



30,000 AROUND THE U.S. ATTEND LEAKEY LECTURES

National Geographic Society



Nancy Crampton

Dian Fossey and Peter Matthiesson (above) are the first two lecturers this fall.

More than 30,000 people around the country attended Leakey Foundation sponsored lectures during the 1976-77 season. There were over 40 lectures in 25 cities including 20 college campuses, some eight museums and science societies, marking a new record for Foundation lecture programs. It was the largest number of lectures booked in any one season since the program was organized in 1968, according to trustee Joan Travis, who chairs lecture programs for the Foundation.

Among the distinguished group of scientists to appear for the Leakey Foundation this year were Mary Leakey, Jane Goodall, Donald C. Johanson, Richard Leakey, Bernard Campbell and F. Clark Howell. In addition, special lectures were given by astronomer Carl Sagan, microbiologist René Dubos, social anthropologist Colin Turnbull and mythologist Joseph Campbell.

Subjects covered a wide range of interests from the female in chimpanzee society to the remains of early man in Tanzania; from the evolution of human sexuality to early man finds in Ethiopia; from terrestrial and extraterrestrial intelligence to the archeology of myth.

Rounding out the schedule were several annual series: one at the California Institute of Technology, Pasadena; another at the University of California, Los Angeles; a third at the California Academy of Sciences, San Francisco; and a fourth at the University of California, Santa Barbara.

Plans now underway for 1977-78 season

As this issue went to press, plans for the 1977-78 lecture season were underway. Among the speakers already confirmed for next season are Peter Matthiesson, Dian Fossey, Robert Ardrey and Jane Goodall. In addition to other speaking engagements for the Foundation around the country, all will participate in the annual lecture series

Continued page 8

EIGHTH PANAFRICAN CONGRESS TO CONVENE IN NAIROBI, SEPTEMBER 4-11

First Congress was organized by Louis Leakey in 1947

Some 300 prehistorians, geologists, paleontologists and others concerned with the study of Quaternary problems — all of whom are currently involved in research in different parts of the African continent — are expected to attend the eighth Panafrican Congress of Prehistory and Quaternary Studies in Nairobi, Kenya, September 4 to 11.

The first Panafrican Congress was inaugurated by Dr. Louis Leakey and met in January, 1947 in Nairobi. It was Dr. Leakey's wish to bring such a group of scientists together at regular intervals in

different parts of Africa in order to establish a platform on which to exchange information, to effect collaboration, and to call to the attention of governments concerned, the need to actively support and extend the study of Africa's past.

Dr. Leakey took an active role in all but one of the six Congresses that followed: Algiers in 1952, Livingstone in 1956, Leopoldville (now Kinshasa) in 1959, Teneriffe (the one he missed) in 1963, Dakar in 1967, and Addis Ababa (his last) in 1971. In addition to serving as secretary-

Continued page 2



Many pioneering scientists working on the African continent were delegates to the first Panafrican Congress in 1947. Among them (front row): Raymond Dart, Alex Du Toit; Abbé H. Breuil, Robert Broom, Mary and Louis Leakey.

1977 ANNUAL MEETING AND CONFERENCE IN LONDON, SEPT. 13-15

The Leakey Foundation's annual meeting will be held at Ditchley Park near Oxford, England, September 13 and 14. This is the first time the Foundation's annual meeting will be held outside the U.S. Attendance is expected to include members from Africa, Europe and the U.S. It precedes a special conference program being planned by the Foundation on September 15 in London. The conference will be chaired by trustees Dr. Bernard Campbell and Fleur Cowles. Miss Cowles heads the Leakey Foundation in Great Britain.

Continued page 8

IN THIS ISSUE

New Grants	6-7
Panafrican Congress	1
1977 Annual Meeting and Conference, London	1
Lectures	1
Editorial	2
Profile: Robert M. Beck	4
Corporate Appeal Program	2
Paleo Program	5
<i>Special Feature Report</i>	
Grantees At Work	3
Did You Know?	8
New Fellows	4
<i>Special Supplement Section</i>	
Fellows Day Conference, 1977	

the L.S.B. Leakey foundation

The L.S.B. Leakey Foundation was established in 1968 by a group of eminent scientists and informed laymen who recognized a critical need to strengthen financial support for new multi-disciplined research into man's origins, his evolving nature and his environmental future. It was named in honor of the man who had become known as "the Darwin of pre-history", Dr. Louis S.B. Leakey.

The Foundation sponsors:

- International research programs related to the biological and cultural development of mankind.
- Long-term primate research projects which may help us to understand how we evolved as a species.
- The training and education of students in these fields.
- Conferences, publication of scientific papers, and educational programs designed to disseminate knowledge relevant to man's changing view of his place in nature.

OFFICERS OF THE BOARD

- * Dr. Edwin S. Munger, *President*
- Robert M. Beck, *Vice President*
- Gordon P. Getty, *Vice President*
- Mrs. Arnold Travis, *Vice President*
- Lawrence Barker, Jr., *Secretary*
- Coleman Morton, *Treasurer*
- * Dr. F. Clark Howell, *Chairman of the Science and Grants Committee*

BOARD OF TRUSTEES

George D. Jagels, *Chairman of the Board*

- William H. Burgess
- Mrs. R. Hugh Caldwell, Jr.
- * Dr. Bernard Campbell
- Harold J. Coolidge
- Miss Fleur Cowles
- Mrs. Justin W. Dart
- * Dr. Irven DeVore
- * Dr. Ekpo Eyo
- * Dr. Murray Gell-Mann
- * Dr. Norton S. Ginsburg
- * Dr. Jane Goodall
- Paul T. Guinn
- * David A. Hamburg, M.D.
- Ed N. Harrison
- Hubert R. Hudson
- Mrs. Max K. Jamison
- Royal Little
- * Dr. Paul MacLean
- * Dr. A.S. Msangi
- * Dr. Richard S. Musangi
- * Dr. Boniface I. Obichere
- * Dr. Melvin M. Payne
- Mrs. Paul Pelosi
- Mrs. Ronald Pelosi
- Mason Phelps
- * Dr. Frederick Seitz
- Jeffrey R. Short, Jr.
- * Dr. Phillip V. Tobias
- * Dr. Sherwood L. Washburn
- Leighton A. Wilkie
- * Dr. Bogodar Winid
- Mrs. Frank M. Woods

* Member, Science and Grants Committee

Mrs. Mary Pechanec,
Executive Director

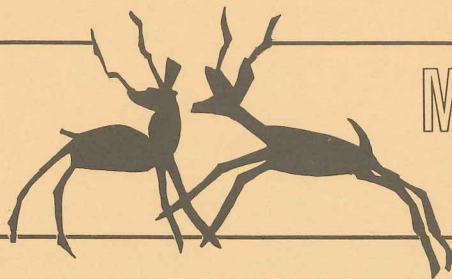
The L.S.B. Leakey Foundation is a public foundation. All contributions are tax-deductible as provided by law.

the L.S.B. leakey foundation news

Editor: Ruth G. Fox
Research Consultant: Joan Travis

The L.S.B. LEAKEY FOUNDATION NEWS is published by the Foundation as a service to its members. Single copy price, \$1. Address all correspondence: L.S.B. Leakey Foundation, Foundation Center 206-85, Pasadena, Ca. 91125.

Copyright 1977, L.S.B. Leakey Foundation



MEMO FROM THE PRESIDENT

Field research in exotic places has the glamor along with the heat, mosquitoes, snakes and civil disturbances. But we all know that the follow-up can take years and the research is not complete without it. To borrow a word from our friend Phillip Hanes of Winston-Salem, when Leakey scientists return from the field, they must do more than practice "omphaloskepis." Tibetan monks may contemplate their navels, but Foundation scientists often face a mountain of laboratory work.

Funding such work may lack sex appeal but without it newspaper clippings of finding a hominid skull in Ethiopia may yellow before the critical details have been studied and shared with other scientists.

Currently we need funds to support laboratory work on the Afar-Ethiopian materials; the fossils from 'Ubeidiya in Israel; the Lake Rezaieyeh expedition's material from Iran; Dr. Judy van Couvering's computerized data bank on Miocene paleo-environments and hominoid evolution at the University of Colorado; and Elizabeth McCown's work on Dian Fossey's collection of mountain gorilla skeletal specimens.

We have neither the assets nor the problems of the Ford Foundation, defined as a large body of money surrounded by people who want it. We are a small, tightly-budgeted foundation with a high degree of volunteerism. We need modest support from individuals of \$25 and up because we are a public foundation and welcome broad support. We also need the generosity of those whose means allow them to give us five and six figure gifts. Even after the initial field research is funded, we still have to keep requesting support from our friends for top priority laboratory follow-ups. We cannot put all our begs in one askit.

Red Munger

Cordially,
Edwin S. Munger

PANAFRICAN CONGRESS

(continued from page 1)

general for all sessions, he was president of the third in Livingstone and received a standing ovation in the plenary session for his discoveries and report on early hominid evolution at the seventh in Addis Ababa in 1971.

This will be the first meeting to be held since Dr. Leakey's death in 1972.

According to archeologist Dr. J. Desmond Clark, who has attended all the conferences since their beginnings in 1947, "These Congresses have been so successful in laying the foundations for friendship, mutual assistance and collaboration between workers from one end of the continent to the other, that it remains the major instrument for exchange and rapport in Quaternary studies in Africa today."

A tentative list of session chairpersons and subjects planned for 1977 include: Donald C. Johanson: Plio-Pleistocene hominids of Africa; J. Desmond Clark: Method and theory in world archeology applicable to the study of Africa's past; Glynn L. Isaac: Dating and correlation in African prehistory; Anna Kay Behrens-meyer: Paleoenvironmental reconstruction in Africa; Mary D. Leakey: Pre-Acheulian and Acheulian cultures in Africa; D. Phillipson: Iron Age technology and economy in Africa; B.A. Ogot: Historical archeology in Africa; John Onyango-Abuje: Economics and settlement patterns and development of food production; B. Andah: Earliest African backed-microlith industries.

Organizing secretaries for the 1977 Congress are Richard Leakey and Dr. John Onyango-Abuje.

CORPORATE APPEAL PROGRAM MOVES INTO HIGH GEAR

Sixteen envoys will spearhead the drive for corporate contributions to sustain and expand the Foundation's grant programs under the Foundation's new corporate appeal program, according to development committee chairmen Mason Phelps and Gordon Getty.

They are Robert M. Beck, Lawrence Barker, Jr., Harold J. Coolidge, Ed N. Harrison, George D. Jagels, Mrs. Max K. Jamison, Coleman Morton, Dr. Edwin S. Munger, Jeffrey R. Short, Jr., Mrs. Arnold Travis, John Delmonte, Mrs. Brawner Ralphs, Dr. John Roberts, J.C. Schwarzenbach, Mrs. Clay Seaman and Mrs. I.D. Weiner.

