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“Safina offers a rich and often heart-touching account of his journeys with scientists exploring the minds and emotions of elephants, wolves, and dolphins. His compassion and empathy for animals shines throughout, and he uses both to illuminate the booming field of animal cognition. A beautifully written, accessible, and compelling read”
Virginia Morrell, author of *Animal Wise: How We Know Animals Think and Feel*

CARL SAFINA’S writing about the living world has won a MacArthur “genius” prize; a Guggenheim Fellowship; book awards from Lannan, Orion and the National Academies; and the John Burroughs, James Beard and George Rabb medals. He has studied seabirds, worked to ban high-seas drift nets and to overhaul U.S. fishing policy. Safina is now the first Endowed Professor for Nature and Humanity at Stony Brook University and he runs the not-for-profit Safina Center. He is author of the classic book, *Song for the Blue Ocean*. He lives on Long Island, New York with his wife Patricia and their dogs and feathered friends.

Beyond Words

What Animals Think and Feel



CARL SAFINA

SOUVENIR
PRESS

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I thought of the long ages of the past during which the successive generations of these things of beauty had run their course . . . with no intelligent eye to gaze upon their loveliness, to all appearances such a wanton waste of beauty. . . . This consideration must surely tell us that all living things were not made for man. . . . Their happiness and enjoyments, their loves and hates, their struggles for existence, their vigorous life and early death, would seem to be immediately related to their own well-being and perpetuation alone.

—Alfred Russel Wallace, *The Malay Archipelago*, 1869

We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err, and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.

—Henry Beston, *The Outermost House*, 1928

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PROLOGUE

Into the Mind Field



Ask now the beasts, and they shall teach thee; and the fowls of the air, and they shall tell thee: Or speak to the earth, and it shall teach thee: and the fishes of the sea shall declare unto thee.

—Job 12:7–8, King James Version

Another big group of dolphins had just surfaced alongside our moving vessel—leaping and splashing and calling mysteriously back and forth in their squeally, whistly way, with many babies swift alongside their mothers. And this time, confined to just the surface of such deep and lovely lives, I was becoming unsatisfied. I wanted to know what they were experiencing, and why to us they feel so compelling and so—*close*. This time I allowed myself to ask them the question that is forbidden fruit: *Who* are you? Science usually steers firmly from questions about the inner lives of animals. Surely they have inner lives of some sort. But like a child who is admonished that what they really want to ask is impolite, a young scientist is taught that the animal mind—if there *is* such—is unknowable. Permissible questions are “it” questions: about where it lives, what it eats, what it does when danger threatens, how it breeds. But *always* forbidden is the one question that might open the door: *Who*?

There are reasons to avoid so fraught an inquiry. But the reason we least acknowledge is that the barrier between humans and animals is artificial, because humans *are* animals. And now, watching these dolphins, I was tired of being so artificially polite; I wanted more intimacy.

I felt time slipping for both of us, and I did not want to risk having to say good-bye and realizing that I'd never really said hello. During the cruise I'd been reading about elephants, and elephant minds were on my own mind as I wondered about the dolphins and watched them pacing fluidly and freely in their ocean realm. When a poacher kills an elephant, he doesn't just kill the elephant who dies. The family may lose the crucial memory of their elder matriarch, who knew where to travel during the very toughest years of drought to reach the food and water that would allow them to continue living. Thus one bullet may, years later, bring more deaths. Watching dolphins while thinking of elephants, what I realized is: when others recognize and depend on certain individuals, when a death makes the difference for individuals who *survive*, when relationships define us, we have traveled across a certain blurry boundary in the history of life on Earth—"it" has become "who."

"Who" animals know *who* they are; they know who their family and friends are. They know their enemies. They make strategic alliances and cope with chronic rivalries. They aspire to higher rank and wait for their chance to challenge the existing order. Their status affects their offspring's prospects. Their life follows the arc of a career. Personal relationships define them. Sound familiar? Of course. "They" includes us. But a vivid, familiar life is not the domain of humans alone.

