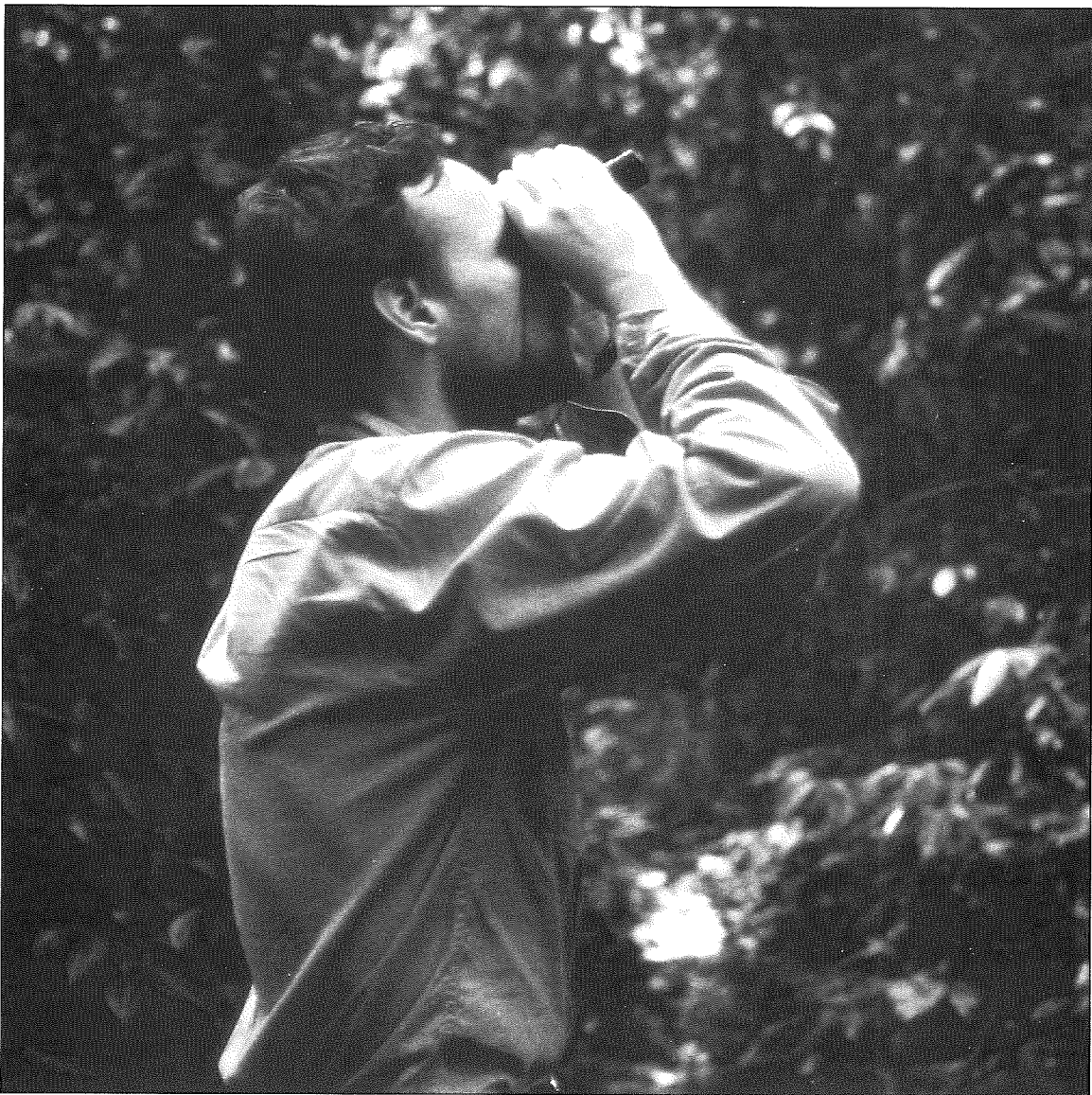


AnthroQuest

Research Related to Human Origins, Behaviour and Survival



Number 48

The L.S.B. Leakey Foundation

Fall 1993

The L.S.B. Leakey Foundation was established in 1968 by a group of eminent scientists and informed lay people who recognized a critical need to strengthen financial support for new multidisciplinary research into human origins, our evolving nature and environmental future. It was named in honor of the man who has become known as the "Darwin of pre-history," Dr. Louis S.B. Leakey. The Foundation sponsors:

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Table of Contents

AnthroQuest

Fall 1993 Issue

FIELD REPORT:

BROKEN BRANCHES AND CURIOUS CALLS:
USING INDIRECT INDICATORS TO STUDY THE
ELUSIVE ORANGUTAN 1

FRAGMENTS, FLAKES AND SHERDS:

RISKY FUNDING 4
UBEIDIYA, ISRAEL 5

SPRING 1993 LEAKEY FOUNDATION GRANTS 6

NEW LEAKEY FOUNDATION GRANT DEADLINES 8

FIELD REPORT:

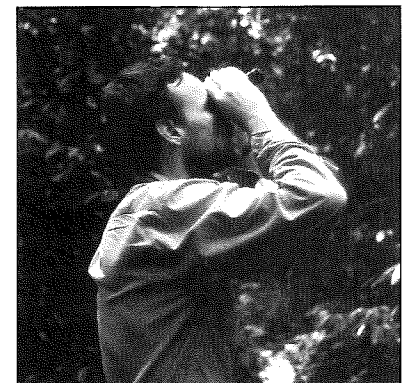
SIXTEEN YEARS OF RESEARCH WITH THE ACHE
HUNTER-GATHERERS 9

FRAGMENTS, FLAKES AND SHERDS:

MURPHY'S LAW HARD AT WORK IN THE FIELD 11

BOOK REVIEWS 12

EVENTS 14



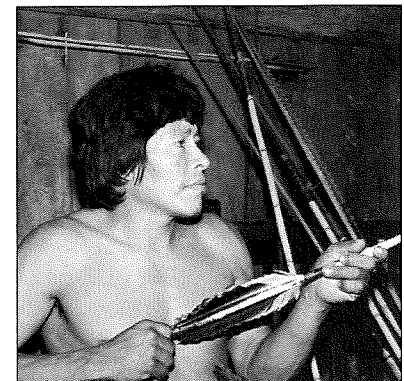
ERRATA

In the Spring issue of Anthro-quest, we published an article by Kevin Hunt entitled, "The Mosaic Lifeway of Our Australopithecine Ancestors: Piecing in Some Fragments From The World of the Chimpanzee." Unfortunately, the article went to press without the descriptions of the figure illustrations. We apologize for this oversight. Below are those descriptions.

Figure 1. Chimpanzees find an arm-hanging bipedalism to be very useful during arboreal feeding. Note how close chimpanzees can bring their shoulders to their midline, even moving them part way behind the neck. Courtesy R.W. Wrangham.

