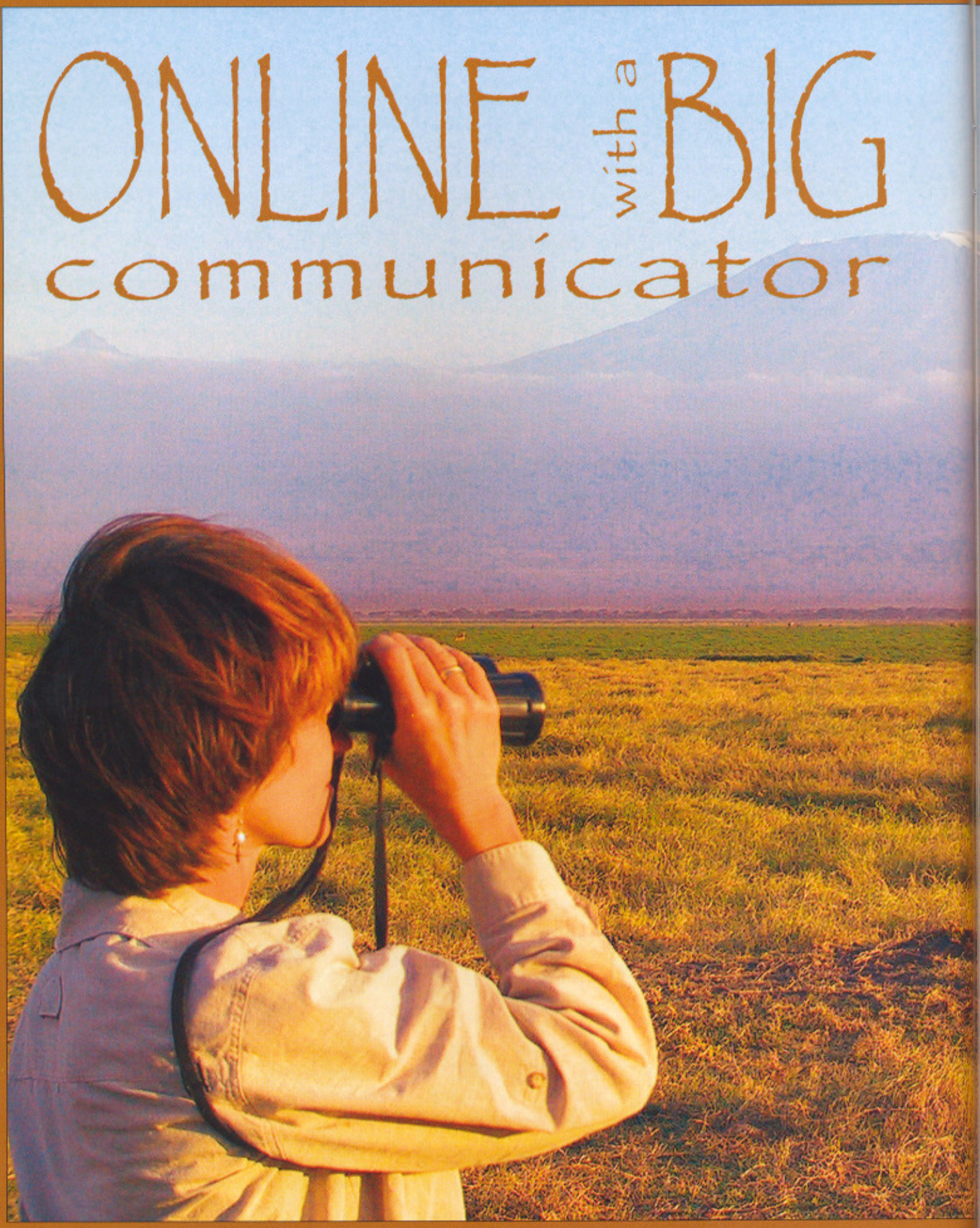
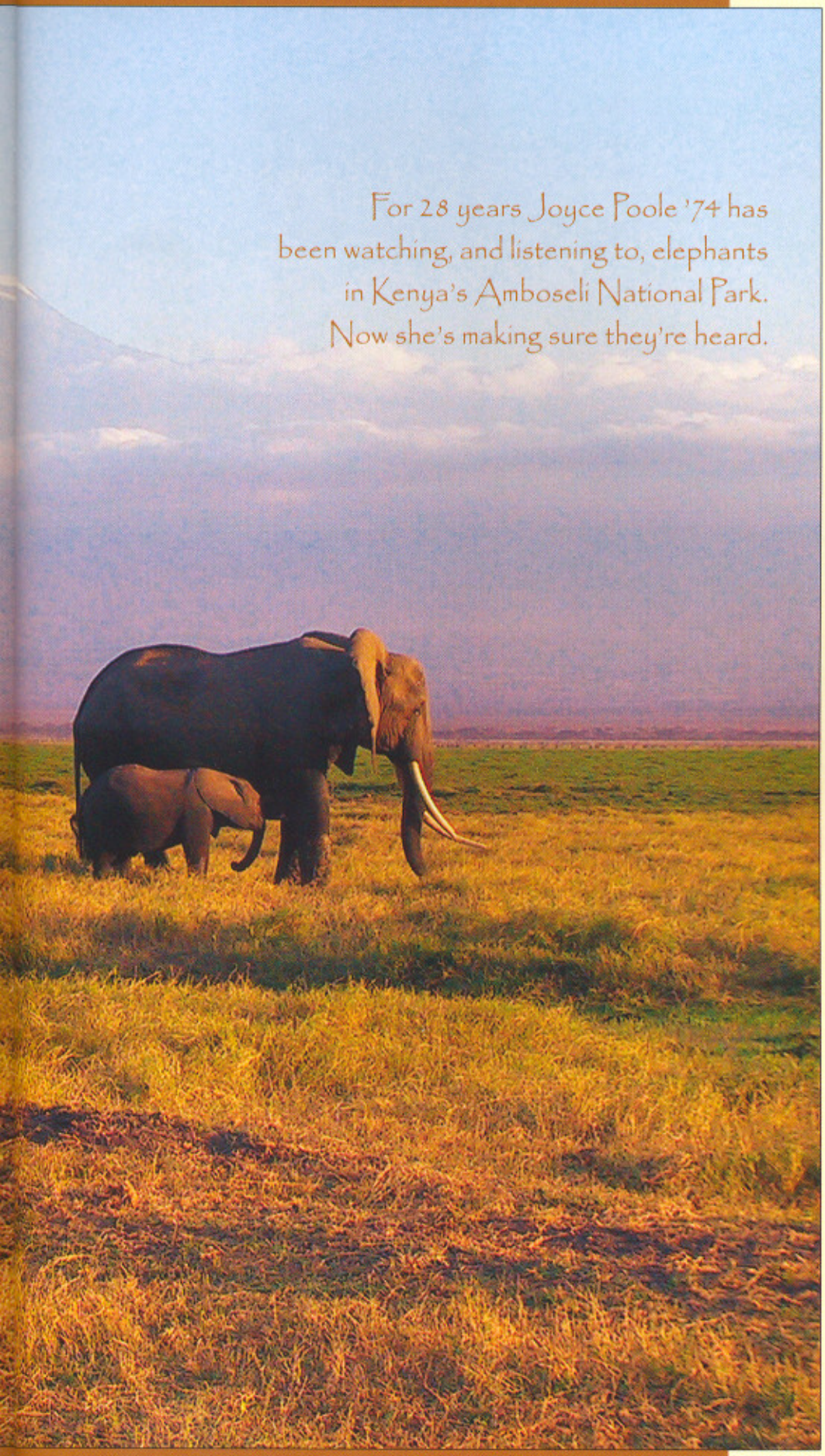
ONLINE with a BIG communicator





