



NUMBER 4

the L.S.B. Leakey Foundation NEWS

WINTER, 1976

D.C. SYMPOSIUM SETS NEW RECORDS

Attendance tops 1100
for 2-day event

"IN SEARCH OF MAN" the Leakey Foundation's fourth annual symposium held November 1 and 2 in Washington, D.C. set many records.

It was the first Foundation symposium ever held in Washington, D.C. 1100 attended the two-day program. Many were new Foundation friends. Hundreds were students having learned about the Foundation and its research programs for the first time. Many more were new contributing members. A large contingent were old friends, members, fellows and trustees of the Foundation who had come from all over the country to attend the annual event. Still others represented interested groups and organizations closely allied with the Leakey Foundation and its research projects.

It was the largest scientific conference ever assembled by the Foundation with 11 scientists from seven countries participating. They represent some of the world's foremost authorities on human evolution. Sharing the podium and their expertise were: Drs. C.K. Brain (South Africa); François Bordes (France); Bernard Campbell (England); Raymond A. Dart (South Africa); Irven DeVore (U.S.); Jane Goodall (Tanzania); David Hamburg (U.S.); F. Clark Howell (U.S.); Mary D. Leakey (Kenya); Paul D. MacLean (U.S.); and G.H.R. von Koenigswald (West Germany).

This was the first Foundation symposium co-sponsored by the National Geographic Society, the Smithsonian Institution Resident Associate Program and the Consortium of Universities of the Washington, D.C. area. Dr. Melvin Payne, president of the National Geographic Society and a Leakey trustee, co-chaired the event with Leakey Foundation trustee Mrs. Ronald Pelosi.

The program itself, unique in the depth of its inquiry and the multi-disciplinary sharing of scientific data, turned up many important new facts and fresh clues to man's evolution. Topics covered a wide range of interests including primate behavior, early man studies in the People's Republic of China, hominids in Tanzania, the evolution of the brain, early man in Java. A special panel discussion at the close of each day's session and including questions from the audience, provided further insights from the experts.

This symposium also set a new record

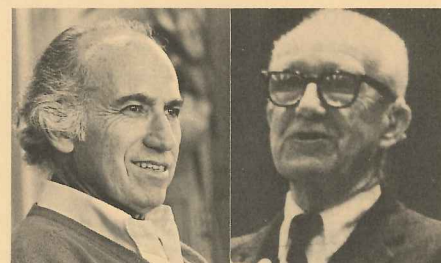
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SALK-FULLER TO WIND UP '75-'76 LEAKEY-CALTECH LECTURE SERIES

Dr. Jonas Salk and R. Buckminster Fuller are to be the final guest speakers of the 1975-76 Leakey-Caltech lecture season. Like the three eminent lecturers appearing before them, these two distinguished scientists are expected to draw a sellout audience. Nearly 6,000 will have attended the series of five Leakey Foundation lectures at Beckman Auditorium at Caltech, Pasadena, Ca. by the close of the season.

Dr. Salk appeared February 18 with an illustrated slide lecture entitled "THE SURVIVAL OF THE WISEST." The talk focused on man's ability to learn how to act wisely and how critically important it is to improving the quality of human life and for survival on this planet. Founding director and fellow of the Salk Institute for Biological Studies in La Jolla, Ca., the famed physician-biologist is the developer of the Salk anti-polio vaccine.

R. Buckminster Fuller appears April 14 speaking on "SYNERGETICS: EXPLORATION IN THE GEOMETRY OF THINKING." Comprehensivist, renaissance man, scientist, humanist and inventor, Dr. Fuller is regarded as a great creative geometer. With the Universe as his scenario, Mr. Fuller will talk about his explorations in the geometry of thinking, and the role of



Salk

Fuller

technology in a world which has been shocked into awareness of its resource-wasting, energy-wasting habits in thought and practice.

The series, now in its eighth season, is jointly sponsored by the Leakey Foundation and the Caltech Faculty Committee on Programs and includes talks by some of the world's leading scientists. This season, the group of distinguished experts included archeologist Mary Leakey, ethologist Dr. Jane Goodall and research zoologist Dr. George Schaller. All examined crucial new discoveries in studies of man's closest living relatives and explored some of the relationships between man's heritage and his environmental survival.

SECOND ANNUAL FELLOWS DAY CONFERENCE TO BE HELD MAY 23

For the second consecutive year, the Leakey Foundation will repeat its unique and highly successful Fellows Day Conference on May 23rd at the J. Paul Getty Museum, Malibu, Ca.

Directed by trustee Kaye Jamison, an all-day series of informal workshops conducted by distinguished scientists is being planned. Among those expected to participate this year are: anthropologist Dr. Sherwood Washburn; archeologist Dr. Donald C. Johanson; geologist Dr. Garniss Curtis; ethologist Dr. Jane Goodall; anthropologist Dr. Bernard Campbell; and primate specialists Biruté Gladikas-Brindamour, Dian Fossey and Shirley Strum.

Because of the unique format, fellows will have an opportunity to engage in dialogues with the experts as well as to hear the latest reports of field studies and special research by many of the Foundation's grantees working throughout the world.

Among the topics to be explored:

primate behavior, conservation, dating processes, genetics, language. There will be briefing sessions on work in progress ranging from fossil finds to ecology, from dating techniques to aggressive behavior in primates.

Other events will include a cocktail party and a lunch set on the portico of the Getty Museum, a replica of an ancient Roman villa.

According to Mrs. Jamison, Foundation member volunteers are already being enlisted to help as guides and hostesses for the day. A first meeting of that group was held on February 4th.

Last year's Fellows Day drew nearly 150. Two hundred trustees, fellows and their special guests are expected to attend this year's conference. Special invitations are to be mailed in the early spring. Those interested in attending may contact Leakey Foundation headquarters, Pasadena, Ca. for early reservations. Space is limited.

the L.S.B. Leakey Foundation

The L. S. B. Leakey Foundation was established in 1968 by distinguished laymen and scientists to encourage international research focusing upon man's origins, his evolving nature and his environmental future. The Foundation was named to honor Dr. Louis S. B. Leakey in recognition of his outstanding contributions to the fund of human knowledge.

The Foundation sponsors:

- Exploration and excavation of sites having a bearing upon the evolution of man.
- Behavioral and taxonomic studies of living primates as a corollary to paleontological finds, as well as to provide insight into contemporary man's behavior.
- Laboratory studies of field specimens resulting from exploration and excavation.
- Publication of scientific reports of field and laboratory findings.

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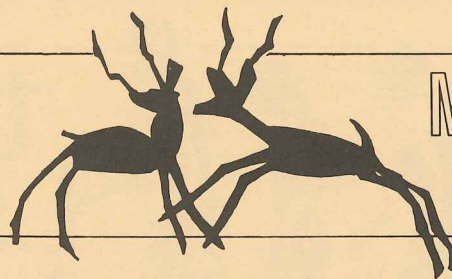
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the L.S.B. Leakey foundation news

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MEMO FROM THE PRESIDENT

This is a Calpurnian epistle because a recent television network program on foundations and charitable organizations highlighted some of the faults and, indeed, some of the improprieties associated with less reputable ones. It never hurts to look for the mote in one's own eye, so I couldn't help but examine how the strictures applied to the Leakey Foundation. We come out positively.

There is no nepotism. We engage in no "boiler room" telephonic campaigns. Our costs for limited and discreet mailings are relatively low. The dynamic presentation of slides with voice-over for our new corporate campaign was funded as a gift by Mason Phelps, President of the VSI Corporation, the new co-chairman (with Gordon Getty) of the Development Committee. Every penny of a corporate gift will go to the designated recipient. (This is assisted by the unselfish wisdom of George and Maggie Jagels who have made gifts solely for "housekeeping" and the fact that we are currently rent-free.)

On designated gifts to the Foundation, there is no overhead charge. One hundred per cent goes to the research effort.

We started small and we are staying small. While we made one \$100,000 grant towards building costs of the Louis Leakey Memorial Institute for African Prehistory in Nairobi, our average grant is from \$2,000 to \$4,000. We intend to stay flexible, open to a wide range of proposals and not, at age seven, suffer from a hardening of the categories. We continue to pride ourselves on our ability to respond quickly and decisively on emergencies.

The key to our modestly steady growth in grant giving, expansion of our lecture programs, our symposia, our grants for publications, and our fellows programs, is clearly the quality of our volunteers. We could never afford salaries for people of the ability of Joan Travis, George Jagels, Ed Harrison, Kaye Jamison, Allen O'Brien, Keven Bellows, Jeff Short, Barbara Pelosi or Ruth Fox, to mention only a few. Without the munificence of Helene and Robert Beck we could not be where we are. And, finally, the generosity of the scientists on our grants committee is what certifies to the quality of our entire effort.

We ask now and will continue to ask, in a low key fashion, for the support both in time and money of members and fellows of the Foundation. In return, we not only offer exciting opportunities to participate in the search for knowledge, but an administration which, like Caesar's wife Calpurnia, is above reproach.

Cordially,

Ned Munger

Edwin S. Munger
President

WASHBURN APPEARS IN FIRST MINI-LECTURE PROGRAM OF 1976

Dr. Sherwood Washburn was the first speaker of the 1976 season of Leakey Foundation luncheon mini-lectures. He appeared on February 19 at Caltech Athenaeum Hall of Associates in Pasadena, Ca. His subject: "THE ORIGIN OF LANGUAGE." Some 60 Foundation members and their guests attended the informal luncheon.

Dr. Washburn, professor of anthropology and a world authority on human evolution, is a perennial favorite with Leakey audiences. His talk concerned the evolution of communication systems of monkeys and great apes into "language."

Additional luncheon mini-lectures are being planned for March, April and May, according to Foundation trustees Joan Travis and Tita Caldwell, who direct the series.

Among the upcoming guests will be the distinguished animal behaviorist Dr. Robert Hinde of Cambridge University, England. Dr. Hinde, scheduled to appear April 5, will discuss "CONTRIBUTIONS FROM PRIMATOLOGY TO THE STUDY OF HUMAN SOCIAL DEVELOPMENT."

Later in the spring, Prof. O. Bar-Yosef of the Hebrew University of Jerusalem Institute of Archaeology is to talk on ongoing

research in the Jordan Valley, Israel. A date is yet to be set.

A total of more than 200 Leakey Foundation members and their guests attended the highly successful 1975 series of three informal luncheons. Guests were Dr. F. Clark Howell, who spoke of his recent trip to China; Dr. Bernard Campbell with an update on his Lake Reziaiyeh expedition and the Hon. Derek Bryceson, with an ecological view of the national parks of Tanzania.

The series is designed to give members a first-hand account of Leakey Foundation activities throughout the world.

MATCHING FUND REACHES GOAL

We wish to express our deep appreciation to all of our Leakey Foundation friends whose generous responses helped us to achieve our goal before the expiration of Trustee Robert M. Beck's \$1 million challenge pledge.

New pledges and contributions totaling \$246,800 were received during the final three months of the campaign, before the September 30 deadline. When paid, every penny of these gifts will be matched by Trustee Beck's own equal contribution to the Foundation's Endowment Fund.

George D. Jagels, Vice President

D.C. SYMPOSIUM

Continued from Page 1

for contributions. As a result of the generosity of some 44 patrons and sponsors, the Foundation was able to offer reduced ticket prices and many full scholarship subsidies to students and teachers for the event.

A series of audio tapes of the Washington Symposium lectures and panel discussion will be available from Foundation headquarters early this spring. For order information write: Washington Symposium, Leakey Foundation, Foundation Center 216-76, Pasadena, Ca. 91125.



