IHO Team Visits China

Although most anthropologists conclude that the human lineage evolved in Africa, scientists working in other areas are also making intriguing discoveries that may help to shed light on our origins.

Sites in south China, for instance, have yielded many hominoid fossils from the Miocene epoch and later. By studying these fossils, scientists hope to gain a better picture of the evolutionary "family tree" of large-bodied hominoids (the group that includes both the great apes and the bipedal hominids).

An Institute team visited Yunnan Province, People's Republic of China, in late 1988 to examine the Yunnan Provincial Museum's collection of hominoid fossils and to tour the sites where they were recovered. The trip was an outgrowth of an earlier journey to Yunnan by a joint University of California, Berkeley/Institute team and a return study visit to California last year by Chinese scientists.

The highlight of the collection is the fossilized skull of a young ape-like creature, the most complete juvenile ape cranium from the late Miocene yet discovered. Its permanent molars were just erupting, meaning the creature was perhaps three years old when it died.

The juvenile skull and other Chinese discoveries intrigue paleoanthropologists for several reasons. First, they may help to shed light on a virtually blank space in the fossil record, a period of several million years which has been nearly devoid of hominoid fossils. Also, other late Miocene ape fossils from Asia (primarily India and Pakistan) appear to be precursors of the modern orangutan, but these apes seem to be more generalized.

The juvenile skull doesn't appear to resemble a young orangutan, according to its discoverer, Professor Zhang Xingyong of the Yunnan Provincial Museum. It is approximately the same dental age as the Taung child fossil (Australopithecus africanus) from South Africa, offering possibilities for an interesting comparison.

Detailed study may help to show how the juvenile and other south China fossils relate to living apes and give scientists a better picture of hominoid evolution during the period from 7 to 5 million years ago.

The juvenile specimen came from a lower deposit in the Bangguo Basin, an area where sedimentary rocks are yielding fossils from possibly latest Miocene or early Pliocene times. Unfortunately there are no volcanic deposits here to help pinpoint the age of the rocks; scientists must estimate the age of the hominoid fossils by studying other faunal (animal) remains in the same sediments.

The Institute team visited Bangguo Basin and also the famous nearby site of Lufeng, where ape fossils about seven to eight million years old have been found since the mid-1970s.

Both sites are located in rural parts of Yunnan province, about 500 kilometers north of Vietnam and Burma—team members, in fact, traveled along the famous "Burma Road" to visit the excavations.

CT scan image shows the palate of OH 62, the Homo habilis partial skeleton discovered at Olduvai Gorge in 1986.

IHO Uses CT Scan To Study Fossils

Paleoanthropology and modern medical technology are joining hands to study the fossilized bones of OH 62, the Homo habilis ("handy man") partial skeleton discovered by a joint Institute/Tanzanian team at Olduvai Gorge in 1986.

Although Institute scientists made an initial study of OH 62 soon after its discovery, detailed analysis is a long-term project. One of the most recent efforts was a CT scan ("cat scan") of the fossil performed in Cleveland, Ohio.

Anthropologists C. Owen Lovejoy of Kent State University and Bruce Latimer of the Cleveland Museum of Natural History will use information from the scan for a biomechanical analysis of limb bone strength. This can determine what kinds of stresses the bones were equipped to handle, and thus provide insight into its style of walking.

CT ("computed tomography") provides a cross-section view of tissues by taking X-rays from many angles and combining them into a single video image. It is most often used by physicians in diagnosing illness. The Picker Xray Co. made equipment available for the OH 62 scan.

The scan took place last autumn when Institute scientists visited Cleveland to meet with Lovejoy and Latimer and to collect other data for the OH 62 analysis. The Cleveland Museum contains one of the world's largest collections of human and other primate skeletons (about 4,000 specimens).

The anthropologists spent several days accumulating measurements on human and ape post-cranial bones. They will use this information to help reconstruct the OH 62 skeleton, and especially to determine the exact size and proportions of the arm and leg bones.

Dr. Donald Johanson, Dr. William H. Kimbel, Dr. Yool Rak and Dr. Tim White took part in the conference and data collection.

Prior to visiting the fossil sites, Institute scientists examined the museum collections in the provincial capital city of Kunming and gave lectures there.

The Institute team included Dr. William H. Kimbel, Dr. Gerald Eck, Dr. Carl Swisher, and Luo Zhexi, a Chinese graduate student in paleontology at the University of California, Berkeley. They were hosted in China by Professor Li Kunsheng, director of the Yunnan Provincial Museum, and Professor Zhang, director of the museum's paleoanthropology office.

Paleoanthropologists in Berkeley and the People's Republic of China have been forging closer ties over the past several years, a process facilitated in large part by Dennis Eder, a graduate student in anthropology at the Uni-
For a nation as technologically advanced as the United States, it is mind-boggling that more than 50% of Americans do not accept evolution as the explanation for the diversity of life on this planet. Not long ago I read in the New York Times, "It is unbelievable to accept that a people who put men on the moon can insist that the universe was created in six days in 4004 B.C."