For 28 years Joyce Poole '74 has been watching, and listening to, elephants in Kenya's Amboseli National Park. Now she's making sure they're heard.

When I close my eyes to think of elephants I feel enduring warmth: Sunlight reflecting off large bodies, amber eyes blinking in deep contemplation, soft footfalls on the pan, lingering exhalations of warm breath, and the comforting resonance of their voices. For more than 28 years these images and feelings have been etched deep into my psyche.

◀ Observing elephants in Amboseli National Park at the base of snow-capped Kilimanjaro

▲ Our lab and office at the edge of Rift Valley, south of the Ngong Hills, an hour outside Nairobi

◀ Echo, Erin, and Enid in deep discussion

FAMILY TIES

Well-known for their intelligence, close family ties and social complexity, elephants are unusually long-lived and have the biggest brain of any terrestrial mammal. Like humans, elephants, living in a fission-fusion society, remember for years other individuals and places, forming close ties with individuals in social groups that form, split and reform in numerous combinations and in multiple layers of complexity. Relationships radiate out from the mother-offspring bond through families, extended families, clans, and populations creating one of the largest social networks of any nonhuman species.

To add to this list of extremes, elephants are able to recognize, up to 1–2 kilometers away, the powerful infrasonic voices of more than 100 friends and relatives, and they can send strong vocal signals that may be detected acoustically by other elephants up to 10 kilometers away and seismically, through sensitive corpuscles in their feet, up to perhaps 30 kilometers away.