In addition, a comprehensive new corporate portfolio, prepared under the direction of Mason Phelps, has been completed for the campaign. It summarizes the achievements of the Foundation's grant programs over the past nine years and points the way toward new research projects recommended for current grant support by the science and grants committee.

Among the new projects included in the portfolio are a site museum in Arizona, a vital new computerized data bank which will help to expand our knowledge of evolution, and support for U.S. scientists invited to participate in the 1977 Eighth Panafrican Congress of Prehistory and Quaternary Studies in Nairobi. Budgets for projects such as these range between \$5,000 and \$21,000.

THE SEARCH CONTINUES . . .

Leakey Foundation grantees at work around the world

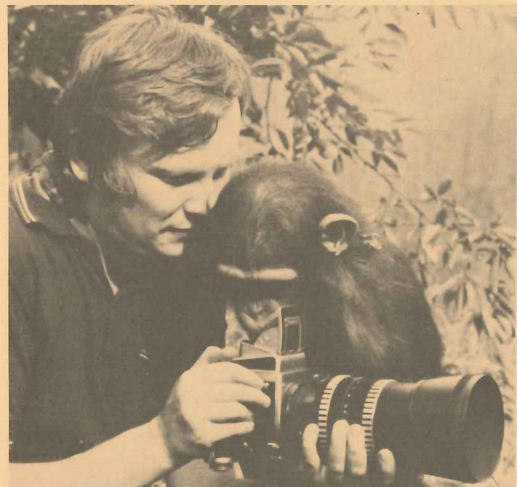
The search for answers to mankind's origins continues. Scientists throughout the world track clues, pursue varied and innovative paths in jungles, on mountain tops, at lonely desert campsites, in primitive pastoral settings, in the laboratory, at the computer.

No single line of inquiry can produce a total answer. The search demands a coordinated and creative effort by many experts in almost every field of scientific investigation: chemistry, geology, ecology, physics, the behavioral sciences, genetics, paleontology, taphonomy, biology, zoology...and more.

The Leakey Foundation is proud of the special and unique part it plays in helping and encouraging a significant number of these researchers. For the past nine years since our inception, more than 125 programs covering a wide range of projects in 24 countries around the world have been assisted with Foundation grants. To date, we have disbursed a total of \$1 million in the effort to gather critical new evidence, uncover new finds, provide for urgently needed long-term investigations. Each year, with the growing support of our membership, the effort accelerates.



Patricia Helfman, who is with the Scripps Institution of Oceanography, La Jolla, Ca. received a grant from the Foundation in order to collect additional bone samples and to install temperature monitoring sensors at major hominid sites in central and northern Israel. The data will provide "calibration" samples to check dates obtained by amino acid racemization dating. Once the additional data is obtained it is hoped a firm chronology for the Near Eastern Middle and Upper Paleolithic sequence can be established.



Vilem Bishof is observing wild chimpanzees in Niokolo-Kobo National Park, Senegal. He believes these chimpanzees may be proof of the high degree of adaptability of the species. Living on the relatively poor vegetation of the park, they obtain only minimum dietary requirements. To prove his premise, Mr. Bishof is collecting parasitological samples as well as distribution and migration pattern data for study. A Czech, he is funded in part by the Leakey Foundation and by the Society for the Protection of the Environment and Nature, Prague.



Shirley Strum

Andrew Hill investigating bone representation at a hyena den in Amboseli National Park, Kenya. Dr. Hill is head of the department of paleontology at the National Museums of Kenya. He was one of ten scientists to receive a 1976 grant from the Foundation to participate in the Pan-European Conference in Nice last September.



Showing off a significant *Homo erectus* skull specimen found at Bodo in the Afar area of Ethiopia are Dr. Clifford J. Jolly (left) of New York University and Dr. Douglas L. Cramer of Rutgers University. Both men participated in preparing and describing the skull along with a collection of primate fossil specimens recovered at the Rift Valley Research Mission Expedition during 1976. Both received grants from the Foundation to do research on the fossils in Addis Abba, Ethiopia this year.

J.C. Onyango-Abuje, head of the department of archeology, the National Museums of Kenya, shown here at Hyrax Hill, Nakuru, Kenya excavating a Neolithic burial cairn. His current research goal is a reappraisal of the Neolithic chronology in East Africa using Lakes Naivasha, Elmenteita, Nakuru Basins in the Rift Valley province of Kenya as case study areas. Dr. Onyango-Abuje was on a Foundation scholarship during his first year of graduate work at the University of California, Berkeley and received an additional grant for field work in the Rift Valley.

PROFILE

ROBERT M. BECK

Rancher, Real Estate Investor, Philanthropist,
Vice President, Board of Trustees



Robert M. Beck

In September, 1970, Robert M. Beck made a challenge gift of \$1 million to the Leakey Foundation. It was motivated by a strong, stubborn, and deep conviction.

"The purpose of the challenge donation I am making," he wrote, "is not simply to finance specific research. It is more than anything else to make funds available and to encourage other people to make funds available for the intelligent and imaginative use of the scientific community.

"There is no question that we must urgently take action for our own preservation and that of our environment. The thrust to this end must come from the concern of the private individual and the scientist together."

And as he further explained:

"My gift shall match the gifts of others on a dollar for dollar basis to the limit of \$1 million over a five-year period.

"The Leakey Foundation can seek support from concerned people and apply this to support work on behalf of mankind. Out of such an approach man can regain faith in himself," he concluded.

It was clear and concise. This was the kind of endowment fund that encouraged others to share a commitment. And it carried with it a philosophy that has been basic to Robert Beck's thinking throughout his life: Explore the human element. If the individual is given a chance to apply his own resources and exclusive talent for imagination and creativity mankind reaps the greatest harvest.

Dr. Louis Leakey, in Los Angeles from his base in Kenya for a meeting of the Foundation's board of trustees, hailed the gift as "opening a window towards man's knowledge of himself". Leakey Foundation trustees throughout the world acknowledged the gift as a chance to encourage critically important research.

Now, seven years later, the role that Robert Beck played in the growth of the Foundation seems immeasurable. His pacesetting gift as well as his confidence in the cause and his continued inspiration and concern for individual accomplishment, has motivated everyone involved in the Leakey Foundation.

He gave significant and dramatic support at a time when the Foundation, then only two years old, was going through its leanest and most formative years.

"Frankly, we were so inexperienced," says one trustee, "that he might as well have pledged the moon. We really never dreamed that we could match it within the five year period. It seemed like 'Mission Impossible'."

But the challenge was met.

By October, 1975, the Leakey Foundation had raised a total well in excess of \$1 million. Its fellows roster of \$1,000 or more contributors estimated at about 50 in 1970, jumped to more than 200 in 1975. Its grant allocations which numbered about 13 in 1970, more than trebled to 50 in 1975. Today, still climbing, the Leakey Founda-

tion has 271 fellows and its grants during the first half of 1977 alone, numbered 41!

But to Robert Beck, reaching that goal seemed to bring the greatest pleasure. As he puts it: "The Foundation was a marvel of efficiency. The money was well used."

Few men accomplish what Robert Beck has accomplished. An imposing yet soft-spoken six-footer, introspective and reserved, modest, warm, congenial, he was a self-made millionaire at the age of 41.

Born in 1926, a native of rural Nebraska, Beck spent his early childhood with his mother (his parents were divorced) on his grandparents' modest little farm near Lincoln. It was the Dust Bowl era with successive days of 100° plus temperatures, which became so oppressive and dismal that his mother finally decided to move the family to Long Beach, Ca. in the hope that it would better their conditions.

Following his high school years there, he entered the U.S. Navy and served as Radarman 3/C on destroyers in the Pacific. In 1946, keenly interested in physics, he entered the University of California, Los Angeles on a GI scholarship. By 1950, he had earned a BA degree in physics with honors.

With his outstanding academic record and high hopes of getting a job building atomic structures or in materials aircraft requiring solid state physics, which he loved, he started hunting for a job. But with World War II over, defense needs had declined and jobs were scarce.

Finally, although he disliked electronics, he heard about an enterprising chap at Northrop who was giving a class in the new field of computer logic. He applied, took the course, and turned out a perfect score in the final examination. His prize: a job at Northrop Aircraft.

Although he could not have been aware of it then, Beck entered the field of computer design at the beginning of the great transition from pinball mechanisms to modern high speed electronic computing machines. Learning the business from a Swiss pinball designer, he soon became both a participant and a valued contributor to many unique and pioneering developments.

Continued page 7

NEW FELLOWS

The L.S.B. Leakey Foundation is proud to welcome six new fellows to its membership roster. They are:

Mrs. Samuel Bowlby, San Marino, Ca.; Mr. and Mrs. Alvin Gittins, Salt Lake City, Utah; Mrs. Louise G. Harper, Washington, D.C.; the Hon. William S. Newsom, Auburn, Ca.; Mr. and Mr. Roger C. Ravel, White Plains, N.Y.; Mrs. Nina Sandrich, Beverly Hills, Ca.

Fellows of the Foundation now total 271 members.

notes

Formal dedication ceremonies for the new Louis Leakey Memorial Institute for African Prehistory in Nairobi, Kenya will be held on September 3, 1977. The Institute received a \$100,000 grant from the Leakey Foundation in 1972 and continues to receive Foundation support in the form of individual grants to scientists associated with the Institute.

Designed to serve as a center for the study of the origins and development of man and his environment, the new facilities include a repository for important fossil and archeological material as well as laboratories for scientific research. The focus will be international, with scholarships, fellowships and visiting professorships planned; and a governing council to be composed of representatives from participating countries and interests. The Institute is now seeking association with the new United Nations University.

A children's book, "Watching the Wild Apes" by Bettyann Kevles (E.P. Dutton & Co., Inc.) has been awarded a certificate of citation and \$250 by the New York Academy of Sciences in its sixth annual Children's Science Book Award Program. Cited as one of the two best science books for children published last year, the book details the primate field research of Leakey Foundation grantees Jane Goodall, Biruté Galdikas-Brindamour and Dian Fossey. However, since publication, the three scientists whose work is described in "Watching the Wild Apes", have objected in varying degrees to the way their research has been reported in this book.

The New York Academy of Sciences Children's Science Book Award is the only one of its kind. The Academy instituted the awards to encourage "more and better books about science for children."