Figure 2. Rear view of schematic torsos of a human and a chimpanzee. The shape of the chimpanzee shoulder blade allows the shoulder to move closer to the midline when the arm is raised above the head during arm-hanging. The shape of the chimpanzee torso approaches the optimum teardrop shape for arm-hanging, whereas the human torso is more barrel-shaped. Note that the socket for the humerus (upper arm bone) is angled upward in the chimpanzee.

Figure 3. Front view of the torso and pelvis. Note the "cone-shape" of the chimpanzee and australopithecine torso, the latter reconstructed by Peter Schmid. It is not known how many lumbar vertebrae *A. Afarensis* had. She is reconstructed with a human (5) rather than ape (4) number Schmid gave her, but she most likely has one more than that.



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Broken Branches and Curious Calls: Using Indirect Indicators to Study the Elusive Orangutan

by Beverly McLeod

Like detectives at a sylvan crime scene, the tools of the trade for Carel Van Schaik and his Indonesian colleague Azwar are a compass, some measuring rope, and binoculars. They walk slowly along a straight line, scanning the treetops for the large sleeping platforms that orangutans fashion by breaking off dozens of branches and bending them over. It takes van Schaik and an assistant about 6 hours to cover a straight trail a mile long, looking up 30 to 150 feet into the trees to spot the nests -- dark circles against the sky, as large as 5 feet across -- and to record the location and stage of decay of each.

During the past three field seasons at Gunung Leuser National Park on the northern end of the island of Sumatra, van Schaik, a member of the Leakey Foundation's Scientific Executive Committee and an associate professor of bioanthropology at Duke University, and Azwar, a graduate of Indonesia's National University in Jakarta, pioneered the use of this transect line method to estimate the orangutan population in the reserve. By measuring the perpendicular distance of each nest from the trail, they were able to plot the distribution of nests and calculate the area in which the nests were counted. Repeating the process in various locales enabled them to estimate the orangutan population density in different environments.

Orangutan Census

Previous studies by Indonesian researchers had revealed that a typical orangutan

makes about 1.8 nests a day -- adult males make fewer, females with infants make more -- and that each nest disintegrates after about 3 months. Like a census taker who seldom finds the residents at home and resorts to counting beds, van Schaik calculated how many orangutans live in the park using nest counts as an indirect indicator.

Fossil remains of orangutans have been found throughout southeast Asia and as far north as southern China. But now the orangutan -- "man of the forest" in Malay language -- survives only in Indonesia, and only where tropical rain forests remain relatively undisturbed by logging or agriculture. Because orangutans are so wide-ranging, obtaining accurate population counts and densities has frustrated researchers for decades. Van Schaik estimates that at least 5,000 orangutans, in two separate populations, live in the national park. The only other sizable extant population of orangutans lives on Borneo.

Pleistocene Hunters

While there are at most 20 - 40,000 orangutans alive in the world today, it is a miracle that the species has survived at all, says van Schaik. Orangutans could have met the fate of other large mammal species that began to disappear from the fossil record 40,000 years ago and were probably hunted to extinction by Pleistocene-era humans as they fanned across the globe. Orangutan teeth are common in the remains found

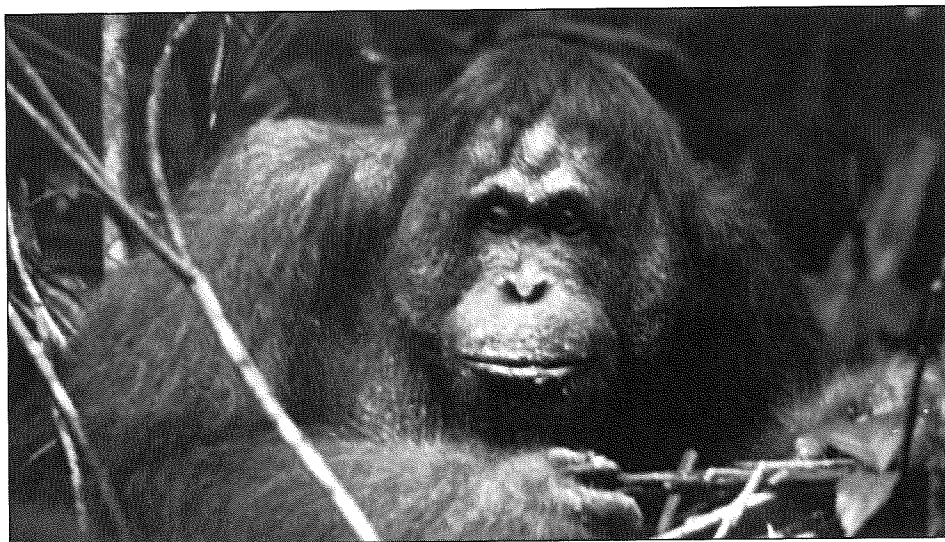
in caves inhabited by early *Homo sapiens* in the Padang highlands in West Sumatra and in Niah in Sarawak. Orangutans have been hunted for food and captured for sale in recent times as well, and have disappeared from many areas they occupied early in this century.

Orangutans are particularly vulnerable to a threat of extinction because they are the slowest breeding primate on earth, says van Schaik. The average female reproduces only every 8 years at most and has only slightly more than 2 female offspring in her lifetime. Orangutans have a low background mortality due to accident or illness, but any additional strain could prove fatal to the species. If their background mortality is exceeded by even 3 percent (by females being killed so their infants can be captured for the pet trade, for example), "the orangutan population will inexorably nosedive toward extinction," says van Schaik. Should this happen, it could take decades or centuries to restore the population density to current levels.

Disappearing habitat

Orangutans are also vulnerable because they have narrow habitat requirements, as van Schaik found in conducting the census. He and his colleagues measured the rainfall and soil pH, and counted the fruit trees and fallen fruit in the swaths produced by the transect line method. This information enabled van Schaik to compare nest counts between areas at different altitudes, with different food sources, and with different

Field Reports •



histories of timber exploitation. He found that orangutan population density decreases with altitude; a square kilometer can support 5 individuals in some lowland forests, 2 individuals in hill forests, 0.5 individuals between 1,000 and 1,500 meters, and virtually none at higher altitudes. Orangutans are less likely to live in forests that have been logged, even if the ecological disturbance seems minimal. And although they have a diverse diet, they depend on soft-pulp fruits.

The bad news for orangutans is that they are in direct competition with humans. "The orangutan prefers exactly those habitats that are most likely to be converted for permanent agriculture -- fertile lowland soils, usually close to rivers," says van Schaik. The national park consists mostly of highlands, unsuitable not only for orangutans, but also for the gibbons, tigers, elephants, clouded leopards, fishing cats, and hundreds of other species of mammals and birds that are native to the area. "The park boundaries are currently drawn but do not reflect ecological boundaries," says van Schaik.

