

## Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

Stone tools are the least familiar objects that archaeologists recover from their excavations, and predictably, they struggle to understand them. Eastern Africa alone boasts a 3.4 million-year-long archaeological record but its stone tool evidence still remains disorganized, unsynthesized, and all-but-impenetrable to non-experts, and especially so to students from Eastern African countries. In this book, John J. Shea offers a simple, straightforward, and richly illustrated introduction in how to read stone tools. An experienced stone tool analyst and an expert stoneworker, he synthesizes the Eastern African stone tool evidence for the first time. Shea presents the EAST Typology, a new framework for describing stone tools specifically designed to allow archaeologists to do what they currently cannot: compare stone tool evidence across the full sweep of Eastern African prehistory. He also includes a series of short, fictional, and humorous vignettes set on an Eastern African archaeological excavation, which illustrate the major issues and controversies in research about stone tools.

The hominin fossil record documents a history of critical evolutionary events that have ultimately shaped and defined what it means to be human, including the origins of bipedalism; the emergence of our genus *Homo*; the first use of stone tools; increases in brain size; and the emergence of *Homo sapiens*, tools, and culture. The Earth's geological record suggests that some evolutionary events were coincident with substantial changes in African and Eurasian climate, raising the possibility that critical junctures in human evolution and behavioral development may have been affected by the environmental characteristics of the areas where hominins evolved. *Understanding Climate's Change on Human Evolution* explores the opportunities of using scientific research to improve our understanding of how climate may have helped shape our species. Improved climate records for specific regions will be required before it is possible to evaluate how critical resources for hominins, especially water and vegetation, would have been distributed on the landscape during key intervals of hominin history. Existing records contain substantial temporal gaps. The book's initiatives are presented in two major research themes: first, determining the impacts of climate change and climate variability on human evolution and dispersal; and second, integrating climate modeling, environmental records, and biotic responses.

*Understanding Climate's Change on Human Evolution* suggests a new scientific program for international climate and human evolution studies that involve an exploration initiative to locate new fossil sites and to broaden the geographic and temporal sampling of the fossil and archeological record; a comprehensive and integrative scientific drilling program in lakes, lake bed outcrops, and ocean basins surrounding the regions where hominins evolved and a major investment in climate modeling experiments for key time intervals and regions that are critical to understanding human evolution.

First published in 1946, this book presents a comprehensive account regarding the origins and early evolution of water transport written by the renowned British ethnographer and zoologist James Hornell (1865-1949). The focus of the text is on different types of transport, and it is divided into three main sections: the first section is

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on 'Floats, Rafts and Kindred Craft', the second is on 'Skin Boats: Coracles, Currachs, Kayaks and their Kin' and the third is on 'Bark Canoes, Dugouts and Plank-Built Craft'. Numerous illustrative figures and a detailed bibliography are also included. This book will be of value to anyone with an interest in archaeology, anthropology and the history of water transport.

Stone tools are the most durable and common type of archaeological remain and one of the most important sources of information about behaviors of early hominins. *Stone Tools and the Evolution of Human Cognition* develops methods for examining questions of cognition, demonstrating the progression of mental capabilities from early hominins to modern humans through the archaeological record. Dating as far back as 2.5-2.7 million years ago, stone tools were used in cutting up animals, woodworking, and preparing vegetable matter. Today, lithic remains give archaeologists insight into the forethought, planning, and enhanced working memory of our early ancestors.

Contributors focus on multiple ways in which archaeologists can investigate the relationship between tools and the evolving human mind-including joint attention, pattern recognition, memory usage, and the emergence of language. Offering a wide range of approaches and diversity of place and time, the chapters address issues such as skill, social learning, technique, language, and cognition based on lithic technology. *Stone Tools and the Evolution of Human Cognition* will be of interest to Paleolithic archaeologists and paleoanthropologists interested in stone tool technology and cognitive evolution.

