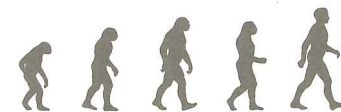


AnthroQuest



The Newsletter of the L.S.B. Leakey Foundation

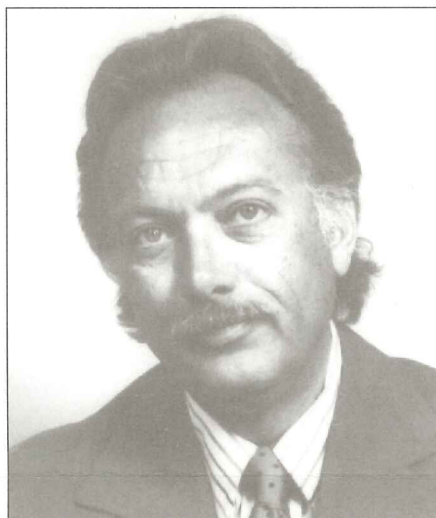
No. 6, Summer 1998

Leakey Prize Awarded to Dr. F. Clark Howell

The L.S.B. Leakey Prize for Multidisciplinary Research on Ape and Human Evolution was established in 1990 to reward intellectual achievement and express appreciation for research performed with courage and perseverance in the fields of ape and human evolution. The purpose of the award is to honor a scientist for achievement transcending the boundaries of his or her discipline by linking widely differing branches of science. The anonymous donor of the Prize intends to encourage and stimulate multidisciplinary research which gives evidence of broad interests and ingenuity.

Louis Leakey stands as a prime example of a multidisciplinarian. He was able to apply his initial research in specific disciplines to a myriad of fields for a more complete picture of human evolution. Leakey's decades of painstaking research resulted in exceptional fossil examples of early man and his ancestors. Rather than providing cursory answers to the mysteries of human origins, these discoveries led him to ask further, unanticipated questions. This extraordinary contribution to science created a web of inquiries into the relationships between the study of great apes and hunter gatherers as they relate to the study of human origins. It is this type of intellectual curiosity, persistence, and achievement that the Prize seeks to encourage and reward.

Nominations for the Prize are solicited from all over the world and reviewed by an international selection committee representing expert scientists from many different fields of research.



Clark Howell

Dr. Philip V. Tobias, Professor of Anatomy at the University of Witwatersrand Medical School in Johannesburg, South Africa, was the recipient of the first Prize in 1991 and Dr. J. Desmond Clark, Professor Emeritus at the University of California, Berkeley, received the second award in 1996.

On April 23, 1998 at a ceremony in San Francisco, the third Leakey Prize was awarded to Dr. F. Clark Howell for his rich and varied contribution to paleoanthropology and for the stimulation and direction he has provided to an entire generation of students and colleagues. Drs. Richard Klein, a Professor of Anthropology at Stanford University and sub-discipline chair in Prehistory for the Leakey Foundation's Scientific Executive Committee, and Tim D. White, a Professor of Integrative Biology at the University of California, Berkeley, gave short talks in

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Investigating Human Evolutionary History

The search to improve understanding of human evolutionary history lies at the heart of the Leakey Foundation's mission. Many scientific disciplines contribute to this quest, but it is the one that is devoted to the interpretation of fossil evidence, paleoanthropology, which seems to attract particular public attention. While new fossil finds inevitably make the headlines, there is little, or no, publicity about the 'behind the scenes' research that paleoanthropologists undertake. Just what is it that they are trying to achieve, and how do they go about it?

Progress in any science comes from two sources: the acquisition of data and improvements in the analysis of those data. In the experimental sciences, new information is gathered from experiments which are designed to tease out the roles of the many factors which influence complex processes. In the historical sciences, of which paleoanthropology is one, the scope for experimentation is more limited and the 'data' largely consists of the fossil remains of extinct animals, together with whatever evidence can be gleaned about their contexts—including information about their ages and paleohabitats.

