Two chimpanzees exchange a reassuring touch. Gombe National Park, Tanzania.
Photo: Hugo van Lawick, 1968.

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Ape Cultures and Missing Links*

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It’s a most wonderful honor to give the first Getty Lecture. Gordon Getty’s leadership of the Leakey Foundation has galvanized our field with an unprecedented combination of philanthropy, intellect, engagement, and fun. As a result of all these, he now brings a positively professorial expertise as well. No-one as done as much to encourage our field. To be speaking in a lecture named for him is a truly humbling experience.

In recognition of Gordon Getty’s extraordinary reach, I’m going to address the three questions at the heart of the Leakey Foundation’s mission. I’ll frame those questions in a minute. But first, ladies and gentlemen, we’ve all had a long day, so please fill your glasses, sit back, and relax. And incidentally, as far as I’m concerned feel free to drink your wine with your fingers, or by dipping a napkin in it, or by sucking the tablecloth, or however you choose. I say this because I want to encourage you into the spirit of our ancestors but, well, I’ll come back to all that in a minute.

Last Saturday, six days ago, I was in Kibale Forest in western Uganda with a party of ten chimpanzees. About eight o’clock, we met a group of sixty red colobus monkeys. The high-ranking chimps stopped and stared. The younger adult males did the same. The colobus chirped in alarm. Some chimps started climbing. Others watched from the ground. Within minutes, chimps were hunting. Two drove a party of monkeys towards a third waiting in ambush fifty feet above the ground. The colobus did their best to file away through the tree-crowns, searching for an escape among the branches. But they found their path blocked. They turned, and tried another escape. The chimpanzees kept turning them back. The hunts went on for an hour and twenty minutes. At one point, thirty monkeys were trapped on a high branch, two chimps drove them higher, till one by one they jumped. There was a chimp waiting at the landing-point. The first three just escaped. The fourth was caught. The fracas went on. There were fourteen separate hunts in an hour and a half. By the end, three colobus were dead, three chimps had killed, and five human observers were enthralled.

How things have changed. In 1959, 100 years after The Origin of the Species was published, humans were the only primate known to prey on mammals. Last week’s observation would have been a paper in Science. Today, thanks to grantees of the Leakey Foundation, it’s almost routine. We know now that chimpanzees everywhere kill and eat their own prey; that to do so, they often use elaborate cooperative strategies; that the meat is held by males, who share it with friends and lovers in exchange for favors; and that they can hunt so well and so often as to kill 15 - 30% of their prey population per year, a higher proportion than any carnivore does.
So what does this sort of observation mean for our history? Does it suggest a cooperatively hunting, killer-ape in our past? Some people think so. But why shouldn’t we focus on other apes instead? For example, think about bonobos, the sister species to the chimpanzee. Bonobos live in similar forests with similar monkeys. They like to eat meat. But they don’t cooperate in hunting monkeys. They don’t even kill monkeys, even though they occasionally catch them and play with them like pets! And when they do eat meat, (meat of small antelopes), it’s the females, not males that hold the carcass. Should we think, because of bonobos, that our male ancestors disdained the hunt, and ceded meat to females?

I’m not going to focus on hunting this evening. I use hunting just as an example. The same issues apply to any behaviors we’re interested in. Whether we’re talking about hunting, or communicating, or tool-using, or anything else, we have to sort out what ape behavior today means for the human past.

In this lecture I’m going to argue that to be with chimpanzees in an African forest, is to climb into a time machine. That by stepping into the world of these extraordinary apes we move back six million years, to glimpse where we have come from. The glimpse isn’t a perfect picture, but it’s amazingly good. That’s the argument.

Let’s begin by looking back 25 years. In those first years of the Leakey Foundation, I couldn’t have made any suggestion about apes as time machines without sounding very silly. At that time, with genetic and fossil data still poor, apes and humans were thought to be distantly related, not only to each other but also to their common ancestors.

Apes were certainly fascinating to visionaries like Louis Leakey, but then to that extraordinary man, everything was interesting. Happily, he supported Jane Goodall. And he was thrilled when she found chimpanzees modifying tools (and hunting prey), because this meant that chimps were a sort of bridge between humans and other primates. This gave flesh to the idea of evolution. But because at that time, 25 years ago, the kinship between humans and chimpanzees was thought to have ended in the distant past, maybe 15-20 million years ago, no-one was sure what these observations meant for our history. And anyway, the idea of chimps as a bridge was undermined by an apparent gulf between apes and humans in certain critical aspects of behavior.

Certainly there were some similarities. Mothers were strongly attached to their infants. Many gestures were strikingly similar. But the parallels evaporated at a critical point: there was no evidence of serious aggression. Chimpanzees were seen to live wonderfully peaceful lives. So human society was something apart. Reviewing the chimpanzee studies of the 1960s, Robert Ardrey decisively affirmed the human-ape divide. The life of chimpanzees was an “arcadian existence of primal innocence.”

This became the conventional wisdom for other apes. George Schaller and Dian Fossey found gorillas to be a gentle giant. Their new picture rightly challenged the view that gorillas were natural aggressors towards people. In so doing, it left them unconnected with modern human behavior. So the prevailing view was that “human forms of social life were largely unique to human, created by us, subject to human manipulation according to our vision of human good.”

In the first hundred years after Darwin, in every area of human thought, people were searching for new meanings of human existence ... and this was a common conclusion. Paul Gauguin was one of the first artists to do what the Leakey Foundation does, to search in the primitive. This painting (Figure 1) he considered his spiritual legacy. It looks to an imagined past, a primitive

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**Fig. 1. Where Do We Come From? What Are We? Where Are We Going?**

Paul Gauguin (1848-1903) Museum of Fine Arts, Boston.
idyll where man and nature lived in harmony. It has on it, written in the top left-hand corner, the three questions of the Leakey Foundation, questions that go back to Thomas Carlyle’s *Sartor Resartus*. On the right is a newborn child, representing “Where do we come from?” The figure plucking fruit in the centre shows our day to day existence: (“What are we?”). On the left, an old woman facing death symbolizes concern for the future: “Where are we going?”.

You might think that, like ourselves today, Gauguin would have been inspired by his exploration of the human past, present and future. No; he was oppressed. Near the centre, you can see by the tree of knowledge two sinister figures. Their sombre colors show the suffering that comes from leaving nature, pain that Gauguin felt acutely. For Gauguin, human history was a story of acquired sin.

The challenge of completing the painting kept him alive during a period of depression over his daughter’s death, but its conclusions left him empty. As soon as he’d finished his masterpiece, he walked out into the mountains, took a massive dose of arsenic, and lay down to wait for death. Should we feel the same depression from looking into the past? Was Gauguin right to see humans as figures of tragedy, doomed by the very abilities of brains and culture that represent the best of our achievements? No. We have new, more confident answers now, coming not from an imaginary vision of primitive Tahiti but from the real world of living primates. The story of human evolution that emerges is different from Gauguin’s, still discomfiting, but much richer and more inspiring. It’s a story of unfinished challenges. I’m going to address them by taking Gauguin’s, and our Foundation’s, three questions in turn. Let’s begin with the past. “Where do we come from?”

So what made a savannah-living, upright hominid out of a forest-living quadrupedal ape? And what was that ancestral species like, in how it looked and how it behaved? I claimed just now that our pre-hominid ancestor looked like a chimpanzee. Let me explain why I think so.

First, it’s obvious that the three African apes, chimpanzees, gorillas, and bonobos, are all very similar, much more like each other than they are like any other species. The genetic evidence unambiguously supports our intuitions. Let’s look at these three species.

Genetic evidence from Phil Morin, Maryellen Ruvolo and others show that West African chimps have been separate for about one-and-a-half million years from chimpanzees in East Africa. But morphologically, there’s very little difference in chimpanzees across the continent. Like all the great apes, this is a conservative species. Most gorillas are lowland gorillas. Recent Leakey Foundation studies are exciting because they are some of the first to watch lowland gorillas undisturbed. They are so similar to chimpanzees that people can find it hard to tell big chimpanzees and small gorillas apart.

Bonobos are the third African ape. They look so like chimpanzees that they weren’t recognized to be different until 1933, when they were called “pygmy chimpanzees.” But so-called pygmy chimpanzees are actually no smaller than some chimpanzees. Most people prefer to call them bonobos. They live south of the Zaire River, where there are no gorillas or chimpanzees. Chimpanzees live north of the Zaire River, and share much of their range with gorillas.

The evolutionary relationship among these three apes is undisputed: chimpanzees and bonobos split most recently, around 2.5 m y ago, and their common ancestor split with gorillas much earlier, about 8-10 m y ago. So where do humans fit? Probably everyone here knows of the shocking genetic evidence now showing chimpanzees to be more closely related to humans than they are to gorillas. The last four years in particular give mounting confidence to this view, as every new nuclear or mitochondrial gene is looked at, currently more than 10 genes in detail as well as from DNA hybridisation looking at the genome as a whole. This means that human ancestors are no sister group to the apes, but instead arose within the African ape tree. Our hominid ancestors apparently split from the chimp-bonobo line after the split from gorillas. Louis Leakey, a great iconoclast, would have loved it. Now, this surprise gives us an unexpected bonus. It implies that our ancestral 6 m y species is likely to have been very like a modern-day chimpanzee. We can see why by reconstructing our various common ancestors.

First, what was the common ancestor of chimpanzees and bonobos like? The answer depends on comparisons with gorillas, the first ape to split off. Which is more similar to gorillas? Is it chimpanzees? or bonobos? The answer is clear: In characteristics that differ between chimpanzees and bonobos, chimpanzees are consistently more like gorillas. This is true for things we can see, such as the body build, the shape of the head, or the structure of the genitals, as well as those we can’t, such as chromosomes and blood groups. Chimpanzees are like small gorillas, whereas bonobos are like changed chimpanzees. So the common ancestor of chimpanzees and bonobos should have looked like a chimpanzee.

What about the common ancestor of chimpanzees and gorillas? Well, a gorilla is basically a big chimpanzee. The differences between chimpanzees and gorillas in morphology, as well as in feeding behavior, sexual anatomy, grouping patterns and social relationships, can all be explained simply by gorillas being larger. These two species are so similar that they should be in the same genus. So the common ancestor of chimpanzees and gorillas was surely an animal built on their body plan, more chimpanzee-like if it was smaller, more gorilla-like if it was larger.