Biodiversity-the genetic variety of life-is an exuberant product of the evolutionary past, a vast human-supportive resource (aesthetic, intellectual, and material) of the present, and a rich legacy to cherish and preserve for the future. Two urgent challenges, and opportunities, for 21st-century science are to gain deeper insights into the evolutionary processes that foster biotic diversity, and to translate that understanding into workable solutions for the regional and global crises that biodiversity currently faces. A grasp of evolutionary principles and processes is important in other societal arenas as well, such as education, medicine, sociology, and other applied fields including agriculture, pharmacology, and biotechnology. The ramifications of evolutionary thought also extend into learned realms traditionally reserved for philosophy and religion. The central goal of the *In the Light of Evolution (ILE)* series is to promote the evolutionary sciences through state-of-the-art colloquia-in the series of Arthur M. Sackler colloquia sponsored by the National Academy of Sciences-and their published proceedings. Each installment explores evolutionary perspectives on a particular biological topic that is scientifically intriguing but also has special relevance to contemporary societal issues or challenges. This tenth and final edition of the *In the Light of Evolution* series focuses on recent developments in phylogeographic research and their relevance to past accomplishments and future research directions.

International archaeologists examine early Stone Age tools and bones to present the most holistic view to date of the archaeology of human origins.

A detailed overview of the Eastern African stone tools that make up the world's longest archaeological record.

This work examines the cognitive capacity of great apes in order to better understand early man and the importance of memory in the evolutionary process. It synthesizes research from comparative cognition, neuroscience, primatology as well as lithic

## Read Book Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

archaeology, reviewing findings on the cognitive ability of great apes to recognize the physical properties of an object and then determine the most effective way in which to manipulate it as a tool to achieve a specific goal. The authors argue that apes (Hominoidea) lack the human cognitive ability of imagining how to blend reality, which requires drawing on memory in order to envisage alternative future situations, and thereby modifying behavior determined by procedural memory. This book reviews neuroscientific findings on short-term working memory, long-term procedural memory, prospective memory, and imaginative forward thinking in relation to manual behavior. Since the manipulation of objects by Hominoidea in the wild (particularly in order to obtain food) is regarded as underlying the evolution of behavior in early Hominids, contrasts are highlighted between the former and the latter, especially the cognitive implications of ancient stone-tool preparation.

Why aren't we more like other apes? How did we win the evolutionary race? Find out how "wise" Homo sapiens really are. Prehistory has never been more exciting: New discoveries are overturning long-held theories left and right. Stone tools in Australia date back 65,000 years—a time when, we once thought, the first Sapiens had barely left Africa. DNA sequencing has unearthed a new hominid group—the Denisovans—and confirmed that crossbreeding with them (and Neanderthals) made Homo sapiens who we are today. A Pocket History of Human Evolution brings us up-to-date on the exploits of all our ancient relatives. Paleoanthropologist Silvana Condemi and science journalist François Savatier consider what accelerated our evolution: Was it tools, our "large" brains, language, empathy, or something else entirely? And why are we the sole survivors among many early bipedal humans? Their conclusions reveal the various ways ancient humans live on today—from gossip as modern "grooming" to our gendered division of labor—and what the future might hold for our strange and unique species. Explores the insights that fossil hominin teeth provide about human evolution, linking findings with current debates in palaeoanthropology.

This volume represents the proceedings of the Irving Stone Memorial Symposium on "The Origin of Humans and Humanness." Scientists in the fields of anthropology, archaeology, biology and ecology were invited to discuss their research concerning the how's, where's and why's of the evolutionary history of humans. Using our knowledge of the behavior and reproduction of living primates, chapter 1 describes what made the earliest human-like animals of 4 million years ago different from their ape relatives. While showing how the science of paleontology works, the origin of our genus, Homo, is discussed in chapter 2. With emphasis on those humans who first made regular use of stone tools some 2 million years ago, chapter 3 interprets ancient human behavior and ecology from an archeological perspective. Tools from genetics, molecular biology, archaeology and paleontology are used to examine the origin of modern Homo sapiens in chapter 4. Chapter 5 looks at the artistry of Ice Age craftsmen. Finally, using computer methods, chapter 6 delves into the complex issue of how does human behavior change, and what is the relationship between biological and cultural evolution? The earliest traces of proto-human technology emerged over 2.5 million years ago on the African continent. Called the Oldowan after the famous site of Olduvai Gorge in Tanzania, these technologies herald a major evolutionary shift in the human lineage. The Oldowan: Case Studies into the Earliest Stone Age provides a critical look at early archaeological sites and their evidence. This volume also shows how a range of probing, multidisciplinary, experimental investigations - including experimental tool-making, comparative studies of ape technologies, biomechanical analysis, and PET studies of brain activity - help us evaluate this tantalizing prehistoric evidence and appreciate its relevance to human evolution. Scholars from a variety of disciplines consider cases of convergence in lithic technology, when functional or developmental constraints result in similar forms in independent lineages.

