"Upright is fascinating and pure pleasure to read. Craig Stanford has decided that 'walking can be sexy,' and he convinces readers about this using great clarity and verve." — Sarah Blaffer Hrdy, author of *Mother Nature*

"This book is wonderfully elegant. Stanford guides us nimbly through a maze of fascinating detective work about human evolution." — Richard Wrangham, author of *Demonic Males*

"In this thought-provoking, stimulating account, Stanford looks at the fundamental question 'Why did our earliest ancestors become bipedal and walk upright?' His unique perspective as an insider who has spent countless enthralling hours watching chimps and gorillas in their natural habitat makes this book particularly special." — Meave Leakey, National Museums of Kenya

**About the Book**

What is it that makes us human? Various ideas have been proposed: the opposable thumb afforded us the ability to use tools; our brain size gave us the capacity for critical thought; language allowed us to communicate complicated ideas. But one critical aspect, a physical distinction, has been overlooked: our two legs. In *Upright: The Evolutionary Key to Becoming Human*, anthropologist Craig Stanford offers the new, engaging, and provocative theory that walking upright — we are the only mammals to do so — is the linchpin in evolutionary development that made the human species possible.

Stanford's theory changes everything. The timeline of human development has been debated for decades, but the pivotal role of bipedalism prompts a dramatic reappraisal. Newly found remnants of two-legged "protohumans" show that our ancestry is much richer and more convoluted than the usual linear apes-to-hominids-to-human theory suggests.
Could it be that the iconic fossil Lucy is not one of our direct forebears? Might our evolutionary "tree" have more than one trunk? And do we really stand on the top rung of an evolutionary ladder of excellence?

In *Upright*, Craig Stanford, co-director of the Jane Goodall Primate Research Center at the University of Southern California, explains how our ancestors' shift from walking on four legs to relying on two led to a cascade of changes that ultimately explain our humanity: walking and running improved our forebears' ability to find meat; meat eating played a key role in the development of intelligence and in processes such as childbirth; the change in posture associated with walking affected our lungs and gave rise to speech.

With his novel research and interpretations, Stanford offers a fresh take on what made us human that will revolutionize the field of anthropology. The supreme importance of walking on two feet, and the reason standing upright is the most basic trait in human evolution, have never before been explained to the general reader. Donald Johnson, director of the Institute of Human Origins at Arizona State University and the discoverer of Lucy, calls this book "a must-read on what set the stage for human evolution, by the prominent primatologist Craig Stanford."

**About the Author**

Craig Stanford is the co-director of the Jane Goodall Primate Research Center at the University of Southern California, where he is also a professor of biological anthropology. His work has been featured in *Natural History*, *New Scientist*, and *The Sciences*. His previous books include *Significant Others: The Ape-Human Continuum and the Quest for Human Nature* and *The Hunting Apes: Meat Eating and the Origins of Human Behavior*. *Los Angeles Times Magazine* has profiled Stanford, and his books have been widely reviewed in the *Los Angeles Times Book Review*, *Scientific American*, *Psychology Today*, and other publications.

**A Conversation with Craig Stanford**

**Q)** How exactly did the ability to walk upright provide advantages that gave rise to modern humans?

**A)** Standing upright was the first step, as it were, on the road to humanity. Though we usually think of the brain as the uniquely human trait, upright standing and walking are really most critical. They led, in several steps that I explain in the book, to more and more efficient bipeds who did eventually, millions of years later, evolve a big brain. Upright posture allowed us to make and use tools, to walk long distances, and to travel in search of meat, all critical human adaptations.

**Q)** Increased brain size, toolmaking, and speech have long been considered the three critical "tipping points" in the rise of modern humans. At what point in the scholarship of anthropology did bipedalism emerge as a significant ability leading to the evolution of modern humans?

**A)** Darwin actually saw that bipedalism was fundamental in becoming human — he saw this
without the benefit of knowing about genes or human fossils. However, Darwin was mistaken in thinking that standing up allowed us to use and carry tools, and that that led to increased brain size. In fact, brain expansion didn't happen for millions of years after bipedalism arose — the two are not connected at all evolutionarily.

