THE LEAKEY FOUNDATION

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The Newsletter of The Leakey Foundation

The Fossil "Hobbits" of Flores:

Perspectives From Morphometric Simulation

by K.P. McNulty & K.L. Baab
University of Minnesota

"In a hole in the ground there lived a hobbit."[1] Like all academics, paleoanthropologists are fond of punctuating their prose with quotations from the giants on whose shoulder they perch: Darwin and Huxley, Leakey and Leakey, Gould and Goodall. It is only recently that they have reached instead for the improbable words of Tolkien, searching for a metaphorical context to match the astonishing discovery of twelve diminutive hominin skeletons on the Indonesian island of Flores.

In this particular hole in the ground, a cave called Liang Bua, the 2003 discovery[2] of an 18,000 year old, three-foot tall fossil hominin skeleton met the two necessary criteria for becoming a cardinal event in the discipline of paleoanthropology. First, it forced us to dramatically reconsider the spatial and temporal distribution of some of the most *important* features in human evolution: brain size, body size, limb proportions, and other aspects of modern bipedal anatomy. Second, the discovery set off a raging debate over the implications of these features. On one hand, the discoverers[3,4] and colleagues[2] pointed to a startling combination of primitive and modern skeletal features as well as small body and brain sizes in support of assigning this specimen to a new species, *Homo floresiensis*.

According to them, the Flores hominins were likely a late surviving relict population descended from the initial dispersal of *H. erectus* out of Africa.[2,3] On the other hand, the tiny brain size, cranial asymmetry, and some resemblances to modern humans from the region, combined with the incredibly young age of the find, suggested to some[5,6] that this specimen was from a population of small bodied modern humans but was born with a congenital pathology causing microcephaly. When subsequent discoveries confirmed that the entire population was short-statured,[4] debate continued but focused largely on the one preserved skull: did this represent some late surviving primitive species of fossil *Homo* or was the skull merely a pathological specimen of an otherwise short modern human group?

Debate over the Flores hominins is much like other debates in paleoanthropology: while researchers deploy their evidence to support contrasting viewpoints, they are unanimous in voicing the need for new specimens to corroborate their results. A second "hobbit" skull might put to rest the debate over LB1's putative microcephaly; older fossils from the region might provide an evolutionary link to a more primitive hominin species. Such anticipation of new discoveries, though a constant source of excitement in paleoanthropology, is scientifically unsatisfying.

What if, instead of waiting for new discoveries, one could generate new fossils from existing data? This is the approach that we adopted to test hypotheses about the ancestry of the Flores hominins.[7] Rather than waiting for the possibility that new finds might establish

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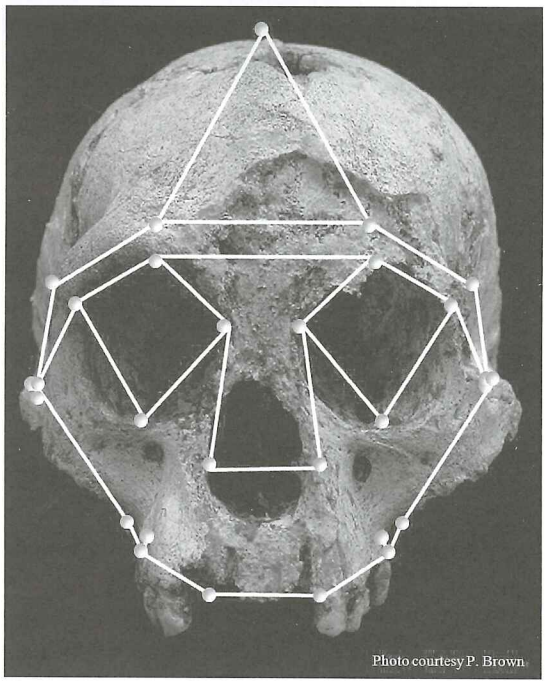


(Top) Karen Baab collecting 3D cranial landmark data with a Microscribe digitizer

(Bottom) Frontal view of the *Homo floresiensis* cranium, LB1, with 3D cranial landmarks superimposed. *Photo by Peter Brown*

The mission of The Leakey Foundation is to increase scientific knowledge, education, and public understanding of human origins, evolution, behavior, and survival.

INSIDE

Dear Friends of The Leakey Foundation,

"I learned what every dreaming child needs to know---that no horizon is so far that you cannot get above it or beyond it."
-West with the Night, Beryl Markham

When I first stepped to the edge of Olduvai Gorge in 1983, there was an indiscernible mystique and personal feeling of awe as if visiting a sacred cathedral. The red and buff colored layers were striking. Upon hiking down to the bedrock layer of the gorge, you notice fossilized bones scattered everywhere. It is a paleontological paradise. This was Louis and Mary Leakey's home for over thirty years and would be the source for many important scientific discoveries.

Although the vast majority of scientists during the 1930's and 1940's believed humankind emanated out of Asia, Louis Leakey was steadfast in his belief that Africa was the cradle of humankind. Louis's first expedition to Olduvai was in 1931 but it would not be until July 17, 1959, twenty-eight years later, when their "eureka moment" would occur with Mary Leakey discovering the iconic fossil skull of *Zinjanthropus boisei*. In a *National Geographic* article Louis stated: "after all our hoping and hardship and sacrifice, at last we had reached our goal—we had discovered the world's earliest human".1 Louis and Mary's decades of painstaking perseverance paid off. Louis soon began an extensive lecture tour to display this remarkable fossil and stir the world's imagination. As a young teen, I was privileged to attend a Louis Leakey lecture at the University of Utah—he was at his charismatic prime.

Olduvai and Louis would be inspirational to others also, including a young woman of twenty-three. Jane Goodall traveled to Kenya from England "hoping to get involved with animals" and was invited by Louis to work at Olduvai. Towards the end of her Olduvai stay during the summer of 1957 Louis described to Jane "a group of chimpanzees that lived along the shores of a lake, very isolated and far away, and how exciting it would be to learn about their behavior". Jane seized the opportunity to establish a research center at Gombe and her celebrated career was launched. Shortly thereafter two other esteemed careers in primatology were launched with Louis's encouragement: Dian Fossey and Birute Galdikas.

On the eve of the 50th anniversary of the discovery of *Zinj* we should pause to reflect on the remarkable progress of science towards a deeper understanding of human evolution. Molecular biology has irrefutably affirmed man's evolutionary connection with all of Earth's life. Multiple hominin fossil discoveries paint the picture of human evolution as a complex phylogenetic bush rather than a simple linear progression. Primatology has revealed that our closest animal relatives, chimpanzees, have culture and complex social behavior

Audrey Sterling (left), Life Trustee Nancy Pelosi and Life Trustee Barry Sterling with Board of Trustees President Bill Wirthlin

similar in many respects to us. Neuroscience taps into sophisticated technology that deciphers how the brain functions. Evolutionary psychology identifies adaptive human behaviors that assist us in understanding how genetics, culture, and environment influence human behavior. Louis would be astonished at how far science has progressed over the past 50 years.