FOUNDATION HONORS 3 TRUSTEES FOR OUTSTANDING LEADERSHIP

Gordon Getty (1) with 3-volume Olduvai Gorge set signed and presented by Dr. Leakey.

Robert Beck (1) was presented with a Taung skull cast by Mary Leakey as Foundation president Munger looks on.

George Jagels (1) receiving a tribute and "Zinj" fossil cast from Dr. Raymond Dart.



Symposium chairwoman Barbara Pelosi and G.H.R. von Koëniqswald enjoy an informal chat at lunch.

Serving on the D.C. committee were Mrs. Vincent Wolfington (1) and Mrs. Thomas Wilner.

L to r: Mary Leakey, J.W.K.Harris, Amb. and Mrs. Paul Bomani of Tanzania

L to r: Bernard and Wendy Campbell, Leakey vp Robert Beck, Mrs. Melvin Payne, Leakey trustee H.J. Coolidge.

150 ATTEND D.C. FELLOWS DINNER

The special fellows dinner honoring the distinguished scientists who participated in the 1975 Leakey Memorial Symposium "IN SEARCH OF MAN" was held November 1 at Explorers' Hall of the National Geographic Society. More than 150 attended.

Highlight of the evening was the presentation of special awards to trustees and fellows for outstanding leadership and service to the Leakey Foundation. Those receiving the special tribute were: Robert M. Beck, George D. Jagels and Gordon P. Getty. Foundation president Edwin S. Munger and Drs. Raymond A. Dart and Mary D. Leakey made the presentations.

In addition, a group of specially framed citations for "dedicated efforts and personal support" were awarded the following fellows: Allen O'Brien, Royal Little, Emott Caldwell, Gordon Hanes, Coleman Morton, Lawrence Barker, Jr., Mrs. Calvin P. Bentley, Mr. and Mrs. Edward Berndt, Mr. and Mrs. Justin Dart, Ed N. Harrison, Mason Phelps, Leighton A. Wilkie, Paul T. Guinn, Hubert R. Hudson, Fred Heidrick, and Jeffrey R. Short, Jr.

In addition to Foundation trustees, their wives and the distinguished members of the Foundation symposium, the following were specially honored guests at the dinner: Ambassador and Mrs. Robert C. Moore, Ambassador and Mrs. Paul Bomani of Tanzania; Mr. and Mrs. Bernard Adundo, charge d'affaires, Embassy of Kenya; Dr. Lita Osmundsen, director of research, Wenner-Gren Foundation; Dr. Alan Horton; Dr. and Mrs. Donald Frederickson, president, Institute of Medicine, National Academy of Sciences; Mr. and Mrs. John Davis; Mrs. Carol Harford; Baron Hugo van Lawick; Mr. and Mrs. Thomas D'Alesandro, Dr. Margery Grant Whiting; Dr. Laura Bolton; Robert Bodley; Robert Blum; Mr. and Mrs. Vincent Youmans; Dr. and Mrs. Seymour Rubinfeld; Victor B. Fisher; Mrs. Sally Lou Nesbitt; Mrs. Helen Nussbaum; Mr. and Mrs. Frank King; Mr. and Mrs. Frank Willingham.



Mrs. John D. Hawke, Jr. of the D.C. symposium committee with trustee Dr. A.S. Msangi at Foundation dinner.

L to r: scientists von Koëniqswald and Howell with Dr. Lita Osmundsen and Foundation secretary Lawrence Barker.

ANNUAL MEETING HELD NOV. 3 IN WASHINGTON D.C.

Elections, committee appointments, reports from the finance, development and science and grants committee were among the items on the agenda at the annual Leakey Foundation board of trustees meeting held November 3 in Washington, D.C. Attendance included board members from the U.S., Africa and Europe.

Re-elected to office for another one-year term were Dr. Edwin S. Munger, president; Robert M. Beck, vice president; Gordon Getty, vice president; George Jagels, vice president; Mrs. Arnold Travis, treasurer. Elected for the first time was Lawrence Barker, Jr. as secretary of the Foundation.

Standing committee chairpersons for the year were appointed. They are: Mason Phelps and Gordon Getty, co-chairmen development committee; Dr. F. Clark Howell, chairman, and David Hamburg, M.D., vice-chairman science and grants committee; George Jagels and Coleman Morton, co-chairmen, finance committee; Mrs. Ronald Pelosi, chairwoman, symposia committee; Mrs. Arnold Travis, chairwoman lectures, publications, cassettes, films; Mrs. Max K. Jamison, chairwoman, national fellows program.

In addition, two new trustees were added to the board. They are Hubert R. Hudson, Brownsville, Tex. and Mrs. Frank M. Woods, San Francisco, Ca.

Outgoing development committee chairman George Jagels announced that trustee Robert M. Beck's \$1 million matching challenge pledge had been met one day before the deadline, September 30, 1975. Mr. Jagels also reported that a new

corporate solicitation program had been prepared and would be launched early in the new year.

The report of the science and grants committee given by chairman Dr. F. Clark Howell praised the broadening of the grant spectrum and the massive rise in both designated and general funds from 1972 through 1975. He noted that the Foundation has consistently supported researchers of all ages, of both sexes, in a variety of established and innovative programs.

The treasurer's report, given by Mrs. Arnold Travis, noted that to compare the 1975 third quarter financial report with the corresponding 1971 report was instructive. She circulated a letter from the late Dr. Louis Leakey noting that at the time of writing (September, 1971) the Foundation had only \$3.08 in the bank and was on the verge of collapse. When Dr. Leakey learned of this crisis he sent his personal check to Mrs. Travis (funds which he had received from an insurance policy and which were subsequently returned to him) and noted that much as he abhorred putting money into operating expenses rather than grants, he wished to keep the Foundation alive and responsive to broad scientific purposes. Despite these dark days, continued Mrs. Travis, and with the help of Robert M. Beck's challenge pledge, Louis Leakey's dream has been fulfilled. The current fund balance at the close of the third quarter of 1975 was \$168,000, the endowment fund exceeded \$1 million and grants to 68 programs in 1975 totalled \$217,383.

PROFILE

TRUSTEE, BEHAVIOR EXPERT David A. Hamburg, M.D.



Dr. David A. Hamburg has been a trustee and member of the science and grants committee of the Leakey Foundation for the past four years. He will serve this year as vice chairman of that committee.

A psychiatrist, internationally known for his studies of stress, coping and adaption and for his work on the biological basis and development of aggressive behavior, Dr. Hamburg is currently Reed-Hodgson Professor of Biology at Stanford University, Ca.

About eight years ago, he turned to the study of primates as a model for understanding some aspects of human behavior. For two decades Dr. Hamburg has been stimulated by the work of Dr. Sherwood Washburn (former Leakey Foundation trustee) whose pioneering research in Africa opened up a new era in primate field studies. The two had even published a series together on the significance of primate studies in understanding human behavior.

Collaborating with such specialists as Dr. Washburn and ethologist Jane Goodall (a Leakey trustee), he developed, organized and is now directing Stanford's new Outdoor Primate Facility. It opened in 1974 (see *FOUNDATION NEWS*, Spring 1975) with an interdisciplinary staff culled from such fields as psychiatry, ethology, biochemistry, statistics. Dr. Hamburg's research work at the primate center now includes naturalistic observation and experimental studies with chimpanzees particularly in the area of hormonal influences and environmental influences on behavior.

In May, 1975, that work took on a new significance and urgency and Dr. Hamburg took on a new role. It was perhaps the most unique of his career.

News was flashed around the world of the political kidnapping of four Stanford students by neighboring Zaire revolutionaries at Gombe Stream Research Center in Tanzania (they had gone there as part of a Stanford exchange-study program).

"It came like a bolt of lightning," he tells us. "It was totally without precedence."

Within days, Dr. Hamburg was flying to

Tanzania.

He spent more than six weeks there shuttling between Kigoma, a small port town near Gombe and Dar es Salaam, in an exhaustive effort to facilitate the release of the students.

A demand for ransom, arms and the release of political prisoners had been made.

"I learned more about what to expect of contemporary poverty, disease and hatred than I had ever known or believed before," Dr. Hamburg tells us.

A global network running from Kigoma to Dar es Salaam, the Hague, Washington and Stanford was established for almost daily communication with faculty, staff, and friends of the University who were involved, as well as members of governments.

"The political and international aspects of it were very important ultimately," says Dr. Hamburg.

After weeks of negotiation the task was completed. Finally, in August, the last student was released safely by the PRP of Zaire and flown home — and Dr. Hamburg came back to Stanford, his home, his family and his work. But his concern continues.

"Those kidnapped students as well as their families should be particularly singled out for their handling of the situation," he tells us.

"If we have learned one lesson from this experience it would be that...in a world where life is so cheap, where egocentrism is so powerful, where cruelty is so prevalent, it is after all a deeply moving experience to live through the kind of compassion, altruism and affection that we have seen so abundantly in this case," says Dr. Hamburg.

Born in Evansville, Ind., David Hamburg is 50 years old. His undergraduate work and medical education were at Indiana University. He received his M.D. in 1947. He served an internship at Michael Reese

Continued on Page 6

notes

The Public Broadcasting Network is scheduled to repeat four National Geographic Society films during their donor "Pledge Week," March 8. The films include "SEARCH FOR THE GREAT APES" which details the work of Leakey Foundation grantees Biruté Gladikas-Brindamour and Dian Fossey. Check local TV listings for dates and time.

Eleven and twelve year olds at the Mirman School for Gifted Children, Los Angeles requested and got to see video tapes of Drs. Raymond Dart, Jane Goodall and Mary Leakey as they appeared at the Leakey Foundation's 1973 San Francisco symposium. Tapes such as these are available for rent or purchase through the Foundation offices.

A recent letter from Birute and Rod Gladikas-Brindamour tells of a recent lecture they gave on their rehabilitation work with orphaned orangutans at the vice presidential palace in Jakarta, Indonesia, January 21 by special invitation of the vice president, Sri Sultan Humonogkubuwono.

Dr. F. Clark Howell, chairman of the Leakey Foundation's science and grants committee has been appointed to the editorial board of the World Book Encyclopedia Science Year.

Jane Goodall's book *IN THE SHADOW OF MAN* will be published in Swahili with a foreword by Julius Nyerere, president of Tanzania sometime early in 1976 by the East African Literature Bureau.

On Sunday afternoon, January 11, at the Huntington-Sheraton Hotel in Pasadena, Ca. Foundation grantee Richard Keatinge, professor of anthropology at Columbia University, showed slides and discussed new excavations at an important pre-Columbian site in the Pacatnamu-Jequetepeque Valley on the north coast of Peru. Some 40 Foundation fellows, trustees and guests were on hand.