ONLY A CALL AWAY

Most recently we have discovered that elephants are able to imitate the calls of other species and machines in their environment, making them the first terrestrial mammal other than humans to do so. Like us they may be using vocal imitation to mimic the voices of close family and friends thus enhancing the bonds upon which the survival of these extraordinary individuals depends.

The study of elephant communication is in a phase of rapid discovery and I believe that over the next ten to twenty years we will continue to uncover astonishing details that challenge the accepted view of the minds of animals.

ECHO

I work with my husband, Petter Granli, in Amboseli National Park, Kenya, at the base of snow-capped Kilimanjaro with a family of 26 African savanna elephants led by 58-year-old matriarch, Echo. From a kilometer away I recognize her unmistakably slow and rhythmical stride that creates the characteristic swing of her crossed tusks; close up the knobbed pattern of

rough skin on her forehead, the cataract in her left eye, the abscess on her right hip are her distinguishing marks. Her calm and steady demeanor belies an arousing nature and a fierce loyalty to her family.

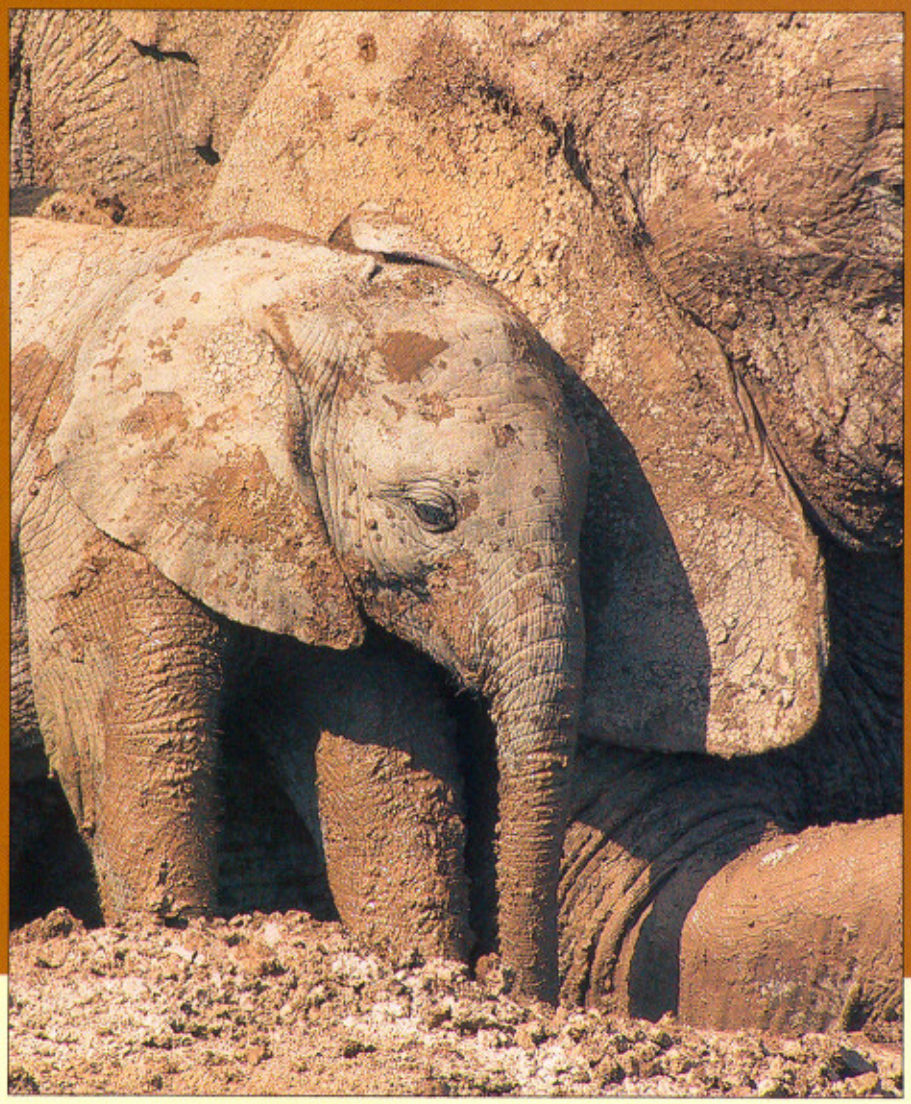
In late April 2003 Echo's eldest daughter, Erin, was speared by Maasai warriors 15 kilometers from their Ol Tukai Orok home in an area the family seldom visited. For over three weeks the family stayed within calling distance, visiting Erin from time to time to greet her in demonstrative vocal and tactile interchanges. I was with Erin and her family over the course of several days during this difficult period. On May 21, after a long and painful struggle, Erin collapsed and died of septicemia. At 34 years old she was the mother of three immature calves, Echeri (8), Erica (5), and E-mail (20 months), two adult daughters, Edwina (21) and Eleanor (18), and three grandchildren. Her son Esau (12) had already left home.