Clearly, new fossils provide fresh evidence, but they are not the only source. Fresh evidence can also come from 'interrogating' existing fossil evidence so that it provides information that was not previously available. For example, the application of advanced methods of medical imaging has enabled researchers to gain access to morphological information which was previously hidden within fossils. The

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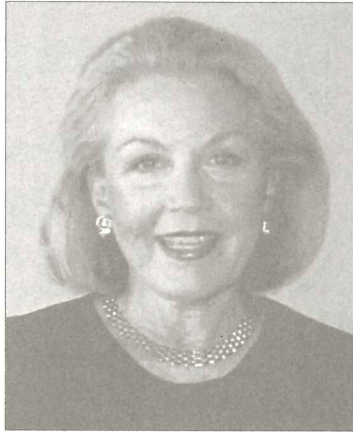
President's Message: Public Outreach

June 1998

Dear Members,

Since the inception of the Leakey Foundation thirty years ago, our mission has included a public education component. I believe that Louis Leakey's spark for capturing the excitement of his discoveries and voicing them to the public with contagious zeal was one of the most essential ingredients in shaping human origins research into the serious field of study that it is today. In this vein, we at the Foundation attempt carry on the "Leakey legacy" by sponsoring events which reach out to our members and the general public. While the vast majority of our funds are devoted directly to research, promoting and explaining the latest finds as well as drawing attention to less familiar efforts which are helping to advance the field are still an important part of the Foundation's work. To accomplish this objective, we work with various academic institutions, museums, and other funding agencies to hold symposia, lectures, and workshops. The articles in this issue of *AnthroQuest* highlight two notable events that we sponsor in order to implement our commitment to educating the public at large about human origins.

One of our most anticipated annual events is the Leakey Lecture. This talk affords us the opportunity to present a public lecture delivered by a prestigious scientist who has expertise focusing on one of the many facets in the diverse array of human evolution research areas. Of particular interest is how these lectures relate the specifics of the research to the overall advancement of the field in general. This fundamental theme is apparent from the article included in this issue by Bernard Wood, who gave an extremely successful Leakey Lecture for us last February in San



Francisco at the California Academy of Sciences.

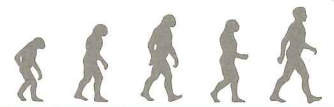
The L.S.B. Leakey Prize for Multidisciplinary Research on Ape and Human Evolution is another means of promoting the science by spotlighting the lifetime achievements of a distinguished individual or team of outstanding scientists. This year I was most

pleased to see Clark Howell receive the 1998 Leakey Prize. As the chair of the Foundation's Scientific Executive Committee, Clark has been a guiding force in our grant-making program for many years. Yet as the Prize is awarded based on nominations from around the world, our longstanding suspicions that he is among the most eminent scholars in human origins research were confirmed by an international committee of his peers.

At the award presentation, it was remarked that through the wide breadth of his exceptional studies, Clark Howell has influenced an entire generation of scientists. It takes extraordinary inventiveness and resolve to cross the conventional boundaries of the specialities, but it is this ingenuity which ultimately expands our knowledge. Each of the Leakey Prize winners—Clark Howell, Desmond Clark, and Philip Tobias—manifests these qualities with distinction. In examining the accomplishments of these scientists, the Foundation's intent is not only to educate about individual discoveries or careers, but to emphasize the unique characteristic of the multidisciplinary approach in fostering the emergence of new questions and fresh avenues of inquiry.

Sincerely,


Kay Harrigan Woods
President



The Leakey Foundation

FOR RESEARCH RELATED
TO HUMAN ORIGINS

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Understanding the Great Apes, the Leakey Foundation 1999 calendar, will be available to our members in October 1998. Contact the Foundation for information on stores in your area.