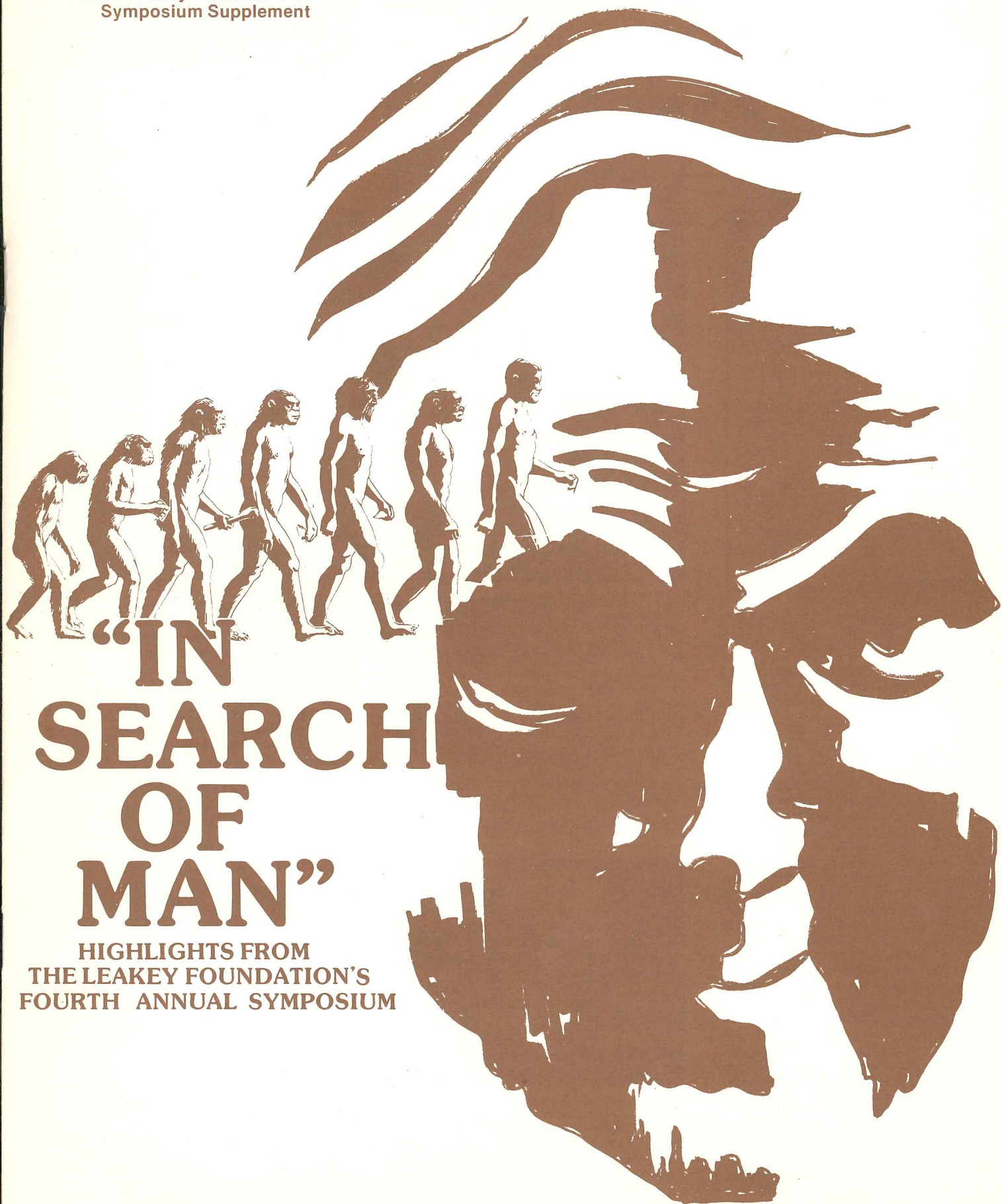
Mrs. Charles E. Holt III of Palm Beach, Fla., fellow of the Foundation, generously hosted a special dinner at Washington, D.C.'s Mayflower Hotel, November 2 honoring symposium participants, Foundation trustees and fellows and other special guests. In proposing a toast to Diana (Holt) at the party, Prof. Irven DeVore created this amusing limerick we think is worth repeating:

*As a hostess she's known 'cross the nation,
For her menus and generous libations,
We know she loves stones
And the pots and the bones
Thank God, she digs the Foundation!*

CALENDAR OF EVENTS 1976

February 18.	Dr. Jonas Salk, "THE SURVIVAL OF THE WISEST"	Beckman Auditorium, California Institute of Technology, Pasadena, Ca. - 8 p.m.
February 19	Dr. Sherwood Washburn, "THE ORIGIN OF LANGUAGE"	The Athenaeum, California Institute of Technology, Pasadena, Ca. - 12 p.m.
March 28	Dr. Jonas Salk, "MAN UNFOLDING"	Royce Hall, University of California, L.A. - 2 p.m.
April 5	Dr. Robert A. Hinde, "CONTRIBUTIONS FROM PRIMATOLOGY TO THE STUDY OF HUMAN SOCIAL DEVELOPMENT"	The Athenaeum, California Institute of Technology, Pasadena, Ca. - 12 p.m.
April 14	R. Buckminster Fuller, "SYNERGETICS: EXPLORATION IN THE GEOMETRY OF THINKING"	Beckman Auditorium, California Institute of Technology, Pasadena, Ca. - 8 p.m.
May 16	Dr. Donald C. Johanson, "CURRENT PERSPECTIVES ON MAN'S EVOLUTIONARY PAST"	Royce Hall, University of California, L.A. - 2 p.m.
May 23	FELLOWS DAY CONFERENCE	J. Paul Getty Museum, Malibu, Ca. - 9 a.m.

L.S.B. Leakey Foundation News
Symposium Supplement



“IN
SEARCH
OF
MAN”

HIGHLIGHTS FROM
THE LEAKEY FOUNDATION'S
FOURTH ANNUAL SYMPOSIUM



HIGHLIGHTS FROM THE LEAKEY FOUNDATION'S FOURTH ANNUAL SYMPOSIUM

On November 1 and 2, 1975, the Leakey Foundation presented its fourth annual symposium. Titled "IN SEARCH OF MAN", it was held in Washington, D.C. and was jointly sponsored with the National Geographic Society, the Smithsonian Resident Associate Program and the Consortium of Universities of the Washington metropolitan area.

The event, a memorial to the late Dr. L.S.B. Leakey, featured a roster of eleven distinguished scientists from seven countries.

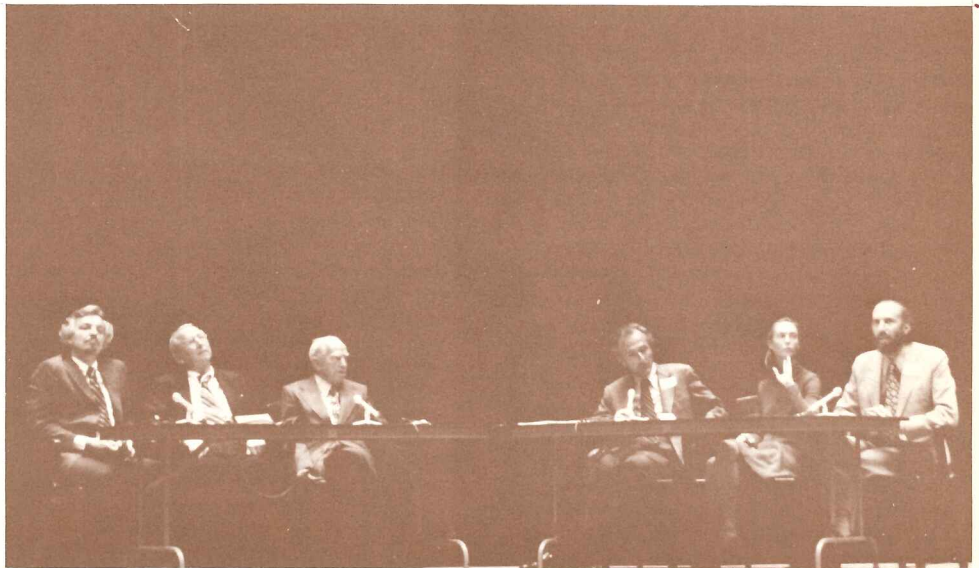
Following each day's series of lectures, the audience of some 1100 was invited to participate in an open forum. This supplement presents transcripts of the highlights of the two forums.

PART I PANEL DISCUSSION

Participants: Drs. Bernard Campbell, Raymond Dart, Irvén DeVore, Jane Goodall, Paul MacLean. **Moderator:** Dr. David Hamburg.

Q. Both Drs. Dart and Campbell mentioned that *Australopithecus* may be in direct hominid line. How is this possible when the various australopithecine dates are later than Mary Leakey's new discovery of genus *Homo* dated 3.7 million? Have the recent human finds in East Africa cast doubt upon the association between the australopithecines and their tools? In other words, can we assert that *Australopithecus* was definitely the maker of the tools found at his sites? This association would have assumed that no other toolmaker lived in the vicinity. Was the structure of the australopithecine community similar to that of the pre-hominids or did they differ so radically that a definite line could be drawn between the two?

A. DART: All investigations that are made are subject to revision with the findings of later discoveries which modify the original interpretations. It depends on how you take the evidence. After all, evidence coming from an individual site usually affects a few bones or a few pieces of a head or a jaw or a pelvis or what not. At least we haven't had, until these recent finds of Lake Rudolph and Ethiopia, such a



First day panelists dealt with many provocative subjects. Among them: hominid evolution, social carnivores, stress in non-human primates, chimpanzee aggression, the evolution of the brain. On the dais were distinguished scientists: (l to r) Drs. Irvén DeVore, Paul MacLean, Raymond Dart, David Hamburg (moderator), Jane Goodall, and Bernard Campbell.

large body of bones. I think one has to have an historical regard, in respect to all of these questions. And it is by putting the evidence together that one bases an opinion. Opinions are not formed as permanent things, they are subject to modification. If that weren't so, we would not call ourselves scientists.



Dart

CAMPBELL: If I may just add a word. I am sorry to say that although I know that Dr. Leakey's interview has been reported in the *New York Times* and the *Washington Post*, I have not read either of them. I am delighted and staggered to hear that she

has bones and that some are dating at 3.7 million. I simply did not know about that or I would have obviously referred to it in my lecture.

The question of whether *Australopithecus* is ancestral in the hominid lineage, I would answer by saying that while I don't think any particular specimen we have discovered is an ancestral form, it is extremely likely that creatures of this kind were ancestral. Clearly, if *Homo* existed 3.7 million years ago, then there must be older specimens. Perhaps the Lothagam jaw I mentioned at 5.5 million would be an example of an ancestral population. But *Australopithecus africanus* is such a good model, as it were, of an ancestor, that it seems hard for me to believe that it was entirely unrelated to our own ancestral line. So I still tend to think that we did evolve from *Australopithecus*, but just in a very broad sense.

As far as being the maker of the tools is concerned, well, *a priori*, I wouldn't expect the person who made the tools and who lived on the living floor to leave his bones there. I would expect the bones to be the bones of his competitor. Therefore, it is always very doubtful to make an assumption that both the toolmaker and his tools are on the same living floor. So perhaps, in many cases, we have *Homo* on the living floor and he was eating maybe his distant

cousin, *Australopithecus*.

Q. *Would the study of social carnivores, for example wolves, coyotes, hunting dogs, prove useful in understanding human evolution?*

A. GOODALL: I think many of you know, I looked at the hyena on the Serengeti. The usefulness for me, was not so much understanding human behavior from the ways in which these animals lived and hunted, but in getting a better idea of the kind of problems that early man probably had to face when he came out onto the savannah.

There have been questions as to whether early man started off his hunting behavior as a bona fide hunter or as a scavenger. And I think once you have watched the animals, the predators at work on the African plains, you begin to realize how dangerous the life of the scavenger is.

Also, I know there are people who have felt that studying the life of the social carnivores might throw light on the behavior of early man. It has only recently come to light what a successful hunter the chimp is, and if we have a creature who is so close to man, it seems to me more useful to study his hunting behavior to learn about early man, than to study the hunting behavior of lions and so forth.