An organization's mission statement establishes a direction and defined purpose and is essential for every successful organization. The Leakey Foundation's mission statement is elegantly simple and was crafted with the insight of Louis's visionary genius. He purposefully included the word "survival" as a part of the mission statement and once stated: "I would regard it a waste of my time to study the past if, in doing so, I could not help guide the future." Over recent decades, a gathering body of scientific research data from various academic disciplines (many funded by The Leakey Foundation) provides a deeper understanding of the biological roots of maladaptive human behaviors such as violence and aggression. Additionally, recognizing how evolution has shaped our nutritional and dietary needs from our hunter-gatherer past will assist us in living healthier lifestyles. Clearly, we all benefit from scientific research, and perhaps our survival on this planet is enhanced.

From my viewpoint, simply experiencing this shared journey of scientific discovery is exhilarating; a journey meant to be shared with everyone. Louis Leakey's legacy of intellectual curiosity, inspiration, perseverance, and scientific discovery continues within the focused mission of The Leakey Foundation. We have completed four successful decades of funding critical scientific research, providing public education and supporting student fellowships. The Leakey Foundation is on the right path with much yet to accomplish.

Once again I deeply appreciate and thank members, Fellows, Trustees and scientists for your continued interest in and support of The Leakey Foundation. Our future remains vital and bright.

With sincere thanks and best wishes,

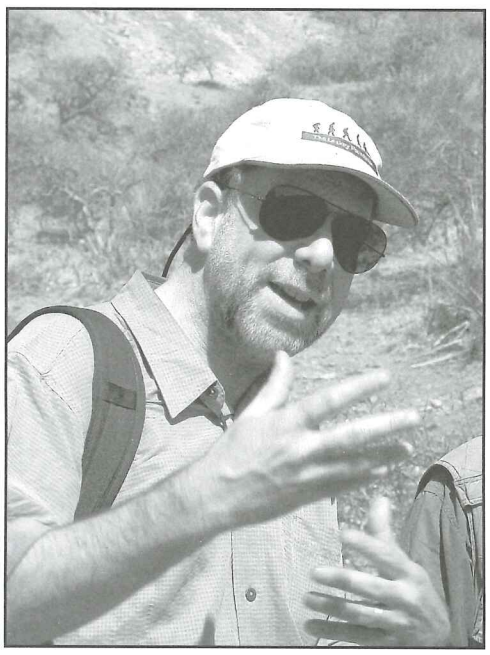
William M. Wirthlin, Jr.
President, Board of Trustees

1 Although Louis called it "the connecting link between the South African near-men and true man as we know him…" A. boisei is considered more of a cousin whose own lineage went extinct than a direct ancestor of humans. For further reading:

Ancestral Passions, The Leakey Family and the Quest for Humankind's Beginnings, Virginia Morel; *The First Human*, Ann Gibbon

Foundation Welcomes New SEC Member, Trustee

Dr. Daniel Lieberman Scientific Executive Committee



Although Dr. Daniel Lieberman is the newest member of The Leakey Foundation's Scientific Executive Committee, he is no stranger to the organization.

In 1990, at the very start of his research career, Dr. Lieberman received a grant from the Foundation for his research project titled "Seasonality and Human Evolution in the Southern Levant." He recognizes that $3,500.00 grant as the seed money that helped launch his career.

Since that initial funding from the Foundation, Dr. Lieberman has remained a friend of the Foundation, donating his time as a peer reviewer of grant applications, and participating in the Annual Leakey Foundation Speaker Series on Human Origins, most recently at The Field Museum in Chicago.

Recently, Dr. Lieberman furthered his commitment to The Leakey Foundation by joining the Scientific Executive Committee (SEC). The SEC is a volunteer group of eight leading experts who are at the heart of the Foundation's scientific direction. They review all grant applications and outside peer reviews to provide the Board of Trustees with recommendations for grant awards.

Today, Dr. Lieberman is Professor of Anthropology at Harvard University and Chair of the Biological Anthropology Department, while also serving on the Curatorial Board of the Peabody Museum. He received his Ph.D. in Anthropology from Harvard University in 1993, along with his A.M. in Anthropology from Harvard in 1990. He holds a M. Phil. in Biological Anthropology from Cambridge University and an A.B., *Summa cum Laude*, in Anthropology from Harvard. Previous appointments include Associate Professor at George Washington University and Assistant Professor at Rutgers University.

Dr. Lieberman is recognized as a leading expert on morphology and he employs a host of experimental and comparative methods to examine how key human features grow and develop, how they function, how their function affects performance, and how and when they evolved. Dr. Lieberman explained, "I study how and why the human body looks the way it does."

In addition, Dr. Lieberman's current research focuses on how and why humans evolved capabilities for throwing; how changes in human diet affect how skulls grow and integrate themselves; how the arch in the human foot functions during walking and running; and how pregnant bipedal mothers stabilize the body.

Major methods used in Dr. Lieberman's lab include morphological analyses of the fossil record; comparative morphological analyses of other primates and mammals; analyses of skeletal growth and development; and experimental biomechanics of the musculoskeletal system.§

Ms. Denise Bradley Board of Trustees

A graduate of Harvard Business School and Stanford University, Denise Bradley feels that that she has come full circle with her recent return to San Francisco to serve as Executive Director of one of San Francisco's newest cultural institutions, the Museum of the African Diaspora (MoAD), where she led the launch and establishment of the institution.

Under her leadership, MoAD generated over 100,000 visitors during its first year, garnered national and international recognition, including a cover story in the *New York Times Arts* section, and forged an impressive number of collaborations with museums and cultural institutions locally, nationally and internationally.

For one of MoAD's inaugural exhibitions, she negotiated a loan from the British Museum of the oldest objects in its collection: stone tools from the Olduvai Gorge in Kenya – which represented the first time the objects traveled outside of the United Kingdom. Her interest in The Leakey Foundation stemmed from her passion around MoAD's core theme: that the human race is one universal family because of our collective origins out of Africa.

Prior to running MoAD, Ms. Bradley was based in London, where she served as Project Manager for the South Bank Centre, Europe's largest multi-arts venue, where she oversaw the integration of programming and audience development for the exhibition of "Africa Remix," the largest exhibition of contemporary African art ever presented in Europe. During her time in London, she was appointed a Trustee of Kew Royal Botanic Gardens, and served on a Steering Committee of Arts Council England under Prime Minister Tony Blair.