## Read Book Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

Hominins began using stone tools at least 2.6 million years ago, perhaps even 3.4 million years ago. Given the nearly ubiquitous use of stone tools by humans and their ancestors, the study of lithic technology offers an important line of inquiry into questions of evolution and behavior. This book examines convergence in stone tool-making, cases in which functional or developmental constraints result in similar forms in independent lineages. Identifying examples of convergence, and distinguishing convergence from divergence, refutes hypotheses that suggest physical or cultural connection between far-flung prehistoric toolmakers. Employing phylogenetic analysis and stone-tool replication, the contributors show that similarity of tools can be caused by such common constraints as the fracture properties of stone or adaptive challenges rather than such unlikely phenomena as migration of toolmakers over an Arctic ice shelf. Contributors R. Alexander Bentley, Briggs Buchanan, Marcelo Cardillo, Mathieu Charbonneau, Judith Charlin, Chris Clarkson, Loren G. Davis, Metin I. Eren, Peter Hiscock, Thomas A. Jennings, Steven L. Kuhn, Daniel E. Lieberman, George R. McGhee, Alex Mackay, Michael J. O'Brien, Charlotte D. Pevny, Ceri Shipton, Ashley M. Smallwood, Heather Smith, Jayne Wilkins, Samuel C. Willis, Nicolas Zayns

50 Great Myths of Human Evolution uses common misconceptions to explore basic theory and research in human evolution and strengthen critical thinking skills for lay readers and students. Examines intriguing—yet widely misunderstood—topics, from general ideas about evolution and human origins to the evolution of modern humans and recent trends in the field Describes what fossils, archaeology, and genetics can tell us about human origins Demonstrates the ways in which science adapts and changes over time to incorporate new evidence and better explanations Includes myths such as “Humans lived at the same time as dinosaurs;” “Lucy was so small because she was a child;” “Our ancestors have always made fire;” and “There is a strong relationship between brain size and intelligence” Comprised of stand-alone essays that are perfect for casual reading, as well as footnotes and references that allow readers to delve more deeply into topics

When, why, and how early humans began to eat meat are three of the most fundamental unresolved questions in the study of human origins. Before 2.5 million years ago the presence and importance of meat in the hominid diet is unknown. After stone tools appear in the fossil record it seems clear that meat was eaten in increasing quantities, but whether it was obtained through hunting or scavenging remains a topic of intense debate. This book takes a novel and strongly interdisciplinary approach to the role of meat in the early hominid diet, inviting well-known researchers who study the human fossil record, modern hunter-gatherers, and nonhuman primates to contribute chapters to a volume that integrates these three perspectives. Stanford's research has been on the ecology of hunting by wild chimpanzees. Bunn is an archaeologist who has worked on both the fossil record and modern foraging people. This will be a reconsideration of the role of hunting, scavenging, and the uses of meat in light of recent data and modern evolutionary theory. There is currently no other book, nor has there ever been, that occupies the niche this book will create for itself.

Stone Tools in Human Evolution Behavioral Differences among Technological Primates Cambridge University Press

Two anthropologists explain their research into Stone Age tools and new theories about the role of toolmaking in human evolution

This book surveys the archaeological record for stone tools from the earliest times to 6,500 years ago in the Near East.

The Evolution of Paleolithic Technologies provides a novel perspective on long-term trajectories of evolutionary change in Paleolithic tools and tool-makers. Members of the human lineage have been producing stone tools for more than 3 million years. These artefacts provide key evidence for important evolutionary developments in hominin behaviour and cognition. Avoiding conventional approaches based on progressive stages of development, this book

## Read Book Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

instead examines global trends in six separate dimensions of technological behaviour between 2.6 million and 10,000 years ago. Combining these independent trends results in both a broader and a more finely punctuated perspective on key intervals of change in hominin behaviour. To draw this picture together, the concluding section explores behavioural, cognitive, and demographic implications of developments in material culture and technological procedures at seven key intervals during the Pleistocene. Researchers interested in Paleolithic archaeology will find this book invaluable. It will also be of interest to archaeologists researching stone tool technology and to students of human evolution and behavioural change in prehistory.