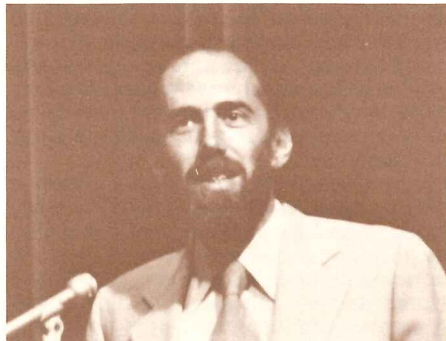
Q. *What effects will the use of contraceptives have on female selectiveness and on male character in western society?*

A. DEVORE: It is as you perceive, a large topic. All of these, I think, actually increase female choice. Contraception, in some ways, especially the Pill, from the male point of view, is the most devious sort of way, because it transfers to the female even more control than she previously had. It is not, I must say, surprising to me that all male legislators debating these topics, often find themselves completely at odds with the women who are agitating to give themselves, that is women, more control over their own bodies. Because, in a certain philosophical or scientific sense, this is giving to women the final control over something which had at least been statistically probabilistic before.

As for very long range effects, obviously, we are now in a position today, where we can not only have house husbands, as in Sweden, and I suppose increasingly in this country, day-care centers in which one can separate the roles of father, mother, child caretaker, professional, and by and large take care of the growing child's welfare without tying the women to hearth and home as she has been tied for several million years in this species.

There are however, certain kinds of considerations which thinking of this sort, which I proposed earlier in my talk, would suggest. For example, one can predict very certainly that women cannot have a liberated sexual life and simultaneously expect males to become more concerned with offspring in the home. The two simply don't go together, and in fact, males who are gulled by that will simply have fewer

genes in the following generations. So any genes that led them to be taken in by that sort of strategy would be systematically eliminated. One can go through all sorts of permutations of that way of thinking about it, but that is an example.



Campbell

Q. *Could Dr. Campbell elaborate on the ecological conditions other than climatic, that characterized the Euro-Asian and Indo-European area that you discussed, specifically those conditions which were favorable to hominid evolution? And based on the preliminary ecological evaluation of the Iranian sites you mentioned, is it possible to speculate on the political/anthropological relations of the first human inhabitants of these settings?*

A. CAMPBELL: As far as the general ecology of Eurasia, I take it to be a savannah environment and judging by the fauna that one finds in this environment, it is not very different than what we find today in East Africa: seasonal rivers, salt lakes, water holes, lake margins, accumulations and so on. At a later stage, a stage when we can be much more sure that early hominids were there, of course, we find changed conditions in much greater variety. We find woodlands coming back in places, we find deep valleys, we find a rich diversity of game because of the more varied ecological states of the temperate band and of course, it is very, very extensive from Europe right through to China. It is such a big question, it is really very hard to answer it.

Later still, one thing that comes to mind is the fact that you get a lot of migratory movement of game between highland and lowland areas and this makes very easy hunting because you get these huge herds passing through relatively narrow places and so on. So that as the climate or environment changes from a simple savannah environment to what we see today, obviously, it becomes more complex. You get more different species appearing and a greater variety of hunting techniques for the different kinds of situations.

As to the second question, we don't have any hominids from Iran at the moment, so I really couldn't talk about human relationships. Indeed, I think talking about human relationships at this level of man's evolution is quite inappropriate. We know so little about it. Of course, since primates as a group are social animals and move and live in social groups with a few exceptions, it is very reasonable to assume that our earliest

ancestors had similar kinds of social groupings. But to take it beyond that, at this stage I think, is definitely not possible.

Q. *What is known about stress responses in non-human primates? Are there any implications for medical practice? What about studies of primate-behavior-stimulating hormones? Isn't there a chicken/egg phenomena here?*



Hamburg

A. HAMBURG: Those are related in the following way. First, a general answer. The relation between hormones and behavior is a two-way street. Variations in hormonal concentrations and metabolism affect behavior; variations in behavior affect hormonal secretion utilization, etc. Probably the stress responses give us the best example, or one of the most interesting examples, of the effect of behavior upon endocrine function. When you feel personally threatened or upset, especially if distress is rather intense and prolonged, you are very likely to have increased secretion of the four adrenal hormones. These, in many ways, act cooperatively. They have effects on energy metabolism and effects on the circulation; the general tendency being to prepare for intensive activity. It's like a kind of warming up, a kind of mobilization for action which may or may not follow. There is no doubt, far reaching changes in hormonal activity follow psychological stress.

Yes, there are some implications for medical practice. The measurement of these hormones is now sufficiently convenient that one can use it as an index as to degree of disturbance. However, one has to say also, that the same kinds of hormonal changes occur not only under psychological stress but with physical stress, burns, fractures, what have you. So that it is a very broad gauge, in a way, non-specific response, to extremely drastic environmental conditions.

In terms of the way in which the hormonal condition of the brain at a given time can influence the response to events in life, the thyroid presents a very good example. When the concentration of thyroid hormone is very high, people tend to respond to stressful experience irritably and anxiously. When concentrations are very low, people tend to respond more apathetically, to be discouraged easily, to get depressed. So the arrow goes both ways between hormones and behavior. And hormonal condition to the brain at the time of stress can affect the way one copes with it. But the psychological meaning of the event and a habitual coping strategy

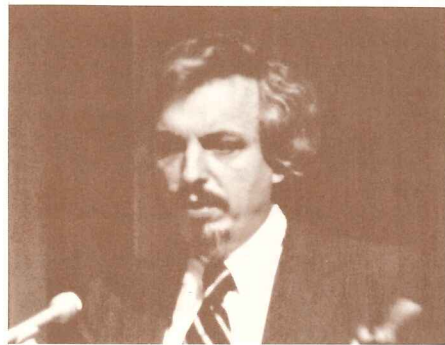
can also affect the secretion of various hormones and also the cardio-vascular system as well. So there is a very intimate interplay between hormones and behavior much of which is integrated not only at the hypothalamic level, I mentioned in my talk this morning, but also in the limbic system discussed by Dr. MacLean this afternoon.

MACLEAN: In the early 1960's much attention was given to research by Calhoun about rat population density, aggression and other factors. His findings have been very fundamental in so far as he has shown in both rats and mice, if you allow them to overpopulate, after a while the young just cease to learn and perform all the activities that are required for self-survival and procreation. So that you get the race, as it were, dying out after a while.

These animals, curiously enough, Calhoun calls 'the beautiful ones', because they have beautiful pelts. They stay around the new area all the time, they don't fight, they don't do anything. They are perfect models of behavior but they just never learn to do all the ordinary things that are required. The rats in turn, develop all of this, what one might call, psychopathology, whether they are given four pens to breed in, or the territorial males hole up in the end pens, the best place up on the hill. The poor lowly rats form these 'behavioral sinks', as Calhoun calls them, even when they have all of the food and water they need. You see, it is not because they can't survive because of food and water. The greatest danger to us is the psychopathology that is probably going to develop out of crowding. You get all of this aggression showing up; tails bitten off, males becoming homosexuals, the nest boxes are so occupied and busy with callers, telephones are always ringing, the mother tries to get the young and take them to another nest and like Slotnick's rats, she forgets where these pups are. Then you find this other type, this withdrawn type. With crowding, some of us get the feeling that we would just like to retire and be by ourselves. These animals, both the rats and mice, are not so unlike a schizophrenic patient. I don't use the word schizophrenia anymore because there is no such diagnosis. They look like the patient we used to call schizophrenic, with covers pulled up over their heads and just retiring. That's enough on that, I think.

a decade or more ago was probably, in fact, brothers or at least close male relatives. Certainly, Jane Goodall's project has had various indications that that was true of male coalitions in chimpanzees. However, there are certainly circumstances (we encounter them in this species all of the time) in which even strangers find it to their mutual advantage to form a coalition. One can do a simple formula, which simply shows that if by acting together the cost/benefit analysis is higher than it would be if you acted as an individual; then even strangers, much less kin, should form coalitions.

On the subject of coalitions, and a question asked earlier that Jane answered, I just wanted to make one brief comment. The question: would it throw much light on human evolution to look to social carnivores? I agree with what Jane said, but I did want to add just one thing: I find them particularly interesting not just in that sense but in a broader sense. There were a few species in which it appeared that instead of females forming the group and males switching from group to group (the dominant pattern amongst the mammals), there were a few apparent exceptions with chimps and humans tending to form these coalitions. We also suspect wolves and wild dogs do the same. I know of no others. We may someday discover others, but curiously enough not lions. So let's say the felid social carnivores form one model and if true, the canid (wolf and wild dog) would form another, and these go along with other things: male coalitions, male hunting, male sharing. By studying them we would not throw light necessarily directly on human hunting habits, but it would put more variables into the models we try to construct, in which we are trying to control for social carnivorous habits, male coalitions, male/female division of labor and help narrow in on the critical variables.



DeVore

Q. Has there been new information concerning alliance formation and central coalitions among savannah baboons?

A. DEVORE: Yes, so much new information, I can't even digest it all anymore. And of course, information comes in various packages: second-hand reports and verbal reports and publications which always lag behind. In a more general sense, there are clearly emerging in social mammals, many situations in which close male relatives cooperate with each other. I suspect that if some of the work done in the late 50's and early 60's including my own, were redone (and we are starting a project, I might say, with Leakey Foundation funding, to do just that), it would be discovered that what we assumed to be a coalition of strangers

Q. Three related questions: 1) With what frequency do the male chimps patrol the boundaries of their home range? 2) What is the significance of chimp display behavior upon a return to their core areas? 3) Are these recent findings published or about to be?

A. GOODALL: To answer the last question first: the findings are going to be published in the book Dr. Hamburg talked about this morning, resulting from the Wenner-Gren Conference.

How frequently do male chimps patrol their boundaries — I think we can't answer that at present. Richard Wrangham worked out some of the data and found that one male during a short time was patrolling his boundary about every four days. He was making a circuit within four days. But there are times when the male chimps for some reason or another, are not moving out to the periphery of the range at all. So I think we need a lot more data, a lot more information. I suspect the changes in time of year, with food availability, the presence of oestrus females, and also the closeness or nearness of the other groups at different times of year.

And the significance of the displays? The feeling we all have — the intuitive feeling, is that after this terrific maintenance of silence which is so dramatic and so tense, that when they get back to an area that's potentially safe, where they know they won't encounter strangers, certainly not strange males, it's a kind of release of tension, such as we sometimes feel. And they are just yelling, screaming and shrieking and banging things about because they can do so again at last.

Q. Please comment on how much information can be gotten on evolution of language from early hominid evidence.

A. CAMPBELL: Well, that's a fascinating question. I didn't even mention language but, it is perhaps, after toolmaking, the most important single characteristic of *Homo sapiens*, and one which has interested me for a long time. Various ideas have been put forward as to how we could assess linguistic ability from the fossil record and I don't think any of them are very satisfactory.

The most recent and I think the most interesting, was the work done by two people — Professor Crellin from Yale and Leiberman from Boston University. They suggested that the angle of the styloid process which is a little tiny bone projecting from the base of the skull which is attached to the hyoid bone, would indicate the position of the hyoid bone which has the voice box. And by examining chimpanzees, new born children, modern man and fossils they concluded that it wasn't really until you reached the stage of modern man that you had the voice box in such a position that it was possible to make a full range of sounds. Some people have doubted this, particularly their reconstructions of the styloid process and its angle and so forth. Indeed, it is rather a complicated matter.