Moreover, human population pressure threatens even the lowland areas of the park and its environs; illegal logging is common, and large areas of pristine forest lands are being cleared for rubber and oil palm plantations. Overall, Sumatra has one of the highest deforestation rates in the world.

Mutual Dependence

Van Schaik first came to Sumatra in 1976 as a plant ecologist to study Indonesia's 30,000 plant species. He points out that the rain forest and the orangutan may be mutually dependent for their survival. Orangutans eat parts of 280 different plants, including the fruits of 200 species, and disperse the seeds widely in their droppings, helping to maintain the diversity of the forest. If the orangutan disappears, the forest itself may be threatened.

Orangutans are extremely sensitive to habitat disturbance; their population density decreases to a half or third in selectively logged forests. Logged or secondary forests differ from pristine forests in ways that may make them less hospitable to orangutans. Logging alters the

vegetation mix of the forest, and may decrease the fruit species the orangutan prefer. The removal of trees also changes the physical structure of the forest, making it more difficult for orangutans to move through the treetops. It is also possible that the mere presence of humans and accompanying noise is sufficient to drive orangutans away, especially in areas where orangutans have been hunted.

Conservation Measures

Van Schaik recommends that the Indonesian government sponsor routine census of the orangutan population using the transect line method to record nest counts. Such censuses could serve as an early warning system for both the viability of the species and the health of the rain forest itself.

The good news to come out of van Schaik's census is that there are some lowland areas adjacent to the national park that could be annexed to expand the suitable habitat for orangutans, a recommendation he has made to the Indonesian government. The knowledge gained about the orangutans' dependence on soft-pulp fruits can also be used to identify other sites in southern Sumatra where the species could survive if reintroduced.

Human Origins Research

Orangutans deserve protection not only because they are an endangered species, but also because, as van Schaik says, "as great apes, orangutans have special significance for the study of the evolutionary origin of hominids and humans." Primate behavior has interested van Schaik since his first Sumatra sojourn 17 years ago, when he and his fiancée traveled from their native Holland to study the social behavior and diet of

macaques and orangutans for their masters theses. Although his attention in the intervening years has focused on conservation, van Schaik now plans to turn to a study of orangutan relationships.

Inferences about the evolutionary blueprint for human male-female relationships have often been drawn from comparisons to other living primate species. In the past, presumptions about sexual dimorphism and male dominance in early humans were based on references to baboon society, since baboons occupy a savanna habitat thought to be similar to that in which *Homo sapiens* evolved.

Van Schaik argues that, while such referential studies are valuable, he prefers a strategic approach that makes predictions about human origins based on general laws of primate behavior. Such a model can only be derived from a good descriptive base for all the great apes. But there is a dearth of information on the social structure of orangutan groups, compared to the wealth of knowledge about gorillas and chimpanzees, says van Schaik.

Males, Females, and Infants

Van Schaik plans to investigate male-female interactions in the hope of solving the puzzle of infanticide avoidance among orangutans. Because primates have a slow life history and long interbirth interval, infanticide represents a significant cost to females and significant opportunity for males if they can re-impregnate the mother. Chimpanzee society has regulated these competing interests with a castle-wall type structure, in which males patrol the borders of the territory, protecting females and infants inside from

threatening males outside. Gorillas have developed a harem-type system, in which females stay in close proximity to a dominant, protective male.

But orangutans are solitary creatures; males do not encircle females protectively nor associate with them for long periods. Infanticide would seem a greater threat, but van Schaik does not believe that the rate is higher among orangutans than other primate species. The puzzle is why.

During his recent trip, van Schaik discovered an area he calls "orangutan heaven," a swamp forest with 7 - 10 orangutans per square kilometer, a population dense enough to study interactions among individuals. There, van Schaik plans to observe who goes where, and who stays near whom.

But he suspects that the organization of the group in space does not tell the whole story. The spatial picture may appear chaotic, and the ranges of individuals may not correlate with their social networks. Van Schaik speculates that, as with other wide-ranging species that cannot depend on physical proximity for communication -- whales and birds, for example -- orangutans may express and maintain social order using vocal rather than visual means.

Throat Sacs and Lighthouses

Van Schaik plans to record and analyze the low booming calls that big adult male orangutans emit with their inflated throat sacs. They often call in the early morning and late evening, and can be heard over a mile away. Females can surely recognize the voices of individual males, says van Schaik, and can distinguish friend from foe. The calls of the male with whom a

female has a relationship, and who is a potential protector, probably serve as a beacon for her, a vocal lighthouse to orient her to a safe haven should danger appear.

Van Schaik will track individual females and observe how they respond to the calls of individual males over a long period of time and in different circumstances, in an effort to show why orangutans differ from chimpanzees and gorillas in their patterns and modalities of social communication. Filling in this missing piece of information about the great apes will contribute to a more accurate general model of male-female behavior for all primates, including humans.



Fragments • Flakes • Sherds

Risky Funding



One of the great challenges in grant-making is to accurately judge whether a risky project is worth funding. The Foundation's Scientific Executive Committee (SEC) often finds itself faced with very well-written and well planned research proposals submitted by eager doctoral students looking for new sites and research opportunities. The SEC has to decide whether the assumptions in the proposal are accurate ones. Our scientists frequently have to ask the following questions: Does the museum collection really have the fossils needed for the study? Will the hunter-gatherer group be where it has been sighted in the past? Will the student be able to find and habituate the primate study group?

In the fall 1992 granting session, the SEC faced just such a decision. The foundation received an application from Shawn Lehmann, a Ph.D. candidate at Washington University, St. Louis. Mr. Lehmann proposed a study involving the diet and behavior of a population of Venezuelan black-headed uakari. The SEC was not convinced that Mr. Lehmann would be able to find the population, and doubted that the population would be habituated even if he was fortunate enough to find the Uakari in the jungles of Venezuela. In the end, the Foundation's SEC agreed to take a risk and give Mr. Lehmann the funds required to prove that the study group was both accessible and habituated. Mr. Lehmann's findings reinforce the importance and potential benefits of taking this type of funding risk.

In March, 1993, Lehmann conducted a survey of Humboldt's black head uakari (*Cacajoa melanocephalus melanocephalus*) in the southern region of Amazonas, Venezuela. He was able to observe four groups of black head uakari, with group sizes ranging from four to twenty animals. None of the groups sighted were shy around the observer. Of the largest group, he reports counting 17 adults and 3 juveniles all of whom were foraging in a patch of *Mauritia flexuosa*. He was able to observe three adult males forage in this patch for 31 minutes and reported that he observed a variety of positional behaviors, including suspensory behavior dominated by hindlimb suspension. In conclusion, Mr. Lehmann reports the following:

"The black-headed uakari is thought to be distributed in the upper Rio Orinoco-Brazo Casiquaire basin. Lack of evidence from sightings along the Rio Negro and Brazo Casiquaire leads me to conclude that hunting may have eliminated this primate from much of its range along these rivers. The surviving southern Amazonas population may be limited to forests between the Rio Baria and Rio Manipitari. Although this area includes the Park Nacional Serrania de la Neblina, no surveys of the primate populations in this park have been conducted recently. As a result of my survey, a study site on the Rio Baria has been located and a longitudinal study of the feeding ecology and ranging patterns of the black-headed uakari is planned. This

study will be the first of its kind on the black-headed uakari."

