



M.G. GRANT

### Reading Ape Bones

Mountain gorilla research didn't die in 1985 with primatologist Dian Fossey (below), or with her famous subjects. Last year an international team in Rwanda recovered the remains of more than 70 gorillas, including some that Fossey lived among. This year scientists will begin microscopically analyzing the great apes' life histories, reading the wear and tear on bones, teeth, and nails for signs of stress, disease, even changes in climate. The next step will be to compare those findings with veterinary records of current populations and the behavioral ones kept by Fossey and her successors—all told, 40-plus years' worth of skeletal and social information. With no mountain gorillas in captivity and only 700 left in the wild, researchers say the multidisciplinary project is breathing new life into the landmark work begun by Fossey. —Jeremy Berlin



This mountain gorilla skeleton, pieced together by researchers last summer, is now stored in Ruhengeri, Rwanda.

**NG GRANT** **Lick Your Poison** Valerie C. Clark's field methods may seem weird. When she sees a frog, she catches it. Then sniffs it. Then licks it. All of which helps her get to know her subject quickly. "Maybe one day I'll find my prince," she jokes.

Clark, a chemical biologist, studies amphibian secretions and toxicity, focusing recently on frogs from Madagascar that ooze alkaloids from their skin glands. The frogs, she says, don't make the alkaloids themselves; they get them by consuming prey that contain these chemicals. But they do depend on the bitter compounds for survival: The poison in alkaloids is what makes the frogs unpalatable to predators.

In Madagascar, Clark found that the more pristine the region, the more toxic the frog—probably because a wider variety of alkaloid-rich ants, millipedes, and mites is available in undisturbed areas than in disturbed ones. It also suggests frogs living in more biodiverse spots have a greater chance of survival than their less geographically fortunate cousins, which may have to learn new defense tricks as they become less toxic—and more appetizing.

"It comes down to taste," Clark says. "If you don't taste bad, somebody's gonna eat you." —Neil Shea

Valerie Clark sniffs for toxins before she licks; a poison dart frog in the wild would be too potent for a taste test. This captive-bred specimen eats different foods, which makes it safe to sample.







A *Propithecus candidus* clings to her sleeping tree.



**Losing Lemurs** They're fuzzy, white, and vocal, but maybe the most remarkable thing about them, says primatologist Erik Patel, is how few there are. He's talking about the silky sifaka, a lemur that lives in only a few patches of high-altitude forest on Madagascar. Patel has found that fewer than a thousand remain. Like other lemurs, the silky sifaka is hunted for meat and is seeing its habitat slashed and burned to clear space for rice fields. Patel hopes that 12 new bungalows near the sifakas' territory in Marojejy National Park will attract tourists—and that the money visitors bring will get locals excited about protecting lemurs too. —Helen Fields



A white baby baboon means at least one ancestor belonged to a subspecies called *kinda*.



**NG GRANTEE True Colors** Mermaids are the stuff of legend, but real hybrids—often the result of interspecies mating—are out there. Mate a lion to a tiger, get a liger. Breed a zebra to a horse for a zorse. In the wild, when a baboon called a *kinda* pairs with a chacma or yellow baboon, their progeny is still a baboon—but it's a hybrid of interest to Society grantees Jane Phillips-Conroy and Clifford Jolly, who are tracking *kinda* gene flow in Zambia's South Luangwa National Park. *Kinda* babies, purebred or mixed, often start off white instead of the usual baboon black. Taking the visual cue, the scientists tested DNA in dung to learn that mixed ancestry is common at the site. Study of such hybrids, which mate with each other as well as the parent species, sheds light on evolution's nonlinear path. And it's not just baboons: Even early humans may have crossed the line. —Jennifer S. Holland





SOCIETY GRANTEE

## These Kangaroos Are Up a Tree

Tree kangaroos inspire two reactions. First: *Awww*, so cute! Second: They can't be real kangaroos! But they are, right down to their pouches. In parts of Australia, kangaroos developed an arboreal lifestyle, their legs adapting for climbing and walking in addition to hopping. And some of them moved to New Guinea.



