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BAGHOR I:

A Possible Upper Paleolithic Shrine in Central India

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The Kerai Ki Devi Shrine.



A closer view.

There is little doubt that a religious belief, imparting a sense of law and order and helping to control the relations between human populations and the other components of their environment, is highly developed among present-day hunter-gatherers. Such beliefs not only help to provide a feeling of unity stretching far beyond the hunting band itself but they afford an ordered interconnection between the foragers and the spiritual

processes which are looked upon as all-powerful forces influencing life and death. This is well exemplified in the case of the Musahar, a Dravidian tribe of hunter-gatherers who inhabit the jungle regions of the eastern Vindhyas in central India. According to Nesfield quoted by Crooke (1896), "The great active power in the universe . . . is Bansapatti, Bansatti or Bansuri, the goddess who . . . personifies and presides over the forests. By her

command the trees bear fruit, the bulbs grow in the earth, and bees make honey, the *tussar* worm fattens on the *asan* leaf, and lizards, wolves and jackals (useful food to man) multiply their kind. She is a goddess of childbirth. To her the childless wife makes prayers for the grant of offspring. In her name and by her aid the medicine man or sorcerer expels devils from the bodies of the possessed. In her

continued on page 11

the L.S.B. leakey foundation

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 multi-disciplined research into human origins, our evolving nature and environmental future. It was named in honor of the man who had become known as "the Darwin of pre-history," Dr. Louis S.B. Leakey.

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PRESIDENT'S MEMO

March 7, 1983

Salutations during my 60th visit to Southern Africa.

Sterkfontein along with Swartkrans and Kromdraai are gentle dolomite hills within sight of each other in the western Transvaal. Driving up to Sterkfontein on a lovely summer's day, my mind reached back to the day when Dr. Robert Broom first accompanied his students to the source of their exciting finds.

The popular image of "cavemen" has always been erroneous but especially so here in these limestone hills where the "cave" roofs collapsed a million years ago. I explored the whole fascinating site — about 50 yards square — including the near areas where both *Homo* and *Australopithecus* have been discovered. Alan Hughes, who has skillfully directed excavations for a decade, told me that 240 individual pieces of both "Ape Man" and "Man" had been found so far, including skulls, bones and teeth.

I watched a skilled African worker take sifted breccia on his hand-held screen and put it into a drum of water to wash off the mud. I observed intently but he found nothing as time passed slowly. Patience, thy name is archeology. The odds of finding something good any single day are very low. Professor Phillip Tobias has told me that in his first three years of excavation he only found three lower teeth.

Suddenly, the African's hand darted into the debris. His eyes (keener than mine) had seen something among the rubble. Triumphant, he handed me part of a jaw with three teeth attached. It was an upper left. I held it against my cheek. It felt strange. Examining it more closely, I could see the still bright enamel. Even my untrained eyes could see how the teeth had been ground by eating hard kernels.

The thought struck me that the last time this four-foot apeman's teeth had been seen could have been by his children 2.8 million years ago. As the next person to see the bright enamel, I was filled with excitement. I immediately tried to picture him roaming the veld hunting springbok, avoiding snakes, shivering in the winter, broiling as I was in 90° heat, and wondering at the nature of the stars.

To an expert, the difference in teeth stood out. To an archeological neophyte like myself, it was their contemporary resemblance that was remarkable. By teatime we knew it was a red-letter day at Sterkfontein with six pieces found — the most in many months, Tobias said, and actually about 2% of all the *Australopithecus* and *Homo* pieces ever found. For a laugh, Alan suggested naming the jaw and three teeth "Munger Molars." I wish all Leakey Foundation friends had been with me!

Olduvai Gorge comes to mind because the Sterkfontein molars remind me of our Fellow Bob Wilkie camping there on the stream bed, eating a dinner of bully beef from Australia. You are supposed to find teeth in the ground, but Bob bit into a human molar. He recalls, "I found it disconcerting and began to suspect the meat." The next day he found a plethora of jaw bones and teeth on the dry stream bed, "so I entitled my article 'Teeth.'"

Ellis Park, Johannesburg, was the venue for a historic four-day cricket "Test" between a West Indies team and South Africa. I took along my black American research assistant, Kendal Price, who has been working in Southern Africa for eighteen months. As Americans, Kendal and I naturally commented on the integrated stands. We also noted that good bowling or batting was clapped impartially by the South African crowd regardless of the cricketer's race. The West Indians won in a tight finish.

Cape Town is buzzing over the acceptance by the Coloured Labor Party of the government's proposals to have a parliament and to provide cabinet ministers. I got one view when I spoke to the Foreign Relations Committee in parliament. For another view, I went with my former librarian, Anneke Vlok, to Esselen School, where she had been teaching. This "Coloured" high school in Worcester, about 70 miles northeast of Cape Town, was the scene of the worst rioting in the 1976 disturbances. The graduation percentage dropped from 75% to 53% but is now back at a high 88%. The senior class appeared equally divided on the Labor Party acceptance of a role in government.

More importantly, I spoke to the principal, Mr. Abrahams, and to the teachers about applying to Leakey for modest "community archeology" grants to dig in the archeologically rich areas just to the north. We have been trying for four years to attract qualified Black or Coloured students to a Baldwin Fellowship without final success.

Swaziland is settling down after the funeral of King Sobhuza. The last time I interviewed the King — who came to power in 1915! — he received me in bare feet and a leopard skin.

In the past, some political friends have observed that I often arrive in an African country just before a coup. I must have lost my touch because the attempted coup here caused a lot of turmoil but didn't come off.

Swaziland has always been one of my favorite countries in Africa, and not just because I won a nice plot of land in a poker game the night of Swaziland independence. Last winter we had a superb lecture by Dr. David Price-Williams on

continued on page 14

CASUAL PRIMATE OBSERVATION IN THE CONGO BASIN

HERMAN A. REGUSTERS
Automated Systems Group, Jet Propulsion Laboratory,
California Institute of Technology



Baby gorilla, rescued because its mother was killed, in the village of Boa with curious children.

In September, 1981, I led an expedition into the Congo Basin area adjacent to the Likouala region in the north of the République Populaire Du Congo. Our mission into this vast, hostile, unexplored forest was totally unrelated to an investigation of its indigenous primate species. As a matter of fact, I was completely unaware of the extraordinary nature of some of our observations until months after our return.

My selected destination was Lac Tele, which lies approximately 100 miles north of the Equator, at latitude 1°20'N and longitude 17°09'E. Starting from the small, remote village of Boa on the Likouala River, we began our difficult trek to the lake. My expedition consisted of seventeen Bomitaba native guides and porters and a scientific group of six persons that included three African naturalists, my wife Kia as medical officer, and a photographer.

Only ten miles north of the village of Boa the dense forest becomes a series of endless morasses covering some 800,000 square miles. Along our immediate path the swamp water varied from a few inches to four or five feet. To either side of our course the depth increased considerably. We were to endure five days of this exposure before reaching Lac Tele. Any thought of keeping ourselves or our

equipment dry proved a futile consideration. In addition to the mud and water under foot, a dense growth of vegetation covered the ground. Huge hardwood trees formed the primary canopy. A thick growth of smaller trees made a secondary canopy about halfway below the first. Woody vines grew up nearly every tree and fell back to the ground from the branches, only to reroot and sprout off in some other direction. A tangle of dense bush, creepers, and the massive aerial root systems of the large trees covered the ground level. Only an occasional large wash allowed free movement for a few yards without the constant and continuous need to use our machetes.

During this five-day march of utter misery, one essential daily requirement was to locate an island of leaves large enough to permit all twenty-three of us to band together and camp for the night. We were constantly besieged by swarms of bees, flies, and a variety of other not readily identifiable insects. Fortunately, even though immersed in brackish swamp waters, we did not encounter any leeches.

The expedition was planned so that we were to subsist from the land. Although occasionally supplemented by a water buck, antelope, river hog or cane rat, the weight of our food source fell upon the many varieties of primates. This was not

due to any delicate culinary preference but rather their ready availability. Until our second day in the bush, this was our total interest in the primates of the region. Their constant chatter and presence was a thing taken for granted.

On our second day from Boa, deep within the swamps, we experienced the first of our continuing contacts with the lowland gorilla. After stopping to make camp in mid-afternoon, our forward guides cornered and killed a young male. The animal weighed about 400 pounds and was covered with silver-tipped hair. It was a magnificent specimen and the members of the scientific group were greatly saddened to see this beautiful animal killed by the natives for food. It made us aware for the first time that the stories we had heard of great numbers of gorillas in these forests had a measure of truth. We had not really believed that gorillas actually inhabited this heavily swamped area. However, the natives of the region have apparently hunted the gorilla as a source of food for many generations, and the meat was a much prized commodity.