Finally, the early, ape-like Australopithecine, *afrensis*, is sufficiently well-known for its body weight to be closely estimated. They were about the size of chimpanzees. So our ape-like ancestor that gave
rise to our hominid ancestors was presumably also the size of a chimpanzee, and built on the body plan of a chimpanzee. And with *Australopithecus ramidus* suddenly presented to us, the earliest australopithecine is looking, as expected, more chimpanzee-like.

This is all very disturbing, and exciting. For years we were brought up to say that the living apes were interesting, but we mustn’t think of them as our living ancestors. But now maybe one of them was!

So here’s the scenario. At 8-10 m y a chimpanzee-like species gave rise to early gorillas; at 5-6 m y it calved off australopithecines; and at 2-3 m y it gave rise to bonobos; and it’s still going. You can still argue, and some people do, that gorillas and chimpanzees are similar from parallel evolution rather than common phylogeny. If so, this argument falls. But the great thing is . . . that this question will eventually be settled when the astonishing fossil gap is filled. (There are no known fossil ancestors of the African apes! - except perhaps the 10-million-year *Ouranopithecus*, which in one extraordinary fossil shows an amazingly gorilla-like face staring out across 10 million years of fossilization — a potentially vivid support for the antiquity of the African ape clade).

The most reasonable view for the moment, however, is that chimpanzees are a conservative species and an amazingly good model for the ancestor of hominids. So . . . “What do we come from?” Our ancestor was likely a black-haired, knuckle-walking, large-brained, deep-voiced, heavily-built, big-mouthed, thin-enamelled fruit-eating, fission-fusion, male-bonded species living at low population density in the forests of equatorial Africa.

If we know what our ancestor looked like, naturally we get clues about how it behaved . . . that is, like modern-day chimpanzees. This helps in some ways of course. But Gary Larson is right. We can’t just talk about The Chimpanzee: we have to talk about particular chimpanzee cultures, because chimps invent lots of different signals and different ways to live. For instance, look at the ways chimpanzees drink. They can put their lips to water. But they often make leaf-sponges, which they dip into water and suck. Sometimes they make drinking-brushes, dipped into narrow-holes. One population uses natural water-bottles. Another uses a pestle and mortar to smash up the juicy parts of a palm. And one, as Denise Wardill has seen this year in Burundi, uses whole leaves as bowls to scoop up water. These different drinking styles come from Guinea and Zaire and Uganda and Tanzania and Burundi. So you make the call: what did an Ethiopian australopithecine do?

I love this list of drinking styles because it makes two other points. First, it shows how dynamic this field is. The stem-sponges were first seen less than 5 years ago, the pestle-and-mortar was reported this year, the moss-sponges and water-bowls haven’t yet been published. People are moving into new chimpanzee populations and seeing new traditions all the time, not just in drinking but in eating, body care, signalling, play, everything! (Figure 2) Earlier this year, Rosalind Alp found chimpanzees in Sierra Leone using leafy branches like sandals: they do this when they climb along the thorn-studded branches of capok trees, holding their leafy sandals in their hands and feet to raise their soles and palms above the spines. So did Lucy sometimes wear shoes?

The inventiveness of chimpanzees is remarkable, and sometimes one can even see it directly. Last year, I watched a lonely boy chimpanzee, eight-year-old Kakama, playing for four hours with a log. He carried it on his back, on his belly, in his groin, on his shoulders. He took it with him every time he moved. He carried it up four trees, and down again. He lay in his nest and held it above him like a mother with her baby. And he made a special nest that he didn’t use himself, except to put the log in. Three months later, he did it again, watched by two of my field assistants in Kibale Forest. They recovered the log, and pinned to it a description of the behavior. Their report was headed ‘Kakama’s toy baby.’ Imagination made wood.

As more chimpanzee populations are watched, each has its own culture. But the differences aren’t understood. A tiny few can be attributed to simple ecological causes, but most appear arbitrary. The explanation of cultural differences is becoming an exciting challenge, and it involves explaining not only why traits are invented and passed on, but also why they go extinct. That’s the first lesson of the drinking tools. And what it means for our big questions is both inspiring and annoying. It means that we can look to our past and see a cultural ape that could show a hundred or more inventions of tools and signs and ways to get food . . . but alas, an ape with so much invention that we can’t easily predict where and what it did.

The second lesson is that some of the new observations are wonderfully suggestive about ape-hominid transitions. People have argued that hominids were seed-eaters, making dramatic the hammer-tools used by chimps in West Africa. The fat-rich seeds made available by smashing...
nuts provide much of the calories for the Tai chimps, at some times of year. Did australopithecines harvest palm nuts along the fringes of a Pliocene swamp draining Lake Turkana? Here is an adaptation they could easily have brought with them from the forests.

Others think that hominids were root-eaters, using, like root-eating pigs, the seasonal stores of diverse savannah tubers. This is reasonable because roots could supply the fallback food eaten when fruits were scarce. But could root-eating have started in the forest? Until the 1990s, there was no evidence of it, and it makes little sense... forests have few large storage organs, a tribute to their relatively even micro-climate. But now we have Annette Lanjouw’s extraordinary observations of the root-eating chimpanzees of Tongo. The Tongo chimps, in eastern Zaire, live on a lava flow. All water drains quickly: there are no streams or pools. So these chimps use their moss-sponges, up to 20 minutes a day, but it’s laborious. So, when they’re lucky, they have another trick. Sometimes they find a stem that excites them. Pulling the lava boulders away, they dig deep into the soil, maybe up to their shoulders, and extract a root. The prize is prized indeed. Like a prey monkey, the root is guarded by the possessor while around him his companions scream and hug and charge in joy. The root may be divided and shared. It can be carried for a kilometer or more, while it’s slowly finished. What’s in the root that excites them so? It’s saturated with water, according to Annette. She thinks it’s a bottle.

So I like the idea of some strangely desiccated forest, on a lava flow, perhaps, or on an upland granite outcrop, leading an early Pliocene population of forest chimpanzees to become root-eaters — first for water, and only then for food... forest root-eating, precursor to savannah life.

And once on the savannah, can chimps help us imagine the past? In Chambura Gorge in western Uganda, Cathy Poppenwimer’s work in the last two years has uncovered a forest-based group of chimpanzees that come into the open savannahs for figs. They can nest in these isolated fig-trees. In the savannah grassland they chase the young antelope, the Uganda kob. Presumably they catch them sometimes. There are two lion dens in the gorge, but the chimps survive: leopards they chase in groups. And only two months ago, the first observations emerged of Ugandan chimpanzees using tools to fish for termites, out on the savannah rim of the gorge.

Nut-smashing, root-eating, savannah-using chimpanzees, resembling our ancestors, and capable by the way of extensive bipedalism. Using ant-wands, and sandals, and bowls, meat-sharing, hunting cooperatively. Strange paradox... a species trembling on the verge of hominization, but so conservative that it has stayed so: little changed for 6 million years or more. It’s hard to imagine what more one could ask for as pre-adaptations to a savannah life. But the history of chimpanzee studies shows that our imagination is limited only by what we know. We’re still a long way from defining the limits of what chimpanzees do, and therefore from imagining the range of our ape ancestor’s feats. We have a good answer, however, to “Where do we come from?”. For one thing, we come from an ape with enough brains to invent novel cultural adaptations in every new environment.

The second of Gauguin’s questions, “What are we?”, goes to the heart of his anxieties. The big issue was the source of evil... human aggression and pain and misery. Gauguin, as we saw, thought it unnatural, the result of the loss of nature... a widespread romantic view, from Rousseau to Ardrey. But others saw deep roots. Dostoyevsky grappled with the question for a lifetime, and gave a stern answer in The Brothers Karamazov: “In every man, a demon lies hidden — the demon of rage, the demon of lustful heat at the screams of the tortured victim, the demon of lawlessness let off the chain...” 2 Who was right? Did humans get their demons after leaving nature, or have we inherited them from our ancient forest lives?

The last two decades allow, at last, a reasonably confident comparison of human and chimpanzee behavior. The first similarities we find in the social behavior of chimpanzees and humans are those attractive ones from the era of Louis Leakey. Wherever chimpanzees are studied they form long-lasting individual social relationships, based on exchanges of gestures and favors in remarkably human-like patterns.

But the dramatic discoveries, of course, of the last two decades, have been of the violence that occasionally erupts to destroy Ardrey’s “arcadian existence of primal innocence.” I’m sure most people here know of the gut-wrenching episodes of male raiding that culminated in at least ten lethal attacks at Gombe and the mortal elimination of seven males that had recently set themselves up as their own independent group. Much was horrifying about that so-called warfare. It involved males that knew each other well, associating as close companions before the split; victims were stalked and hunted like prey; the kills appeared the result of...
deliberate attempts to maim often with extreme cruelty, such as the tearing of skin up an arm, or the twisting of a limb to break it.

Does this mean chimpanzees are naturally violent? Ten years ago it wasn’t clear. The warfare was in Gombe, where chimpanzees were fed bananas. Maybe other populations, unaffected by human provisioning, would be found to have escaped the horror of cooperative male violence? Alas, the evidence is mounting, and it all points the same way. Here from my study site in Kibale (Figure 3), are the bones of the one of our chimpanzees killed by the neighbouring group during a period of feeding competition...the first death known in an undisturbed population. In Mahale, border patrols, stalking, counter-chasing, and the extinction of the males of a community all suggest a comparable pattern of inter-group attacks. In Tai, reports of wounds from territorial encounters. In captivity, lethal gang attacks. In this cultural species, it may turn out that one of the least variable of all chimpanzee behaviors is the intense competition between males, the violent aggression they use against strangers, and their willingness to maim and kill those that frustrate their goals.

As the picture of chimpanzee society settles into focus, it now includes infanticide, rape, and regular battering of females by males. Some of these occur in other apes. If we leave Africa for a moment and go to Asia, we find that male orangutans rape regularly, so that perhaps half of their copulations involve force and patent resistance by the female. Orangutan rape has never been photographed in the wild, but something like it has been shown in captivity. And in the wild, adult male orangutans can’t be together without violent aggression.

Back in Africa, the threat and practice of infanticide appears to lie at the heart of the mountain gorilla social system. Males fight violently for the control of groups, and can sometimes kill each other. The average female experiences infanticide at least once in her lifetime, and infanticide has been found responsible for 37% of infant deaths in these gentle giants. As in chimpanzees and orangutans, sexual coercion emerges readily in captivity. Males attack females, who copulate more willingly as a result.

There is a common theme to these relationships: male sexual aggression against females whose only defence is other males. The females of these species of ape live at risk of male brutality. The risk is not constant. For years on end a female gorilla may endure charmed days of relaxed relationships. But intermittent scenes of violence appear to pervade all their lives, so that all must be constantly on their guard.