We look at the world through our own eyes, naturally. But by looking from the inside out, we see an inside-out world. This book takes the perspective of the world outside us—a world in which humans are not the measure of all things, a human race among other races. In our estrangement from nature we have severed our sense of the community of life and lost touch with the experience of other animals. And because everything about life occurs along a sliding scale, understanding the *human* animal becomes easier in context, seeing our human thread woven into the living web among the strands of so many others.

I'd intended to take a bit of a break from my usual writing about conservation issues, to circle back to my first love: simply seeing what animals do, and asking why they do it. I traveled to observe some of the most protected creatures in the world—elephants of Amboseli in Kenya, wolves of Yellowstone in the United States, and killer whales in the waters of the

Pacific Northwest—yet in each place I found the animals feeling human pressures that directly affect what they do, where they go, how long they live, and how their families fare. So in this book we encounter the minds of other animals *and* we listen—to what they need us to hear. The story that tells itself is not just what's at stake but *who* is at stake.

The greatest realization is that all life is one. I was seven years old when my father and I fixed up a small shed in our Brooklyn yard and got some homing pigeons. Watching how they built nests in their cubbyholes, seeing them courting, arguing, caring for their babies, flying off and faithfully returning, how they needed food, water, a home, and one another, I realized that they lived in their apartments just as we lived in ours. Just like us, but in a different way. Over my lifetime, living with, studying, and working with many other animals in their world and ours has only broadened and deepened—and reaffirmed—my impression of our shared life. That's the impression I'll endeavor to share with you in the pages that follow.

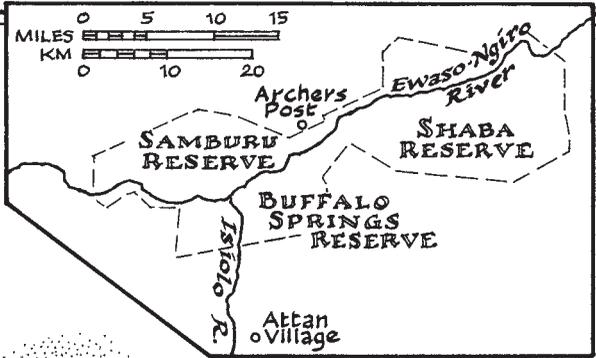
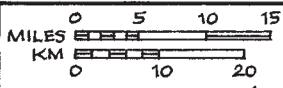
————— • PART ONE • —————

Trumpets of Elephants

*Delicate and mighty, awesome and
enchanted, commanding the silence
ordinarily reserved for mountain
peaks, great fires, and the sea.*