Too bad those versatile limbs can't protect tree roos from danger. In Papua New Guinea, logging and mining are eroding their rain forest habitat; villagers hunt them for meat and for their tails, worn as headdresses in celebrations. Conservation biologist and Society grantee Lisa Dabek leads the community-based Tree Kangaroo Conservation Program in the Huon Peninsula. Local clans pledged 150,000 acres as a haven where the 15-to-18-pound Matschie's tree kangaroo (left), one of ten species, can laze in a favorite tree, chew leaves whose tannin boosts its camouflaging red hue, and raise babies, which spend up to 18 months with mom. A radio-collar project is gathering data about the elusive but well-adapted rain forest residents. When they curl up to sleep, whorls in their back fur let water run right off. —*Marco Silver*

The tree kangaroo's long tail is a vital balancing tool 150 feet up a tree.

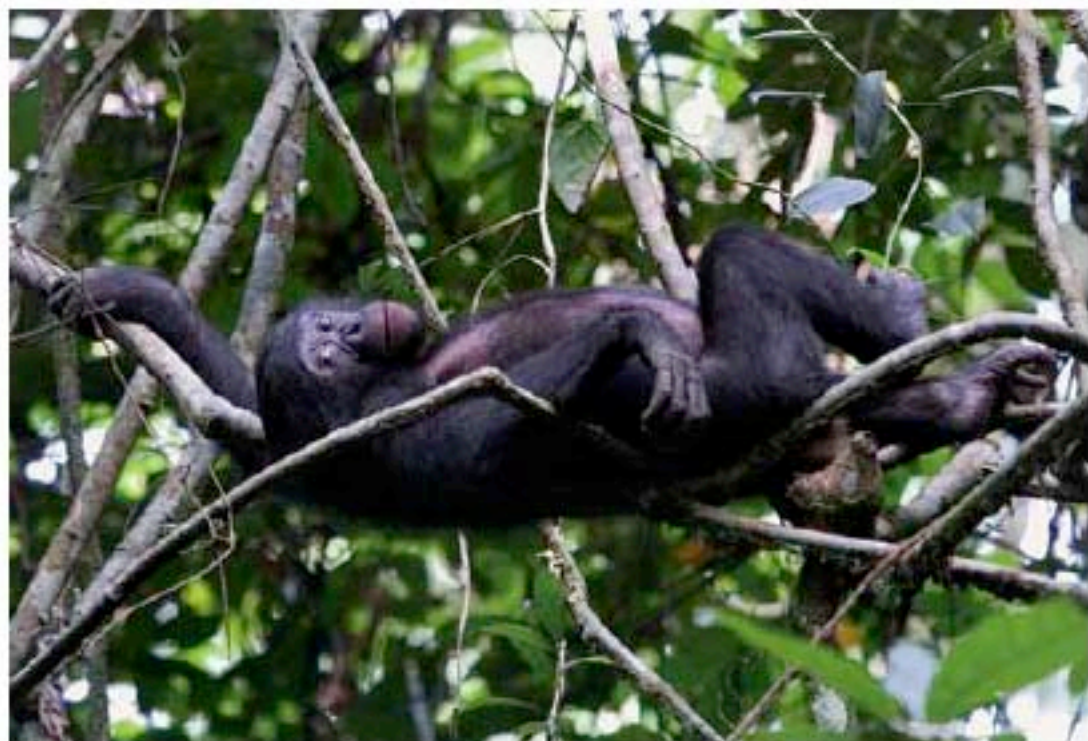


NG GRANTEE

## Clues in a Feather

The imperial eagle is nearly impossible to catch, tag, and track, so how do scientists study this rare raptor? Andrew DeWoody, a geneticist at Purdue University, saw the answer lying in plain sight. In the Naurzum State Nature Reserve in Kazakhstan, DeWoody's team gathered feathers the birds shed at nesting sites, then analyzed their DNA to find the unique genetic fingerprints of individual eagles. Following this molecular trail, the scientists discovered all sorts of bird behavior that can't readily be observed. For instance, not one imperial eagle ever strayed from its mate, a level of monogamy that's rare among birds. "We could use this method to monitor the behavior of other imperiled birds," says DeWoody, "and never ruffle a feather." —*Alan Mairson*





Similar in size to a chimpanzee, a bonobo stretches out in the canopy to eat.

**NG GRANT** **A Boon for Bonobos** In the great ape family, bonobos are the cheeky, easy-going members. Not for them aggressive, chest-pounding displays of dominance. They are lovers, seldom fighters. In their female-dominated societies, individuals copulate to settle conflicts. Bonobos also engage in communal sex to ease strains at a new feeding site.

