NATIONAL GEOGRAPHIC

BOTH BY JOE MCNALLY

From the Editor

"WE HOPE THAT THE WORLD will not narrow into a neighborhood before it has broadened into a brotherhood," Lyndon Baines Johnson said in 1963. The Vietnam-era President spoke before cell phones, before the Internet, before instantaneous global satellite communication, yet his words address both the promises and perils Erla Zwingle explores in this month's story on globalization.

As that term implies, world cultures seem to be becoming homogenized. But for the moment, at least, it is still arresting to see the juxtaposition of different societies, as men in Shanghai proudly carry around a life-size Michael Jordan cutout (above) or a Los Angeles artisan applies Old World henna designs to a woman's hand.

Yes, even NATIONAL GEOGRAPHIC is a part of the phenomenon. We now publish six international editions, and although each has its share of locally produced content, the magazines remain essentially GEOGRAPHIC. In the coming years members reading the English-language edition will enjoy the fine work of our foreign partners as well. As I see it, the world can only benefit from this global give-and-take. In the words of another mid-century U.S. statesman, Adlai E. Stevenson, "Understanding human needs is half the job of meeting them."

Bill Allen

By **Joel L. Swerdlow**
ASSISTANT EDITOR

CULTURE

Monroe (page 75) oversees a jungle—as Western pop seems everywhere to overrun local cultures.

STUART FRANKLIN

"Cultures are maps of meaning through

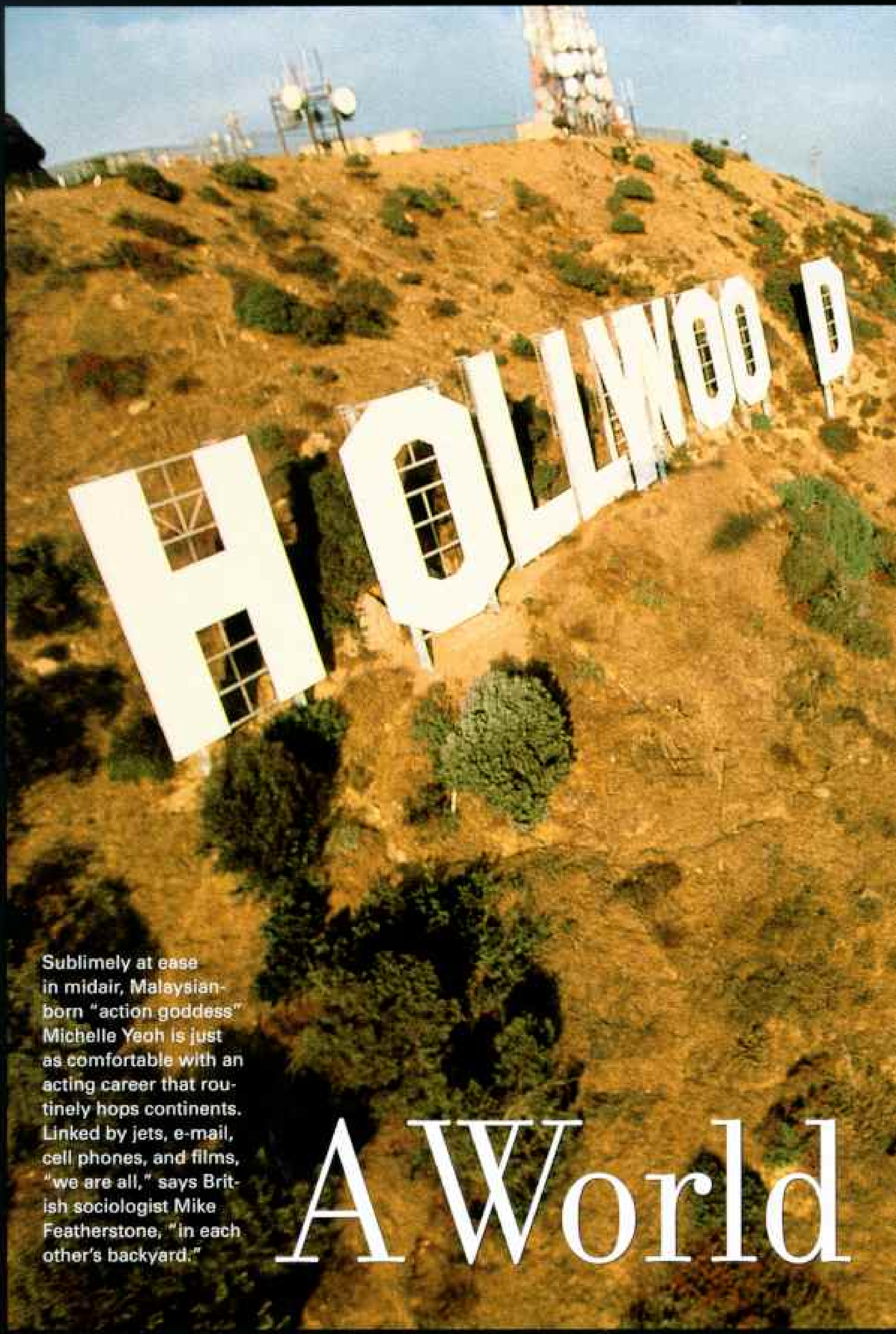
AT FREEPORT-MCMORAN COPPER AND GOLD INC.'s 24,700 acres of mines in Irian Jaya, some 14,000 people use huge trucks and excavating machines to hollow out mountains. But what impressed me most when I visited several years ago was fleeting glimpses of local Amungme people who had had little contact with the outside world until Freeport-McMoRan arrived in the 1960s. ■ Some Amungme became miners, mastering new equipment. Others resisted intrusion, using bows and bone-tipped arrows to attack mine workers and buildings. A few sometimes took things from Freeport employees. A boy would grab a pair of knee-high miner's boots and dart away. ■ Why take boots that are of no use unless you work in a mine? The answer: to get manufactured goods. These Amungme saw that outsiders had many novel possessions and wanted their share. ■ As the new millennium approaches, modern technology extends human life spans and levels of comfort. But it also destroys thousands of remote cultures. Today the world's people speak about 6,000 languages, a good measure of diversity; by the year 2100 the number of languages could drop to 3,000, as traditional cultures change. ■ Some of what is lost are brutal practices like ritual warfare and mutilation. But as Wade Davis shows in "Vanishing Cultures," threats to cultures are also threats to unique perspectives on life. Davis spent time with the Penan in Borneo, who have one word for "he," "she," and "it" and six words for "we." What lessons could the Penan teach about social cooperation? ■ Loss of traditional cultures means loss of knowledge too. Many have insights into nature that still defy modern science. Traditional healers, for example, have identified plants that counteract snake venom. ■ The rapid disappearance of remote cultures is part of a larger trend: Human societies have always mixed and changed, but goods, people, and ideas move farther and faster today, spreading an urban-oriented, technology-based culture around the globe in just a few generations. Thanks to radio, television, and videos, this new world culture reaches virtually everyone, even the world's nearly one billion illiterate people. ■ Far from uniform, the new global culture is a shifting mixture of experimentation and innovation in which more and less developed societies learn and benefit from one another. As Erla Zwingle notes in "A World Together," old and

which the world is made intelligible."

—PETER JACKSON, GEOGRAPHER, 1989

new are mutually transformed. Many changes, such as the growing demand for democracy and human rights, are positive. Others seem less desirable. Chinese culture prides itself on family loyalty, yet migration to cities and changing priorities are blunting age-old traditions like caring for one's parents. ■ Even those who try to protect traditional practices find themselves embracing new technology. Afghanistan's Taliban, who seized power in 1996 and fulfilled their promise to exclude movies and other cultural intrusions, recently completed an old-fashioned stoning by having a tank knock a brick wall down on top of the condemned. ■ As their influence increases, dominant cultures tend to splinter. Sanskrit prevailed in South Asia for centuries, but by 1200, largely because of invasions and the emergence of new religions, distinct groups speaking Panjabi, Hindi, and Bengali had evolved. ■ English, now spoken by more than one-fifth of the world, is an essential element of the new global culture. Are electronics spreading that culture so quickly and pervasively that it will kill any new languages that might take the place of English? Perhaps. But the use of new spoken Englishes is on the rise, as David Crystal points out in his 1997 book, *English as a Global Language*. Ghana, Nigeria, and Singapore, for example, are developing versions of English unintelligible to outsiders. Singapore's Singlish combines English with Malay and a Chinese language called Hokkien. "That's really very sayang lah" has no direct translation but conveys great sadness, a feeling of "what a waste or pity." ■ The city-state of Singapore itself, which has grown from fewer than 300,000 people in 1900 to four million today, also represents a dramatic characteristic of the global culture. Today nearly half of us live in cities. In 1900 only a tenth of us did. The chief reason: technological innovations that require fewer and fewer farmers. ■ Urban life, which seems to have begun in the Tigris and Euphrates Valleys at least 6,000 years ago, is one of the world's oldest inventions. People living in cities generate most knowledge and art, and muster the resources needed to explore what lies beyond humanity's reach or understanding. ■ "Tale of Three Cities" examines leading cities in the years A.D. 1, 1000, and 2000. These cities teach a familiar lesson: Humans can resist and shape change, but, as in nature, loss of the old is inevitable because it makes room for the new. □

The millennium series will continue with articles on science in the October 1999 issue. For more on the millennium visit www.nationalgeographic.com.



Sublimely at ease in midair, Malaysian-born "action goddess" Michelle Yeoh is just as comfortable with an acting career that routinely hops continents. Linked by jets, e-mail, cell phones, and films, "we are all," says British sociologist Mike Featherstone, "in each other's backyard."

A World

Together

CULTURE CHORUS Gleefully ready to swell an operatic procession, Chinese acrobats costumed as ancient Egyptian soldiers flash smiles and muscles backstage at the Shanghai Grand Theatre. With Italian singers from the Teatro Comunale di Firenze, they performed

in the new opera house's first international coproduction, Verdi's *Aïda*. The 1998 schedule also packed in appearances by Russia's Kirov Orchestra and the Radio Symphony of Berlin, plus a Russian National Ballet production of Tchaikovsky's *Nutcracker*.

SOPHISTICATED LADIES They're well-off, well educated, widely traveled, fluent in several languages. Nakshatra Reddy is a biochemist, married to a prosperous businessman in Mumbai (formerly Bombay). Her daughter Meghana (in a PVC catsuit of her own

design) is a model and former host on the music video channel VTV. Another daughter models full-time, and a third works for Swatch, the trendy Swiss watchmaker. They are elites, and the global marketplace for goods, information, and style is their corner store.

Goods move. People move. Ideas move. And cultures change.

By ERLA ZWINGLE
Photographs by JOE McNALLY

ONCE I STARTED LOOKING for them, these moments were everywhere: That I should be sitting in a coffee shop in London drinking Italian espresso served by an Algerian waiter to the strains of the Beach Boys singing "I wish they all could be California girls. . . ." Or hanging around a pub in New Delhi that serves Lebanese cuisine to the music of a Filipino band in rooms decorated with barrels of Irish stout, a stuffed hippo head, and a vintage poster announcing the Grand Ole Opry concert to be given at the high school in Douglas, Georgia. Some Japanese are fanatics for flamenco. Denmark imports five times as much Italian pasta as it did ten years ago. The classic American blond Barbie doll now comes in some 30 national varieties—and this year emerged as Austrian and Moroccan.

Today we are in the throes of a worldwide reformation of cultures, a tectonic shift of habits and dreams called, in the curious argot of social scientists, "globalization." It's an inexact term for a wild assortment of changes in politics, business, health, entertainment. "Modern industry has established the world market. . . . All old-established national industries. . . . are dislodged by new industries whose . . . products are consumed, not only at home, but in every quarter of the globe. In place of the old wants . . . we find new wants, requiring for their satisfaction the products of distant lands and climes." Karl Marx and Friedrich Engels wrote this 150 years ago in *The Communist Manifesto.* Their statement now describes an ordinary fact of life.

How people feel about this depends a great deal on where they live and how much money they have. Yet globalization, as one report stated, "is a reality, not a choice." Humans have been weaving commercial and cultural connections since before the first camel caravan ventured afield. In the 19th century the postal service, newspapers, transcontinental railroads, and great steam-powered ships wrought fundamental changes. Telegraph, telephone, radio, and television tied tighter and more intricate knots between individuals and the wider world. Now computers, the Internet, cellular phones, cable TV, and cheaper jet transportation have accelerated and complicated these connections.

Still, the basic dynamic remains the same: Goods move. People move. Ideas move. And cultures change. The difference now is the speed and scope of these changes. It took television 13 years to acquire 50 million users; the Internet took only five.

Not everyone is happy about this. Some Western social scientists and anthropologists, and not a few foreign politicians, believe that a sort of cultural cloning will result from what they regard as the

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ERLA ZWINGLE, a former GEOGRAPHIC editor who now lives in Venice, Italy, has written on subjects from Morocco to Australia's outback. JOE McNALLY is a frequent contributor who chronicled John Glenn's return to space for the June 1999 issue.

COMPUTER ENHANCEMENT BY INDUSTRIAL LIGHT & MAGIC

Filmmaker George Lucas appears with denizens of his elaborate galactic saga—both the tangible and those that spring only from digital workstations. Epics can be lucrative: Homer may never have licensed his Greek heroes as action toys or collectible figurines, but Star Wars *global merchandising has earned more than 4.5 billion dollars in profits since 1977.*

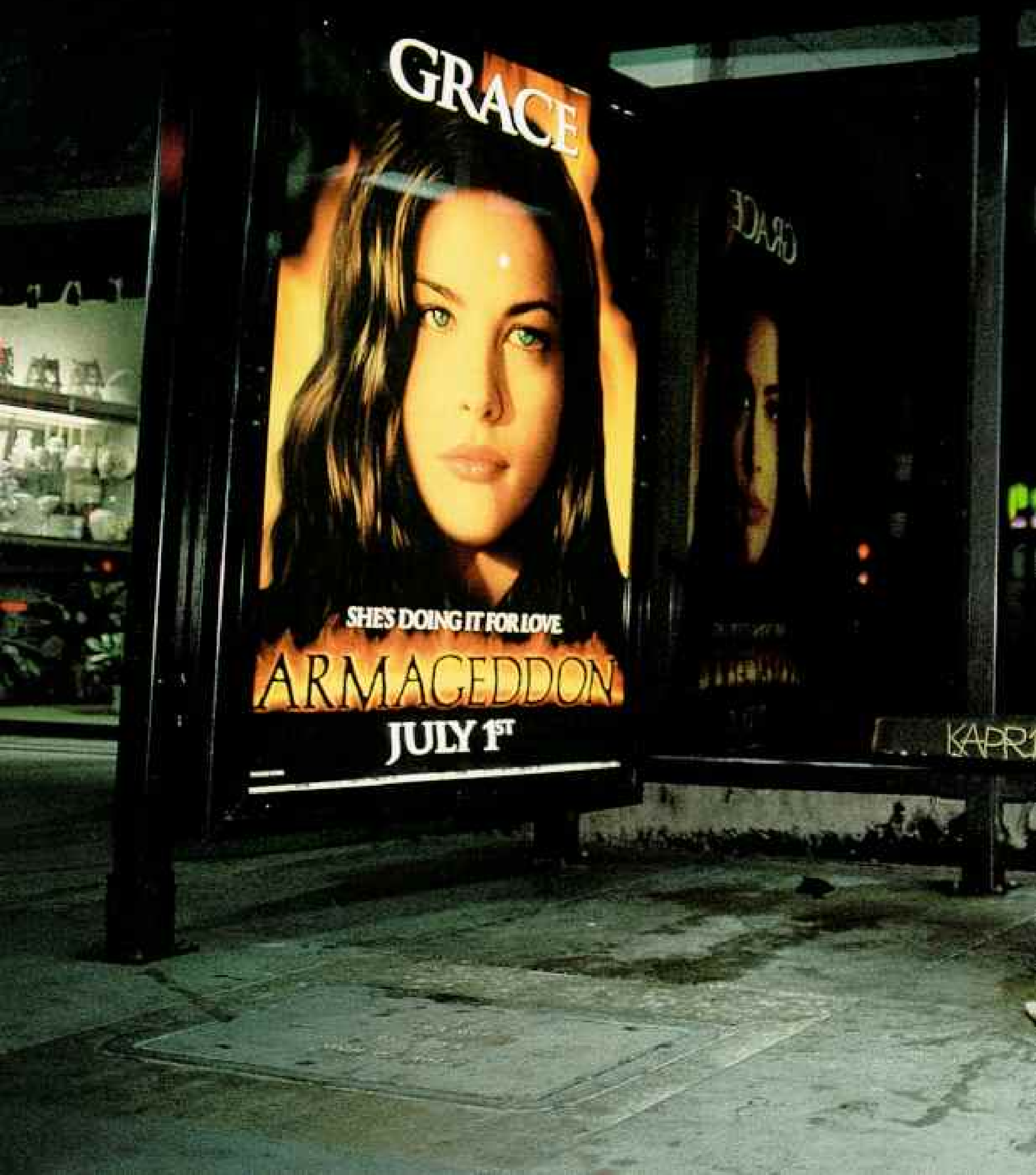
"cultural assault" of McDonald's, Coca-Cola, Disney, Nike, MTV, and the English language itself—more than a fifth of all the people in the world now speak English to some degree. Whatever their backgrounds or agendas, these critics are convinced that Western—often equated with American—influences will flatten every cultural crease, producing, as one observer terms it, one big "McWorld."

Popular factions sprout to exploit nationalist anxieties. In China, where xenophobia and economic ambition have often struggled for the upper hand, a recent book called *China Can Say No* became a best-seller by attacking what it considers the Chinese willingness to believe blindly in foreign things, advising Chinese travelers to not fly on a Boeing 777 and suggesting that Hollywood be burned.

There are many Westerners among the denouncers of Western cultural influences, but James Watson, a Harvard anthropologist, isn't one of them. "The lives of Chinese villagers I know are infinitely better now than they were 30 years ago," he says. "China has become more open partly because of the demands of ordinary people. They *want* to become part of the world—I would say globalism is the major force for democracy in China. People want refrigerators, stereos, CD players. I feel it's a moral obligation not to say: 'Those people out there should continue to live in a museum while we will have showers that work.' "

Westernization, I discovered over months of study and travel, is a phenomenon shot through with inconsistencies and populated by very strange bedfellows. Critics of Western culture blast Coke and Hollywood but not organ transplants and computers. Boosters of

OUTSIDE LOOKING IN A life in which socks make do for shoes is far more than a Los Angeles bus stop bench away from the deep pockets of U.S. movie studios. Touchstone Pictures reportedly spent more than 200 million dollars to produce and promote



Armageddon. Ticket sales for the 1998 thriller topped 500 million dollars worldwide. Filmmakers in other countries often feel overwhelmed by the spending power of American media, part of what Canadian writer Margaret Atwood calls "the great star-spangled Them."

Western culture can point to increased efforts to preserve and protect the environment. Yet they make no mention of some less salubrious aspects of Western culture, such as cigarettes and automobiles, which, even as they are being eagerly adopted in the developing world, are having disastrous effects. Apparently westernization is not a straight road to hell, or to paradise either.

But I also discovered that cultures are as resourceful, resilient, and unpredictable as the people who compose them. In Los Angeles, the ostensible fountainhead of world cultural degradation, I saw more diversity than I could ever have supposed—at Hollywood High School the student body represents 32 different languages. In Shanghai I found that the television show *Sesame Street* has been redesigned by Chinese educators to teach Chinese values and traditions. "We borrowed an American box," one told me, "and put Chinese content into it." In India, where there are more than 400 languages and several very strict religions, McDonald's serves mutton instead of beef and offers a vegetarian menu acceptable to even the most orthodox Hindu.

"I used to say that Peoria will look like Paris, and Beijing will look like Boston," said Marshall W. Fishwick, professor of American studies at Virginia Tech, "but now I'm not so sure."

FOR HUNDREDS OF YEARS, women in Africa, the Middle East, and South Asia have decorated their bodies with designs painted with a paste made from henna leaves. In India this practice is called *mehndi*. It's also called mehndi in Los Angeles, and as I write, it is considered a very cool thing to do, though by the time you read this it may have followed the love song from *Titanic* into oblivion.

One sunny September afternoon I was sitting in a spacious frame house in West Hollywood watching a French artist named Pascal Giacomini carefully draw swirls down the bare arm of a Hispanic girl to the rhythm of Brazilian samba music. "It's a temporary, painless tattoo—in two weeks it's gone," Pascal explained softly as he concentrated on the little dots he was making around the curving tendrils near her elbow. "Henna is tied to a wedding tradition, and it has no connection with drugs or rock-and-roll. It's an art form with roots. Now it's hugely popular—in Japan, Argentina, Sweden, Greece. My Guatemalan maid does it. . . ."

He took my left hand and drew a sinuous uncoiling circle; it trailed down my middle finger and ended with a dot at the cuticle.

Pascal has developed a mehndi kit, which he sells through Learningsmith and more than a hundred other outlets. "In America, people

will grab anything and run with it," Pascal said. Incorrigibly curious, ravenous for novelty, Americans love to experiment with ethnic food, clothes, words. Mehndi is just one of the many bits of exotica to become the mall rat's latest diversion. And when something becomes fashion, it becomes commercial.

The critical mass of teenagers—800 million in the world, the most there have ever been—with time and money to spend is one of the powerful engines of merging global cultures. Kids travel, they hang out, and above all they buy stuff. I'm sorry to say I failed to discover who was the first teenager to put his baseball cap on backward. Or the first one to copy him. But I do know that rap music, which sprang from the inner-city ghettos, began making big money only when rebellious white teenagers started buying it. But how can anyone predict what kids are going to want? Companies urgently need to know, so consultants have sprung up to forecast trends. They're called "cool hunters," and Amanda Freeman took me in hand one morning to explain how it works.

Amanda, who is 22, works for a New York-based company called Youth Intelligence and has come to Los Angeles to conduct one of

Breakfasting monks in saffron robes excite no particular curiosity at a Denny's restaurant in California. A dozen or more Theravada Buddhist monks, most ordained in Thailand, serve five-year "tours of duty" at Wat Thai of Los Angeles. The temple provides a spiritual and cultural center for the local Thai community—some 40,000 strong.

three annual surveys, whose results go to such clients as Sprint and MTV. She has shoulder-length brown hair and is wearing a knee-length brocade skirt and simple black wrap top. Amanda looks very cool to me, but she says no. "The funny thing about my work is that you don't have to be cool to do it," she says. "You just have to have the eye."

We go to a smallish '50s-style diner in Los Feliz, a slightly seedy pocket east of Hollywood that has just become trendy. Then we wander through a few of the thrift shops. "If it's not going to be affordable," Amanda remarks, "it's never going to catch on."

What trends does she see forming now? "People aren't as health conscious as they were, so we're seeing fondue and crepes," she answers. "Another trend—the home is becoming more of a social place again. And travel's huge right now—you go to a place and bring stuff back.

"It's really hard to be original these days, so the easiest way to come up with new stuff is to mix things that already exist. Fusion is going to be the huge term that everybody's going to use," she concludes. "There's going to be more blending, like Spanish music and punk—things that are so unrelated."

LOS ANGELES IS FUSION CENTRAL, where cultures mix and morph. Take Tom Sloper and mah-jongg. Tom is a computer geek who is also a mah-jongg fanatic. This being America, he has found a way to marry these two passions and sell the result. He has designed a software program, *Shanghai: Dynasty,* that enables you to play mah-jongg on the Internet. This ancient Chinese game involves both strategy and luck, and it is still played all over Asia in small rooms that are full of smoke and the ceaseless click of the

chunky plastic tiles and the fierce concentration of the players. It is also played by rich society women at country clubs in Beverly Hills and in apartments on Manhattan's Upper West Side. But Tom, 50, was playing it at his desk in Los Angeles one evening in the silence of a nearly empty office building.

Actually, he only appeared to be alone. His glowing computer screen showed a game already in progress with several habitual partners: "Blue Whale," a man in Cologne, Germany, where the local time was 4:30 a.m.; Russ, from Dayton, Ohio; and "yobydderf" (or Freddyboy spelled backward), a Chinese-American who lives in Edina, Minnesota. (According to one study 64 percent of Asian-American families are linked to the Internet, compared with 33 percent of all U.S. families.) Tom played effortlessly as we talked.

"I've learned about 11 different styles of mah-jongg," he told me with that detached friendliness of those whose true connection is with machines. "There are a couple of different ways of playing it in America. We usually play Chinese mah-jongg. The Japanese style is the most challenging—more hoops to jump through."

I watched the little tiles, like the cards in solitaire, bounce around the screen. From what I gathered, it has to do with collecting similar or sequential tiles of dots, characters, bamboos, winds, or dragons into groupings called pungs, kongs, or, in some cases, chows. As Tom played, he and his partners conversed by typing short comments to each other.

"I'm trying to coax Fred to be a better sport—he kind of gloats too much when he wins, and he really likes the Spice Girls too," Tom remarked as his fingers gripped the mouse. "Oh, he got a pung of dragons, I hate him. . . ." The mouse clicked, some tiles shifted.