FUNDING STUDIES AT RISK

Louis Leakey believed that there was an enormous amount about human evolution which we can learn from the study of the great apes and living hunter-gatherer societies. The problem is that both the great apes and hunter-gatherer groups are study populations whose very existence are at risk. Thus, when the foundation evaluates proposals whose purpose it is to find and begin to study one of these at-risk groups, we often decide that, if the proposal is well-written and the project well-designed, it is a funding risk worth taking. The same is true for fossil-bearing sites which are somehow endangered. Following is an example of a project which was worth the risk, but whose timing may be just a few years too late.

In a hand-written report from Palu, Sulawesi, Indonesia dated May 1993, Michael Alvard outlined for the foundation the problems encountered with his project Rain Forest Foragers of Sulawesi, Indonesia: Exploratory Research. Of the three groups Mr. Alvard set out to study (the Tauje, Topeng Buni and Bunggu communities), he had the following to report:

"While previous reports from biologists, government workers and locals attributed full time foraging status to these groups, this investigation has revealed a consistent, current subsistence pattern of mixed swidden horticulture, in combination with a government subsidized move towards cash crops,

especially coconuts and cocoa...While the current situation is one of rapid cultural change for these groups, informants report that before being settled they led a somewhat mobile existence, with a diet supplemented by forest-provided carbohydrates. The extent of the reliance is difficult to estimate from interviews, however."

Of the Topeng Buni, Mr. Alvard reports, "At contact, the group was wearing bark cloth and made fire by wood friction. They hunted pig, monkey (macaques), anda, babirusa, deer, boar, and a variety of birds using spears, dogs and blowgun technology. Fish and fresh-water

eel were also important. The area into which the Topeng Buni emerged was the fourth in a series of transmigration settlements along the Budong Budong River, totaling approximately 2,000 families. The group was quickly assimilated into the project and provided with houses, cloths (their bark clothes were taken away), land, cocoa and coconut seedlings, and goats and cows. Many of the men work on a rubber tree plantation. It is difficult to imagine that only four years ago these people had no contact with the outside world."

In conclusion, Mr. Alvard offers the following statement of explanation, "Part of the

confusion in having identified these groups as hunter-gatherers may result from the Indonesian view of Suku Terasing ("isolated tribes"). Such groups live out of the reach of the government and often do not grow rice. It is perhaps perceived by many that if one does not have a wet rice garden, one has no garden at all."

Ubeidiya, Israel



In a recent report on his project "Excavation, Replication and Technological Analysis of Lithic Assemblages from 'Ubeidiya, a Lower Paleolithic Site in Israel", Dr. John J. Shea, SUNY - Stony Brook, came to the following conclusions about this extremely important site.

"The Lower Pleistocene site of Ubeidiya is located in Israel several kilometers south of the Sea of Galilee in the Jordan Valley. Dating to around 1.4-1.6 Ma, Ubeidiya is the oldest archaeological site outside of Africa. Standing as it does in the northernmost extension of the East African Rift Valley, the Levantine "gateway" to Eurasia, Ubeidiya is an ideal place in which to investigate the adaptive

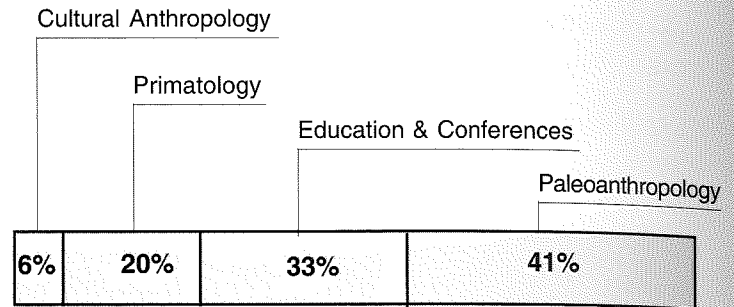
radiation of *Homo erectus* from tropical Africa into temperate Eurasia."

"What can we say about early hominid activities at Ubeidiya? Ironically, it is easier to say what Ubeidiya is not. It is almost certainly not a 'home base' of the kind envisioned by Isaac (1978). Living permanently by the shore of a lake like that near Ubeidiya, one that was demonstrably frequented by felids, hyaena, and canids, would have been a settlement strategy which can only be described charitably as 'fitness-reducing'. There are some rather dense concentrations of stone tools in some of the fluvatile beds of Ubeidiya that one could possibly see as stone 'caches' like those

inferred by Potts (1988) for Early Stone Age sites at Olduvai. However, most of these are clearly in sedimentary contexts that have experienced a significant amount of hydrodynamic sorting. The most parsimonious view of the Ubeidiya sites is that they represent 'palimpsests', locally-dense accumulations of stone tools and bones in places that were repeatedly visited by hominids (Stern 1991). The goal of future research on early hominid behavior at 'Ubeidiya must include efforts to connect those activities occurring at the lakeshore to hominid range-utilization strategies in other parts of the ancient landscape."

Grants •

**Total Grants
Spring 1993**
from Grant Budget
and from Designated Gifts
\$201,089



Cultural Anthropology

Kelly, Robert (U Louisville)	\$5,075
Ethnoarchaeology Among the Mikea of Southwestern Madagascar	Madagascar
Mutundu, Kennedy (Washington U)	\$7,250
Ethnoarchaeology among the Mukogodo of Northern Kenya	Kenya

Paleoanthropology

Barham, Lawrence (Oxford U)	\$3,500
The Re-Investigation of Mumbwa Caves	Zambia
Chen, Xingbin (Yale U)	\$4,500
Modeling the Biomechanics of Hominoid Mandibles: a 3-D Finite Element Study	USA
Harris, Jack (Rutgers U)	\$5,000
Meneses, Paola (Rutgers U)	
Paleoanthropological Studies in Mozambique	Mozambique
Kamau, Robert (U Utah)	\$5,480
Paleomagnetic Studies on Hominid-Bearing Plio-Pleistocene Deposits in Northern Kenya	Kenya
Koufos, George (Aristotle U-Thessaloniki)	\$4,500
Excavations for Hominoids in Late Miocene of Northern Greece	Greece
Mania, Dietrich	\$10,000
Fossil Man from Bilzingsleben - His Culture and Environment	Germany