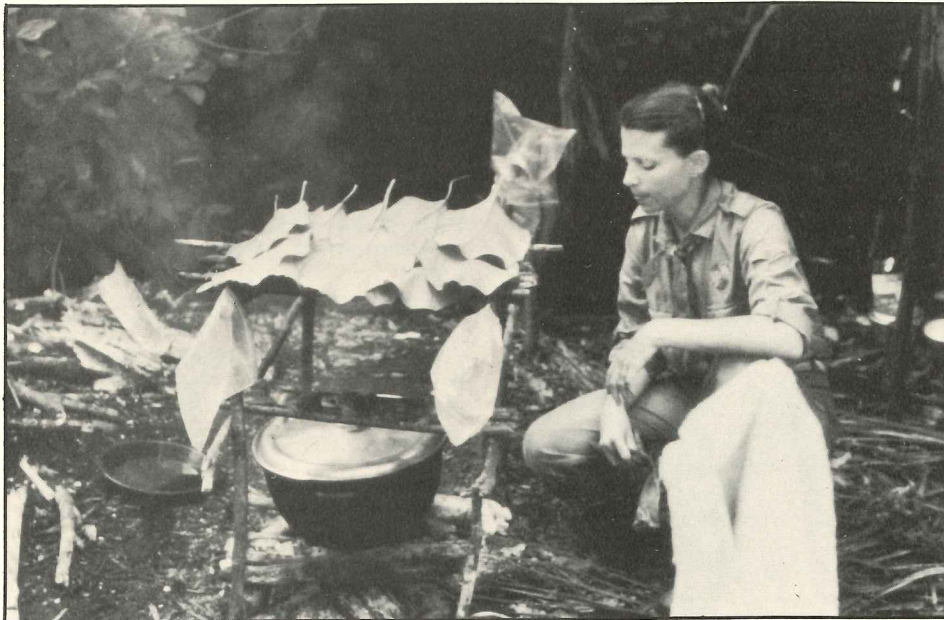
Throughout the remainder of our ambitious effort to reach Lac Tele, we were in daily contact with gorillas. This fact bore out the truth of the natives' response to our inquiries regarding the number of gorillas occupying this swampy forest. Invariably their reply was, "many, many, many!" Very few hours passed that were not punctuated by the screams of some nearby gorilla group. Several times each day we would encounter the nesting place where a group had rested for the night.

Generally a slender medium-height tree, without lower branches, was chosen for a nesting area. A nest of branches and leaves was constructed at the top, for the female and young. A second nest was constructed at the base of the tree, upon the roots and well out of the water, where the male bedded. In frequent cases we observed that low, bushy trees had been chosen. Here branches and leaves were used to construct an enclosure that very closely resembled a small hut. In fact, the natives actually referred to this arrangement as a "gorilla house."

On our return to the States, I was surprised to learn of the long-term controversy that has waged among primatologists over the actual existence of such gorilla houses. Such structures do indeed exist, for we have observed and photographed them several times.

Never once did we encounter any sizeable group of gorillas, only single males or a small family consisting of a mature male, a female and accompanying young. Generally the native hunters killed the entire group encountered, except when the male proved formidable enough to allow the rest of his family to escape.

Lac Tele is a totally isolated lake, fifty miles from the nearest river. Practically circular and about three miles in diam-



Kia preparing meal in jungle camp.

eter, it is the only disruption in the otherwise unbroken canopy in several thousands of square miles of dense forest and swamp. It resembles a gigantic amphitheater that reflects the jungle sounds from miles around. The entire shoreline is false, the surface waters simply blending into the surrounding swamp. During the more than one month that we camped there, we were never able to locate a solitary piece of dry ground. We were forced to camp upon islands of leaves and other vegetation that had accumulated over hundreds or thousands of years. Every effort made to find soil somewhere below went unrewarded.

Here there existed a primate population of unbelievable dimensions. Our naturalist identified over a dozen different types, all living in close harmony. With the lake filtering in the surrounding jungle sounds, there was no mistaking the fact that many isolated bands of lowland gorillas occupied the jungle around the

full circumference of the large lake. Their movements and sounds could be identified all through the day and frequently right through the night. On one occasion, Kia and I sat in our small boat for over an hour and listened to a gorilla group that seemed to be "picnicking" on the ground, about fifty yards into the jungle. The density of the foliage prevented any actual visual observation. However, we thought the group consisted of several young and two adults, as the young were distinguished moving about and receiving occasional reprimands from one or both of the adults. Finally they leisurely moved off deeper into the thicket.

The bravery of the Bomitaba native hunters cannot be questioned, yet they maintained a genuine fear of the lowland gorilla. Because of the apparent number of gorillas in the jungle about us, the natives constructed their shelter on a small island of leaves and roots about fifty feet or more out in the lake. They

warned us not to believe that the gorillas would not attack our camp should they get the notion.

Many European and Western inhabitants I met in the Congo possessed "souvenir" ash trays or other ornaments fashioned from various anatomical gorilla parts. In defense of the Bomitaba who accompanied us, the sum total of their interests in hunting the gorilla was one of personal subsistence. Every part was eaten, including the hands and feet.

A few months after my return to America, I had the opportunity to discuss our observations with Dr. Francine Patterson of The Gorilla Foundation, in Woodside, California. After seeing some of the photographs taken during the expedition, she was astonished to learn that we had found lowland gorillas inhabiting an extensive swamp area.

We hope our brief observations will lead to a serious reconsideration of the habits, behavior, and population of the lowland gorilla, and lay to rest other unsubstantiated conjectures I have read. This area represents an extraordinary world for research. The opportunities are great for any researcher in the field of biology and animal behavioral science daring enough to take on the challenge of this unexplored 800,000 square mile morass, with its unquestionable hostility, deprivations, and accompanying hardships. □

LETTER FROM GOMBE

The research at Gombe continues to provide new and exciting insights into the behavior of chimpanzees. Passion, as many will remember, was the infamous female who, with the assistance of her daughter Pom, killed and ate newborn infants of other females of her community. When Passion and Pom themselves gave birth to infants (December, 1977, and October, 1978, respectively) the infant killing came to an end. Passion became the second known grandmother since the beginning of the study; old Flo was the first. Bonds between Passion and Pom remained extremely strong and supportive and the family members were usually seen travelling about together.

In early 1981, Passion and her infant son Pax received extremely severe injuries; circumstantial evidence suggested that they had been attacked by members of the powerful Kalande community (unhabituated) to the south. We thought, in fact, that Pax might die, but eventually they both recovered. Later that year, however, Pom's infant son Pan was killed when he was blown from a 45 foot palm tree during a gale. And toward the end of that year Passion herself became very ill indeed. She lost much weight and often



Jungle campsite during trek.

seemed to be in extreme pain as she crouched motionless on the ground, arms and legs flexed.

Passion's condition continued to deteriorate. Early in 1982 field assistants Eslom Mpongo and Hilali Matama watched as Passion tried to construct her last tiny nest one evening, trembling with weakness. In the morning she was dead, hanging by one arm from a tangle of vines. Her family were around her and almost all day they remained close to the body, moving off for short periods to feed a little, then returning to sit and stare at their dead mother. Pax was the most distressed; whimpering and screaming he pushed and pulled at her body until, after several hours, his efforts freed it from the vegetation and it fell to the ground. Repeatedly he tried to suckle, pulled at her arms, peered into her face. The two older offspring were also disturbed, but for them the death was, of course, less serious since they were no longer dependent on a mother. Moreover, both had already experienced the death of others.

A post mortem was carried out on Passion and small pieces of heart, liver, kidney and other organs were sent to Mr. Jones, chief veterinarian of the London Zoological Society. But no disease was identified.

Pom tried very hard to care for her infant brother. But, although he was only four years old, he rejected almost all her attempts to help him. When, during travel, Pax whimpered because he found it difficult to keep up, Pom quickly stopped, turned and tried to gather the infant so he could ride on her back. Typically he pulled away from her, sometimes screaming and clinging to the vegetation if she persisted. Each evening as darkness fell, Pax moved around in the branches close to Pom, crying softly, as she made her nest for the night. But when, after completing her work, Pom reached out, begging for him to join her, he refused, avoiding her outstretched hand, ignoring her soft whimpers of distress.

To my amazement Pax has survived. He is now five years old and, apart from the fact that he never suckles, never rides on Pom or shares her nest, a naive observer would almost certainly think they were a mother-infant pair. Pax also has a close relationship with his brother, Prof, and the trio are almost always together. During the second half of 1982 the family went through a rather traumatic time as Pom came into oestrus; there were wild days when all three of them travelled with all the adult males and Pax was often the victim of aggression when he got in the way during copulations. By the end of the year Pom was pregnant again. It will indeed be fascinating to observe the reaction of Pax to the new infant and the relationship that develops between them.

Another adult female died toward the

end of 1982 — Pallas. Her illness seemed very similar to that which had claimed Passion; she, too, became emaciated and sometimes crouched to the ground as though in pain. Pallas, like Passion, left an orphan — five year old Kristal. This female infant now travels in close association with her "foster sister," Skosha. Skosha is also an orphan, having been adopted as a five year old in 1975 by Pallas, after the death of her mother. It is somehow rather moving to watch the two orphans, Kristal and Skosha, as they wander through the forests, keeping very close together. Skosha is now nearly thirteen years old, yet she has not even shown the beginning of sexual development although the first tiny swellings of the sex skin usually appear during the ninth year. (A male orphan of similar age, Beethoven, shows a like slowing down in his physical development. In his case it seems even more extreme since, in body size and weight, he compares with a seven year old although he is, in fact, about thirteen.)