Since her return to the Bay Area, Ms. Bradley has been appointed by Mayor Gavin Newsom as a San Francisco Film Commissioner, presented a "Profile of Excellence" award by ABC-7, and named by the *San Francisco Business Times* as one of the Bay Area's Most Influential Women of 2007. §

Homo Sapiens Texicanus

The Struggle for the Evolutionary Soul of The Lone Star State

by Gregory Crouch
Special Contributer

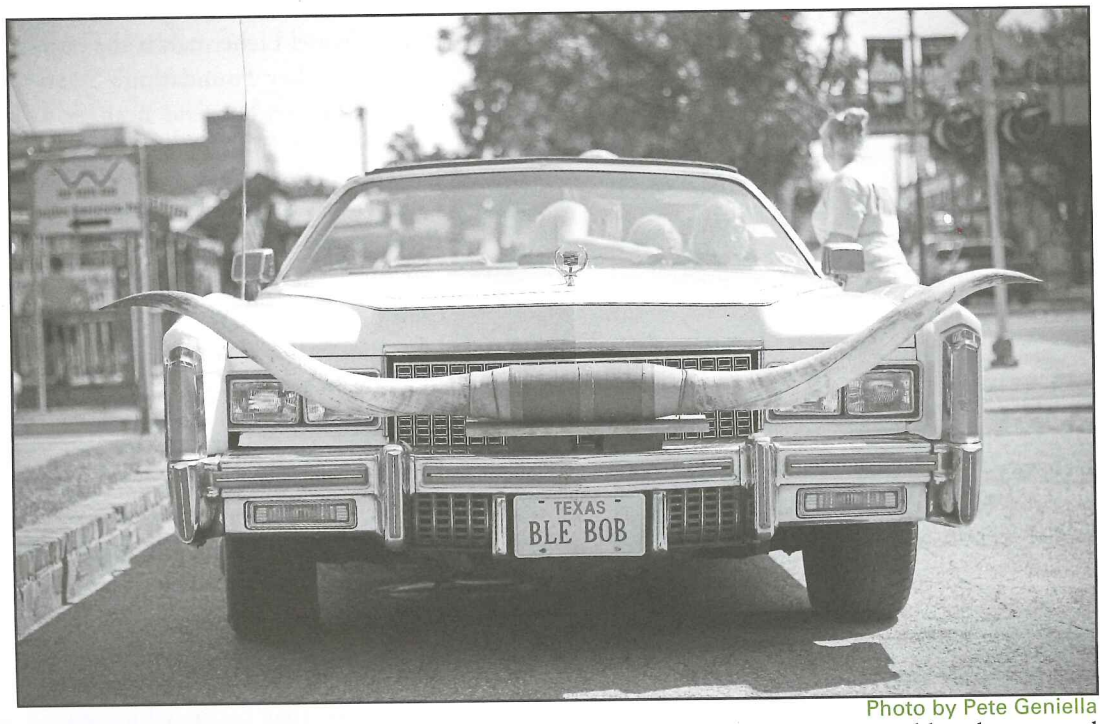


Photo by Pete Geniella

Texas. Part Old West, part Deep South, fully maverick, and entirely American, Texas boasts top shelf universities and research institutes and some of the nation's most vociferous social conservatives. Not surprisingly, it's at the forefront of the tousle between Evolutionary science and Creationism and Intelligent Design.

The Texas State Board of Education jolted science educators nationwide when its block of religious right members agitated to have the "strengths and weaknesses" of scientific theories presented as part of the state's science curriculum. Since nobody intends to teach high schoolers about the weaknesses in theories such as plate tectonics, quantum mechanics, and relativity, the language was plainly aimed at debasing evolutionary theory and advancing the religious concept of "Intelligent Design" despite the fact that evolutionary science is older and every bit as rigorously tested as those other theories. Proponents of "Intelligent Design" contend that it's a scientific theory rather than a religious one, an argument which, if accepted, might allow them to circumvent our nation's long-established church/state divide and give religious education in public classrooms.

After a months-long hullabaloo, the Board of Education rejected the "strengths and weakness" language by the slimmest of margins, a 7-7 tie that fell one vote short of the simple majority required for its insertion and adopted less controversial – but hardly ideal – language that requires students to "analyze and evaluate scientific explanations using empirical evidence, logical reasoning, and observational testing."

The scuffle had implications that went far beyond the state's borders: Texas is the United States' second most populous state, trailing only California, and it buys textbooks for the state's entire school system. California allows its local school districts to make independent decisions. Publishers therefore routinely adapt textbook content to accommodate the Texas requirements.

Unfortunately, that hasn't been the only assault on the State's intellectual standards. By state law, the Texas Higher Education Coordinating Board (THECB) is the only agency allowed to give the state's educational institutions permission to grant graduate degrees. In 2007, the Institute for Creation Research (ICR), a passionate denier of old earth evolution, petitioned THECB for authority to award Masters of Science degrees in Creationism. The Coordinating Board rejected the ICR petition on April 24, 2008. ICR retaliated by filing suit in federal court, claiming discrimination.

Enter Leo Berman, a Republican state representative from Tyler, a town of 100,000 some hundred miles east of Dallas who doesn't think his genetic ancestors crawled from a swamp millions of years ago. He believes creationism is every bit as scientific as evolution and should therefore receive equal weight in Texas education. Moved by the ICR's unsuccessful petition, in March, 2009, Berman introduced a bill in the Texas State Legislature that would exempt private, non-profit educational institutions from the Board's authority and allow them to award advanced degrees as long as they don't accept federal or state funding.

Aside from fears that the proposed legislation would devalue Texas graduate degrees and attract low- or no- standard "degree-mills," there is another angle to the anti-scientific advance: since a THECB-approved degree is required to teach in Texas public schools, the accreditation of Masters of Science degrees in Creationism could serve as an avenue which would allow Creationists to teach science in public school.

By way of compromise, THECB offered to allow ICR to grant degrees in Creation Studies, Christian Apologetics, Genesis Studies, Creation Apologetics, or Origins Theology, ones similar to those given at other Christian institutes. ICR refused to budge, insisting on their original desire to grant science degrees in Creationism.

The drama continues. However, the fight for Texas's intellectual soul isn't necessarily condemned to end in an Alamo overrun by Young Earth Creationists. Rational forces rallied against Berman's proposed legislation, and as of April 17, 2009, no less than six bills have been introduced in the State Legislature that intend to reduce or strip the Board of Education's power to control curricula and approve textbooks.