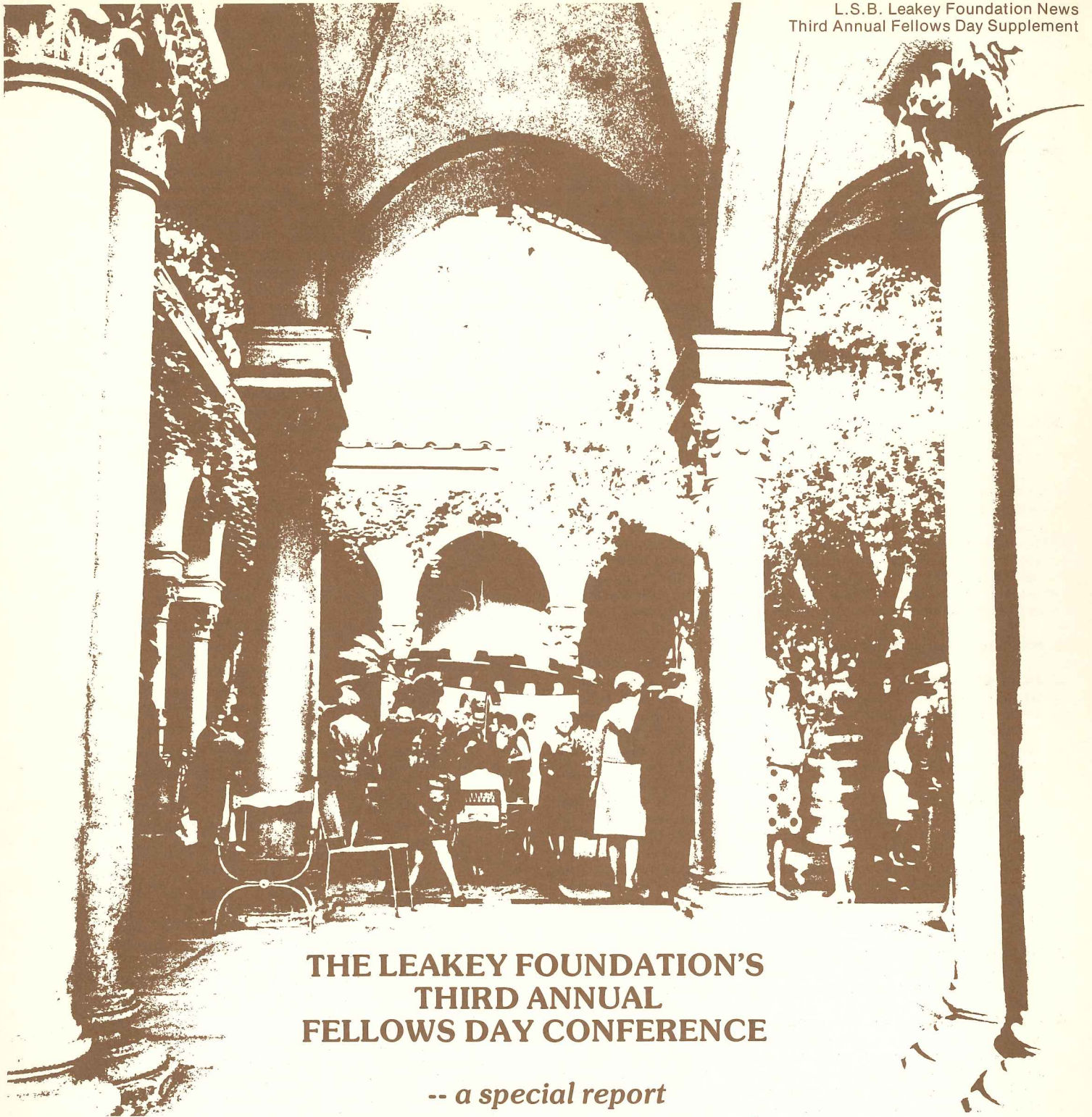
Awards were presented at a March luncheon at the Academy's headquarters by Dr. Herbert J. Kayden, president. Christopher Lehmann-Haupt, daily book critic of *The New York Times*, was a featured luncheon speaker.

The panel of judges included: Elliott Montroll, Albert Einstein Professor of Physics, University of Rochester; Professor Philip Morrison, department of physics Massachusetts Institute of Technology; Professor Alexander Rich, department of biology, Massachusetts Institute of Technology; and Professor Howard Topoff department of psychology, Hunter College and department of animal behavior, The American Museum of Natural History.

San Francisco fellows were hosts to several visiting lecturers this spring, among them Donald C. Johanson, Bernard Campbell, Joseph Campbell and Biruté and Rod Brindamour. Receptions honoring Foundation speakers were given by Mmes. Paul Pelosi, Ronald Pelosi and Frank Woods.

Others assisting in hospitality for visiting scientists were Mr. and Mrs. E. Peter Schlesinger and Mr. and Mrs. Harold Pischel.

A luncheon to honor Leakey Foundation Associates is scheduled for October 12. A keynote speaker is planned as part of the program.



THE LEAKEY FOUNDATION'S THIRD ANNUAL FELLOWS DAY CONFERENCE

-- a special report

PARTICIPATING SCIENTISTS:

- J. Desmond Clark
- Garniss Curtis
- George C. Frison
- Biruté Galdikas-Brindamour
- Diane P. Gifford
- A.H. Harcourt/Kelly Stewart
- F. Clark Howell
- Glynn Ll. Isaac
- David Pilbeam
- Sherwood L. Washburn

Although their views on human evolution may differ and their search for answers take different avenues of exploration, the 11 scientists who gathered to give workshops at the L.S.B. Leakey Foundation's third annual Fellows Day Conference, May 21, provided everyone attending with a day full of ideas and facts about man, how he began and how he developed.

Working within the framework of their various disciplines, the experts shared ideas, concepts and their latest findings with a group of more than 100 Foundation trustees, fellows and special guests gathered in the grand and scholarly setting of the Athenaeum of the California Institute of Technology, Pasadena.

There were reports on new fossils found this year in Pakistan, Ethiopia and Kenya; theoretical discussions about the values of ethnographic, taphonomic and ecological studies in understanding prehistoric man; field reports on gorilla groups in the Virunga Mountains of Rwanda and orangutan research in the jungles of Indonesia; a talk about early man in North America; a summary of the values of potassium argon dating; and new ideas about how to reconstruct prehistoric behavior from bones and stones.

There is a sampling in these next pages of the question and answer sessions that followed each of the workshops. We hope that sharing them with you will provide a taste of the excitement and the significance of this outstanding Foundation event.



J. DESMOND CLARK
Professor of Anthropology
University of California, Berkeley

Subject:
**HOW CAN THE RECENT ETHNOGRAPHIC PRESENT BE
USED FOR THE BETTER UNDERSTANDING
OF HUMAN BEHAVIOR?**

Q. *How do archeologists start to interpret the activities of human populations from the remains that are found dispersed on the prehistoric occupation areas?*

A. To begin with, it is necessary to expose as much as possible of the living and activity areas for each occupation horizon so that each association of artifacts, food waste, and features such as hearths or hut floors can be clearly seen. When the relationships between the various components become apparent then an estimate of the range of activities can be made of the social and economic level to which they belong. Dating methods and classificatory systems for artifacts show where in the paleo-anthropological record the particular horizon being investigated belongs, but to understand the behavior it is necessary to recover, record and interpret the relationships of all the artifacts to the many non-artifactual features preserved on a site.

Q. *How can a study of ethnography help in this interpretation?*

A. There still are, and until recently there were many more, societies living at many different economic levels with relative social organization that provide examples of the ways in which hunters and gatherers, pastoral nomads, slash and burn cultivators and mixed farmers have elected to make use of the resources at their disposal. It is from the study of these, that archeologists can get some appreciation of what is involved in these different economic systems — what are the approaches, limitations and advantages, for example as a hunter-gatherer. Of course, it is impossible to see and indeed, to expect a one-to-one correlation between an existing and prehistoric population but when a number of such social and economic units are examined then certain general principles can be seen to apply and it is these that can form a basis for reconstructing the past.

Q. *When so much has disappeared from the prehistoric sites, how can one hope to be able to put back a little flesh and blood into the prehistoric past and make these communities live again?*

A. This is one of the most fascinating and challenging aspects of paleoanthropology. To this end we study the animal and plant populations, the soils, climate and geography of the prehistoric locations. We endeavor to ascertain which of these were being used. By the study of bone refuse for example, we can see whether camps and villages were permanently or seasonally occupied; whether the animals and plants were wild or domesticated and so on. The distribution patterns and dispersed scatter of the surviving cultural remains on the site will show where the working, sleeping, storage, refuse dispersal areas and so on, were located. By a similar study of



Facts and findings from their latest field trips were discussed by the scientists during workshop sessions.

ethnographic settlement areas, we can make comparisons that have enabled us to reconstruct the life ways of the prehistoric past. The most reliable reconstructions, of course, are those cases where some historic continuity can be demonstrated between the present and the past.

Q. *What kind of progress did you make in your last field season in Ethiopia?*

A. We had an extremely successful season in east-central Ethiopia last winter — January to March — where an international team of geomorphologists, paleoecologists and archeologists were able to recover a virtually unbroken sequence from about two million years ago. This record, which comes from the southeast Ethiopian plateau about 2,300 meters altitude will provide a unique understanding of climatic and vegetational fluctuations in the upland areas adjacent to the Rift Valley where the well-known early man sites at Omo, Hadar, and East Turkana are located. We have found evidence also of a human settlement in this mountainous area that probably began one million years ago. By this time, our evidence indicates that man appears to have been using fire systematically and we have a record of movement between the plateau and the rift in which the Acheulian populations were carrying obsidian for hand axes onto the plateau from sources over 100 kilometers distance in the rift.



GARNISS CURTIS
Professor of Geology
University of California, Berkeley

Subject:
**RECENT DATING OF HOMINID-BEARING DEPOSITS
IN ETHIOPIA, KENYA AND TANZANIA**

Q. *How is it that fission track dates on zircon crystal for the KBS tuff differ from potassium argon dates by over 500,000 years? Which dates are valid? Which are invalid or can a choice be made?*

A. Many workers here in America and in Britain and in Australia are trying to resolve that question right now. The potassium argon dates are supported in this laboratory by argon 40-argon 39 dates and the vertebrate fossil data support the younger potassium dates. That is, the vertebrate fauna associated with the KBS tuff is very similar to the vertebrate fauna in the Omo River area of Ethiopia and to the vertebrate fauna in Bed I at Olduvai Gorge in Tanzania, both of which areas have dates of 1.8 to 1.9 million years.

There are many uncertainties in fission track dates where the uranium content is very low as is the case in the zircons of the KBS tuff. Each zircon crystal averages about four fission tracks and if any spurious track is counted such as may be produced by lattice imperfections in the zircon, it can give an analogous old age.

Every precaution is taken to obviate that possibility but where track counts are very low, the probability of spurious counts is high. Samples have now been recollected from the KBS tuff and are being sent to several participating laboratories for separate analyses by both fission track and potassium argon. No results have as yet been obtained.