From my own point of view the most disturbing aspect of the research here is the extension of the range of the large Kalande community in the south. The range of the Kasakela study community has shrunk from about 12 sq. km. in 1978 to about eight at the end of 1981; the figure for 1982 is not yet available. During the past four years three Kasakela adult males have vanished — Sherry, Humphrey and, most recently, the alpha male Figan. All three were healthy when last seen, and it seems quite possible, if not probable, that they fell victim to the kind of intercommunity aggression that we witnessed between the Kasakela and Kahama communities in the 1974–77 period which resulted in the annihilation of the smaller Kahama community. At the start of 1983 the Kasakela community has only five socially mature males as compared with eight to ten in the Kalande community. We shall be attempting to gain as much information as possible on interactions between the two communities during 1983.

A highlight of 1982 was the birth of Gremlin's first infant, Getty, named, of course, for Gordon Getty who has been a powerful supporter of the research at Gombe for the past ten years. Gremlin is the daughter of Melissa who mothered Gombe's only recorded twins. Getty's was the second birth to be observed in 23 years. Gremlin is the youngest known mother at Gombe; most females do not have an infant until they are about 13 years old but she was only 11½. Gremlin is an excellent mother and Getty is developing into a lively and precocious infant.

Jane Goodall



Professor Imanishi, the Father of Japanese Primatology, and Dr. Jane Goodall attending a chimpanzee seminar put on by Dr. Itani at Kyoto University.

Editor's Note:

Jane Goodall also speaks of her trip to Japan in November, 1982, when she participated in a symposium in Osaka. With only two exceptions, all 23 speakers addressed themselves to human problems of child rearing. Dr. Goodall gave a forty minute talk on "The Child and the Family in Chimpanzee Society," and also presented a paper at a workshop in Tokyo.

"Following these two events," she writes, "I visited the Department of Human Evolution Studies at Kyoto University at the invitation of Professor Itani. It was he who began the study of chimpanzees about one hundred miles south of Gombe in 1966, when I first met him. He is, in fact, my oldest primatologist friend."

Dr. Goodall exchanged information and views not only with those who are now carrying on Professor Itani's research in the Mahale mountains but also with scientists studying pigmy chimpanzees or bonobos. She feels that her visit to Japan will lead to close collaboration work between herself and her Japanese colleagues.

She has now been invited by the British Council to visit the People's Republic of China, following a request from Professor Pang Qifang, director of the Kunming Institute of Medical Biology. Her writings have been translated into Chinese and now have a wide following; Professor Pang reports that she is one of the most popular English personalities in the republic. She plans to visit there this spring.

"Wouldn't Louis Leakey have been delighted," Dr. Goodall writes, "if he could see how the study of chimpanzees, initiated by him in 1960 (when such studies were few and far between), was influencing scientific thinking in places as far away and seemingly remote as Japan and China? He was, truly, a giant among men and anyone working for the L.S.B. Leakey Foundation can be proud to serve an organization bearing his name." □

FIELD REPORTS

Excerpts from reports by Leakey Foundation grantees on their work in progress.

CAVE ART OF BAJA CALIFORNIA

Elanie A. Moore
Art Center College of Design,
Pasadena

My trip to the painted murals in the caves of the Sierras de San Francisco, Baja California, was very successful and I am most thankful to the Leakey Foundation for making it possible.

The trip presented only minor problems which were easily overcome — among them, bad weather. We had rain, fog and snow! Very little sunshine. I found it difficult to work in the rain and utterly impossible in the snow. There were several days when the rain was so bad that I couldn't work at all. I simply had to sit it out. I had the frustrated feeling that I was getting nowhere, yet this last month, which has begun the organizing, cataloging and rewriting of material collected, has proven the trip to be productive. In spite of the weather, I managed to fill two sketch books with drawings and notes and to take 53 rolls of film with images from the murals, their environment and the local people.

Each day that I sat on my little camp stool in front of a new section of mural, searching with the binoculars, there would be another exciting image that had been indiscernable. It was Christmas and each discovery carried a Christmas measure of elation with it. In the cave at Cuesta del Palmarito, I found images of four pregnant women, each pair sharing one rock. The two figures were superimposed so that their bellies lay over the same rock, making them both pregnant. Next to that pair was another arranged in like manner. One of the "impregnating" rocks had been repainted many times and covered with white dots. It took about four hours to trace through the faded, disappearing images of many overlying figures to be sure that these four women and their two impregnating rocks existed on the wall, not just in my imagination. It was an exciting find which led to more just as exciting.

I am now convinced that the caves were painted to denote singular purposes, i.e., possibly those of fertility, death and the hunt, and that each is found in close proximity to the others, combining to make a unit of distinct types. For instance, two of the fertility murals that I studied had several pregnant women, always in the base line of the mural's

triangular composition. These two caves were located at least two days' hike from each other. Yet near to each, within never more than a half hour's walking distance, were a death mural and a hunt mural.

The fertility murals contain pregnant human females, many deer and borrego, white dots, white arrows, white half arrowheads and checkerboard grids. All are arranged in a triangular composition with an upward focus.

The death murals contain horizontal human, nonfemale figures, upside down vertical animal figures, black arrows, fully-shaped arrowheads and one shaman-like rotund human figure. The compositions are based on the vertical and horizontal with no singular focus but a heavy-weighted stasis instead. There seems to be little attempt to animate the figures in the death murals as compared to those of the fertility and hunt scenes.

The hunt murals contain a wider variety and number of animals than do the fertility and death murals, which have mostly deer and borrego. The checkerboard and shaman occasionally appear in these murals, too.

I am anxious to continue the work to see if there is more evidence to support my theories or to disprove them. To this end I plan to return to the caves in June.



Cueva Pintada, Sierras de San Francisco, Baja California Sur.

HOMINID CRANIOFACIAL REMODELING AND GROWTH: A SCANNING ELECTRON MICROSCOPE STUDY

Timothy G. Bromage
Department of Anthropology,
University of Toronto

My current research is on the growth and bone remodeling of the modern human, chimpanzee and early hominid facial skeleton. It concerns itself with the evidence of actual bone growth processes on the surfaces of dry and fossil bone. I employ silicone impression materials to take replicas of bone surfaces, from which positives are made and then viewed with the scanning electron microscope (SEM). This SEM/replica technique avoids the destructive nature of histological techniques previously used in bone remodeling studies. L.S.B. Leakey Foundation sponsorship has enabled me to collect replicas of virtually every Plio-Pleistocene hominid subadult craniofacial specimen in South and East Africa.

Remodeling, as a consequence of growth and development of the skeletal system, involves the coordinated activity of certain bone growth mechanisms (bone resorption and deposition) which can be interpreted by SEM investigation. Resorption from certain bone surfaces and concomitant deposition on other surfaces serves to increase the size of the bone and to remodel the bone so that its shape and proportions are maintained as the bone enlarges. The interfaces between fields of resorption and deposition delineate the remodeling activity and are termed remodeling reversals. The remodeling features of the craniofacial skeleton have been recognized as important indicators of craniofacial growth pattern.

Bone remodeling is a key mechanism by which species specific craniofacial growth patterns are achieved. For instance, the differences between modern human remodeling reversals and those of *Macaca* (the only two primates for which detailed remodeling studies have been performed) reflect unique differences in the pattern of facial growth. Fundamental differences in facial form between species reflect different growth patterns and consequently, reflect differences in their characteristic remodeling reversals as well.

Research of this kind may also have taxonomic implications. One commonly held assumption is that juveniles are not representative of their adult "type" and so are not useful for taxonomic purposes. The claim is that juveniles of closely related forms look similar and so are not very useful taxonomically. Theoretically, however, this claim cannot be justified. Before the craniofacial skeleton has the "ontogenetic time" to significantly respond to environmental factors, the differences which do exist between juveniles

of different taxa must largely be attributed to genetic differences in their growth patterns. These differences which are expressed early in ontogeny should be able to be separated out as a group from those which may simply be responses to different environmental situations and occur much later on. Inasmuch as facial remodeling reflects craniofacial morphogenesis, the study of these differences and their characteristic remodeling, between taxa, should throw some light on the taxonomic value of young individuals. Ultimately I hope that the study of craniofacial remodeling of juvenile early hominid remains will contribute to our understanding of the taxonomy of our Plio-Pleistocene ancestors.

The biggest hitch in fossil bone remodeling research is the preservation of microscopic details characteristic of resorptive and depositional surfaces. Even worse is the possibility of incorrectly identifying a weathered surface for a biological one (e.g., remodeling). For this reason taphonomic interpretations should figure prominently in SEM analyses of fossil bone. An appreciation of the depositional environments from which the hominid material comes is consequently necessary.

While on my research tour in Africa I took advantage of three field opportunities with an eye to interpreting taphonomic effects at the microscopic level. Courtesy of the director and staff of the Bernard Price Institute for Paleontological Research I have begun such observations and research on cave deposits at the Makapansgat hominid site in South Africa. In Kenya, with Richard Leakey's permission, I went to Koobi Fora and spent some time appreciating the uniqueness of open-air site fossil depositional environments versus those of the South African cave sites — the kind of scientific and esthetic appreciation that only comes from being there. I also travelled down to Amboseli Park with Kay Behrensmeyer who let me take a look at (and a nice handful of replicas of) "Kay's Critters" (pet carcasses). Kay's notes on the taphonomic histories for each of her critters details the best natural experiment for interpreting weathering effects on bones of known depositional date and environment, etc., in East Africa.