This generously illustrated book tells the story of the human family, showing how our species' physical traits and behaviors evolved over millions of years as our ancestors adapted to dramatic environmental changes. In *What Does It Mean to Be Human?* Rick Potts, director of the Smithsonian's Human Origins Program, and Chris Sloan, National Geographic's paleoanthropology expert, delve into our distant past to explain when, why, and how we acquired the unique biological and cultural qualities that govern our most fundamental connections and interactions with other people and with the natural world. Drawing on the latest research, they conclude that we are the last survivors of a once-diverse family tree, and that our evolution was shaped by one of the most unstable eras in Earth's environmental history. The book presents a wealth of attractive new material especially developed for the Hall's displays, from life-like reconstructions of our ancestors sculpted by the acclaimed John Gurche to photographs from National Geographic and Smithsonian archives, along with informative graphics and illustrations. In coordination with the exhibit opening, the PBS program NOVA will present a related three-part television series, and the museum will launch a website expected to draw 40 million visitors.

Cognitive archaeology is a relatively new interdisciplinary science that uses cognitive and psychological models to explain archeological artifacts like stone tools, figurines, and art. *Squeezing Minds From Stones* is a collection of essays from early pioneers in the field, like archaeologists Thomas Wynn and Iain Davidson, and evolutionary primatologist William McGrew, to 'up and coming' newcomers like Shelby Putt, Ceri Shipton, Mark Moore, James Cole, Natalie Uomini, and Lana Ruck. Their essays address a wide variety of cognitive archaeology topics, including the value of experimental archaeology, primate archaeology, the intent of ancient tool makers, and how they may have lived and thought.

In this book the author, a Harvard evolutionary biologist presents an account of how the human body has evolved over millions of years, examining how an increasing disparity between the needs of Stone Age bodies and the realities of the modern world are fueling a paradox of greater longevity and chronic disease. It illuminates the major transformations that contributed key adaptations to the body: the rise of bipedalism; the shift to a non-fruit-based diet; the advent of hunting and gathering, leading to our superlative endurance athleticism; the development of a very large brain; and the incipience of cultural proficiencies. The author also elucidates how cultural evolution differs from biological evolution, and how our bodies were further transformed during the Agricultural and Industrial Revolutions. While these ongoing changes have brought about many benefits, they have also created conditions to which our bodies are not entirely adapted, the author argues, resulting in the growing incidence of obesity and new but avoidable diseases, such as type 2 diabetes. The author proposes that many of these chronic illnesses persist and in some cases are intensifying because of 'dysevolution,' a pernicious dynamic whereby only the symptoms rather than the causes of these maladies are treated. And finally, he advocates the use of evolutionary information to help nudge, push, and sometimes even compel us to create a more salubrious environment. -- From publisher's web site.

*Principles of Human Evolution* presents an in-depth introduction to paleoanthropology and the

## Read Book Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

study of human evolution. Focusing on the fundamentals of evolutionary theory and how these apply to ecological, molecular genetic, paleontological and archeological approaches to important questions in the field, this timely textbook will help students gain a perspective on human evolution in the context of modern biological thinking. The second edition of this successful text features the addition of Robert Foley, a leading researcher in Human Evolutionary Studies, to the writing team. Strong emphasis on evolutionary theory, ecology and behavior and scores of new examples reflect the latest evolutionary theories and recent archaeological finds. More than a simple update, the new edition is organized by issue rather than chronology, integrating behavior, adaptation and anatomy. A new design and new figure references make this edition more accessible for students and instructors. New author, Robert Foley – leading figure in Human Evolutionary Studies – joins the writing team. Dedicated website – [www.blackwellpublishing.com/lewin](http://www.blackwellpublishing.com/lewin) – provides study resources and artwork downloadable for Powerpoint presentations. Beyond the Facts boxes – explore key scientific debates in greater depth. Margin Comments – indicate the key points in each section. Key Questions – review and test students' knowledge of central chapter concepts and help focus the way a student approaches reading the text. New emphasis on ecological and behavioral evolution – in keeping with modern research. Fully up to date with recent fossil finds and interpretations; integration of genetic and paleoanthropological approaches.