And there have been other bright rays of Texas reason. Lucy, best preserved remains of our *Australopithecus afarensis* ancestor made her American debut at the Houston Museum of Natural History. The most famous hominid fossil yet discovered, Lucy drew 170,000 visitors during an eight-month stay, few of whom saw fit to dispute the scientific estimates that Lucy walked the earth 3.2 million years ago, and before Lucy continued to Seattle, the University of Texas, Austin received permission to scan her fossilized remains. Scientists collected more than 40 gigabytes of CAT scan data, information from which they hope to glean deeper understanding of *Australopithecus afarensis* anatomy and behavior.

Another major coup for higher education in the Lone Star State was the completion of the Human genome sequencing project coordinated by Houston's Baylor College of Medicine, a project that represents years of collaborative effort between a variety of international institutions. The collected data opens the way to enormous discoveries in human medicine and biology, just the kind of advances that inspire those at The Leakey Foundation.

Texas, ever a study in contrasts, presents a dangerous, but hopeful paradox as we struggle to glean rational insight into humankind's greatest questions: where we come from, why we're here, and why we behave the way we do. The science of evolution is far too important to surrender. §

Baldwin Fellowship Program Receives a Major Funding Boost

by Sharal Camisa
Managing Director

By all accounts, the Leakey Prize Gala was a rousing success, both for honoring the life work of Dr. Jane Goodall and Dr. Toshisada Nishida, and for raising $20,000 to support the Franklin Mosher Baldwin Fellowship Program.

The Baldwin Fellowship Program is one of most vital opportunities offered by the Foundation for advancing scientific education in Africa. Each year the Foundation provides funding and guidance for young African scholars, interested in anthropology, primatology and paleontology, to complete advanced studies in the United States or Europe.

The Foundation utilized the special occasion of the Leakey Prize Gala to bring attention to the Program by hosting a live auction with 100% of the proceeds supporting Baldwin Fellows, in the field of primate studies. With the encouragement of Dr. Goodall and fellow "Leakey Angel" Dr. Biruté Galdikas, twenty "Trimate" posters from the 1981 Leakey Foundation symposium featuring Goodall, Galdikas and the late Dian Fossey were auctioned.

Auctioneer and Gala Chair Ms. Joy Sterling began the auction by asking "for twenty individuals to stand, who are willing to support The Baldwin Fellowship Program by paying $1,000 for a Leakey Foundation collectible". Within minutes, $20,000 was raised for the scholarship of two Baldwin Fellows.

The Leakey Foundation understands Africa possesses extraordinary resources in the field of prehistory, with uniquely rich fossil and primatological sites, and the stewardship and responsible use of these assets is a task of international importance. By enabling bright young scholars to obtain graduate educations, the Foundation is helping prepare these men and women to assume leadership roles in the future of prehistory, while promoting the intrinsic value for cultural exchange. In addition, the Foundation is fostering the advancement of responsible science in some of the most environmentally, historically and culturally sensitive regions of the world.

The Gala was truly a night of celebration, as revelers enjoyed wine from Plumpjack Wines and Iron Horse Vineyards, delicacies prepared by Paula LeDuc, and traditional African music and dance performed in a magical setting within the newly opened doors of the California Academy of Sciences – all while raising funds for educating future scientists in a critical field of research.

The Leakey Foundation offers our most sincere thanks to the generous Gala guests who supported this special initiative. §

(Top) Traditional African dancers greeted Leakey Prize Gala guests as they entered the California Academy of Sciences.

(Middle) Leakey Prize Laureates Dr. Jane Goodall (left) and Dr. Toshisada Nishida (right)

(Bottom) The 1981 "Trimate" poster that was auctioned.

"Leakey Angels" Dr. Birute Galdikas (left) and Dr. Jane Goodall, (right)

Photos by Brunk Photography

A Forty Year Perspective:
What Primates Have Taught Us About Being Human

by Dr. John Fleagle
Scientific Executive Committee

From October 30 through November 1, 2008 The Leakey Foundation, in conjunction with the California Academy of Sciences held a series of events in San Francisco to commemorate the Foundation's 40th Anniversary and to celebrate the awarding of the 2008 Leakey Prize to Dr. Toshisada Nishida and Dr. Jane Goodall, for their pioneering, long-term research on chimpanzees. The schedule of programming included a Primatology Film Screening of three award winning documentaries; the sold-out Leakey Prize Laureates Lectures; the Leakey Prize Public Forum for Primatology and Scientific Roundtable; and an evening Gala hosted by Michael Krasny, of KQED's Forum with special opening remarks by Leakey Foundation Life Trustee and Speaker of the House Nancy Pelosi.

Saturday, November 1 was devoted to a public forum titled, "What Does it Mean to be a Primate: a Human Discussion", moderated by the science reporter, Ira Flatow, of NPR's *Talk of the Nation: Science Friday.* The program featured seven individual presentations and two 45-minute roundtable discussions with twenty of the leading experts on primate studies. These scientists reflected on what the world has learned about primate behavior and ultimately human evolution over the past forty years of fieldwork, as well as looked to the future of primatology. All participants recognized that the study of primate behavior has changed considerably with the emergence of new questions about humans and our primate cousins, along with new tools available for answering those questions.

What Have We Learned Over the Past 40 Years?

The first presentation by Dr. Richard Wrangham (Harvard University) entitled, "The Inspirational Chimpanzee: How Four Decades of Research have Changed our View of Humanity," emphasized the importance of phylogeny (the study of evolutionary relatedness among various groups of organisms) in the evolution of human behavior. He recounted how studies of chimpanzees have revealed numerous chimpanzee behaviors that we previously thought were restricted to humans; including our similar use of sexual coercion, cooperation, intergroup violence, tool making, hunting and many gestures. These, he argued, are phylogenetically old behaviors shared through our common ancestry.

Wrangham was followed by Dr. Juichi Yamagiwa (Kyoto University) who compared the differences in the behavior and ecology of eastern gorillas at Kahuzi