Microscopic and macroscopic (morphological) observations may combine to give us a realistic appraisal of craniofacial growth in early hominids. The principles of mandibular growth which result from remodeling studies of chimpanzees and humans, for which there is more potential data, can be used to interpret the remodeling information retrieved from fossil specimens. The next one or two years of intensive SEM work should take us one step closer to interpreting actual growth processes in the early hominid facial skeleton.



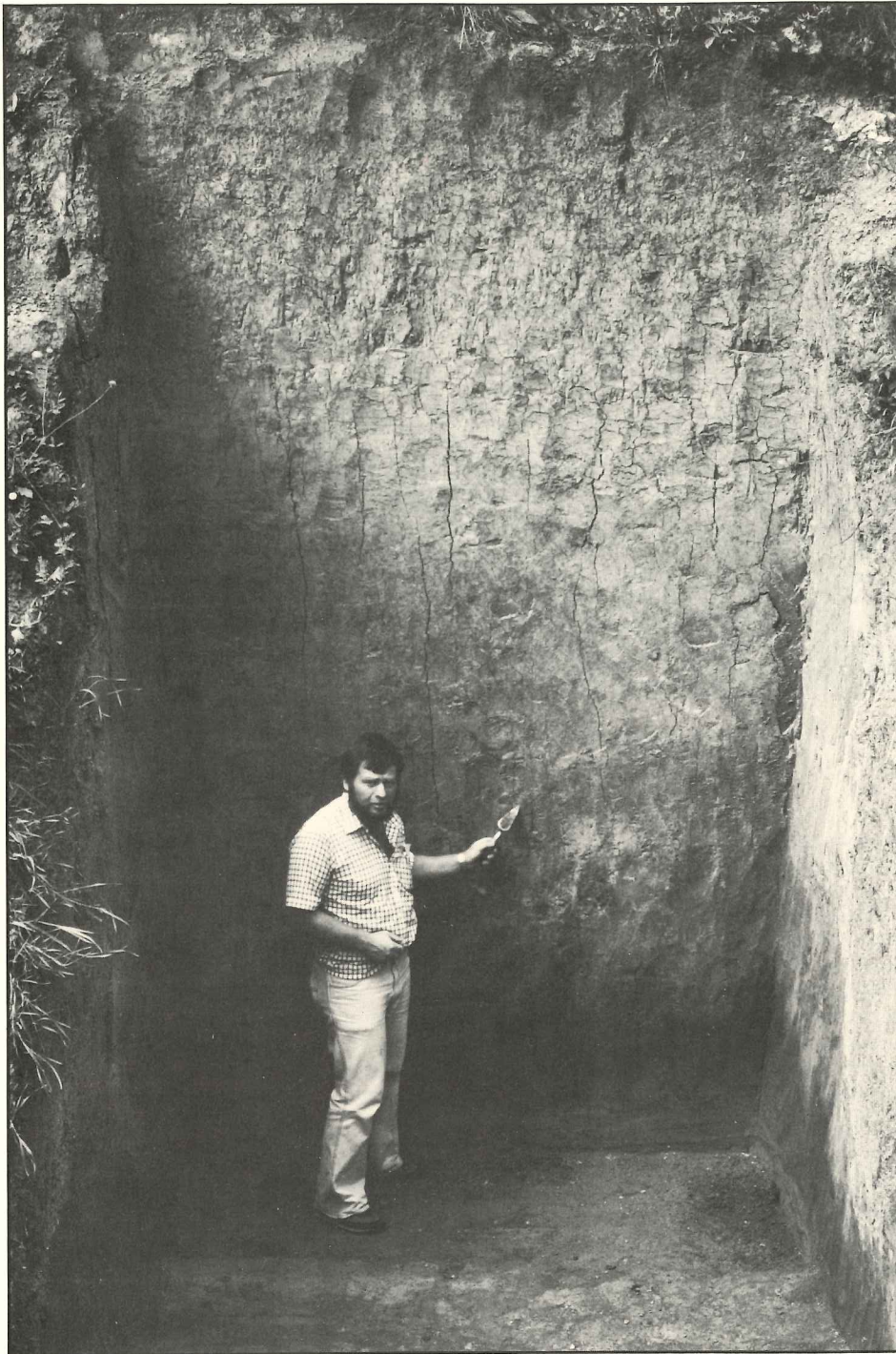
FOOD DISTRIBUTION AMONG HUNTER-GATHERERS

Hillard Kaplan and Kim Hill

Last year the Leakey Foundation funded Hillard Kaplan, anthropologist at Columbia University, and Kim Hill, University of Utah, for research on the Ache, a hunter-gatherer group in eastern Paraguay. The Ache represent one of the last of such groups, and possibly the only non-desert, non-arctic one for which good data exist about foraging habits. Kaplan and Hill's project was aimed at describing food sharing in this group. The results of their labors will be forthcoming later.

Most of human experience has taken place in societies dependent on hunting and gathering. Aspects of behavior now regarded as uniquely human had their origins and subsequent development in these societies. For these reasons the study of food distribution in a modern day hunter-gatherer group is of extreme value, throwing more light on the behavioral changes of human development than can be deduced from archeological residues.





Dr. John W. K. Harris pointing to the cultural level at the Upper Paleolithic site of Sungir near Vladimir during the XIth INQUA pre-Congress excursion, July, 1982.

QUATERNARY RESEARCH CONGRESS AND RUSSIAN FIELD EXCURSION

*J.W.K. Harris
Department of Anthropology
University of Wisconsin, Milwaukee*

During the summer of 1982, with travel funds awarded by the Leakey Foundation, I attended the XIth Congress

of the International Union for Quaternary Research (INQUA) in Moscow. I also made a pre-Congress field excursion to the Upper Volga region in the central part of the Russian plains some 250 kilometers east of Moscow. The purpose of my participation in the INQUA Congress was to present three scientific papers to a large and distinguished international body of geologists, paleoanthropologists and archeologists on joint re-

search findings at Hadar, Koobi Fora, and Chesowanja, important Plio-Pleistocene early man sites in the Rift Valley of East Africa. The field excursion to the Upper Volga provided the opportunity to see geological sections and landscapes dramatically affected by colder and warmer glacial and inter-glacial periods over the last million years in contrast to my own research area on the tropical savanna of East Africa, and to gain some appreciation of how these changes in climate and landscape were reflected in the lifeways and economy of prehistoric peoples. Finally, but just as important, I was able to reestablish personal friendships with colleagues in my own subdiscipline of archeology as well as to establish new interdisciplinary contacts.

My port of entry to Russia was Leningrad and there can be no more impressive a beginning to any trip than by starting with one of the most beautiful cities in the world. Situated on the banks of the Neva River and often referred to as the "Venice of the North," Leningrad has over 400 bridges crossing the river and the multitude of canals dissecting the city. It is also one of the most important cultural, historical and research centers in the Soviet Union. In the time available, I was able to visit briefly the Institute of Archeology and the world renowned Winter Palace (The Hermitage), which houses one of the largest collections of art and antiquities to be found anywhere.

Participants in the excursion to the Upper Volga and "Golden Ring" of historical cities assembled in Moscow to begin the journey. Scientists from Australia, Belgium, Canada, Germany, South Africa, Sweden, Switzerland, the United Kingdom and the United States were present. About twenty scientists from many parts of the Soviet Union accompanied our group, bringing their own local color. Many of the participants had a good background in glacial geology and the archeology of Ice Age Europe.

The next seven days were spent in the central part of the Russian plains, particularly within the environs of the old historical cities of the "Golden Ring": Vladimir, Suzdal, Rostov, Uglich and Zagorsk. Here broad, flat and featureless valleys with meandering streams and rivers showed very little physical relief. Much of the land was grass covered, interrupted occasionally by patches of cultivation, areas that had reverted to forest and small villages outside of the main centers.

Because we were travelling in settled farming areas the roads were good and transport by bus was nearly always possible. The distances were often long between exposed geological sites which were generally situated along the eroded banks of meandering streams. One of the highlights of the trip was the view from a boat of well-exposed deposits on the banks of the Volga.

The geological deposits generally sampled the time range from the last interglacial (warm) period (c. 120–80,000 years ago) through the last glacial (cold) period (c. 80–10,000 years ago) to the Holocene. For archeologists, one of the most interesting localities visited was the Sungir Upper Paleolithic site. Although excavations had long ceased, it was still possible to envisage the scope of operations. The site had been occupied 25,000 years ago and well-preserved human remains were found in profusion, together with burial goods and evidence of hunting of reindeer, horses, polar foxes and mammoths.

Our itinerary also included guided tours to all the famous historical cities within the "Golden Ring". Memories of visits to the monuments of ancient Russian architecture at Vladimir, Suzdal and Rostov will long stay with us. The monastery at Zagorsk was perhaps the most impressive. We returned to Moscow weary but enlightened. We were very grateful for the excellent hospitality shown by our Russian hosts and the comradeship that had grown from our experiences and time together.

The setting of the INQUA Congress was the Moscow State University, beautifully situated high in the Lenin Hills overlooking the Moscow River and the huge Sports Colosseum built for the 1980 Olympic Games. There were a thousand people attending the Congress, including a fair sprinkling of scientists from almost all countries. Senior scientists presented papers which provided a synthesis of results and progress in Quaternary studies. On the third day the Congress began in earnest with the presentation of group and individual research results in sessions organized around specific subjects and themes.