Q. *How is it that the potassium argon dates for the Webi River area in Ethiopia all come so close together at between 2.6 and 2.7 million years? So many things appear to have occurred; shouldn't they take longer?*

A. 100,000 years is geologically a short time, but the events that have taken place can easily take place in a short time. The damming of the river by a lava flow produced a lake behind the dam in a very short period of time, perhaps only 15 or so years, in an area of moderate rainfall. A formation of diatomite deposits is again a short term event. Diatoms can flourish under suitable conditions and can make thick deposits of their shells in just a few hundred or few thousand years. This is an area of

active vulcanism and the pouring out of several lava flows in 100,000 years is not abnormal. Many volcanic areas in historic times have produced large numbers of lava flows; so that the damming and filling of the lake and then the incision of the dam by the river flowing behind the lake could easily take place in 100,000 years or less.

Q. *Are the dates of Johanson's group from the Afar area of Ethiopia and the dates from the Laetolil area of Tanzania supported by similar faunas?*

A. Yes. The hominid remains as well as the other vertebrates are very similar and are more primitive than any other dated hominid bearing deposits in East Africa. This lends support to the idea that these are valid dates independently furnished in two different laboratories yielding ages of 3½ million years for what appear to be hominid ancestors.



GEORGE C. FRISON
Head, Department of Anthropology
University of Wyoming, Laramie

Subject:

EARLY MAN ON THE HIGH PLAINS OF NORTH AMERICA

Q. *Why have you developed an intense study of faunal remains in Paleo-Indian (Early Man) sites, especially in communal kill situations?*

A. Animal kill sites are the most visible of all Paleo-Indian archeological manifestations. However, they represent only a small increment of the total year-round social and economic activities. Careful identification of the numbers and ages of animals taken provides a basis for estimates of the amount of food acquired, the actual nature of the kill events (e.g. several events over a period of time or a single mass kill). This, in turn, provides insights into the necessary societal requirements. This would include the number of persons required to operate a large animal kill; what kind of leadership might be expected within the human group? At what stage of these operations did the communal nature of this kind of procurement break down and revert to family level operations? Detailed studies of faunal remains are helping to answer such questions.

Q. *How do geological and related studies fit within the framework of Paleo-Indian studies?*

A. This is closely tied to the first question. Much of the High Plains is an area of sparse vegetation cover and high relief. Consequently, geological processes have altered landforms to a greater extent than in many other areas. It is vital to be able to reconstruct past landforms in order to reconstruct the animal procurement methods. Driving bison into a sand dune trap, an arroyo trap, or over a precipice, each has a different set of procurement methods, different animal-handling techniques, and consequently, different manpower requirements. Usually, the archeological materials repose on remnants of the original landform. The archeologist is, in turn, dependent upon geological expertise to reconstruct the landform situation at the time of the original event.

Q. *What are the cultural and ecological implications surrounding the disappearance of animals such as the mammoth, horse, camel, but not the bison at the time of the terminal Pleistocene on the North American High Plains?*

A. Although there has been a good deal of study of this problem, the question remains open. Certainly the numbers of young mammoths taken in kill sites (e.g. Lehner in Arizona and Colby in Wyoming) would suggest human predation as a major factor in their disappearance. As yet, however, the evidence does not indicate that early man on the Plains was taking large numbers of horses or camels. On the other hand, the bison was under heavy predation beginning at least in Clovis times but was able to survive. The true nature of human predation on animal

populations during this time period remains something of a mystery. Traditional interpretations of many prehistoric hunting methods need to be questioned also. I would argue that these people were good hunters so that predictability of acquiring large animals in locations of their choosing was usually high. In this sense, procurement of these animals in geomorphic features and locations that were unfavorable to utilization of the meat products was the exception rather than the rule.



DIANE P. GIFFORD
Assistant Professor, Anthropology,
Merrill College
University of California, Santa Cruz

Subject:

**WHY PREHISTORIANS STUDY THE PRESENT:
THE TAPHONOMY OF BONES AND SITES**

Q. *Lately, the word taphonomy has become increasingly common in articles on fossils. What is taphonomy?*

A. The word taphonomy (literally the *laws of burials*), while at first glance a rather mystifying term, is actually a very useful one. It was coined by a Russian paleontologist, I.A. Efremov, earlier in this century and refers to the paleontological study of all the processes operating on the remains of creatures from the time they die until they end up in their fossil contexts. This includes the effects of predators, scavengers, and microorganisms on carcasses; of weathering processes; of water or airborne transport and burial; and of chemical fossilization processes on the remains of once-living organisms. It has become an increasingly important field of study in paleontology and paleoanthropology over the past 15 to 20 years. Archeologists are also increasingly concerned with the processes affecting sites between the time they are abandoned and the time they're excavated.

Q. *Why should paleoanthropologists and archeologists care about this area of research?*

A. The main thing we prehistorians do in reconstructing the past is advance the most reasonable explanations for the patterns we see in the fossil record. When we excavate a fossil bed or an archeological site like those at Olduvai or Lake Turkana, we want ultimately to learn about the ancient life processes and activities that led to those accumulations. Naturally, in the case of early man studies, we are really interested in getting at prehistoric human adaptations and behavior. However, like many other scientists, we have to ask whether all the patterns in our data are directly due to the processes we want to learn about, or whether they could be due to the operation of other processes.

For example, we might encounter an unusual alignment of stone tools on the living floor of a site — one possible agency of this arrangement could be ancient hominid behavior, which would certainly delight us as archeologists interested in defining activity areas and so forth. However, we would want to check very carefully the possibility that the alignment might have been caused by other agencies, perhaps by water running over the site after it was abandoned by its occupants. Likewise, if paleoanthropologists find the remains of two different hominid species in the same fossil beds today, they seek to ascertain whether the bones are together because the two species lived together in the same environment — which allows one set of possible reconstructions; or because they simply died in the same place — which would be a different story; or because they actually lived and died in two different environments and areas, but were mixed together after death by natural processes, such as the action of a large river in annual flood.

Studying and trying to tease out these problems of secondary factors affecting fossil deposits and sites, in order to focus on the primary ones of interest, is what taphonomy is all about.

Q. *What do taphonomists actually do in trying to define the processes that cause patterns in the prehistoric data?*

A. Basically, in one form or another, we apply our observations of

present-day processes and their material effects to understanding patterns in the prehistoric data. Some people begin with the end product of all the processes, the fossil deposit or site itself, and study its geologic context — the texture and bedding structures of the actual fossil matrix. By analogy with modern situations, much can be inferred about the actual conditions of burial undergone by the fossils or human artifacts.

Other researchers have worked on both ends of the time scale together, using the fossil bones themselves. Dr. C.K. Brain, for example, has done extensive observation and experimentation on the effects of carnivores, porcupines, and hoofed animals on modern bone assemblages and has applied the results to understanding of the agencies that formed the South African australopithecine cave deposits with some interesting comments on the quality of ape-man life!

Dr. Kay Behrensmeyer has done a very interesting study in Amboseli Park, Kenya, that has for the first time described the actual bone "fallout" of a living ecosystem, so that we have some idea of what natural processes have to work with in forming fossil deposits. She and other workers have also supplemented their field observations with experiments on water transport of bone, both in hydraulic flumes and in actual rivers. Behrensmeyer and others are now applying this knowledge to the Pliocene bone deposits in the Siwaliks of Pakistan, to assess whether *Ramapithecus* and other animals lived together or were simply buried together.

Dr. Andrew Hill and I have been watching large animal carcasses from the day of death at Lake Turkana in a long-term study of the fate of bones in a lake margin environment, similar to that of ancient Lake Tavana or Olduvai Gorge in Bed I times, which is producing some useful results for paleontologists.

I have also become interested in studying recent human living sites, and the processes that affect them after abandonment to selectively preserve or destroy them. I was lucky enough to "follow" one such site — a Dassanetch campsite at Lake Turkana — from its creation through burial in spring flood sands and silts, and then to excavate the remains. The results of that pilot study in "site taphonomy" have shown the value of studying the present to understand our prehistoric sites. Generally, although taphonomic researchers go in a number of different directions in their studies, we're all doing it with the ultimate aim of understanding the meaning of the prehistoric record with greater confidence and detail.



BIRUTÉ GALDIKAS-BRINDAMOUR
Director, Orangutan Research
Tanjung Puting Reserve,
Kalimantan, Indonesia

Subject:
**NEW INSIGHTS ABOUT THE BEHAVIOR
OF INDONESIAN ORANGUTANS**

Q. *Very few primatological field studies are long-term. The average primate field study seems to last only eighteen months or two years and then the primatologist goes home to write up his/her data. After what amount of time in the field is one faced with the problem of "diminishing returns"? Are long-term primatological studies really justified?*

A. To answer your first question about when the problem of "diminishing returns" sets in: generally never. Of course, it does depend to some extent on the purpose of the study, the methodology employed, and even species of primate studied. In the case of the orangutan research at Tanjung Puting Reserve, the reverse has proved to be true. Rather than dealing with diminishing returns, each new observation now has far more meaning than it would have had in the initial stages of the study. We are in a position where we can finally begin to reap the fruits of our first, very careful observations made over five years ago.

To give an example, in 1972 we observed adult females briefly traveling together. However, at that time we did not know whether these represented a mother and her mature daughters, grown-up sisters, or simply unrelated "friends". At that time we also observed three adolescent females who traveled together,

two of whom could not have been siblings since they had different mothers. Five years later, two of these same females are now primiparous mothers who occasionally forage together. Observations on the changing relationships among these three individuals over the years indicate that associations among females at all stages of development are determined as much by peer relations as by genealogy. Also, when the second of these young females gave birth last February, her mother became the first known grandmother. This "grandmother" is now in the process of weaning her latest offspring and is actively consorting with mature males. A five and a half year study such as ours represents only a good beginning when one is dealing with long-lived complex primates such as orangutans (57 years is the longevity record for a zoo orangutan).

Q. *Cannibalism and infanticide have long been known among the wild chimpanzees. Last year Dr. Dian Fossey reported cannibalism among wild gorillas for the first time. Have you ever observed cannibalism or infanticide among orangutans?*

A. We have never seen cannibalism or infanticide among *wild* orangutans. However, in late 1976 we observed two cases of infanticide among the population of immature rehabilitant orangutans released across the river from our main camp. This is the first time that infanticide has ever been observed among orangutans, either in captivity or in the forest. Its importance should *not* be exaggerated. These incidents were the work of one individual — one whom we suspect is abnormal. Nonetheless, if all three great apes who now exhibit very different kinds of adaptations are capable of infanticidal behavior, it certainly suggests that the potential for such behavior existed at the time all great apes species shared a common ancestor with the hominids.