Photo by Dr. Juichi Yamagiwa

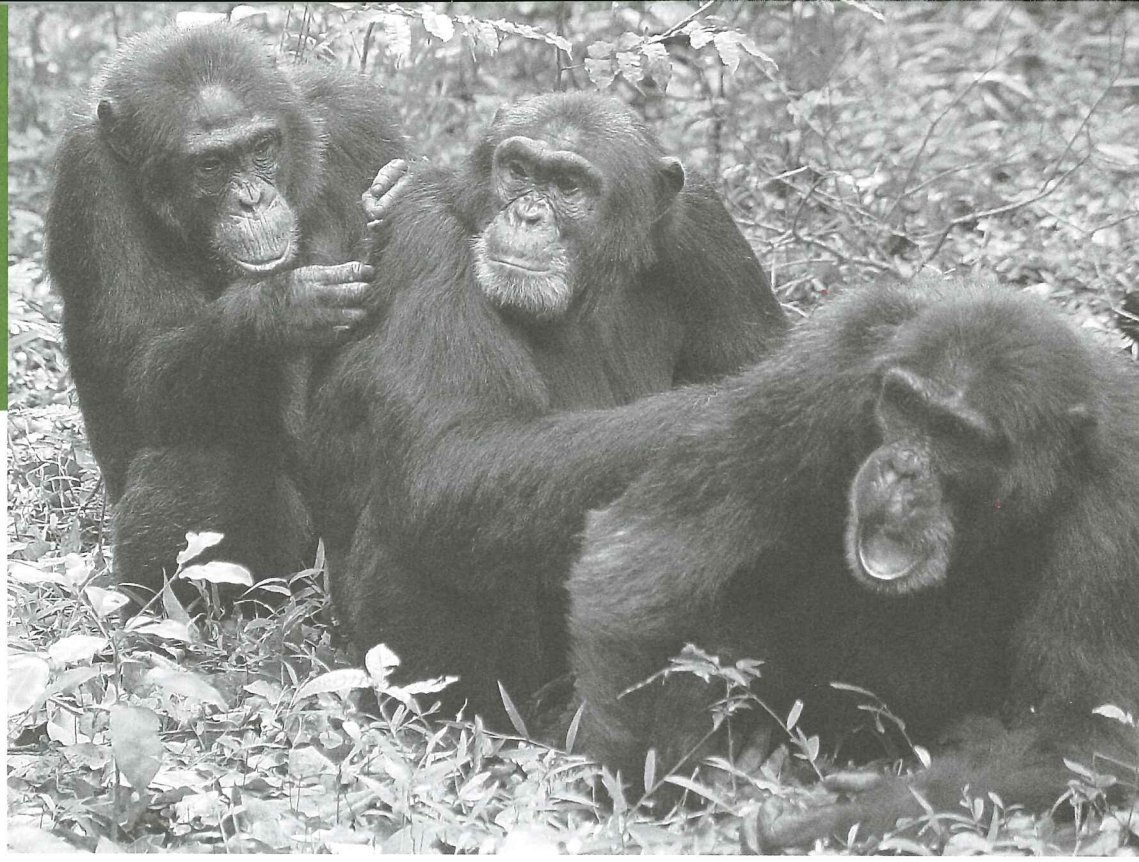


Photo by Dr. John Mitani

(DRC) and western gorillas at Moukalaba (Gabon), which show more agonistic behavior among females over fruits; resident silverback males show agonistic behavior to females in the presence of solitary males; and silverback males show vigilant behavior when the western groups cross patches of open land. He suggested that this had implications for the evolution of the human family.

Dr. Lynne Isbell (University of California, Davis) presented a brief summary of her new hypothesis "The Snake Detection Theory" which posits that most of the distinctive visual adaptations in primate evolution including forward facing eyes with extensively overlapping visual fields and trichromatic color vision evolved as adaptations to detect and avoid snakes. She argued that the distribution of trichromatic color vision among different radiations of primates is associated with the presence of venomous snakes in their evolutionary history. Thus, among the monkeys and apes of Africa and Asia where there are numerous venomous snakes, trichromatic color vision is largely fixed, and among the lemurs of Madagascar, where venomous snakes are absent, trichromatic color vision is rare. However among the monkeys of the New World where venomous snakes are a relatively recent arrival, trichromatic color vision is more sporadically distributed. She further suggested that the unique attribute of pointing to direct attention, may have evolved from a need to avoid deadly snakes in a bipedal primate, thus associated with increased social cooperation and language.

Dr. Robert Seyfarth (University of Pennsylvania) then discussed the relationship between stress and sociality based on long term baboon studies in Botswana with Dr. Dorothy Cheney. They found that among individual females, increased stress was not correlated to dominance relationships, but to the occurrence of unpredictable events such as infanticide, or appearance of new individuals, or natural disasters. The individuals with the lowest stress were those with a few close grooming associates rather than many, more superficial associations, and so in the face of increased stress, individuals concentrated on building new, closer grooming relationships.

Following Seyfarth's lecture, a roundtable discussion focused on what we have learned from studying primates. Dr. Joan Silk (University of California, Los Angeles) noted that although female primates were originally perceived as relatively uniform clones devoted to raising infants, we now see them as individuals with diverse personalities, goals, strategies, successes, and failures. Dr. Anne Pusey (University of Minnesota) emphasized that primatologists are now very interested in life history differences among species and comparisons with humans. Dr. David Watts (Yale University) pointed out the many new noninvasive methods for studying hormone levels and genealogical relationships of individuals. And Dr. Diane Doran-Sheehy (Stony Brook University New York) discussed the importance of sampling techniques and methods statistically analyzing behavioral data. Leakey Prize Laureate Dr. Toshisada Nishida noted that current research and publications in primatology is increasingly driven by theory, but warned that this should not diminish the value of natural history observations. There was considerable discussion within the group about the extent to which nonhuman primates can perceive what other individuals are thinking and the difficulty of testing whether other primates have a "Theory of Mind" and Machiavellian Intelligence.

When asked what they would do differently if they could rerun their research careers, Dr. Doran-Sheehy said that if she had initially used the habituation techniques that she now understands, she would have been able to habituate western gorillas in two years rather than ten. Dr. Watts wished he had learned more lab skills, and Dr. Pusey wished that researchers had been collecting feces samples since the beginning to reconstruct mating patterns and other aspects of the biology of individuals over the decades. Dr. Nishida emphasized the value for a researcher visiting several sites (rather than a single site as most researchers tend to do) to gain an understanding of both the variation in primate behavior across sites as well as differences in the approach of the research teams.

What Can We Learn Over the Next 40 Years?

Dr. Brenda Bradley (University of Cambridge) began the afternoon session with a presentation entitled, "From the Field to the Lab: Primate Genomics and Primatology". She noted that primates are in the forefront of genomics studies and there are ongoing projects to sequence the genomes of 24 additional primate species covering 19 of the 65 recognized genera. She reviewed how genetics has become an integral part of modern primatology in addressing three areas of research: reconstructing phylogenetic relationships among living, and a few fossil primates; using genetics to uncover genealogical relationships, mating patterns and population structure of primate groups and populations; and the ability to learn about the evolution of adaptations through identifying links among genetic differences, morphological and physiological traits, and fitness in wild populations.