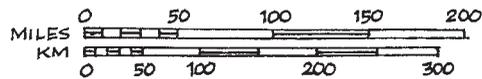
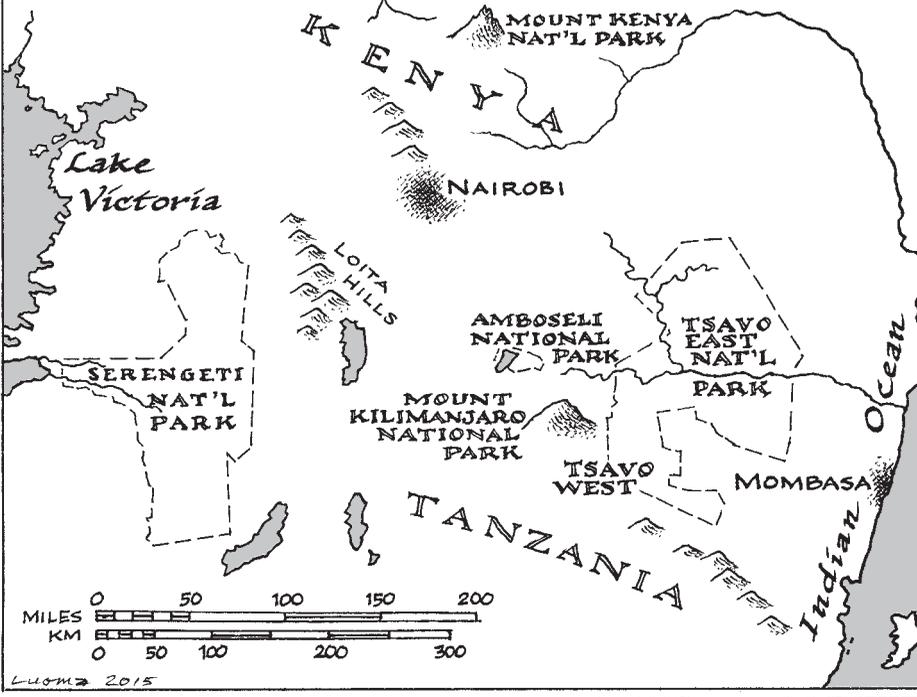
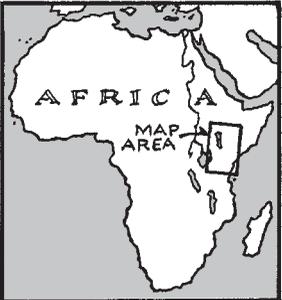
—Peter Matthiessen, *The Tree Where
Man Was Born*

Kenya



Chalbi Desert

Lake Turkana





Finally I saw that the very land itself had risen, that the sunbaked land had taken form as something vast and alive and was in motion. The land walked as multitudes, their strides so utterly of the earth that they seemed the source of the very dust. The cloud they raised engulfed us, seeped into every pore, coated our teeth, sifted into our minds. Both flesh and metaphor. That big.

And you could see their heads, like warriors' shields. Their great breaths, gushing in and out, resonant in the halls of their lungs. The skin as they moved, wrinkled with time and wear, batiked with the walk of ages, as if they lived within the creased maps of the lives they'd traveled. Travelers across landscapes, and through timescapes. The skin moving like swishing corduroy, textured and rough but sensitive to the slightest touch. The grind of their cobblestone molars as, sheaf by sheaf and mouthful by mouthful, they acquired the world. All the while uttering the contented purring of mounds of memories.

Their rumbles rolled through the air like distant thunder approaching, vibrating through the undulating ground and the roots of trees, rallying families and friends from the hills and rivers, sending among themselves greetings and recognitions and news of where they had been; sending to us a sign of something coming.

A mind moves a mountainous mass of muscle and bone, the brown eyes light a landscape, and one elephant rumbles in. See her squared brow, trace the tracks of snake-sized blood vessels. Heralded by her own trumpet, applauded by her own clapping ears, she strikes us as timeless and a bit sublime, aware and deliberative, peaceful and nurturing and deadly

dangerous as needs arise. Wise only within the confines of her capabilities, like us. Vulnerable. As we all are.

Watch. Simply listen. They will not speak to us, but to one another they say much. Some of it, we hear. The rest is beyond words. I want to listen, to open to the possibilities.

Disproportioned ears flapping. Tough dust-crusts hide. Bizarre protruding teeth the size of human legs astride the world's most phallic nose. Such gargoyle grotesqueness should strike us as hideous. Yet in them we perceive a vast intangible beauty, at times so intense it fells us. We sense much more, much deeper. We can feel that their march across the landscape is *intentional*. We cannot deny; they are going to a place they have *in mind*.

That's where we're headed now.

The Big Question

“It was the worst year of my life,” Cynthia Moss is saying over breakfast. “All the elephants over fifty years old died, except Barbara and Deborah. Most over forty died. So it’s particularly amazing that Alison, Agatha, and Amelia have survived.”

Alison, now fifty-one years old, is right *there*, in that clump of palms—see? Forty years ago, Cynthia Moss arrived in Kenya determined to learn the lives of elephants. The first elephant family she saw she named the “AA” family, and she named one of those elephants Alison. And there she is. Right there, vacuuming up fallen palm fruits. Astonishing.