The second approach is to look at the brain and to wonder why the brain expanded in the way it did, particularly as regards to the neocortex and remembering what Dr. MacLean said about reading, writing and arithmetic, being up there. I think there is no question that the expansion of the brain must have been closely related to the use of symbols and association of sounds, objects and so forth, in a gigantic memory bank. So my own feeling about it is, that language is a very complicated process, it must have evolved slowly, because things don't happen overnight, and that probably its best record is

in the expansion of the human brain, from one that is about the size of that of a chimp which we find in an early form of *Australopithecus*, to the size of the brain of modern man.

And so my summary would be that the best fossil evidence is really the endocranial capacity and that it shows the evolution of language to have been a slow and steady progress.

HAMBURG: Related to that, there have been several questions directed to Dr. Goodall essentially asking what she considers the most interesting features of the various and most recent studies on non-verbal language in chimps.



Goodall

GOODALL: Just briefly, there are three main groups of studies which are looking into the possibilities of some kind of language development in chimps but it is not spoken language. The pioneer one was teaching chimps the standard sign language of the deaf which was done by the Gardners. The second group was started by Primack, where the chimps are taught little symbols and each symbol represents a word or a cluster of words and it is taught so that the chimp will use it in logical progression; and then the third and most recent, is the new study by Yerkes and the chimp Lana, who does the same kind of thing, but she has a typewriter (computer) where she types certain symbols in order to get certain things to happen to her.

I think for me, the most significant impact of these studies as a whole, is the amazing insight it gives us into what the chimpanzee intellectually is capable of. We now can assert that the chimpanzee is capable of feats of cognition which even ten years ago, most people would have doubted, except those who worked very closely with chimps.

Q. Are relationships between hominid and other animals present in the *Australopithecus*, not in the sense of domestication, in its most primitive form, but rather, the following of wild dogs to the kill or watching of carrion birds for example?

A. DART: It is very difficult for us to know how much their advances in cranial or cerebral development have modified their activities beyond those of birds and other mammals and I think the only way in which we can judge it, is by what we know of the difference between individual groups of mammals and the higher primates, the ape, and the extent to which we see how much some of the living apes resemble ourselves.

DEVORE: I can't help but to comment briefly, although I think that Bernard Campbell has worked on this and knows more about this than I do. The problem of scavenging and hunting often gets discussed in terms that are too simple. For example, it is certainly true today that many hunter/gatherer groups will watch the behavior of vultures and so on and go to a kill. It is also true that hyenas do it. And one would have to say that our ancestors were less bright than hyenas and jackals, let's say not to put together the notion that circling vultures means a kill.

On the other hand, when Sherry Washburn (who got me interested in this a long time ago) and I were out in East Africa doing the original baboon studies, we were always struck by the fact that to the degree that baboons (males weigh up to 100 lbs and they are rather fierce animals) could detect the presence of carrion, they avoided it like the very plague — even very fresh carrion. I don't mean the smell, but I mean a freshly killed animal ... we reasoned because in their minds, the presence of a kill meant the presence of carnivores.

So the issue becomes quite complicated. He and I and others came to the conclusion then, and Schaller and Loutler's very excellent work on this a few years ago seemed to indicate that scavenging as a consistent way of life is very poor, as an adaptation. And that's the one issue: that is, was scavenging first, foremost and consistently done, is that the way we became hunters? My answer to that is, I don't believe so. However, becoming hunters and then taking advantage of the occasional scavenge is a different issue.

Q. Have the chimps ever been observed using weapons other than the stones you mention they sometimes throw? You spoke repeatedly about chimp attacks on each other but not how or with what they do it?

A. GOODALL: The chimps normally attack with their own anatomy: their hands, their feet. The typical pattern of their attack is for the aggressor to perhaps leap on the back of his victim and stamp with his feet; pick the victim up and smash him on the ground. The smaller ones they drag by the arm or foot, very seldom bite. In gang attacks on strangers the chimpanzees did, indeed, bite and observers on three or four of the occasions all concluded that the aggressors were actually trying to kill the victim. That is not the impression you get during a normal quick attack. On these occasions they went on attacking until the victim was completely limp and even showed patterns similar to that shown in killing prey — twisting the legs, biting strips of flesh off of the arms. We have seen them use stones as weapons and sticks but these are used very seldom. They are much more apt to rely on their own strength, I think.

Another point, that is perhaps interesting: it's often considered that aggression when it relates to attacking another member of the same species should be considered in a totally separate category to

aggression when it relates to catching prey. These are two quite different mechanisms. But it has been of particular interest to us to find that on three of the five occasions when victims were attacked so badly that they were killed, on two occasions the group of aggressors then went on and spent a considerable amount of time hunting until they were successful. So that the arousal of aggression which accompanied the attack of the victim then seemed to carry on and they continued and hunted. They very often have been seen hunting at a time when they are on one of these tense patrols. So it does seem as though there is some kind of underlying motivation which is fairly similar in these two things.

Q. How many generations are required for significant modification in a species in a characteristic controlled by each of three brains? Would Drs. MacLean and DeVore comment on the predictions, both of you made, about future physical evolution of the brain and the cultural relationship.



MacLean

A. MACLEAN: The remarkable thing about the human brain is that we have had all of this terrific mass for so many thousands of years. We must have had it long before we had language, words or a language of size, mathematics, and so on. Now what's happened is that suddenly you've got a mushrooming of language, of words, numbers, and we are seeing these mighty developments so suddenly, yet the brain has been that way for thousands of years.

DEVORE: It is a difficult question. I think one could make a couple of observations about it though.

There has been an insufficient awareness on the part of biologists as well as social scientists that natural selection is an ongoing process but it's operating in this room at this moment, if you will. It operates between every generation.

To measure change from generation to generation is very difficult. It is not difficult if you take the animal, as they have done in behavior/genetic experiments, like dogs or rats into a laboratory and the experimenter plays God, in effect, and imposes a much harsher degree of selection than natural selection would be. That is, you kill all but the ten most aggressive rats for say, five generations and then compare them to the stock from which they came. Then you can believe

you have a much more aggressive group of rats. But these things do change slowly and of course, environmental conditions change, intermarriage takes place, gene flow takes place, so it is not an area particularly in humans where one can make these measurements very easily.

There is one other thought that is related to it however. One of the reasons I always disagreed with Robert Ardrey in his original

and most popular book, *African Genesis*, was the notion that we had inherited, and were therefore bound to live out a career as an aggressive species because *Australopithecus* or whatever species early hominid ancestor one wants to choose, so behaved, is in fact, quite naive. That is to say, we know that even under comparatively mild selective pressures, one can change the aggressive behavior of a species in say, 50

generations quite dramatically. So there is no point in blaming our sins on *Australopithecus*. In that sense, it was a litany of original sin. If we find ourselves aggressive today, it is because we continued to reward in whatever manner, aggression down to the present time and we are as aggressive as the immediate previous generation we have rewarded.

PART II

PANEL DISCUSSION

Participants: Drs. François Bordes, C.D. Brain, F. Clark Howell, G.H.R. von Koenigswald, Mary Leakey. **Moderator:** Dr. Bernard Campbell.

Q. How much experience does one need to produce tools as you have demonstrated?

A. BORDES: It depends upon what you call experience. I am fairly sure and I have the proof, that somebody who is clever with his hands and not stupid, who is taught how to make some tools, can make very good stone tools in one year and can become really pretty good in two or three years. The problem in prehistoric times was in teaching their children how to make tools. As for the problem of finding the techniques again, I can speak for myself and my colleagues Jacques Tixier and Don Crabtree in the States — it took us about forty years.

Q. We have had a number of questions about *Paranthropus* on the one hand and *Australopithecus africanus* on the other. For example, here is one: Would you agree that *Paranthropus* did not evolve because he stayed an herbivore lacking tool use? Why would *Paranthropus* have lacked the incentive to change — to adapt to his environment?

A. BRAIN: I don't know that I can really answer that convincingly at all. I think that fewer people believe in the dietary hypothesis that Dr. Robinson proposed originally, than previously. I am still inclined to think that from what I have seen of *Paranthropus* that he was very likely to have been essentially an herbivore feeding on the coarse fibrous food of the open grasslands. But why he didn't evolve further, I don't know. Perhaps he wasn't making anything in the way of intricate tools and so had no incentive to really improve his mind. I am not sure about this. I think this is really Mary's field. Do you think that making tools improves your mind, Mary?

LEAKEY: I think you probably have to have an improved mind in order to make tools.

BRAIN: I once asked one of my arche-



The second day's forum included a lively interchange of questions and answers concerning: prehistoric toolmaking, the relationship between *Homo habilis* and *Australopithecus*, how early man adapted to his environment, among other subjects. Providing the expertise were scientists: (l to r) Drs. C.K. Brain, François Bordes, F. Clark Howell, Bernard Campbell (moderator), G.H.R. von Koenigswald, and Mary Leakey.

ologist friends if he thought these australopithecines could speak. He said he didn't know if they could speak but he was absolutely sure they could swear. I was a little bit intrigued by this and I asked further. He said well, you know, they were making stone pebble tools quite obviously, because we found the remains and if you have ever tried to make a pebble tool, swearing is quite automatic.

Q. Can the early and late forms of *Gigantopithecus* be closely ruled out of man's ancestry?



Howell

A. HOWELL: Well, some people think not. I don't see how it is possible. The adaptation so far as the structure of the lower jaw, the anatomy, the proportions and the specific anatomy of the anterior, the front teeth, the cheek teeth and so on, all show a very distinctive pattern from the earliest forms of mandible I showed from the Siwaliks, to the same principle, but even more so, in the forms that are known from China. And that is a very distinctive anatomy. They seem also perhaps to have been getting larger. If you think that the Chinese forms are found in horizons that yield other hominids, for certain, it seems to me, that is already a long-term anthropoid parallelism that *Gigantopithecus* represents. And we have many other examples like that among all kinds of organisms, all kinds of mammals in particular. So why should the higher primates be unusual in not having this kind of unusual adaptation as well?

In evolutionary terms, the normal kind of thing to happen is for there to be a radiation and diversification of organisms initially going into many niches, many of them fall behind and become extinct, others persist longer and others shift and move into new directions and evolve and so on. *Australopithecus boisei* represents one of these radiations that peters out, *Gigantopithecus* is another one. *Oreo-*

pithecus was mentioned — it's another extraordinary thing that became extinct; all the many, many lemurs, lemuroids, that were also mentioned — *Megaladapis* is one of the many extinct lemuroids that radiated and then became extinct in post-Pleistocene times. So *Gigantopithecus* is a very distinctive animal.



von Koëniqswald

von KOËNIQSWALD: May I just add a few remarks. Certainly *Gigantopithecus* is without doubt *not* an ancestor of man but this would not exclude him from a relationship with the hominid group. I think that Dr. Woo in Peking is right when, in his family tree, he tried to point out that *Gigantopithecus* left the main line of the hominids before the australopithecines. There are certain astonishing features in the dentition, the first pre-molar is nearly shaped as a human deciduous molar and *Gigantopithecus* is a very remarkable form because we don't have the direct ancestor of the chimpanzee or the gorilla; of the orangutan I think they found a paleosimian from the Siwaliks and it might be the ancestor, although Simons is very much against it. But the *Gigantopithecus* from the Middle Pliocene of India is certainly the ancestor from the *Gigantopithecus* from the Lower and the Middle Pleistocene of China. So this is a very important line, and we have from the Omo, I think, some very large lower jaws of *Paranthropus* and they are very nearly equal in size to the big jaws of *Gigantopithecus*.