Ng'ang'a, Patrick (Duke U)	\$8,500
Lacustrine Ostracods and Hydrochemistry from Lakes in Kenya	Kenya
Pinto, Ana (Natural History Museum)	\$2,681
Taphonomy of Middle Pleistocene Amphibian Remains from Atapuerca	Spain
Powell, Joseph (Texas A&M U)	\$3,000
Dental Variation and Affinities Among Middle Holocene Human Populations in North America	USA
Price, Heather (UC Berkeley)	\$1,254
Context and Variability in Upper Paleolithic Visual Imagery	France
Reed, Kaye (SUNY - Stony Brook)	\$2,899
The Paleoecology of Makapansgat and other African Pliocene Hominid Sites	South Africa
Rink, Jack (McMaster U)	\$5,500
Coupled ESR/U-Series and TL Dating of Archaeological Sites in Europe	Spain, Moldavia Crimea
Rogers, Michael (Rutgers U)	\$5,000
A Study of ESA "Mini-Sites" at East Turkana	Kenya
Sahnouni, Mohamed (Indiana U)	\$3,600
Continuation of New Archaeological Investigations at Ain Hanech, Algeria	Algeria
Semah, Francois (Institut de Paleontologie Humaine)	\$2,500
Javanese Homo Erectus Cultural Behavior: the Ngebung Site at Sangiran	Indonesia

Shea, John (SUNY-Stony Brook) \$3,500
Continued Excavation and Analysis of Lithic Assemblages at 'Ubeidiya Israel

Sherwood, Richard (Kent State U) \$1,500
Internal Morphology of the Temporal Bone of Hominoids USA

Stern, Nicola (La Trobe U) \$6,000
Identifying Individual Behavioral Episodes from Archaeological Traces in the Koobi Fora Formation, Northwestern Kenya Kenya

Todd, Nancy (George Washington U) \$3,500
A New Analysis of Variation in the African Elephas Lineage: Implications for the Biostratigraphical Framework of Hominid Sites Kenya, France

Primateology

Bergeson, David (Washington U) \$3,000
A Study of Prehensile Tail Use in Three Species of Costa Rican Primates Costa Rica

Boubli, Jean (UC-Berkeley) \$5,000
The Behavioral Ecology of the Black Uakari Monkeys in Pico da Neblina, Brazil Brazil

Di Fiore, Anthony (UC-Davis) \$5,000
Socioecology of Common Wooley Monkeys (Lagothrix lagotricha) in Eastern Ecuador Ecuador

Maggioncalda, Anne (Duke U) \$5,000
Suppression of Secondary Sexual Development in Subordinate Male Orangutans USA

Moore, Jim (UC-San Diego) \$6,000
Chimpanzee Ranging and Habitat Use in the Tongwe Forest Reserve, Tanzania Tanzania

Muruthi, Phillip (Princeton U) \$5,000
Sociological Correlates of Parental Care in Baboons Kenya

Rendall, Drew (UC-Davis) \$6,000
The Social Functions of Vocal Communication in Free-ranging Rhesus Macaques Puerto Rico

Watts, David (Duke U) \$4,700
Variation in Male Chimpanzee Social Relationships in the Kibale Forest, Uganda Uganda

Education and Conferences

Anisman, Milton (LA Unified School Dist) \$4,000
STONES & BONES: A Laboratory Approach to the Study of Physical Anthropology for Public & Private Schools, Grades 5-14, Throughout USA, Canada, and Australia

Dong, Zhuan (Indiana U) \$8,500
Dissertation Research into the Peking Man's Subsistence China

Peng, Nanlin (Indiana U) \$8,500
Graduate Study in Archaeology at Indiana University USA

Schick, Kathy (Indiana U) \$4,350
Conference Support for African Graduate Students to Attend SAfA at Indiana University; April 1994 USA

Baldwin Fellowships

Kibunja, Mzalendo (Kenyan) \$8,500
New Fellowship: One year of support to complete PhD in paleoanthropology at Rutgers University under the direction of Dr. Jack Harris

Malyango, Avelin (Tanzanian) \$8,500
New Fellowship: First year of support to pursue an MA in physical anthropology at New York University under the direction of Dr. Terry Harrison

Negash, Agazi (Ethiopian) \$11,000
Continuing Fellowship: Summer research project and second year of support to pursue an MA in prehistoric archaeology at the University of Florida under the direction of Dr. Steven Brandt

Ng'ang'a, Patrick (Kenyan) \$4,800
Partial support to pursue PhD in Geology at Duke University under the direction of Dr. Thomas Johnson

Thiaw, Ibrahima (Senegalese) \$8,500
New Fellowship: First year of support to pursue a PhD in archaeology at Rice University under the direction of Dr. Roderick McIntosh

L.S.B. Leakey Foundation Announces New Grant Deadlines

The Following new deadlines were announced by the Foundation in July 1993:

GENERAL RESEARCH GRANTS:

AUGUST 15 - SEPTEMBER 15

JANUARY 2

Notification the beginning of December and the beginning of May respectively.

Advanced pre-doctoral students, as well as established scientists, are eligible for general research grants. Priority for funding is normally given to the exploratory phases of promising new projects that most closely meet the stated purpose of the Foundation. Although the majority of the Foundation's general research grants to pre-doctoral students are in the \$3,000 - \$7,000 range, larger grants, especially to senior scientists, are also funded up to \$12,000.

SPECIAL RESEARCH GRANTS

- FELLOWSHIP FOR GREAT APE RESEARCH
- FELLOWSHIP FOR THE STUDY OF FORAGING PEOPLE
- PALEOANTHROPOLOGY AWARD

PRE-APPLICATION: OCTOBER 15

APPLICATION: JANUARY 2

Notification the beginning of May

Special larger awards are available to post-doctoral students and senior scientists for the study of great apes, research into hunting and gathering, or multidisciplinary paleoanthropological research. Potentially these awards may be renewed for additional years; subsequent years are not guaranteed but are based on the results of previous years.

FRANKLIN MOSHER BALDWIN MEMORIAL FELLOWSHIPS

JANUARY 2 for the following academic academic year. Notification the beginning of May

This fellowship is awarded to Africans who seek to complete an advanced degree in anthropology at a major institution. This award is limited to a two-year program of advanced training towards an MA, PhD or equivalent. Priority is given to students involved in disciplines related to human evolution. The fellowship is limited to \$8,500 per year for **non-tuition** expenses only, for a total of \$17,000. Successful candidates are eligible to apply for limited travel and/or summer research funds for up to an additional \$3,000. **Additional dependent support is not considered.**

Sixteen Years of Research with Ache Hunter-Gatherers

Professor Kim Hill, University of New Mexico, recently submitted the following conclusions from his sixteen years of work with the Ache of Paraguay:

"In 1992 and 1993 I returned to the Ache of Paraguay to conduct research on life history and social organization. My research with the Ache and other hunter-gatherers has spanned 16 years including 9 Leakey Foundation grants, since my first in 1981. During that time, that Ache became one of the best known hunter-gatherers in the scientific world, with nearly 40 published articles describing different aspects of their behavioral ecology. I went back to do final data collection for a book on Ache life history, which should appear next year, and to begin a project analyzing the way local ecology had influenced the size, composition and movement patterns of Ache bands prior to outside contact. During my field sessions I collected data on nearly 100 Ache pre-contact forest camps including location, duration, size and membership composition. In combination with the existing information on the Ache, this new data will provide the most complete picture of the ecology of social organization for any group of hunter-gatherers ever studied.