The study of human evolution is advancing rapidly. New fossil evidence is adding ever more pieces to the puzzle of our past; the new science of ancient DNA is completely reshaping theories of early human populations and migrations. Bernard Wood traces the field of palaeoanthropology from its beginnings in the eighteenth century to the present.

'Beautiful, evocative, authoritative.' Professor Brian Cox 'Important reading not just for anyone interested in these ancient cousins of ours, but also for anyone interested in humanity.' Yuval Noah Harari Kindred is the definitive guide to the Neanderthals. Since their discovery more than 160 years ago, Neanderthals have metamorphosed from the losers of the human family tree to A-list hominins. Rebecca Wragg Sykes uses her experience at the cutting-edge of Palaeolithic research to share our new understanding of Neanderthals, shoving aside clichés of rag-clad brutes in an icy wasteland. She reveals them to be curious, clever connoisseurs of their world, technologically inventive and ecologically adaptable. Above all, they were successful survivors for more than 300,000 years, during times of massive climatic upheaval. Much of what defines us was also in Neanderthals, and their DNA is still inside us. Planning, co-operation, altruism, craftsmanship, aesthetic sense, imagination, perhaps even a desire for transcendence beyond mortality. Kindred does for Neanderthals what Sapiens did for us, revealing a deeper, more nuanced story where humanity itself is our ancient, shared inheritance.

Recent neuroscience research makes it clear that human biology is cultural biology - we develop and live our lives in socially constructed worlds that vary widely in their structure values, and institutions. This integrative volume brings together interdisciplinary perspectives from the human, social, and biological sciences to explore culture, mind, and brain interactions and their impact on personal and societal issues. Contributors provide a fresh look at emerging concepts, models, and applications of the co-constitution of culture, mind, and brain. Chapters survey the latest theoretical and methodological insights alongside the challenges in this area, and describe how these new ideas are being applied in the sciences, humanities, arts, mental health, and everyday life. Readers will gain new appreciation of the ways in which our unique biology and cultural diversity shape behavior and experience, and our ongoing adaptation to a constantly changing world.

Our capacity to care about the wellbeing of others, whether they are close family or strangers, can appear to be unimportant in today's competitive societies. However, in this volume Penny Spikins argues that compassion lies at the heart of what makes us human. She takes us on a

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journey from the earliest stone age societies two million years ago to the lives of Neanderthals in Ice Age Europe, using archaeological evidence to illustrate the central role that emotional connections had in human evolution. Simple acts of kindness left to us from millions of years ago provide evidence for how social emotions and morality evolved, and how our capacity to reach out beyond ourselves into the lives of others allowed us to work together for a common good, and form the basis for human success.

This volume is a compilation of results from sessions of the Second International Conference on the Replacement of Neanderthals by Modern Humans, which took place between November 30 and December 6, 2014, in Hokkaido, Japan. Similar to the first conference held in 2012 in Tokyo, the 2014 conference (RNMH2014) aimed to compile the results of the latest multidisciplinary approaches investigating the issues surrounding the replacement of Neanderthals by modern humans. The results of the sessions, supplemented by off-site contributions, center on the archeology of the Middle and Upper Paleolithic of the Levant and beyond. The first part of this volume presents recent findings from the Levant, while the second part focuses on the neighboring regions, namely, the Caucasus, the Zagros, and South Asia. The 13 chapters in this volume highlight the distinct nature of the cultural occurrences during the Middle and Upper Paleolithic periods of the Levant, displaying a continuous development as well as a combination of lithic traditions that may have originated in different regions. This syncretism, which is an unusual occurrence in the regions discussed in this volume, reinforces the importance of the Levant as a region for interpreting the RNMH phenomenon in West Asia. An exploration of how the evolution of behavioral differences between humans and other primates affected the archaeological stone tool evidence.

Looks at how humans have evolved complex behaviours such as language and culture.

A breakthrough theory that tools and technology are the real drivers of human evolution

Although humans are one of the great apes, along with chimpanzees, gorillas, and orangutans, we are remarkably different from them. Unlike our cousins who subsist on raw food, spend their days and nights outdoors, and wear a thick coat of hair, humans are entirely dependent on artificial things, such as clothing, shelter, and the use of tools, and would die in nature without them. Yet, despite our status as the weakest ape, we are the masters of this planet.