It was during the section devoted to problems of anthropogenesis and paleo-anthropology that I presented three research papers. The first, coauthored with Dr. Donald Johanson, reported on the Gona archeological site at Hadar in Ethiopia. The artifacts and faunal remains recovered there, which were indicative of very early hominid activities, had been dated to 2.5 million years ago and these may well be the earliest material manifestations of culture so far discovered. A second paper, coauthored with Dr. Glynn Isaac, was a synthesis of results from archeological investigations at Koobi Fora, Kenya, undertaken over the last ten years with special emphasis on early hominid site locations and land use approximately 1.5 million years ago. Finally, a third paper was presented on findings at the Chesowanja site in northern Kenya jointly undertaken with Dr. John Gowlett and Dr. Derek Walton which described the context and character of archeological materials dated to 1.5 million years ago. The report included the earliest evidence of fire on a hominid

occupation site. (See *Anthroquest* No. 24.)

One of the great pleasures of attending the INQUA Congress was to discuss with old colleagues research methods and results as well as establishing new contacts in the myriad of subdisciplines of paleo-anthropology. I am deeply grateful to Mrs. Charles Holt III of Palm Beach, Florida, and to the Leakey Foundation for making such a wonderful trip possible.

THE FUNCTIONAL MORPHOLOGY OF PRIMATE CARPOMETACARPAL AND INTERMETACARPAL JOINTS

Mary W. Marzke
*Department of Anthropology
Arizona State University, Tempe*

The purpose of the proposed research was to provide a basis for interpreting the structure of the carpometacarpal region of fossil hominoid hands by obtaining data on the form and functions of the joints of this region in living primates. With the funds from the L.S.B. Leakey Foundation, I purchased photographic and laboratory equipment and traveled last summer to five museums and universities to examine hand and wrist bones in primate skeletal collections. (The institutions visited were the U.S. National Museum, Cleveland Museum of Natural History, American Museum of Natural History, Museum of Comparative Zoology and Department of Anthropology at Harvard University, and Brown University.)

Data from the museum samples of hand skeletons, and from my recent dissections, indicate considerable variability in structure and functions of the carpometacarpal region among the species surveyed. The correspondence between these variations and variations in substrate preferences and locomotor and manipulatory behavior are now being analyzed. I found that the species most closely similar in structure to *Dryopithecus (Proconsul) africanus* in the region of the capitate and second and third metacarpals are the rhesus monkey and vervets. I re-examined the hand bones of *Australopithecus afarensis* at the Cleveland Museum of Natural History (casts, this time) and reconfirmed and extended my functional interpretations of their

structure made in 1980 after seeing the original bones. These hands exhibit an interesting mosaic of ape-like specializations for strong flexion of the fingers and modern human specializations for rotation of the second metacarpal. The latter pattern for rotation was found to be unique in humans among living primates, as I had suspected on the basis of an earlier, smaller sample. This finding has stimulated my collaboration with physicists in a first attempt to use *in vivo* nuclear magnetic imaging to analyze gripping postures of the human hand. We hope to determine the significance of the rotational ability of the second finger in modern humans and the Australopithecines. (This project has just received funding from Arizona State University.)

At Harvard University, through the courtesy of Dr. David Pilbeam, I examined the recently discovered hominoid capitate from Pakistan, and Dr. Erik Trinkaus kindly made available hand and wrist bones of hominids from Shanidar. I was also able to travel to the IXth Congress of the International Primatological Society to give a paper on the relation between carpometacarpal joint structure and hand postures in living and fossil anthropoid species. The meeting was an invaluable source of contacts with colleagues and information about the location of additional resources for my research.

It remains now for me to dissect more hands in my own collection and at the U.S. National Museum, and to complete the analysis of data from these dissections and from the museum collections.

BALDWIN FUNDS IN KENYA

Daniel Stiles
*Visiting Research Associate
National Museums of Kenya
Baldwin Fellow*

Since 1979 I have received three Baldwin Fellowships, the last in the summer of 1982. These funds were of crucial assistance in the development of the B.A. in the archeology program at the University of Nairobi, Kenya, and in providing for field research opportunities for Kenyan B.A. and M.A. archeology students. The first six B.A. in archeology students in Kenya graduated in 1981, the year I left the University of Nairobi.

Baldwin funds went towards buying reference books to start an archeology library, the purchasing of needed field equipment, the support of students during fieldwork, and in the preparation and



University of Nairobi archeological field school, January, 1981.

reproduction costs of B.A. theses. Without the Baldwin Fellowships much less could have been accomplished. Because of the August, 1982, closure of the university, following a coup attempt in Kenya, no further students have graduated. I hope that once the university reopens, however, the archeology section in the Department of History can carry on and expand what was begun between 1977 and 1981.

Baldwin funds have also helped to support a research project of mine in northern Kenya around the Chalbi Desert involving a study of changing environment and pastoral socio-economy. I am interested in how pastoralism developed in northern Kenya and in the causes and consequences of desertification in the region. This multidisciplinary project concerns both prehistoric and present day pastoralists. In the course of the research various interrelated projects have been conducted involving archeology, ethnoarcheology, ethnography, human ecology, geomorphology, and palynology. The work with present day pastoralists in the region (Gabbra, Boran, Rendille, and Samburu) only reinforces my belief that it is impossible to reconstruct the past accurately without a knowledge of the present.

Two theses in archeology, one B.A. and one M.A., have been written at the University of Nairobi on aspects of the project, and one doctoral dissertation in ethnolinguistics is currently being prepared by a Kenyan student at the University of Paris (Sorbonne). The goals of the Baldwin Fellowship program are being realized and for my former students, I would like to thank the L.S.B. Leakey Foundation for their needed support. □

The Franklin Mosher Baldwin Fellowships, instituted in 1977, provide funds for the Third World that are available from very few other sources.

The following Baldwin Fellowships were recently awarded:

BALDWIN GRANTS AWARDED

Berhane Asfaw,

a University of California Graduate Fellow currently funded by a Baldwin grant, has been awarded \$8,340 to continue his studies at Berkeley for another year. Mr. Asfaw is an Ethiopian.

Steve A. Brandt,

who is continuing his research on the origins of food production in southern Somalia, will be given a Baldwin grant of \$3,310 to purchase a vehicle for use during his archeological project. Dr. Brandt's work involves African students.

Dovi Andre Kuevi,

a Ph.D. candidate at the University of California at Los Angeles, will receive a Baldwin grant of \$8,000 to continue his studies there for a year. Mr. Kuevi is from Togo.

Sally McBrearty,

a Ph.D. candidate at the University of Illinois at Urbana, has been awarded a Baldwin grant of \$2,500 for analysis of archeological material from the Mugurak River site, a Middle Stone Age occupation and factory site near Kisumu in western Kenya. Ms. McBrearty, already a Baldwin recipient, directed excavation there and performed preliminary laboratory analysis at the Kenya National Museum. Now the quantitative data will be examined in terms of the artifacts' technological features and spatial distribution. □

GRANT SPOTLIGHT

The Grant program of the L.S.B. Leakey Foundation, under the guidance of the distinguished Science and Grants Committee, depends upon public support for its success. Every penny of your contribution dollar directly supports the grant awards. Members and donors are invited to designate their gifts in support of specific research projects.

Won't you take this opportunity to direct your contribution to the grant project of your choice?

Jane Goodall

\$6,000 needed

FIELD STUDIES OF FREE-RANGING CHIMPANZEES AND BABOONS AT GOMBE

Dr. Goodall requests funds to continue the ongoing research at Gombe, Tanzania. This year the emphasis will be on comparing the frequency of consort behavior with similar behavior observed by other researchers. Attempts will be made to follow consort pairs and data will be collected regarding the behavior of offspring of females involved as well as ranging patterns. Another important project will involve the study of relationships between neighboring communities. Baboon research will include study of female ranking, aging and intertroop encounters.

David P. Watts

\$5,000 needed

ECOLOGY OF THE MOUNTAIN GORILLA SOCIAL SYSTEM

Mr. Watts, a Ph.D. candidate at the University of Illinois, plans a research period of two years, during which time he will be collecting data on the habitat use pattern, feeding ecology and intergroup relations of mountain gorillas in the Karisoke Study Centre, Rwanda. Data on the distribution and abundance of gorilla plant resources in combination with demographic data will be used to test hypotheses concerning the evolution of polygyny. □

SERVICE OFFERED

Young physician, internist and Fellow of the Leakey Foundation, keen to join archeological expedition for expenses only. Strong back — good digger — can make coffee — contribute medical skills. Enquiries to editor.

INDEX

An index for the *L.S.B. Leakey Foundation News* (now *AnthroQuest*) is available for Number 1 through 23, Spring 1975 through Summer, 1982. A copy of the index, priced at \$1, may be ordered from the Foundation office.

NEW FELLOWS

The L.S.B. Leakey Foundation is honored to welcome as new Fellows:

Kevin Anderson, Alta Loma, California, Mrs. Arthur R. Carlson, San Marino, California, T. H. Obenchain, Dallas, Texas, Mr. and Mrs. Richard C. Seaver, Los Angeles, Shirley Stoneberger, Los Angeles, and Harold Thom, Jr., Long Beach, California.