Investigating *continued from page 1*

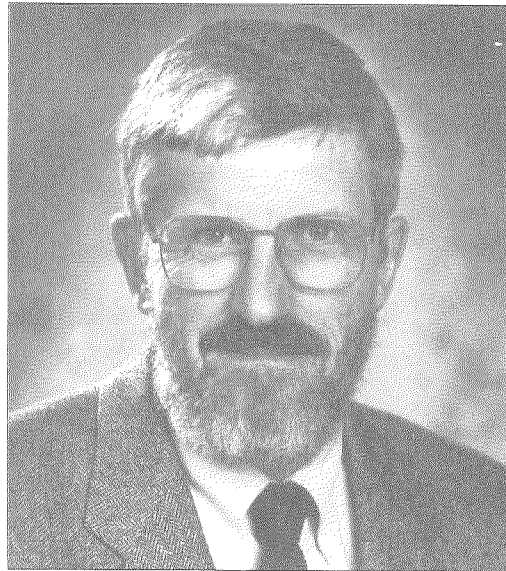
ability to reconstruct an accurate picture of the complex shape of the semicircular canals within the inner ear in hominin fossils is a good illustration of the extraordinary potential that imaging holds for progress in paleoanthropology. Evidently, in quadrupedal primates, these canals are orientated differently than they are in modern humans who stand upright and walk bipedally. Consequently, now that the disposition of these canals can be determined in fossil crania, this method affords an additional source of evidence about the evolution of bipedalism.

Similarly, analyses using surface and subsurface microscopy on a tooth can provide information about the rate and pattern of the enamel and dentine growth that make up the bulk of the tooth's crown and root. This technique enables researchers to look in unprecedented detail at the growth processes which determine the thickness of tooth enamel as well as the size and shape of tooth roots. The technology of microscopy is so advanced that it detects approximately daily and weekly rhythms in the growth of enamel and dentine, so that surprisingly accurate estimates can be made about the amount of time it took for fossil teeth to develop. These estimates can be used to determine whether the rates of development in our fossil ancestors were relatively rapid, like apes, or more gradual, like modern humans.

Important developments have also taken place in the ways that fossil evidence is analyzed. Without sound hypotheses about the nature of fossil taxa, any other type of interpretation is worthless. Researchers have been working to devise better methods for circumscribing the limits of variation within early hominin species, and the results of their efforts are enabling others to carry out investigations about the ways that the early hominins functioned. Computer models, some of them borrowed from engineering, are allowing researchers to use the shape

and structure of fossil teeth, as well as the size and shape of fossil limb bones to reconstruct the likely diet and locomotion of the early hominins.

Some of these computer models allow researchers to reconstruct the motion that would have been employed by the jaws of a fossil animal in clench-



Bernard Wood

ing its teeth together. These computer models also enable the simulation of muscle activity and joint excursion in the trunk and limbs during walking and running. This ability to infer function from structure using methods validated in living animals has greatly improved our knowledge of the performance of the early hominins.

Where do we stand in our search to understand human evolutionary history? It is plain from the fossil record, which now reaches back to almost 4.5 Myr, that hominin evolution has been characterized by repeated episodes when several species have evolved showing a spectrum of dental and locomotor specializations. Whereas some have large chewing teeth, others may retain the ability to climb, and a third group may show evidence of a greater commitment to bipedalism. Yet others may manifest a range of combinations of masticatory, postural, and locomotor specializations.

We have not made as much progress as we would like in the search for methods that will provide reliable information about how fossil hominins are related. Until we do, we shall never understand the true extent of convergent evolution which occurs when animals with different evolutionary histories evolve similar morphological solutions to the same environmental challenge.

As for developments in analytical methods, the next decade promises to be as exciting as the previous ones. It is possible that even more sensitive techniques for the detection of DNA will be developed which will allow the sex of fossils to be determined. Advances in developmental biology may enable researchers to predict the nature of the genetic adjustments that were necessary for the evolution of the teeth and jaws of the early hominins.