Given these inherent deficits, how did humans come out on top? In this fascinating new account of our origins, leading archaeologist Timothy Taylor proposes a new way of thinking about human evolution through our relationship with objects. Drawing on the latest fossil evidence, Taylor argues that at each step of our species' development, humans made choices that caused us to assume greater control of our evolution. Our appropriation of objects allowed us to walk upright, lose our body hair, and grow significantly larger brains. As we push the frontiers of scientific technology, creating prosthetics, intelligent implants, and artificially modified genes, we continue a process that started in the prehistoric past, when we first began to extend our powers through objects. Weaving together lively discussions of major discoveries of human skeletons and artifacts with a reexamination of Darwin's theory of evolution, Taylor takes us on an exciting and challenging journey that begins to answer the fundamental question about our existence: what makes humans unique, and what does that mean for our future?

This ambitious book probes our biological past to discover the kinds of lives that human beings have imagined were worth living. Bellah's theory goes deep into cultural and genetic evolution to identify a range of capacities (communal dancing, storytelling, theorizing) whose emergence made religious development possible in the first millennium BCE.

Discusses the long period of human history known as the Stone Age during which humans evolved into beings capable of inventing and using increasingly sophisticated tools and creating complex social groupings.

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Did Neanderthals have language, and if so, what was it like? Scientists agree overall that the behaviour and cognition of Neanderthals resemble that of early modern humans in important ways. However, the existence and nature of Neanderthal language remains a controversial topic. The first in-depth treatment of this intriguing subject, this book comes to the unique conclusion that, collective hunting is a better window on Neanderthal language than other behaviours. It argues that Neanderthal hunters employed linguistic signs akin to those of modern language, but lacked complex grammar. Rudolf Botha unpacks and appraises important inferences drawn by researchers working in relevant branches of archaeology and other prehistorical fields, and uses a large range of multidisciplinary literature to bolster his arguments. An important contribution to this lively field, this book will become a landmark book for students and scholars alike, in essence, illuminating Neanderthals' linguistic powers.

Africa has the longest and arguably the most diverse archaeological record of any of the continents. It is where the human lineage first evolved and from where *Homo sapiens* spread across the rest of the world. Later, it witnessed novel experiments in food-production and unique trajectories to urbanism and the organisation of large communities that were not always structured along strictly hierarchical lines. Millennia of engagement with societies in other parts of the world confirm Africa's active participation in the construction of the modern world, while the richness of its history, ethnography, and linguistics provide unusually powerful opportunities for constructing interdisciplinary narratives of Africa's past. This Handbook provides a comprehensive and up-to-date synthesis of African archaeology, covering the entirety of the continent's past from the beginnings of human evolution to the archaeological legacy of European colonialism. As well as covering almost all periods and regions of the continent, it includes a mixture of key methodological and theoretical issues and debates, and situates the subject's contemporary practice within the discipline's history and the infrastructural challenges now facing its practitioners. Bringing together essays on all these themes from over seventy contributors, many of them living and working in Africa, it offers a highly accessible, contemporary account of the subject for use by scholars and students of not only archaeology, but also history, anthropology, and other disciplines.

The pace of research on Autism Spectrum Disorders (ASD) has expanded exponentially in recent years. It is difficult for anyone to keep up with all developments. This book will assist the experienced and non-specialist reader to keep up with recent developments. The book opens with a focus on the evolutionary aspects of autism and then focuses on the public's attitude towards autism including the stigma issue. Then there is a focus on cortical modularity and electrophysiology followed by treatment issues including sensory, medical and community-based interventions. Finally, forensic issues are dealt with and the importance of the built environment is focused on. The book will be relevant to psychiatrists, psychologists, paediatricians, social workers, speech and

## Read Book Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

language therapists, occupational therapists and care workers.