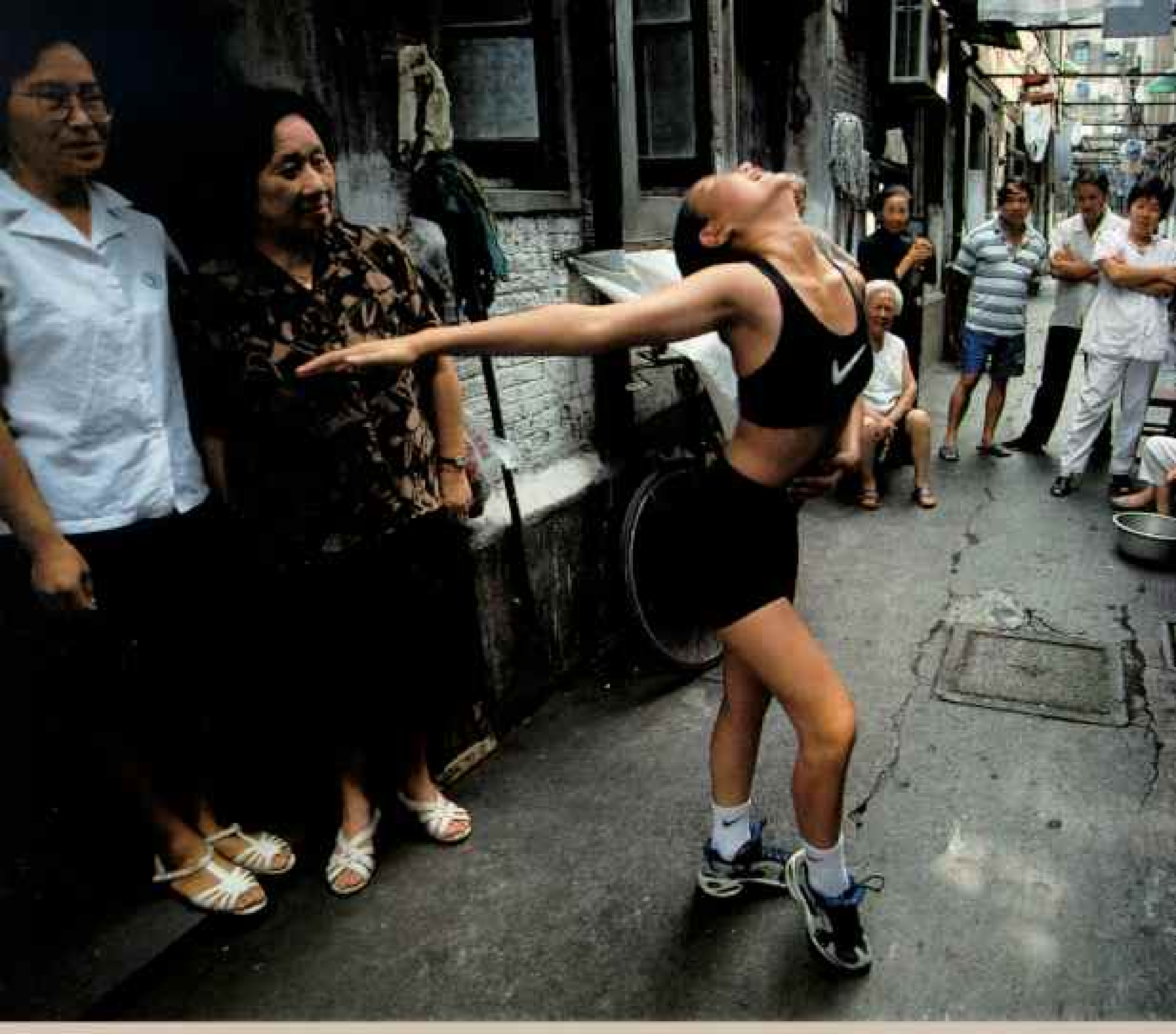
Does he ever play with real people? "Oh yeah," Tom replied. "Once a week at the office in the evening, and Thursday at lunch." A new name appeared on the screen. "There's Fred's mother. Can't be, they're in Vegas. Oh, it must be his sister. There's my eight dot. TJ's online too, she's the one from Wales—a real night owl. *(Continued on page 24)*

Some 1,600 Shanghai teens turned out for a basketball tournament run by Nike. Many lined up for a chance to shoot over a life-size cutout of American sports icon Michael Jordan. Says Nike's Terry Rhoads, "He's the most popular man in China who's never been to China."

Fans of Big Bird's Chinese cousin, Da Niao (below), are just as devoted. Called Zhima Jie *on Shanghai Television,* Sesame Street *now stretches from Mr. Hooper's store to the Great Wall of China and beyond, reaching more than 120 million viewers.*

SHANGHAI RISING Punctuated by the 1,500-foot-tall exclamation point of the Oriental Pearl TV Tower, a skyscraping special economic zone scrawls along the Huangpu River. Foreign investors have pumped more than 15 billion dollars into the Pudong New Area.

In 1990 it was farmland and paddies. "Now," reports *Shanghai Talk* editor Lily Tung, "it's where you'll find the biggest of everything: the tallest tower in Asia, the largest department store on the continent, and—coming soon—the tallest building in the world."



"I think I'm like most young people. . . ." She likes jeans and singer Mariah Carey, expects to watch Disney movies with her kids someday, and thinks her mother (bottom left) is too critical of fads like midriff-baring shirts. In the alley behind her home (left) 17-year-old Shanghai dynamo Zhou Die Die practices hip-hop moves for appearances with Nike's Dance Team. At the Zhong Ya Hotel restaurant (below) she trains for a hotel-management diploma, putting in 12 hours every other day and bicycling home late at night (bottom). "Once I start earning money," she says, "the first thing I want to do is see Paris." But Zhou also sees new economic opportunity clouding some Chinese lives: "There is more pressure to be rich," she worries. "People are never satisfied."

She's getting married soon, and she lives with her fiancé, and sometimes he gets up and says, 'Get off that damn computer!'"

Tom played on into the night. At least it was night where I was. He, an American playing a Chinese game with people in Germany, Wales, Ohio, and Minnesota, was up in the cybersphere far above the level of time zones. It is a realm populated by individuals he's never met who may be more real to him than the people who live next door. "Can't be, they're in Vegas." The global village gets a fiber-optic party line.

IF IT SEEMS that life in the West has become a fast-forward blur, consider China. In just 20 years, since market forces were unleashed by economic reforms begun in 1978, life for many urban Chinese has changed drastically. A recent survey of 12 major cities showed that 97 percent of the respondents had televisions, and 88 percent had refrigerators and washing machines. Another study revealed that farmers are eating 48 percent more meat each year and 400 percent more fruit. *Cosmopolitan* magazine, plunging necklines and all, is read by 260,000 Chinese women every month.

I went to Shanghai to see how the cultural trends show up in the largest city in the world's most populous nation. It is also a city that has long been open to the West. General Motors, for example, set up its first Buick sales outlet in Shanghai in 1929; today GM has invested 1.5 billion dollars in a new plant there, the biggest Sino-American venture in China.

Once a city of elegant villas and imposing beaux arts office buildings facing the river with shoulders squared, Shanghai is currently ripping itself to ribbons. In a decade scores of gleaming new skyscrapers have

shot up to crowd and jostle the skyline, cramp the narrow winding streets, and choke the parks and open spaces with their sheer soaring presence (most are 80 percent vacant). Traffic crawls, even on the new multilane overpasses. But on the streets the women are dressed in bright colors, and many carry several shopping bags, especially on the Nanjing Road, which is lined with boutiques and malls. In its first two weeks of business the Gucci store took in a surprising $100,000.

"Maybe young women today don't know what it was like," says Wu Ying, editor in chief of the Chinese edition of the French fashion magazine *Elle*. "But ten years ago I wouldn't have imagined myself wearing this blouse." It was red, with white polka dots. "When people bought clothes, they thought 'How long will it last?' A housewife knew that most of the monthly salary would be spent on food, and now it's just a small part, so she can think about what to wear or where to travel. And now with refrigerators, we don't have to buy food every day."

As for the cultural dislocation this might bring: "People in Shanghai don't see it as a problem," said a young German businessman. "The Chinese are very good at dealing with ambiguity. It's accepted—'It's very different, but it's OK, so, so what?'"

Li Ping is a cardiologist who discovered Amway cosmetics two years ago and began what Americans call selling door-to-door. Because it's very difficult for an individual to start a business, direct sales have become the new road to prosperity for many enterprising Chinese. As incomes and curiosity about Western products have grown, companies such as Amway, Avon, Tupperware, and Mary Kay have made swift inroads. Amway, for example, has some 92,000 sales representatives who made almost one hundred million dollars in sales in 1998.

I went with Dr. Li to visit some of her clients. A compact, robust, middle-aged woman wearing a stylish white cotton dress with little brass stars scattered over the shoulders, Dr. Li made no secret of her enthusiasm for her new avocation. "In the past every person had a dream that they could do what they want," she said, "but they couldn't, because tradition wouldn't allow them to do it. I hope to build a clinic

Coca-Cola claims to own the world's best known commercial trademark. Passersby on Mumbai's busy Tulsi Pipe Road may notice the logos, but for a small girl and her family the corrugated metal walls and ragged plastic-sheeting roof aren't a billboard —they're home.

Advertising has little impact in villages like Kaggalipura (below), near Bangalore. So companies like toothpaste maker Colgate-Palmolive send out vans loaded with free samples, hoping to capture a profitable share of a vast market.

for myself in the future. So I have to earn extra money, and Amway is a good chance. Because money doesn't fall from heaven."

Mrs. Gong Suihua has been a client for a year. She lives with her husband in a comfortable apartment with polished wood floors and two bedrooms; there is also a large Panasonic television with Sony speakers. She offered us coffee and pulled out photographs of her daughter in Los Angeles. Then Mrs. Gong settled down for a demonstration of the new facial products—cleanser and cream. "Age will destroy our skin. We need to take care of it," Dr. Li says as she works on her friend's face. "I'm a doctor, so I have some knowledge about beauty."

Mrs. Gong didn't take long to order several items. "I know the quality is very great," she said. "Even if the price is high, it's worth it. We feel confident buying this way because friends introduce the products."

The morning passed quickly. It seemed so unremarkable that I had to remind myself how revolutionary it really was. "This way has put new ideas into people's brains," Dr. Li said, her eyes shining. "It is helping you tap all your potential."

POTENTIAL: This is largely a Western concept. Set aside the makeup and skyscrapers, and it's clear that the truly great leap forward here is at the level of ideas. To really grasp this, I had only to witness the local performance of Shakespeare's *Macbeth* by the Hiu Kok Drama Association from Macau.

There we were at the Shanghai Theatre Academy, some 30 professors and students of literature and drama from all over China and I, on folding chairs around a space not unlike half of a basketball court. "I'm not going to be much help," murmured Zhang Fang, my interpreter. "I don't understand the Cantonese language, and most of these people don't either."

I had spoken earlier with the young director, Hui Koc Kun, known as Billy. He chose *Macbeth*, he said, because it represents so perfectly the current situation in Macau. This year the Portuguese colony will become part of China, and this is generating a great deal of anxiety. "I wanted to show the feeling of contradiction," he explained in tentative English. "Macbeth is a general. He's a hero. He wants to do the right thing. But everything takes him to a road—he doesn't want to be on that road, but things want him to take that path. The war, the environment, his wife. We have no choice in the modern city. You think you can choose, but actually you have no choice."

I thought I knew what to watch for, but the only characters I recognized were the three witches. Otherwise the small group, dressed in leotards and capes, spent most of an hour running in circles, leaping, and threatening to beat each other with long sticks. The lighting was heavy on shadows, with frequent strobelike flashes. Language wasn't a problem, as the actors mainly snarled and shrieked. Then they turned their backs to the audience and a few shouted "Free Macau!" in Cantonese. The lights went out, and for a moment the only sound in the darkness was the whirring of an expensive camera on auto-rewind.

This is China? It could have been a college campus anywhere in the West: the anguished students, the dubious adults, the political exploitation of the massacred classic. Until recently such a performance was unthinkable. It strained imagination that this could be the same

country where a generation ago the three most desired luxury items were wristwatches, bicycles, and sewing machines.

An inflated American astronaut entertains in Bangalore. Selling saris and children's toys, Kemp Fort is becoming an after-work hangout as its fanciful characters introduce Indian consumers to a mix of shopping and showbiz long familiar in the U.S. and Japan.

EARLY ON I REALIZED that I was going to need some type of compass to guide me through the wilds of global culture. So when I was in Los Angeles, I sought out Alvin Toffler, whose book *Future Shock* was published in 1970. In the nearly three decades since, he has developed and refined a number of interesting ideas, explained in *The Third Wave*, written with his wife, Heidi.

What do we know about the future now, I asked, that we didn't know before? "We now know that order grows out of chaos," he answered immediately. "You cannot have significant change, especially on the scale of Russia or China, without conflict. Not conflicts between East and West, or North and South, but 'wave' conflicts between industrially dominant countries and predominantly agrarian countries, or conflicts within countries making a transition from one to the other."

Waves, he explained, are major changes in civilization. The first wave came with the development of agriculture, the second with industry. Today we are in the midst of the third, which is based on information. "In 1956 something new began to happen, which amounts to the emergence of a new civilization," Toffler said. "It was in that year that U.S. service and knowledge workers outnumbered blue-collar factory workers. In 1957 Sputnik went up. Then jet aviation became commercial, television became universal, and computers began to be widely used. And with all these changes came changes in culture.

"What's happening now is the trisection of world power," he

ENTERTAINMENT WITHOUT BOUNDARIES For 100 rupees—$2.34—a month, even Mumbai's slum-dwelling families can have access to more than 50 cable television channels. A decade ago one government-run channel aired nationwide for just a few hours a

day. Today state and commercial television producers offer local-language talk shows, game shows, soap operas, music videos, and news, along with an alphabet soup of imports—TNT, MTV, CNN, ESPN—and export Indian programming to 50 other nations.

continued. "Agrarian nations on the bottom, smokestack countries in between, and knowledge-based economies on top." There are a number of countries—Brazil, for example—where all three civilizations coexist and collide.

"Culturally we'll see big changes," Toffler said. "You're going to turn on your TV and get Nigerian TV and Fijian TV in your own language." Also, some experts predict that the TV of the future, with 500 cable channels, may be used by smaller groups to foster their separate, distinctive cultures and languages.

"People ask, 'Can we become third wave and still remain Chinese?' Yes," Toffler says. "You can have a unique culture made of your core culture. But you'll be the Chinese of the future, not of the past."

RAJAN BAKSHI is a good example of the Indian of the future. He is a lawyer and a cable TV entrepreneur in New Delhi, brash, energetic, and making money. He, for one, has no interest in clinging to India's vast and elaborate past. "I think periodic upheavals are part of the regeneration process," he told me. "No culture exists in a vacuum. It all comes from somewhere. Ancient customs were modern at one time."

India, like China, teems with a billion people. But the contrast between the traditional and the new seems sharper and more ironic in a country that has nuclear power but no four-lane highways linking its major cities; that has some four million doctors and ranks among the world's top five countries in computer software production but where nearly half the population can't read or write.

In 1991 India began opening its economy to wider trade, and the United States quickly became its primary trading and investment partner—687 million dollars invested in 1997, almost three times as much as the year before. But promoters of global culture may have expected too much. Foreign companies were thrilled by sheer numbers—an estimated 150 million potential middle-income consumers—without knowing that "middle income" in India often connotes an annual per capita amount of only about 1,500 dollars. Many multinationals, from McDonald's to Panasonic, have had to accept paper-thin profit margins to stay afloat in India.

And while some politicians rail against "cultural pollution," they make no mention of the fact that many foreign companies have "gone native." Revlon, for instance, has adapted the color palette and composition of its cosmetics to suit the Indian skin and climate, and when MTV added an India-dedicated network with Indian performers, its ratings jumped. In Rajan Bakshi's opinion, foreign companies have also brought better job opportunities: "I think the average worker is better off with the multinationals," he said. "I see these young people at the satellite companies—girls who are 24, 25. If they'd been working for an Indian company, they'd have been exploited. Smart young people now have options because of the multinationals."

Anyway, Bakshi isn't impressed by the interminable debates about cultural purity. Neither is Yogendra Singh, a retired sociology professor, who explained: "India has lived with cultural pluralism for centuries. In fact, the history of India is based on linkages with other cultures."

Early one hot October morning I made my way along the banks of New Delhi's Yamuna River to Jamuna Basti, a massive slum that

Toting a toy space gun, an Indian boy plays in a New Delhi slum. But more than poverty shadows six-year-old Rashid's future. Long-range missiles and nuclear weapons have proliferated in the region. As nations extend their destructive reach, neighbors grow even warier of each other.

swarms with hundreds of thousands of destitute people, many of them migrants from Bangladesh and the state of Bihar. The preoccupations of politicians and intellectuals—whether the government should block international calls that offer phone sex, say, or whether English is making India's national languages "look inadequate"—had yet to reach this outpost. Everyone here was talking about the astronomical price of onions. Almost overnight the cost reportedly spiked tenfold, and without onions you can hardly make anything worth eating.

Santosh Kumar, a 16-year-old boy who earns a hundred rupees ($2.34) a day driving a bicycle ricksha, led me to the riverbanks where the *dhobis*, or washermen, were working. The Yamuna was beige, loaded with detritus and raw sewage. Along the shore men and women were laboring over wet piles of clothes. Each dhobi took a heavy handful of laundry, hauled it out of the water, and swung it through the air, slinging it down hard against a block of reddish stone.

Walking on, we passed a café where a boy was stirring tea in a large pot. The café wasn't big, but at least it had two rooms. The hundreds of dwellings clustered around it were no more than rectangular patches of concrete with three low walls made of cinder block or brick or matting. Many were missing the front wall, so I could see straight into the back.

From the café came the unexpected glow of a black-and-white TV. Rajnai, the burly owner, was lounging in the doorway. He said he'd gotten the TV "to indulge his son."

"I paid 500 rupees for it secondhand," he said. "We watch mostly films and news." I looked surprised. "It's no big deal," he shrugged. "A lot of houses have television."

As we talked, a crowd quickly formed around me, and a slender,

Applying henna paste to a well-stretched canvas, artist Nicole Baum brings Old World body art to Los Angeles. For her clients, like countless others in an ever more interconnected world, borrowed culture can serve very personal ends. "I was eight months pregnant," recalls Dara Paprock Brown. "I wanted to feel beautiful."

gray-haired woman named Zahida Khatoon pushed to the front. I asked what she thought of Coke and Pepsi. "If those companies come in and the local people benefit," she answered, "I don't object. But while the government is levying huge taxes on these foreign goods, we can't afford to send our kids to school. We don't care about multinationals. I can't feed my children. Our 'cultural roots'—it doesn't concern me."

I got into the car and headed back toward the main road, moving slowly through the masses of people, the cows, the dogs, the toddlers. A group of teenage boys squeezed past. One of them was wearing a T-shirt emblazoned "Titanic." I had to know why. He grinned shyly.

Had he seen the movie? "No," he replied. Did he know the story? "Not really," he said. "But my friend told me about it."

But why, I wondered, would a boy want to wear a T-shirt advertising something he knew nothing about, that represented no experience he'd ever had, that referred to nothing that mattered to him? The shirt, it occurred to me, didn't link him to the movie (or that damn song) or even to the West at large. But it did link him to his friend.

Linking: This is what the spread of global culture ultimately means. Goods will continue to move—from 1987 to 1995 local economies in

California exported 200 percent more products, businesses in Idaho 375 percent more. People move: It is cheaper for businesses to import talented employees than to train people at home. Ideas move: In Japan a generation of children raised with interactive computer games has sensed, at least at the cyber level, new possibilities. "What this exposure has given them is a direct sense . . . of asking the 'what if' questions they could never comfortably ask before (because of the Shinto superstition that saying a thing would make it happen)," wrote Kenichi Ohmae in *The End of the Nation State*. "The implicit message in all this . . . is that it is possible to actively take control of one's situation or circumstances and, thereby, to change one's fate. . . . For the Japanese, this is an entirely new way of thinking."

CHANGE: It's a reality, not a choice. But what will be its true driving force? Cultures don't become more uniform; instead, both old and new tend to transform each other. The late philosopher Isaiah Berlin believed that, rather than aspire to some utopian ideal, a society should strive for something else: "not that we agree with each other," his biographer explained, "but that we can understand each other."

In Shanghai one October evening I joined a group gathered in a small, sterile hotel meeting room. It was the eve of Yom Kippur, the Jewish Day of Atonement, and there were diplomats, teachers, and businessmen from many Western countries. Elegant women with lively children, single men, young fathers. Shalom Greenberg, a young Jew from Israel married to an American, was presiding over his first High Holy Days as rabbi of the infant congregation.

"It's part of the Jewish history that Jews went all over the world," Rabbi Greenberg reflected. "They received a lot from local cultures, but they also kept their own identity."

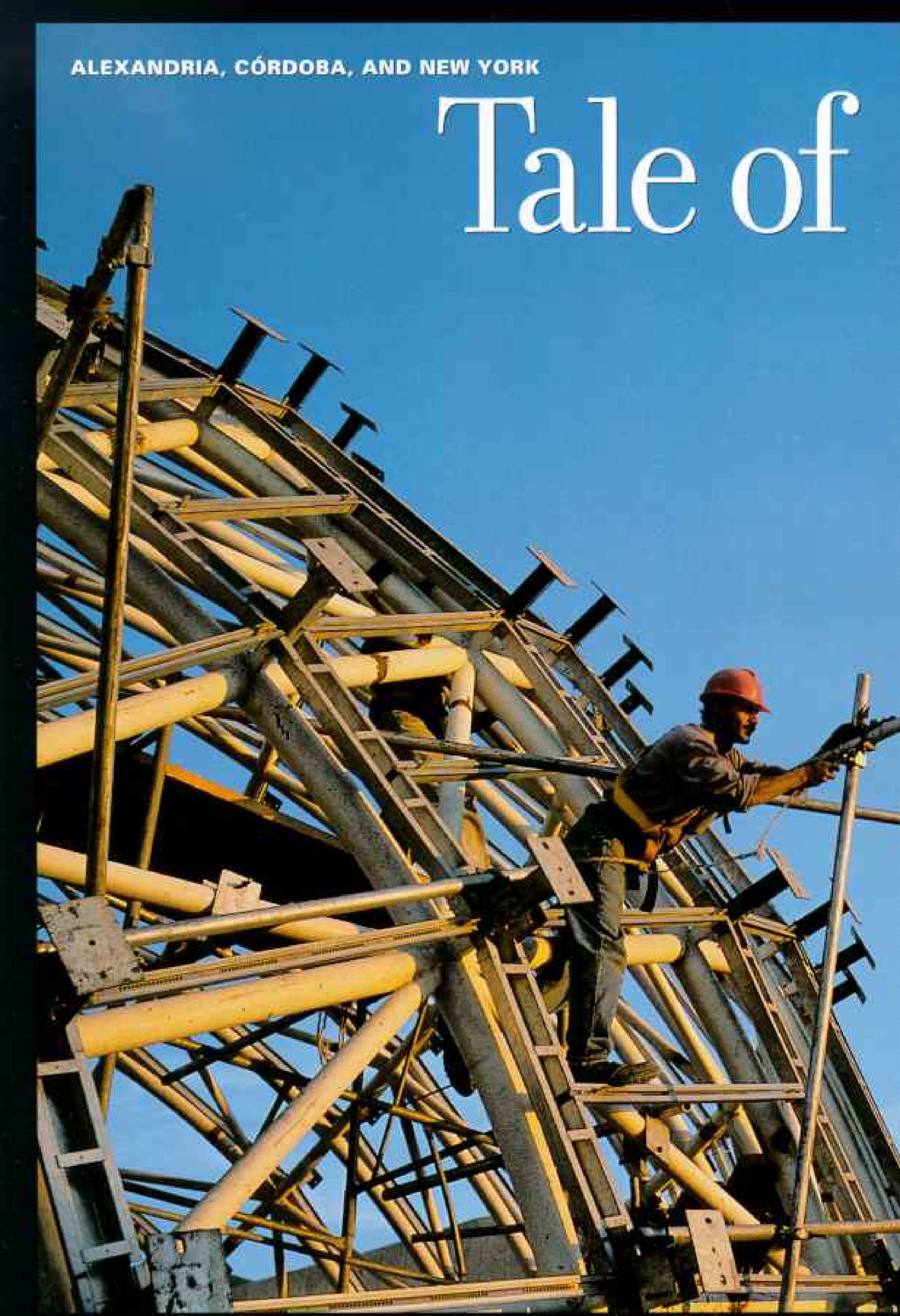
The solemn liturgy proceeded, unchanged over thousands of years and hundreds of alien cultures: "Create in me a clean heart, O God, and renew a right spirit within me," he intoned. I'm neither Jewish nor Chinese, but sitting there I didn't feel foreign—I felt at home. The penitence may have been Jewish, but the aspiration was universal.

