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Craig B. Stanford

beautiful minds

THE PARALLEL LIVES OF
GREAT APES AND DOLPHINS

ENDOWED THROUGH EVOLUTION WITH LARGE brains, the great apes (chimpanzees, bonobos, gorillas, and orangutans) and the cetaceans (dolphins and whales) are second only to humans in intelligence. In this delightful and intriguing book, dolphin specialist Bearzi and primatologist Stanford discuss the similarities between these groups. Both use tools, have sophisticated means of communication and cooperation, solve problems innovatively, transmit cultural traditions to the next generation, and are able to imitate others. Like humans, apes and dolphins form complex social networks, and they are capable of deception and manipulation. The authors cite many examples: dolphins hoard objects in order to get treats or wear sponges as protective masks as they forage; apes use twigs to extract termites from termite mounds, chimpanzees cultivate alliances with group mates to dominate their communities. In the final section, Bearzi and Stanford survey the factors making dolphins and apes endangered species, and they make a plea for conserving the ecosystems in which they live, because the beautiful minds of these creatures are “a terrible thing to waste.”

—*Publishers Weekly*

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APES AND DOLPHINS: PRIMATES AND cetaceans. Could any creatures appear to be more different? Yet both are large-brained intelligent mammals with complex communication and social interaction. In the first book to study apes and dolphins side by side, Maddalena Bearzi and Craig B. Stanford, a dolphin biologist and a primatologist who have spent their careers studying these animals in the wild, combine their insights with compelling results. *Beautiful Minds* explains how and why apes and dolphins are so distantly related yet so cognitively alike and what this teaches us about another large-brained mammal: *Homo sapiens*.

Noting that apes and dolphins have had no common ancestor in nearly 100 million years, Bearzi and Stanford describe the parallel evolution that gave rise to their intelligence. And they closely observe that intelligence in action, both in the territorial grassland and rainforest communities of chimpanzees and other apes, and in groups of dolphins moving freely through open coastal waters. The authors detail their subjects' ability to develop family bonds, form alliances, and care for their young. They

CONTINUED ON BACK FLAP

offer a deeper understanding of their culture, politics, social structure, personality, and capacity for emotion. The resulting dual portrait—with striking overlaps in behavior—is key to understanding the nature of these “beautiful minds.”

MADDALENA BEARZI is the President and Co-founder of the Ocean Conservation Society and a visiting scholar in the Departments of Anthropology and Biological Sciences at the University of California, Los Angeles. She has studied dolphins and whales in California and different parts of the world.

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BEAUTIFUL MINDS

the parallel lives of
great apes and dolphins

MADDALENA BEARZI
& CRAIG B. STANFORD

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Maddalena: *For Charlie*

Craig: *For Erin*

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beautiful minds

introduction

BEAUTIFUL MINDS

ONE HAS HANDS much like yours or mine and can use them to skillfully manipulate a tool, delicately groom a partner, or speak in fluent sign language. The other doesn't have hands at all. One looks like you or me, more or less. The other has the body of a cruise missile. One swings through the trees of an African forest; the other dives deep

in cold oceans. Great apes and dolphins would seem to have very little in common. They live in worlds so different that you would have to dissect one to find that their organs and limbs share any common features. They are both mammals, but distantly related; the two groups haven't had a common ancestor in nearly a hundred million years. A gorilla and a bottlenose dolphin are about as closely related as a mouse and an elephant.

In spite of these differences, dolphins and apes—and by extension ourselves—share some strikingly similar and profoundly important traits. All three groups—the various dolphin species, the four great apes, and we humans—possess the acme of brains on Earth today. With due respect to a few other brainy animals like elephants, the cetaceans—dolphins and whales—and higher primates are the most cerebral of the world's creatures. We are all highly intelligent relative to the millions of other co-inhabitants of Earth. We live in highly complex, often fluid societies which defy the easy categories that apply to most other animals. The two creatures have evolved in parallel, exemplify-

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ing what biologists call convergent evolution. Although a casual observer won't see these parallels, research on dolphins and apes has produced increasingly abundant evidence for the comparison.