Bradley's presentation was followed by Dr. John Mitani (University of Michigan) who noted that we now have over 200 field years of research on chimpanzees, yet there remain many aspects of chimpanzee behavior that we do not understand, in part because chimps, like humans have a long lifespan. He addressed what we know and do not know about how and why male chimpanzees cooperate in many activities, including coalitions, hunting, and territorial patrol and defense. Next, Leakey

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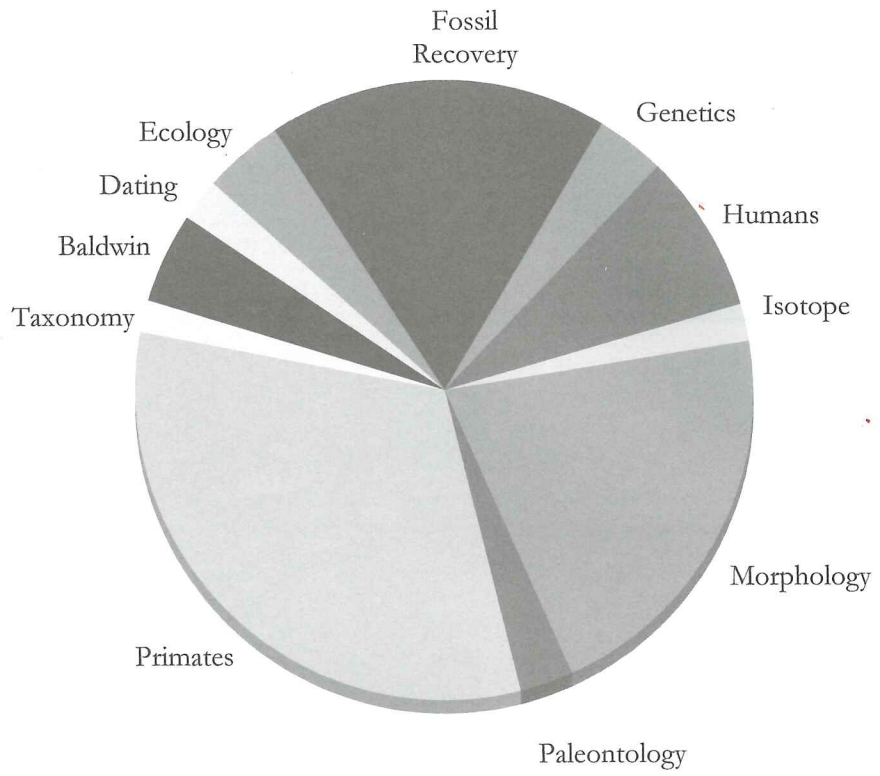
Grants Awarded Spring 2009



Franklin Mosher Baldwin Fellowships

Habiba Chirchir
George Washington University
1st Year Baldwin Support

Lauren Schroeder
University of Cape Town
2nd Year Baldwin Support

Hesham Sallam
University of Oxford
3rd Year Baldwin Support

Behavioral

Melanie Beuerlein
Yale University
The Aging Male Chimpanzee: investigating changes in reproductive effort, social networks and endocrine physiology at Ngogo, Kibale National Park, Uganda

Alecia Carter
The Fenner School of Environment and Society, The Australian National University
Personality and sociality in chacma baboons in Namibia

Amy Cobden
Emory University
Stress and sociality in female bonobos (Pan paniscus), Lomako Forest

Catherine Crockford
University of St. Andrews
Wild chimpanzees' social mind and relationships: hormonal and experimental analyses

Cedric Girard-Buttoz
German Primate Center (Deutsches Primatenzentrum DPZ)
Costs of mate-guarding in wild Sumatran long-tailed macaques (Macaca fascicularis)

Danusa Guedes
Pontificia Universidade Católica do Rio Grande do Sul
Social foraging decision-making by free-ranging marmosets (Callithrix penicillata)

Andrew Marshall
University of California at Davis
Causes and consequences of habitat quality variation for Bornean primates

Courtney Meehan
Washington State University
Cooperative breeding and maternal time allocation among Aka forest foragers

Ulrich Reichard
Board of Trustees, Southern Illinois University Carbondale
Spatial cognition in Gibbons at Khao Yai, Thailand

Carrie Veilleux
University of Texas at Austin
Evolutionary effects of light environment on nocturnal lemur color vision

Victoria Wobber
Harvard University
A comparison of salivary hormones in chimpanzees and bonobos

Paleoanthroplogy

Bryce Carlson
Emory University
Compound specific isotopic analyses: Chimpanzees of Ngogo, Kibale National Park

James Enloe
The University of Iowa
Excavation of Mousterian levels at Arc-sur-Cure: Hominid fossils and archaeology

Olaf Joris
Römisch-Germanisches Zentralmuseum Mainz
Spatial behavior in the Aurignacian: new excavations at Breitenbach, Germany

Scott Maddux
University of Iowa
Assessing the reliability of infraorbital characters in phylogenetic analyses of Pleistocene Homo

Stephanie Melillo
Stanford University
Evolution of the early hominid shoulder: comparative description of KSD-VP-1/1

Ellen Miller
Wake Forest University
Paleontological exploration at Buluk, northern Kenya

Philip R. Nigst
Max-Planck-Institute for Evolutionary Anthropology
The age of the Early Aurignacian: Continued excavations at Willendorf II

J. Michael Plavcan
Board of Trustees, University of Arkansas
3D analysis of Koobi Fora hominin postcranial anatomy and variation

Gonen Sharon
The Israel Prehistoric Society
Behavior, subsistence and paleo-environment of Middle Palaeolithic hominids in the northern Dead-Sea-rift

Randall Susman
Research Foundation Stony Brook University
Descriptive and functional morphology of Homo habilis from Olduvai Gorge

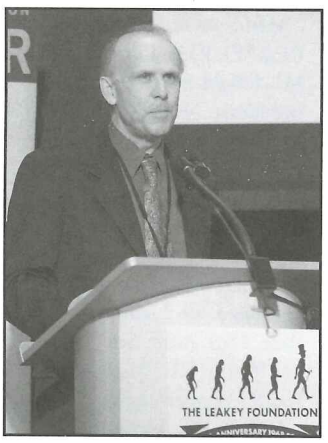
What Primates Have Taught Us, continued from Page 5

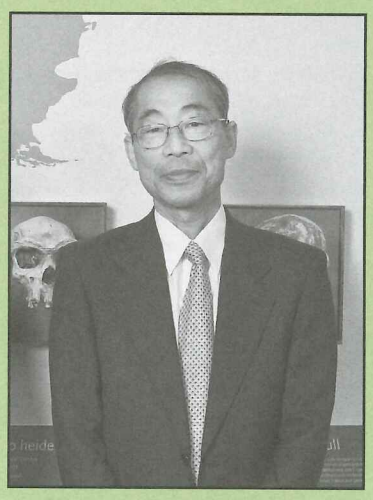
(Top) Roundtable participants with Leakey Foundation Board of Trustee members

(Middle) NPR's Ira Flatow moderates the afternoon Roundtable.