Global culture doesn't mean just more TV sets and Nike shoes. Linking is humanity's natural impulse, its common destiny. But the ties that bind people around the world are not merely technological or commercial. They are the powerful cords of the heart. □

Read more from Erla Zwingle about global culture at *www.nationalgeographic.com/2000/culture/global.*

ALEXANDRIA, CÓRDOBA, AND NEW YORK

Tale of



Three Cities

Celestial in shape and ambition, a planetarium rises over the dusty soils of Alexandria, Egypt. It is part of a new library meant to emulate the famed Ptolemaic library and museum that made Alexandria a cultural beacon before the first century A.D. Alexandria in ancient times, Córdoba, Spain, in the tenth century, and New York City today—each helped shape the culture of an age. Marked by both glory and strife, these cities hold lessons for the urban stars of the next millennium.

MAKESHIFT MOSQUE Kneeling in reverent prayer at Alexandria's train station, Muslims display a fervor reminiscent of the ancient city—but a uniformity that would have been rare. Though ruled by Rome, first-century Alexandrians worshiped a blend of Egyptian,

Greek, and Roman deities, the composite god Serapis chief among them. Tolerance of varied faiths fostered philosophical debate among pagans, Jews, and Christians. Islam arrived with the Arab conquest in A.D. 641 and now claims the majority of the population.

"The test of civilization is the power of drawing the most benefit out of cities."

—RALPH WALDO EMERSON

By JOEL L. SWERDLOW
ASSISTANT EDITOR
Photographs by STUART FRANKLIN

SMOKE AND THE FRAGRANCE OF ROASTING QUAIL float up from long charcoal grills lining the perimeter of Suq el-Attarine, the Market of Scents, in Alexandria, Egypt. It is October, the season when quail fly south from Europe, tire over the Mediterranean Sea, land on beaches, and are easily trapped. Along sidewalks men sit on benches and puff apple-cured tobacco through water pipes called *sheesha*. Some play dominoes. Above us hang the purple flowers of jacaranda trees.

The tranquil scene recalls earlier times in the city that Alexander the Great founded more than 2,300 years ago. But as I stroll from the marketplace toward the harbor, I am clearly in a modern city. Apartment buildings, home to most of Alexandria's nearly three and a half million people, surround me. Traffic jams the streets. Supermarkets, cell phones, motorcycles, and teenagers in baseball caps are everywhere.

Nearly half the world's population lives in cities. The number of megacities—those with populations of more than ten million—will exceed two dozen by 2015, up from fourteen in 1995.

All cities share certain characteristics. They are places to buy and sell, to worship, to share companionship. They are where new ideas trigger changes in science and art, where cultures meet and evolve. But why and where do cities, these centers of trade and knowledge, grow? What causes some to flourish and others to fade? I am in Alexandria at the beginning of my journey to three great cities to seek the answers.

I have begun here because in A.D. 1 this was one of the few international cities. Part of Africa, close to Arabia, and home to Europeans from Greece and Rome, Alexandria was a crossroads for trade that ranged from China to Britain. Strabo, a geographer in the first century A.D., called Alexandria "the greatest emporium in the inhabited world." After Alexandria I will visit Córdoba, Spain, western Europe's largest city in A.D. 1000, now a modest town supported mainly by agriculture. In its prime Córdoba was, in the words of one observer, "the mother of towns; the abode of the good and godly, the homeland of wisdom." My travels will end in New York City, a modern epicenter of finance and culture. New York, writes Joan Didion, is "an infinitely romantic notion, the mysterious nexus of all love and money and power."

Dodging cars speeding along El-Horreyah Avenue, Alexandria's busiest street, I arrive at the waterfront. I see small fishing boats at anchor, young boys jumping off rocks into the water, and, beyond, the natural harbor that Alexander the Great saw in 331 B.C.

Alexander's engineers realized that Mediterranean currents running west to east would keep the harbor navigable and free of Nile River silt. They also knew that the Island of Pharos, if joined to the mainland

Frequent contributor STUART FRANKLIN photographed the Galápagos Islands for the April 1999 issue.

Far below the bustling streets of modern Alexandria, the catacombs of Kom el-Shoqafa unfold like a scroll revealing the city's hybrid past. Jackal-headed figures of Anubis, the Egyptian god of death, guard the main tomb armed as Roman soldiers. The wealthy family that built this vault around A.D. 100 filled it with Greek, Egyptian, and Roman motifs—as if hedging their bets with the gods.

by the construction of a pier, would offer an effective wave breaker.

The city grew steadily as a center for trade. About four decades after Alexander's death in 323 B.C. Ptolemy II built a lighthouse, known as one of the seven wonders of the ancient world. It rivaled the Pyramids in height at about 400 feet and had as many as 300 rooms. Fires, reflected in mirrors on top of the lighthouse, could be seen for some 35 miles, alerting ships to Egypt's reefs and shifting coastline.

In the 14th century it collapsed during an earthquake, and the Egyptians built a fortress here using, some accounts say, stones from the lighthouse. From my waterside café table I can see the fortress, where team members from the Alexandria-based Centre d'Études Alexandrines are easing into wet suits. They will dive down 20 feet, where they are cataloging statues, columns, and other architectural elements near the lighthouse site.

The past—and the answers it might hold—feels impossibly distant as I wander up the coast near where Cleopatra's palace once stood. Somewhere in this area, perhaps beneath my feet, lies the sarcophagus holding Alexander the Great. It disappeared from recorded history in the third century A.D. Also buried here in a site yet to be located is the famous Alexandria library, founded early in the third century B.C. as part of the Mouseion, the great research center of its day.

The idea of a library was not new. Egyptian papyrus libraries existed in 3200 B.C., and Athens had a library in the fourth century B.C. But Alexandria's library was on a scale new to the Mediterranean world, and the city was notorious for its aggressive pursuit of texts.

The United Nations and other international agencies are cooperating with the Egyptian government to finance a new 200-million-dollar Alexandria Library near a possible site of the old one. Cranes swing steel beams overhead, and workers scamper up the scaffolding surrounding the building's circular framework.

Mohsen Zahran, the library's project manager, talks about reviving "the lighthouse of knowledge." The new library, he says, "will encourage peace and the exchange of ideas throughout the region and provide a place for scholars of diverse backgrounds to meet."

Little is known about how the ancient Mouseion operated because so few written records have been found. But we do know that it was a place for scholars to meet. From throughout their known world Alexandria's rulers invited nearly a hundred learned men to the Mouseion, where they lived in a communal residence and ate together in a dining hall. From these scholars came Euclidian geometry, the first scientific dissections of human bodies, a translation of the Hebrew Bible into Greek, and a compilation of Homer's epic poems.

Scholarly pursuits had immediate commercial applications. Translations helped Alexandrians to better understand their trading partners, and new maps enabled traders to calculate distances more accurately.

Alexandria had hit upon a winning formula: Trade produces wealth, wealth pays for knowledge, and knowledge stimulates more trade.

Around 120 B.C. members of the Egyptian coast guard found an Indian sailor shipwrecked on the Red Sea. They took him to Ptolemy VII. The sailor spoke a language that no one in Alexandria knew, so Ptolemy treated the sailor like a book needing translation: He ordered that the sailor be taught Greek.

Thus educated, the sailor taught his captors something amazing: Monsoons over the Indian Ocean blow in a regular pattern—from northeast to southwest in winter and the opposite way in summer.

A significant part of Alexandria's trade took place with India and lands farther east that supplied the spices used for religious rituals, medicine, and preserving food. At the time, ships traveling from India

were sailed by Arabs and Indians who had mastered the monsoons. These sailors unloaded their ships at Eudaemon, Arabia (now Aden), and transferred goods to ships manned by Alexandrians sailing across the Red Sea to the coast of Egypt. Likewise, tools, iron, clothing, glassware, and linen from Alexandria were unloaded and reloaded on their way to India.

The stop in Arabia greatly increased shipping costs. The only alternative—transporting goods overland across the Hindu Kush, Persia, and Mesopotamia—was far more risky and expensive.

A trip to India with the shipwrecked sailor as pilot showed that the monsoon winds could facilitate a direct journey, and Alexandrians began to bypass the Arab middlemen.

THE STORY OF THE INDIAN SAILOR comes from the writings of Strabo. Such written sources provide most of our knowledge of ancient Alexandria, but much of it also comes from the kinds of artifacts that are being destroyed as the modern city grows. The foundations of Alexandria's new library are pounded into buildings dating from the second century B.C.

"Unfortunately, destroying ancient artifacts is the only way to build anything," an architect working on the new library explains to me. "The whole city sits on top of its ancient predecessors. If we are to make progress, to continue to grow, we can save only a little. The rest of what's down there must be left to our imaginations."

"What we do all over the city is largely rescue archaeology," Colin Clement, a researcher with the Centre d'Études Alexandrines, explains as we approach a necropolis where *(Continued on page 48)*

When Alexander the Great founded Alexandria in 331 B.C., he chose the site for its potential as a port linking the Mediterranean and the Nile. Access to the flow of foreign trade and culture made Alexandria the crown of the Hellenistic world. Today a choked peninsula frames the city's Western Harbor (above), which handles most of Egypt's shipping. Cotton (facing page) is a prized export, much as papyrus was in Ptolemaic Egypt.


EXTREME
THE FUTURE IS NOW
ATLAS
SPAIN
EGYPT

A Look at Life Through the Ages

A.D. 1
Alexandria, Egypt

Beyond the cosmopolitan clatter of an Alexandrian boulevard, a boy stands in his doctor's home awaiting a prognosis. On a table the latest medical tools, herbs, and scrolled treatises suggest reassuring competence. Roman furniture, shelved Egyptian idols, and Corinthian columns signal the multicultural mix of a city renowned for advances in geometry, astronomy, mathematics, and medicine.

To create this triptych of plausible scenes from the daily life of Alexandria in A.D. 1, Córdoba in 1000, and modern New York, artist René Milot consulted scholars and studied period objects. "Throughout history," he says, "we all need knowledge, music, food, interaction. We're all the same."

Likewise all cities share the hope of being immortal. Alexandria's massive lighthouse seemed a monument to invincibility. Yet after the Arabs established a new Egyptian capital, Alexandria faded into obscurity, and the lighthouse eventually tumbled into the sea.

A.D. 1000
Córdoba, Spain

Soothed by the sound of burbling water, two Cordoban children learn the Koran at the feet of a scholar. Perched on pillows of linen and silk, they may pause to sample dried figs, play a game of chess, or pluck the lute. Beyond their bloom-scented courtyard a minaret towers over a prosperous city of mosques, palaces, synagogues, and shops, the capital of western Islam.

Such was the life of well-to-do Cordobans in the late tenth century, the city's golden age. Conquered by Muslims in 711, the region blossomed because of advances in irrigation, introduction of grain and fruit crops, and patronage of art and science.

Literacy flourished as Córdoba became a center for translation of the religious, scientific, and philosophic works of antiquity. One Arab poet called the city "the garden of the fruits of ideas." Indeed, through Islamic Córdoba, scholarship passed into a backward Europe, forming a foundation for the Renaissance.

A.D. 2000
New York City

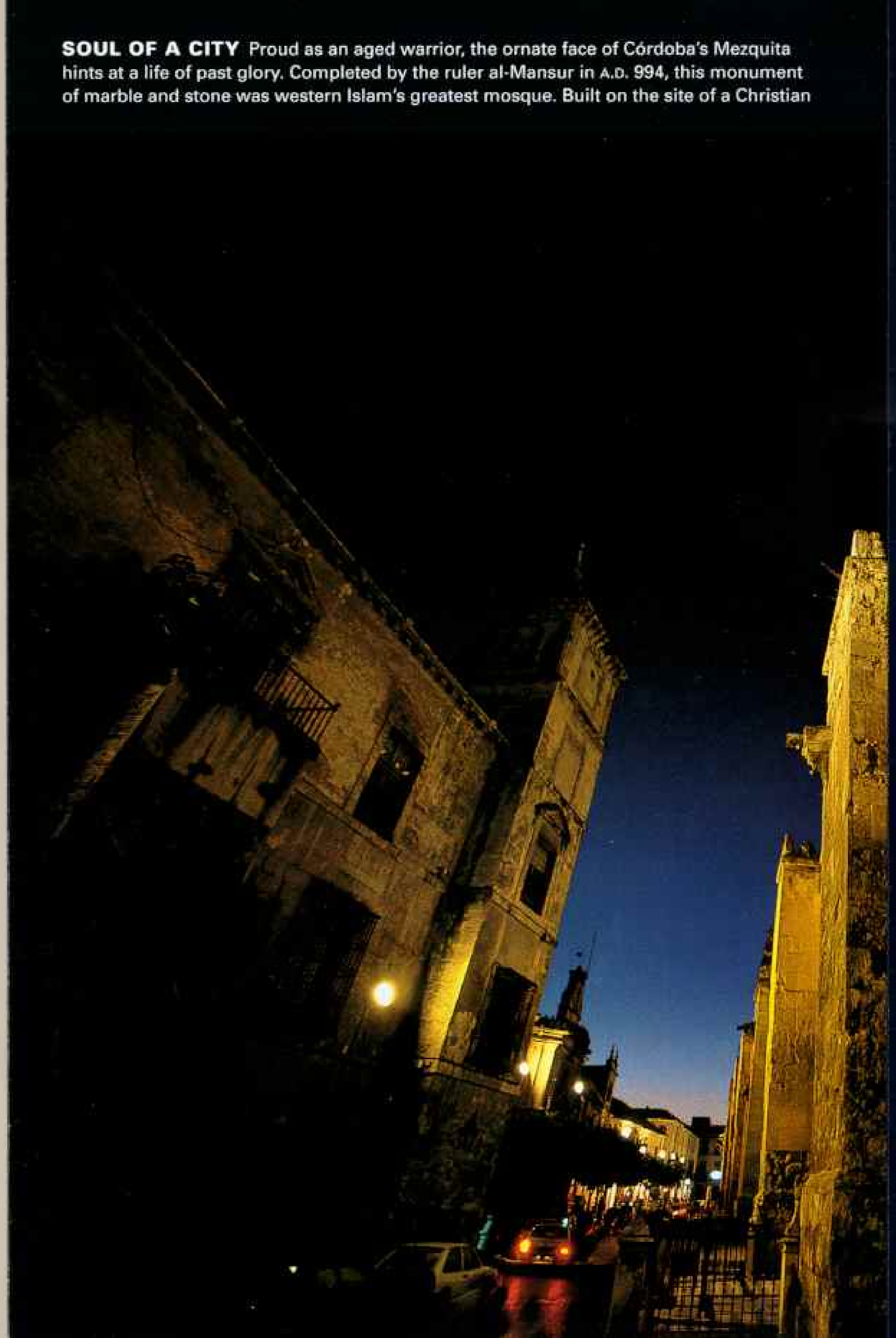
A young woman sits in her basement apartment, window barred against urban threats. When not out with friends, she is connected to the world via computer, cell phone, television, and radio—living life remotely, in a barrage of information. A caged iguana, dusty telescope, and potted plant hint at the natural world she has little time to enjoy. Cultural trinkets litter her room, disposable as a pizza box.

Craving stimulation, she wouldn't dream of living anywhere else. This "city of ambition," writes novelist Tom Wolfe, is "the irresistible destination of all those who insist on being *where things are happening.*"

Founded by the Dutch in 1653 and fueled by the creative energies of immigrants, New York is now a linchpin of global finance, culture, and trade—and a master of self-promotion. "I see New York as the center of the world," says Mayor Rudolph Giuliani. "It has a boundless future"—sentiments once shared, no doubt, by Córdoba and Alexandria.

For an interactive version of the artwork, visit *www.nationalgeographic.com/3cities*. Art by René Milot; consultants (above, from left) Marjorie Venit, Dede Fairchild-Ruggles, Bob Deutsch.

SOUL OF A CITY Proud as an aged warrior, the ornate face of Córdoba's Mezquita hints at a life of past glory. Completed by the ruler al-Mansur in A.D. 994, this monument of marble and stone was western Islam's greatest mosque. Built on the site of a Christian



church, its history foretold its fate: Christians reconquered Córdoba in 1236. Perhaps swayed by the mosque's beauty (or carrying out a symbolic affront), they built a cathedral within its walls in 1523. Today, Roman Catholic prayers echo past the rich mosaics.

Alexandrians buried their dead from the third century B.C. until the sixth century A.D. This necropolis covered more than a square mile.

We reach the excavation site, riddled with holes and piled with mounds of dirt. Overhead, a four-lane highway ends abruptly in midair. Streetlights line the sides of the road right up to the edge.

"Work on the highway stopped in 1997, when the Egyptian antiquities service realized the foundations were being driven into some pretty fantastic ruins," Clement says. "They asked us to take over work at the site. Our permit runs out next year."

Conducted down a 15-foot wood ladder, I am shown a room with red-and-yellow plaster friezes depicting dolphins and cupids—most likely a funerary chamber associated with a series of tombs.

In other rooms huge columns smash through the floors. "They'll support the finished highway when we're forced to end our work and leave," Clement explains after I've climbed back up.

We find a six-year-old boy with a group of men hauling dirt from an excavation. The child tells me that his nickname is Balaha—"date" in Arabic—because he loves to eat dates.

Clement tells me that after roadworkers realized they were opening old tombs, Balaha, who lived in a nearby shanty, showed archaeologists the necropolis's network of underground passageways. Balaha, who wears a torn baseball cap, ragged clothes, and rubber sandals, speaks with the poise of an adult as he describes how he stumbled upon an opening—presumably left by a long-gone grave robber—and began to play underground, telling no one. "I was never scared," he says.

I ask Balaha if he wants to be an archaeologist when he grows up.

"I already am," he replies.

From where I stand with Balaha, I can see freighters in Alexandria's harbor. That harbor, which now handles about 75 percent of the freight entering and leaving Egypt, has proved resilient. In the middle of the third century A.D. the city was torn by riots and religious conflicts: "Every street was polluted with blood, every building of strength converted into a citadel," wrote Edward Gibbon in *The Decline and Fall*

of the Roman Empire. Earthquakes struck around A.D. 365. A plague wiped out much of the population in the late sixth century, and in the seventh century Muslims, less reliant than their predecessors on sea trade, conquered Egypt. Yet in A.D. 1000, more than 1,300 years after its founding, Alexandria was still an emporium of the world.

In A.D. 1 Alexandria's chief trading partner was Rome. By 1000 Rome had declined from the seat of a worldwide empire to a city of 35,000, and Alexandria was trading heavily with another power: Cordoban-controlled Spain.

CÓRDOBA, in the south-central Iberian Peninsula, had been a provincial capital under the Romans and was controlled by the Phoenicians before that. By A.D. 715 the Umayyads, a Muslim dynasty ruling from Damascus, had annexed most of the peninsula. Around mid-century a revolution destroyed the family and a surviving prince fled to Córdoba, where he proclaimed himself emir. The city grew, made wealthy by agriculture and mining in surrounding regions.

By the middle of the ninth century the city had running water, sewers, hospitals, paved and lit streets, promenades, gardens, and fountains. Contemporary observers described Córdoba's population as enjoying some 80,000 shops, 60,000 mansions, 1,600 mosques, 900 public baths, and 70 libraries. The craftsmen of Córdoba carved rock crystal and manufactured leather, paper, linen, and silk.

In the tenth century Córdoba's caliphs welcomed ambassadors from much of Europe and the Middle East. Scholars invented new surgical techniques and instruments, advanced understanding of medicinal

Enticing as a bridal blush, the grounds at Córdoba's Fortress of the Christian Monarchs owe their enchantment to the Arabs. Using waterwheels and canals, these people of the desert turned Córdoba into a garden scented by citrus, jasmine, and other fragrant plants they introduced. At historic Plaza del Potro (facing page) an octagonal fountain evokes Islamic style—a stone oasis for weary souls.

herbs, accurately observed and measured celestial phenomena, and refined methods of irrigation, plant grafting, and crop rotation. Córdoba's merchant and naval fleet, based at the Mediterranean port of Almería, was among the largest in the world.

I make the overland trip between Almería and Córdoba with Jorge Lirola Delgado, professor of Arab and Islamic studies at the University of Almería. By car, on country roads, the 200-mile journey takes about six hours. In 1000, Lirola tells me, the transportation of goods between the two cities took seven days by foot or mule. Although the wheel had been in use for 4,000 years, the Muslim world had dropped it in favor of pack animals. A sea journey to Córdoba from points east was no simpler. It meant a passage out through the Strait of Gibraltar—difficult and potentially dangerous for vessels reliant on wind and oars—and then a trip up the Guadalquivir River from the Atlantic coast, stopping at Seville to transfer from seagoing ships to riverboats.

Córdoba, so inaccessible by water and far from international trade routes, seems an improbable site for such a large city. In fact, by the early 11th century Córdoba's heyday was passing. Alexandria, on the other hand, situated on a natural harbor, remained a center of trade for more than 2,000 years. Circumstances of geography contributed to Córdoba's eventual decline, but what other factors were at work?

THE MEZQUITA is the biggest single reminder of Arab civilization left in Córdoba today. Completed in the tenth century, the mosque—much of its interior since transformed into a cathedral—held 52,000 people. As I walk into the courtyard where Muslim worshipers once performed ritual cleansing, I reflect on the social structures in Córdoba and Alexandria.

Both possessed religiously and ethnically diverse populations that interacted in complicated ways. Greeks and later Romans in Alexandria and Muslims in Córdoba were the dominant groups and as such enjoyed legal, social, and economic privileges.

The Romans allowed the Jews but not the Egyptians in Alexandria to rule themselves. Roman citizens had the right to appeal legal cases to Rome, while others had to rely on local magistrates. Muslim Córdoba permitted Christians and Jews to enforce their own laws if they did not conflict with Islamic law. A Muslim man in Córdoba could marry a Christian woman, but only after she converted. If a Christian killed a Christian, the Christian community handled the case, but any crime involving a Muslim, whether as victim or accused, was tried in an Islamic court.

Christians eventually conquered Córdoba

in 1236, but the city's decline came much earlier, at the Muslims' own hands. In the early 11th century, despite its prosperity, Córdoba experienced decades of conspiracy, assassination, slave revolt, and insurrection, in which thousands of people were slaughtered. Within two decades the once powerful caliphate disintegrated into more than 20 principalities.

I walk through Medina Azahara, site of one of the world's great palaces in the year 1000. Built five miles from the city by a caliph of Córdoba, the palace and grounds held more than 4,000 marble columns and, reportedly, mechanical birds and lions and shimmering pools of mercury. Hundreds of buildings sprawled over some 275 hillside acres.

A mob from Córdoba accompanied by Berber mercenaries demolished the palace around 1010, and soon Medina Azahara was abandoned. Stone floors, broken walls, and crumbling arches now stretch for hundreds of yards in all directions; more ruins lie buried under the green fields beyond. Pilfered pieces of marble columns and chunks of carved stone from the palace today adorn Córdoba's shops, restaurants, bank lobbies, and the patios of private homes.

Córdoba's decline as a major city was swift. Yet Córdoba endures.

Shrouded by the dominance of Catholicism, Córdoba's Islamic past is all but forgotten during Holy Week, when hooded penitents walk the streets in processions of contrition and hope. A thousand years ago Muslims tolerated—and also repressed—the sizable Christian minority. But by 1525 Cordobans had a stark new choice: Christianity or expulsion.

WIRED AND RESTLESS Stars in a steel constellation, the towers of midtown Manhattan burn with a relentless energy that typifies New Yorkers themselves. Audacity began early on this island, the smallest of New York's five boroughs. In 1626 Dutch official Peter

Minuit "bought" Manhattan from resident Lenape Indians for the equivalent of $24. At that time it was an Eden of fertile hills. Transformed by money and engineering, it became one of the most densely populated places on Earth—the crown jewel of capitalism.

At the Cubillas River on my way to the city, I crossed the Pinos Puente stone bridge. More than a thousand years ago caravans carrying leather and silk goods from Córdoba crossed the river at this exact spot. From local farmers I purchased olive oil; some of the trees that produce this oil, they told me, grew from cuttings taken from trees standing when the Muslims ruled Córdoba. Indeed, olive oil has always been a major export here. The Spanish call it *aceite*, derived from *zayt*, Arabic for olive oil.

Black pony, large moon,
and olives in my saddlebag.
Although I know the roads,
I will never reach Córdoba.

Federico García Lorca, a Spanish poet, sensing that past glory had made Córdoba an unattainable ideal, wrote these words in the early 20th century. Yet Córdoba *is* reachable—not the city once called "the mother of towns" but a thriving, and timeless, agricultural city of about 320,000 people. Fields of olive trees end where downtown department stores and office buildings begin. In cobblestone streets a millennium old, young couples walk arm in arm past sidewalk cafés.

Córdoba: once a powerhouse, undermined by its geographic location and political instability, now a small Spanish city supported by agriculture and steeped in romance.

AS MY PLANE FLOATS over New York City, I look down at the empty berths of its harbor and wonder whether future generations will ever stroll around ruins in New York the way I strolled around the ruins of Medina Azahara.

Like Alexandria, New York was born beside a natural harbor. In 1950 the waterfront handled almost 20 percent of the nation's sea cargo, measured by weight. Today it handles less than 6 percent.