Only after Erin's death did Echo and the extended family depart. Traveling southwest they walked across the border into Tanzania to a place Echo had not visited in 31 years. There they remained for several more weeks. When Echo and her family returned to Kenya they walked straight to the place of Erin's death and stood touching and fondling her bones.

A FAMILY IN MOURNING

What goes on in the minds of beings such as elephants? What kind of thoughts and feelings can an individual as long-lived, as large-brained and as socially and emotionally complex as Echo have? Did she feel love and loss for a daughter from whom for 34 years she had rarely been separated by more than tens of meters? In remaining near to Erin through the course of her decline was Echo able to comprehend not only that Erin was unable to walk home, but that she probably never would? If not why didn't she, or some of the others, simply go home and wait for Erin to follow later, as they normally would have done?

These were some of the questions that Petter and I asked ourselves as we watched the drama on the plains unfold. It seemed to us that Echo remained with Erin because at some level she *understood* that her daughter needed her



◄ Erin's death was a grim experience. In 2002, during happier times, Erica plays in the mud by her mother's side.

► A family group bunches together after hearing a lion call; teamwork is a vital component of elephant survival.

presence and because she was able to comprehend that her daughter would probably die.

It appeared, too, that Echo was able to communicate to other members of her family, perhaps through simple vocal signals, her insight as well as her intention to remain with Erin, for rather than splitting up as they usually would have done, they remained together in an unfamiliar place for weeks. The apparent ability of elephants to empathize and to have some understanding of death contradicts the conventional view of the minds of nonhuman animals.

Are we correct in our conclusions or are there other simpler explanations for Echo's behavior? These are the questions that continue to fuel my life's work. Answering them may open a window into the minds of elephants, as well as provide us with deeper understanding of our own human origins.

GREAT COMMUNICATORS

I have studied the behavior and communication of elephants over a period of 28 years as part of the Amboseli Elephant Research Project—the longest study of elephants in the world. While no species vocal communication can begin to compete with human language in terms of its richness and complexity, elephants have an extensive repertoire including over 70 different calls. Elephants call to advertise physiological or hormonal state, threaten adversaries and secure group defense, demonstrate strong emotions, announce needs or desires, propose, discuss a plan of action, coordinate group movement, care for calves, elicit care or support from others, reinforce bonds between family and friends, and to reconcile differences.

Elephant vocalizations are highly variable ranging from very low frequency rumbling sounds, or "rumbles", to higher frequency trumpets, roars, barks, bellows, cries, snorts, screams, squeals, and groans. These different sounds vary over more than 10 octaves from 5 hertz (far below the level of human hearing) to 9,000 hertz. Indeed, within a single call an elephant may slide over 6 octaves—significantly better than an opera singer!

In addition to this basic vocal repertoire, elephants produce a variety of idiosyncratic and novel sounds. Elephants

also communicate via a wide variety of visual and tactile gestures and displays and chemical secretions. A complex suite of these signals mediates the intricate teamwork displayed by members of an elephant family, including the kinds of decisions that Echo and her family took over the course of the weeks leading up to and following Erin's death.

WORKING TOGETHER

A couple of years ago Petter and I initiated the Savanna Elephant Vocalization Project (SEVP) to create a multimedia collection of elephant communicative signals and interpretive information easily accessible to biologists, wildlife managers and conservationists around the world through our website, www.elephantvoices.org. The elephant communication collection, started in 2002 and hopefully to be completed in 2006, is being created in collaboration with scientists and institutions both in Kenya and around the globe.

In Kenya our main collaborators are members of the 31-year Amboseli Elephant Research Project, of which I am scientific director, and the Kenya Wildlife Service, as well as a team of biologists and engineers at the University of Cornell and individuals at other academic institutions in the United States, Europe, and Asia. Through the collection and our work with colleagues we aim to form a new scientific basis of understanding for the intelligence and behavioral complexity of elephants, provide innovative tools to enhance their long-term survival, and inspire other people working with and for elephants.

As among the elephants, long-distance communication is vital to the success of our project, and the Internet and e-mail are fundamental tools for us. The growing number of contacts and mail gives us long working hours, but also inspiration and deep satisfaction. A lesson we have learned from elephants: teamwork is a key to achievement! Our collective goal in the long run is a world where people, elephants, and other living creatures live together in relative harmony. To achieve that goal we need understanding.

All photos by Joyce Poole '74/Petter Granli