To help save this singular and endangered primate, found only in the rain forests of the Democratic Republic of the Congo, the DRC government and U.S.-based Bonobo Conservation Initiative have created a vast sanctuary. Larger than the state of Massachusetts, the 11,803-square-mile Sankuru Nature Reserve likely harbors several thousand bonobos out of an estimated population of 50,000.

(Numbers are inexact, as a decade of civil war has kept researchers out of the area.) To make the reserve work, local communities have vowed to stop killing bonobos for meat, the chief threat, in return for development aid. Sankuru is the first part in a network of planned reserves to be called the Bonobo Peace Forest. —Tom O'Neill





**NO GRANT** **Shot by a Conquistador** The bodies found in the path of a planned expressway near Lima showed signs of terrible violence. Nearly 500 years ago, about 70 men, women, and adolescents were hacked, torn, and impaled—and some looked as if they were shot. The sandy soil of the burial ground preserved the bones, saving valuable forensic evidence from the era when Europeans subjugated the Americas, says Guillermo Cock, a Peruvian archaeologist excavating Inca cemeteries. And the musket wounds offered a clue to the identity of the killers. “We know many natives were killed by European weapons during colonial conquest,” he says. “This may be the first time the evidence has been found.” Based on precolonial burials in the same cemetery, Cock

believes the killings took place in the summer of 1538 during an Inca uprising against the Spanish occupiers. In that confrontation, the superior weaponry of Francisco Pizarro and his fellow conquistadores helped carry the day. —Chris Carroll



A Spaniard's iron musket ball blasted a piece (below left) out of the skull of the New World's first known shooting victim (above).



**NOVA—National Geographic Special**  
*The Great Inca Rebellion*, airing June 26 on PBS, traces the 1536 uprising.



El Pantano artifacts include a drinking vessel, cooking pot, and a female figurine (below).



**NG GRANTEE Mysterious Traders** Rancher Juan José de la Torre was bulldozing a ditch in an area known as *el pantano*, the marsh, in Mexico's Mascota Valley when he turned up human bones and pottery figurines and vessels. No one could identify what he had found until Joseph Mountjoy, an archaeologist with the University of North Carolina, Greensboro, had a look. Mountjoy was dumbfounded. The artifacts belonged to an ancient culture he had discovered 80 miles to the north in 1968. He had been searching for more sites ever since without much success.

Mountjoy began to excavate where the rancher's bulldozer left off. Over the next six years, he uncovered an entire cemetery from about 800 B.C. More domestic pots and figurines came to light, as well as evidence of astonishingly early long-distance trade: jade beads, iron pyrite, and faceted quartz jewelry, all likely imported from Central America, as well as distinctive pottery typical of South America. The culture revealed in these graves has now been named after this defining site: El Pantano. —A. R. Williams





CULTURAL PRESERVATION

## An Archaeologist's Lament

Mourning the sack of the Iraq Museum, an expert assesses the toll



MUSKIN HANAN, DEPUTY DIRECTOR OF THE IRAQ MUSEUM, THE DAY AFTER LOOTING SUBSIDED

MARCO TAMAI GETTY IMAGES

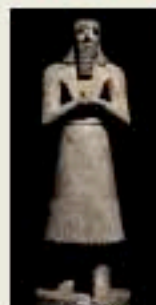
When bombs started falling on Iraq in March, I had the same first thought that every archaeologist who's ever done fieldwork there must have had: What will happen to the Iraqis who worked with us—people who welcomed us into their homes? Fortunately that question has been answered: My friends and colleagues survived the war.

But I soon saw my second greatest fear become reality: Much of the unique record of the Mesopotamian civilization that blossomed between the Tigris and Euphrates Rivers 6,000 years ago was stolen or irreparably damaged. Tens of thousands of artifacts at the Iraq Museum in Baghdad were lost over the course of three chaotic days in early April. Not all of these treasures were claimed by frenzied mobs of looters. Some were probably stolen in an organized plot by art thieves, a scheme that might have been thwarted had coalition forces heeded pleas from the world's archaeologists to protect the museum.

Among the museum's collections were not only the statues of gods and goddesses, the possessions of kings and queens, law codes and religious texts, but also the mundane items of daily life. There were the 60,000-year-old flint tools and fragmentary skeletons of early humans from Shanidar Cave in the mountains of northern Iraq. There were sickle blades left by some of the world's first farmers 10,000 years ago. And there were tens of thousands of pottery fragments, which not only tell us about everyday activities in the past eight millennia, but also (because their styles change rapidly and these changes have been carefully studied) enable archaeologists to know the age of layers in which they're found.