People, however, have always been New York's greatest import. Since 1860 between 20 and 50 percent of all New Yorkers have been foreign-born.

Easy-access jobs attract many immigrants to New York. So does the opportunity to make money. "The New York City economy is porous," says Mitchell Moss, director of New York University's Taub Urban Research Center. "There are many ways to enter. You wash dishes, then you own your own restaurant, then you manage the building." A large share of New York's immigrants, says Moss, are skilled and well educated. "No other city attracts the kinds of people who come here," he says. More than 700,000 of these new arrivals make Queens one of the most ethnically

and racially diverse counties in the United States. Its public library, the country's busiest, loans material in 50 languages.

I'm standing on the sidewalk outside the Flushing branch of the Queens Library at 9:30 a.m., a half hour before the doors open. More than a dozen people are here, waiting to go in. By 10:30 the library resembles a busy supermarket, with clerks shouting "Next, please" to people lined up to check out books.

An English conversation group is meeting on the lower level, and I sit in for a while. Some of the students describe New York as a school, where they learn about survival in America. "If I can make it there, I'll make it anywhere," says one, quoting a 1977 show tune.

Most of the people in the group are immersed in the city. One describes a matinee performance of Bizet's *Carmen*; another recounts a recent visit to Rockefeller Center. The daughter of a third has just completed a recital at the Juilliard School.

I join an English language class in another room, where I sit between an opera singer from Shanghai and a botanist from Uzbekistan.

Yuzef Murdakhayev, the botanist, invites me home for lunch. His wife, Margarita, brings out apricots, almonds, pistachios, chickpeas,

"Taxi!" Hailed as icons of New York, yellow cabs haul a million people a day in this city of 7.5 million. "What New York did . . . with congestion was to make an art of it," wrote architecture historian Douglas Haskell. The first U.S. city with an elevated railway and an under-river tunnel for cars, New York became a theater for the art of urban movement.

Art reflects life at the Marian Goodman Gallery, where a tiny boy flips for sculptor Juan Muñoz's "Towards the Mirror." "New York is a city that enables the arts to flourish," says Goodman. "There is respect for the creative process here."

There's an equal respect for space. A fashion showroom doubles as a party venue (facing page) in the garment district, where yesterday's sweatshops are today's boutiques.

and dumplings. Yuzef, who speaks Russian, Persian, and Turkish, has written three books and about 300 scholarly articles. Books fill one wall of his living room. "Why bring clothes?" Yuzef says. "I brought books."

Unable to find work as a botanist because he does not yet speak English well, Yuzef helps his two sons with their jewelry manufacturing business. Two of his grandchildren, born in New York, are American citizens, and the rest of the family expects to gain citizenship soon.

After lunch Yuzef walks me to the subway. Emerging 40 minutes later from Grand Central Terminal, I am immediately struck by the energy, the anything-is-possible attitude, that makes Manhattan unique. It comes from the concentration of people, the sky-scraping architecture, and from money, Manhattan's main import. Trillions of dollars move through the city each day.

BILLIONS OF DOLLARS PASS ANNUALLY over the desk of Dan Stern, a 37-year-old investment banker. He has lived in New York since graduating from business school in the late 1980s. Stern's corner office on the 43rd floor of a midtown office building has a view of Central Park. In addition to a desk and credenza, it has an easy chair and sofa for visitors, a small tree, and a table holding an orchid in full bloom. A chalkboard covers an entire wall—Stern uses it for financial calculations.

Most of the day Stern stands in front of his computer screen, talking on the telephone about deals and potential deals, including the purchase and sale of hotels, factories, and publishing ventures. He occasionally checks e-mail or an online stock quotation or asks his assistant to send documents via fax or overnight delivery.

Despite the money involved—30 million dollars for a "small" deal—Stern is relaxed and soft-spoken. "Putting together a profitable venture is like making a movie," he tells me. "You have to balance ideas, capital, and talent. Your judgment about people has to be good."

Of a potential partner in an overseas venture, Stern tells an associate, "I know him. He has good intentions. We can trust him."

Most people Stern calls, or whose calls he accepts, are people he already knows or people who know people he knows. "I wouldn't have spoken to him unless he was a friend of someone I trusted," he tells me after one conversation that could affect the operation of a major international hotel chain.

Stern is in New York, he says, for the stimulation and the competition. "This is the big leagues," he explains. "If you want to play in the majors, you have to be here."

Although he'll soon fly to Japan to examine possible investments, Stern doesn't travel much. People he needs to meet in person, the Chinese business executive who has stopped here on his way between New Zealand and Switzerland, for example, always seem to come to New York.

Dan Stern's world is electro-personal. With telephone, e-mail, fax, and computer, he can communicate all over the globe. But at every step a personal relationship or face-to-face contact is crucial.

This electronic dealing characterizes knowledge-based industries, like finance, corporate management, and advertising, which now produce almost a third of the private-sector jobs in New York City.

DoubleClick, an Internet advertising company, was started in Atlanta in 1995 and moved to New York the next year. The company places 200 million website advertisements a day, reaching 40 million people each month.

"We could be anywhere," says Kevin O'Connor, the co-founder and chief executive officer. "We're in New York because a Madison Avenue address gives us instant credibility, especially overseas."

DoubleClick is hiring people at the rate of one a day and will soon

CIRCLE OF LIFE Hidden in the wings, dancer Michael Joy prepares to swoop onstage to portray a flock of birds in *The Lion King*—a musical that is "visually and physically breathtaking," says Joy. It plays in Broadway's New Amsterdam Theatre, whose recent

restoration by the Walt Disney Company has helped ignite a revival of the once seedy theater district. "When people experience live performance, a theater can become a sacred space," says *Lion King* director Julie Taymor. "In its realm your spirit is touched."

Theater of the absurd, Times Square offers a tableau of people, pop culture, and philosophic angst. New York is a city of strangers, wrote essayist E. B. White, "seeking sanctuary or fulfillment or some greater or lesser grail." Perhaps the role of all great cities is to serve as crucibles for evolving human identity.

have a thousand employees. It's a "24-7" company—open all the time.

At 2 a.m. I chat with the four DoubleClick employees on duty. Two are from China, one is from Ukraine, and one has a father from Hong Kong and a mother from Burma.

Victor Ng is 21 years old and studies computer science full-time at a local college. "Do you do schoolwork during slow periods between phone calls and e-mails?" I ask.

"I don't have time," he says, pointing toward five books on network operations and problem solving. "I read those. I have to keep up with practical applications."

Victor doesn't have time to study for school because he is studying for work. He seems to be a living manifestation of the winning formula I'd discovered in Alexandria, Egypt: Trade produces wealth, wealth pays for knowledge, and knowledge stimulates more trade. What Victor learns produces more business for DoubleClick. With increased profits DoubleClick pays for more knowledgeable employees. Knowledgeable employees bring more business.

The next morning I wander south from DoubleClick toward the Union Square area, which was full of small factories at the beginning

of the 20th century—when manufacturing was the single most important source of jobs in New York. The buildings, many of which housed artists' studios in the 1960s, are now stores, offices, and restaurants.

School buses wrapped around the block in front of a former glove-and-belt factory prompt me to go inside. Ballet Tech now occupies the top two floors. Under exposed pipe and pressed-tin ceilings are classrooms and mirrored dance studios.

Twenty years ago Eliot Feld, who had danced with the New York City Ballet at age 11 and in 1969 formed his own dance company, was wondering where to find young dancers. Watching public schoolchildren on a subway, he realized they were an untapped pool of talent, and Ballet Tech was born.

More than 800 young students, selected from the 30,000 who audition each year, arrive by bus several times a week from throughout the city. After the fifth grade another selection process narrows the student body to 60, who attend middle and high school full-time at Ballet Tech. Of these, fewer than a dozen eventually join Feld's professional company.

"Dance training should not be wed to our notion of classic ballet, which is essentially a 19th-century idea of what ballet should be," Feld tells me. "Dance should capture what you feel when you walk the streets of New York. It should challenge accepted wisdom, weave in the new, allow change and growth. Art is always an argument with the past."

I watch a rehearsal. Nine girls, ages 12 to 14, have been dancing for an hour and a half and have two more to go.

Feld demonstrates steps as he choreographs a dance. "Show me your soul, ladies," he pleads. They try the new steps. "Come on, a little more stately," he shouts. A moment later: "You need fewer bones in your arms. Dance more like a squid. You must not show me any edges. There are no edges."

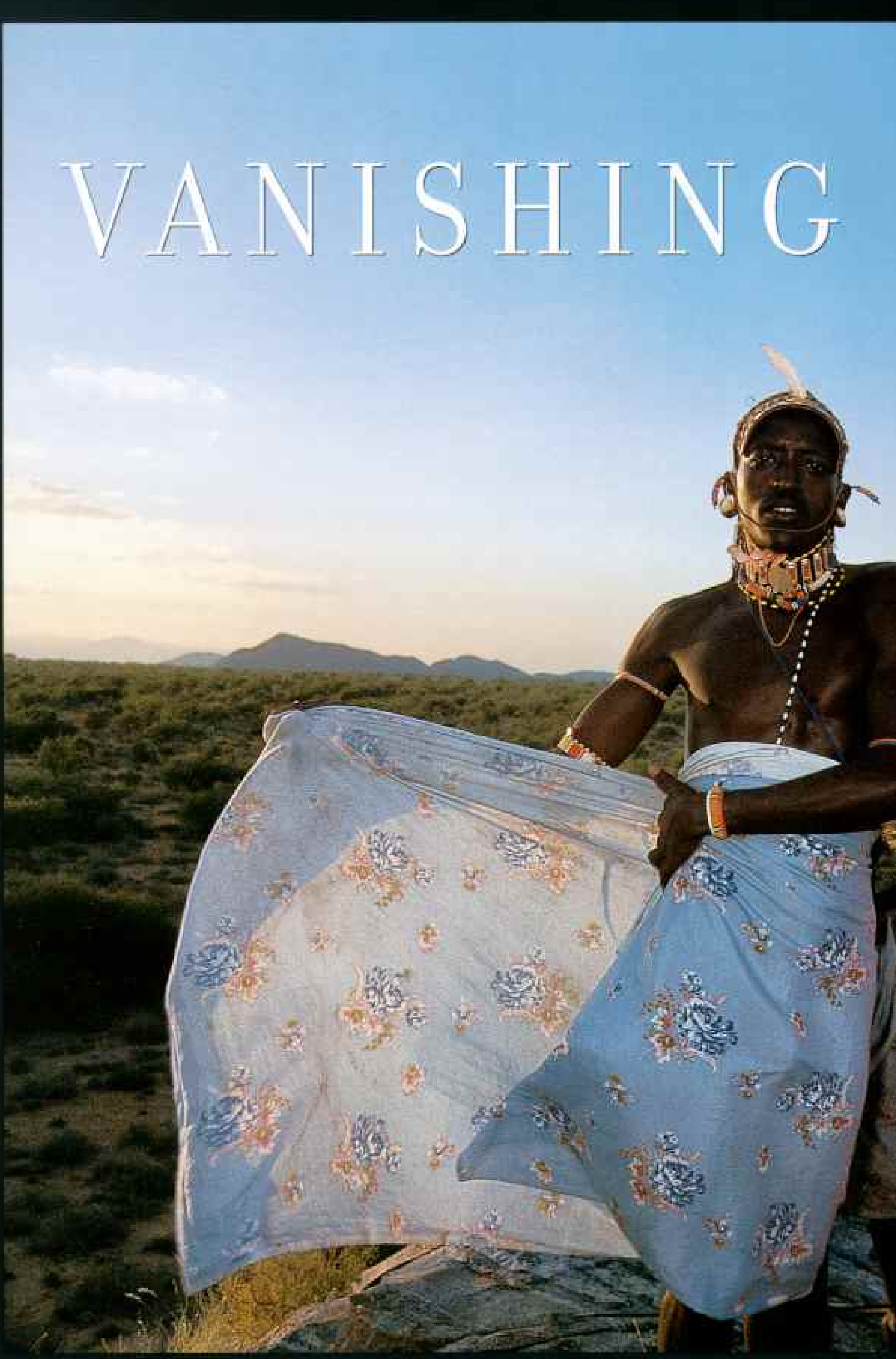
The girls glide past again. "No, no, no!" Feld shouts, on his feet. "You started to feel it, and then you lost it!"

They return to the far corner of the room and dance toward him again. "Nice, ladies! Nice, ladies! Getting there."

Watching Feld, I realize I'm witnessing the essence of the three cities—and the two millennia—that I've visited: human interaction fueling challenges to the known and a desire to create something better.

Ballet slippers are still slapping the hardwood floor as I leave. Subway sounds drift in a window. Joining the crowds rushing along the sidewalk, I keep hearing Feld. "You can't only do what's possible," he told his young dancers. "You *change* what's possible." □

VANISHING



CULTURES

Around the world it's the same story but with different faces: age-old cultures besieged by modern pressures. The faces here are drawn from three distinct peoples on three different continents. In Kenya, Ariaal warriors (left) cling to a nomadic existence. Borneo's Penan face destruction of their rain forest home. And in the high desert of Bolivia the Chipaya persevere in an all but barren land.

The issue is whether ancient cultures will be free to change on their own terms.

By WADE DAVIS
Photographs by MARIA STENZEL

AMONG THE KOGI INDIANS of northern Colombia, a child of four is taken from his family and carried high into the Sierra Nevada to be trained for the priesthood. For the next 18 years he will be a stranger to the sunlight, sequestered in stone huts for two nine-year periods deliberately chosen to mirror the nine months spent in his natural mother's womb. Now in the womb of the divine Mother, he will know only darkness and shadows and thus acquire the gift of visions, becoming capable of seeing not only into the future and past but also through every material illusion of the universe.

Finally, after years of study and rigorous practice, the great moment of revelation arrives. On a clear morning, with the sun rising over the flank of the mountains, the initiate is led into the light of dawn. Until then the world has existed mainly as a thought. Now for the first time he sees the world as it is, the transcendent beauty of the Earth. In an instant everything he has learned is affirmed. Standing at his side, the elder who has trained him sweeps an arm across the horizon as if to say, "You see, it is as I told you."

This tradition is but one example of the infinite range of the human imagination brought into being by culture. In Haiti a voodoo priestess responds to the rhythm of drums and, taken by the spirit, handles burning embers with impunity. In the Amazon lowlands a Waorani hunter detects the scent of animal urine at 40 paces and identifies the species that deposited it in the rain forest. A Mazatec farmer in Mexico communicates in whistles, mimicking the intonation of his language, sending complex messages to other Mazatec across the broad valleys of his mountain homeland. It is a vocabulary based on the wind.

Just to know that such peoples exist, that jaguar shaman yet journey beyond the Milky Way, that the myths of Athapaskan elders still resonate with meaning, is to remember that our own world does not exist in some absolute sense but rather is one model of reality. The nomadic Penan in the forests of Borneo, the Ariaal herders in the deserts of Kenya, the Chipaya farmers scratching a living from the tired soils of Bolivia reveal that there are other possibilities, other ways of thinking and living with the Earth.

Worldwide some 300 million people, roughly 5 percent of the global population, still retain a strong identity as members of an indigenous culture, rooted in history and language and attached by myth and memory to a particular place. Yet increasingly their unique visions of life are being lost in a whirlwind of change.

In Brazil a gold rush brings disease to the Yanomami, killing a quarter of the population in a decade, leaving many of the 8,500 survivors hungry and destitute. In Nigeria pollutants from the oil industry saturate the delta of the Niger River, homeland of the Ogoni, impoverishing the once

fertile soils. In Tibet 6,000 monuments and monasteries, ancient temples of wisdom and veneration, are reduced to riprap by the Chinese. And in the forests of the Congo sexually transmitted diseases and other illnesses from the outside are ravaging the Efe Pygmies.

These are not isolated events but rather elements of a global phenomenon that will no doubt be remembered as one of the hallmarks of this century. There is no better measure of this crisis than the loss of languages. Throughout all of history something on the order of 10,000 spoken languages have existed. Today, of the roughly 6,000 languages still spoken, many are not being taught to children—effectively they are already dead—and only 300 are spoken by more than a million people. In another century fully half of the languages spoken around the world today may be lost.

More than a cluster of words or a set of grammatical rules, a language is a flash of the human spirit by which the soul of a culture reaches into the material world. "A language," says Michael Krauss of the University of Alaska, "is as divine and mysterious as a living organism. Should we mourn the loss of a language less than the loss of a species?"

The biological analogy is apropos. Extinction when balanced by the birth of new species is a normal phenomenon. But the current wave of species loss caused by human activities has no precedent. By the same token, languages, like cultures and species, have always evolved, but today languages are being lost at an alarming rate—within a generation or two.

"When we lose a language, it is like dropping a bomb on the Louvre," laments Ken Hale of the Massachusetts Institute of Technology. As languages disappear, cultures die. The world becomes inherently a less interesting place, but we also sacrifice raw knowledge, the intellectual achievements of millennia.

The issue is whether ancient cultures will be free to change on their own terms, adopting beneficial aspects of the modern world while rejecting intrusions that can only harm their spirit and heritage. With this question in mind I made two journeys, accompanied by Maria Stenzel, my photographic colleague: one to the rain forests of Borneo, home to some of the last nomads of Southeast Asia, and the other to the deserts of East Africa, long inhabited by wandering herdsmen, among them the Ariaal and the Rendille.

THE BARAM RIVER is the color of earth. To the north the soils of Sarawak disappear into the South China Sea, and fleets of Japanese freighters hang on the horizon, awaiting the tides and a chance to fill their holds with raw logs from the forests of Borneo. A hundred miles upriver, on the banks of the Tutoh at the Penan settlement of Long Iman, my old friend Mutang is away hunting wild pigs, to be sold to loggers in a nearby camp. His father, Tu'o, headman of the longhouse, was born in the forest, at a time when nearly all Penan were hunters and gatherers.

But all of Mutang's life has been marked by the frenzy of logging that has gripped Malaysia over the past three decades. The country accounts for 33 percent of world tropical timber exports, with most logs coming from the states of Sabah and Sarawak. As the trees fall, the Penan, deprived of their traditional basis for life, drift toward government settlements, built with the intent of drawing the people out of the forests. As a result no more than 300 of the roughly 7,000 Penan are today nomadic.

Colors indicate regional concentrations of indigenous peoples.

NATIONAL GEOGRAPHIC MAPS
SOURCE: JULIAN BURGER, UNITED NATIONS

Requiem or Reprieve?

There are at least 5,000 indigenous cultures worldwide, and the map above only hints at their diversity. Though marginalized in most societies, these peoples have survived. Says Julian Burger of the UN's Office of the High Commissioner for Human Rights, "All over the world indigenous peoples are asserting their cultural identity, claiming their right to control their futures, and struggling to regain their ancestral lands."

Long Iman is bleak, a wooden longhouse roofed in zinc, with great empty rooms and shuttered windows that keep out the wind. The river is soiled with silt and debris, the water no longer fit to drink. The afternoon rains turn the clearings around the settlement to a mud mire where children play. When Maria and I meet Tu'o on the landing by the river, he greets us warmly, touching our hands in turn and passing his fingers over his heart. I don't mention his name, and he says nothing of mine. We call each other *padéé*, brother, the proper salutation.

In the evening children gather around a television and watch as a Malaysian journalist reads the news in a language few of them understand. Tu'o apologizes for the spartan fare at dinner: rice and broth, a plate of wild ferns. "How can you feed your guests in a settlement? It's not like the forest, where there is plenty of food. In the forest I can give you as much as you want. Here you just sit and stare at your guests, and you can't offer them anything. This longhouse is well built, and we have mattresses and pillows. But you can't eat a pillow."

Thirty years ago government agents induced Tu'o to settle at Long Iman. Facilities that were promised—schools and clinics—were never built. There are few jobs, mostly menial work in logging camps, and with little experience the Penan make poor farmers. For Tu'o recalling the past is not a matter of mere nostalgia. It is a longing for a time when his children didn't have to go to sleep hungry and the people lived by the grace of the forest, unaware of the impending cataclysm.

WADE DAVIS holds a Ph.D. in ethnobotany from Harvard University and has written extensively on subjects ranging from Haitian voodoo and Amazonian myth to the global biodiversity crisis. This is his first article for the magazine. MARIA STENZEL is a frequent contributor who photographed one of the last nomadic bands of Nenets reindeer herders in Siberia for the March 1998 issue.

I explain to Tu'o the purpose of our journey: To reach one of the last bands of nomads, a cluster of families from the Ubong River who live for the most part in the remote reaches of Gunung Mulu National Park, a mountainous refuge that rises from the Tutoh River. Only in the confines of the park is the forest pristine and the traditional subsistence base intact. With us is Ian Mackenzie, a Canadian linguist intent on compiling the first Penan grammar and dictionary. It is a labor of years. This is Ian's tenth sojourn among the Penan, my third visit.

Asked to form an expedition overnight, Tu'o is ready by dawn. With six young Penan as our companions and Tu'o as guide, we leave Long Iman traveling up the Tutoh by longboat to reach a trail that climbs steeply through gingers and wild durian. Movement toward the ridge is slow and deliberate. For the Penan, even those recently settled, the destination is everywhere and nowhere. The capacity for survival lies all around in the forest.

Approaching the ridgeline, two hours above the Tutoh, we hear the low drone of logging trucks downshifting on the far side of the river. Peering through an opening in the trees across the narrow valley, Yapun, one of the young Penan, says with obvious contempt, "That is the work of Taib." Having denounced Abdul Taib Mahmud, the government minister responsible for Sarawak's forestry practices, Yapun turns his attention to a parade of insects at his feet. "If only we were as plentiful as these ants, the Malaysians would leave us alone. But it is they who outnumber the ants and make our lives so miserable."

For two long days we walk farther into the forest, following a route that rises and falls with each successive ridge. Delighted to be away from the settlement, the Penan watch the forest for signs, hunting hornbills at dusk, tracking deer and sun bears, gathering the ripe fruits

SHOULDERING HIS BURDEN, Lakei Padeng gathers poles to build a shelter deep in Gunung Mulu National Park, a protected swath of rain forest in the Malaysian state of Sarawak on the island of Borneo. Of the some 7,000 people of the Penan tribe, Lakei

Padeng is one of 300 or fewer who still live in the rain forest. As for the rest, three decades of government-sanctioned logging has nearly destroyed their homeland, forcing them to live in dreary resettlement camps—an even heavier burden to bear.

of mango trees. On the third morning our party crests a steep hill; we have reached the nomads. It is just after dawn, and the sound of gibbons howling runs across the canopy. Smoke from cooking fires mingles with the cool mist. A hunting party returns. Tu'o bows his head in morning prayer. "Thank you for the sun rising, for the trees and the forest of abundance, the trees that were not made by man, but by you."

On this ridge at Lamin Sapé, where generations of Penan have come, four families remain, in flimsy thatch shelters made of poles and rattan perched above the forest. Asik is the headman. Ten years ago I met him on the banks of the Tutoh, when the river ran clear. He had recently been jailed for participating in blockades that had shut down logging in much of Sarawak. Begun as a quixotic gesture, blowpipes confronting bull-dozers, the protests electrified the international environmental move-ment, leading then Senator Al Gore to describe the Penan as the frontline troops in the battle to save the Earth. But the logging continued.

"From the time of our origins," Asik laments, "we have preserved the trees and animals, every single thing in the forest. This we know. It is in our legends, our traditions. When we think of the places and our land, our hearts are troubled. Everywhere I go, I feel the need to weep."

For the Penan the destruction of their forests represents far more than the loss of subsistence: It implies the death of a people. The forest is their homeland, and all their history is recorded in landscape. Peter Brosius, an anthropologist at the University of Georgia, lived among the Penan for nearly four years. "The land," he says, "is filled with cultural signifi-cance. For streams alone they have over 2,000 names, each imbued with its own history. Bulldozers and roads obliterate recognizable features. Once the canopy is opened, an impenetrable mass of thorny underbrush makes access and movement impossible. The cultural resonance of the landscape, all the sites with biographical, social, and historical signifi-cance, are hidden, producing a sort of collective amnesia."

IN THE MORNING we go with the children to gather fruit in the forest. Pajak, the eldest of the nomads, who vows never to enter a settlement, sends with us two of his daughters, Tudé and Lesevet. The wild tangle of trails and vegetation would lose us in a moment were we not able to follow the nimble steps of girls not yet a decade old. They skip across ravines, slip past thorn palms, squeal with delight as they climb, hand over hand, up lianas that lead to branches of white *langsat* fruits, sweet as nectar, which, shaken from the limb, are gathered and carried back to camp in baskets woven from rattan.

Asik is there to meet us, and we follow him and his wife, Juna, down a steep and slippery slope to a glade in the forest where water runs. With him is his son Péndi, a toddler of two, scampering alongside a pet mon-key, a pigtailed macaque that strikes away at every opportunity. "Come back, my friend," Asik cries, "I will protect you." The monkey returns and leaps onto his shoulder. Though content to kill most anything in the wild, the Penan never harm an animal once it has been brought into the circle of the family. Nothing horrifies them more than the thought of raising domesticated animals for slaughter.