BOOKS

THE HUNTERS OR THE HUNTED? AN INTRODUCTION TO AFRICAN CAVE TAPHONOMY, by C. K. Brain, University of Chicago Press, 1981, \$35.

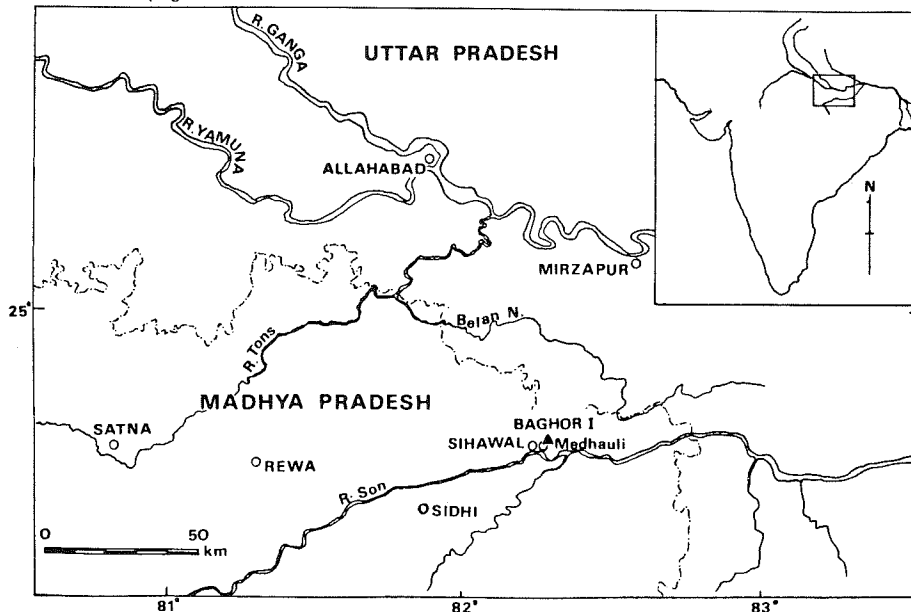
This book includes a wealth of detailed observations with insights into some of the most critical factors affecting an assemblage of bones prior to its incorporation in the fossil record.

THE CAMBRIDGE HISTORY OF AFRICA, VOLUME I: FROM THE EARLIEST TIMES TO C. 500 B.C., edited by J. Desmond Clark, Cambridge University Press, 1982, 1,157 pages, \$89.

AWARD

On November 28, 1982, Drs. J. Desmond Clark, F. Clark Howell, Donald C. Johanson and Tim D. White received the Gold Mercury International Award. The presentation ceremony, at which Clark, Johanson and White were present, was held in Addis Ababa, Ethiopia. The awards were conferred on these scientists for their significant research in Ethiopian paleoanthropology and for their "outstanding contribution to the development of international relations and world peace." Dr. Howell is chairman of the Leakey Foundation Science and Grants Committee, of which Dr. Clark is a member.

continued from page 1



Location of Baghor I, Madhya Pradesh, India.

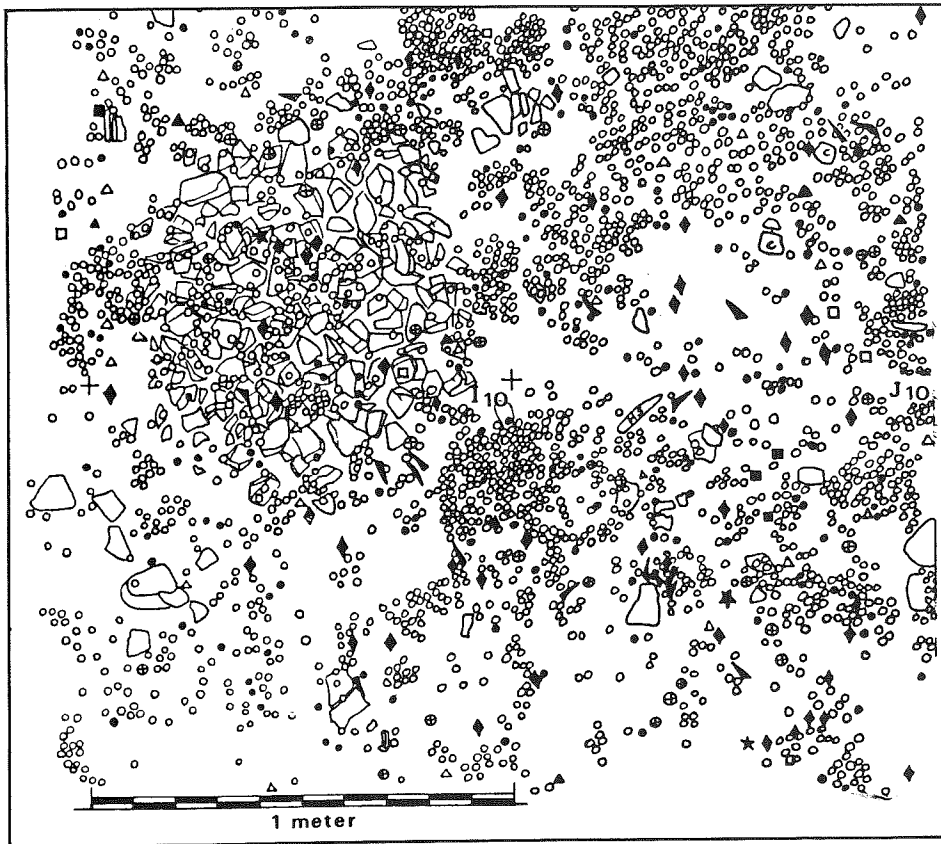
name and to her honour the village man kindles a new fire for lighting a brick kiln. Woe to the man who takes a false oath in the name of Bansatti."

There is every reason to suppose that, from Upper Paleolithic times onwards, the hunting-gathering populations, being equally dependant on their environment, were in a similar intimate relationship with all its component parts. Such early beginnings of these kinds of beliefs and responses can be seen in the cave art of Franco-Cantabria. They emerge again in the painted rock slabs in the Apollo 11 shelter in southern Namibia and the crude engravings in the Koonalda Cave, Australia — all of comparable age — and, by the early Holocene, such continuity is well represented in many parts of the world.

In central India there is a rich treasure house of art in the painted rockshelters and caves of the Vindhya Plateau. The shelters themselves have consistently yielded sequences of Mesolithic artifact assemblages which reflect the changing patterns of subsistence and the strategies these demanded. This art shows very well the continuity that exists from prehistoric into historic times. The various scenes of everyday life depicted lend credence to the association of this art with the ancestors of the Gonds and other tribal groups still inhabiting this region today. The earliest styles, which are dated from 2000 B.C. to possibly as early as 8000 B.C., show only aspects of the hunting-gathering way of life. Of particular interest in this present context is a characteristic of these early styles where the bodies of the animals and some of the human figures are often elaborately decorated with geometric or abstract designs in which, among others, concentric triangles are a recurring motif. Such motifs are a feature of the large and uncommon representations of wild boar,

gaur, rhinoceros and deer which are notable because of their proportions compared to the much smaller scale of the rest of this art. These animals are thought of by those who have studied them as "deified" animals representing mythological scenes and some of the figures possibly represent deities. The infilling of these drawings with concentric, geometric and triangular motifs draws our attention because of the common practice of tribal groups in the Kaimur region of central India, where concretionary sandstone blocks with concentric geometric and, especially, triangular laminae are set up as shrines for the worship of the female principle in nature or the goddess.

However, any attempt to use prehistoric rock art to try to identify the religious and ritual practices of the artists is fraught with difficulty. We find that the practice of filling drawings of animals with geometric patterns became a common technique for pottery design during the Chalcolithic Period throughout the Indus Valley and Baluchistan. Even where, as is the case in the Vindhyan region, continuities in both art and related material culture have been established, considerable caution is needed. Aspects of religious beliefs, other than burial customs, are basically unknown for the prehistoric period since much of the *art mobilier* is open to other kinds of interpretation. Fortunately there are situations when connections do exist and can be identified, as have been convincingly demonstrated in southern Africa between the beliefs and rituals of aboriginal hunter-gatherers and the rock paintings of the southern San. Furthermore, the recent discovery in northern Spain of a cave shrine which is associated with a Magdalenian industry and is dated to 14,000 B.P., is an indication that some manifestations of religious beliefs can be expected to have become established by this phase



Baghor I, artifact distribution.

KEY: ○ flake & flake fragments, ● blade & blade fragments, ⊕ chunk, △ core trimming flake, ▲ core, ▣ retouched flake/blade, □ edge damaged/utilized, ◆ backed blade fragment, ▽ scalene, ★ backed & denticulate, ⊙ sandstone rubble, ⊕ chert nodule, ⊗ chalcedony nodule, ⊕ hammer stone.

in human history. The discovery described below would seem to confirm this.