With much luck and decent rainfall, Alison might survive another decade. And there is Agatha, forty-four years old. And this one coming closer now is Amelia, also forty-four.

Amelia continues approaching, until, rather alarmingly, she is looming so hugely in front of our vehicle that I reflexively lean inward. Cynthia leans out and talks to her in soothing tones. Amelia, practically alongside now, simply towers as she grinds palm fronds, rumbles softly, and blinks.

In the light of this egg-yolk dawn, the landscape seems an eternal ocean of grass rolling toward the base of Africa’s greatest mountain, whose blue head is crowned by snow and wreathed in clouds. Through gravity-fed springs, Kilimanjaro acts like a giant water cooler, creating two miles-long marshes that make this place magnetic for wildlife and for pastoralist herders. Amboseli National Park got its name from a Maa word that refers to the ancient shallow lake bed—half the park—that seasonally glitters

with the sparkle of wetness. The marshes expand and contract depending on the rains. But if the rains fail, panes of water dry to pans of dust. And then all bets are off. Just four years ago, a drought of extremes shook this place to its core.

Through times lush and calamitous, through these decades, Cynthia and these three elephants have maintained their presence, urging themselves across this landscape. Cynthia helped pioneer the deceptively complex task of simply seeing elephants doing elephant things. Longer than any other human being ever has, Cynthia has watched some of the same individual elephants living their lives.

I was expecting that, after four decades, the famous researcher might be a bit field-weary. But I found in Cynthia Moss a young woman in her early seventies, of bright blue eyes and startling bubblyness. A bit pixie-ish, actually. A *Newsweek* magazine writer during the 1960s, Cynthia decided, after her first visit to Africa, to chuck New York and all things familiar. She'd fallen in love with Amboseli. It's easy to see why.

Perhaps too easy. The great plain of mirages and heat waves conveys the illusion that Amboseli National Park is big. It is too small. You can easily drive across it in well under an hour. Amboseli is a postcard that Africa once mailed to itself and now keeps in a drawer marked "Parks and Reserves." Kilimanjaro, not even in the same nation, stands across an imaginary line in a place called Tanzania. The mountain and the elephants know that it is one true country. But the 150-square-mile park serves as a central watering hole for the surrounding three thousand square miles. Amboseli elephants use an area roughly twenty times larger than the park itself. As do cattle- and goat-grazing Maasai people. The only year-round water is here. The outer lands are too dry to water them. The park is too small to feed them.

"To survive the drought," Cynthia is explaining, "different families tried different strategies. Some tried to stay close to the swamp. But they did very badly as it dried. Some went far north, many for the first time in their lives. They did better. Out of fifty-eight families, only one family did not lose anybody." One family lost seven adult females and thirteen youngsters. "Usually if an elephant goes down, the family gathers around and tries to lift it. In the drought, they had no energy. Watching them dying, seeing them on the ground in agony—"

One in four of Amboseli's elephants—four hundred out of a population of sixteen hundred—perished. Nearly every nursing baby died. About 80 percent of the zebras and wildebeests died, nearly all of the Maasai's cattle; even people died.

So when the rain returned, the surviving female elephants bereft of babies all cycled into estrus at about the same time. Result: the biggest baby boom in Cynthia's forty-year history here, about 250 little elephants born in the last two years. This is a sweet spot in time to be born an elephant in Amboseli. Lush vegetation, plenty of grass—and little competition. Water makes elephants. And water makes elephants happy.

Several happy elephants are sloshing through an emerald spring under ample palm shade. It's a little patch of paradise. With their bouncy, rubbery little trunks, the babies seem to transit the outer orbits of innocence.