(Bottom) Richard Wrangham presents "The Inspirational Chimpanzee"

Photos by Gene Kosoy





"I recollect the most pleasant and joyful Leakey events we had last October-November with warm memory. Really, they were the happiest events I have ever had in my lifetime."

–Leakey Prize Laureate Dr. Toshisada Nishida

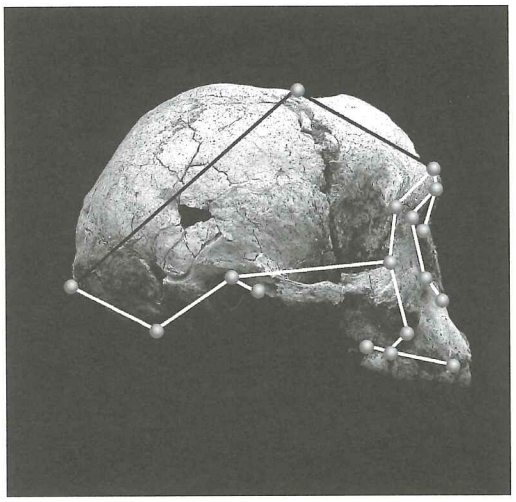
Prize Laureate Dr. Jane Goodall discussed the future of Gombe Stream. She argued that the future of the chimpanzees lies with the economic future of the people living around the park, and outlined the many ongoing projects in community development.

In the final roundtable discussion, participants were asked to identify the areas that need to be addressed in the future of primatology. Former Leakey Foundation Baldwin Fellow, Dr. Anthony Nsubuga (Zoological Society of San Diego) stressed the need for greater cooperation between scientists from developed countries and those in African countries, through programs like The Leakey Foundation's Franklin Mosher Baldwin Fellowships. There is also a great need for more outreach programs in countries with indigenous primates to help educate young students and the population at large.

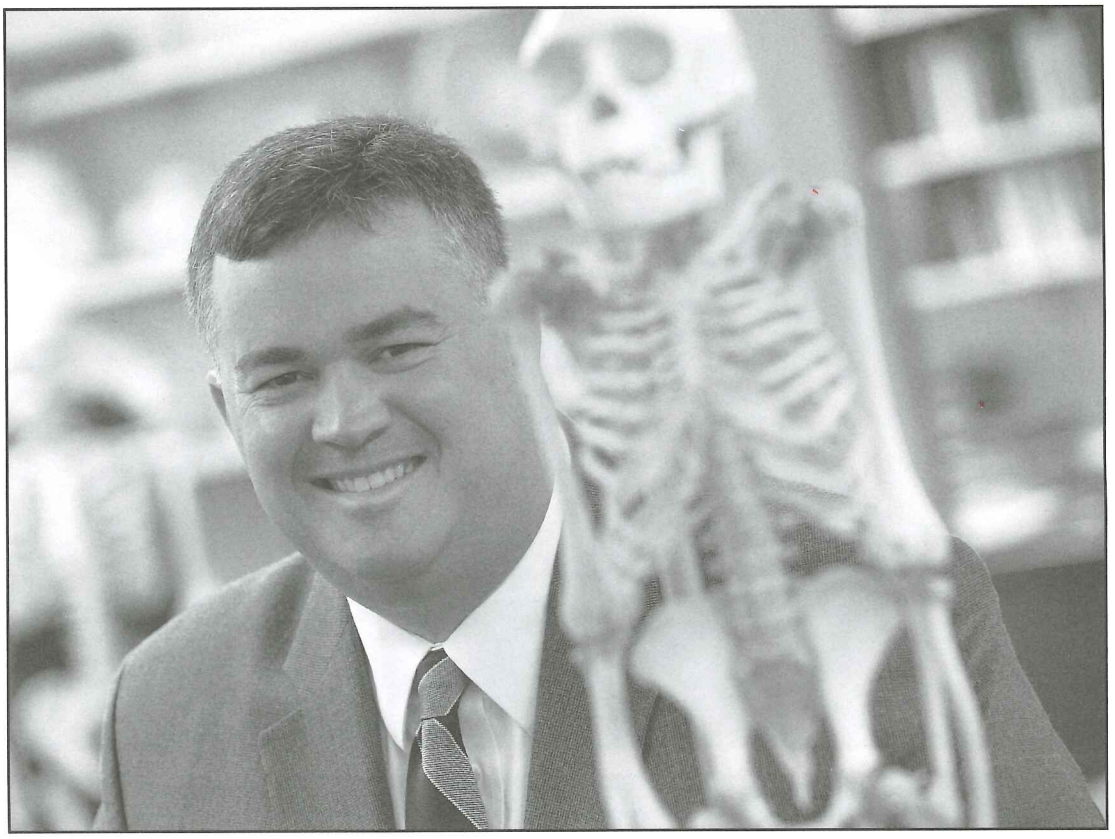
When asked about major challenges to our understanding of primates, the researchers brought up a diverse collection of topics for future research. Dr. Dorothy Cheney (University of Pennsylvania) noted our poor understanding of the cognitive differences among primates; Dr. Adrienne Zihlman (University of California Santa Cruz) argued that we needed to know more about bonobo life history; and Dr. Kristen Hawkes (University of Utah) outlined the many differences between human and chimpanzee life histories, including reproductive senescence, communal care and rearing of children. Dr. Goodall talked about special relationships between the old and young primate individuals, and Dr. Cheney noted a near total lack of understanding of the importance of differences in personality and emotion, or even a way of characterizing and studying these clearly distinctive aspects of social behavior and individual success.

In a final discussion of conservation priorities and estimates of population decline in apes, Dr. Doran-Sheehy noted the rapid spread of Ebola that is decimating African ape populations; Dr. Martha Robbins (Max Planck Institute of Evolutionary Anthropology) explained the difficulties of obtaining accurate censuses; and Dr. Goodall suggested that the plight of the orangutans of Southeast Asia was probably even worse that than of African apes. All participants agreed that there was much urgent work to be done and a need for many more primatologists to continue long term research projects. §

To view all of the science presentations from "What Does it Mean to be a Primate: A Human Discussion" along with pictures and audio/visual of other Leakey Prize programming, please visit www.leakeyfoundation.org



(Left) Lateral view of the *Homo floresiensis* cranium, LB1, with 3D cranial landmarks superimposed. *Photo by Peter Brown*



(Right) Kieran McNulty standing with a juvenile chimpanzee skeleton. *Photo by Kelly MacWilliams*

a link between *H. floresiensis* and either modern or fossil humans, we constructed the argument in reverse to ask a different sort of question. What *should* a species of fossil *Homo* look like if it were only three feet tall?