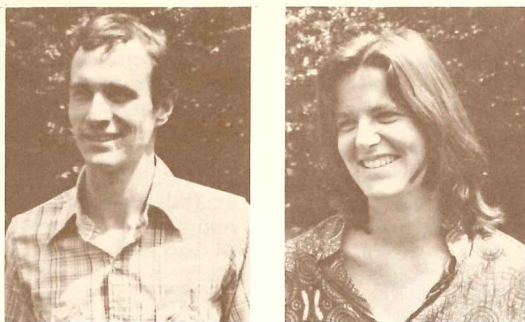
Q. *Speaking of behaviors shared between the ancestors of the great apes and humankind, have you ever seen a wild orangutan use tools?*

A. Some authorities, such as Dr. Jane Goodall, call branch breaking and throwing, tool use. Other authorities include nest making. Orangutans regularly construct both nests and overhead platforms as well as break and drop/throw branches in the course of agonistic displays. However, I prefer not to include such activities as tool-using behavior. (In the case of branch breaking and throwing, such behavior seems an expression of the general excitement associated with displays rather than a means of attaining a specific end. One mature orangutan male would get very excited and throw down branches at us. But if the intent was to hit us in order to drive us away, we wonder why he was snapping off tiny twigs when he obviously had the strength to throw down large branches that would have caused us to run away from the base of his tree. We have also seen orangutans crumpling up leaves and wiping their faces with them. Again, the context suggested that this behavior was an expression of frustration at the observers' presence, rather than a purposeful act.)

The first case of indisputable tool use ever witnessed among wild orangutans occurred during our fifth year of fieldwork. A mature male broke off the end of a dead branch and used the stick to scratch himself for about half a minute. Certainly, this was not a very dramatic instance of tool use but it was, nonetheless, tool use.



Fellows heard a variety of views and many provocative theories presented during the day-long conference sessions.



A.H. HARCOURT/KELLY STEWART
Department of Animal Behavior
Cambridge University, England

Subject:
**GORILLA GROUPS: ADULT BEHAVIOR AND THE
INFLUENCE OF THE YOUNG**

Q. *Dian Fossey had been studying the gorillas for more than five years before you started. How did your work add to knowledge of the animals?*

A. Let us first say that ten people could study the gorilla for ten years and still there would be more to discover. To answer your question more specifically, a long-term field study can be seen as having two areas of investigation. One is continuous collection of information on all facets of the animals' life. The other is highly detailed, quantitative investigations of particular aspects of the biology of the animals. Full understanding of the significance of the findings in the detailed work needs the perspective supplied by the broad picture of the general work. Dian, who knows the area and the animals so well, is uniquely qualified to continue the collection and collation of the general information, while students like ourselves concentrate on more particular lines of study.

Q. *Why is it so necessary to collect the detailed, quantitative data that you speak of?*

A. At the start of a study, the more obvious behaviors of the animals need only qualitative description. Later, as one comes to know the individuals and habitat better, previously hidden subtleties and patterns of behavior become apparent. To prove to oneself and to others that these are not figments of fevered field workers' imaginations, numerical data is necessary. In addition, further patterns not noticed in the field can be revealed by quantitative analysis of the systematically collected data.



Between workshops many fellows pursued particular questions in informal interchanges with the scientists.

Q. *Two years ago Dian gave us the exciting information that gorilla females characteristically move between groups. This is unusual among primates, isn't it? How does such movement affect relationships between adults in gorilla groups?*

A. You are right: female transfer is unusual. So far, for only two primates — the chimpanzee and gorilla — and one other mammal — the hunting dog — is there good evidence that we know of that shows that females move between groups more often than males. In other group-living primates, because females are the most stable portion of a group with close friendships being maintained for life between mothers, daughters and sisters, females have been spoken of as the core of the group. Now for gorillas this is not the case. Even after years of living in the same group the adult females, most of whom are unrelated, seem merely to tolerate one another. Thus the leading adult male and older adult females form the core of the group. The group is maintained by attraction between him and the females and not, as in many other primates, by friendships between females.

Q. *In your title you write of the influence of young on adults: wouldn't one expect the influence to be the other way around?*

A. Of course the adults influence the young; there is no question of that. And it is not just the mother that affects her own offspring. The father, that is the leading silverback, also plays an important, and so far underestimated, part in the upbringing of the young. The emphasis of the young on adults in our title arises mainly because we were so surprised, first in the field and then from analysis of our data, how deep and far reaching were the influences of the young on their parents. To give just one of many examples, almost as soon as a young female conceives she stops her former immature behavior and begins to act like a staid and matronly adult. If her infant dies, she immediately reverts to acting like a playful immature.



F. CLARK HOWELL
Professor of Anthropology
University of California, Berkeley

Subject:
**THE CHANGING ENVIRONMENTAL SETTINGS
DURING THE EARLY PHASES OF HUMAN EVOLUTION**

Q. *What are some of the principle approaches employed to elucidate past environments and in particular environmental settings of early hominids?*

A. The approaches are essentially geological, paleontological and paleobotanical.

Initially, efforts were directed toward investigation of paleo-environments in northern latitudes following the recognition in the last century of past evidence of Pleistocene glaciation. Once patterns of glaciation and intervals of deglaciation were discerned, a sequence of glacial and non-glacial intervals was recognized in Europe, some parts of Asia and North America. As more specialized research is actively pursued, description of this sequence is repeatedly modified and refined.

Studies in the lower latitudes only began within this century and are still in the developmental stage, as is the general geological knowledge of those areas. Investigation of the geological record preserved in deep sea sediments, which also recorded paleoclimates well, was only effectively begun after World War II. It required that oceanographic vessels be designed to handle special coring devices, provide housing and laboratory facilities for scientific workers, be equipped to undertake cruises of very long duration and remain on station without

movement, in particular drilling situations. The refinement of techniques for many aspects of sedimentary geology, of radiometric dating employing radioactive isotopes, and diverse developments in geophysics and related fields, are profoundly changing the approach to paleoenvironmental studies in general and to early man occurrences in particular. This research offers the general geological historical framework for paleontological studies.

However, special methods involving the earth sciences, paleontology and paleobotany afford a direct measure of the past environmental settings of early hominids: for example, within the earth sciences, studies are made of sediments and ancient soils and their respective characteristics; within paleontology, large mammals having distinctive habitat preferences and small mammals which often have very particular habitat requirements must be understood; and within the field of paleobotany, past plant communities yield their identity whether from examination of mineralized woody plant remains or fossilized pollen.

Q. *Were the ancient environments of sub-equatorial and equatorial regions comparable to those now prevailing in lower latitudes? Or were there climatic changes during the Pleistocene Ice Ages related to and perhaps reflective of glacial advances and retreats in the northern latitudes?*

A. Evidence of past climatic, and hence environmental changes in northern latitudes was clearly recognized over a century ago through the investigation of geological features which could only be attributed to extensive and prolonged montane and even continental glaciation. It was subsequently theorized that in middle and lower latitudes, the wetter (or pluvial) climates correlated or were in synchrony with glacial events; and drier (or interpluvial) climates correlated with interglacial events.

This theoretical framework to explain conditions prevailing in the northern latitudes was broadly applied in the 1930's and 1940's to the subtropics and tropics of Asia and Africa. In fact, a paleoclimatic scale established on this basis was proposed and then accepted, especially in Africa, several decades ago. However, intensive research in recent years in many parts of Africa has failed to substantiate this wide-sweeping hypothesis of a paleoclimatic relationship and correlation of events between higher and lower latitudes. A greater appreciation of the meteorological complexity of air masses established through satellites has been of great value in this connection.

Thus, new evidence from various parts of Africa now demonstrates, at least late in the Pleistocene period (some 20 to 12 thousand years ago), that the very opposite was the case in some areas; that is, maximum cold in northern latitudes corresponded with maximum dryness in low, subequatorial latitudes. The understanding of this relationship has been enhanced through refinements in radiocarbon age dating, through studies of the recent geological history of closed lake basins, and through studies of vegetational changes reflected in fossil pollen collected from such lake sediments.

Q. *Which localities yielding early hominids in Africa have provided good indications of their past environmental settings?*

A. For the moment the most diverse sources of corroborating evidence are the early hominid sites in eastern Africa usually in proximity to Rift Valley settings.

Several sites yielding *Australopithecus* and early *Homo* species in South Africa are being restudied. The best paleoenvironmental evidence has come from detailed analysis of the fossil-bearing sediments which filled caves there, from studies of different frequencies of open and bush-tree loving mammals (especially antelopes) preserved as fossils there, as well as one preliminary study of the pollen content of the sediments. As a consequence, each locality is now known to have a far more complex history of infilling than was thought and their paleoenvironments were demonstrably different at different times over a span of several million years.

By comparison, several localities in eastern Africa have afforded much more evidence of their paleoenvironmental situations. As a result, the settings of the many early fossil hominids recovered at each locality have their own distinctive geological history and paleoenvironmental story. The fact that the age of each is well established is of great importance, and is due to radiometric age determination and paleomagnetic studies. Over all, there is a time span encompassing between

six and less than one million years ago — a broad sampling in diverse environments, of a protracted time span. It is quite unique in the world.

All of these localities have been investigated with varying interest within the past 15 years by many scientists specializing in unravelling the paleoenvironmental situations of proto-hominid and hominid occurrences. The evidence is diverse and complex in each instance, but has begun to offer a background against which the early — maybe the earliest — phases of human emergence may be viewed.



GLYNN LI. ISAAC
Professor of Anthropology
University of California, Berkeley

Subject:
**ARCHEOLOGY: RECONSTRUCTION OF BEHAVIOR
FROM BONES AND STONES**

Q. *Would you explain your recent statement, "For many people paleolithic archeology is synonymous with the study of stone tools, but in fact this situation is changing steadily"?*

A. Perhaps the first step in the development of a scientific archeology of the long Pleistocene record of prehistory had to be the detailed study of stone artifacts — after all we do have millions of them. But now that we have achieved a kind of first outline history of tool technology, we can and should turn our attention to other aspects of the development of human behavior — changes in diet and subsistence, patterns of social group and organization, ecological relationships, the development of language — the origin of family groupings — even as Roy Lewis foresaw in his book "The Evolution Man" — the discovery of love!

Q. *How does archeological research fit in with the anatomical study of fossil proto-human bones?*

A. I enjoy teasing my hominid logical colleagues, by pointing out that once we have as many fossils as we now have from the time range between, say 1½-2 million years ago, the really important investigation becomes archeological inquiry into how the hominids lived. We know they were fully upright bipeds, with their hands free, with jaws and teeth of a certain character — and with brains that were starting to undergo evolutionary enlargement. The burning questions now become non-anatomical ones: Where did those feet choose to walk? What mischief did the hands get up to? What did those teeth chew? What kinds of social, economic and technical problems were being tackled by those brains? Answering questions like these is the stock and trade of archeology.

Q. *What kind of evidence do you have to enable you to make inquiries of this kind?*



Workshops dealt with a wide range of subjects including taphonomy, dating techniques, and primate research.