"Look how fat *that* baby is," I say. The fifteen-month-old looks like a ball of butter. Four adults and three little babies are wallowing in one muddy pool, spraying water over their backs with their trunks, then sprawling on the bank. As a little one melts in pleasure, I notice the muscles around the trunk relaxing, eyes half-closing. An adolescent named Alfre lies down to rest. But three youngsters pile on, stepping on Alfre's ear. *Oomph*. The fun softens to a snooze, with babies lying asleep on their sides, adults standing protectively over them, the adults' bodies touching one another's as they doze. Feel how calm they are, knowing their family is safe here now. It's soothing just to watch.

Many people fantasize that if they won the lottery, they would quit their job and immerse themselves in leisure, play, family, parenthood, occasional thrilling sex; they'd eat when they were hungry and sleep whenever they felt sleepy. Many people, if they won the lottery and got rich quick, would want to live like elephants.

The elephants seem happy. But when elephants seem happy to us, do they really feel happy? My inner scientist wants proof.

"Elephants experience joy," Cynthia says. "It may not be human joy. But it is joy."

Elephants act joyful in the same situations that make us joyful: familiar "friends" and family, lush food and drink. So we assume they feel the

way we feel. But beware of assumptions! For centuries, people's assumptions about other animals have ranged from believing that animals cast spells on people to believing that they are aware of nothing and can't even feel pain. Observe what an animal does, scientists advise, but speculation about mental experiences is meaningless, a waste of time.

Speculation about animals' mental experiences happens to be the main quest of this book. The tricky task ahead: to go only where evidence, logic, and science lead. And, to get it right.

Cynthia's free-living colleagues seem wise. They seem youthful, playful. Powerful, majestic. Innocent. All these things, they are. Inoffensive. But of all the animals, they are the ones who can wage sustained resistance to human persecution with deadly force. As we do, they strive to survive and to keep their children safe. I guess I am here because I am ready to learn, ready to ask, How are they like us? What do they teach us about ourselves?

What I don't see coming is: I have the question almost exactly backward.



Cynthia Moss is most at home in her Amboseli field camp. The camp, nestled cozily in a clearing ringed by palms, features a small cook shack and half a dozen large tents, each with a proper bed and a bit of furniture. On a recent morning, tea was late. The researcher who unzipped her tent flap to go and inquire about the tea's progress found a lion dozing on the cook shack's step, and a very awake cook behind the door.

Today the tea is on time, and over toast I have, finally, gotten round to asking Cynthia what I think is the Big Question. "What has a lifetime of watching elephants," I ask, "taught you about humanity?" I glance to make sure my recorder's light is on, then settle back a bit. Forty years of insight; this will be good.

Cynthia Moss, however, gently deflects my question. "I think of them as elephants," she says. "I'm *interested* in them as elephants. Comparing elephants to people—I don't find it helpful. I find it much more interesting trying to understand an animal as itself. How does a bird like a crow, say, with so small a brain, make the amazing decisions it makes? Comparing it to a three-year-old human child—that doesn't interest me."

Cynthia's mild objection to my question comes so unexpectedly that at first I don't fully grasp it. Then I am stunned.

As a lifelong student of animal behavior, I'd long ago concluded that many social animals—certainly birds and mammals—are fundamentally like us. I've come here to see how elephants are "like us." I am *writing this book* about how other animals are "like us." But I'd just gotten a major course correction. It took a few moments—in fact, it took days—but, like an intravenous drip, it seeped in.

Cynthia's enormous little comment implied that humans are not the measure of all things. Cynthia is traveling a higher road.

Cynthia's comment hit Reset, not just on my question but on my thinking. I'd somehow assumed that my quest was to let the animals show how much they are like us. My task now—a much harder task, a much deeper task—would be to endeavor to see *who* animals simply *are*—like us or not.



The elephants we're watching are nimbly pulling grass and brush with their trunks, rhythmically stuffing tufts and wads into their cheeks, their massive molars mightily mashing away. Thorns that can puncture a tire, palm fruits, bundles of grass—it all goes in. I once stroked a captive elephant's tongue. So soft. I don't understand how their tongues and stomachs can handle those thorns.