In July of 1993, as I sat in the airport in Asuncion and prepared to return to the U.S. I reflected on 16 years with the Ache, a period which has seen some important changes but also surprising continuity. The people that I thought might someday soon forever cease to be foragers are as enthusiastic about forest life as the day I met them. The

younger Ache have become increasingly sophisticated and informed about the world and its workings, but meanwhile, the past 2-3 years has seen a return to emphasis on forest life by the Ache and an increasing interest in tropical conservation.

The Ache, who lived as nomadic forest hunter-gatherers, were first contacted by outsiders in the 1970s and settled on reservations. They were strongly encouraged by missionaries and government agents to take up farming and wage labor and abandon their forest life. Though the Ache were essentially forest people when I first met them after their initial contact, they soon began to develop split cultural personalities. Throughout the 1980s I watched as scan sample data at settlements showed the reservation population go from spending nearly 50% of its time living in the forest to a low in 1988 of only slightly more than 10% of all days on overnight trips hunting and collecting forest products. That was the year the Ache received legal title to their land and decided to sell off all the valuable trees for quick cash. During that year everybody wore new clothes and threw lavish parties with cases of soft drinks and Paraguayan foods. They bought a new car stereo (with no car), some big speakers, and paid to have 12 volt batteries charged each week so they could blast out Paraguayan country music every night. By 1989 the party was over. People went back to foraging, working at subsistence horticulture and increasingly tried their hand at cash crops. Nevertheless, cotton, tobacco, soy and a variety of other schemes brought little better than break even payoffs for year. Ache

families borrowed money for seeds, pesticide, and provisions only to discover that their final profit was barely enough to pay off the debt. Young men went out to work wage labor and came back with nothing more impressive than a used piece of clothing.

By 1990 something else was happening. A small group which had lived on the edge of the Mbaracayu forest reserve began to grow rapidly as the Ache searched for proximity to un hunted forest lands. Groups began to go back out into the forest again, first every weekend, then for 2 or 3 weeks at a time. Finally in 1992 I discovered one band of 7 families that was living in the forest during my entire 6 week field session. A 1992 survey of net worth showed that most Ache families had no more accumulated wealth (clothing, tools, housing, radios, etc.) than they had in 1977 when I first began working with them. Not a single working radio or bicycle was to be found, shotguns were few and being rapidly abandoned as men found that shot was too expensive and maintenance of equipment required long trips to cities. Bow and arrow hunting, while more work, was almost as effective as shotguns for a variety of game, and silent so that neighboring outside groups (Paraguayans and Mennonites) did not detect hunting on their private land.

Then, in 1993, the Ache took control of a new piece of forest land down river from their current reservation and nearly 12,000 acres in size. The land had been acquired as part of a deal worked out by the Nature Conservancy and the Fundacion Moises Bertoni when they converted the heart of traditional Ache territory into the

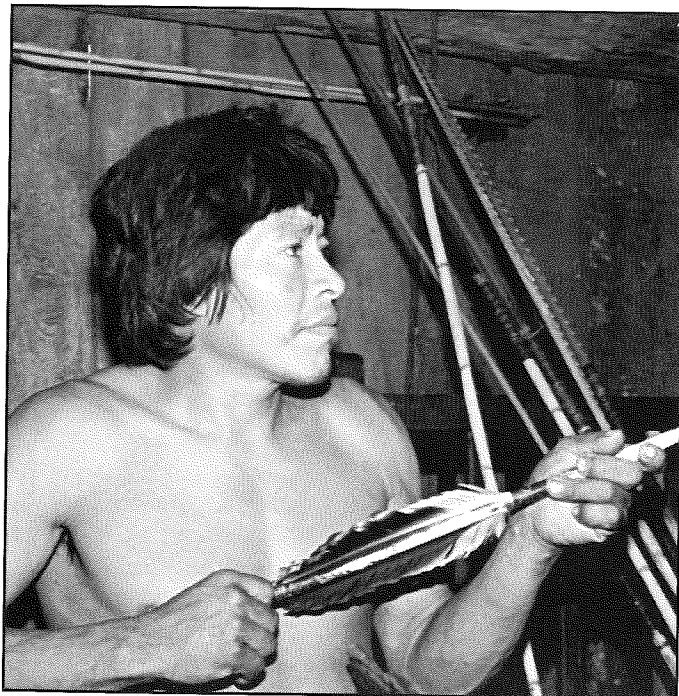
Field Reports •

Mbarabayu Forest Reserve. The core group of people who had lived at the main Ache reservation settlement for nearly 15 years began to splinter. Kuchingi, one of our most consistent companions during the studies of the early 1980s took 3 families off into the forest near the new reservation boundary and announced that they would not return. Chevungi, another longtime companion, whose first son is named for me, took 4 more families to the far end of the reservation downstream to live "where game is abundant and outsiders never come to bother us." Dozens of families moved to the new settlement near the Mbaracayu forest reserve where they were guaranteed exclusive use rights by the conservationist groups managing the reserve.

The Ache began to change their goals as well. Young men who had badgered me to loan them money for cotton production in the 1980s were no longer interested in cash crops. "We will

never have money" they said. "You people need lots of things", "Why are you so happy with lots of things" they joked with me. "We need to plant some manioc to feed our children, but we are happiest in the forest". For the first time people talked about health and nutrition rather than radios and bicycles. "If we can eat well and stay healthy, then we are happy," one of the Ache leaders told me, "We have learned that it is not easy to get money and have things, and we are Ache, we will laugh if we are happy and strong". The Ache also lamented the loss of the forest. I took two community leaders on a trip through the entire area that used to be the Ache home range in the 1960s. Less than a third of it is still forest. "Brazilian settlers think of nothing but cutting all of the forest...They took the land from us and now they own it. But what they do is very sad. We must keep our own land as forest if we want to hunt."

I don't know if the current "back-to-the-bush" movement will be a blip in Ache time or represents a permanent reevaluation of the Ache situation after trying other ways. I don't know if Ache cultural history will make them more enthusiastic about forest conservation than their farming and ranching neighbors, or if that is just a romantic notion. I do know that people seemed happier this year than I had seen them in several years and that in a tribal meeting I heard the community leaders insisting that they would not sell lumber from their new piece of land, nor cut it down for farms or pastures. I had come to collect data from informants living at reservation settlements but eventually spent several days in the forest with two different Ache bands who insisted that I had not been to the forest enough lately with them. We ate honey, palm larva, armadillos, coatimundis, pacas, palm fruits, and a variety of other forest products. We made plans for next year when the



Jungle Trek with the Ache!