Human evolution is the evolutionary process that led to the emergence of anatomically modern humans. The topic typically focuses on the evolutionary history of the primates-in particular the genus *Homo*, and the emergence of *Homo sapiens* as a distinct species of the hominids (or "great apes")-rather than studying the earlier history that led to the primates. The study of human evolution involves many scientific disciplines, including physical anthropology, primatology, archaeology, paleontology, neurobiology, ethology, linguistics, evolutionary psychology, embryology and genetics. Genetic studies show that primates diverged from other mammals about 85 million years ago, in the Late Cretaceous period, and the earliest fossils appear in the Paleocene, around 55 million years ago. Within the Hominoidea (apes) superfamily, the Hominidae family diverged from the Hylobatidae (gibbon) family some 15-20 million years ago; African great apes (subfamily Homininae) diverged from orangutans (Ponginae) about 14 million years ago; the Hominini tribe (humans, Australopithecines and other extinct biped genera, and chimpanzees) parted from the Gorillini tribe (gorillas) about 8 million years ago; and, in turn, the subtribes Hominina (humans and biped ancestors) and Panina (chimps) separated about 7.5 million years ago. The basic adaptation of the hominin line is bipedalism. The earliest bipedal hominin is considered to be either *Sahelanthropus* or *Orrorin*; alternatively, either *Sahelanthropus* or *Orrorin* may instead be the last shared ancestor between chimps and humans. *Ardipithecus*, a full biped, arose somewhat later, and the early bipeds eventually evolved into the australopithecines, and later into the genus *Homo*. The earliest documented representative of the genus *Homo* is *Homo habilis*, which evolved around 2.8 million years ago, and is arguably the earliest species for which there is positive evidence of the use of stone tools. The brains of these early hominins were about the same size as that of a chimpanzee, although it has been suggested that this was the time in which the human *SRGAP2* gene doubled, producing a more rapid wiring of the frontal cortex. During the next million years a process of rapid encephalization occurred, and with the arrival of *Homo erectus* and *Homo ergaster* in the fossil record, cranial capacity had doubled to 850 cm<sup>3</sup>. (Such an increase in human brain size is equivalent to each generation having 125,000 more neurons than their parents.) It is believed that *Homo erectus* and *Homo ergaster* were the first to use fire and complex tools, and were the first of the hominin line to leave Africa, spreading throughout Africa, Asia, and Europe between 1.3 to 1.8 million years ago. According to the recent African origin of modern humans theory, modern humans evolved in Africa possibly from *Homo heidelbergensis*, *Homo rhodesiensis* or *Homo antecessor* and migrated out of the continent some 50,000 to 100,000 years ago, gradually replacing local populations of *Homo erectus*, Denisova hominins, *Homo floresiensis* and *Homo neanderthalensis*. Archaic *Homo sapiens*, the forerunner of anatomically modern humans, evolved in the Middle Paleolithic between 400,000 and 250,000 years ago. This book discusses the latest comprehensive information about human

## Read Book Stone Tools In Human Evolution Behavioral Differences Among Technological Primates

evolution and is designed to be a reference and provide an overview of the topic and give the reader a structured knowledge to familiarize yourself with the topic at the most affordable price possible. The accuracy and knowledge is of an international viewpoint as the edited articles represent the inputs of many knowledgeable individuals and some of the most current knowledge on the topic, based on the date of publication.

The study of human evolution is advancing rapidly. Newly discovered fossil evidence is adding ever more pieces to the puzzle of our past, whilst revolutionary technological advances in the study of ancient DNA are completely reshaping theories of early human populations and migrations. In this Very Short Introduction Bernard Wood traces the history of paleoanthropology from its beginnings in the eighteenth century to the very latest fossil finds. In this new edition he discusses how Ancient DNA studies have revolutionized how we view the recent (post-550 ka) human evolution, and the process of speciation. The combination of ancient and modern human DNA has contributed to discoveries of new taxa, as well as the suggestion of 'ghost' taxa whose fossil records still remain to be discovered. Considering the contributions of related sciences such as paleoclimatology, geochronology, systematics, genetics, and developmental biology, Wood explores our latest understandings of our own evolution. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Whether we realize it or not, we carry in our mouths the legacy of our evolution. Our teeth are like living fossils that can be studied and compared to those of our ancestors to teach us how we became human. In *Evolution's Bite*, noted paleoanthropologist Peter Ungar brings together for the first time cutting-edge advances in understanding human evolution with new approaches to uncovering dietary clues from fossil teeth. The result is a remarkable investigation into the ways that teeth—their shape, chemistry, and wear—reveal how we came to be. Traveling the four corners of the globe and combining scientific breakthroughs with vivid narrative, *Evolution's Bite* presents a unique dental perspective on our astonishing human development.

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