Along the trail Asik points out leaves that heal, others that kill, and magical herbs believed to empower hunting dogs and dispel the forces of darkness. There are trees that produce rare resins and gums for trade with traveling merchants, vines that yield twine and fiber for baskets,

a liana that smolders for days and allows for the transport of fire.

The most important plant of all is the sago palm, the tree of life. Already that morning Asik has cut down a stand. Now, on a bed of fresh leaves, he splits the sections of trunks in half lengthwise and with a slow steady rhythm pounds the soft pith. Leached with water, the pith yields a thick paste, which is dried into sago flour, the main staple of the nomads. In an afternoon Asik and Juna secure enough food for a week.

Two nights later, close to dusk, with thunder over the valley and the canopy of the forest alive with the electrifying roar of black cicadas, we sit by a fire as Tu'o cooks the head of a small deer. Everything one hears, he explains, is an element of a language of the spirit. Thunder is the embodiment of *balei ja'au*, the most powerful magic in the woods. Trees bloom when they sense the song of the peacock pheasant. Bird-calls heard from a certain direction bear good tidings; the same sounds heard from a different direction are a harbinger of ill. Entire hunting parties can be turned back by the call of a banded kingfisher, the cry of a bat hawk.

Asik emerges from the forest, his face scratched and bleeding from an encounter with a thorny vine as he hunted monitor lizards. Tu'o laughs as Asik recounts his folly, a whole day on the trail and nothing to show for it. Asik's nephew Gemuk appears. Stunned to find us in his home, he pours a basket of rambutan fruits at our feet, fruit that had taken hours to gather. Other Penan return with baskets of *buaa nakan* fruits to roast, wild mushrooms for soup, hearts of palm, and succulent greens. When Gemuk announces that not one but two wild pigs have been killed, Asik roars with delight. "Don't be hungry. Good to be full."

Moments later there is a shout from the ridge. Two other families have

Boredom consumes young and old at Long Iman, a resettlement camp built on the banks of Sarawak's Tutoh River amid government promises of economic development. After more than 30 years the villagers are still waiting for a school to be built. Children, meanwhile, play in squalor and go to bed hungry.

TO GET FLOUR FROM THE RAIN FOREST, Asik, headman of a band of Penan nomads, tramples pulp from the sago palm as his wife adds water. Strained through a rattan mat, the pasty starch is collected and dried into powder. The nomads' staple food,

sago is plentiful in Gunung Mulu National Park. Elsewhere in the forest, loggers plow down the palms to get at larger timber. The resulting underbrush—tangled and overgrown from direct sunlight—makes the remaining palms often difficult to reach.

BLOWPIPE HANDY JUST IN CASE, a hunter (below) returns to camp after taking down a *babui,* or bearded pig, with a rifle. The main source of meat for Penan nomads, pigs have become less plentiful as loggers raze fruit trees where the animals forage. After Asik erects a shelter from saplings, palm fronds, and rattan (bottom right), the group's children prepare the pig's head for cooking (right). Practicing the Penan tradition of sharing, a girl distributes a handful of sweet *langsat* fruit (bottom). "They're losing that tradition in the settlements," says photographer Maria Stenzel. "There's never enough food to go around."


GUESS

arrived just as a tremendous rainstorm cracks open the sky. In the midst of the downpour they erect *lamin*, shelters built in an hour that will house them for a month. The men and boys cut poles and rattan to build the frame; the women gather palm leaves to be sewn into thatch. A fire is kindled. Infants huddle beneath leaves while older children assist their parents. Lakei Padeng is Asik's stepfather, an old man known as "black face." I watch as he empties the rattan backpacks. Two families—five adults, eleven children—together possess a kettle, a wok, several sharpening stones, dart quivers and blowpipes, sleeping mats, an ax, a few ragged clothes, a tin box and key, two flashlights, a cassette player, three tapes, eight dogs, two monkeys.

"The Penan are so profoundly different," Ian remarks later that night. "They have no writing, so their total vocabulary at any one time is the knowledge of the best storyteller. There is one word for 'he,' 'she,' and 'it,' but six for 'we.' There are at least eight words for sago, because it is the plant that allows them to survive. Sharing is an obligation, so there is no word for 'thank you.' They can name hundreds of trees but there is no word for 'forest.' Their universe is divided between *tana' lihep*, *tana' lalun*—land of shade, land of abundance—and *tana' tasa'*, the land that has been destroyed."

"In the place they want us to live," Asik says, referring to the Malaysian policy of encouraging the Penan to settle in places like Long Iman, "the sago is gone, and the trees have been destroyed, and all the land is ruined. The animals are gone, the rivers are muddy. Here we sleep on hard logs, but we have plenty to eat."

Addressing a meeting of European and Asian leaders in 1990, Prime Minister Mahathir Mohamad remarked, "It is our policy to eventually bring all jungle dwellers into the mainstream. . . . There is nothing romantic about these helpless, half-starved, and disease-ridden people."

"We don't want them running around like animals," says James Wong, Sarawak's minister for housing and public health. "No one has the ethical right to deprive the Penan of the right to assimilation into Malaysian society." While a number of individual Penan have benefited from the economic development of the past 30 years and the population has more than doubled, largely because of improvements in basic health care, for the vast majority in the longhouses there has only been impoverishment.

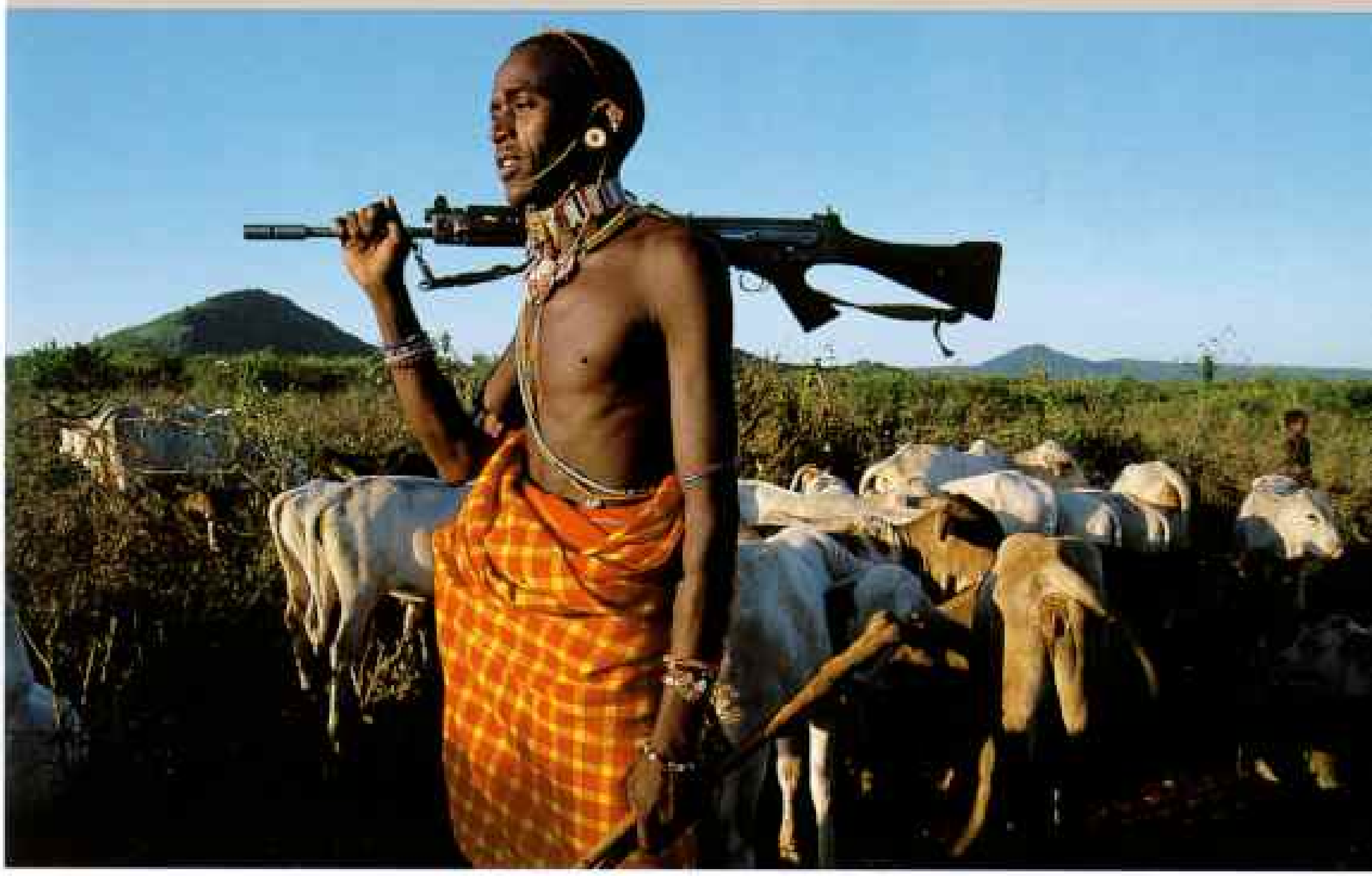
Malaysian policies have drawn criticism from anthropologists and human rights activists, including David Maybury-Lewis, professor of anthropology at Harvard and president of Cultural Survival, a nonprofit organization that works with indigenous peoples. Maybury-Lewis views the Penan situation as symptomatic of a global dilemma.

"Genocide, the physical extermination of a people, is universally condemned," he says. "But ethnocide, the destruction of a people's way of life, is not only not condemned when it comes to indigenous peoples, it is advocated as appropriate policy."

The Malaysians want to emancipate the Penan from their backwardness, which means freeing them from who they actually are. Indigenous peoples such as the Penan are said to stand in the way of development, which becomes grounds for dispossessing them and destroying their way of life. Their disappearance is then described as inevitable, as such archaic folk cannot be expected to survive in the modern world.

The idea that indigenous societies are incapable of change and bound to fade away is wrong, according to Maybury-Lewis. Cultures disappear

THE ARIAAL OF KENYA



only when they are overwhelmed by external forces and when conditions imposed upon them render them incapable of adapting. "Too often," he says, "we meddle with lives we barely understand."

To match the firepower of armed cattle raiders, an Ariaal warrior carries a rifle supplied by the government. "Without guns we'd be sitting ducks," says Joseph Lekuton, an American-educated Ariaal tribesman. Dependent on cows for the milk and blood that nourish them, the 10,000 Ariaal around Mount Marsabit remain largely nomadic, resisting government pressure to settle.

STUDDED WITH CRATER LAKES and blanketed by lush forests, Mount Marsabit stands as a fertile sentinel above the barren sands of northern Kenya. To the east a flat horizon reaches to Somalia. To the south and west lie the Kaisut Desert and, beyond, the Ndoto Mountains, a rim of peaks rising more than 8,500 feet above the white heat of the lowlands. For thousands of years pastoral nomads thrived here because they and their animals traveled lightly on the land. Mobility was the key to survival. Drought, the long hunger that descends ruthlessly from a searing sky, was not a cruel anomaly but a constant if unpredictable feature of life and climate. Surviving drought was the essential challenge that made the desert peoples of Kenya who they are.

In the wake of a series of especially devastating droughts in the 1970s and '80s, along with famine induced by ethnic conflict and war in neighboring Ethiopia and Somalia, international organizations arrived by the score to distribute relief. Mission posts with clinics, churches, schools, and free food drew the people from the parched land. At the same time and despite evidence to the contrary, it became accepted in Western development circles that the nomads were to blame for degrading their environment through overgrazing. In 1976 the United Nations launched a multimillion-dollar effort in the Marsabit District to encourage two of the tribes in particular, the closely related Ariaal and Rendille, to settle and enter a cash economy. This dovetailed with the interests of those

SHOWING OFF THEIR BEST MOVES, teenage girls dance during a wedding celebration in Parkishon, a traditional Ariaal village. Heavy beaded necklaces given to her by a warrior in her clan identify a girl as his *nekarai,* or steady girlfriend and sexual partner.

Yet the pair will never marry. Following Ariaal custom, he will wed a girl from another clan, while she—a silent bystander in a bride-price negotiation between her parents and an older suitor—will be pledged to a man she barely knows.

VOICES RING OUT across rain-washed hills as Ariaal women (top left) make their way to a wedding: *"Meirita ngai nkeera ang!"* they sing. "God bless our children!" All of Marsabit District revels at the end of the rainy season. Warriors and beaded girls prepare for the wedding by applying a makeup of red ocher and sheep fat (top). In contrast to their festive mood, the newly circumcised bride (left, at right) spends much of the celebration in her mother's hut in the company of her best friend. The bride's mother (above) receives the blessing of the elders: a drop of oil from the ox slaughtered for the event.

Kenyans who considered nomads a symbol of the past and saw education and modernization as the keys to the country's future.

For the 10,000 Ariaal herders, circumstances for the most part weren't so dire that they were forced to settle. On the western flanks of Marsabit and in the Ndoto foothills, where water could almost always be found, they kept cattle, while on the plains far below their camels foraged in the shade of frail acacias. In contrast, the 30,000 Rendille, camel herders of the vast Kaisut Desert, suffered terrible losses in the droughts and drifted by the thousands toward relief camps. By 1985 more than half of them lived in destitution around the lowland towns of Korr and Kargi, their well-being inextricably linked to mission handouts.

WRAPPED IN A RED SHAWL, an old man with a wizened face and earlobes studded in gold reaches for my hand and nonchalantly spits into my upturned palm. "It's a sign of greeting," explains Kevin Smith, a young anthropologist from Utah State, as we walk with one of his closest Ariaal friends, Jonathan Lengalen, through Karare, a community on the southern slope of Mount Marsabit. With a full moon over the grassland, Jonathan leads us along a chalky trail to his *manyatta*, a cluster of domed shelters built of branches and mud, cow dung and hides. From the shadows emerge the Ariaal warriors, tall and thin, their long hair woven in tight braids dyed red with ocher and fat. Their bodies shine with decoration. All carry weapons, swords sheathed in leather, wooden clubs, iron spears, and the odd assault rifle. They are singing, deep resonant chants that draw the young girls, equally beautiful in beads and ocher, into the clearing. As the warriors move forward, slapping the girls with their hair and leaping into the air, their spears flash in the moonlight.

The singing and dancing last well into the night. With the end of the rains, grass is abundant and milk plentiful. It is a time of great joy, a season of celebrations, and almost every day there is a wedding. Sunrise finds us in a cool mist, walking with Sekwa Lesuyai and his best man as they lead a bull and eight heifers along a trail that climbs toward the home of his bride, Nantalian Lenure. All night the two men have slept beside the animals, guarding the gifts that will secure the marriage. The bride's mother washes the men's feet with milk. The bull is slaughtered, its meat distributed with ritual precision. The elders brew tea and then slip away from the manyatta into the bush to roast and eat their share of the meat. The women stay by Nantalian. "God is big," they sing, "big as a mountain; the bride is beautiful, sweet as perfume." Only in the late afternoon do the warriors arrive, to resume their dancing with an intensity that drives several into a trance.

Two days later Jonathan invites us to spend a night in one of the remote encampments, or *fora*, where the warriors live apart with the young lads, managing and protecting the herds, raiding enemy tribes. For ten years, from the time they are circumcised until they are finally permitted by the elders to marry, they spend each night in the open, sleeping on the stony ground, living on soups made of wild herbs and on fresh milk and blood, drawn each evening from the neck of a heifer. Sitting with the warriors in the moonlight, with the sound of cattle bells ringing in the night and the friendly faces of Zebu cows crowding the fire, I come to understand how for the Ariaal these animals are the fulcrum of life.

"If we lose our cows," explains Jonathan, "we lose our faith in life itself.

All our rituals and ceremonies lose their meaning without the animals."

He reaches for a burning stick, snaps off the ember, and drops it into his empty milk gourd. In the absence of water, it is the way the Ariaal clean the containers. As Jonathan speaks of the tribe, the outline of the culture unfolds in my mind like the pages of an old monograph.

Everything in the culture is built around the need to manage risk. "With a large herd, at least some of the animals will survive," he says. Keeping the herd intact is essential. Managing hundreds of animals creates an incentive to have many children and wives. Polygyny addresses this problem but inevitably creates tensions in the society. With the old men having three and sometimes four wives, there is invariably a shortage of women for the young men. This is solved by getting rid of the young men by sending them off to the warrior encampments. But to make their exit desirable, it is enveloped with prestige.

The highlight of a young man's life is his public circumcision, the moment when he and his peers enter the privileged world of the warrior. The ceremony occurs only every 14 years, and those who endure it together are bonded for life.

"You sit perfectly still," Jonathan remembers, "legs apart, with your back supported by your closest friend. They pour milk on you. Everyone is singing or yelling, warning you not to flinch. All your family promises animals, if you are brave. You can build up a herd just with those frantic promises. But you are so intent. You only hope that the blade is sharp. It's over in seconds, but it seems like years."

Should a boy reveal the slightest expression of fear or pain as the nine cuts are made to his foreskin, he will shame his clan forever and possibly be beaten to death. Few fail, for the honor is immense.

Generations of skill flow through nimble fingers as Chipaya women plait another's hair. When finished, she'll wear a hundred ribbon-thin braids in the style of her ancestors, contemporaries of Peru's Inca. Despite drought, cold, and the lure of city life, some 2,000 Chipaya remain bound to their Altiplano homeland.

PETITIONING THE SPIRIT, a Chipaya family extends a graveside invitation—"Come home with us!"—to a deceased loved one on November 1, the eve of the Day of the Dead. Relatives return to the cemetery the next day to bid the soul farewell. Blending

Christianity with ancient Andean rituals, the Chipaya call on their gods and ancestors to bless the tasks of daily life in this dry lake bed they call home. In a windswept world of sand and salty soil, their religion is sometimes all that sustains them.

DRINKING A TOAST to the dead, elected representatives of Chipaya clans (bottom left) preside over a Day of the Dead ritual by sharing alcohol and dried coca leaves. Cradling skulls symbolizing the founders of the two original clans (bottom), they return to the cemetery chapel in the town of Santa Ana de Chipaya; confident their ancestors will bless their crops and cattle. In nearby Ayparahui (left) a family battles unforgiving soil to plant quinoa, the staple grain. Each planting season Chipaya farmers channel water from the Lauca River to irrigate and desalt the soil. Santiago and Emiliana Condori (below) graze sheep on patches of sparse grass to produce wool for clothes and blankets.

Scoured by gusting sand, a Chipaya woman follows her sheep home across the high plains. As more of her people leave to become farmworkers or housekeepers elsewhere in Bolivia and Chile, will the Chipaya's roots hold, or will they be pulled up and scattered to the winds?

After ten days on the mountain Kevin Smith and I drive to the desert lowlands to visit Lewogoso and Losidan, Ariaal nomadic encampments along the base of the Ndoto Mountains, and then on to the town of Korr, the mission post where so many Rendille had settled. The contrast between the two worlds could not have been greater.

In the Ariaal manyattas traditions are strong and enduring. On rocky outcrops warriors painted in ocher stand like raptors overlooking the narrow traffic of camels and cattle on desert trails. At Lewogoso women and children are herding goats and sheep and drawing blood in the morning from the faces of camels. At Losidan a death has occurred. The manyatta is deserted; by custom the people have moved on. Following them into the desert, we meet Kanikis, a *laibon*, a healer and soothsayer, who reads the future in colored stones and bones tossed from a gourd onto a green cloth spread out in the shade of an acacia tree. Fighting sorcery with amulets and herbs, he protects livestock and people while providing an anchor of spiritual certainty in a harsh land.

As recently as 1975 Korr was a seasonal watering hole visited by small bands of Rendille camel herders. That year Italian missionaries set up a few buildings to distribute relief. Within a decade a town existed, with shops, schools, and a large stone Roman Catholic church. Today there are some 2,500 houses within walking distance of the mission, a local population of 16,000, and 170 hand-dug wells. Missing are the trees that once gave shelter in a windswept desert. Most have been cut to produce charcoal to cook maize gruel, the staple subsidy. Those Rendille who still own camels and goats must herd them far from town, in distant rangelands. Fresh milk is hard to find, and many children go without. In place of sisal, the houses are roofed in cardboard, burlap, and metal sheets

bearing the names of relief agencies. A walk around town reveals that almost every Western nation has helped create this oasis of dependency.

FOR MANY RENDILLE it was not just food but a chance to educate their children that drew them to Korr. In the face of drought, having at least one child in school destined for the cash economy was another means of managing risk. One who made that choice is our host, Kawab Bulyar Lago, a Rendille of 48. Born in the desert but crippled by polio during his teens, Kawab grew up in a mission and became one of the first of his tribe to be educated. With seven children, Kawab sold his animals and saddled himself with debt to send his son Paul to Catholic school outside Marsabit. Now awaiting the results of the national exams that will determine his fate, Paul hopes to attend university and become either a doctor, a civil engineer, a teacher, or even a tour guide. "I'd prefer to be a doctor," he tells me one morning, "but anything would be all right."

As I listen to his stories of school, with its curriculum dominated by Western religious studies, of the dormitory teasing he endured that led his father to have him circumcised in a hospital before his time, I sense his anxiety and cannot help but recall the calm authority and confidence of Kanikis, the healer, a young Ariaal man of similar age so firmly rooted in tradition. The weight of the world rests on Paul's shoulders. In the old days he would have inherited his father's herd. Today he inherits his hopes and dreams. The family has staked everything on his education. Kawab knows the risks. "For the few who benefit, who get good jobs, they do well," he said. "But most just suffer. Here you can survive. People will help you. In the cities they just leave you to die."

Too often education is a ticket to the bottom rung of an economic ladder that goes nowhere. Unemployment rates in Kenya's cities hover around 25 percent. Among those who have attended school in the Marsabit District, well over half are unemployed.

The danger of Western-style education is clear to many Ariaal, including Lenguye, an elderly midwife from Ngurunit, an Ariaal settlement in the foothills of the Ndoto Mountains. "We send our children to school, and they forget everything. It's the worst thing that ever happened to our people. They only know how to say 'give me.'"

If the Ariaal are to retain the power and spirit of their traditions, perhaps the best hope lies in a new kind of education, in which the curriculum is tailored to their needs. Rather than quartering nomads in boarding schools and teaching them to be clerks, perhaps the teachers should be sent to the Ariaal manyattas to share knowledge of veterinary medicine, range management, and dryland ecology.

In the end the cultures that survive will be those that are willing and able to embrace the new on their own terms, while rejecting anything that implies the total violation of their way of life. In Borneo, throughout the homeland of the Penan, the sago and rattan, the palms, lianas, and fruit trees lie crushed on the forest floor. The hornbill has fled with the pheasants, and as the trees fall in the forest, a unique vision of life is fading in a single generation. In the deserts of northern Kenya, despite droughts and famine and countless other pressures from within and without, the Ariaal have, for the moment, found a way to stay. □

Learn more about the challenges facing the world's aboriginal cultures and share your thoughts online at *www.nationalgeographic.com/2000/culture/lost.*

ITALY'S ENDANGERED ART

A nation of art lovers finds new

Shattered during earthquakes in Assisi, the face of St. Rufino stares out from reassembled rubble at the Basilica of St. Francis. Natural disasters, modern hazards, and age-old decay threaten Italy's heritage. Equipped with new ideas, citizens and scientists labor to preserve it.

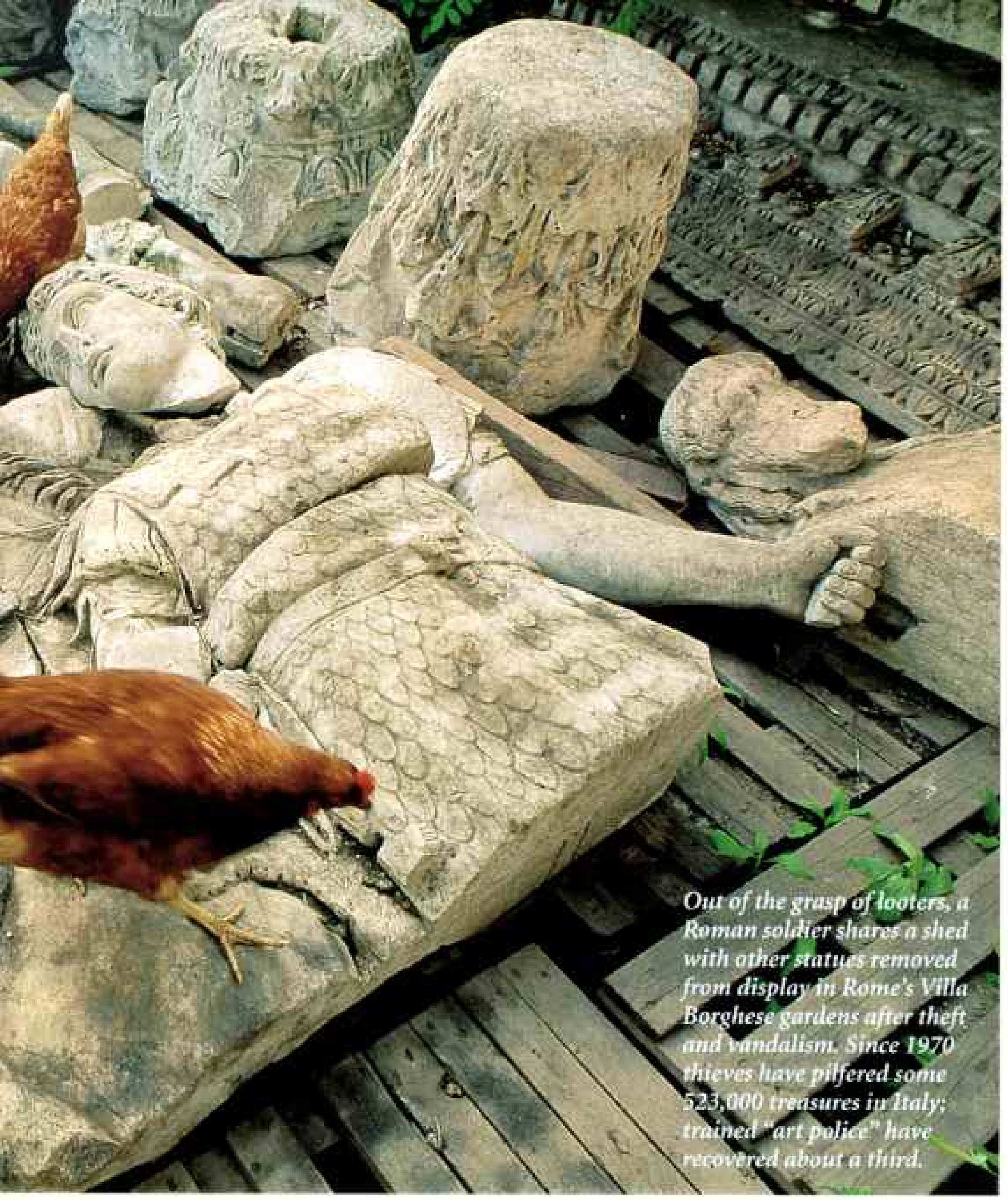
SOPRINTENDENZA BAAS UMBRIA

ways—and will—to save its priceless legacy.