A. Well, in the first instance, what we have looks rather like a dog's breakfast — rather unpromising patches of smashed stones and broken bones. However, archeologists have come to realize that the content and arrangement patterns of materials is an even richer set of clues than the material itself. Our species is par-excellence, a litter-bugging species, and the trail of refuse that we have left behind us all through prehistory can inform archeologists and paleoecologists of how our ancestors used the landscapes in which they lived. The fact that some of this refuse is clustered into dense patches is indicative of patterns of social organization that involved a home base and division of labor. This, in turn, makes the existence of male-female pair bonds and family modules, highly advantageous. The bones at ancient campsites suggest that food was carried about and that, in turn, suggests that food sharing began at least several million years ago. This is a very peculiar behavior. In short, in the stratified deposits of lake basins such as those of Olduvai, Omo, Koobi Fora or the Afar, there exists a wealth of little clues as to how the early hominids made their living — each clue by itself is of limited value — but if they are taken all together, we have the exciting prospect of being able to figure out something of the behavioral systems that induced the enlargement and fine tuning of the human brain.



SHERWOOD L. WASHBURN*
University Professor
Department of Anthropology
University of California, Berkeley

Subject:
**THE STUDY OF OUR NEAREST LIVING RELATIVES:
DESCRIPTIVE OR EXPERIMENTAL SCIENCE?**

Q. How can human language and nonhuman primate communication be usefully compared?

A. The structure of the brain must be included in the comparisons because it is the structure of the human brain which makes language different from the communication of any nonhuman primate. In human beings the cortex of the brain is important in making speech possible. This is the structure which makes language easy to learn. By giving a basis for a phonetic code, the cortex of the brain makes the linguistics open and almost infinitely adaptable. In nonhuman primates sounds are controlled by the evolutionarily old parts of the brain. This limits learning and what may be communicated.

Q. In what ways may social systems be compared?

A. Social systems must be regarded as functional patterns; then our understanding of the patterns may be compared. Comparison of aspects of behavior (sex, aggression) is minimally useful. For example, with gibbons small areas are defended, and there is not enough food to support more than a male, female, and their young. The pattern of locomotion makes long journeys impractical. Seeing the whole pattern makes comparisons useful. The same is the case for other primates. Comparisons should be based on our understanding of the whole social-adaptive systems.

Q. How can the basis of comparison be changed from a descriptive to an experimental science?

A. The understanding of behavior must be experimentally verified. This means close cooperation between the field and laboratory workers. It is always possible to think of more than one explanation for a behavior. Therefore it is essential to devise experiments which show which explanation is correct. For example, it has been claimed that man's ancestors could not have been arm-swinging apes, but experiments show that humans are fully able to locomote in this way (although they rarely have the need to do so!).

* Illness prevented Dr. Washburn from participating in the Fellows Day Conference as scheduled. However, he submitted the foregoing for this supplement.



DAVID PILBEAM
Chairman, Department of Anthropology
Yale University, New Haven, Conn.

Subject:
IDEAS ON HUMAN ORIGINS: NEW FOSSILS FROM PAKISTAN

Q. What have you discovered in your last field season in the Siwalik rocks of Pakistan?

A. We had good luck this year, discovering another 40 primates, bringing our total to almost 100, along with many more mammals. Also we have continued our geological mapping and paleomagnetic surveys, and are now quite happy with our geological knowledge of the northern half of our field area (where most of our fossils come from).

Particularly nice specimens this year were a complete associated upper and lower jaw of *Sivapithecus indicus*, and an adult and infant jaw of *Ramapithecus*. The infant is a special prize and should tell us a great deal about growth and maturation in these early forms.

Q. Why is Pakistan important anthropologically?

A. The discoveries made by our team of scientists (jointly sponsored by the Geological Survey of Pakistan and Yale University) cast doubt on the theory that Africa was the sole birthplace of the human family and places Pakistan in prominence as a vital source for evidence of man's long and complex evolutionary journey to where he is today. The fossils found by the expedition in Pakistan clearly show that between eight and 13 million years ago, South Asia was the home of several species showing unique blends of manlike and apelike characteristics.

Our discoveries have shed a new dimension not just on man's geographical origins but on his total evolutionary process. At least four species lived in Pakistan: one, *Ramapithecus punjabicus* with jaws, teeth and facial features very similar to African "near-man" *Australopithecus* found in East and South African rocks between four and one million years ago. *Ramapithecus* is believed to be a small creature weighing no more than 40 pounds. The somewhat larger *Sivapithecus* weighs about 80 pounds, and *Gigantopithecus*, the largest of the species, weighs about 150 pounds or more. It appears very likely that these early specimens contain the ancestors of all later manlike forms, including what we know today as human beings. The evolutionary changes that occurred were most likely caused by changes in feeding behavior rather than the more popularly held theory centered on the changes occurring with the adoption of tool-making.

Q. What are your future plans?

A. We hope to be able to continue field work for at least another three seasons. We are now at a stage where we can plan fairly carefully the kinds of work needed to answer quite specific questions. As well as field work, we also need to do research in the laboratory in order to understand the functional meaning of the teeth and bones that we find. It is important not to neglect or overlook these kinds of studies, which tend to be less spectacular than the field work itself.

Q. What do you see as the major problems remaining for paleoanthropologists?

A. We now have a reasonable, broad picture of the human evolutionary story from over 20 million years to around eight million years, then again from three to one million or less. Remaining major problems are clearly: what went on during "the gap" four to eight million years ago, and where and when did truly modern man originate? The first problem may be answered in Kenya and Pakistan (and a few other places); the second will probably be more difficult, since it is hard to specify one or even a few places where research might be concentrated.

Of course, more evidence from all time periods is still greatly needed!

HIGHLIGHTS OF THE DAY

There can be little doubt — the Leakey Foundation's third annual Fellows Day Conference, chaired by trustee Mrs. Max K. Jamison, organized and hosted by the Leakey Associates, proved to be an exciting and successful event. Members who came to hear the distinguished scientists in informal workshop sessions at Caltech's Athenaeum found themselves fully captivated and involved. As one Leakey fellow punned, "I came to bone-up — now I have more bones to think about than I ever imagined existed!"

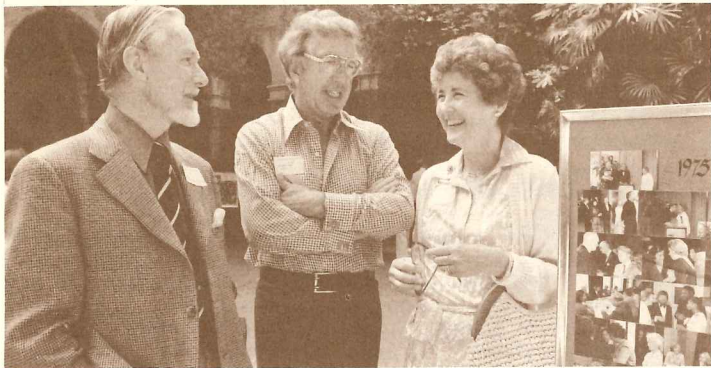
On the evening preceding Conference day there was a special dinner to honor attending scientists hosted by the Leakey Foundation. 75 trustees and fellows attended.

In addition, the weekend schedule included a special collegial conference which provided the scientists themselves with an opportunity to exchange facts, findings and viewpoints with their associates.

Here are some of the picture highlights of these events.



At the opening of the day's events (l to r): Leakey trustee Kaye Jamison and George D. Jagels, chairman of the board of the Foundation with guest Dr. Seymour Sitkoff of the Los Angeles City school system.



Left: Sharing a conversation between workshops (l to r) Dr. J. Desmond Clark, one of the 11 participating scientists, Dr. Edwin S. Munger, Foundation president and fellow Diana Callery.



Many special publications and cassettes offered to Leakey Foundation members were available at the conference. Here interested fellows look over the variety of materials. Left to right: Trudie Ralphs, James Stewart, Renata Van Voorhis, Ida May Humphreys.



Left: Leakey Associates helped to organize and host the Fellows Day Conference. Among them were Foundation fellows (l to r): Gayle Weiner, Elaine Leventhal, Nina Sandrich and Pauline Natzger.



Enjoying an informal chat (l to r): Helene Beck, Dr. F. Clark Howell, chairman of the science and grants committee, and Rosemary Lokey.



Discussions, questions, debates went on even over lunch. Left to right: Edwin Wald, scientist Dr. Glynn L.I. Isaac and Elizabeth Anderson.

THANK YOU

For their time, help, interest and dedication to the many details of organizing our Fellows Day Conference, we want to acknowledge with thanks Leakey Associates:

Maggie Jagels who chaired hostesses with Billie Bowlby and Joanna Muir assisting.

Our guides: Gloria Stewart, Jean Brody, Dale Schafer, Nina Sandrich, Gayle Weiner, Janice Seaman, Anne Getty, Elaine Leventhal, Westine Kern, Carol Friedman, Frances Muir.

The registration: Katie Schwarzenbach, Renata Russell, Nanon Mann.

For books/cassettes: Ida May Humphreys, Trudie Ralphs, Renata Van Voorhis.

Visual displays: Ann Munger, Janice Seaman, and Gayle Weiner.

And in charge of audio visual materials for the scientists: Jean Brody, Elaine Leventhal.

News in Brief

GUINEAN SCIENCE COUNCIL SEEKS AID

Edward A. Mainland, Deputy Chief of Mission at the American Embassy in Conakry, Guinea, recently visited the office of the Leakey Foundation. At the request of the government of Guinea, the Embassy is trying to catalyze cooperation in the fields of museum sciences and archeology, between the Guinean National Council for Scientific Research and Documentation and any interested American institutions.

Mr. Mainland said that the Guineans "have an urgent need for materials and techniques to preserve the national collection of masks, textiles, statues and other artifacts. Wood preservatives, anti-insect materials and site communication equipment are desired but unobtainable under current budget restrictions."

Almost no archeological work has been done in Guinea in recent decades although there are excellent leads. American scientists or institutions willing to help may well be able to participate in collective field work.

The Leakey Foundation will forward any inquiries to Mr. Mainland.

PAGE MUSEUM OPENS IN LOS ANGELES

The George C. Page Museum, which will function as a satellite of the Los Angeles County Museum of Natural History, opened April 13. It is built on the site of the famous La Brea Tar Pits in the center of the city where untold numbers of animals once lived some 40,000 years ago.

Permanent exhibits include 20 reconstructed fossil skeletons, among them an imperial mammoth, mastodons, saber-tooth cats and one human 9,000 years old — all found in the adjacent tar pits over the years.

Another interesting feature is a unique glass-walled paleontology laboratory which permits visitors to view scientists and their staff working on fossil specimens. There are also three mini-theaters.

The museum, which cost nearly \$5 million to build, is the gift of philanthropist George C. Page, who founded the Mission Pak Company. Emceeding the ceremonies was F. Otis Booth, Jr., chairman of the Museum of Natural History Foundation, assisted by Ed N. Harrison, president of the Natural History Museum board of governors and a trustee of the Leakey Foundation. Administrator for the museum is Gregory P. Byrd. Dr. William A. Akersten is curator.