Would you like the opportunity to observe hunter-gatherers close up and learn about how our ancestors really lived? Would you like to see the Amazon forest with people who know every bird, plant and animal? Learn to track tapirs, eat wild forest foods, and get to know the Ache as people without the fake feather headdresses, cheap handicraft sales, and staged dances common to most Amazonian tours. Help the forager lifestyle to remain a viable alternative while supporting tropical conservation and the Ache tribe through ecotourism. Kim Hill, a Professor of Anthropology with many years experience in South America, will be taking two small groups on trek with the Ache in 1994. For more information write: Ache, 429 Live Oak Lane, Albuquerque, N.M. 87122.

• Field Reports

peccaries will be fat and talked about the bamboo which will soon be full of white grubs.

I thought about life in the forest, as I waited at the airport in Asuncion. I thought about the biting insects, poisonous snakes, and jaguars that eat people. I thought about sweet wild honey and fat capybaras. Mostly though, I thought about the Ache and their journey. For me the Ache will

continue to be close friends, but also subjects of study. For all of us interested in human origins, the Ache continue to provide an opportunity to study foragers as they make the slow transition to sedentism and the use of domesticated resources. Why did our ancestors finally decide to give up the foraging way of life? How long did it take? 16 years is a blip in evolutionary time, but for

humans it is a good part of a lifetime./ For me, 16 years with the Ache suggests that the transition from forager to farmer is slow and complicated."

Murphy's Law Hard at Work in the Field

As all field researchers know, their greatest nemesis can be the unavoidable delays which come about particularly when working in Africa. The following is an account of one researcher's many battles with Murphy's Law.

During the 1989-1990 granting sessions, the foundation awarded Daniela Sieff, a Ph.D. candidate at Oxford University, a grant for the project The Relationship Between Food Production and Reproduction in the Datoga Pastoralists of Tanzania. Since that time, Ms. Sieff has diligently been trying to achieve the goals outlined for her project. Following are excerpts from a report submitted by Ms. Sieff describing her seemingly endless battles with Murphy's Law.

"I came out in August 1990, and in fact it took me until Christmas to find a vehicle, have it over-hauled and get it imported into Tanzania. I then spent the first couple of months of 1991 doing a preliminary demographic survey of the villages along the side of Lake Eyasai, in order to establish which village would be the most suitable for my work... Having established the current demographic profile of these villages, a settlement called "Gidimiland" (the place of the palms) was chosen in which to base the project. There were 32 households in Gidimiland (March,

1992), making it the largest (and earliest established) village in the area... Working with the Datoga during March and April is relatively difficult as it is the rainy season, and although rainfall was very low in 1991, it is nevertheless the time when the Datoga hold dances."

"During June (91), I was unable to collect any data at all, as my assistant got into a fight at the local market and spent most of the month either in jail or in a traditional court. I did try to find somebody else as an assistant, but there were no other Datoga with either sufficient language skills or sufficient education to understand what I was trying to do."

"When I returned to Gidimiland in July (91), it became clear that the low rainfall of 1991 was going to present a serious problem. Most seriously, the wells in Gidimiland began to dry up. Although the Datoga are by tradition semi-nomadic, when they find an area with water and grazing they tend to build settlements which they inhabit for a number of years... I had relied on this fact in designing my project, as I planned to follow the women and families over the course of a full year... However, with the low rainfall of 1991, Gidimiland was gradually abandoned... and I was left looking for a new village in which to work."

"During August (91), we located another village "Udachotech"... I decided to base myself in this village, which meant that research time was lost. I started in Udachotech with the detailed demographic data collection, but having had more problems with my vehicle and with my assistant, who disappeared on safari without warning, the work progressed slowly... By September (91) I felt that the original project plan needed reassessing... Consequently, I spent October and November rethinking and redesigning the project."

"The new questionnaires were given a trial run in December 1991 and I started the revised project in January 1992, planning to carry it out for 12 months. The first two months of data collection went well... However, in March I broke my collarbone rather seriously which required an operation, thus I was flown back to England. It was April before I could take my arm out of the sling and June before I was able to drive. At that time, I returned to Tanzania and Udachotech. I feel that in order to get the best data collection, I should go until next June (93) to get a full year of data."

We commend Ms. Sieff for her perseverance.

Book Reviews •

A Look at our Neandertal Ancestors

The Neandertals: Changing the Image of Mankind

Author: Erik Trinkaus and Pat Shipman

Published: Alfred A. Knopf, 1993

Price: \$30 Hardcover

The Neandertals are the most recently extinct and paleo-anthropologically best known form of early human. As we usually recognize them today, they lived in Europe and western Asia (from Portugal to Uzbekistan) between at least 200,000 to 35,000 years ago. In fact, research progresses so rapidly on these subjects, that just since publication of this book, wonderfully preserved early Neandertals or their predecessors (drawing the line is difficult) were reported in Spain at over 300,000 years ago, while Portuguese material may date to as young as 30,000. Interpretations of the lifeways of Neandertals and their relationships to modern humans are also the subject of much argument: does their Mousterian culture tell archeologists that they hunted large mammals or just scavenged them?; did they bury their dead, or are these supposed graves wrongly interpreted?; are modern Europeans the descendants of Neandertals (possibly interbreeding with more modern "invaders"), or did they die out without trace? It is questions like these that make the Neandertals so fascinating to specialists and the lay public alike, and provide a wide audience for books like this.

Trinkaus is one of the leading specialists on Neandertal fossils, having intensively studied and changing ideas about the Neandertals. The book proceeds historically, with a first chapter which sets the scene of early nineteenth-century natural history, from Cuvier to Darwin. Successive chapters concentrate on 10-20 year intervals from 1856 to 1991,

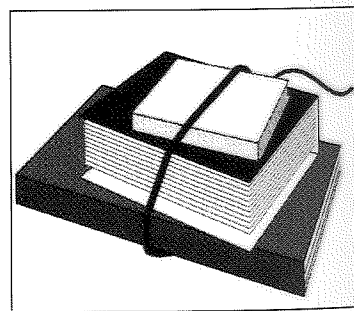
providing a narrative of the main paleoanthropological (and related) events of each phase. The major personalities get extensive treatment, placing them in social and educational context, often quoting important passages from their writings. I was pleased to learn more about the backgrounds of such friends and colleagues as Sherry Washburn, Clark Howell, and Fred Smith, among others. At times this approach leads toward overkill: one chapter spans work at Zhoukoudian (Chou-k'ou-tien, home of "Peking Man"), Dart and Broom finding *Australopithecus*, the Mount Carmel excavations of Skhul and Tabun Caves, and a host of other specimens. What a time the 1920's and 1930's must have been for this burgeoning field!