Q. What do you see as the route of entry for early man into Europe — Gibraltar, Middle East?

A. BORDES: That is a big problem. We have no real indication in the Middle East. There is a very strange similitude all through the Lower Paleolithic, beginning with pebble tools and going on with Acheulean, between African material and Spanish material. And I really wonder if during a period when the sea was low and when the climate was colder, it could not have been possible for very early man to cross the Gibraltar Strait riding on logs because the big problem was not the distance. Even today, you can very well see the African coast from Spain or the other way around. The problem is that there is a lot of current going from the Atlantic into the Mediterranean which is probably due in great part to the higher rate of evaporation of the

Mediterranean. One could suppose, that it could be looked into by the meteorologists. One could suppose that during a glacial time when the climate was colder even in the Mediterranean zone, these currents would not have been so strong. In a way, of course, it did not matter very much if these people were carried 40 miles by the current before they landed on the other side of the sea. I think it is difficult to believe that such a primitive people could have the guts to look on the other side. But when you remember not very much later on, as far as evolution goes, they were going against elephants with just probably spears and stone tools, you can maybe imagine that these people were not that afraid.

Q. Can it still be said with a fair degree of certainty that *Australopithecus* was a toolmaker?



Leakey

A. LEAKEY: This is a very difficult question to answer briefly because I don't think any two people quite agree as to the answer. In fact, we don't have any direct evidence. We have not found any specimens of *Australopithecus* clutching stone tools or *Homo* clutching stone tools from the earlier sites. Personally, I don't think the robust australopithecines, that is *Australopithecus boisei*, made formalized tools to a set and regular pattern. I think it is more than likely that he broke sticks, bones, with his teeth and hands and used sharp objects, but I don't think he took one stone to make another stone tool, which is a conceptual thought. I don't think myself, that he was capable of doing this. There are others who think that he was. The toolmaker from Olduvai Bed One does seem to be *Homo habilis*, but whatever you call the creature — it doesn't really matter too much — but he certainly had many common features with the gracile australopithecine.

There is now the possibility of a third creature at Olduvai who might have been a descendant of the early *Homo* that has been found nearby. But the material is so incomplete that we can't say anything definite at this stage. As for myself, I don't visualize the robust australopithecine as a genuine toolmaker.

Q. I am still not clear on the relationship between *Homo habilis* and *Australopithecus*. Were they contemporary or did they evolve one from another? (I think the

best way for us to handle this is for each of us to say very quickly, what their views are on the relationship between the earliest form of *Homo*, let's say on the one hand, and *Australopithecus* on the other.)

A. LEAKEY: This question does not distinguish between the two australopithecines. I can tell you that at Olduvai, what we have called *habilis* was entirely contemporary with the robust australopithecines and *boisei*, but *habilis* did disappear at about the bottom of Bed Two although the robust australopithecine continued to the top of Bed Two. Now whether *Homo habilis* was an East African equivalent of the South African gracile *Australopithecus* or not, I'm really not in a position to decide. He has been considered as a toolmaker in Bed One and I see no reason to abandon that belief at that stage. But certainly he was contemporary with Zinj in Bed One and part of Bed Two.

von KOËNIQSWALD: I am not so familiar with the African forms and I am still somewhat a disbeliever of the differentiation between *Paranthropus* and *Australopithecus*. In *Paranthropus*, the deciduous dentition is very highly specialized and very complicated and the stages which would precede it are just the stages that you find in *Australopithecus*. There must surely be several groups of australopithecines and how they fit together I would not know at the moment, because also in Java we have this *Meganthropus* and *Meganthropus* has a number of characteristics which I think are more human-like than what the *Paranthropus* in Africa shows. We just don't have enough material.

HOWELL: I think everyone thinks somewhat differently about these things, which means we have a problem or a lot of problems. Yet one needs to remember that many, many things are being found all the time. Everyone hasn't seen everything and everything isn't published or even studied. This makes a big difference. There is a big lag but there is also a group of people who are very busy working on these things and we all know each other. We see things together and we talk and argue together. We manage mostly to remain good friends, even when we disagree, which is healthy, I think.

At Olduvai, to add to what Mary is saying, I think that some of the specimens, and I'm not alone in this, originally attributed to *habilis* are in fact, a little *Australopithecus africanus* as far as I can tell. I think that at East Rudolph it is very clear that a robust (a *boisei* kind of *Australopithecus*) certainly co-existed with something that has been called, rightly or wrongly, and I think it is rightly, a kind of early *Homo*. I think also, there is evidence there from several specimens — again, other people feel the same way, but not everybody — that there is also *A-africanus* there, too. I think there are really three things co-existing and they probably didn't always overlap in their distribution, roughly at the same time. By "this time" we really mean on either side of 2 million, right? And probably back to 2½ and

potentially even farther than that. The Omo also seems to show this. There is some evidence coming out of the Afar which is back towards 3, where it seems very clear that there are at least two things — the question is what are the two things? As Johanson and other people work there (we understand now, that they are in the field this year) we will probably have a new rash of data in that range of time. We didn't know 3 million years before, and Mary has just suddenly shown us with the new discoveries at Laetolil that there is something to be learned that is brand new from the 3½ million year time range.



Bordes

BORDES: I think that it is very silly to try to treat the fossils as living species. For instance, I think it would have been much better if the old names of *Paranthropus* and *Australopithecus* had been kept. It would have meant less confusion than

now. Because now, when somebody speaks of *Australopithecus* he is asked to decide if it is *Australopithecus africanus* or *Australopithecus robustus* and so on and that makes for a terrible mix up.

As for myself, I don't see any impossibility that at some time at the beginning of Africa there co-existed several different types, some being outside of the direct human line or closer to the direct human line or inside the human line, anymore than I see impossible to co-exist for instance, a great uncle, an uncle and a nephew, you know? I suppose we all agree that if we go deep enough, all that will come together. So it depends on wherever we put the line, what we see. To some, of course, the great uncle will die before the uncle and the uncle before the nephew. We could have an *Australopithecus robustus* going up to *Pithecanthropus*. The *Australopithecus africanus* being the uncle, not very close but not quite human, and maybe *Homo* giving way to *Homo erectus*, giving birth to *Homo erectus*, so that on different levels we can have one or two co-existing or two or three co-existing.

von KOENIGSWALD: May I just ask you a question: What would you prefer, *Pithecanthropus* or *Homo erectus*?

BORDES: I always say *Pithecanthropus*. I do it the same because then you know if it is a Javanese find.

Q. Dr. Brain, what was the view like from South Africa then?



Brain

A. BRAIN: You know, I would say that if you were going to look for a good synonym for *Homo habilis* that it would simply be advanced *Australopithecus*; advanced gracile *Australopithecus*. And this may have occurred at different places at different times. But when the typical gracile *Australopithecus* advances somewhat and increases the size of its brain, it then becomes an intermediate in my mind, between *Australopithecus* and *Homo*. I think you need this tag on *Homo habilis* simply to fill that vacuum, but it may mean different things in different places.



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News in Brief

UCLA OFFERS 4 MAJOR LECTURERS

The scheduled series of four Leakey Foundation lectures at the University of California, Los Angeles, has drawn well over 2,500 to date. Guest speakers were Dr. Jane Goodall on November 16 discussing "CHIMPANZEE: CHILDHOOD AND SOCIETY" and Joseph Campbell on January 18 who spoke on "THE ARCHEOLOGY OF MYTH."

Dr. Jonas Salk will appear on March 28 with a talk "MAN UNFOLDING" and Dr. Donald C. Johanson is scheduled May 16 with a talk on his internationally known Afar Research Expedition which has turned up 3.5 million year old hominid fossil remains.

Attendance for the series of four UCLA lectures are expected to total well over 4,000.

ARDREY AUTHORS NEW BOOK

A new book by Robert Ardrey is expected to be published early in 1976 called THE HUNTING HYPOTHESIS.

In a note to Leakey Foundation president Ned Munger, Mr. Ardrey comments, "It's the best, most readers think, of my evolutionary books. Definitely, it's the last. And I sometimes wonder if by saying it's the best they don't really mean it's the shortest. Could be."

Mr. Ardrey, author of three previous books: TERRITORIAL IMPERATIVE, AFRICAN GENESIS, THE SOCIAL CONTRACT, appeared together with the late Dr. Louis Leakey in a unique and now classic dialogue, "AGGRESSION AND VIOLENCE IN MAN," which was sponsored by the Foundation at the California Institute of Technology in the fall of 1971. The transcript of that dialogue is available from the offices of the Leakey Foundation.

A LOUIS LEAKEY TRIBUTE VOLUME

HUMAN ORIGINS: LOUIS LEAKEY AND THE EAST AFRICAN EVIDENCE has just been published by W.A. Benjamin, Inc., Menlo Park, Ca. Edited by Glynn L.I. Isaac and Elizabeth R. McCown of the University of California, it is meant to be both a tribute to the late Dr. Louis Leakey and a guide to interested students and lay audiences of the ferment of paleontological and archeological inquiry that Louis Leakey inspired.

It includes essays by many Leakey Foundation trustees, grantees and lecturers. Among them: Phillip V. Tobias, Jane Goodall, F. Clark Howell, C.K. Brain, Mary D. Leakey, J. Desmond Clark and some ten other scientists.

The book, illustrated with maps, photos and special reconstructions of hominids and geological formations, is available from the Leakey Foundation both in paperback (\$9.95) and in hardback versions (\$15.95).

MUNGER IN AFRICA

Dr. Edwin S. Munger, president of the Leakey Foundation, recently visited Nairobi for discussions with trustee Richard Musangi and with Dr. Sandy Richards, director of the Tigon Primate Center, long supported by the Foundation. Dr. Munger is on a 6-week working visit to Africa.

He reports excellent progress on building the new Louis Leakey Memorial Institute for African Prehistory in Nairobi, for which the Foundation contributed \$100,000 under an arrangement with the Harry Frank Guggenheim Foundation of New York. After dealing with other Foundation business involving Dr. Shirley Strum's Gilgil project and Elizabeth Meyerhoff's study of the Pokot in Kenya, he flew to the Seychelles for his first visit to those Indian Ocean islands in a decade.

Professor Munger is currently in South Africa to attend a symposium at which prominent black and white Americans and black and white South Africans will discuss mutual problems. He plans to meet with trustee Phillip Tobias in Johannesburg and to interview prospective black archeologists in Cape Town in connection with the Leakey program of supporting selected black scholars in East, Central, and Southern Africa.

QUOTABLE

A recent letter from Foundation grantee, Dr. John A. Van Couvering of the University of Colorado Museum seems worthy of quoting. Dr. Van Couvering received a travel grant from the Foundation within a month of his urgent request and remarks:

"I am lucky...that the Foundation is structured to respond to short term, unorthodox requests which are designed to take advantage of...sudden turns of events. This flexibility, to my way of thinking, gives the Foundation a place where it can exert enormous leverage and do a great deal of good at relatively low cost. The Foundation's approach, in fact, reminds me of the way Louis Leakey himself went about spending his hard-won donations and grants. He sympathized with unconventional people and ideas, but what made him effective was the ability — more often than not — to select the unconventional projects which had real promise and to fund them judiciously. He got enormous mileage out of relatively little money this way, and never ceased to remark on the amounts which some of his colleagues appeared to require."

29 NEW FELLOWS JOIN THE FOUNDATION

The Leakey Foundation is happy to announce the addition of 29 new fellows to the Foundation's roster. This brings to 241 the total number of fellows currently active in the Foundation.