Evolutionary theory is one of humankind's greatest intellectual breakthroughs. It has been said that Charles Darwin was to the 19th century what Isaac Newton was to the 18th. The ideas promulgated by both these great minds precipitated major revolutions in our understanding of the world around us. How appropriate that Darwin and Newton are interred side by side in Westminster Abbey.

We often hear that evolution is only a theory — only a theory! What people intend to suggest by this is that a theory is a guess, an interpretation based on pure intuition. This reflects a fundamental misunderstanding of just what a theory is.

A scientific theory is a statement of principles which generates explanatory hypotheses about observable phenomena, hypotheses which can be tested, falsified — and revised — or corroborated. Einstein's ideas may be "only a theory" to someone at a cocktail party, but to those in Hiroshima and Nagasaki, theory has a different meaning.

When Maitland Edey and I published our book *Lucy: The Beginnings of Humankind* (Simon and Schuster, 1981), we gave thought to additional collaboration. We decided to produce an account of the evolution of the idea of evolution. With humanity now on the threshold of being able to direct the evolution of life on this planet, we feel it is imperative for people to understand the process of evolution and not to fear it.

In late April, Little Brown and Co. will publish the result of our joint effort in *Blueprints: Solving the Mystery of Evolution* (by M. Edey and D.C. Johnson). This book presents, in an easily understandable style, the story of scientific discovery which led to the modern conception of evolutionary theory. I know you will enjoy reading it.

*Evolution, by the process of natural selection (the preservation of heritable variations, through differential reproductive success, in the face of limited resources), explains the interconnected web of all life. The observation that DNA, the blueprint of life, is found in all organisms on this planet, from bacteria to humans, is dramatic testimony to the power of this principle. Indeed, I predict that if life is found elsewhere in the universe, it will have evolved through the work of precisely the same process.*

Charles Darwin, the architect of modern evolutionary theory, was a sickly, reclusive man whose entire view of life changed when he became ship's naturalist on the *Beagle*. His observations during the five-year voyage instigated a colossal change in his understanding and appreciation of life: from a traditional belief in divine creation, through his early work on geology and biogeography, to publication of *On the Origin of Species by Means of Natural Selection* in 1859.

Last October, during a visit to England, I had the opportunity to spend a day at Down House, Darwin's home in Downe, Kent. Philip Titheradge, custodian of Down House, permitted me to wander freely through the home and to sit in quiet contemplation in Darwin's study (in Darwin's study at Down House — holding a copy of *Origin*).

**On Blueprints**

"The new book, *Blueprints*, by Maitland Edey and Donald Johanson brings the essence of evolution to the general reader in the form of a fascinating historical narrative. It is just what the doctor ordered for the large portion of our population that does not understand how critical our evolutionary past is to our future. Those who do not understand evolution are, to a degree, isolated from their own humanity. This book can help them make the connection."

**Paul R. Ehrlich**

Bing Professor of Population Studies Department of Biological Sciences Stanford University
study, where Origin was written. In the late afternoon I ventured out onto Darwin's "thinking path" in Sandwalk Wood. The sand underfoot is now washed away, but some of the same trees loom overhead. I felt a sense of awe when I realized that it was here, along this same path, that revolutionary ideas on the evolution of life had hatched in Darwin's mind. For me it was a dream realized to visit Darwin's home and pay homage to the man who formulated an idea—over a century ago—which is still the underlying premise of all biology.

During my visit I also learned that the Royal College of Surgeons of England, which oversees Down House, has very limited funds for continued preservation of the home. As you will see from the book jacket of Blueprints, the Institute of Human Origins is assisting the Royal College in its effort to raise funds to endow and renovate the home. I hope we will be able to attract enough funding to insure that this historic spot will be preserved for future generations to visit.

Don Johnson

Book Review:
Encyclopedia of Human Evolution


The editors of this handsome, large-format encyclopedia have achieved something of a small miracle in persuading 41 busy scientists (including themselves) to write more than 1,000 concise, accessible articles that will appeal to the large popular audience interested in paleoanthropology. The breadth of the material covered here is impressive; perhaps no other single volume packs in so much information on human evolution and prehistory.

Nearly every known fossil primate taxon is profiled, from Early Paleocene plesiadapiforms to Late Pleistocene "archaic modern" Homo sapiens. More than 100 fossil localities, and an even greater number of archeological sites, are treated individually. General entries on stratigraphy, phylogeny, classification, diet, locomotion, the brain, geochronometry, ethnoarchaeology, and dozens more topics provide a wealth of contextual information. Rounding out the volume are many articles on living primates, molecular and population genetics, and prehistoric lifeways, to name only a few.

Entry length ranges from a short paragraph to several double-column pages. Each article is cross-referenced, and the longer key entries include brief bibliographies of recent technical literature. The text is accompanied by numerous drawings, maps, charts and photographs. Photographic quality is mixed and, unfortunately, no scale is shown for many of the fossil specimens and artifacts depicted, potentially misleading the uninitiated reader.