What a change we see now from the 1968 view. Then, humans were an independent line, and the violence of our species represented novelty, perhaps arbitrary, perhaps random, perhaps a maladaptive trait, but at least without any evolutionary precedence.

Now, not merely do we see humans as descended from within the tightly related cluster of African apes, but the apes also show similar kinds of violence to ourselves. What makes this especially vivid is that these patterns of violence are generally uncommon in other primates and other animals. Deliberate raiding into neighbouring territories to ambush neighbours; sexual coercion, especially of females outside estrus...these are rare. The implication is that strong aspects of human violence have long evolutionary roots. “What are we?”

In our aggressive urges we are not Gauguin’s creatures of culture. We are apes of nature, cursed over six million years or more with a rare inheritance, a Dostoyevskyan demon.

It’s a galling scenario. The implication is that for six million years or more, while we have been evolving from ape to australopithecine to human, through several foraging specialisations, while abandoning the trees and committing ourselves to earth, while brains expanded and faces shrunk and hair became short and fine, while sexuality shifted from promiscuity towards bonding, throughout all this we clung to a suite of characters so rare that it’s not confirmed in any other species, and so dangerous that it threatens the survival of our species. Through all these changes we retained intense rivalry between neighbouring groups of males, lethal coalitional behavior, and a systematic use of violent sexual coercion. On another day, we could discuss the reasons, which look consistent and visceral: unbalanced power corrupts and pays. There’s much still waiting to be explained about the conditions that lead to male-bonding. But once male-bonding is present, lethal aggression follows easily. The coincidence of demonic aggression in ourselves and our closest kin bespeaks its antiquity.

If that’s what we are, “Where are we going?” The big issue, in taking up the third question, is whether we can go beyond our past. Gauguin eventually did. His suicide failed: (he threw up the arsenic). Eventually, he decided to send his picture to Paris, and it was his curiosity about the public response to it that dispelled his mood of morbid helplessness and led to his painting a pastoral which was an optimistic counterpoint to the tragedy of his earlier fresco. The fourth ape gives us the equivalent to our Tahitian pastoral, our opportunity to be optimistic about controlling our natural demon.

Bonobos, as we saw, have apparently evolved from a chimpanzee ancestor. Yet, as we shall see, they have escaped the violence of chimpanzees. How has this happened?

Bonobos have been watched less than other apes, so generalizations are a little less secure. Still, from Kano’s group in Wamba, the Stony Brook group in Limako, and several studies in captivity, the overall pattern is clear. Bonobos have communities like chimpanzees, founded on a resident group of males and their sons. But the violence has died.

Male chimps commonly batter females. Male bonobos hardly ever attack females. And when they do, these occasional incidents suggest one main way that bonobos reduce male aggression. A female that is attacked screams, and what happens? Other females pour in on her side, and chase

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the offending male. Alliances among females keep males from getting out of hand. Kano saw them in Wamba. Amy Parish has been showing this very clearly in captivity, and just recently Barbara Fruth and Gottfried Hohmann have been seeing it in Lomako.

The extraordinary thing is that this doesn't happen in wild chimps. Why not? I mentioned that female chimps rarely travel together. So how can they help each other? But female bonobos are hardly ever apart: small parties are made up of females with the occasional male, whereas small parties of chimps are males with the occasional female. Do female bonobos support each other simply because they can spend time together? Yes — just like chimps in captivity. They also have to trust each other. Female bonobos invest a lot of time in developing friendly relationships with each other, using the most exotic means. If they're going to spend a lot of time together, supportive relationships are invaluable.

Bonobos have much else to recommend them, such as their famous sexual gymnastics, but I want to focus just on this use of alliances among females to deter male aggression. What does it do for the species? It means that sexual coercion doesn't pay. So males compete for mates not by being brutal, but by being socially attractive. This, I believe, lies at the heart of the bonobo changes from chimpanzees. Bonobos are neotenous, retaining a suite of juvenile characters into adulthood. They are slender, and their vocal repertoire is full of high-pitched, submissive-sounding calls. They have become sexy, friendly, mild. If only males assisted in parenting, they'd be a feminist's dream.

How did this change come about? The critical change, I believe, was the evolution of grouping patterns. Chimpanzee females travel together when fruits are abundant, but when fruits are scarce they split up. That clearly suggests they travel alone to feed well. But bonobo females travel together all the time. Is there something different about the foods of bonobos?

Several years ago a number of us suggested that the key difference was that bonobos eat more piths from the forest floor. Pith-eating is a good thing if you can do it. The piths of forest herbs, like sugar-cane, provide good alternatives to fruits. And there's often a lot of it, so there's no need for foraging parties to break up if they can find a field of piths. Gorillas eat a lot of piths. It's the fields of pith that appear to allow the groups of lowland gorillas to forage together as a group.

But do bonobos eat more piths? Recently Richard Malenky and I compared pith densities and the amount of pith taken by bonobos in Lomako and chimpanzees in Zaire. We found that bonobos passed much more pith than the chimps did over the year. They were consistently more focussed on the pith fields than chimps were. So they seem to have a good back-up food when fruits are few — and one that allows groups to stay together.

Let me, then, imagine one way that bonobos evolved from their chimp...
ancestors. Genetic evidence dates the split at 2-3 my ago. We know from Liz Vrba and others that around 2.5 my there was a major drying event. I suggest that south of the Zaire River, gorillas and chimps, or ancestors very like them, lived together as they do now to the north of the river. Then the drying event, and what happened? Only chimps survived. As we see today, in the more

seasonal areas north of the Zaire River, gorillas give out and only chimps remain.

Then the moistness returned, and with it, the piths that gorillas like to eat, as recent studies have been finding in Gabon. But there were no gorillas. So the chimps expanded to occupy the empty niche, including gorilla-foods — in other words, the piths — alongside their previous chimp-foods — that is, the tree-fruits. And as they adapted to the new combination of gorilla foods and chimp foods, they changed. They were rarely forced to travel alone. Females lived together. They developed supportive relationships. They attacked aggressive males. Aggressive males were failures as mates. Males were juvenilized.

The details of the process can barely be guessed at the moment. Certainly, a major role was played by the prolonged sexuality of bonobos, maybe involving concealed ovulation. But the principle will surely remain, that bonobos evolved from changed circumstance; and the way it happened was for a change in the environment to allow a political change. Bonobos weren't constrained by their chimpanzee past to keep their legacy of male violence. Social strategies have different pay-offs in different contexts. They can be easily changed when the contexts change. And a remarkable feature of the alliances among bonobo females is that they are developed among strangers. In other animals, alliances are linked to kinship. In bonobos, alliances are produced from recognition of common interest, a recognition that takes brains. The development of big brains and advanced cognition has brought with it the ability to escape from the constraints of biology, even in a species with little self-consciousness. Gauguin thought us tragic: the very skills that make us human, our intellect and emotions, also bring demons. But that romantic view is wrong, almost the reverse of history as we can see it now. Our demons come from our ape past, and we need our intellect and emotions to forge the alliances that can defeat the beast. It's common sense, supported by the evidence.

What does it do for us, then, to know the behavior of our closest relatives? Chimpanzees and bonobos are an extraordinary pair. One, I suggest, shows us some of the worst aspects of our past and our present; the other shows an escape from it. In thinking creatively about our future, I hope we honor our sister species, who by being different from ourselves, emphasize the unity of our humanity.

Let me return to the extraordinary achievements of the Leakey Foundation. In this talk I've referred to perhaps twenty field studies. All have input from the Leakey Foundation. I should be referring to each by name, and honoring the individual scientists that make a broad review possible. But let me honor, instead, the trustees and supporters of the Leakey Foundation, who have put their time, their money, and their spirit into helping us all.

In a mere quarter-century, this imaginative group has presided over the golden age of biological anthropology, stimulated a range of exciting discoveries, brought academics face to face with the public that supports them, and incidentally greatly benefited primate conservation efforts.

The knowledge so gained should help us, though some fear it. For Gauguin, "primitive" was good. Those who ate from the tree of knowledge suffered. For others today, "biology" (the primitive) is fearful. Many people reject the idea that we still follow rules that we can trace to the Pliocene. So we can pretend it's not true, but much good that may do us. Denial of our demons won't make them go away. But even if we're driven to accepting the evidence of a grisly past, we're not forced into thinking it condemns us to an unchanged future. There are many challenges.

For primatologists: to understand more precisely the conditions that favor male aggression, and the conditions that suppress it. Are there populations of chimpanzees that have evolved beyond violence? Are there bonobos that are violent like chimpanzees? We can expect some such local adaptations to special conditions — can we use them to explain the ill effects of testosterone poisoning in our own ape lineage?

For psychologists: what has the long legacy of aggression done to our psyche? Has it made men specially vulnerable to deindividuation — that mindless loss of self, and acceptance of gang wisdom; ... or to dehumanization — the cruel emotional deafness to the cries of outsiders? If it prepared us for a career of obedience to authority, of heroism and impulsivity, of quick acceptance of group norms, how can our understanding of history create an enlightened world? The human future may depend on taming the demonic male. It may involve the growing political power of women. But it will not happen in quite the bonobo way. We must look to nature not to copy but to learn.

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Scholars, symposia, and seminars

Department of Anthropology Faculty

Ofer Bar-Yosef, George Grant MacCurdy and Janet G.B. MacCurdy Professor of Prehistoric Archaeology, attended the conference on "4 Million Years of Human Evolution" - a Symposium honoring Dr. Mary Leakey, Arusha, Tanzania, 8-12 August 1993. He delivered a paper entitled "The Earliest Lower Paleolithic Sites in the Levant." Prof. Bar-Yosef and Renne Kra (Univ. of Arizona) are the authors of Late Quaternary and Paleoclimates in the Eastern Mediterranean, published by Radiocarbon and the American School of Prehistoric Research, Peabody Museum, Harvard Univ. Other publications by Prof. Bar-Yosef include "Site Formation Processes: A Levantine View," in Formation Processes in Archaeological Context, M. Pertaglia, P. Goldberg and D. Nash, eds., Prehistory Press, Madison, 1993; and "The contributions of Southwest Asia to the Study of the Origin of Modern Humans," in Origins of Anatomically Modern Humans, Plenum Press, New York, 1994. Prof. Bar-Yosef delivered a lecture on "Lower Paleolithic of western Asia, the origins of modern humans, and transitions to agriculture in the Near East," at the Institute of Archaeology, Lund Univ., Sweden. He has been named co-editor, with Dr. Paul Goldberg, Univ. of Texas, Austin, of Geoarchaeology. In the summer of 1993, Prof. Bar-Yosef continued his participation in the Turkish-Belgian project at Karain and Okusini caves in the Antalya region of Turkey.