We welcome: George A. Binney, Crystal Bay, Nev.; Ms. Helen Boughton, Carmel Valley, Ca.; Dr. and Mrs. Donald C. Corbett, Montrose, Ca.; Dr. Joseph M. Dixon, Birmingham, Ala.; Mr. and Mrs. Henry J. Escher, Jr., North Hollywood, Ca.; Andrew R. Getty, San Francisco, Ca.; Mrs. Gloria Getty, Corona del Mar, Ca.; Gordon P. Getty, Jr., San Francisco, Ca.; John G. Getty, San Francisco, Ca.; William P. Getty, San Francisco, Ca.; Mrs. A.W. Gillette, San Francisco, Ca.; Edward R.

FOUNDATION TO SPONSOR MOBILE UNIT FOR SCHOOLS

A plan to establish a paleoanthropological teaching unit for secondary schools has been approved by the board of trustees of the Leakey Foundation.

Under the co-direction of Leakey trustee Kaye Jamison and Seymour Sitcoff, instruction specialist-science, representing the Los Angeles City Unified School District, a study unit will be organized including fossil materials, skeletal reproductions, audio-visual aids, kits of related materials and teacher guides, among other elements. Envisioned as a laboratory unit, it will be made available to junior high and high schools and serve to extend the science curriculum presently offered to this age group in the field of paleoanthropology and related subjects.

Now in the process of obtaining official approval from the Los Angeles City Unified School District, the pilot program is expected to be introduced in secondary schools in the Los Angeles area in the fall of 1977 and run for a three-year period.

MARY LEAKEY FINDS EARLY MAN REMAINS 3.75 MILLION YEARS OLD

*2 jaws and teeth
from at least 11
creatures found*



Fossil evidence that man evolved and lived 3.75 million years ago in East Africa was presented by Dr. Mary Leakey at a Washington, D.C. press conference in the offices of the National Geographic Society this past October. The remains, dated at almost a million years earlier than had been previously established, were found in Tanzania.

Dr. Leakey, widow of Louis Leakey, said that she had found the jaws and teeth of at least 11 creatures who appear to belong to the genus *Homo*. They were found in a dry riverbed in an area called Laetoli, just 25 miles from Olduvai Gorge, where the Leakeys have made many spectacular fossil discoveries over the last two decades.

Dr. Leakey's new discoveries are said to be the oldest reliably dated examples of true man. Previously, the oldest reliably dated hominid or man-like fossils, were no more than three million years old.

Jagels, Bakersfield, Ca.; George D. Jagels, Jr., San Marino, Ca.; Ms. Jean Elise Jagels, San Marino, Ca.; Jeffrey R. Jagels, San Marino, Ca.; Mrs. Vincent Jardine, Pasadena, Ca.; Robert Jastrow, New York, N.Y.; Dr. Patricia Kennedy, Providence, R.I.; Mr. and Mrs. Solomon Kimerling, Birmingham, Ala.; Mr. and Mrs. John F. Leslie, Chicago, Ill.; Mr. and Mrs. John J. Louis, Jr., Chicago, Ill.; I.R. McCulley, Pasadena, Ca.; Dr. Josephine Murray, Cambridge, Mass.; Mrs. Thomas C. Reed, Alexandria, Va.; Mrs. Katherine Rust, Albuquerque, N.M.; Mr. and Mrs. Dana Smith, Pasadena, Ca.; Mr. and Mrs. Donald F. Todd, Boulder, Colo.; Ms. Cyndie Travis, Los Angeles, Ca.; Mr. and Mrs. I.D. Weiner, Malibu, Ca.

Grant SPOTLIGHT

Each year the Leakey Foundation, through its distinguished 16-member science and grants committee, awards grants for scientific research on man and his origins. In 1975 the Foundation set new records in allocations with a total of \$217,383 awarded to 68 research projects throughout the world.

So far this year, the Foundation has approved \$168,570 in new grants to 25 projects. As always, these funds cover a wide range of interests and involvements in the fields of human evolution, early cultures and conservation. You can be sure that as the need arises, other new grants will be added through the year.

Interesting in the group for 1976 are five young newcomers to the Foundation's roster of distinguished research programs. Each are needful of continuing support. All show strong evidence of developing new facts in the search for scientific understanding of man and his origins.

The details of these projects follow. The success of these programs depends upon your support. Membership in the Foundation and special contributions [even the smallest donation!] directly assist such research. Won't you help? Send a contribution now to the Leakey Foundation.

Kathleen D. Gordon \$1370 needed
Dental Attrition

Many problems in reconstructing human evolution cannot be resolved without further information about the nature of changes in behavior which led hominids further and further away from the life styles of their pongid contemporaries. The nature of the feeding behavior of early (Miocene) and later (plio-Pleistocene) hominids is critical to an understanding of this process.

Since the dentition has evolved, at least in part, for the purpose of processing food, some knowledge of the habitual diet of a species may be gleaned directly from a close study of these structures. The study proposed here is an attempt to extract data from the tooth surfaces itself about the substances and mechanisms involved in tooth wear.

It is hoped that such information will be of some use in adding to our knowledge of the ecological status and feeding behavior of the fossil species in question.

HAMBURG

continued from page 4

Hospital in Chicago and a residency in psychiatry at Yale University School of Medicine and Michael Reese Hospital. After two years of medical service, Dr. Hamburg served as assistant and associate director for Psychosomatic and Psychiatric Research at Michael Reese Hospital. He spent a year as a fellow at the Center for Advanced Study in the Behavioral Sciences and from 1958-61 was chief of the Adult Psychiatry branch of the National Institute of Mental Health.

From 1969-72 he was professor and chairman of psychiatry at Stanford University School of Medicine. Having made major administrative contributions to the development of the School of Medicine, he

M.K. Jackes \$2,000 needed
Analysis of Pliocene faunal material

To continue work begun in Tanzania this year by Ms. Jackes (who is from Australia), under the direction of Dr. Mary D. Leakey. The work involved the sorting and preliminary analysis of the faunal material from the Pliocene site of Laetoli. Future work will include the excavation and analysis of material from two key localities at the site and is scheduled to run from July through September 1976.

U.M. Juwayeyi \$3,000 needed
Archeology scholarship

Mr. Juwayeyi holds a Bachelor of Social Science degree from the University of Malawi. He has been engaged in a wide oral history/ethnography program with the Department of Antiquities for a year now and feels that graduate training on the Ph.D. level in archeology in the U.S. will enable him to continue to pursue a meaningful reconstruction of pre-colonial African history and to contribute significantly to the on-going program in which the Malawi government is embarked: to record his country's historical and cultural heritage.

W.C. McGrew \$2,000 needed
Wild chimpanzee study

The project involves a long-term field study of the behavior and ecology of wild chimpanzees, *Pan Troglodytes verus*, in the Niokolo-Koba National Park in Senegal. It is a three-person project with Pamela Baldwin (Ph.D. student, University of Stirling, Scotland), Caroline Tutin post-doctoral fellow, University of Edinburgh) and W.C. McGrew (lecturer, University of Stirling) involved. They hope to make comparisons with the chimpanzee population of the Gombe National Park, Tanzania, over a three-year period. (Tutin and McGrew worked at Gombe between 1972-74).

P.L. Shipman \$1500 needed
Taphonomy and paleoecology study at Ft. Ternan fossil site

This is a very significant site which Louis Leakey excavated earlier and never had funds to complete. The purpose is to reconstruct the paleoecology and taphonomy of the vertebrate assemblage from Fort Ternan as a pre-doctoral topic. Since the fossil hominoid, *Ramapithecus wickeri*, is known from Fort Ternan, a reconstruction of the paleoecology of the area during the Miocene is critical to the formulation and testing of hypotheses concerning that creature's habitat and possible role in evolution.

turned more attention to research and teaching, and was named Reed-Hodgson Professor of Human Biology.

In addition, during the academic year 1974-75 he was named Sherman Fairchild Distinguished Scholar in Residence at the California Institute of Technology in Pasadena.

Professor Hamburg has been a member of the American Academy of Arts and Sciences, a member of Phi Beta Kappa and Alpha Omega Alpha medical society, and a member or fellow of numerous professional societies in the fields of psychiatry, psychoanalysis, anthropology, genetics and human development. He has served on the National Research Council, the National Academy of Sciences-Institute of Medicine, was president of the Society of



Dr. Edwin S. Munger, president and Joan Travis, treasurer of the Leakey Foundation had a green Christmas — a package identified as a bundle of money turned out to be just that: a gift to the Foundation to further the research of grantee Elizabeth Meyerhoff.

A BUNDLE OF MONEY TO FURTHER FOUNDATION RESEARCH

It arrived at Christmas time. And it had a string attached. A note attached to the string read: "The string is that you are to give anything of value in this bundle to the Leakey Foundation for Elizabeth Meyerhoff's project."

Howard Wilson, who wrapped his donation in sandwiched layers of brown paper and dollar bills, asked that the amount of his gift be withheld — "I just want to make more people think of giving to the Leakey Foundation," he said.

"The gift starts us on our second million of endowment funds," said Leakey Foundation president Ned Munger. "We have just finished getting donations and pledges totalling a million. That is pretty good for an organization that in 1971 was down to its last \$3.08 and was considering disbanding."

The Meyerhoff project (see *FOUNDATION NEWS*, Fall 1975, page 7) will hopefully shed new light and understanding on the ancient culture of the West Pokot tribe of Kenya. Research centers on the role of the Pokot woman — their status and social power and includes a study of their ancient female circumcision rites. In June, 1975 a launching grant from the Leakey Foundation enabled Ms. Meyerhoff to return to the field to continue the study.

At present Elizabeth is in need of a four-wheel drive vehicle. The site is 100 miles from Lake Baringo and 175 miles from Nairobi. At one time she was totally without transportation and walked the 100 miles to Baringo! She now negotiates the rutted dirt roads on a motorbike — which will be totally useless when the rains come.

Human Evolution.

In his spare time for distraction he reads Eric Ambler and Helen McGinnis mysteries, which he tells us stood him in good stead for his experiences this past summer in Tanzania.

Married, his wife Betty is a psychiatrist. They have two children, Eric, who is a political science major at Stanford and Peggy, who is in her second year at Radcliffe.

At the end of this academic year, Dr. David Hamburg will take a leave of absence from Stanford for several years to serve as president, Institute of Medicine, National Academy of Sciences in Washington, D.C. During this time, he will be returning to Stanford frequently to consult on continuing primate research.

A VISIT TO CHINA

Some aspects of paleoanthropological and related studies there.

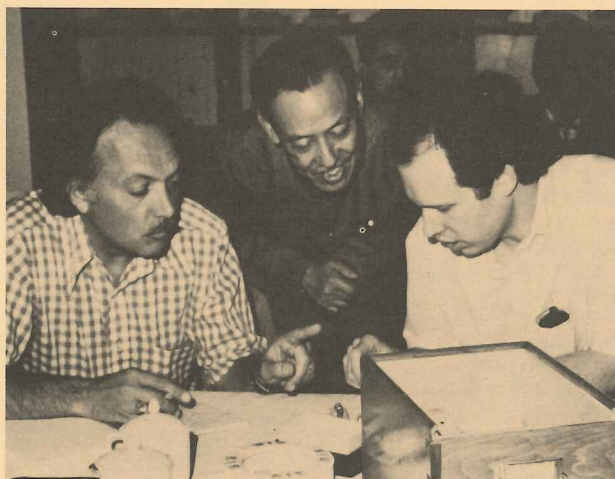
by F. Clark Howell

(Clark Howell is professor of anthropology at the University of California, Berkeley, and chairman of the science and grants committee of the Leakey Foundation. Last summer he led a delegation of scientists interested in early man researches and related studies to the People's Republic of China (PRC) for a month's visit. Here he shares some of his thoughts on the trip.)