In the preface, the editors note that they did not "impose a common view upon our contributors." For this they are to be congratulated, for the book would otherwise have suffered immeasurably. However, the very act of selecting contributors cannot help but to introduce subtle bias.

Thus the careful reader will note that cladistic interpretations of phylogeny (an emphasis on the shared pattern of novel morphologies to infer evolutionary relationships) reign supreme here. While this is not necessarily sinister, many cladsists eschew examinations of evolutionary process, and it is unfortunate that this volume tends to give short shrift to such important topics as adaptation, natural selection, and functional morphology. But this shortcoming is far outweighed by the benefits it brings even to the casual reader.

At nearly $90, this book is probably beyond the reach of many of those who would enjoy it most. Put it on your Christmas list; you'll want to come back to it often.

William H. Kimbel, Ph.D.
Institute of Human Origins
Spring Lectures

Four speakers are scheduled during the Institute's spring lecture series for the general public. Programs will take place Monday evenings, March 20, April 3, May 1, and May 15, at 8 p.m. at the Institute, 2453 Ridge Rd., Berkeley (near Euclid).

Admission is $4 per person ($3 for students and Institute members), and advance reservations are strongly advised, as recent lectures have sold out. Reservations are held until 7:45 p.m. on the evening of the lecture. Tickets may be purchased at the door if space is available.

For reservations, call 845-0333 as far in advance as possible.

The speakers and their topics will be:

- March 20, Dr. Donald Synnors, "Darwin and Human Sexuality," an evolutionary look at human sexual behavior and preferences.
- April 3, Dr. Robert C. Walter, "The Dating Game," how geologists determine the age of hominid fossils.
- May 1, Dr. Frederick E. Grine, "Evolution of Robust Australopithecines," including their origins, biology, and behavior.
- On May 15, Dr. C. Owen Lovejoy, "Modeling Human Origins: What Are the Rules?" His model incorporates monogamous pair bonding as a fundamental hominid characteristic.

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'Bones of Contention' Exhibition at Cal State

"Bones of Contention: Controversies in Human Evolution" is a major exhibit of fossil hominid casts and related material at California State University, Hayward, through June 30.

The exhibition is co-sponsored by the university's C.E. Smith Museum of Anthropology and the Institute of Human Origins.

Nearly a dozen prominent paleontologists are participating in the Raymond A. Dart Memorial Lecture Series, offered in conjunction with the museum exhibit.

The display features casts of most of the important hominid fossils discovered during the past 15 years, including "Lucy," the "Black Skull" and "1470," along with text, maps and photographs, says Dr. Alan Almquist, the museum director and moving force behind the exhibition.

The exhibit is open to the general public weekdays from 10 a.m. to 4 p.m.; group tours may be arranged on weekends. Admission is free. The museum is located in Meiklejohn Hall on the Cal State, Hayward, campus, with metered parking and some free guest parking.

The lectures are scheduled for several Tuesdays in April and May, at noon in the Biella Room on the ground floor of the main campus library. Although the lectures are designed primarily for students and space is limited, the general public is welcome to attend. Admission is free.

The schedule includes Dr. Alan Walker of Johns Hopkins University on April 11; Dr. Yovel Rak, Tel Aviv University, April 18; Dr. Fred Grine, State University of New York, Stony Brook, May 2; Dr. F. Clark Howell, University of California, Berkeley, May 9; Dr. C. Owen Lovejoy, Kent State University, Ohio, May 16; and Dr. J. Desmond Clark, University of California, Berkeley, May 23.

For more information on the exhibition or to arrange a group tour, call Dr. Almquist at (415) 881-3094.

China

Continued from page 1

University of California, Berkeley. Etler has a long-standing interest in China, having studied the language as well as focusing on the Chinese fossil record in his anthropological studies.

Etler visited China in 1985 and returned again in the summer of 1987 with Professor Desmond Clark of the University of California, Berkeley, at the invitation of senior Chinese anthropologist Jia Lanpo. During the latter trip he was able to visit scientists at the Yunnan Provincial Museum, a meeting which led, in turn, to a joint UC Berkeley-Institute visit to Yunnan the following winter.

Professors Li and Zhang of the Yunnan Museum paid a return visit in the spring of 1988, spending six weeks at the Institute and at Dr. Howell's laboratory at UC.

At the Institute

Thomas F. Hill of New York has been named chairman of the IHO board of directors. Hill, a founding director, had served as vice president of the board since 1981. He is a prominent international financial consultant.

Dr. Donald C. Johanson remains the Institute's director, and Dr. William H. Kimbel is assistant director and president.

Newly named to the board of directors are Bruce L. Ludwig of Los Angeles and Dr. Garniss H. Curtis, director of the IHO's Berkeley Geochronology Center.

AWARDS DINNER

Gordon P. Getty will serve as honorary chairman for the Institute's 1989 Awards Dinner, scheduled for late autumn in New York City. The featured speaker will be Professor Philip V. Tobias of the University of Witwatersrand, who is renowned for his work on Australopithecus and Homo habilis.