What I see: elephants, eating. But those words cast, as all words do, the loosest lasso around reality. We are watching "elephants," true, yet I realize with embarrassment that I know nothing about their lives.

But Cynthia does. "When you look at a group of anything—lions, zebras, elephants," Cynthia explains, "you're seeing just two flat dimensions. But once you know them individually, their personalities, who their mother was, who their kids are, it adds new dimensions." One elephant in a family might seem regal, dignified, gentle. Another will strike you as shy. Another as a bully who will be pushy to get food in sparse times; another as reserved; another as "flamboyantly" playful.

"The realization of how complex they are took me about twenty years," Cynthia continues. "Over the period that we were following Echo's family—she was about forty-five years old at the time—I saw that Enid was

incredibly loyal to her, Eliot was the playful one, Eudora was flaky, Edwina was unpopular, and so on. And slowly I realized that I'd begun knowing what would happen next. I was taking my cues from Echo herself. I was understanding her leadership—as her family was understanding it!”

I look at the elephants.

Cynthia adds, “It made me realize how totally super aware they are of what we're doing.”

Super aware? They seem oblivious.

“Elephants don't *seem* aware of details,” Cynthia explains, “until something familiar changes.” One day a cameraman working with Cynthia decided that for a different angle, he'd position himself *underneath* the research vehicle. The oncoming elephants, who usually just passed by the vehicle, immediately noticed, stopped, and stared. Why was a human under the car? A male named Mr. Nick snaked his slithering, sniffing trunk under there to investigate. He was not aggressive and did not try to pull the man out; he was just curious. Another day, when the vehicle appeared with a special door designed for filming, elephants came exploring, actually touching the new door with their trunks.

Trunks are strangely familiar, familiarly strange things. Extremely sensitive and unimaginably strong, they can pick up an egg without breaking it—or kill you with an easy smack. An elephant's trunk terminates in two almost fingery tips, like a hand in a mitten. The way elephants use their trunks helps make them seem familiar, like one-armed people, hiding their hideous nose in plain sight and affecting its transformation. Can we ever get over how strangely wonderful, how wonderfully beautiful? Segmented like the tree trunks of the palms under which they sometimes rest, the trunk is an elephant's Swiss Army knife. Rounded on the outer edge, flattened on the inner, a great mine-sweeping, water-hosing, mud-flinging, dust-deviling, air-testing, food-gathering, friend-greeting, infant-rescuing, baby-reassuring caterpillar of a nose. “It has double hoses for sucking in and spraying out water or dust,” wrote Oria Douglas-Hamilton. Journalist Caitrin Nicol adds that a trunk does “what a person would rely on a combination of eyes, nose, hands, and machinery to do.” Yoshihito Niimura of the University of Tokyo offers: “Imagine having a nose on the palm of your hand. Every time you touch something, you smell it.”

They're firmly wrapping those wondrous noses around sheaves of grass, and when the soil is reluctant to surrender the clumps, they give a little kick to break them. The food is freed and lifted. Sometimes they shake soil from roots. The eating is slow, relaxed. Often they slightly swing the trunk for a little momentum in pitching the next mouthful into their triangular jaw. Sometimes they pause for a moment, seeming thoughtful. Perhaps they're just stopping to listen, monitoring indicators of their children's well-being, family safety, and possible danger.

I'd love to know how much overlap there is right now between what I am sensing and what the nearest elephant is sensing. Our input channels are similar: sight, scent, sound, touch, taste; what these senses bring to our attention must broadly overlap. We can see the same hyenas, say, as do the elephants and hear the same lions. But we, like most other primates, are very visual; elephants, like most other mammals, have an acute sense of smell. Their hearing is excellent, too.

I'm sure the elephants here are sensing much more than I; this is their home, and they have a history here. I can't tell what's going on in their heads. Nor can I tell what Cynthia's thinking as, quietly and intently, she observes.