This is why we have written a book about apes and dolphins. Although both have been the subject of many other books, rarely have the two been considered as companion species, evolutionary partners in ways that are not immediately apparent to most people. And we two—Stanford, a primatologist, and Bearzi, a dolphin biologist—felt a consideration of the surprising parallels between these two creatures might result in some timely lessons for humankind. We decided to write the book in the first person, so each of us could be the voice for the animals we have spent our lives observing.

However you define intelligence, apes and dolphins are second only to humans in brainpower. Their brains are enormous in comparison to the size of their bodies. This brainpower has allowed dolphins and apes to possess communication skills and social interactions so complex that we are only now beginning to understand how they work. Un-

like most animals, apes and dolphins tend to live in flexible, open societies, and the relationships among individual animals are based on long-term memory of who is whose friend, and who owes whom a favor.

This combination of intelligence and social complexity is incredibly rare. It occurs on Earth today mainly in the living tips of the two great lineages: the cetaceans (dolphins and whales) and great apes (chimpanzees, bonobos, gorillas, and orangutans). In this book we suggest that the parallels between great apes and dolphins point us toward a deeper understanding of what it means to be human. We are, after all, the ultimate in big, brainy social complexity on the planet and possibly in the universe. We share with apes practically one-hundred percent of our evolutionary baggage, so our intellect is at its most basic primate level the same as theirs. Dolphins are an entirely different story; their big brains evolved without any historical connection to our own. But in this book we will consider whether the reasons for dolphin intelligence and social complexity have parallels in the great apes' and therefore our own evolution.

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Apes

They sit like worried buddhas, their brows furrowed and eyes burning from underneath, just a few inches away. Some are handsome and virile, others are youngsters, and a few are old and shabby—just like the people gathered around me outside the zoo exhibit. A strikingly handsome male chimpanzee is grooming himself, looking regal compared to kids around him. An old female, Pandora, has a ragged body capped by a massive pink swelling that hangs off her posterior end. I find it pretty hideous, but its appeal apparently goes way beyond the human aesthetic range, because she raises excitement among the male chimpanzees wherever she goes.

The glass barrier between us looks at first glance like it is there to protect us from savage apes, but I know better. It's also there to protect them from savage, disease-ravaged visitors. Chimpanzees can catch virtually all our diseases, for the diseases evolved to attack us have only a tiny adjustment to make to invade a creature so geneti-

cally like us. With thousands pressing their noses to the glass every day to connect with the mind of an ape, chimps without the barrier would be like lost tribes at the mercy of the germs carried to them by well-meaning missionaries.

The zoo has gone to great lengths to educate the public about the plight of the chimpanzee; its endangered status in Africa, the rate at which it is being hunted out of existence to feed people even while its forest homes are being logged. It's all happening with breathtaking speed, several million years of evolution being scratched out in an instant. But the message seems lost on the zoo visitors this morning; they're just trying to make a connection with an ape.

One of the children hoping to leap momentarily into the skin of an ape is my son. Adam looks through the window that separates us from the chimpanzees and then glances back at me. At seven years old, he stands about the same height they do. He's fascinated by all primates, partly because people naturally are, and also because his father is always talking about them or flying off to some remote place to study them. He was re-

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cently mentioned in a newspaper story about my work with chimpanzees—the journalist had watched Adam watching the chimpanzees in the zoo just as he is today and found it an irresistible hook for the story.

Adam's understanding of our connection to chimpanzees is simple but accurate. We are they, and they are us, for the most part. Adam knows that people "came from" apes long, long ago. Like many kids, he knows all about dinosaurs and has no trouble imagining that there may have been myriad animal forms in Earth's history like nothing we have seen since. It's usually adults who avoid acknowledging the continuity between them and us. Adam sees that the chimps are not monkeys, even though that is what most zoo visitors around us apparently believe. Chimpanzees are, in fact, more closely related to humans than they are to gorillas, all hirsute, beetle-browed appearances to the contrary.