Perhaps the most valuable artifacts were thousands of clay tablets covered with cuneiform signs, written between 3200 B.C. and A.D. 75. It's unclear how many of these tablets were lost, but each one is a treasure for scholars. All early civilizations kept

## LOST WORLD? A gallery of priceless artifacts from the Iraq Museum in Baghdad

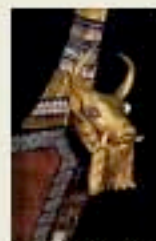


LYNN ABERCROMBIE

### Statue of Sumerian worshiper

**DATE:** circa 2600 a.c.  
This stone statue was placed in a temple to pray perpetually for the life of the donor. Religion and ritual performed a fundamental role in the lives of early Mesopotamians.  
**STATUS:** Unknown

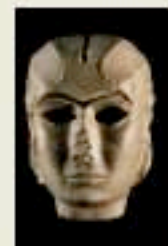
**Mosque door**  
**DATE:** 12th century a.c.  
Adorned with floral and geometric designs, a rare two-panel door from a mosque in the city of Mosul was crafted 500 years after Islam took root in Iraq.  
**STATUS:** Stolen



LYNN ABERCROMBIE

### Gold bull-headed lyre

**DATE:** circa 2500 a.c.  
An exquisite example of the lyre—an instrument invented by the Sumerians around 3200 a.c.—from the royal cemetery of Ur. The gold-covered bull's head was attached to a sound box decorated with colored stones and bits of shell.  
**STATUS:** Gold torn off



LYNN ABERCROMBIE

### Warka head

**DATE:** circa 3000 a.c.  
One of the most refined pieces of early sculpture, this life-size marble head of a woman originally had a headdress and eyes and eyebrows of inlaid stone. It was possibly part of a statue of Inana, Sumerian goddess of love and war.  
**STATUS:** Stolen



ERN THOMAS

### Shanidar skull

**DATE:** circa 50,000 years old  
Skeletons from Shanidar Cave are the only Neanderthal fossils found to date in southwest Asia east of the Jordan River. This skull belonged to a male who suffered severe injuries yet lived to the relatively old age of 45—evidence of social behavior: To survive he must have been cared for by members of his group.  
**STATUS:** Unknown



LYNN ABERCROMBIE

### Cuneiform calendar from Nimrud

**DATE:** circa 850 a.c.  
Written almost 2,500 years after Sumerians created cuneiform—the world's first writing—this small tablet listed daily instructions for the seventh month of the year. Example: Avoid eating garlic on the second day or risk a death in the family.  
**STATUS:** Unknown

### Bassetki statue

**DATE:** circa 2250 a.c.  
An inscription on the base of the 350-pound cast-copper monument proclaims the military victories of an Akkadian king. Though only the bottom half of the male figure was intact when discovered, it was prized for its realism. Such statues were commonly depicted in artwork from the time, but this was the only example discovered so far.  
**STATUS:** Stolen

**Boat model**  
**DATE:** circa 4500 a.c.  
Found in an Ubaid grave at a site called Eridu, a baked clay model of a boat (its wood mast is restored) is the best preserved example of early water transport in Mesopotamia.  
**STATUS:** Unknown



LYNN ABERCROMBIE

### Little king

**DATE:** circa 3000 a.c.  
With inlaid eyes of shell and lapis lazuli, this finely carved alabaster figure stands just seven inches tall. Found beneath a temple in the ancient city of Uruk (today's Warka), it was likely a portrait of En, the city's ruler.  
**STATUS:** Unknown



GWYN DAGU ORTI, CORBIS

### Warka vase

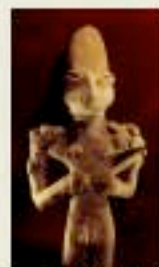
**DATE:** circa 3000 a.c.  
One of the earliest depictions of the hierarchy of the world as understood by the Mesopotamians: plants, animals, humans, and gods. The alabaster vase was a valuable commodity in its time.  
**STATUS:** Stolen



STEVE McCURRY

### Lioness killing a Nubian shepherd

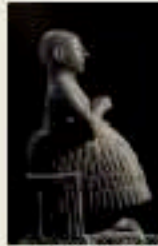
**DATE:** late eighth century a.c.  
Made of ivory, color was added with inlays of gold, carnelian, and lapis lazuli.  
**STATUS:** Unknown