By ERLA ZWINGLE

Photographs by O. LOUIS MAZZATENTA

FISHERMEN OFF SICILY haul in their nets and find they've dragged aboard a 2,200-year-old Greek statue. Workers in the port city of Ancona break ground for a parking lot and discover storerooms dating from A.D. 600. An airplane mechanic strolling outside the Venice airport on his lunch hour bends down and picks up a Roman coin—a rare sestertium minted by the Emperor Galba in A.D. 68. In Italy all this is practically normal.

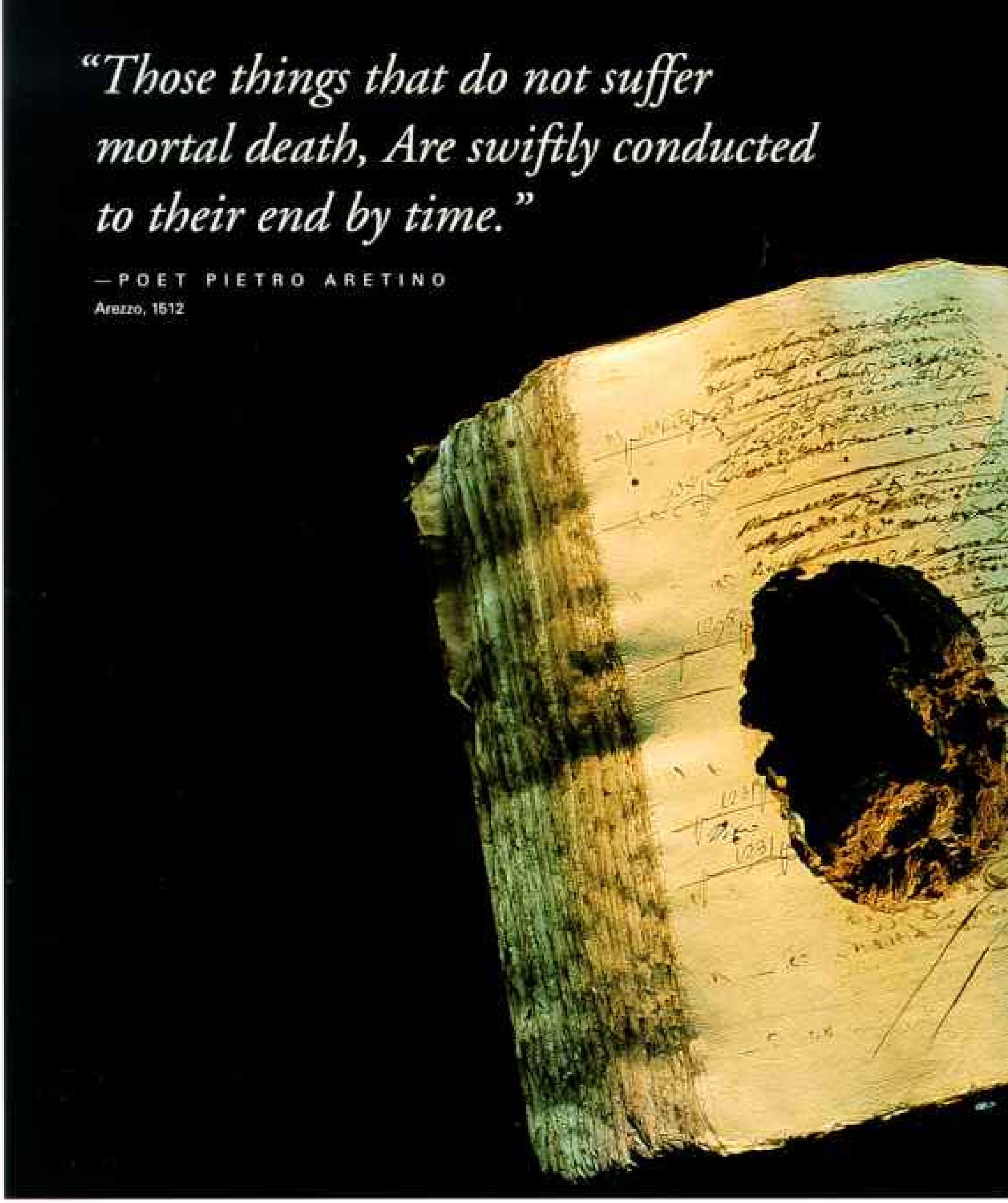


Out of the grasp of looters, a Roman soldier shares a shed with other statues removed from display in Rome's Villa Borghese gardens after theft and vandalism. Since 1970 thieves have pilfered some 523,000 treasures in Italy; trained "art police" have recovered about a third.

Paintings, palaces, churches; towers and frescoes; manuscripts and bridges and gardens; Etruscan tombs, Greek temples, early Christian chapels, Roman triumphal arches—Italy contains an apparently inexhaustible trove of treasures, the remains of thousands of years of history. Museums can display only the merest sampling. As the Italians are prone to say, the whole country is a museum.

These works are fighting for their survival. Art of every type is confronted by an endless assortment of threats: fire, flood, earthquake; thieves, vandals, and terrorist bombs; bureaucracy and corruption; man-made environmental hazards from humidity to bright lights to traffic fumes; insects that eat books, airborne chemicals that eat stone, and salts that corrode. The effects of industrialization and of mass tourism, added to chronic lack of money, personnel, and even concern, have taken a heavy toll.

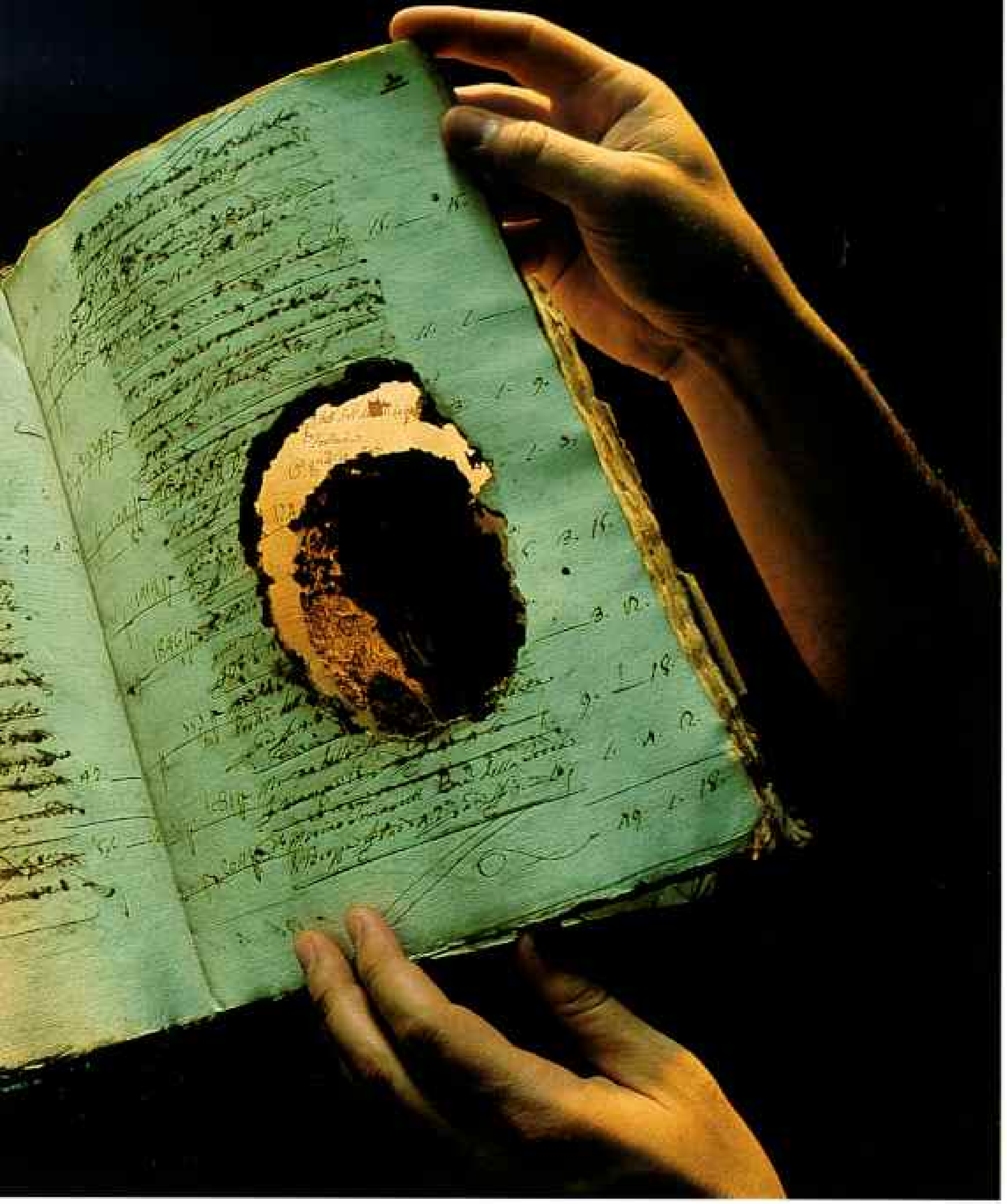
The world responds to crises with instant



Gutted by termites, a 16th-century bank ledger earned a place as a cautionary tale in the museum of Rome's Book Pathology Institute. Often criticized as haphazard, Italy's efforts to conserve its past are hampered by a lack of data—no catalog exists of all the country's art and its condition.

generosity and worries about Leonardo's "Last Supper" and the ceiling of the Sistine Chapel. Yet for every masterpiece that earns international attention, there are thousands of artworks leading lives of quiet desperation.

But this story isn't about paint, plaster, or museums. It's about the wealth of art that forms the body and soul of Italy and that forms part of daily life for ordinary people—and about the silent army that is laboring to save it. Although the amount of wear obvious



to any passing tourist may give the impression that no one cares, in reality the Italians' rapport with their art is a contradictory relationship of intense intimacy. It's not unusual for an Italian to be baptized in a medieval church patched with bits of Roman ruins, to kick a soccer ball against the walls of a Renaissance palace after school, to drive past Carthaginian castles on the way to work. Yet Italians can also show a surprising apathy toward the very treasures they grew up with, a disengagement fostered by centuries of ownership of art by the church, the state, and the nobility.

"There has been the sense that there's no moral obligation of the citizens to protect their cultural patrimony," said Gianfranco Mossetto, professor of the economics of art at the University of Venice. "We need to regain the sense of being the true proprietors of these treasures."

In the past four years this has begun to happen. A burst of energy, ideas, new laws, and money has begun to give Italy's art hope for a

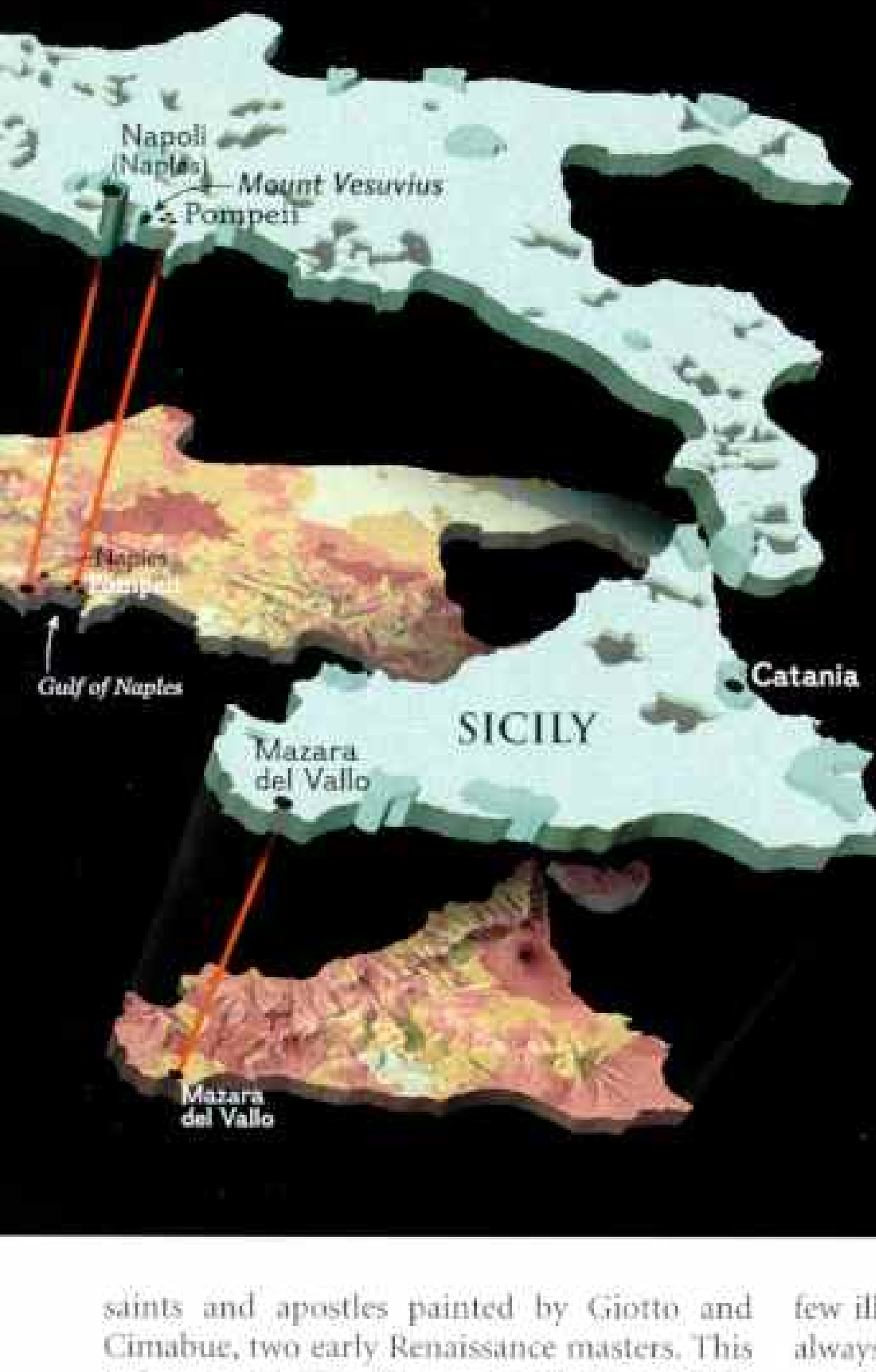
better future. Bureaucrats, restorers, and ordinary Italians have begun to change their thinking, and the results are more surprising, and perhaps more important, than the finding of another Greek statue or another Roman coin.

In an immense vaulted room that was once the stable beneath the medieval monastery of St. Francis in Assisi, Giulio Cenci is trying to put together a puzzle. He stands under bright fluorescent lights amid long tables covered with trays full of thousands of bits of painted plaster, many no larger than coins. He picks one up and blows on it gently to remove the dust—a brush might damage it further. All I see is a fragment of red with a few random white marks. What Cenci sees is something much bigger.

On September 26, 1997, earthquakes shook Assisi. The 13th-century Basilica of St. Francis stood firm, but several interior vaults collapsed. Crashing to the floor were 1,900 square feet of luminous frescoes, a shining army of

ON THE FAULT LINE

Ranged along a peninsula shaken by earthquakes and swept by floods, Italy's art is never far from danger, as shown by these maps. Despite obvious risks, much of the country's patrimony goes unprotected. On September 26, 1997, violent tremors near Assisi collapsed 13th-century ceilings in the Basilica of St. Francis, killing four people and pulverizing frescoes as a television cameraman filmed the devastation. Experts blamed the tons of loose debris that had accumulated for centuries above the vaults. Quick work in the months that followed saved the rest of the church. "There was a great wound," says art historian Francesca Cristoferi, "but now hope prevails over destruction."



UMBRIA TELEVISION/MASSIMO SESTINI PHOTOS (ALL)

saints and apostles painted by Giotto and Cimabue, two early Renaissance masters. This infinity of fragments was carefully collected and brought here in the hope that the frescoes could be reassembled. It looked hopeless.

Works of art, like their creators, lead an intensely physical life. Born of a moment of desire, they survive accidents, suffer exhaustion, slowly age, and even face death. Restorers dedicate their own lives to helping them age with some dignity. But, like doctors, they have few illusions. They know that their work will always be approximate.

Giulio Cenci called up the day after the Assisi quakes and offered his services, one of scores of volunteers and experts who rushed to the site. Like many restorers he is passionate, tireless. He led me past tables where five or six people were working quietly, dividing fragments by color and theme. A color photograph of each fresco was propped up by trays full of little piles of rubble.

Many artworks and monuments have lost their context. . . . stuck in the worst possible spots.

"At the beginning it was really upsetting," Giulio admitted. "All the pieces seemed the same. But after three days, you start to recognize differences. And the more you work, the more you see."

We wandered from table to table as he picked up various bits. There is a red bit with feathery white lines: Cimabue. Then a blue fragment with stronger white lines: Giotto. I could already begin to discern differences. "Now we're used to it," Giulio said, "but at first when we went home, we'd close our eyes and still see them. We'd dream of them. . . ."

Without obstacles, the restoration could theoretically be finished in three years. But obstacles abound, primarily funding. There won't be enough money to restore the basilica and all the other damaged monuments and smaller churches in the region, and some people have already complained that Assisi is getting all the attention. The earthquakes also destroyed whole villages; people are living in trailers, and some of them ask why giving money to restore art is more important than helping them build new homes.

We paused before a table in the corner. In one tray was a carefully arranged assortment of apparently random bits. Then I looked closer. Two small pieces side by side: a pair of eyes. Below them, another fragment: a mouth. "This," said Giulio, "is the face of St. Francis." The eyes were earnest, the mouth a little crooked. Lonely, disembodied, but still eloquent. I looked at the numberless fragments and felt an odd tenderness. They seemed so helpless. I murmured something to that effect.

"Yes," Giulio agreed without embarrassment. "They start to seem like my children."

In a country littered with famous ruins, Pompeii is one of the most famous. It is also one of the most remarkable archaeological sites in the world: a perfectly preserved city that once held more than 10,000 inhabitants. Buried in A.D. 79 by the ash falling from the eruption of Mount Vesuvius, it is now buried by two million visitors a year who tramp its stony streets admiring the frescoes and forum, not to mention the plaster casts of some of the agonized victims in their death throes.

One spring morning I strolled along a path overlooking the ruins. The trail was a new idea and had just been opened along the city's northern edge. Brilliant red poppies lined the path, and white butterflies flitted among the fragrant rosemary bushes. Birdsong minimized the thrum of distant traffic along the misty Gulf of Naples.

Pompeii spread out below me, its orderly streets and broken walls already teeming with thousands of people. But up here just three of us walked through what was once a quiet neighborhood of luxurious villas. Here, at least, I could still detect the faint pulse of the city as it once was and not the throbbing of the tour groups with their jaded guides.

More than two and a half centuries have passed since Pompeii was unearthed, and it now gives the impression of an orange that has been sucked dry. Major excavations have been halted for years, the area open to the public has shrunk, while the number of visitors has steadily increased. The city must have been fascinating once, but the shelves of broken pottery are monotonous and the famous frescoes in the Villa of the Mysteries are worn and chipped.

But Pompeii is beginning to come alive again, owing to a dramatic transfusion of money. Pompeii is the test case of a law granting greater financial authority to superintendents of Italian monuments. Until now all money from entrance fees to museums or monuments had to be turned over to the state, which then reallocated the funds to each site.

That was great for smaller places that couldn't expect to earn much, but it was very bad for the big players. In a year, Pompeii might take in eight million dollars at the gate,

Out of place and time, the second-century Arch of Trajan leads from a flight of 19th-century steps into the busy port of Ancona. Having survived centuries of salt air and more recently coal dust, the arch is now besieged by engine exhaust and rattled by passing trains. Officials plan to move port facilities farther away.

Recording the scene of the crime, computer scientist Fabio Carrera, in checked shirt, and his students gather clues that helped identify the culprits eroding canal walls in Venice: seeping sewage and waves churned up by passing boats. Standing firm, Dr. Gianfranco Falzoni (opposite) heads a group that fought demolition of the Royal Palace of Venaria Reale near Turin, persuading the government to restore it instead.

but it was given only two to three million for its expenses. This was why digs were closed, why there are no decent signs, not even a reasonable map to be had.

Now, after less than a year of greater control, the situation has already begun to improve: The new trail and a new bookshop have opened, and there is talk of new excavations. If all goes well here for five years, more sites may become self-sufficient.

This shift in thinking at the ministry of culture has inspired enthusiasm and optimism in the art world. "Italy's great resource is the fine arts," one expert told me, "but adequate investment hasn't been made in this sector. The arts were viewed as a drain on the economy that should be kept at a minimum, rather than as an investment." When Walter Veltroni became minister of culture in 1995, the government allocated less than one percent of the annual budget to the fine arts. "For many years this ministry was considered the least important," Veltroni told me frankly. "I asked to have this job—and everyone thought I was crazy."

They don't now. Veltroni instituted a new lottery in betting-mad Italy whose income is dedicated to the fine arts. In 1997 this lotto netted 200 million dollars—twice what the state budget had allotted for restorations. In addition the annual income-tax form allows Italians to allocate a percentage of their taxes to the fine arts. This netted an additional three billion dollars. And the tax law has been revised to encourage donors. All over Italy, artworks that had been limping along in genteel poverty now have hope for prosperity. "Ideas are in the air," Veltroni said. "You just have to grab them."

EVERY SUNDAY EVENING, within the soaring golden spaces of the Basilica of San Marco in Venice, the faithful chant the Litany of the Blessed Virgin Mary. This moment is especially beautiful in winter, when the chill darkness and fog outside give the church the atmosphere of some fantastic cavern, gleaming with

Former staff members ERLA ZWINGLE and O. LOUIS MAZZATENTA often cover Italy for the magazine.

Venice represents the clearest result of all the dangers facing Italy's treasures.

mosaics, smoky with incense, full of power. The priests pace slowly down the echoing nave as the solemn Latin cadences rise with the heat of flickering candles: "Mother of Christ, pray for us. Mother of our Creator, pray for us . . . Mystical Rose . . . Morning Star . . . Queen of Peace."

The procession halts in the chapel of the Madonna Nicopeia, where a Greek icon of the Mother and Child has hung above a small altar for 700 years. This icon is small and simple, but in the light of the candles Mary's face seems to glow with shy, solemn pleasure.

If you go to the chapel on a weekday morning, what you'll see is just a very nice picture. But on Sunday the icon is more than a work of art: It is a participant, still fulfilling the purpose for which it was created.

By now, though, many of Italy's works of art and monuments have lost their context. Often they are stuck in the worst possible spots, right where sewers, subways, houses, or streets need to go. Superintendents of fine arts and municipal authorities struggle to collaborate—for the equal benefit of the artworks and the pursuit of daily life. And so it is probably inevitable that safeguarding works of art is not a mission that everyone embraces with equal enthusiasm. Even a brief visit to Padua and Venice demonstrates some dramatic differences in outlook.

Padua has long been famous for the Scrovegni Chapel, which contains one of the greatest masterpieces of early Renaissance painting: Its four walls are covered with frescoes depicting biblical scenes including the life of the Virgin Mary painted by Giotto, one of the geniuses of Western art.