Kwang-chih Chang, John E. Hudson Professor of Archaeology, was the co-organizer for the Conference on the Integration of Chinese Archaeology and Historiography, held in January, 1994, in Taipei. He participated in a Conference on the Prehistoric Cultures of Southern and Southeastern Coastal Areas of China, sponsored by the Institute of Culture of the Chinese Univ. of Hong Kong, in February, 1994. Recent publications by Prof. Chang include: "Data on shamans in the Yangshao culture" (in Chinese), Bulletin of the Institute of History and Philology, Academia Sinica, No, 64, 1993; and "Neolithic antecedents of the man-and-beast motif in Bronze Age art of China," in Ancient Chinese and Southeast Asian Bronze Age Cultures: Proceedings of the Conference at Kioala, New South Wales, 8-12 February 1988. Prof. Chang reports that the Shangjiu project on early Shang civilization in Henan, China is in full swing.

Byron J. Good, Professor of Medical Sociology in the Dept. of Social Medicine and Health Policy, and Lecturer on Anthropology, served as Acting Chair of his department during 1993-94. Medicine, Rationality, and Experience: An Anthropological Perspective (the 1990 Lewis Henry Morgan Lectures) was published by Cambridge Univ. Press, 1994.

Professor Michael Herzfeld, Curator of European Ethnology in the Peabody Museum, is the 1994 winner of the School of American Research's $7500 J.I. Staley Price, for his book Anthropology through the Looking-Glass: Critical Ethnography in the Margins of Europe (Cambridge Univ. Press, 1987). In his "News of the Academy" column in the Anthropology Newsletter (September 1994), David Givens commented that "the J.I. Staley Prize's nominations procedure, painstaking selection process and cash award have made it the virtual 'Pulitzer Prize' of anthropology in less than a decade." The prize, which is awarded "to a living author for a book that stands as an example of the best work being done in anthropology today." was formally presented to Prof. Herzfeld at a ceremony at Harvard in November. Earlier last year, in June, Prof. Herzfeld - who has been engaged throughout the academic year on a sabbatical-year project on apprenticeship in Crete, supported by grants from the National Science Foundation and the American Philosophical Society - received the Royal Anthropological Institute's Rivers Memorial Medal. The medal is awarded for "exceptional merit" in a body of work published over a five-year period, and was presented at a ceremony in London. During the academic year, Prof. Herzfeld also held the Honorary Simon Professorship at the Univ. of Manchester (January-February), and had speaking engagements at other universities in the United Kingdom as well as Bulgaria, Greece, Israel, Italy, and Sweden.

In the fall of 1993, The Univ. of Chicago Press published a paperback edition of The Social Production of Indifference: Exploring the Roots of Western Bureaucracy, which was originally published by Berg (Oxford) in 1992. On July 1 Herzfeld assumed the editorship of the American Ethnologist for a four-year term.


Pgs. 495-515, August, 1994. Prof. Matory is currently working on a book on gender and political identity in the Afro-Brazilian religion called Candomble.


Robert W. Preucel, Associate Professor, spent the spring semester of 1993 as a Fellow Commoner at Churchill College, and as a Visiting Scholar in the Dept. of Archaeology at Cambridge Univ., While at Cambridge, he researched material for two books to be published by Basil Blackwell. The first is a volume on the practice of archaeology entitled Archaeological Interpretation and the second is a reader in archaeological theory entitled Contemporary Archaeology in Theory (co-edited with Ian Hodder).

Last spring Prof. Preucel gave an invited lecture entitled “Cooking Status: The Role of Competitive Feasting among the Classic Hohokam” at the Dept. of Anthropology at SUNY Binghamton and served as a discussant for “Perspectives on Place,” at the annual meeting of the Conference on New England Archaeology. He was the faculty consultant to an exhibit at the Peabody Museum entitled Is dzan nadeeshe’ bi chaghashe, the Children of Changing Woman, curated by Ernestine Begay. The exhibit highlights the significance of the Apache women’s puberty ceremony in the reproduction of Apache culture. During the summer, Prof. Preucel continued his excavations at Brook Farm, the site of a 19th century utopian community in West Roxbury, Massachusetts. Research focused on the Phalanstery, the building that burned down in 1846 and symbolically marked the end of the community.

Recent publications by Prof. Preucel include: “A Social History of Maize on the Pajarito Plateau, New Mexico,” (with Jack Barker) in Papers on the Early Classic Period Prehistory of the Pajarito Plateau, New Mexico, edited Continued on next page

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Evon Z. Vogt, Jr., Professor Emeritus, is the author of the follow-


James L. Watson, Fairbank Professor of Chinese Society and Professor of Anthropology, is the principal investigator of a three year research grant recently awarded to the Fairbank Center (which is currently directed by Prof. Watson). The Henry Luce Foundation is supporting the project, entitled “Food, Consumption Patterns, and Dietary Change in North China.” It is a cooperative endeavor with a team of five researchers from the Research Center for Rural Economy, Ministry of Agriculture, Beijing. Prof. Watson is working in conjunction with Prof. Arthur Kleinman, Dr. Rubie S. Watson, and Dr. Yun-xiang Yan (a recent Harvard Ph.D. who is now teaching anthropology at Johns Hopkins Univ.). The grant will cover field research expenses for Harvard graduate students and faculty, as well as Beijing team members. An international conference on dietary change in Chinese society will be held at Harvard in 1996. Project members will track various types of “new,” processed foods as they enter the Chinese market and investigate their influence on daily life (family patterns, labor relations, gender roles, and ritual activities).

Visiting lecturers

Throughout the academic year a number of scholars from the U.S. and abroad gave lectures in the Dept. of Anthropology and at meetings of the Peabody Museum Association.

Prof. Anita Jacobson-Widding, Uppsala Univ., Sweden, delivered a lecture on “Eating People as a Symbolic Discourse on Selfhood: An Interpretation of African Ideas about Cannibalism, Witchcraft, and Totemism.” Dr. Kenneth Campbell, Univ. of Massachusetts, Boston, spoke on “Dangers in Single Parameter Approaches to Endocrine Evaluations: A Thyroid-Axis Example.” “Ondo: Religious Pluralism in Yoruba City” was the title of a lecture by Prof. K. Jacob Olupona, Univ. of California, Davis. “Is there a cut-off period for the development of language?” was the title of a talk by Prof. John Locke, Massachusetts General Hospital.

Prof. Deborah Gewertz, Amherst College, gave a lecture entitled “From Darkness to Light in the George Brown Jubilee: The Invention of Nontradition and the Inscription of a National History in East New Britain.” Prof. Guerdes Fleurant, Wellesley College, spoke on “The Music of Haitian Vodun: Syncretism and Humanocentrism.” “Sperm Competition and Reproductive Tactics in Primates” was the title of a talk by Dr. Frederick Bercovitch, Caribbean Primate Research Center.


Prof. Alison Betts, Univ. of Sydney, Australia, lectured on “Ancient Hunters of the Steppes: Game Drives in Central Asia and North America.” Dr. Frank Bronson,
Univ. of Texas, gave a talk entitled “To Breed or Not to Breed: Seasonal Strategies in Mammals.” Dr. Gordon G. Gallup, Jr., Univ. of New York, Albany spoke on “Do minds exist in species other than our own?” “Selves and Others in Japanese Culture — An Approach in Historical Anthropology” was the title of a lecture by Prof. Emuki Ohnuki-Tierney, Univ. of Wisconsin, Madison. Prof. Ohnuki-Tierney also spoke on “Rice in Japanese Culture and History: Approaches to Historical Anthropology Re-examined.” David Woodruff, Univ. of California, San Diego, lectured on “Non-invasive genotyping and the past and future evolution of animal species.”

Dr. Lynne Isbell, Rutgers Univ., presented a talk entitled “Primates as Dinner and Dinners: Influences of Predation and Resource Competition on the Social Systems of Primates.” Dr. Mariko Hiraiva-Hasegawa spoke on “Big Son or High-Class Daughter: Theory and Evidence on Sex Skewed Birth Ratio of Large Dimorphic Mammals.” Dr. Meredith F. Small, Cornell Univ., lectured on “Female Choice in Primates.”

“Nature and Implications of Egyptian Eocene Primates” was the title of a lecture by Dr. Elwyn L. Simons, Duke Univ. Prof. Roberto Da Matta, Univ. of Notre Dame, spoke on “Liminality and Individuality.” Dr. Anne Savage, Roger Williams Park Zoo, Providence, presented a lecture entitled “An Integrated Approach to In Situ Conservation in Colombia: Long-Term Studies of the Reproductive Biology of the Cotton-Top Mandarin.”


Museum curators and staff

Marie Jeanne Adams, Associate in African and Oceanic Ethnology, Peabody Museum, gave a lecture titled “Myths, Metaphors & Dreams” at the Museum of Fine Arts, Boston. Other recent invited lectures include “Photography: Its Delights and Distortions” at the Univ. of New Hampshire, and “Cosmic Measure in Indonesian Cloth” and “Beyond Symmetry in Sub-Saharan Textiles” at the Tufts School of Art. In June Dr. Adams delivered a lecture at the “African-American Visions Conference” at the Univ. of Hawaii. Her publications include “Women’s Art As Gender Strategy,” African Arts 26 #4, 1993,” and “Discours de negociation entre les couples maries dans le village de Keibli, Canton Boo, Cote d’Ivoire” (journal des Africanistes, Paris - Fall 1994).

Clemency Chase Coggins, Adjunct Professor of Archaeology and of Art History at Boston Univ. did research in Guatemala and Yucatan, Mexico in the spring of 1993. She gave a paper at the Asociacion Tikal in Guatemala on the metaphoric titles of ancient Maya women, and she visited ancient and modern limestone quarries in the two countries in an effort to understand the ancient Maya characterization, choice, and use of limestone. An essay on the relationship between Teotihuacan and the Maya appeared in the catalog of the major exhibition “Teotihuacan: City of the Gods,” which was created by and for the De Young Museum, San Francisco. In June Prof. Coggins spoke at the Getty Conservation Institute about the problems with unprovenanced antiquities. At the end of July, she gave a paper on ideological explanations for the presence of Teotihuacan warriors in the Maya Lowlands in the fourth century A.D., at the XIIIth International Congress of Anthropology and Ethnology, Mexico City. In the spring of 1994, she was Visiting Scholar for two months at the Instituto Nacional de Antropologia, Universidad Nacional Autonoma de Mexico.