A preview opening, hosted by the trustees of the National History Foundation, was attended by Leakey Foundation

PALEO PROGRAM AWARDED A FEDERAL GRANT

The paleoanthropology program for high school science students initiated by the Leakey Foundation in cooperation with the Los Angeles City Unified School District and the Los Angeles County Museum of Natural History, has received a federal grant through ESEA, Title IVc of close to \$300,000 over a three-year period commencing July 1, 1977. It is the first known program of its kind to gain major funding in a large metropolitan school district.

The curriculum, which took nearly two years to plan and assemble, is expected to serve as a pilot model for similar projects in school districts throughout the U.S.

Teaching materials were developed

under the guidance of Leakey Foundation committee members: Dr. F. Clark Howell, Dr. Bernard Campbell, Mrs. Max K. Jamison; Los Angeles City School representatives: Dr. Seymour Sitkoff, George Benares, Paul Lund, Milton Anisman, Gerald Gardner; Los Angeles County Museum of Natural History curator Dr. William B. Lee; and the Reverends John Gill and Christopher Kearney.

Other consultants who provided guidance for the program include Foundation trustees Drs. Paul MacLean, David A. Hamburg and Sherwood L. Washburn; as well as Dr. James Sackett, who served as a special consultant.



Attending a special luncheon to launch the new paleoanthropology program for high school science students initiated by the Leakey Foundation are committee members and consultants: (l to r): Dr. Seymour Sitkoff, Dr. William B. Lee, George Benares, Foundation president Edwin S. Munger, trustee Kaye Jamison, Paul Lund, Gerald Garner and Milton Anisman. (See story this page for further details.)

YALE UNIVERSITY PLANS A FLINT LECTURESHIP

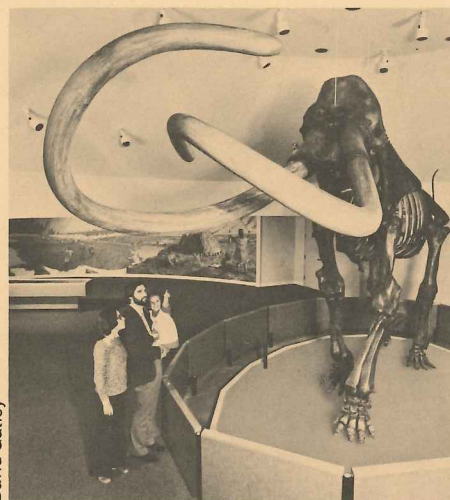
To honor the memory of Richard Foster Flint, who was the most widely recognized American in Quaternary studies, Yale University will institute an annual Richard Foster Flint Lectureship in Quaternary Studies and is requesting support from donors to raise the needed endowment.

According to Dr. George Veronis, chairman of the department of geology and geophysics at Yale, "The lectureship with attendant publication befitting the stature of Professor Flint requires an endowment of at least \$50,000. We hope those involved in Quaternary studies will assist in the establishment of this endowment."

Professor Flint's work, covering a span of more than 50 years, influenced the thinking of almost everybody interested in Quaternary problems. He joined the Yale faculty in 1926 and spent the rest of his life there. He died in 1975.

It is expected that each lecturer will be an internationally distinguished scholar who will deliver one or more lectures at Yale on a topic at the forefront of Quaternary science and be asked to prepare a paper or book on the subject to insure wider distribution of ideas.

Donations are tax deductible and should be made payable to Yale University, The Richard Foster Flint Fund, c/o George Veronis, chairman, department of geology and geophysics, Yale University, Box 2151, Yale Station, New Haven, Conn. 06520.



David Gatley

A 12-foot high, 20,000 pound ice age imperial mammoth is among the exhibits at the new Page Museum in Los Angeles. The fossil skeleton was recovered at the La Brea Tar Pits, site of the new museum.

trustees and fellows including Mr. and Mrs. B.E. Bensinger III, Mr. and Mrs. Justin Dart, Dr. and Mrs. Franklin D. Murphy, Mr. and Mrs. John Callery, Jr., Mr. and Mrs. Kenneth Leventhal, Mr. and Mrs. George Jagels, among others.

Grant SPOTLIGHT

The grant program of the Leakey Foundation, under the guidance of 19 eminent scientists who make up the Foundation's science and grants committee, depends largely upon public support for its success. Membership in the Foundation and all special contributions directly assist vital international research into man's origins, his behavior and his survival. Won't you help? Send your contribution today!

Eitan Tchernov **\$11,000 needed**

Neogene Research — Negev Area, Israel

Dr. Tchernov, professor of zoology at the Hebrew University of Jerusalem, was for 15 years the co-leader of the 'Ubeidiya excavations in the Jordan Valley, Israel. Dr. Tchernov is now organizing an archeological team to study sites in the Negev area of southern Israel. This area of the Rift Valley was first identified as an important potential site by Dr. Louis Leakey in 1967 when he suggested that due to its geographical setting, the Negev area represented a critical bio-geological crossroads.

The exploration and excavation of the site will focus on the remains of small mammals and lower vertebrates as these fossils offer the best means of detailed correlation and of habitat interpretation for the Neogene time period in Israel. Apart from developing the Israeli fossil record, better knowledge of the age and environment of Neogene deposits in Israel will help to resolve the controversies over the history of the Jordan Rift Valley. Grant support is sought for a four-wheel drive vehicle to enable the archeological team to have access to the site.

Glynn L.I. Isaac **\$1,500 needed**

Olorgesailie Publications

Dr. Isaac is professor of anthropology at the University of California, Berkeley. Funds are needed to assist with the final publication of comprehensive research reports prepared on Olorgesailie in Kenya. This famous site, first discovered by Mary and Louis Leakey in 1943 and excavated by them in 1968, is one of the world's most spectacular examples of an Acheulian site. It is now a field museum visited each year by thousands of people from all over the world.

In 1968, Dr. Isaac, at the request of Louis Leakey, completed a comprehensive archeological report on this site which became a part of his doctoral thesis for Cambridge.

Dr. Isaac is now requesting \$500 for the publication of a geological map of the area in color by Professor R.M. Shackleton which will appear in the Royal Society of London's volume, "Background to Fossil

Man in East Africa" (dedicated to Louis Leakey); and \$1,000 to cover preparation for a paperback edition of Dr. Isaac's forthcoming book, "Olorgesailie: the Archeology of the Middle Pleistocene Lake Basin in Kenya" (University of Chicago Press).

John R.F. Bower **\$1,750 needed**

Archeological Investigations of the Serengeti, Tanzania

Dr. Bower, assistant professor of sociology and anthropology at Iowa State University, has been involved in archeological investigations in East Africa for the past five years working with Dr. Mary Leakey at Olduvai Gorge, among other sites. Under his direction, an exploratory investigation of the archeological aspects of the Serengeti National Park in Tanzania will be initiated this June.

Surveys will be conducted in selected portions of the park to determine the range of prehistoric cultures represented in the area and to map their spatial distribution *vis à vis* such environmental factors as land surfaces, rainfall and vegetation. Two or three sites will be selected for test excavations. The organic debris recovered from these sites will be utilized to determine: (1) paleoenvironments, (2) the economic practices of the prehistoric people, and (3) the temporal distribution of cultures. Since the Serengeti National Park is virtually *terra incognita* from an archeological point of view, such data on extinct cultural adaptations may provide a foundation for further studies of long-term cultural changes.



Vicki Foley **\$4,000 needed**

Amboseli Pastoral Settlement Site Study, Kenya

Ms. Foley is a predoctoral candidate at the department of archeology, University of Cambridge, England. She is one of a small group of scientists in the burgeoning field of archeological ethnography. The thrust of this innovative research is to examine the behavior patterns of a living community with an eye to the physical traces it would leave as an archeological record. Such research will assist archeologists in making detailed and realistic reconstructions of prehistoric behavior. The study may also yield valuable information on human ecology and environmental effects.

Ms. Foley will be working in the Amboseli Game Reserve of Kenya, examining occupied settlements, recently abandoned settlements, and those that can be more accurately labelled archeological sites. With a primary focus on the

ecology of settlement, it is expected that her research will strengthen the potential level of archeological inference from settlement sites. Ms. Foley is seeking answers to such questions as: Why are settlements located in particular areas and positions? What determines their size and duration of use? What is their physical effect on the surrounding environment?



David Pilbeam **\$2,140 needed**

Comparative Middle Miocene Hominoid Study

Dr. Pilbeam is professor of anthropology, geology and geophysics as well as chairman of the department of anthropology at Yale University. He has just completed his fourth season as director of the joint Yale-Geological Survey of Pakistan paleo-anthropological project to the Neogene Siwalik Hills of Pakistan. Siwalik sediments in the Potwar Plateau range in age from 15 million years to one million years and contain abundant fossil vertebrates, including hominoid primates. Some 70 new primates have been recovered, all coming from approximately equivalent stratigraphic levels around 9.5 million years.

Drawing upon the fund of knowledge regarding Miocene fossils provided by the excavations in Pakistan, Dr. Pilbeam plans a study visit to Kenya during the summer of 1977 to directly compare original Siwalik primate material with that from the Kenya early Miocene, Pliocene and Pleistocene. He also plans to visit the British Museum of Natural History, the Musée de l'Homme, the Transvaal Museum and the University of the Witwatersrand department of anatomy for similar comparisons. The middle Miocene hominoid data gathered from all these sites in the past few years is, as yet, largely unpublished and constitutes a highly significant sample which suggests that earlier ideas about hominoid evolution may need to be revised.

Michael J. Mehlman **\$1,200 needed**

Lake Eyasi Paleoanthropological Investigations, Tanzania

Mr. Mehlman, predoctoral candidate in African prehistory at the University of Illinois, has directed paleoanthropological investigations at the Nasera (Apis Rock) site since 1974. Anticipating completion of work at Apis Rock by June 1977, and with the guidance and approval of Drs. Mary Leakey and Jeffrey Bada, Mr. Mehlman will now undertake an investigation at Lake Eyasi in Tanzania.

The area was first investigated by Drs. Mary and Louis Leakey and geologist Dr. W.J. Reeve in 1937 with grant support from the Royal Society. The site was later worked by Dr. Kohl-Larsen in the late 1930's.

Mr. Mehlman will perform "a salvage operation" at Mumba-Hohle and a nearby fossil man site. He will attempt to recover samples of animal bones for dating purposes at the early man site and hopes to uncover additional hominid remains. Such research will not only provide firm dates for the Lake Eyasi area excavations, but will enhance Mr. Mehlman's own research at Apis Rock inasmuch as he was not able to obtain bone samples for dating at the MSA (Middle Stone Age) level.



Tepilit Ole Saitoti **\$3,000 needed**
Wildlife Management Scholarship

In the fall of 1976, Tepilit Ole Saitoti, a Maasai, began his graduate studies in wildlife management at the University of Michigan, with scholarship assistance from the L.S.B. Leakey Foundation.