The terminal Upper Paleolithic site of Baghor I (Lat.24°35'2"N., Long.82°18'34"E.) is located in the Son River valley near the base of the Kaimur Escarpment, some 4 km. northeast of Medhauli village, Sidhi District, Madhya Pradesh, India. The site was first exca-

vated in 1980 by a combined team from Allahabad University and the University of California, Berkeley, under the direction of Professors G. R. Sharma and J. Desmond Clark. In January, 1982, the site was reopened for further excavation by the same team under the supervision of J. M. Kenoyer and J. N. Pal. During the course of the two seasons, a total of 286 square meters was excavated, expos-

ing the periphery of the site on three sides, while the western side had been exposed by erosion. Several different activity areas were identified: flaking areas where the rough blank forms were produced; adjacent areas where the chert and chalcedony blades were retouched to make various tools; places where debitage and spent tools had been dumped forming thick accumulations of waste flakes; and two distinct areas with rubble features and a possible hearth which can be related to living areas. In the midst of these various features was a rubble platform which will be discussed below. The artifact assemblage is primarily a blade and bladelet industry with backed blades, scalene triangles, drills, *percoirs* and some scrapers. Numerous hammerstones and pieces of flat stones showing some minimal evidence of grinding were found *in situ*, as well as a partly perforated, broken ringstone. No other primary context sites of this period have been excavated in this manner in south Asia and the only distant affinities to the lithic industry are to be found in the Zarzian from Iraqi Kurdistan and the Epi-Paleolithic of northeastern Kurdistan, dating between about 10,000 and 8,700 B.C.

During the final days of the 1982 excavation a circular concentration of sandstone rubble forming a low platform was discovered which had previously been obscured by an accumulation of chert debitage. The artifact distribution in the area of the platform consists of a widespread accumulation of manufacturing waste together with some shaped tools and sandstone rubble. These artifacts had been discarded in such a manner that they formed numerous small concentrations which suggest that they represent individual dumping places for debitage cleared from the working areas. They comprise unmodified waste flakes, blades, cores and nodules together with a small number of shaped tools and some sandstone rubble. Lifting the exposed artifacts revealed numerous pieces of sandstone



General view of the stone platform, Baghor I.



Close-up of same view of the platform.

rubble interspersed with chert debitage. Upon lifting the chert artifacts we discovered that the sandstone rubble formed a roughly circular platform about 85 cm. in diameter. In the center of this platform was a fragment of a natural ferruginous sandstone concretion, the weathering of which had accentuated a pattern of concentric triangular laminations, the colors ranging from a light yellowish red to a dark reddish brown. The alternating light and dark colors present a very striking pattern and we were able to locate several fragments of the same stone which had spalled off from the central piece. Two additional joining pieces were found on the periphery of the platform while one fragment was displaced some 90 cm. to the south of the center of the platform. So far ten fragments have been found, all of which join together to form a triangular shaped natural stone which is 15 cm. high, 6.5 cm. wide and about 6.5 cm. thick.

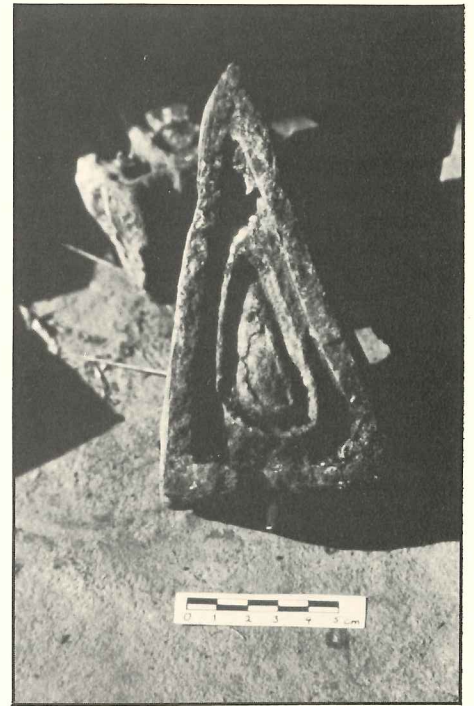
Since seven of these fragments were found in or near the center of the platform, it would appear that the complete stone had originally been placed in that position. The physical structure of the sandstone concretion is quite weak, tending to fracture along the laminations and, since there is no evidence that the stone was deliberately broken, it is probable that it became cracked and broke apart in the normal process of weathering and that the fragments later became scattered naturally in the rubble platform. The nearest source of this type of stone is some 2 to 3 km. northwest of the site.

The significance of this rubble platform with its peculiar natural stone becomes apparent only when it is considered in the light of both the archeological and the ethnographic contexts. The archeological context shows that the platform is an artificial construction, the sandstone rubble for which was carried onto the site, and in the center of it was placed a unique and colorful stone. Sometime later, probably after the structure had been abandoned, the stone became broken and the platform was partially covered by flaking waste from tool manufacture. There is absolutely no doubt that the rubble platform with its unique stone and the chert artifacts throughout the rest of the site are contemporaneous and were made by a group of final Upper Paleolithic hunter-gatherers.

The significance of the central triangular stone became apparent in the light of current practices among the present inhabitants of the area, especially the tribal groups such as the Kol and Baiga, whose primary subsistence used to be from hunting and gathering and who have Dravidian affinities. These groups use this same type of colorful natural stone with concentric geometric laminations, often in the form of triangles, as a symbol for the female principle or the Mother Goddess, *Mai*. If it had not been for the fact

that we had occasion to visit the shrine of *Kerai ki Devi*, the Goddess of Kerai, about one kilometer northeast of the site, the significance of the archeological stone would certainly have been overlooked. The *Kerai ki Devi* shrine is situated on a low spur of shale at the foot of the Kaimur Escarpment. It consists of a roughly circular platform composed of sandstone and limestone rubble blocks on which six natural pieces of concretionary sandstone have been set up. In addition there is a headless figurine of what one informant called *Angari Devi* (the Goddess of Burning Coals) who is probably the same as *Angar Mati*, a goddess worshipped by the Agaria. The six stones in the center of the shrine all have triangular or ellipsoidal laminations ranging in color from yellowish red to reddish brown and are identical in nature to the one found in the excavations. These stones are said to represent the goddess and are smeared with vermilion, while the area around the shrine is littered with broken coconut shells, shorn locks of hair, potsherds and fragments of clay figurines. According to one informant who happened to be a Muslim, the goddess protects and bestows health and prosperity on those who worship her and the surrounding villagers bring offerings of coconuts and shave their heads to honor the goddess. The people who worship at this shrine include the Kol and Baiga tribals, caste Hindus and even local Muslim converts.

Once we began looking for such shrines to the goddess we found them scattered here and there over the countryside or in the villages. Our site watchman, who is of the Kol tribe, has set up near his house a shrine dedicated to the goddess *Kalika Mai*. This shrine consists of one large, tabular stone with geometric laminations and three smaller stones with various shaped concentric laminations and is marked by a long bamboo pole with a red flag. In the village of Medhauli is a more impressive shrine which has been constructed at the base of an enormous nim tree (*Melia azadirachta*). The platform is made up of an earthen plinth capped by a stone slab upon which numerous oddly shaped blocks of limestone and sandstone have been placed. These stones represent various manifestations of the goddess and, here again, we find the use of triangular and ellipsoidal sandstone concretions with concentric laminations. This last shrine is very similar to the Kol shrines described by Crooke. He reports that the Kols of the Mirzapur region, which is just to the northeast of Sidhi District, worship a deity called *Bara Deo* (the great god) otherwise known as *Gansam*. Worshipped at a small plain platform, often marked by a red flag, outside the village, he is the protector of the crops and is propitiated by the sacrifice of a fowl, a goat or a young pig and a libation of liquor. "He often too resides in a nim tree and near his shrine is generally a rude stone representing *Devi*,



The natural triangular stone from the Medhauli village shrine.

some vague manifestation of the female principle in nature" (Crooke, 1896).

A search of the ethnographic literature on the tribal groups in the Vindhyan Kaimur and adjacent regions produced numerous references to the use of stones to represent the goddess or the female principle, *Shakti*. Unfortunately, the informants rarely give any detailed description of the stones used. The Gonds of Andhra Pradesh use "rounded stones" to represent the Village Mother, *Nat Auwal*, and the Oraon tribes worship "roundish stones" which represent the goddess *Chandi* who brings success in war and hunting. The use of our particular type of stone has not been referred to in any of the ethnographic studies done in the Vindhyan Kaimur region or in adjacent areas but this is not unexpected since the researchers were not particularly concerned with or aware of the historical and archeological significance of these types of rocks.

Although we have numerous ethnographic analogies, there is very little comparative material from the archeological record. The discovery of two flat, engraved stones from the Neolithic levels at Burzahom, Kashmir, may be examples of memorial stones associated with some form of shrine. Both of these were found in association with a rectangular structure made of stone slabs and rubble with an infilling of fine sand, suggesting that they had been placed on some type of platform. The larger stone is engraved with a hunting scene and is roughly rectangular in shape. The second stone is smaller, triangular in shape and bears a schematic, linear design described as a "tectiform". The first stone was found fixed upright in

the structure and brings to mind the practice of raising memorial stones which is still carried out by the Gonds and other tribal groups throughout south Asia.