LYNN ABERCROMBIE

### Lizard-faced terra-cotta figurine

**DATE:** circa 4000 a.c.  
This curious effigy of a human male is characteristic of the Ubaid culture. Male and female figurines with lizard-like faces have been found in graves and temples at Ur and Eridu.  
**STATUS:** Unknown



LYNN ABERCROMBIE

### Stone statue of a Sumerian scribe

**DATE:** circa 2400 a.c.  
This high official of the city of Girsu may have established a system of weights and measures. Stone blocks roughly equivalent to 24 ounces have been found inscribed with his name.  
**STATUS:** Unknown



SCALAPART RESEARCH, NY

### Lions of Tell Harmal

**DATE:** circa 1800 a.c.  
Two large, snarling lions in terra-cotta guarded the entrance to a temple. To Mesopotamians they were fearful symbols of gods and kings.  
**STATUS:** Heads smashed

### WEBSITE EXCLUSIVE

For updates on the status of artifacts—and links to other sites and resources about Iraq's heritage—go to [nationalgeographic.com/ngn/0307](http://nationalgeographic.com/ngn/0307).





AFTERMATH OF MAYHEM.

PATRICK SAE, AFP

daily records, but most were on perishable materials that vanished long ago (papyrus in Egypt, palm leaves in India, wood and bamboo in China, cotton and wool twine in Peru). But these clay tablets were different. With careful excavation, cleaning, and baking for preservation, the tablets revealed everything from business accounts to intimate letters between friends. Because lab work is expensive and few specialists can read the long-dead Sumerian and Akkadian languages, the work is slow, and many of the tablets were as yet unbaked and unread.

The looting and damage of the museum may not be the only archaeological tragedy. Innumerable artifacts remain unexcavated across the country. Some 160 years of excavation have taught us much

about Iraq's ancient cities, but our understanding of thousands of smaller rural sites is based largely on hasty preliminary surveys. In these surveys we've learned that ancient landscapes are often surprisingly well preserved but fragile, unlikely to survive the passage of heavy armored vehicles. I well remember finding 3,300-year-old plow furrows, with water jars still lying by small feeder canals, near Ur in southern Iraq, an area that this spring saw much conflict—and plenty of tank traffic.

We may never know how many unexcavated finds were crushed by tanks, how many fragile objects were shattered by looters, or how many of the museum's artifacts were sold to private collectors or melted down for their gold. As soon as reports of the looting reached us, we begged authorities to inspect vehicles leaving Iraq and to urge citizens to return objects to the museum voluntarily—which some began doing within days. (Apparently some artifacts had been stashed for safekeeping by well-meaning individuals.) Officials and scholars rushed to reconstruct collection records, many of which are duplicated in the records of institutions around the world that sponsor scientific excavation. And teams of museum professionals from several countries have joined Iraqi curators to compile a definitive, illustrated inventory of what's been taken—a list that's being circulated to Interpol, national police forces, museums, and responsible galleries.

Thanks to these efforts, by the time you read this some of the items pictured on the previous page may have been found. But I'm not naive: No matter what we do to get these pieces back, we'll never find them all. In my 48 years as an archaeologist I've never felt so angry about the abuse of the past. What has been lost is not only the heritage of a nation; it is the heritage of the world.

—Henry Wright

NGS COMMITTEE FOR RESEARCH AND EXPLORATION

## HELP MAINTAIN CONNECTIONS TO THE PAST

The devastating loss of Iraq's historic treasures isn't an isolated event. Around the world artifacts and monuments are threatened by war, the elements, and a lack of resources to preserve them. In response, the Society has created the World Cultures Fund to support the work of archaeologists,

curators, and artists wherever the history of civilizations is at risk. One of the fund's flagship projects is an expedition led by Henry Wright to assess the status of Iraq's cultural resources.

You can support this expedition and preserve cultural treasures worldwide by going to [nationalgeographic.com/help](http://nationalgeographic.com/help),

clicking on "Urgent Funding Need," and donating online. Gifts may also be mailed to World Cultures Fund, National Geographic Society Development Office, 1145 17th Street NW, Washington, DC 20036.

—John M. Fahey, Jr.  
PRESIDENT AND CEO  
NATIONAL GEOGRAPHIC SOCIETY