Thirty years ago, perhaps 10,000 people visited the chapel each year. Today the number is upwards of a quarter million. Inevitably the frescoes began to suffer. Heat from the lights, shocks from sudden temperature changes every time the door opened, dust, humidity. Increased traffic added acrid fumes to the mix.

I stood in the chapel, looking at the rows of paintings reaching to the ceiling. Angels, saints, and sinners shimmered down from walls that for seven centuries have withstood the elements. I gazed on the elegant, sloe-eyed faces, the desperate angels floating above the crucified Christ as they wailed, clutching their faces, tearing their garments. I wanted to abandon myself to the beauty, but I felt like a microbe standing there. I tried not to breathe. I tried not to sweat.

The city has already made great strides to overcome threats like me. The nearest streets have been closed to traffic. The main entrance will soon be closed and the original side entrance reopened, complete with a closed corridor as entryway, which helps to equalize the temperature. Carbon filters combat dust and humidity. Inside, "cold" halogen bulbs have replaced the hot incandescent lights that once

Fixing past repairs, restorer Francesca Ciani Passeri applies paint to Rubens's "Triumphal Entry of Henry IV into Paris" in Florence after removing restorations that failed to match the original. Critics charge such retouching can change a painting's character. "We know that any action is aggression," Passeri says, "so we try to limit it."

blasted the frescoes. Sophisticated monitoring systems track the chapel's vital signs. "It's constant work," says Serenella Borsella, an architect employed by the city's museums, "but it will mean minimum interventions. Even my own son isn't cared for like this."

Most Italian cities contain art. In Venice, the entire city is a work of art. Yet while Padua, among other cities, is working hard to resolve the conflicting needs of life and art, Venice often seems to have simply given up. Wander

DIPINTO DELLE PRIGIONI

along any canal and your eyes will be seduced by the soft yellow and rose and pale greens of the palaces, the sinuous curves of their gothic windows, the secret gardens overhung with roses, all mirrored in the undulating reflections of myriad canals. You don't go to Venice to see art but to live it.

People who worry about Venice believe that the enemy is periodic flooding. Flooding may be the city's enemy, but it is also the waves that are destroying it. If you listen as well as look, especially along the wide Giudecca Canal, instead of peaceful lapping you'll hear slapping. Punching. Thudding. The ceaseless surging of surf produced by every form of motorboat is gouging the foundations right out from under the city. Weakened stretches of walkway are now shielded by temporary walls of iron sheeting to take the brunt of the waves. Cracks are opening up between walls and sidewalks, and low tide reveals crumbling bricks, collapsing slabs of marble, gaping holes.

"You hear numbers mentioned. But frankly

we have no idea how many treasures we have."

—ALESSANDRO BIANCHI
Central Restoration Institute, Rome

Dug up only to be reburied in a multitude of other artifacts, a first-century statue from Pompeii (left) lies orphaned in a Naples storeroom. In Mazara del Vallo on Sicily's southwest coast, a bronze satyr fished up after 2,200 years under the sea gets a freshwater bath (above) before a lengthy restoration. Italy has so much distressed art that it must practice triage: Important pieces get attention first; action on the rest is postponed, sometimes indefinitely.

SOPRINTENDENZA BCA TRAPANI (ABOVE)

Digital Caesar: Physicist Giorgio Accardo holds his computer-generated plastic model that helped artists reproduce an 1,800-year-old bronze statue of Emperor Marcus Aurelius without touching its fragile surface. The copy stands behind him on Rome's Campidoglio. The original was placed indoors, out of polluted air,

Once the tiniest fissure opens, waves do the rest.

"There's a Venetian saying, 'Water doesn't have bones,' " said Giovanni Borgo, "which means that it can go wherever it likes, even into the smallest spaces." Borgo is acting president of a group called Pax in Aqua (peace in the water), which is dedicated to persuading citizens and government to address this problem. It is discouraging work.

"Certainly there are speed limits," he said, answering my most obvious question. But no

"Even as we believe less in human immortality, we insist the more on the immortality of these objects."

—ANTONIO PAOLUCCI

Superintendent of Fine Arts and History
for Florence, Prato, and Pistoia

one obeys them. The group has suggested many simple ways in which to minimize, perhaps even eliminate, the waves and their damage. Lowering speed limits is one good idea; actually enforcing them is even better. Regulating the shape of the hulls and the power of the motors would be best of all.

So far the proposals have generated only more discussion. Everyone agrees the waves are a problem, but it's always somebody else's fault. And faced with fierce opposition from various groups (primarily taxi drivers, barge owners, and the public transport company), the city government has dithered.

Venice represents the clearest result of all the dangers facing Italy's treasures: environmental degradation, fruitless political maneuvering, massive bureaucracy, the impact of mass tourism, and, on the part of the citizens themselves, a weird combination of cynicism, impotence, and an almost sublime lack of awareness of the irony of their own actions. The mayor affirmed

Unlike the actual monuments, it doesn't matter whether models at Rimini's Italy in Miniature survive throngs of sightseers. Even the breathing of hordes of visitors can speed the decay of art. Might tourists at Pompeii one day be channeled into a theme park of the city? Presenting them with an illusion could help save the real thing.

his concern about the wave damage, for example, while another politician proposed granting 300 new taxi licenses. And then there was the day two gondoliers came to a meeting of Pax in Aqua to present a letter of protest. The waves are making their work more difficult, even dangerous, and they wanted to add their voices to those of other concerned citizens.

They came to the meeting in a motorboat.

"THERE'S NO DOUBT," one art historian declared, "that tourism is Italy's petroleum." Tourists provide employment for millions of Italians. They spent nearly 75 billion dollars in Italy in 1997, of which at least 25 billion dollars was from cultural tourism. Many smaller towns, including Assisi, are now almost completely dependent on the flow of tourists for their economic survival.

But mass tourism has hit Italy hard: Two million a year in Pompeii, five million in Florence, twelve million in Venice. The jubilee celebrations of the year 2000 will attract untold millions more. The entire country is bracing for the impact.

They arrive in swarms, from buses, airplanes, cruise ships. You see them in their exhausted hordes under the summer vacation sun, standing in line for hours to enter Florence's Uffizi Gallery or the Vatican Museum in Rome, slumped in shady doorways consuming cold slices of pizza. They are also consuming much of the cultural and historic patrimony they've come to enjoy.

"I think with terror what will happen when that huge ship, the *Grand Princess*, begins to cruise," says Antonio Paolucci, the superintendent of fine arts in Florence. "A stop in Livorno will mean a visit to Florence: 500 tour buses will arrive. They'll all go to the Uffizi to see Botticelli's 'Primavera' and the Accademia to see Michelangelo's 'David.' We can't expand the Uffizi like an accordion."

There are several new ideas afoot to better manage the flow of visitors. One is to extend museum hours; a number of museums are now staying open until 10 p.m., later than

Tourism has hit Italy hard: Two million a year in Pompeii . . . twelve million in Venice.

anywhere else in Europe. At the Scrovegni Chapel, among others, they are limiting the number of visitors to 25 at a time, and for only 15 minutes. Museums will probably even begin requiring reservations; the Villa Borghese in Rome has already started.

IN THE FACE of this tremendous consumption of art, it would be understandable if the average Italian were to feel that his country's treasures were being restored and presented mainly for the benefit of everyone else. Yet a new pride, planted and cultivated by several tireless pioneers, has begun to flourish.

In Naples it began with the children. A Neapolitan baroness named Mirella Barracco designed a program in 1992 to encourage students to "adopt" a monument, study it, and then during weekends in May act as tour guides. This program has now been copied in 180 Italian cities, as well as abroad.

"At first our foundation concentrated on restoration," Barracco explained. "Then we realized we had to work on the young generation, those to whom these works are entrusted."

Three years ago the students of the Flavio Gioia Middle School "adopted" the imposing 14th-century church of San Giovanni a Carbonara, and each May they stand at the ready, waiting to introduce its wonders to any curious visitor. On a hot Saturday morning a small group of them was somewhat tensely waiting for potential customers, the girls giggling, the boys occasionally punching each other.

When I appeared, Alfonso, a 14-year-old boy from the very dicey La Sanita neighborhood, took me in hand. It was his job to explain the ornate marble tomb of the Miroballo family. He spoke rapidly, in a low, heavily accented monotone, but he used lots of impressive technical terms. He pointed out the statues, the inscriptions. He finished with relief.

I asked if there was something he particularly liked on the tomb. He paused, then smiled. "That part there," he said, pointing to some exuberant cherubs. "It's more simpatico."

Rosario Stanco, the classroom teacher, has been working for years with these irrepressible, disadvantaged teenagers. He understands them. "Many have difficulty in reading and writing," he explained, "so they started 'reading' the monument from life. They used to cut school, but they come here willingly. And through this project I've been able to understand certain aspects of the boys better. I realized that the kids who give you less in the classroom give you more here in these unusual activities. They begin to sense that they're worth something."

In the end Mirella Barracco's project is not really about art. It's about life. That they might be one and the same struck me as quintessentially Italian. "It's the civic sense that we want to create," she said. "The pride that the children feel for their monuments—it's a lifelong project. It's not just for a weekend."

One twilight in Siena, I sat in the spacious Campo, the medieval main square. A perfect half moon hung just above the imposing bell tower, the Torre del Mangia, as swallows swooped through the cooling evening air. Young couples reclined on the sloping brick apron of the square, and three small boys kicked a soccer ball to and fro. A barefoot baby peacefully gnawed a cracker. All of us were looking at the beauty, absorbing it, but we were also part of it.

My thoughts drifted out toward the fantastic panoply of art spreading beyond us under the limpid, pearly sky: the silent temples in the darkness, the paintings inside the quiet churches, the marble angels with broken wings, the archaic mysteries of yet undiscovered tombs. All the art waiting to be revived; the chipped, cracked, flaking handiwork of ages. The endless procession of Madonnas and martyrs, the Roman generals, Gothic princes, all gazing upon the centuries with the same patient, enigmatic expressions. They certainly need us, but we also need them.

Even Alfonso, the incorrigible Neapolitan teenager, understood this. "The art is like a bambino," he told me simply. "It needs to be taken care of." Like children, these treasures require sacrifice, but they repay us with joy. □

THE POWER OF

Writing

HANDMAIDEN TO HISTORY, CHRONICLER OF THE MIND AND THE HEART, WRITING IS HUMANKIND'S MOST FAR-REACHING CREATION, ITS FORMS AND DESIGNS ENDLESS. DURING THE U.S. CIVIL WAR, FOR EXAMPLE, A UNION SOLDIER'S LETTER HOME WAS WRITTEN IN TWO DIRECTIONS TO SAVE SCARCE PAPER. IN INDIA AN ARTISAN MADE SUCH LIMITATION A VIRTUE BY INKING THIS ARTICLE'S BYLINES ON GRAINS OF RICE (ABOVE). AND THE WORDS YOU ARE NOW READING WERE WRITTEN ON A COMPUTER EQUIPPED WITH SOME 800 STYLES OF TYPE. YET THE PURPOSE OF WRITING REMAINS UNCHANGED: TO CONVEY MEANING, WHETHER PLAYFUL, MUNDANE, OR PROFOUND.

Echoing Egyptian hieroglyphs and composed of 400 separate photographs, this illustration presents a riddle in the form of a rebus. The names of eight pictured objects suggest the sounds of other words that together form a simple declarative sentence. Clues appear throughout the text of this article, where the names of the objects are written in various languages.

Five Thousand Years of Writing

CUNEIFORM was used by speakers of some 15 languages over the course of 3,000 years. The latest datable tablet, written in the city of Babylon, was an astronomical almanac describing planetary positions for A.D. 74-75.

PAPYRUS, made from the reedy plant of the same name, was used as a writing material by Egyptians from at least 2500 B.C., though a blank roll was sealed in a tomb 500 years earlier. With chiseled reed pens, Romans wrote on papyrus into the second century A.D.

PARCHMENT, made from thinly stretched skin of sheep and goats, takes its name from Pergamum, in Asia Minor, where its manufacture was perfected in 190 B.C. for a king seeking a library to rival Alexandria's. A finer calfskin version is often called vellum. Both began to decline in use after the tenth century A.D., when Europe was gradually introduced to a revolutionary product invented in China nearly a thousand years earlier: paper.

The origin of writing was the need to record the stuff of everyday life. Fussy calligraphy, subway ads, priceless first editions, speedy e-mail—all can be traced to clay tokens, precursors of writing, used to count goods in the Middle East. Found in Iran, a crescent-shaped clay token from the fourth millennium B.C. (above) has been interpreted as representing an ingot of metal, a round token as one sheep.

A leap forward came when a Sumerian picked up a reed and impressed pictures of the tokens into a moist clay tablet: Cuneiform, the first script, was invented. Like points of light blinking on in a dark field, other civilizations developed their own forms of writing. All met a general and commonly used definition: a system of human communication by means of conventional visible marks linked to spoken language.

ORIGINS OF MAJOR WRITING SYSTEMS

3000 B.C. | 2000 | 1000

Mesopotamian Cuneiform

3200 B.C. TO A.D. 75

Impressions made in damp clay with a wedge-shaped reed stylus initially recorded lists and administrative accountings, then expanded into historical accounts and literature. Cuneiform spread from Sumer to other Middle Eastern cultures.

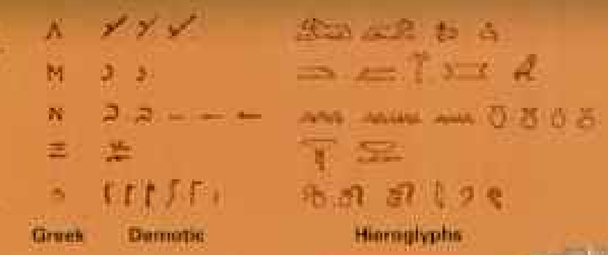
A cuneiform tablet found in Iraq recounts how a ruler's wife sacrificed livestock to the gods in 2350 B.C.

Egyptian Hieroglyphs

CIRCA 3200 B.C. TO A.D. 394

Barely dimmed by the ages, vivid writing adorns a coffin lid from the fourth century B.C. Hieroglyphs can function as either logograms—signs representing things or ideas—or phonograms, in which pictured objects represent sounds.

In 1822 Egyptologist Jean-François Champollion deciphered hieroglyphs using the Rosetta stone, which was also inscribed with Greek and an Egyptian cursive script, demotic.



Chinese Logograms

1200 B.C. TO PRESENT

Dating from the Shang dynasty, the earliest Chinese writings appear on bone or turtle shell (right) that was heated over fire to divine the future. Resulting cracks revealed the answers, which scribes then recorded.

Indus Valley

2800 TO 1900 B.C.

Excavations in Pakistan's Indus River Valley shed light on the trade and crafts of the Harappa civilization. Inscribed seals and other artifacts bearing writing may have served as forms of personal identification, guarded as carefully as today's credit cards.

Harappan writings, from left: early-period button seal, inscribed sherd, two seals with people and mythical beasts, and, below, late-period seal.

Levantine Alphabets

1050 B.C. TO PRESENT

An alphabet created by Phoenicians planted the roots of other writing systems in the eastern Mediterranean, including modern Hebrew and Arabic. Around the sixth century B.C. the Greek alphabet gave rise to the Latin system widely used today.

Painted on an eighth-century A.D. vase, a Maya rabbit god writes in a folding-screen book with a jaguar-skin cover.

TOKENS MUSÉE DU LOUVRE, PARIS; CUNEIFORM WEDGE MARVIN A. POWELL, JR., NORTHERN ILLINOIS UNIVERSITY; TABLET PHOTOGRAPHED BY CECCHINI, RAPHO, AT MUSÉE DU LOUVRE; COFFIN LID EGYPTIAN MUSEUM, CAIRO; TURTLE SHELL PHOTOGRAPHED BY WAN-GO H. C. WENG AT ACADEMIC SINICA, TAIPEI; CHINESE CHARACTERS ART BY KENNETH JOE; HARAPPAN ARTIFACTS, FROM LEFT, PHOTOGRAPHED BY J. M. KENOYER, HARAPPA ARCHAEOLOGICAL RESEARCH PROJECT; AT THE DEPARTMENT OF ARCHAEOLOGY AND MUSEUMS, KARACHI, PAKISTAN; J. M. KENOYER; PHOTOGRAPHED BY JEHANGIR GAZDAR, WOODFIN CAMP; AT NATIONAL MUSEUM OF INDIA, NEW DELHI; NATIONAL MUSEUM OF PAKISTAN, KARACHI; J. M. KENOYER; RABBIT ART BY DIANE GRIFFITHS PECK FROM BREAKING THE MAYA CODE; MICHAEL D. COE; MAYA GLYPH VASCHALAN, MEXICO; LATIN "A" FROM CHAMP FLEURY; GEOFFROY TORY, 1529

MAYA SCRIBES painted glyphs on pounded bark with brushes tipped with bird feathers. Chinese calligraphers prized bamboo brushes tipped with hair from the thick autumn coats of martens.

VIRTUALLY all writings in the runic alphabet, used in northern Europe in the first millennium A.D., were incised on wood or stone.

IN THE 1450s Gutenberg's movable-type printing press ignited an explosion of book publishing and literacy.

LOUIS BRAILLE, blinded as a child, in 1824 invented the 63-character alphabet read by fingertip.

REMINGTON'S 1874 typewriter was the first to use the keyboard character arrangement still found on word processors today.

A.D.1000

2000

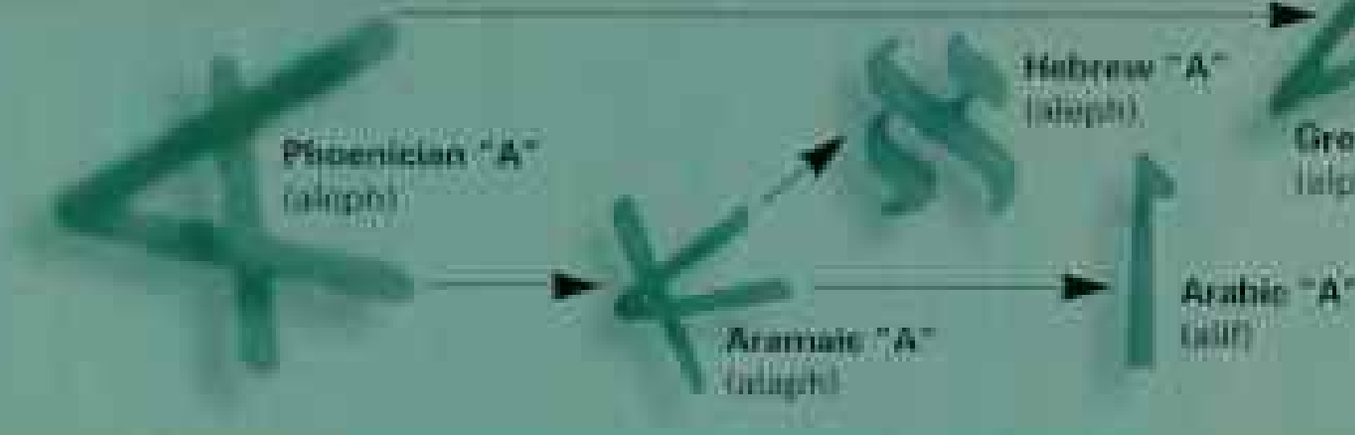
Chinese script reads, from top: "gold, jade, fill, hall" in archaic seal style, in modern script, and in flowing grass style used for poetry and personal letters. Translation: "hall full of precious things."

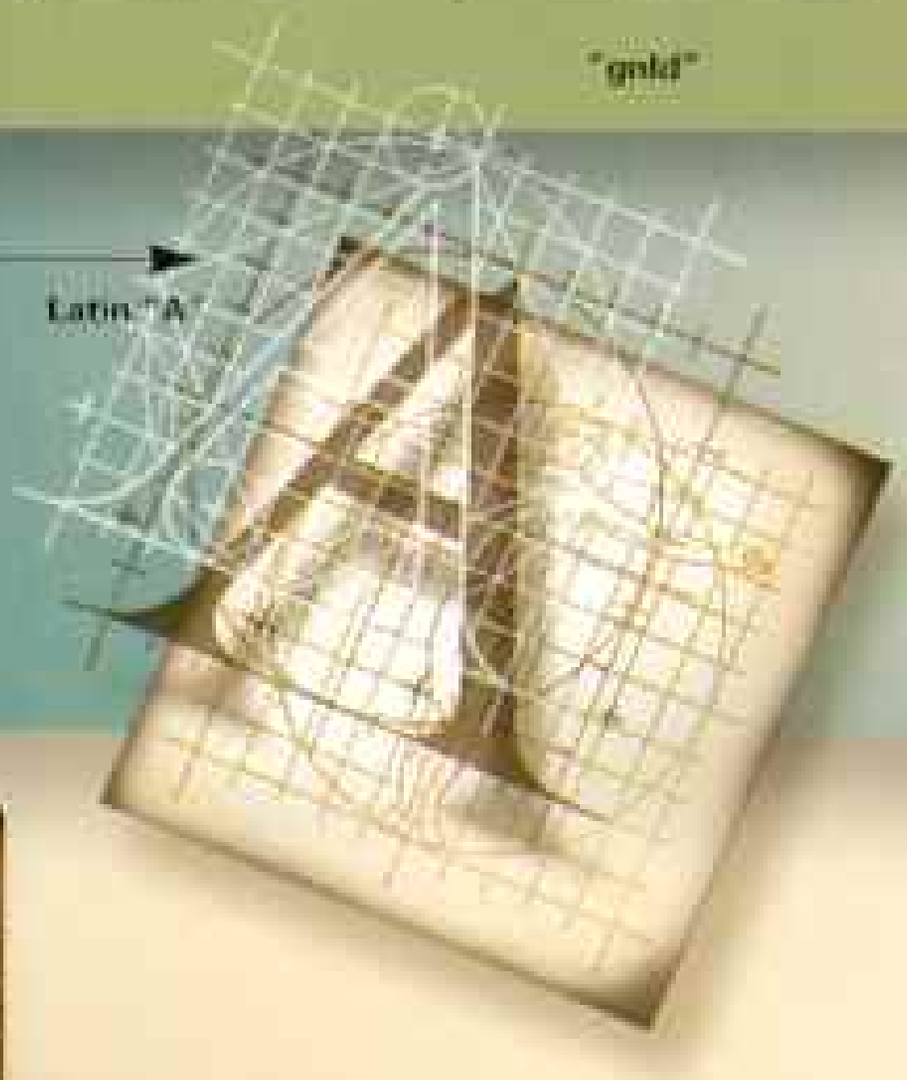
Seal style Modern script Grass style

Applied by normal printing processes, E-Ink is composed of microscopic spheres that change color by electronic signal, instantly transforming a book from, say, *Moby Dick* to *Huckleberry Finn*.

Computerizing Chinese: To create this character on a Latin-alphabet computer keyboard requires four strokes—four strokes fewer than if written by hand.

"gold"





Maya Hieroglyphs

A.D. 250 TO 900

The Maya wrote dates in symbolic figures. On a stone lintel a monkey representing a day holds a head denoting the number 6 above a skull standing for 10, signifying 16 days.

ART BY ALYCIA BUSCOW
TITLE CALLIGRAPHY BY JULIAN WATERS;
RUBIK'S CUBE CALLIGRAPHY BY MARK VAN STONE

THAI
"eye"

Pinpoint precision and steadfast devotion guide the hand of Rabbi Akiva Garber (below), a Torah scribe in Jerusalem. Copying a Torah, the five Books of Moses, can take more than a year and is governed by hundreds of laws. A worn-out Torah is put to rest in a ceremony not unlike a funeral.

At Jerusalem's Western Wall, a young man attending a bar mitzvah wears passages from the Torah coiled inside a leather box called a tefilla. Jews who wear such phylacteries follow the dictum from Exodus calling on males to wear "a memorial between thy eyes."

CHINESE STATE SECURITY OFFICERS *arrested Wei Jingsheng, an electrician, on March 29, 1979. Among his major crimes: writing essays arguing for democracy. Wei, who would spend 18 years in jail and become a prominent symbol of the power of the written word, was placed in the Beijing detention center.*

Chinese authorities feared Wei, recognizing that writing has an almost magical power: Words on paper, created by ordinary citizens, have overthrown governments and changed the course of history. So powerful is writing that the beginnings of civilization and history are most often defined as the moment cultures develop it. Anthropologists can only paint outlines of ancient societies that had no writing; a written record provides the human details—history, belief, names and dates, thought, and emotion.

No other invention—perhaps only the wheel comes close—has had a longer and greater impact. Writing helped preserve the three major monotheistic religions, whose believers the Koran refers to as "the People of the Book." The transformation of language into written words has immortalized passion, genius, art, and science—the letters of St. Paul, the poems of Li Po, the humor of Aristophanes, the treatises of Maimonides.

Much of writing's power comes from its flexibility. Ever since the Sumerians began keeping records by impressing cuneiform signs on clay tablets 5,000 years ago, humans have searched for the ideal tools to portray words. They have chiseled symbols in stone and bone and have written on leaves, bark, silk, papyrus, parchment, paper, and electronic screens. This skill, once known only to a few professional scribes, grew into mass literacy: Some five billion people can read and write today, about 85 percent of the world's population.