The excitement of paleoanthropology hinges upon the dual challenge of squeezing as much information as one can from the hominin fossil record, and then devising more ingenious and fruitful ways of using those data. By supporting researchers through its various grant programs, the Leakey Foundation plays a unique role in ensuring that the research community can continue its attempts to unravel the secrets of human evolutionary history.

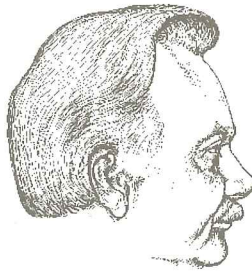
Bernard Wood is presently the Luce Professor of Human Origins in the Department of Anthropology at George Washington University and Honorary Senior Scientist at the National Museum of Natural History, the Smithsonian Institution. He is also the Director-designate of the Center for the Advanced Study of Human Evolutionary History which is to be established jointly by George Washington University and the Smithsonian Institution. His research centers on increasing our understanding of human evolutionary history by developing and improving the ways we analyze the hominid fossil record. ■

Howell *continued from page 1*

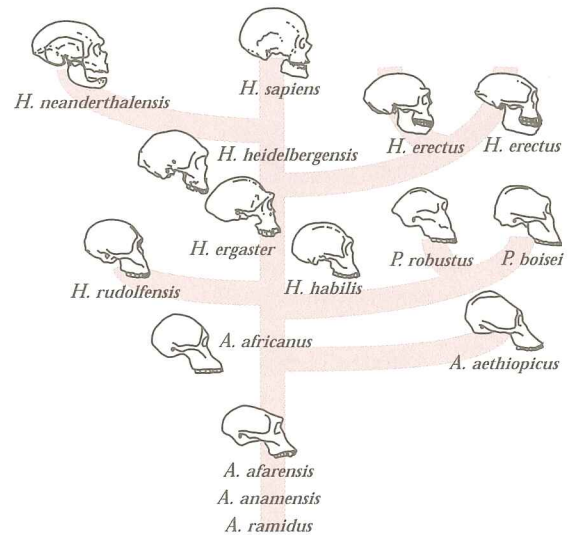
tribute to Dr. Howell recognizing many highlights of his distinguished career. Kay Harrigan Woods, President of the Leakey Foundation, presented Dr. Howell with the \$25,000 Prize and a medal commemorating his great achievement.

Dr. Howell has been a moving force in the development of modern interdisciplinary field research in human biological and cultural evolution—with special interests in paleoanthropology and human paleontology, anatomy, human biology, and paleoenvironmental studies. He can, in fact, be credited with bringing the term, “paleo-anthropology,” into common use and thus helped lay the groundwork for the recognition of paleoanthropology as a specialized field of study.

Dr. Howell received his Ph.D. from the University of Chicago. He began his teaching career at Washington University Medical School, followed by 15 years at the University of Chicago. For almost three decades, he has taught at the University of California, Berkeley where he also founded and still co-directs with Tim D. White the Laboratory for Human Evolutionary Studies. Dr. Howell's research initially focused on early Stone Age archeology but he soon emerged as a leader in interdisciplinary approaches to human evolutionary studies. His intense concern with scientific practice and the development and advancement of international paleoanthropology have not only been exemplified by his university service but also through his dedication as the co-chair of the Scientific Executive Committee of the Leakey Foundation. His fieldwork spans the globe including France, Africa, Spain and Turkey. Dr. Howell has been honored with membership in the Academie des Sciences (Institut de France), National Academy of Sciences, American Academy of Arts and Sciences, American Philosophical Society, Royal Society of South Africa, and other scientific and learned societies in the United States, England, and Europe. ■



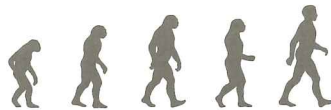
**Clark Howell
and Friends**



Calendar of Events

- October 9, 1998 **Lecture by Drs. Meave and Richard Leakey**
National Geographic Society, Washington, DC
- February 18, 1999 **Annual L.S.B. Leakey Lecture**
California Academy of Sciences, San Francisco, CA
Dr. Matt Cartmill, Duke University

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