Given the evidence that particular stones are used to represent deities or spiritual forces, we are confronted with a situation where some stones are used to symbolize the female principle, *Shakti*, and some the male principle, *Shakta*, while other, seemingly identical, stones are regarded as just ordinary rocks. How are these stones differentiated and selected for worship? The site watchman at Baghor I informed us that when he decided to set up a shrine to the goddess, he went to the top of the Kaimur Escarpment where these particular stones are found and searched until he discovered the "right" stones for his shrine. His decision was determined by the shape of the stones and the various colors of the laminations but he could not be specific as to the precise shape or colors that were required. According to him and all of the other local people who examined the archeological stone, this too was the "right" stone to represent the goddess. In fact, one indignant observer asked why we had broken this stone which was holy! When we had explained that the stone had been buried for thousands of years and that we had only just recovered it, he

immediately paid his respects to the goddess by touching his forehead to the ground in front of the platform. On the other hand, not all rocks with concentric laminations were treated with the same reverence since a similar quadrangular block of concretionary sandstone which was found on the slope west of the site was dismissed as being just another rock and not suitable for representing the goddess. The use of this particular type of stone with concentric laminations appears to be limited to the Kaimur area and is probably only as widespread as the geological formation which produces this form of concretionary sandstone.

While it is not impossible that this laminated stone could have been collected fortuitously with the rest of the rubble when the platform was constructed, this seems improbable. Its central position on the platform, its striking similarity to the stones on the present-day shrines to the goddess, the immediate and spontaneous recognition of its significance by the local inhabitants and its origin on the top of the Kaimur Escarpment, provide strong circumstantial evidence that it had a special significance for the group that brought it to the site. We believe that there is a very strong probability that this structure and the stone represent a shrine to the goddess, or

female principle, *Shakti*, which was built by the group of final Upper Paleolithic hunter-gatherers who were living at the site of Baghor I.

The site did not contain any radiometrically datable materials but it is bracketed between sediments that are being dated. One already dated sample from the Early Mesolithic site of Baghor II, which is stratigraphically younger and lies about 1 km. southeast of Baghor I, dates to $8,330 \pm 220$ B.P. Other samples come from the coarse member of the Baghor Formation with a Late Upper or Epi-Paleolithic small blade industry which is dated to $11,870 \pm 120$ B.P.. The age of the Baghor I site, which is in the overlying fine member of the Baghor Formation, probably, therefore, lies between 9000 and 8000 B.C. If this interpretation and dating prove correct and our identification of the shrine is substantiated, then this antedates by several thousand years the next oldest religious structure of this kind in south Asia, and is evidence of the remarkable continuity of religious beliefs and motifs in the Indian sub-continent.

Dr. Clark is a member of the Science and Grants Committee of the L.S.B. Leakey Foundation. A version of this article will appear shortly in Antiquity. □

continued from page 2

Siphiso Cave in the Lumbombo Mountains, which stand out gray and green in the shimmering summer heat as I write. His newest finds here are from the Late

Pleistocene between 12,000 and 18,000 years. I am hoping that some of the African students we are assisting through a grant to Earthwatch will become involved.

Parktown, Transvaal, was the site of a magnificent dinner honoring Professor Raymond Dart, of Taung Skull fame, on his 90th birthday. I represented the Foundation at this stunning black tie dinner. Among the other overseas visitors honoring Dart was Leakey Fellow Ann McIntosh from Sydney.

What does a man like Dart say on his 90th when he is heaped with encomiums on his past? "Look to the future," he said. "Look to the next 90 years! South Africa has given the world outstanding examples of early man. I would hope that South Africans of all races will give the world an example of harmony for the future!"

Trustee Phillip Tobias chaired the dinner and spoke eloquently. He has just stepped down as Dean of the Medical School, and told me he is looking forward to meeting with Leakey friends at our symposium in San Francisco in May, at which Phillip is a featured speaker. See you there then! *Sahle Gahle* (stay well)!

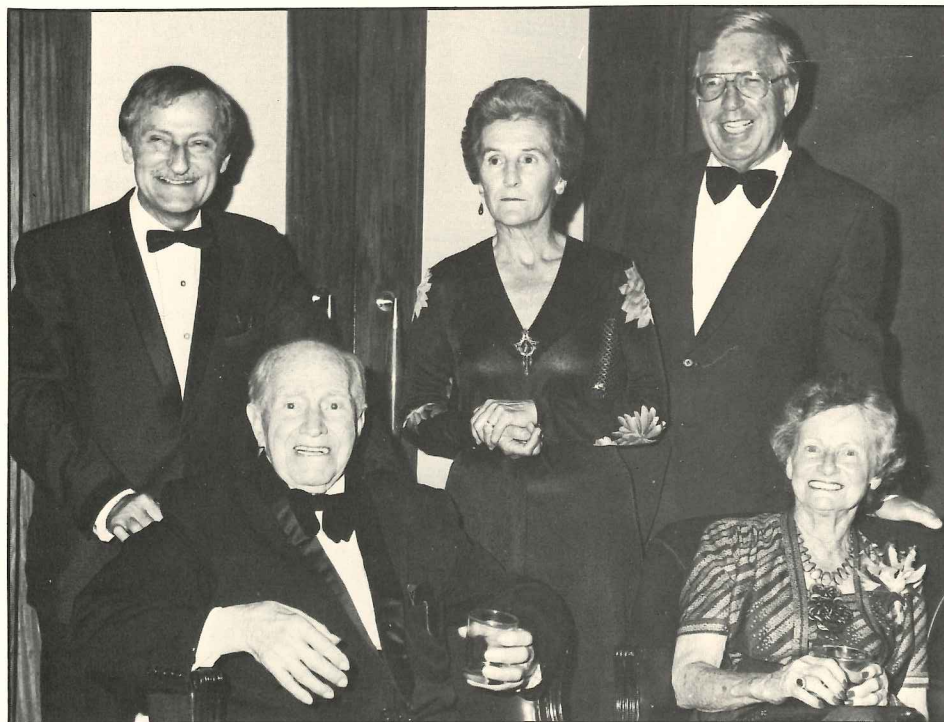


photo: Dr. Robert Brain.

At Professor Raymond Dart's 90th birthday celebration, back row, from left: Phillip Tobias, Ann McIntosh and Ned Munger; seated, Mr. and Mrs. Dart.

Ned Munger

IN LONDON

A private view of the Treasures of Ancient Nigeria exhibition at the Royal Academy in London was sponsored by the Louis S.B. Leakey Trust, the British counterpart of the Leakey Foundation, on November 24, 1982.

H.M. Queen Elizabeth The Queen Mother had consented to honor the reception by attending but was unable to do so because of an emergency operation to remove a bone from her throat. Princess Alice, Duchess of Gloucester, who has excellent firsthand knowledge of Nigeria, graciously took her place at the reception.

The exhibition earlier toured the major cities of the United States before being brought to England by Fleur Cowles, the president of the Leakey Trust. Both the London reception and the subsequent showing are reported to have been very successful. □



From left: Michael Day, L.S.B. Leakey Trust; Fleur Cowles; Ekpo Eyo, National Director of the Nigerian Department of Antiquities and member of the L.S.B. Leakey Foundation Science and Grants Committee; Norman Rosenthal, Secretary, Exhibitions, Royal Academy; and Princess Alice, Duchess of Gloucester.

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CALENDAR

SYMPOSIUM

May 7 – See notice below

LECTURES

BIRUTE GALDIKAS

April 14 – California State University, Fresno, California

JANE GOODALL

April 22 – N. Kentucky/Cincinnati Zoo, Highland, Kentucky

April 23 – Louisville Zoo, Louisville, Kentucky

April 25 – Sweet Briar, Virginia

May 2 – Central Washington University, Ellensburg, Washington

May 5 – Cleveland Museum of Natural History, Cleveland, Ohio

May 6 – Ohio Wesleyan, Delaware, Ohio

May 9 – University of California, San Diego, California

EDWIN KRUPP

May 17 – Ramo Auditorium, Caltech, Pasadena, California

GERARD O'NEILL

April 21 – Ramo Auditorium, Caltech, Pasadena, California

PHILLIP TOBIAS

May 17 – See notice below

SYMPOSIUM

A symposium entitled "In Search of Man: Recent Developments in Human Origins and Behavior" will be held on May 7 at the Palace of Fine Arts in San Francisco. Seven scientists will speak:

Dr. Desmond Clark, "By Their Works Ye Shall Know Them: Significance of Tool Manufacture and Behavior"

Dr. Irvén DeVore, "The Hunter-Gatherer: Past, Present, Future"

Dr. Jane Goodall, "The Nature of the Mother/Child Bond in Chimpanzees: Implication for the Western Nuclear Family"

Dr. C. Owen Lovejoy, "Bipedalism: The Hallmark of Mankind"

Dr. Phillip Tobias, "South African Fossil Hominids and the Evolution of Man"

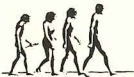
Dr. Sherwood Washburn, "Human Nature"

Dr. Richard Wrangham, "The Roots of Social Organization"

Dr. F. Clark Howell will moderate the symposium which will open at 9:30 a.m. and close at 5 p.m. The tickets are \$40, \$20 for students, \$125 for sponsors and \$500 for patrons. □

TOBIAS LECTURE

Dr. Phillip Tobias, the distinguished South African anthropologist and a member of the Leakey Foundation Science and Grants Committee, will speak at the Delacour Auditorium at the County Museum of Natural History, Los Angeles, on May 17. Entitled "South African Fossil Hominids and the Evolution of Man," the lecture will begin at 7:30 p.m. For tickets (\$5 per person) send your check with a self-addressed, stamped envelope to: Museum Alliance, 900 Exposition Blvd., Los Angeles, CA 90007. □



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