
The alligator who has shared Wewa Pond with the Carr family in Alachua County, Florida, for more than forty years. Photo by Tom Carr.

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A Naturalist in Florida

A Celebration of Eden

Archie Carr

Edited by Marjorie Harris Carr
Foreword by Edward O. Wilson

Yale University Press
New Haven and London

"Carr's essays of Florida shine with charm, grandeur, and a childlike delight. This is the writing not only of a brilliant naturalist, but of a poet and of a journalist. It stands as a memoir to a breathtaking paradise, and as an eloquent call to save what's left of it."—Carl Hiaasen

"Carr will entertain and enlighten new generations with his intimate appreciation of natural beauty and his lifelong commitment to protecting the environment. Whether the subject is lizards or moss, alligators or hyacinths, or whether it's his beloved turtles, he gently but firmly nudges us to appreciate our environmental responsibilities, to respect the past, and to renew our commitment to the future."
—Senator Bob Graham, Florida

"Carr was Florida's premier naturalist and a great writer. His book is wondrous. The images of the Florida that once was are a tragic reminder of what we have lost. This is a book that *every* Floridian who loves Florida must have."—Nathaniel P. Reed, former Assistant Secretary of Interior for Fish, Wildlife and Parks

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