Although Mr. Saitoti's transition from a liberal arts background to a master's degree program encompassing scientific disciplines was initially difficult, he has distinguished himself by achieving a high academic standing.

In view of his excellent progress, the science and grants committee of the Foundation has recommended that Mr. Saitoti's initial grant assistance be extended to enable him to complete his studies. Following receipt of his degree, Mr. Saitoti will return to Africa. Mr. Saitoti originally came to the U.S. to narrate the

National Geographic Society film, "Man of the Serengeti", in which he starred, describing the tribal traditions of the Maasai and the wildlife on the Serengeti plain.

Funds are urgently needed to assist Mr. Saitoti in his educational goals. Mr. Saitoti notes, "There are fundamental reasons why any person would want to study a particular field. Of course, education is

PROFILE (continued from page 4)

Between 1950 and 1961 he worked for Northrop Aircraft, Bendix Aviation and Packard Bell. He became project manager for the Maddida computer at Northrop. He executed the design for the Bendix G15 computer with magnetic drum memory and vacuum tube circuits. At Packard Bell he designed the PB 250 computer with magneto-strictive delay line memory and transistor circuits, aided by Dr. Stanley Frankel, computer pioneer from the Los Alamos atomic project.

In 1961, with computer development mushrooming, he struck out for himself, joining the founding group of Scientific Data Systems where he became executive vice president, a stock holder, and a participant in new computer development. He designed the 910 and 920 computer with core memories and silicon transistor circuits. He supervised the design work for the 930, 9300 and Sigma series computers.

Then in 1967, with a simplicity and directness which is so characteristic of his style, Robert Beck, his stock now worth many millions, took his holdings and retired from the computer business. "I had such a sense of being on a treadmill — that this was so unsatisfactory and not what I wanted to spend the rest of my life doing. I just had to quit," he tells us. "I wanted to go back to school, expand my horizons, buy a ranch—perhaps in some small way, do something constructive for mankind. Doesn't everybody?" he adds.

Robert Beck, now 51, currently divides his time between his 10,000 acre cattle ranch in Ennis, Montana and Los Angeles, Ca. where he has a home and is involved in real estate investments. Married in October, 1970, he and his wife Helene, have two children, Cindy and Claudia.

In addition to his active participation as a trustee and vice president of the Leakey Foundation, Robert Beck is also on the

desired by everyone today. While this applies to me as well, I feel that in my case, it is not only a desire that I want to fulfill but a duty that I owe to myself and to my people to do all I can to get a professional education in my proposed field, wildlife management, because there is a highly urgent task waiting for me back home in Africa."

board of the Isotope Foundation, founded by Nobel laureate Williard F. Libby. He is a contributor to the work of the American Universities Field Staff and is a member of the Audubon Society. He is also a consultant to the First Women's Bank of California, where his wife is a board member.

What of his relationship with Louis Leakey?

Robert Beck knew of Louis Leakey and had contributed to his research even before he became active in the Foundation. They were introduced by Dr. Libby. Almost immediately, they became great friends.

"I felt like a foster son," he tells us. "He would explain his work, his problems, his successes with such a great sense of excitement and enthusiasm. We could talk for hours."

Beck's most vivid memories of Dr. Leakey were in Africa at the Omo, at Olduvai, and at Louis' home in Langata. Beck visited him three times in those last years before Leakey's death October 1, 1972.

"What impressed me most was his intense concern for everything from vegetable shopping to fossils. And he had such a keen sense of people and what they needed," Beck tells you with obvious emotion.

How does Robert Beck feel now about the Foundation and its stunning growth?

"We've drawn so many new people — doers — and we've developed a style and character. We're better organized now, more than ever able to do useful, worthy work. I think we're close to ideal."

It seems certain now, that the Leakey Foundation's role as a vital force in man's search for self knowledge is assured. It will continue to enrich and elevate its support in the future. But had it not been for the vision, confidence and help of a man like Robert Beck, the Leakey Foundation might not have had a chance.

ARE YOU A MEMBER OF THE LEAKEY FOUNDATION?

Your annual membership (\$25 or more) entitles you to the following privileges:

- Invitations to meet with renowned scientists
- A year's subscription to the *L.S.B. Leakey Foundation News*
- 10% discount on books and cassettes, as well as a free gift book with your membership or renewal
- The pleasure of knowing that every penny of your membership dollar directly supports the grant research programs of the Foundation.

JOIN NOW . . .

YES, I WANT TO BECOME A MEMBER OF THE LEAKEY FOUNDATION.

Membership Categories

- \$15 Student
- \$25 Friend
- \$100 Contributor
- \$250 Associate
- \$1,000 Fellow
- \$5,000 Benefactor

Gift Books

- Year of the Gorilla*, George Schaller
- By the Evidence*, Louis Leakey
- Leakey's Luck*, Sonia Cole
- The Quest for Man*, ed. Vanne Goodall
- Hunter and His Art*, J&I Rudner

My check for \$_____ payable to the Leakey Foundation is enclosed.

- Bill Me Check one: New Membership Membership Renewal

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

I WISH TO DESIGNATE MY CONTRIBUTION TO THE FOLLOWING RESEARCH PROJECT:

The L.S.B. Leakey Foundation is a public foundation. All contributions are tax-deductible as provided by law.

MAIL TO: L.S.B. Leakey Foundation, Foundation Center 206-85, Pasadena, Ca. 91125

WALTER WILLIAM BISHOP, GEOLOGIST

Walter William Bishop, head of the department of geology, Queen Mary College, University of London, who was due to take over as director of the Peabody Museum of Natural History at Yale University on July 1, 1977, died suddenly this past spring in London. He was 45 years old.

Dr. Bishop had just accepted an invitation to serve as a trustee of the Leakey Foundation.

Dr. Bishop was for 20 years involved in research on programs of continental geology, the East African Rift and environments of early man. He had participated in many major archeological investigations in East Africa. He had also served on the faculties of leading universities in Scotland and England and from 1962 to 1965 was director of the Uganda Museum in Kampala and lecturer in geology at Makerere College, University of East Africa. He had been at the University of London since 1974.

LEAKEY LECTURES

(continued from page 1)

given by the Foundation in cooperation with the California Institute of Technology, Pasadena. Dr. Fossey will speak October 25, Mr. Matthiesson in early November, Mr. Audrey is scheduled for early April, and Dr. Goodall appears in late April.

It is expected that the lecture season will also include several other series, among them one at the University of California, Los Angeles.

In addition, lectures will be booked during the year involving Foundation associated scientists such as Bernard Campbell, F. Clark Howell, Biruté and Rod Brindamour, Donald C. Johanson, Brian Fagan, and Mary Leakey.

All Foundation members will be notified of dates, time and lecture locations as information becomes available.

ANNUAL MEETING

(continued from page 1)

In addition to its annual science and grants committee meeting and a plenary session of the board of trustees, the Foundation's conference will include a special awards dinner and a day-long series of workshops with key scientist guests. Among those expected to participate are Drs. Glyn Daniel, Robert Hinde, Jane Goodall, F. Clark Howell, Paul MacLean and Phillip V. Tobias.

Members wishing details and travel information should contact Foundation headquarters, Pasadena, Ca.

Did you Know?

An analysis of geochemical "thermometers" at the California Institute of Technology shows that temperatures on earth were much warmer three billion years ago — about 160°F.

The data provides scientists with one of the few measured facts about conditions on earth that long ago and is based on an isotopic analysis of rocks exposed today in the central and western U.S. The technique is geochemical "thermometry" developed over the last two decades and based on the principle that the specific composition of hydrogen and oxygen isotopes in certain rocks depends upon the ambient temperature at the time of the rock's formation. This isotopic record is "frozen" in the rock and remains unaltered if the rock is not subsequently recrystallized.

If these estimates are even nearly correct, it would explain why multi-celled organisms did not appear on earth until about one billion years ago. The earth was simply too hot for sophisticated life to evolve. But it would not have been too warm for bacteria, which have been known to exist since at least 3.3 billion years ago, or primitive algae, which followed the bacteria on earth, according to Dr. Samuel Epstein, professor of geochemistry at Caltech, who reported the findings.

Internationally-known biologist Donald R. Griffin, of Rockefeller University, New York raises the possibility that animals may have the capacity to plan, to make choices and to be aware of themselves and their environment, in a provocative book "The Question of Animal Awareness" published last September.

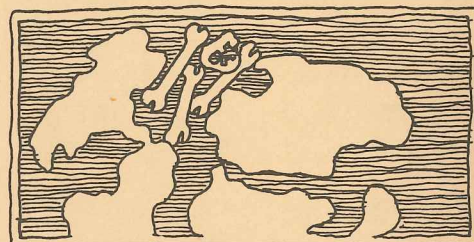
Dr. Griffin does not suggest that animals have sophisticated intellectual qualities on the level of man's, but he does argue that research to date on animal behavior has given no indication that animals do not have such qualities in some degree. He proposes that research into the nature and depth of animal intelligence be given a high priority. He argues that the Darwinian theory of adaptive evolution, which holds

that the survival and progressive physiological development of different species depend on their ability to adapt to their environment, also includes the progressive development of their nervous systems, intellect and mental capacities.

For 20 years historians have debated the cause of the sudden and widespread appearance of Chinese cultural remains in Japanese archeological sites of about 200 B.C. Some think there was a large immigration of Chinese to Japan at that time; others theorize that trade with China brought the artifacts.

New biological evidence may just put an end to the long controversy.

Studies of ancient and modern teeth from Japan and China have led Dr. Christy G. Turner, a physical anthropologist at Arizona State University, to conclude that the Japanese people of today are descendants of a colony of Chinese people who sailed to Japan around 2,200 years ago displacing a culturally more primitive people who had been living there for thousands of years.



Dr. Mary R. Dawson of the Carnegie Museum of Natural History, Pittsburgh and Dr. Robert M. West of the Milwaukee Public Museum have found fossil bones of snakes, birds, turtles, alligators, mice and a number of extinct larger mammals, including a dog-sized tapir, on Canada's Arctic Ellesmore Island. They think these confirm the theory that North America and Europe were linked by a land bridge and shared the same animal species until 45 to 48 million years ago.

Before the recent theory of continental drift, the only link was assumed to have been through Asia and across the now submerged Bering land bridge. Then, with the new knowledge that North America and Asia were far apart 50 million years ago, scientists looked for evidence of a North American bridge. Two years ago, the geological evidence of a land bridge was found — the surviving land masses are the islands of Canada's Arctic — Greenland, Iceland and Spitsbergen.

Discovery of the new fossils lends support to this theory.

the L.S.B. Leakey
foundation news

FOUNDATION CENTER 206-85, PASADENA, CA. 91125

SEE SUPPLEMENT FOR
THIRD ANNUAL FELLOWS DAY REPORT

NONPROFIT ORG.
U.S. POSTAGE PAID
L.A. CALIFORNIA
PERMIT NO. 29207