These chimpanzees, born and raised in the zoo, seem almost domesticated. Their physique is like that of bodybuilders compared to their wild counterparts. At four years old, zoo apes are the

size that ten-year-old chimpanzees would be in the wild. With an abundant, carefully managed food supply, their growth rate is astounding, their muscles bulging at an early age. Yet zoo chimps are different from their wild-living cousins in many ways, including the ways in which they relate to one another.

Despite their smaller size, in the wild, chimpanzees are altogether different animals. They are sinewy and immensely powerful. I have seen males break off saplings to drag about in their macho charging displays at other males. Once a particularly bellicose male broke a tree on top of me in an apparent attempt to bully me. It was highly successful. Just as males can be brutal bullies, females are devoted, loving mothers. But females also exercise their own power, ganging up at times on unruly males. Despite their strength, I am always struck at how restrained most chimpanzee behavior is; they reserve their brute power for those rare times when it is truly needed. They spend nearly all of their lives peacefully plucking fruits, grooming one another, and sleeping; only in the smallest fraction of their lives do they let loose and show their power.

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Chimpanzees are one of four species of great apes, along with bonobos, gorillas, and orangutans. Their anatomy is close enough to ours that they belong in the same taxonomic family. Only because the earliest classifier, the Swede Carolus Linnaeus, was devoutly religious did the apes end up in their own family, separate from our own. Several million years ago, they and we shared the same ancestor. Then, the evolutionary lines split. Our own direct ancestors eventually stood up and walked, their brains mushroomed, and sophisticated intelligence blossomed. So the apes offer us a window onto whom we once were, not so long ago.

Jane Goodall began her famed study of wild chimpanzees in 1960, and not until the mid-1970s did a clear understanding of chimpanzee society emerge. The complexity of chimpanzee social behavior is such that it took nearly two decades to begin to understand how their society works. And now in spite of nearly half a century of research, we still have major gaps in our understanding about these apes. They are smart and resourceful, sharing the same range of emotions as ourselves. In watching wild chimpanzees, I have seen fear, aggression,

and nurturing, but also guilt, shame, and love. This is not just anthropomorphism on my part; given our kinship, our *a priori* assumption is that the emotional motivations of great apes are similar to our own.

The great apes live in the tropical forests of Africa and Asia. Their plight in the wild is so severe—from habitat loss to poaching for meat to rare viral epidemics—that they may well all disappear from Earth within our lifetimes. There are today an estimated 200,000-250,000 great apes of all four species combined—most of these are chimpanzees—and their numbers are in freefall. While they are still with us, they have much to teach, if only we would observe and listen.

How genetically similar are we to the great apes? By some estimates, the percentage of spots on our mutual DNA sequences that do not match up is substantially less than one percent. Now that the human genome map is more or less complete, molecular biologists have turned to mapping the chimpanzee genome. When that work is complete, scientists may begin to understand not just the percentage of similarity between us, but which

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genes differ in function. We are beginning to crack the code.

Dolphins

In the cold ocean waters of the world swim intelligent torpedoes. If people and apes are cousins, then people and dolphins are long-lost relatives. We are both mammals; we nurse our babies, we have hair (precious little in the dolphins' case), we have big brains and live in complex societies. But in most respects, notwithstanding the mammalian link, they are perhaps as different from us as any smart extraterrestrial creature would be. Their world is seawater, not land, and they navigate their territory by sonar rather than by sight. Buoyancy, not gravity, defines their body form and function. Where we expect legs, they have flippers. Their vocal communication, clicks and whistles, is unfathomably unfamiliar to us.

Recently my children and I stood watching dolphins cavort in a large aquarium tank. Their beauty comes from grace and power, artfully blended. But whereas a child will immediately see