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The Road to Harvard and Copan and Back Again

WILLIAM L. FASH

William L. Fash has been appointed Bowditch Professor of Central American and Mexican Archaeology and Ethnology in the Dept. of Anthropology. Before coming to Harvard he was on the faculty of Northern Illinois Univ. (1984-1994).

I was born in Stillwater, Oklahoma, in July of 1954, nearly three years after my sister, Victoria. Both of our parents are cultured and visual people, with broad interests in the humanities and a deep appreciation of other cultures. Between my father’s Fulbright-sponsored M.A. studies in architecture (in Denmark), and my mother’s Fulbright-sponsored M.A. studies in art (in Mexico), we did a great deal of travelling abroad during my youth. Always eager to travel, my sister and I quickly learned Danish and Spanish, and the joy of learning about other people and countries. We both distinctly remember visiting a Viking site and museum in Sweden, and walking around in the Coliseum in Rome during our early travels. Ironically, my parents’ most vivid memory of our return to this country from Europe in 1961 was my vigorous protest when they suggested we visit a museum in New York: “No, sireee, I’ve been to every darned museum in Europe this summer and I’m not about to go to another one!” Thankfully, my appreciation for museums has grown over the years, and my love of learning about ancient and living cultures evolved into my life’s work.

My focus on the cultures of Mesoamerica began in high school in Urbana, Illinois, in 1970. My Spanish instructor, Frank Medley, was a gifted teacher, and allowed those of us with a good grasp of the language to read and write independently. Since we had recently been to my mother’s one person show at the National Autonomous University of Mexico, and had travelled to the ruins of Monte Alban once the show wrapped up, I set about to read more about the ancient Zapotec people who had built that great site. My father, then a professor of architecture at the University of Illinois, graciously arranged for me to use the architecture library, where a number of works were available in Spanish — many by the Mexican archaeologists who had dug at Monte Alban and elsewhere. My interest sparked, I began to write a series of reports in Spanish on the rise and fall of the ancient cultures of Mexico, Central, and South America. The summer after my junior year in high school I embarked on my first solo journey to Mexico and Central America. For the first six weeks, I intensively studied Spanish, Mexican literature, and folklore at the Escuela de Artes Plásticas in Guadalajara, and for the following four weeks, set out to explore modern and ancient cultural monuments in Mexico, Guatemala, and Honduras. This journey, and the fine people whom I met during its course, succeeded in convincing me that I had indeed found my calling.

Happily, the University of Illinois had great programs not just in architecture and art, but dozens of other fields, including anthropology. As a senior in high school, my sister persuaded (and escorted) me to meet the university’s Mesoamerican archaeologist, Professor David Grove. (In her teens, Vickie briefly considered archaeology as a career, but eventually settled on a much more remunerative line of work in the private sector that allows her to travel around the globe several times a year.) Grove persuaded me to study under him, and to join his dig at the important Formative Period site of Chalcatzingo, Morelos, Mexico. It was truly a great privilege and honor to work under Grove’s direction at that site in 1974 and again in 1976, where I managed to find a number of important burials, offerings, and the remains of one of the earliest settlements at the site. Grove was not only a master field archaeologist, but a fabulous teacher, keeping us all entranced in the subject of archaeology and the wonders of Mesoamerica. In my own case, this spilled over into an independent study of surviving Zapatistas in...
Morelos and Guerrero, who still recalled the trials and tribulations of the Mexican Revolution of 1910-1919. The interviews from this study, which I carried out on the weekends so as not to take away from time on the dig, became the subject of my senior honors thesis. At Grove’s suggestion, I participated in the University of Arizona’s renowned archaeological field school at Grasshopper, Cibecue, Arizona, in 1975, where I broadened my understanding of archaeological method, theory, and research design under the able guidance of J. Jefferson Reid and William Longacre. For the 1976 spring season at Chalcatzingo, I persuaded Grove to allow a talented artist whom I had met at the University of Illinois to join his dig and try her hand at rendering Olmec-style bas-relief carvings. This was Barbara Wascher, who with her first morning’s work at the site won Grove’s everlasting respect. (It had taken me nearly four years!) Upon seeing Mexico, Barbara became enamored with it and the life of the Mesoamerican archaeologist. We were married the following summer.

In Chalcatzingo and in the classroom, I had been inculcated in the importance of the Formative Period in Mesoamerican culture history, when the Olmec people of the Gulf Coast Mexican states of Veracruz, Tabasco, and Campeche were at the forefront of the move toward urbanism and civilization. At the same time, my travels and readings had drawn me to the Maya culture, who inhabited the eastern third of Mesoamerica and whose immense architectural, artistic, and hieroglyphic legacy have long inspired awe among all those who observe them. When it came time to decide where to pursue my doctoral degree in anthropology, the choice was clear: Harvard, under the dean of Mesoamerican archaeologists, Professor Gordon R. Willey. I graduated summa cum laude in June of ’76 with highest honors in anthropology and a minor concentration in Latin American Studies, and managed to secure a National Science Foundation graduate fellowship for the fall of that year to pursue my graduate career here.

As the (first) Bowditch Professor of Central American and Mexican Archaeology and Ethnology, Gordon Willey had built up an immense publication record and an impeccable reputation through decades of field research on settlement patterns in Central America and Mexico. Equally important, he had trained and ably guided dozens of students, who had gone on to produce impressive publications and students of their own. In his work, Willey championed a holistic approach to the study of the Mesoamerican past, focusing primarily on the material remains of the bulk of the population through settlement and artifact studies, but always conscious of the need to understand ideological adaptations and history through the analysis of public monuments and their associated pictorial and hieroglyphic records. It was a balanced perspective that I admired and sought to emulate in my own work.

So it was that as a first-year graduate student at Harvard I was asked by Gordon Willey to join his settlement pattern survey and excavation program in the Copan Valley, in western Honduras. I had visited this idyllic locale twice, in 1971 and again in 1974, and was more than happy to apprentice under the master in such a magnificent setting. Over the course of the spring term of 1977, I learned a great deal from Willey and his senior graduate student and field director, Richard Leventhal, about archaeological surveying, mapping, and excavation in the Maya area. Barbara joined the team in April, concentrating on drawing the ceramics and other artifacts that had come out of the digs. Much to all of our surprise, in that same month Richard found an elaborate hieroglyphic inscription on the façade of the bench or throne inside the largest structure of Copan Valley (CV) site 43, the residential compound that he was excavating. All of a sudden, settlement pattern studies were entering new and uncharted waters, as the common people entered the realm of Maya history.

That summer, we were visited by Drs. David Kelley, Linda Schele, and Peter Mathews, foremost experts on Maya hieroglyphic writing. They examined the bench with great enthusiasm, but admitted to being for the most part baffled by its text. Upon our return to Cambridge, Barbara visited Ian Graham, director of the Corpus of Maya Hieroglyphs Project at the Peabody Museum, to get his advice on her drawing of the inscription and how to prepare it for publication. Peter Mathews subsequently wrote me to share his decipherment of the main date in the inscription (corresponding to A.D. 771), and invited me to join Floyd Lounsbury’s glyph seminar at Yale the next fall. Studying with Lounsbury and Mathews, and later interacting with Berthold Riese, the German epigrapher hired on the subsequent Honduran-government sponsored Copan Archaeological Project, I came to understand the structure of the Maya writing system and the kinds of information that it recorded.

But my own field research was happily devoted to the Copan Valley settlement patterns and mapping, which I assumed responsibility for in 1978. Once I finished the map of the central 24 sq. km. of the city and completed the study of its settlement history, I was placed in charge of the excavation of a long sequence of human occupation by the pre-eminent cultural ecologist (and director of the second phase of the Copan Project), William Sanders. The work at this site, known as Group 9N-8, allowed us to answer a series of questions about the nature of the earliest sedentary agriculturalist settlements in the valley (ca. 1100 B.C.), the nature of Copan’s involvement in the evolving Mesoamerican cultural tradition during the heyday of the Olmecs, and the participation of the resident valley population in the formation and maintenance of a Classic Maya kingdom. My 1983 dissertation at Harvard was couched in terms of state formation, but its central contribution was to show how the process

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of urbanization and increasing social inequality eventually outstripped the capacity of the locally available resources to sustain them, leading to the decline of the city and the end of divine kingship and the Classic Maya tradition in the region. Sanders' and Willey's influence can clearly be seen in that work, but the subject that most fascinated me was the role of the landed nobility at sites like CV 43 and Group 9N-8 in the formation and eventual collapse of centralized rule.

During the first of my three years of excavations at Group 9N-8 I participated in the excavations of a nobleman's palace, under the direction of Sanders' Penn. State colleague (and project co-director), Professor David Webster. Barbara and I became intrigued with trying to piece back together the 200 or so fragments of stone sculpture that had originally adorned the four exterior façades of this building, but subsequently crashed to the ground when the forces of nature toppled the building in the centuries following the ancient city's demise. Barbara had spent the years from 1978 to 1983 drawing the hieroglyphs and the ruler portraits on the Copan monumental statues ("stelae"), altars, and famous Hieroglyphic Stairway — as well as bearing and nurturing the first two of our three sons — and by this time had a formidable understanding of Maya art. Based on the locations where each stone had fallen (carefully plotted during the excavations), and the depth of relief, and designs on the sculptures themselves, we soon had a reconstruction of which we were confident.

We eventually persuaded Carlos Rudy Larios, the Guatemalan architect and archaeologist in charge of architectural restoration on Sanders' project, of the veracity of our findings. Larios subsequently restored a small part of the adornment — for which structural, contextual, and artistic evidence were resoundingly clear — back onto the building. In the meantime, the abundance of information provided by the archaeology, epigraphy, and pictorial symbolism, was explored by a number of members of the Copan Project in terms of then-current knowledge about the site in a volume.
cal collapse of the kingdom in our work in the valley, we sought to explore how it was that the central-ized rulership of this Maya kingdom was able to impose its will in the face of such tremendous problems, and successfully maintain an urban and political center for four centuries. We sought to understand how it was that the Maya kings, to borrow the socio-cultural anthropologist Clifford Geertz's phrase, "made inequality enchant." In brief, we wanted to describe and explain the ideological adaptations developed by the Copan kings in response to severe social, economic, and political stress through the recovery, documentation, reconstruction, and decipherment of the hieroglyphic records and pictorial sculp-

and our three young charges, and over the following decade we were able to pursue our vision with vigor and strong backing from several quarters. We began the Copan Mosaics Project with the idea of doing the same type of sculptural, and cultural, reconstructions that we had pioneered with our work in the valley on Group 9N-8, but on a larger and more powerful scale: the architectural sculpture of the dozens of buildings that comprised the royal compound or "site-core" of Copan. Having seen first-hand the evidence for ecological devastation, social inequality, and politi-

ture of the 8th century Copan acropolis buildings.