One consequence of the 1972 visit to the PRC by then President Richard Nixon and Henry Kissinger was a mutual agreement to encourage cultural and scientific exchanges between the two countries. A number of official scientific delegations was ultimately decided upon between the Scientific and Technical Association (PRC) and the Committee on Scholarly Communication with the PRC (USA), the matter under the auspices of our National Academy of Sciences and Social Science Research Council.

As a member of the National Academy of Sciences, I was asked to serve as chairman for a delegation interested in early man studies and related researches. Due to the broad interdisciplinary nature of such studies every effort was made to obtain a diversity of scientific expertise and research experience within the 11 person (2 women, 9 men) delegation. Thus, the group included 3 archeologists, 2 physical anthropologists, a geologist and a geophysicist, a paleobotanist, a paleontologist, and two China scholars, one a specialist in history and another in political science. Our group arrived in Peking by air from Tokyo on May 15 and departed Canton by train to Hong Kong on June 14. The initial 10 days were spent in Peking, including a day-long trip by car to Tientsin, and the remainder of the month elsewhere in central, eastern and south-eastern China. Throughout our stay we were accompanied by 3 Chinese; two were from the STA and one, a physical anthropologist, was from an Institute in Peking. We visited 11 cities in 6 provinces, and travelled over 6,000 kilometers, by air and by rail. In spite of this substantial exposure to China and its people the vastness of the country (about a third larger than the USA) much remains to be seen — including the northeast (former Manchuria), the northwest (Sinkiang and Kansu, where foreign visitors are rarely permitted), and the southwest (particularly Yunnan and Szechwan, where foreign visitors are apparently uncommon). These latter areas of the country have numerous paleontological sites, and hence are of great potential for early man studies. Teeth of fossil apes are already known from coal deposits in Yunnan, and recently several very ancient hominid teeth have also been found there.

The China we saw, and as many others have seen it in recent years, is a new China — post-liberation (1949) and proletarian cultural revolution (1965). I was broadly familiar through reading, with the more important paleoanthropological researches there during those 15 years. However, the lack of scientific publication in China after the cultural revolution left



Dr. Howell (left) and Eric Delson (CUNY) with Dr. Woo Ju-Kang (center) of the Institute of Vertebrate Paleontology and Paleoanthropology in Peking. Dr. Howell lectured at the Institute during his visit there in May, 1975.



Sculpture of restored *Homo erectus*, male and female adults, at the Choukoutien Museum near Peking.

one largely in the dark as to the nature and results of their subsequent research activities. Their scientific journals again appeared in 1973 (and numbered consecutively from the last volume) although a seven year gap intervened. As is now well known, that was a time of criticism, of internal change in goals and direction of the country and of continued, and expanded rebuilding. Universities were largely closed, students and faculty were dispersed to the countryside or elsewhere. The effects of those events were surely far reaching, and one felt their impact sometimes in the general intellectual environment in the structure and activities of universities, and some research institutes.

In Peking we stayed in the new, wholly modern wing of the Peking Hotel. The original wing seemingly remained unchanged since the days one reads of when foreign and Chinese scientists met there sometimes to discuss the new hominid (*Homo erectus*) discoveries at the famous Choukoutien (Dragon Bone Hill) site in the Western Hills beyond the city. As I had known both Franz Weidenreich and Teilhard de Chardin it was an emotional experience to pass through the rooms where they and others doubtless met over 40 years ago.

Every moment was full there — visits to institutes, the University Library, the Palace Museum (former Imperial Palace), Summer Palace, the Great Wall, and Ming Tombs. The Summer Palace is maintained as a popular park, and the vast reaches of the Palace Museum are either open to visitors or undergoing restoration. A memorable day was spent at the famous Choukoutien site, preserved now as a scientific resource, and where a most modern museum and other facilities have been constructed for the numerous visitors and for the renewed searches into the numerous cave fillings. The exhibits, reconstructions and murals at this on-site museum were first-rate, and an indication of what we were ultimately and repeatedly to see elsewhere in respect to the concern for the preservation of antiquities and education of the masses in regard to man's place in nature and the prehistoric development of human society.

We all gave lectures one or more times at various institutes of the Academia Sinica, including Vertebrate Paleontology

and Paleoanthropology, Archeology, Geology, Geography and Botany, a Chinese colleague serving as translator. The opportunity to share our own scientific interests and experiences with our Chinese counterparts and especially the younger students, was among the most rewarding experiences of the trip. Apparently word of these lectures preceded us elsewhere for a colleague and I were asked to discuss our work in the Omo valley, Ethiopia, later at the Natural History Museum in Shanghai.

Early man studies are centered in the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) in Peking. The most important and extensive fossil and stone tool collections are housed there; those of us principally interested in paleoanthropology were able to examine collections, so far as they were available, as the Institute was moving into new quarters. Researches on early man were greatly stimulated in China in the 1930's through the extensive researches on the Choukoutien site which afforded fossil remains of over 50 individuals of *Homo erectus* ("Peking man"). The finds still represent the largest single population sample of that extinct species. These specimens, as is well known, were lost at the outset of World War II. (Sometimes it has been asserted that the specimens were spirited away to the USA and hidden here; however, the specimens, their loss, and possible whereabouts were never mentioned in the course of our visit.) There are fragmentary new finds from renewed work at Choukoutien, but nothing like the wealth of material found previously. Still older, *Homo erectus*-like remains are known from the Lantian site, Shensi, where Chinese scientists carried out very extensive, thoroughly up-to-date interdisciplinary researches in the early 1960's. (We had greatly hoped to visit this locality, which is not far from Sian, but were told it was impossible to make the necessary local arrangements to do so.) Human occupation of China may well extend back to the very early Pleistocene for in the Nihowan basin, northwest of Peking, stone artifacts have been found recently in old lake deposits much older than sites yielding *Homo erectus*. (This is another important and extensive fossil locality we greatly wanted to visit, but were told by the Chinese that it was then impossible to do

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A VISIT TO CHINA

Continued from Page 7

so — recently some Australian scientists were taken there!)

Among the most interesting fossil primate remains recovered from China are those of *Gigantopithecus blacki*. This creature was first recognized in the mid-30's by Prof. Ralph von Koenigswald from a few molar teeth he purchased from Chinese 'drug stores' in Hong Kong. He regarded it as a giant, extinct ape which he named after Davidson Black, the Canadian anatomist who first recognized the distinctiveness of the human remains from Choukoutien. In the 1950's Chinese scientists undertook to find further, more complete remains of this peculiar creature, and succeeded in doing so from fossil-rich caves in south China. Now over a thousand teeth and three enormous mandibles are known; only recently another cave in Hupei has afforded additional specimens, there for the first time directly associated with early human teeth, which seem to show some resemblances to *Australopithecus* in Africa. *Gigantopithecus* became extinct perhaps a million years ago, but had a long evolutionary history before that as it is known from a jaw found a few years ago in the Siwalik Hills of northern India in deposits 4-5 million years old. Unfortunately the skull and skeleton of this creature are still unknown, and its adaptations and life style remain a mystery.

The group visited universities in Peking, Sian, Nanking and Shanghai where in many instances faculty and students were largely away in the countryside assisting with the harvest. In Sian and elsewhere several faculty returned to their institution first for our visit. Museums were visited in these cities as well as in Tientsin, Anyang, Chengchow and Canton. A prehistoric site of late Pleistocene age, which was especially prepared for our visit, was seen at Tsingsun, above the Fen River (Shansi). At the village nearby we visited a children's school and were shown the well-equipped dispensary by the young woman who was the "barefoot doctor." Neolithic sites were seen near Sian (Ban-Po) and near Chengchow (Ta Ho); in each instance parts of the excavated sites were roofed over and enclosed by large, well-constructed buildings and the major archeological features

were well labelled and explained. The quality of excavations and the efforts made at preservation of these and other, more recent archeological sites we saw, were the most impressive. Such efforts are altogether too rare in this country, as well as elsewhere (I know of only one early man site in East Africa which has been preserved in a comparable manner).

At Chengchow the delegation also visited the Ch'iliyin commune and the splendid Museum of the Yellow River. The extraordinary, successful efforts to control and harness the waters of the Yellow River unquestionably rank as one of mankind's major accomplishments. In Nanking seeing the new and first bridge across the Yangtze was another highlight of the trip. At Shanghai we were entertained by music and dance at the Children's Palace, visited the zoo and workers' new housing projects and saw the Industrial Exhibition as do most visitors to China.

Before leaving China we were fortunate to be able to visit Kweilin in the magnificent karstic country of Kwangtung province. A nearly day long trip down river by excursion boat afforded us a unique opportunity to view the scenic landscape so familiar in Chinese art, as well as to obtain some idea of the kinds of situations from which *Gigantopithecus* remains have been recovered.

Throughout China we met with the same outward friendliness, warmth and hospitality that has so impressed everyone who has visited there. There was great concern for our comfort and convenience and our hosts everywhere did their utmost to assure that we had an opportunity to appreciate their monumental strides forward in a difficult world situation, and in spite of a trying period of internal political dissent. On the other hand, it was often recalled to us, and perhaps especially to me in my role as spokesman, that the Chinese felt dissatisfaction, anger and hurt at the failure of our government to offer formal diplomatic recognition to theirs (a particularly sensitive matter as the Philippines recognized the PRC at the very time of our visit). So long as this situation prevails it will limit and hinder more close scientific exchange and cooperation. Hopefully it will not always be so for there is much to be done and much to learn, together.

Did you Know?

A University of California research team says man's activities could have a radical effect on the earth's climate, ranging from making the world warmer to making it cold enough to set off a new ice age.

The team's computer experiments show that current efforts at widespread clearing of tropic jungles could cause temperatures to drop and rainfall to decrease around the planet.

Since jungles absorb the sun's warming rays and keep the atmosphere moist, clearing jungles would reflect the sun's energy back to space and cause less recycling of moisture warming.

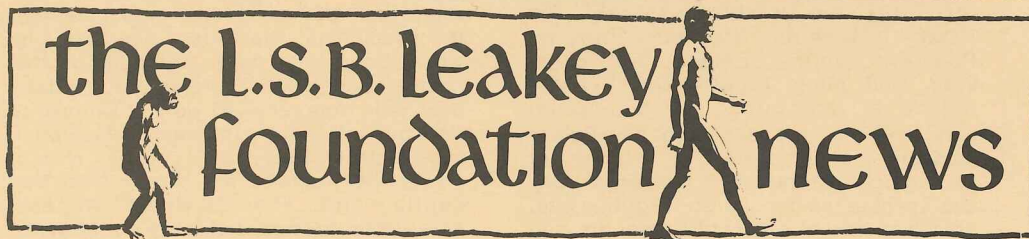
At the same time, if the pace of fossil fuel burning (coal and oil) continues to rise in the next century, many scientists believe the pileup of carbon dioxide in the atmosphere would double, causing temperatures to rise by at least 2.5 degrees.

Were it not for that warming influence, jungle clearing might well be enough to trigger expansion of the polar ice caps and start a new ice age.

Soviet scientists may have found the first Paleolithic musical instruments of their kind ever discovered. Mammoth bones dating back 20,000 years recently found in excavations in the Ukraine, at Mezin, could be percussion instruments, say the Soviets. In addition, a mammoth-tusk ivory was also found which could be a "castanet bracelet."

It was the way the bones were deformed, that led investigators to conclude that they were crude musical instruments.

Previous evidence of the use of music generally, has been dated at roughly 5,000 years ago, although many paleontologists believe musical form probably existed much earlier.



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