With twelve partial skeletons now known from Liang Bua, it is clear that at some point the Flores lineage underwent a significant reduction in body size.[2,5] It is also known from comparative anatomy that changes in body size correspond to significant, and often predictable, changes in shape. In fact, our work[7] demonstrated that modern and fossil humans, gorillas, chimpanzees, and bonobos all share a common pattern of shape change that is associated with changes in body size. Armed with this biological information, we set about to simulate a new fossil hominin.

Taking advantage of new approaches in 3D modeling, we calculated the shape change that is associated with size change in a sample of fossil *Homo* crania. We then used that pattern of shape change to "morph" these fossils into a new, simulated cranium of the same size as the LB1 fossil. This simulation represents what *H. habilis* or *H. erectus* might have looked like had either evolved to have a skull size as small as that of *H. floresiensis*. Finally, we compared the real "hobbit" cranium to our simulated model to determine whether the LB1 cranium resembles a scaled-down version of fossil *Homo*.

In fact, the similarities between the real and simulated fossils were remarkable. Compared to variation in modern humans and apes, our simulation could have belonged to the same species as the LB1 cranium! What's more, we found no evidence that *H. floresiensis* was part of the modern human species. Perhaps the most important result of our study, however, was showing how the relationship between size and shape can influence, and even confound, studies of human evolution. We found that, whether you look at gorillas, chimpanzees, bonobos, or humans, as the animals get smaller and smaller, the underlying structure of their *faces* takes on more modern human-like features.[7] Put another way, the smaller one of our relatives is, the more we would expect its facial skeleton to resemble ours. Thus, some of the similarities between *H. floresiensis* and *H. sapiens*[6] may be due only to the small size of the fossil "hobbits," not to a close relationship with anatomically modern humans.

Based on our results, we concluded that *H. floresiensis* is most likely a late-surviving population descended from a more primitive ancestor, probably early *H. erectus* or *H. habilis*. This fits with a variety of other evidence from studies of the cranium,[8,9] endocast,[10] jaw,[4] upper limb,[11] wrist bones,[12] and lower limb[13] that all point to the fossil "hobbits" as a primitive branch on the larger human family tree. As minders of such trees, we join moot with other paleoanthropologists hoping for new fossil discoveries. Yet, using advanced methods in 3D modeling, simulation, and analysis, we can also expand our scientific knowledge of human origins and evolution in directions that might otherwise be obscured by the penurious fossil record. §

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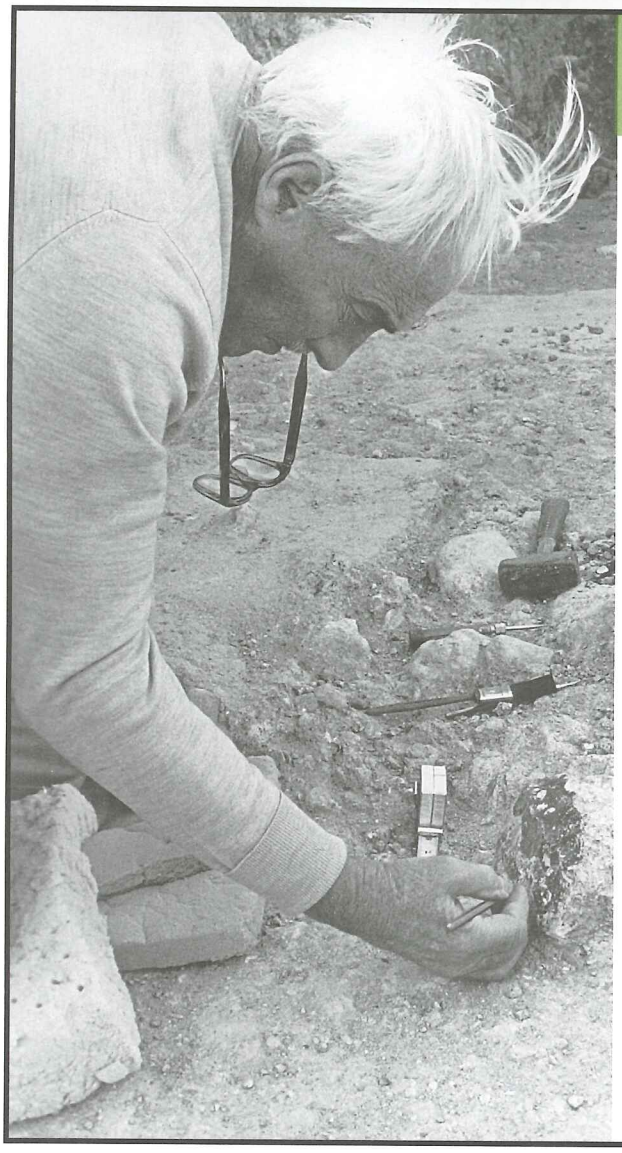

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Social Networking:
The Leakey Foundation Explores New Frontiers

by Beth Lawrie
Communications Manager

While The Leakey Foundation is no stranger to the Internet, and our presence is already known in the online community, we have discovered a new frontier to conquer: Social Networking. As part of a larger effort to widen our online reach, we have expanded our presence to include accounts on YouTube.com, Facebook.com and the wildly popular Twitter.com.

For over 40 years, The Leakey Foundation has funded and inspired countless explorations into new frontiers of human origins research. The Foundation has also grown to become a source of knowledge by providing a stage for intelligent and innovative discourse.

Our Leakey Learning Expedition program brings world-renowned scientists to classrooms throughout the United States, and our Fellows' Travel Program brings our most enthusiastic supporters across the savannas of Africa and through caves in Europe to view some of the most ancient art known to humankind.

Understanding that our website serves as the face of the Foundation, we have decided to make some changes and include new additions. As the Foundation staff continues to increase our online presence, our list of networks will undoubtedly grow. The look and design of the website will also transform, to include a greater variety of scientific content and educational resources. To learn more about this new venture into our virtual safari of the Internet and to see the links to each of our new profiles, please visit our website at www.leakeyfoundation.org. §

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50 Years Ago
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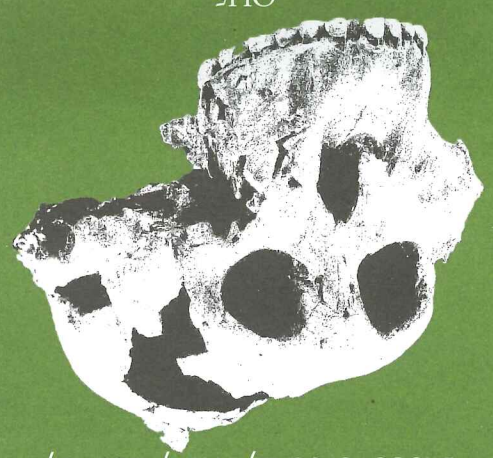
Discovered by Mary Leakey



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