When the story approaches the present, matters begin to turn sticky. Extensive discussions in the third person of the developing viewpoints and major advances made by the senior author of the book approach self-congratulation. It is necessary to discuss Trinkaus' work, as he is one of the major players, but to treat him in the same vein as other scholars leaves the reader wondering if he simply left the room at that point, like a professor whose tenure was being decided. The give and take of alternative viewpoints also becomes more polarized, as Trinkaus' preferred scenario of more continuity between Neandertals and (at least some) later humans is emphasized. For example, a long discussion of a 1971 paper by David Brose and Milford Wolpoff just mentions a 1974 rebuttal by William Howells which some of us thought demolished the previous work, rather than being "gently critical". More space could also have been provided for explanation of the several competing views actively being debated in the journals and books of the past few years.

All in all, the benefits of this book far outweigh its faults. It carries the reader up to and in fact

past the early 1993 date of publication—there is a quote from a paper which did not appear until March. New hypotheses about the origin of modern humans based on revised dates and on studies of mitochondrial DNA are explained clearly, and the authors' views are substantiated where needed. A "cast of characters" at the beginning provides a ready reference to the many scholars treated throughout the work, but some active researchers are unaccountably missing: the work of Jeffrey Laitman on Neandertal skull bases and speech is not even mentioned in the text, which refers only to his less active original colleagues. Other important workers are introduced several times, as if the reader might have a very short attention span. A long section of endnotes documents most of the details for interested readers, although a bibliography of selected major references might have been useful as well. Numerous illustrations of fossils and personalities help to enliven a usually sparkling text which holds the reader's attention well. For a good look at what we know about Neandertals, and why, this book is a strong candidate for a weekend's enjoyment.

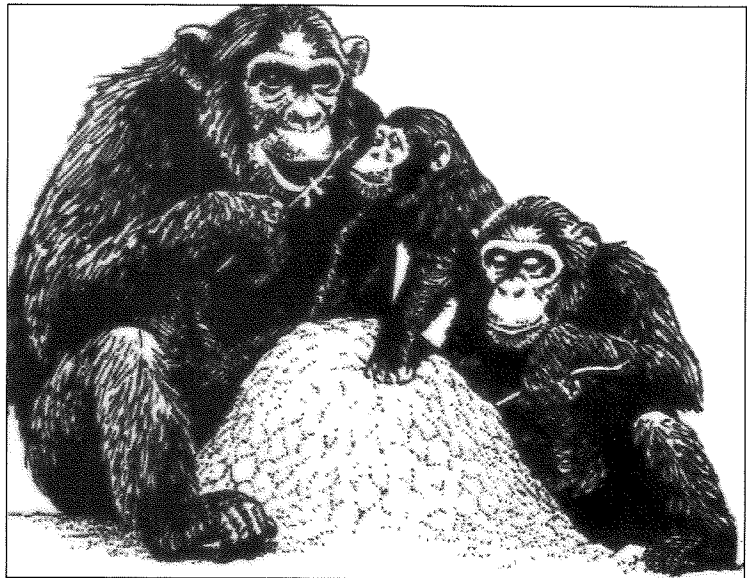
Eric Delson, American Museum of Natural History, New York, and Leakey Foundation Scientific Advisory Board



1994 Great Ape Calendar Announcement

The Foundation is pleased to offer our annual Great Ape Calendar. The calendar can be purchased at your local bookstore or by calling:

Ms. Jeanne Gucciardi
Workman Publishing
TOLL FREE 1-800-722-7202.



Georgina Dasilva Memorial Scholarships

The Primate Society of Great Britain will be offering scholarships in memory of Dr. Georgina Dasilva. One scholarship will be awarded in 1994 and a second in 1995. These scholarships (approximately \$2,250) will be offered to students fitting these requirements:

- A. Are citizens of a third world country where primates occur and
- B. Are studying or about to study for a higher degree (MSc or PhD level) in any subject relevant to the biology and conservation of primates at an institution of higher education in the United Kingdom.

Students wishing to be considered should submit a full Curriculum Vitae, a statement (500 words or less) describing how their proposed degree course will be relevant to primate conservation in their country; letters of recommendation from an academic advisor in their country of origin; a letter of acceptance from a UK institute of higher education; and a statement of their sources of funding for their higher degree.

Please submit the above information to:
Professor R.I.M. Dunbar, Department of
Anthropology, University College London, Gower
Street, London WC1E 6BT, England

Primateology Funding on Grenada

The Foundation for Field Research announces an opportunity for research on the Caribbean island of Grenada. A population of Mona Monkeys (*Cerpithecus mona*) introduced from Africa exists on the island. The foundation will support a graduate student or professional for the time period August 1, 1994 to August 1, 1995.

Support will consist of the use of the foundation's research center on the island, food, airfare and a limited budget for supplies.

Send vitae and passport picture. Your vitae should indicate your age and ability to hike steep trails.

Foundation for Field Research
P.O. Box 771
St. George's, Grenada
809-440-8854
809-440-2330 FAX

Events •

December 4, 1993 "Recent Advances in the Study of Human Evolution" Louis S.B. Leakey Symposium, Stanford University, 9:00 AM - 12:00 PM.

In conjunction with the Leakey Foundation Board of Trustees meeting, the foundation will host a short symposium featuring regional scientists. For more information, please contact the foundation office at 510-834-3636.

February 28, 1994 Premier of NOVA Series on Human Evolution, PBS television stations

Dr. Donald Johanson will host this three part series on human evolution. Site visits will include Olduvai Gorge, Swartkrans, Klasies River Mouth and Hadar. A companion book will be published in February.

March 5 - 8, 1994 The International Conference on Orangutans: The Neglected Ape. California State University, Fullerton.

This conference, which is jointly sponsored by California State University, Fullerton; The Zoological Society of San Diego; and the Atlanta/Fulton County Zoo, Inc., will feature Dr. Birute Galdikas and Dr. Terry Maple as keynote speakers. For more information, please contact: Norm Rosen, Dept. of Anthropology, California State University, Fullerton, CA 92634-9480 or call (310) 318-3778.

April 28 - May 1, 1994 The Society of Africanist Archaeologists (SAFA), 12th Biennial Conference, Indiana University, Bloomington, Indiana

This SAFA meeting, organized by Kathy Schick and Nick Toth of the Center for Research into the Anthropological Foundations of Technology (CRAFT), will have no single conference theme. Papers and reports in all aspects of African archaeology and prehistory are welcome. Deadline for organized symposia proposals: January 7, 1994. Deadline for individual papers and reports: January 21, 1994. For more information contact: Anthropology Department, Student Building 130, Indiana University, Bloomington, IN 47405.



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