We asked Rudy Larios to join the project as its co-director in charge of architectural restoration. Linda Schele was then invited to join our team, and she in turn invited young David Stuart to join us. Like Lounsbury and Mathews, Schele and Stuart appreciated the Copan inscriptions to be the work of highly creative and original scribes. With so many texts at a place like Copan, one of the ways for scribes to distinguish themselves was by using the phonetic and pictorial signs of the writing system in combinations that had never been used or publicly displayed before. This free-wheeling substitution pattern had led Lounsbury to proclaim the Copan inscriptions a veritable Rosetta Stone for epigraphers. Together, Schele and Stuart put together a complete dynastic sequence for the site, and in the summer of 1986 wrote a masterful summary of the content of the inscriptions of the Hieroglyphic Stairway, based on Barbara's drawings and their own examination of the old Peabody Museum photographs.

The Hieroglyphic Stairway itself, of course, had been the subject of intense scrutiny in the 1890s by the Peabody Museum Honduras expeditions. Copan, with its abundance of architectural and free-standing sculp-

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Sculptured heads from the Hieroglyphic Stairway, Copan, Honduras. Peabody Museum Fourth Honduras Expedition, 1895.
remaining stairs were restored back onto the pyramid-temple known as Structure 26 in the late 1930s and early 1940s by the Carnegie Institution of Washington's Division of Historical Research. With the best of intentions for preserving the monument, they inadvertently contributed to its destruction: each year the torrential downpours of the rainy season converted the Hieroglyphic Stairway to a waterfall, slowly but surely erasing all of the original carving. While the Maya had solved this problem by periodically coating the steps with lime plaster, to do so now was against international canons of architectural conservation and restoration. Rudy Larios persuaded me that something had to be done to save this great monument and its priceless text, before all was lost.

Thus, in addition to the scientific goals of recovering, recording, publishing, and interpreting the anthropological significance of the sculpture fragments and the buildings that they graced, our project had another goal, ultimately more lasting and important than any social theory that happens to be most influential at the moment: the conservation of a cultural legacy — literally, saving the past for the future. Thus far, we have recorded, computerized, and shelved in new, safe storage facilities over 27,000 fragments of stone sculpture. By 1997, which will make Barbara's and my 20th year at Copan, we hope to have completed that process for the 5,000 or so fragments that we have not yet gotten to at the site. Of course, the extensive collections of Copan sculpture in the Peabody Museum represent a treasure trove for us, especially since Barbara can identify which buildings the pieces came from, and which pieces fit to others that she has seen in Copan or in other collections. Thus, returning to Harvard is a special privilege for both of us: for me, to try to carry Willey's (and Mr. Bowditch's) legacy into the 21st century, and for Barbara, to document and puzzle back together the pieces of the Copan temples. To work with the faculty and students of the Department of Anthropology, Harvard University, and the staff of the museum, is likewise a font of inspiration. The opportunity to work and interact with Ian Graham and David Stuart on a daily basis is literally a dream come true for both of us.

Under the good offices of the Honduran Institute of Anthropology and History, and with the strong support of two consecutive Presidents of Honduras and our long-time friend and archaeologist colleague Ricardo Agurcia, we are now completing the work on a massive new sculpture museum at the archaeological park in Copan, where over 3,000 original sculpture pieces will be on display, including six complete building façades and parts of ten others. The museum is designed to bring the past
to life, and to share with the visitor everything the Maya recorded in stone sculpture about their world — both natural and supernatural. It will be the pride of a modern nation-state that has seen fit not just to study its own past, but to invest in it to forge a better future. It is our hope that even the weariest of young travellers will enjoy the museum (providing their parents can entice them to enter it), and be inspired by the lasting legacy of Mesoamerican civilization. We have been assured by knowledgeable people who have seen it that this museum will be among the finest of its kind in the world.

As the years have passed in Copan, the Copan Mosaics Project grew in size, scope, and recognition, and I have managed to persuade several of my elders and betters at other distinguished universities to join our ranks and enhance the study of the rise and fall of this Maya kingdom. If experience is any indication, in future projects we will work with still other colleagues, with other viewpoints. Since 1977, Barbara and I have found ourselves in the company of many different accomplished scholars and talented students, with a wide array of interests and specializations. Palynologists, a geologist, a river geomorphologist, botanists, a podologist, zooarchaeologists, an archaeomagnetometer, ceramicists, epigraphers, iconographers, architects, artists, agricultural specialists, ethnographers, ethnohistorians, an energetics expert, obsidian hydration and use-wear analysts, paleopathologists, demographers, and many others, have come and gone, and many have come back again. Through it all, we have made many lasting friendships and gained a broader understanding of the many kinds of people and pursuits that played out in one ancient Maya city. Indeed, arguably our greatest contribution to Mesoamerican anthropology has been our reconstruction of the Council House, and the importance that the institution of the royal council had in this part of the world.

That same diversity of lifeways and often conflicting interests exists today among our gracious hosts and hundreds of co-workers in Copan, about whom we are compiling data for an ethnography. My coursework and interactions with Evon Vogt at Harvard alerted me to the richness and complexity of living Mesoamerican cultures in their own right, as well as a rich source for analogy with archaeological data. Although we can and do appreciate the environmental, biological, and technological frame for our story, we can’t help but agree with Willey that ideas are what move people, and that is where the real interest lies.

The people of Copan say that once you have tasted the water there, you will always return. Although most visitors actually find the water to be one of Copan’s lesser virtues, there must be something to this theory, for we have returned there for 18 consecutive field seasons. Harvard has also returned to Copan, first with Gordon Willey, and now with us. This most informative and informed-upon Classic Maya ruins continues to hold great challenges for us and for future generations, since at this point only about 1% of the remains of the total settlement system have actually been dug. We also hope to build on the Harvard tradition by providing field opportunities for students to pursue the whole gamut of scientific and humanistic inquiry possible in Copan, at other Mesoamerican sites, and among living cultures of the region. We will do this through our field school and ongoing research and conservation projects in Copan. If all goes well, Barbara and I hope to eventually return to Mexico, for our own road to both Copan and to Harvard started there.

Museum curators, from page 13

National Science Museum monograph 8:115-129, 1994. Dr. Flynn’s field work in Gansu Province, Lanzhou Basin on mid-Tertiary deposits bearing vertebrate remains is ongoing, and he has renewed field research with Dr. John Barry and Prof. David Pilbeam on the Siwalik deposits of Pakistan.

T. Rose Holdcraft, Administrative Head of the Conservation Department, participated in a Museum Management Project under the Academic Specialist Program of the United States Information Agency during the month of January (1994). She collaborated with the staff of the Center for Precolombian Studies of Honduras on exhibit preparations for the new San Pedro Sula Museum, presenting informal training sessions on preventive conservation measures, assisting with textile conservation treatments, and assisting with the object installation for the archaeo­logical component (curated by Prof. Rosemary Joyce, Univ. of Calif., Berkeley, and Dr. John Henderson, Cornell Univ.) involving more than 350 objects.

Barbara Isaac, Assistant Director, Coordinator of Photo Archives, and Director of the Repatriation Office, made a presentation on repatriation at the Peabody Museum at a roundtable discussion of the National Graves and Repatriation Act for the New England Association annual meetings in Portland, Maine on November 2, 1994. She also talked on repatriation to the Oxford Anthropology Society on November 26, 1994. The manuscript Plio-Pleistocene Archaeology at Koobi Fora, Kenya which she was co-editing with the late Glynn Isaac will be published towards the end of 1995. She spent three weeks of fieldwork in the Republic of Georgia, focusing on the Plio-Pleistocene record, in the area around Akhalkalki, together with Reid Ferring of the Univ. of North Texas, Ofer Bar-Yosef of Harvard, and Anna Belfer Cohen of the Hebrew University. The visit ended with the signing of agreements between the Georgian State Museum and Harvard Univ., and between the Georgian State Univ. and the Univ. of North Texas, for future cooperative research. The Repatriation Office successfully submitted a grant application to the National Parks Service to bring Hopi, Hoopa and Karuk tribal members to.

Continued on next page
the museum to consult over collections that contain sacred objects and objects of cultural patrimony.


**Ape Cultures**, from page 9

It may be tempting to condemn the aggressive apes and overly praise the bonobo. But of course apes are not humans, even though humans may be apes. Their failure to conform to a human morality is their problem, not ours, and they deserve sympathy, respect, and admiration, not disdain. Apes provide us both with a story of our ancestry and a glimpse of a better future. So let us celebrate their lives as instructive visions of other worlds. We still know little, but every population of apes teaches something new. Of course, those populations are disappearing fast. Even the vast forests of Zaire, uncut though they may be, are being attacked: this year, when I was in Wamba, all mammals but the tabooed bonobo were gone; and the local population had already started killing and eating the bonobos. The same problems are everywhere. We have only a few decades to recover the extraordinary evidence waiting elusively in a hundred forests still unvisited by scientists. Future generations will think ill of us for letting them slide unknown into oblivion. But if we can get the observers into the field, and watch the apes in nature, we will surely continue to learn and to be inspired. In that way, the next version of this lecture (in 25 years' time) won't have to be retitled 'Ape Links ... and Missing Cultures'!

So ladies and gentlemen, for our sakes and theirs, the apes need all the support they can get. I ask you therefore to raise your glasses, or suck your table-cloths, in celebration of all that's been done, and will be done, by Gordon Getty and the Leakey Foundation!


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Catherine Linardos is the Editor of *Symbols*. 
Digging Through Our Data: Using Archaeological Databases for Repatriation Resource Allocation*

LANE A. BECK and DIANE M. ZORICH

Lane Beck received her Ph.D. in Anthropology from Northwestern University in 1990 under the direction of Professors Jane Buikstra and James Brown. Between 1986 and 1994 she directed a reorganization of the human osteology collection for the Peabody Museum. She is now a Visiting Assistant Curator at the Florida Museum of Natural History. Her research combines bioarchaeology and regional analysis. Her edited book, Regional Approaches to Mortuary Analysis is scheduled for release by Plenum early in 1995.