Q) The brain seems endlessly complex and complicated, and walking on two feet seems rather simple, yet you make a very strong case that bipedalism, over brains, is the reason that humans have inherited the earth. Was it a controversial idea? How radically did it change our understanding of human evolution?

A) Every anthropologist, and many people in general, understand how basic an adaptation standing and walking are. But they are not often seen as sexy in the way that brain power is. I try to change this perception in *Upright*, by telling the amazing story of how humans came to stand up.

Q) Modern humans and Neandertals coexisted during the same period and in the same geographic areas. Both walked upright. What other abilities did modern humans have that allowed them to flourish while Neandertals disappeared?

A) How modern people and Neandertals differed, and what that meant for the rise of modern people, are hotly debated these days. My own view is that moderns and Neandertals shared many environments for thousands of years; they resembled each other closely, used the same tools, had the same habits. I don't accept that Neandertals were somehow doomed to extinction because of the rise of the moderns. Eventually, Neandertals disappeared, but whether they were driven to extinction by moderns or were just genetically swamped into modern European peoples is an open question today.

Q) You write that theories about human origins are supposed to be rigorously scientific. You also note that the key to getting your theories accepted by the scientific community is to tell a story. Your book employs several very strong narratives. Is there a danger that the storytelling might overshadow the science? Is there such a thing as responsible scientific storytelling?

A) Human evolution is the greatest story ever told, more so because it actually happened. Scientists have an obligation, I think, to tell the story of their work to the public. It increases our understanding of the world and our place in it. I love teaching, and successful teachers know that employing narratives in their lectures is a key to communication.

Q) It's clear that bipedalism is an essential component to understanding human evolution. Many scientists think that human evolution has essentially reached an end: that significant change is reduced by the fact that humans travel and mix more than ever before. Do you foresee further evolution in terms of humans' physical mobility?

A) Human evolution is still happening today, but not in the way most people think. We're not necessarily going to lose our little toes or our pinky fingers. Instead, we are evolving constantly at the molecular level, in response to each new plague — think of the natural-selection pressure that HIV or Ebola puts on human populations.
Q) You travel often to Africa for your research on apes. What light has that research thrown on the evolution of humans?

A) My work for the past fifteen years has mainly been on great apes — chimpanzees and gorillas. I've studied hunting and meat eating by chimpanzees, and also the way in which chimps and gorillas manage to share the same ecosystem in some forests in Africa. Currently, I'm studying a chimpanzee society that shows the highest levels of bipedalism ever seen in wild apes. This is what prompted me to write *Upright*. I often feel I'm watching human evolution in action when I'm sitting in an African forest watching my chimps.

Q) As co-director of the Jane Goodall Primate Research Center at the University of Southern California, you must be involved in many interesting studies. What current programs at the center do you find most exciting? Are you involved in conservation efforts in Africa?

A) The work I do in the Impenetrable involves half of the world's remaining mountain gorillas; the results of our study there help to guide conservation strategies in the last pockets of forest where they live.

Q) Are you working on a new book or a study likely to become a book?

A) I'm currently in the early stages of co-writing a book that compares the lives and societies of great apes with those of dolphins. It might seem an unlikely comparison, but chimps and dolphins show some striking parallels in social behavior and ecology that may be related to [the animals'] both being such big-brained, smart creatures. My coauthor, Dr. Maddalena Bearzi, has been studying bottlenose dolphins for many years, and we've been writing academic papers together, so we decided to write a book that people in general can learn from.

**Praise for *Significant Others***

"*Significant Others* is brilliant in scope and scholarship. It is refreshingly candid in embracing the reality of Darwinian continuity and in rejecting the common practice of pandering to the Cartesian delusions of human uniqueness so often passed off as science. With hard data and a fascinating writing style Stanford takes humans and our fellow apes on their own terms. This book should be required reading for everyone who claims to be human." — Roger Fouts, author of *Next of Kin*

"In eloquently laying out his argument, Stanford touches on many elements of modern anthropology — including its disagreements — and brings a rich background to his presentation." — *Scientific American*

"Stanford is an accomplished field investigator whose fascinating book combines a critical synthesis of his and others' primate research, a healthy dose of philosophizing on the scientific method, and a painful look at the plight of great apes today. Though Stanford's book will undoubtedly raise the ire of some, it is rich food for thought on what it means to be human." — *Choice*