Diane Zorich was Documentation Administrator at the Peabody Museum, Harvard, where she and Dr. Beck worked to help the museum comply with the information requirements of the Native American Graves Protection and Repatriation Act. She then became Data Manager for the Association of Systematics Collections in Washington, D.C. Ms. Zorich currently is a museum information management consultant based in San Diego.

*This paper was presented in a panel titled “Archaeological Databases: New Perspectives” at the Museum Computer Network Annual Conference held October 30, 1992, in Pittsburgh. Some figures have changed as additional information has begun to be clarified.

INTRODUCTION

Archaeological databases increasingly are being used to address issues that exceed the traditional areas of research and collections management. One of these issues is the Native American Graves Protection and Repatriation Act (P.L. 101-601) — hereafter referred to by its acronym—NAGPRA. This legislation, which was signed into federal law in November 1990, requires all US museums to prepare inventories and summaries of collections that are culturally affiliated with living Native American tribes, and to “reach agreements on the repatriation or other disposition of these objects.” (NAGPRA Draft Guidelines)

The legislation specifically addresses four categories of materials: human remains, associated and unassociated funerary remains, sacred objects, and items of cultural patrimony. For the purposes of this paper, we will discuss only the first two of these categories — human and funerary remains — because these materials are archaeological in origin: i.e., they are from past cultures and were retrieved from an excavated context. The remainder of the materials are ethnological: i.e., made by living or recent cultures and important for contemporary ritual or tribal identity. They present interesting database issues of their own which are outside the purview of this paper.

Tracing the cultural affiliations of these objects with contemporary native tribes is not a straightforward task. In a region such as Hawaii, one need only determine that the collections come from the Hawaiian Islands and are not European in origin. However, in other regions the problem is much more complex. Native groups on the mainland formed and reformed different tribal alliances over the centuries. Many tribes changed their location over the generations and vastly diverse cultures often interacted with one another across large regions. Because the culture history of native peoples is so complex, different sets of expert knowledge are needed to trace the cultural affiliations for the material remains of these groups — remains that exist today in archaeological collections.

To determine cultural affiliations for our excavated materials, the Peabody Museum is using its archaeological database, which originally was designed for collections management tasks, to identify patterns and distributions for our Native American holdings. We hope that analyzing these patterns within the broader context of archival and historical information will give us a better sense of the depth and breadth of these materials so we can allocate limited museum resources more efficiently, and isolate areas where we need to seek external expertise or information.

One of our first steps has been to identify the geographic distribution of our archaeological collections. In this paper we will present some examples of how we proceeded with this portion of the analysis, and what we have learned thus far about our Native American archaeological collections. Let us begin with some background information.

The Peabody Museum of

Continued on next page
Archaeology and Ethnology is a large, university-based anthropology museum with approximately two million objects and half a million photographs from all areas of the world. Approximately one million items, or half of our collection, are Native American in origin. Of these materials, all the catalogue records for human remains have been entered into the database as well as the records for a small portion of the funerary remains. Although the patterns we will be discussing in this paper are derived solely from the information in the human remains records of the database, it is important to note that by association, they also apply to the funerary objects which were buried with these remains.

In previewing our database information, we realized that we had to keep two important distinctions at the fore. First, number of database records do not equal number of items in the collection. Those who work with archaeological collections know that these materials frequently are recorded in a “many-to-one” relationship—i.e., one record documents many items. Nevertheless we found that in our own institution, even experienced archaeologists would forget this distinction. The hazard, of course, is that an analysis based on distribution of records will always yield lower figures than truly exists (Figure 1, where you can see that the number of individuals greatly exceeds the number of records).

The second important distinction is that archaeological database records represent materials found from sites and, in fact, are often organized by site or a subcomponent thereof. This fact has enormous ramifications in terms of time and resource allocation for establishing cultural affiliations as defined by NAGPRA. When you determine the cultural affiliation for a site, you establish cultural affiliation for objects from that site, thus it is more effective to undertake research at the site-level rather than the item or record level.

Let us clarify this point with the scatter plot shown in Figure 2 of the average MNI by archaeological site. The acronym “MNI,” connotes a method for counting the minimum number of individuals present in an archaeological context by noting the number and type of each bone and comparing it with the known number and types of bones present in the human body. For example, each human skeleton possesses one left femur, so if a mixed grave is found with six left femora, it is assumed that at least six individuals were buried in that grave.

The scatter plot illustrates the average number of individuals per site by state, with each box representing a particular state. In our database, there are 1580 records from New Mexico representing 2324 individuals from 52 different sites. If we were to use each of these raw values alone as a basis for assigning staff resources to research cultural affiliations for this region, we would have to conclude that New Mexico requires a major allocation of time and effort.

However, if we look at the mean number of individuals per site for New Mexico, you’ll notice that an average of 45 individuals were recovered from each site: thus, establishing cultural affiliations for even one of these sites means you have established the cultural affiliation for an average of 45 individuals. Again, site-level research results in the greater yield than would otherwise be assumed from assessments based on record totals, numbers of individuals or a simple tally of sites.

The importance of these distinctions between number of records, number of individuals, and number of sites arises at nearly every step of our analysis. We began rather broadly by reviewing the geographic distribution of our collections across the United States. On the map shown in Figure 3 you can see that the number of collections held by the Peabody is not evenly distributed across all fifty states. Five states, primarily in the upper
midwest and north central states, are not represented by any archaeological collections in the museum. The states represented by the largest number of catalogue records (N>501) are centered in New England, the midwest, southeast, and southwest.

On the map shown in Figure 4 you will notice some differences in the distributions. This map shows clearly the number of archaeological sites represented in our database. It shows clearly that the Peabody will need to focus on the area defined archaeologically as the Eastern Woodlands — the states east of the Mississippi River — with emphasis on the Mississippi, Ohio, and Tennessee River Valleys, for New England with emphasis placed on coastal settlements, and for the Southwest with emphasis placed on the Pueblo region. Areas with smaller numbers of sites will require attention but to a much more limited degree.

Next we proceeded to look more closely at the regions that have the largest concentration of Peabody materials. Each of these regions poses a different set of problems in terms of the geographic and temporal culture histories of the native populations, and the excavation and curation strategies utilized by the scientific community. This variation in both regional history and in scientific approach can best be illustrated by closer examination of two states — Ohio and Massachusetts.

Ohio is represented in our database by the largest number of catalogue records of any state (N=1866). It would therefore seem to pose the greater task in terms of research required for determining cultural affiliation. However, although the number of records is large, the number of sites is more limited (Figure 5). Further, when we looked at the distribution of sites on this map of counties in Ohio (Figure 6) you can see very clearly that the sites whose collections we curate come from a very small portion the state, that along the Ohio and Miami Rivers. These river valleys have long been recognized as the heartland of what was once termed the “mound builders” culture: an area...
known for large settlements with massive earthworks. This dramatic appearance in the landscape attracted scientific attention from an early date. Research conducted here in the late 1800s resulted in well-documented material-culture sequences (i.e., sequences of stylistic changes in artifacts through time) which provide a ready method for determining the archaeological horizon and general time period of each site. This established chronology will simplify the research involved for these sites and the over 2000 individuals recovered from them.

In looking at our acquisition records it becomes clear that there are still other patterns that will aid in our documentation efforts for this state. These records show that virtually all the Ohio sites were excavated under the auspices of formal museum expeditions. Furthermore, these excavations took place almost exclusively between 1880 and 1900. This scientific time interval combined with an expedition approach in excavation means that there were a limited number of researchers involved in these projects, so the format of the field notes and other pertinent records is largely consistent for all sites from this area. Consistency in the original records makes the process of research and standardization a less daunting task.

When the site distribution pattern for Ohio is analyzed in the context of prehistory and the history of scientific exploration for the area, it becomes clear that although we have a large number of holdings from this area, the task of identification is not proportionate to scale. Few sites are involved, they are consistently documented, and the cultural history of the area provides a strong starting point for assessing temporal data and suggesting clues to cultural affiliation. Because these explorations were very high-profile and remain widely known today throughout the academic community, we often are able to obtain the information we need through correspondence with experts. Unfortunately, such is not the case in other states.

Massachusetts, for example, presents the other end of the spectrum. It is represented in our collections by a much smaller number of items than is Ohio. Initially, this would seem to suggest that our time investment in Massachusetts would not be as great. However, this prediction immediately changes when we shift the view from number of records to numbers of sites. From a site perspective, Massachusetts, with 96 sites averaging 6 individuals each, may present more demands on our time than any other state. Identifying the cultural affiliation of a small number of individuals distributed over so many sites requires a much greater allotment of time than the reverse.

A further complication is the patterns of prehistory that are known for native groups from Massachusetts. In general, Massachusetts settlements are identified as “Woodland” cultures composed of small, often seasonal, villages and camps that existed up until the time of the first European settlement in the area. Unlike Ohio, where the “mound” cultures and their elaborate earthworks attracted the attention of scientists from the colonial era through today, the sites in Massachusetts stirred much less interest, and thus are not as well documented.

Let us look more closely at a map of how distributions are patterned geographically within Massachusetts (Figure 7). Unlike Ohio where our holdings were restricted to two river systems, in Massachusetts there is a clear drop in site density as you move inland from the coast, with a complete absence of materials west of the Berkshire Mountains. This distribution pattern is deceiving; it does not reflect the pattern of native settlements in this region, rather it is a bias reflecting the distance researchers were willing to travel from the Peabody Museum, which is located in eastern Massachusetts. Unlike the Ohio materials in our collection, the
The majority of our holdings from New England were not excavated under the auspices of major expeditions. Often they were weekend projects for classes offered by Harvard University or salvage contracts that provided experience for graduate students at the University. Large numbers of different researchers participated in these projects and the field notes incorporate these individual differences.

The final graph (Figure 8) illustrates the deceiving difference in numbers between Ohio and Massachusetts collections. Looking at this graph it appears that research needs for Ohio would far outweigh those for Massachusetts. But when these distributions are put in context we conclude the opposite: despite its large number of records and individuals, Ohio will require less time and fewer resources to establish cultural affiliations for its materials than will Massachusetts. Ohio sites were excavated under the auspices of large, well-known projects. Project directors were few in number and the timeframe for research was brief so the records of this work remained highly consistent. The material culture sequence and settlement patterns underwent a series of changes in prehistory which allow for accurate temporal identification based on the archaeological collections themselves. Numerous researchers have been attracted by the exotic aura of the mound builder myths, so expert consultation is readily available. Massachusetts (and this holds true for the rest of New England), with its smaller number of records but larger number of sites, poses a greater problem. Its excavations were small-scale and conducted by a large number of individuals over more than a century; consequently the field records are variable in quality and quantity. The material culture sequences do not offer clear temporal identification. The Woodland societies have less of an aura of the exotic and have attracted fewer scholarly researchers in recent years. As a result, not only is our task more daunting for Massachusetts, but the needed expertise is also harder to find.

CONCLUSIONS

We would like to conclude by reiterating that the Peabody Museum's archaeological database originally was created to facilitate collections management and inventory tasks, but is now being used more and more as the basis for analyses like those we've presented here. Although there are hazards in trying to "retrofit" a database designed for a different purpose, we believe that we have been able to derive extremely useful information that, when combined with historical and archival information, will help us more readily ascertain the relative amounts of time and resources we will need to trace the cultural affiliations of our collections as required by NAGPRA. Clarifying the extent of our holdings by geographic area has enabled us to focus our information-gathering strategy on those regions represented by the greatest concentration of materials. From here we can target those collections that need more information, identify possible institutions and individuals who can assist us, and begin to share/exchange information on the well documented components of our own holdings with institutions who need to supplement their own records.

As we progress with these types of analyses, we have come to recognize the importance of exchanging infor-

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Doris Zemurray Stone
1910 - 1994

Doris Zemurray Stone, an archaeologist and ethnologist who specialized in the history and culture of Central America, fell ill while traveling in Ethiopia and returned home to Louisiana, where she died October 21, 1994 at the age of 84.

Long active professionally as both a specialist and a generalist, Doris Stone wrote not only for experts but also for a broader audience. She served as Associate Archaeologist at the Middle America Research Institute at Tulane University from 1930 to 1941. She later worked as a Research Fellow in Central American archaeology and ethno­logy at the Peabody Museum from 1942 to 1966, and at the museum as a Research Associate from 1966 to 1971, an Honorary Associate since 1971, and Honorary Curator of Central American Archaeology and Ethnology since 1989. In connection with the museum, she authored sci­entific monographs and popular vol­umes, and her generosity made exhibits possible for both the Mesoamerican and North American halls.

In bestowing an honorary Doctor of Science degree in March, 1994, Radcliffe College recognized her “scientific and humanitarian efforts, primarily in Central America, and her limitless energy and bountiful spirit through which she brought inestimable benefits to institutions in both her own and adopted countries.” In 1993 the Harvard Alumni Association awarded her the Harvard Medal. Doris’ long-time friend and colleague, Stephen Williams, Peabody Professor Emeritus, offered the following state­ment: “Doris was a productive and insightful scholar, a wise and generous benefactor, a joyful companion in research and travel, and a most gracious hostess in her home. She ‘agit­ated’ to bring out the best in all the people and institutions that she came in contact with. We will truly miss her enthusiastic spirit and her enviable ability to get so much out of life over such a long period of time.”

Philip Phillips
1900-1994

Philip Phillips, an archaeologist of great distinction and a long-time associate and a loyal supporter of the Peabody Museum at Harvard University (Assistant Curator of Southeastern Archaeology, 1937-1949; Curator of Southeastern Archaeology, 1949-1967; Honorary Curator, 1967-1994; Member of the Faculty of the Peabody Museum, 1951-1967), died at his home in Bolton, Mass. He is remembered for his gifted and creative scholarship and for his profound knowledge of the field of Southeastern United States prehistory, a knowledge which he was always willing to share with colleagues and students for six decades.

Philip was born in Buffalo, New York. He attended Williams College in Massachusetts, graduating from there in 1922. That same June he married a childhood sweetheart, Ruth Schoellkopf, also from Buffalo. Shortly after that, Phil and Ruth moved to Cambridge, Mass. where Phil enrolled in the Harvard Graduate School of Design, receiving a Master’s Degree in architecture in 1927. He practiced architecture back in Buffalo for a short time, but this career was brought to a close by the Great Depression.

Casting about for something else to do, Phil recalled earlier casual interests in archaeology. These had been stimulated by two friends of his Graduate School days at Harvard, Singleton Moorehead, the son of the well-known archaeologist, W.K. Moorehead, and George C. Vaillant, later to become famous in Maya and Mexican archaeology. Phil returned to Harvard in the early 1930s, enrolling as a student of archaeology under the guidance of Prof. A.M. Tozzer. Tozzer would have preferred it if Phil had pursued the Maya-Mexican fields, but he was, nevertheless, supportive of Phil’s desire to focus on United States archaeology, particularly that of the Mississippi Valley on which Phil did a doctoral thesis, receiving the degree in 1940.

Thereafter, there was no slackening in Phil’s archaeological interests and productiveness.

Phil Phillips was a wonderfully generous collaborator, much liked and admired by those who worked with him. With J.A. Ford and J.B. Griffin he produced one of the landmark works in North American Archaeology (Archaeological Survey in the Lower Mississippi Alluvial Valley, 1940-1947, Peabody Museum Papers, Vol. 54, 1951). From the middle 1950s until the end of his life, he worked closely with a series of junior colleagues, especially with Stephen Williams, one of the principals of what became the Lower Mississippi Survey Program within the Peabody Museum, and with Jeffrey Brain and Ian Brown. Although not involved in the Lower Mississippi work, I too had the pleasure of working with Phil on a more general book, Method and Theory in American Archaeology (1958).

Phil climaxed his active Peabody Museum career with a two-volume monograph, Archaeological Survey in the Lower Yazoo Basin, Mississippi, 1949-1955, (Peabody Museum Papers, Vol. 60, 1970), a work which blocks out chronology and regional cultures for a large segment of the Lower Mississippi Valley. Since then, working in his Bolton home, he has written and published (with James Brown) Pre-Columbian Shell Engravings from the Craig Mound at Spiro, Oklahoma, (6 vols. quarto, Peabody Museum 1975-1982), and, at the time of his death, had just finished another major work on Southeastern United States Pre-Columbian art (in collaboration with Jeffrey Brain).

Phil’s wife, Ruth, died in 1962. He subsequently married Wilhelmina Schoellkopf who also predeceased him. He is survived by his two daughters, Patricia (Lady Davies), of England, and Sayre Sheldon Morgan, of Cambridge, Massachusetts, and by a host of grandchildren and great-grandchildren, and by one great-great-grandchild.

Prof. Emeritus Gordon R. Willey
CONSERVING MAYA PAPER MOLDS

by T. Rose Holdcraft, Conservator, Peabody Museum

The Conservation Department at the Peabody has initiated several preservation and conservation projects during the 1994-95 academic year. The following note is a progress report on the stabilization and rehousing project for the museum's collection of late 19th century and early 20th century paper molds made from Maya stone monuments. This project includes a survey of the existing molds, their condition and their requirements for stabilization, cleaning and storage.

The paper molds, dating between 1880 and 1910, are a museum asset, previously not easily accessible for research purposes. They provide the essential form necessary for the production of the cast copies of the originals. They are valuable museum artifacts illustrating a unique period in the long history of preservation of Maya culture; other molding techniques have since taken their place.

The papier mache molding technique was first employed in Europe in the early 19th century. It was adapted for use at archaeological sites in Guatemala, Honduras, and Yucatan in the 1880s through the efforts of Desire Charnay and Alfred Maudsley; other individuals such as George B. Gordon, Teobert Maler, Gorgonio Lopez, and Edward H. Thompson carried on the technique for at least 30 years more. University archival records indicate a frequent exchange between the associates working in Central American sites and C.P. Bowditch and F.W. Putnam in Cambridge and/or New York, regarding preferred molding papers and their availability, brushes, adhesives, coating materials, and the shipping arrangements for the molds to Cambridge. The paper molding method was obviously the core means to implement the museum’s commitment to forming a comprehensive body of hieroglyphs. Letters by Putnam in 1901 and 1906 indicate that it was the interest of the Peabody to obtain the originals, or cast or photographs of all hieroglyphs found in Central America. Current preservation efforts involve photographic and written documentation, vacuum cleaning under controlled suction, and soot removal with a natural dry sponge followed by re-vacuuming. Each mold is then placed in an archival protective container which serves for ease in transport and handling during research use. Additional treatments might include humidification prior to flattening of folded pieces, and the repair of tears or cracks as future funds become available.

A general survey of the paper molds in the storage room indicate that there are more than 100 pieces ranging in size from one foot by two feet to more than four feet by nine feet. More than 30 pieces have been documented and cleaned to date. Represented sites include Uxmal, Kabah (from a wood lintel/jamb?), Yaxchilan (Lintel 14 and others), Quirigua (Stela H), Piedras Negras (Stela 25, said to be no longer extant, and Stela 36), Chichen Itza (Casa Colorado), Yula and Xcalumkin.

About one-half of these molds have one shellac-coated side and plaster residues which are indicative of plaster cast fabrication; several are uncoated. As noted in two early annual reports (1896 and 1901) of the

Detail of the 4 ft. by 9 ft. paper mold of stela 25, Piedras Negras, Guatemala. Photo: Hillel Burger.

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Peabody Museum, there was difficulty in making casts from all the molds sent up from Central America due to the lack of sufficient funds to cast them, and due to lack of exhibition space.

This conservation project will have as its end result a complete inventory of the existing paper molds, descriptive reports on each mold and an improved protective storage system for easy access. Conservation efforts for this project have been gratefully supported by several Peabody colleagues including Prof. Rosemary Joyce, Ian Graham, Dr. David Stuart, Prof. Gordon Willey, Daniel Jones, Gloria Greis, Hillel Burger, Elizabeth Sandager, Scott Fulton, and Martha Labell. With the assistance and enthusiasm of Dubravka Kiseljev (1994 summer conservation intern from the graduate art conservation program at Buffalo State College), a detailed condition survey form, a conservation treatment plan for the paper molds, and an initial storage system for several related molds has been developed. This project is currently continuing through the attention and consistent efforts of Antje Neumann, pre-conservation student volunteer under the supervision of the museum conservators.

Digging through data, from page 25

information with other institutions affected by NAGPRA. Although the Peabody is fortunate to have a breadth of expertise beyond that of many museums, we cannot match the depth of expertise found in a more specialized regional institution. NAGPRA affects several hundred institutions, and all of them will need to use their archaeological records to analyze their collections in order to comply with its mandates. Because no money has been allocated to assist us in undertaking this task, we believe that cooperative information exchange among all these institutions has not only legislative but also economic incentives.