From its beginning as recordkeeper to its transformation into one of humanity's most potent forms of artistic and political expression, writing reveals the power of innovation.

But the story of Wei proclaims writing's greatest power—its ability to move hearts and minds.

His cell measured four and a half feet by nine feet. Authorities kept the light on at all times. No one, not even his guards, was allowed to speak to Wei, and he was not permitted to read or write. His requests for paper and pencil were ignored.

To understand how writing evolved, I visit Sarabit el Khadim, a flat-topped, wind-eroded mountain of reddish sandstone in the southwestern Sinai Peninsula of Egypt. Here, in a turquoise mine dug by Egyptians almost 3,500 years ago, is one of the earliest examples of a phonetic alphabet. Avner Goren, an Israeli archaeologist who supervised excavations in the Sinai for 15 years, is leading me up a steep

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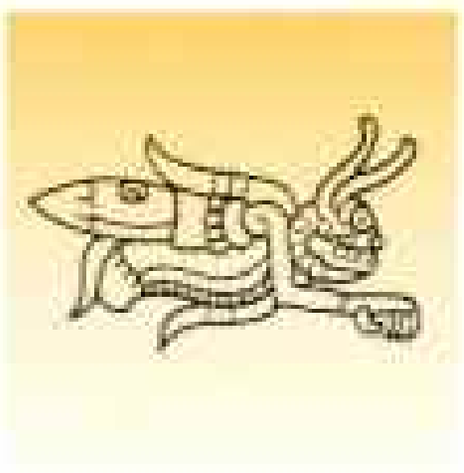
CARY WOLINSKY's article and photographs on color appeared in last month's issue.

trail, with narrow ledges and a drop-off to rocks far below. Near the top, we stoop to enter a dark hole.

"What do you think?" Goren asks, pointing to a wall about six feet in front of us. Carved into the stone are crude sketches of a fish, ox head, and square, remarkably different from the Egyptian hieroglyphs found elsewhere at the site.

The simplicity of these marks belies their significance. I move closer, as if proximity will reveal their magic. The people who made these signs were among the first to use characters each of which represented one sound—an alphabet. These alphabetic symbols had acrophonic values, with each representing the initial sound of the object depicted. The picture of the square—a house—thus stood for the *b* sound because the word for house was *beit*.

If these ancient writers were not Egyptians, who were they? After British archaeologists explored Sarabit el Khadim in 1905, some scholars argued that they were Israelites fleeing from Egypt with Moses about 1250 B.C. But similar writing as old or older was discovered in present-day Israel in the 1930s, so most researchers now believe that this alphabet was invented in Canaan, a region between the Jordan River and the Mediterranean Sea. Most likely, Canaanites who were brought in to work the mines left these messages.

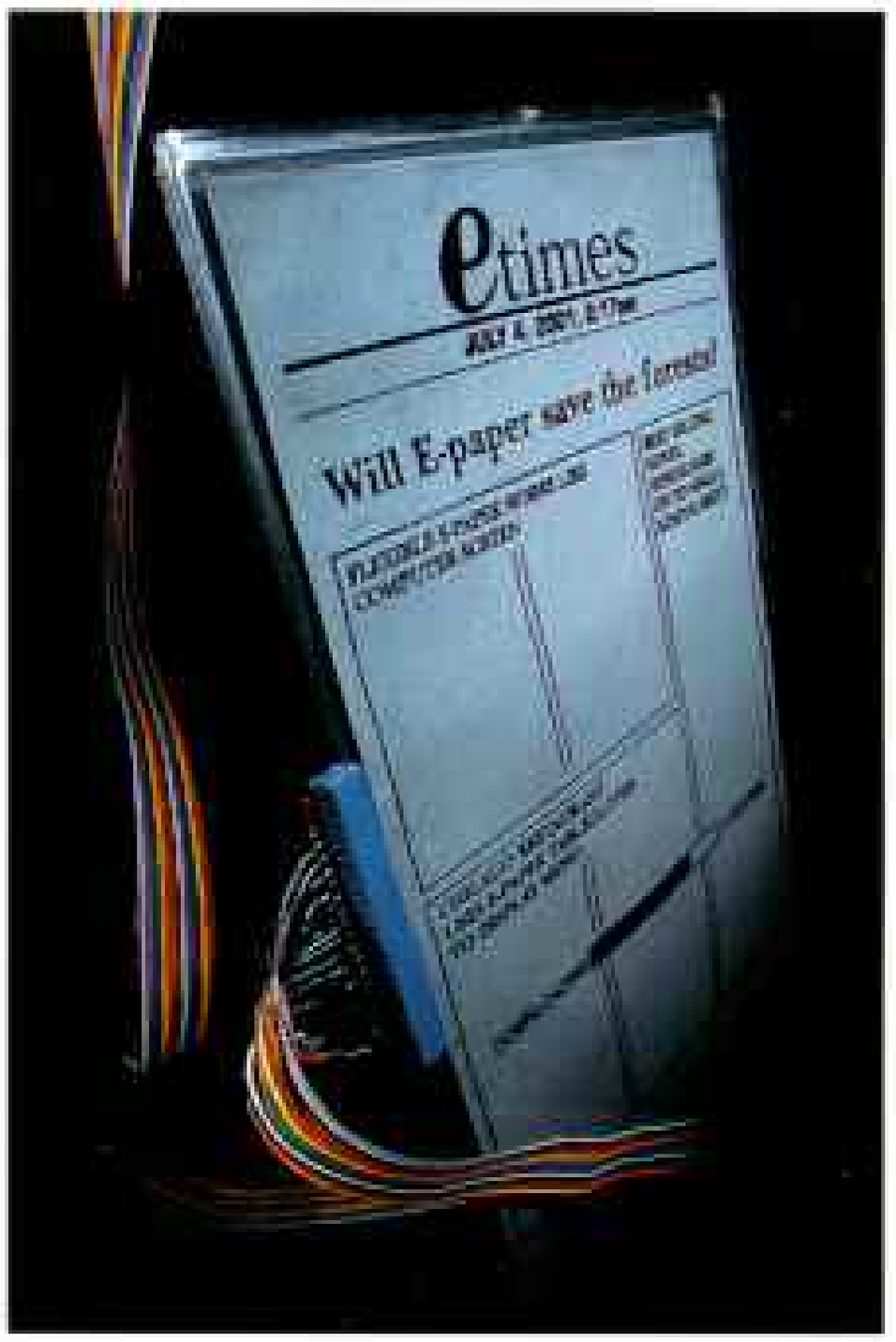


MIXTEC PICTOGRAM
"bee"

Egyptian scribes had to master hundreds of symbols. I tell Goren that alphabetic writing must have seemed much more attractive to those scribes. "Probably not," he says. "About 30 of the symbols in Egyptian hieroglyphs represent single sounds, just like the alphabet. They knew about using symbols to represent sounds. To the Egyptians the Semitic writing may have looked too primitive to be significant."

That night, as we lie in sleeping bags at the base of the mountains, Goren warns against seeing an alphabet as "superior" to pictographic writing. "If you came from outer space and wrote a report, you'd give the alphabet high marks," he says. "It's flexible and easy to learn. But

Sacred duty awaits a calf skin processed in Jerusalem as parchment for a Torah, each sheet of which is made from a separate animal. Precious in its own way, the chained library at England's Hereford Cathedral holds more than 200 one-of-a-kind medieval manuscripts.



Readers may someday use tree-saving electronic paper being developed by Xerox (above). Sheets are filled with bicolored microscopic balls: one hemisphere with a positive charge, the other with a negative charge. Voltage flips the balls, creating text pages that can be reprogrammed at will.

Dedicated to the Egyptian god Amun, the mortuary temple of Ramses III, Medinet Habu, towers on the west bank of the Nile. Its elaborate hieroglyphs describe battles with Libyans and invaders called Sea Peoples. To ancient Egyptians writing was a divine gift from Thoth—scribe of the gods, magical healer, lord of wisdom, and patron of scholars.

what actual effect did that have? There was no mass literacy until after the development of the printing press in the mid-15th century."

But alphabets, it seems to me, changed the way people thought. Theoretical science, formal logic, and the concept of time as a straight line moving from past into future came from societies with alphabets.

From a small patch in the Middle East the notion of one symbol per sound spread around the world, taking root first among the Greeks, who modified some characters into written vowels. The Latin alphabet of the Romans evolved from the Greek around the sixth century B.C. By the ninth century A.D., Japan had developed strong phonetic components in its written language; Korea by the 15th. Indeed, of the several hundred written languages in the world today, only Chinese still relies on a writing system in which individual characters represent individual words. These characters often mean one thing when used alone, but something else when combined. The Chinese character for

"sincerity," for example, shows the character for "man" alongside the one for "word," literally a man standing by his word.

Wei drew characters in his head, taking pride in this mental calligraphy. One morning, more than two years after he was placed in solitary confinement, his food tray included a ballpoint pen—another prisoner or a sympathetic guard had smuggled it to him.

Wei began to write letters to his family on the rough sheets he had for toilet paper. Guards found these letters and demanded to know where he had hidden the pen. Wei refused to say. After guards failed to find the ballpoint, which Wei had tied to a string and lowered inside the hollow metal rods of his bed, the warden ordered him to another cell. Wei sneaked the pen with him.

NORSE RUNES
"leaf"

Since writing's invention, people have used it to combat loneliness and establish a sense of self. In the fourth century B.C., Aristotle saw writing as a way to express "affections of the soul." Recent studies have documented that writing about feelings can alleviate depression, boost the immune system, and lower blood pressure.

Complexities of Japanese confront second graders in Kyoto, where students write some of the 200-plus characters for the sound "shou." The language commonly uses 15,000 kanji characters, which are borrowed from Chinese. Because so many words are homophones—the same sound but a different meaning—exchanging business cards is an absolute necessity to know the spelling of a Japanese name.

How, then, do people in societies without writing express themselves? Of the more than 10,000 languages ever spoken, most had no written form. "We talk to each other, listen, visit, and trust the spoken word," says Guujaaw, a leader of the Haida Nation. "Expressing yourself without writing is natural."

The Haida have lived on the Queen Charlotte Islands off the coast of British Columbia for more than 10,000 years. Guujaaw and I are walking on Sgan Gwaii, a small island in the south that has some of the world's last temperate rain forest. Mosses and ferns cushion our steps. In the ocean, sea lions and puffins dive for fish.

"Like most other cultures in the Western Hemisphere, you never developed writing until outsiders brought it in," I say. "Do you think that's because you had no need for writing?"

"Are you suggesting that writing is better than speaking?" Guujaaw asks in response to my question.

The answer seems obvious, I say. Things get distorted when people repeat them to one another, especially over long periods of time.

"Things get distorted in writing as well," he says. "Oral histories from our people go back thousands of years. They are a living history. They provide a link between storyteller and listeners that written

stories cannot. In fact, human intimacy and community can best come through oral communication."

Guujaaw leans on a rock. "I'll tell you a Haida story," he says. "Don't write it down. Listen. If you are busy writing, you will miss half the story. A story includes the telling and the listening."

Hearing his story about how animals warn humans not to spoil the water stimulates my senses. Guujaaw's voice, the breeze, the ocean, and the trees around us all flow through me. If I were reading the story, I would be alone in another world—and much less aware of my surroundings.

ARABIC
"eye"

Plato would have said, "I told you so." Living at a time when writing began to challenge Greece's oral-based culture, he warned that writing would make people "trust to the external written characters and not remember of themselves. . . . They will be hearers of many things and will have learned nothing."

But Plato lived in the fifth century B.C., when reading was physically difficult. Books were papyrus scrolls often more than 60 feet long; the idea of pages, sparked in large part by the availability of parchment, emerged in Europe in the second century A.D. Space between words did not become standard in Western society until the seventh century. Long after Plato's time, writing served mostly as an aid to memory, something to stimulate the spoken word. People read aloud, a practice that died slowly. St. Augustine, one of the world's leading scholars in the fourth century A.D., was shocked to come upon his mentor St. Ambrose reading silently.

This transition from the spoken to the written word occurred because writing meets certain needs so much more effectively. Writing permits analysis, precision, and communication with future generations in a way not possible via the spoken word. The only way I know about St. Augustine's experience is that he mentions it in a book.

Still, Plato was right—people in an oral culture need strong memories. I have forgotten most of Guujaaw's story by the time we enter Ninstints, an old Haida village.

Ninstints was home to hundreds of Haida families in the mid-19th century, before white people landed. Now all that remains are the foundations of a few houses and some rotting totem poles. Today there are only about 4,000 Haida compared with 40,000 in the 19th century.

Despite such decline, Guujaaw insists that the Haida have not been defeated by people with writing. "We've been here on this land for thousands of years, and we're still here," he says. "Writing is not essential to living. People with writing are a brief chapter in our history."

But Native American oral culture worked best when people went on long hunting or fishing trips and gathered around campfires every evening. Now modern devices like television discourage the sharing of oral traditions.

Days later I share this thought with Pansy Collison, a Haida who teaches high school in Prince Rupert, British Columbia. "Don't forget that oral history is an essential part of our students' identity," she says.

Collison uses storytelling in the classroom to help her students learn their history and build pride in who they are. As part of this, her

Shouting their messages, colossal neon signs light the night in Tokyo's glitzy Ginza shopping district. Some business leaders believe that using the Latin alphabet in advertising lends prestige to their corporations. While many Japanese can read English, relatively few can write or speak it.

students write out the oral traditions of their family or clan—she relies on writing to preserve oral history.

As Collison shows me how these written lessons help invigorate oral traditions, I realize I am seeing another example of writing's extraordinary flexibility. Most Native Americans lost ground to outsiders who had weapons and machinery that developed only in societies with writing. But now writing is vital to the Haida's rejuvenation.

In the winter of 1981, after holding Wei in solitary confinement for more than two years, authorities realized they could not keep him from writing. They gave him a new ballpoint pen and better paper and authorized one monthly letter to his two sisters and brother.

In these letters Wei discussed art and offered advice on romance. He was forbidden to write about being beaten or deprived of sleep. He also could not mention his malnutrition, headaches, heart pain, diarrhea, and rotting teeth.

Wei never knew if his letters were delivered. He told his fiancée to find someone else, not knowing that she had already married.

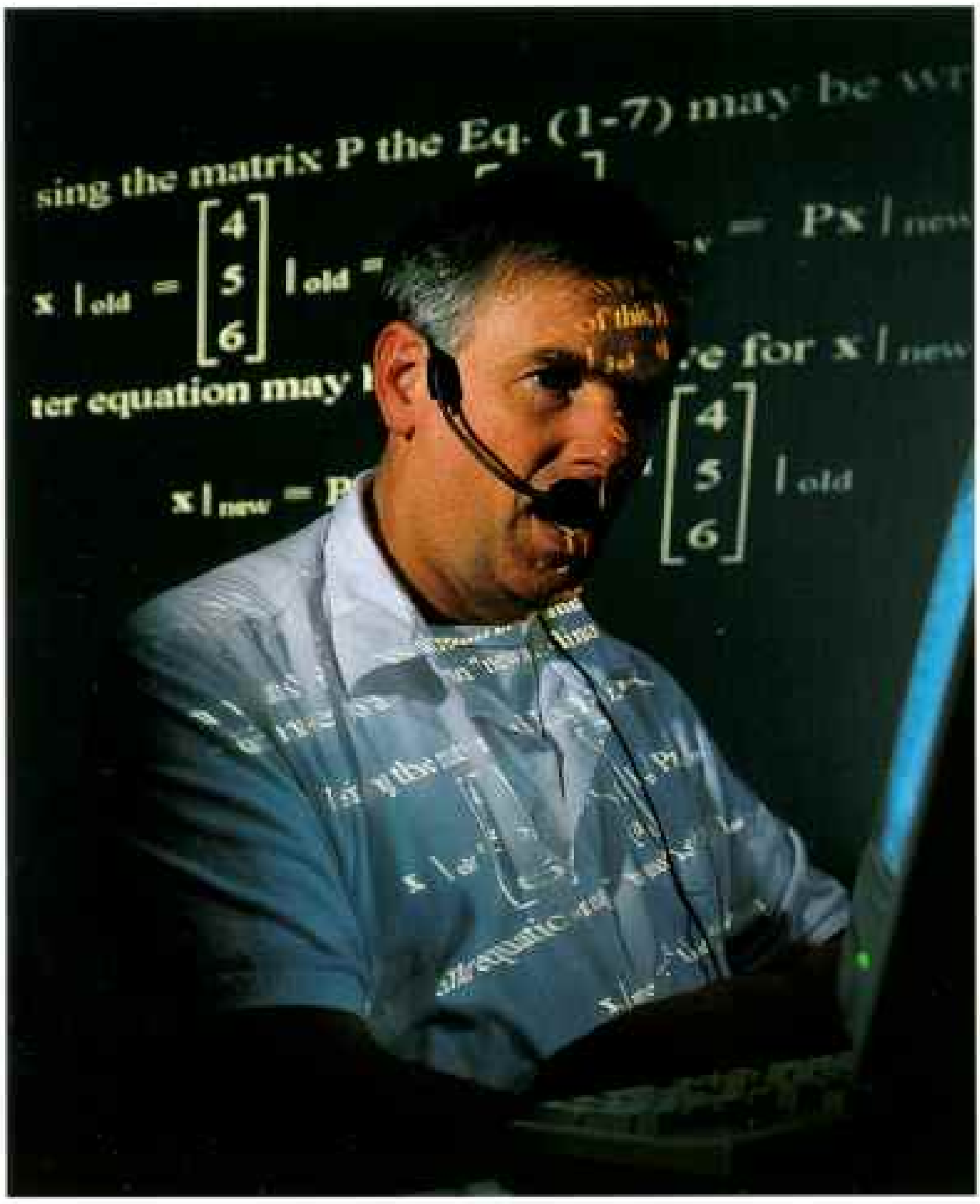
Authorities also told Wei to write to government officials explaining his crime: trying to break up China. He did write to officials but told them they threatened national cohesion by suppressing freedom.

Maintaining national cohesion has always been a prime concern for China's rulers, who learned thousands of years ago that sharing the same written language can unite people. In the third century B.C., Chinese people spoke at least eight languages and countless dialects, but with establishment of a unified empire and a standard system of writing around 200 B.C., everyone could read the same characters.

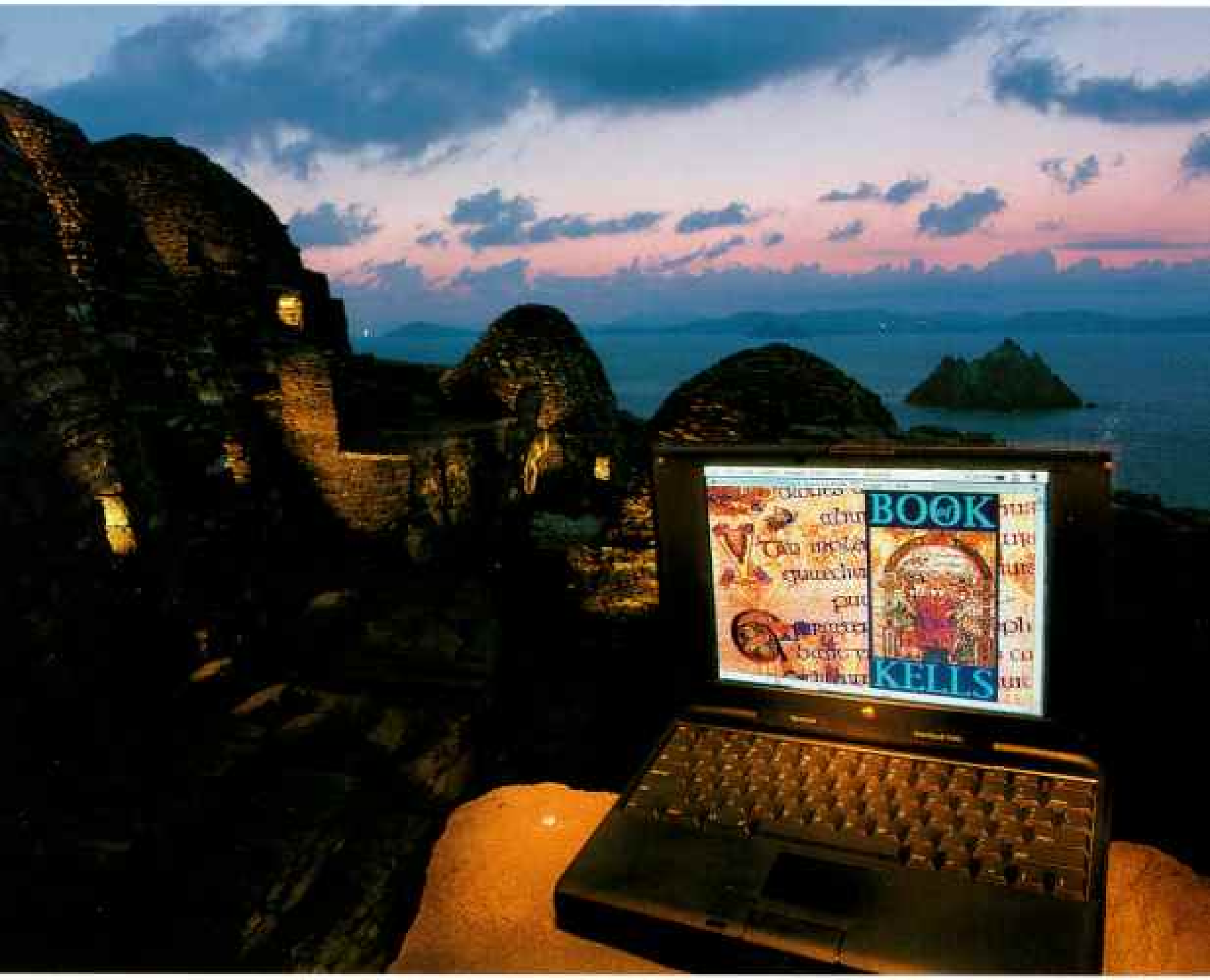
CHINESE "can"

Joseph Stalin, who ruled the Soviet Union from 1928 to 1953, was a master of using writing to control people. Russia and Persia had divided Azerbaijan in the early 1800s. Shortly after taking power, Stalin feared the Azerbaijanis' loyalty to their countrymen in neighboring Iran, formerly Persia. Hoping to divide the two groups, he encouraged the Soviet Azerbaijanis to emulate nearby Turkey and switch from the Arabic alphabet to the Latin alphabet.

By the 1930s Stalin, concerned about growing ties between Turkey and Azerbaijan, forced the Azerbaijanis to adopt Cyrillic, a script used for writing Russian and other Slavic languages. It had evolved from a script created by missionaries of the Orthodox Church in the ninth century A.D.



Bypassing mechanical typing, Gary Reid writes straight from the mind. A former varsity swimmer who lost his motor skills to multiple sclerosis, Reid uses software that translates his voice into characters. In his Hollis, New Hampshire, home he prepares a new edition of his engineering textbook, *Linear System Fundamentals*. Photographer Wolinsky used projectors to cast



formulas onto Reid and his bedroom wall.

At Ireland's Skellig Michael monastery, Wolinsky's computer displays a website page from the *Book of Kells*. Kept at Trinity College, Dublin, the illuminated manuscript was housed at Kells, one of the Irish monasteries that preserved classical Greek and Roman writings by copying manuscripts during the Dark Ages.

This alphabetic clash seems alive as I walk through Baku, Azerbaijan's capital. Newspapers are in Cyrillic, labels on canned food are in the Western Latin alphabet or in the Turkish-style Latin with its umlauts and cedillas, and street signs are in freshly painted Azerbaijani Latin, which has "x," "ə," and "q," letters not found in the Turkish alphabet. There is no sign of Arabic letters.

"We chose Latin letters largely because they will help us be modern and will link us to the rest of the world," Oruj Musayev, professor of English at the Azerbaijan State Institute of Languages, tells me. Musayev has just finished compiling the first Azerbaijani–English dictionary using Latin letters. "Our alphabet choice reflects geopolitics. Dropping Cyrillic meant moving away from Russia. Although we're Muslim, we're nonsectarian, so we didn't want to use the Arabic alphabet, which would link us to the mullahs in Iran."

The stakes are high. Azerbaijan has promising oil reserves and is courting Western buyers.

That the West relies on the Latin alphabet is a remnant of the Roman Empire. Latin letters have endured because they serve Western languages well—and using Latin letters has become associated with being "modern."

Eyes only: Developed by the U.S. Central Intelligence Agency, paper that dissolves in water (below) allows operatives to read and then quickly destroy covert messages.

A logo designed for Nike athletic shoes also proved less than permanent. Muslims objected to the stylized word "Air," which they felt resembled "Allah" in Arabic script and was disrespectful when used on shoes; Nike apologized, calling the design an innocent mistake and pulling the shoes from distribution.

The Latin alphabet's ability to link Azerbaijan to the outside world becomes evident the next day when I drive to Lahic, a village isolated in the Caucasus Mountains. In addition to Azerbaijani, people in Lahic speak a dialect of Persian found nowhere else, which has no written form.

Aga Ismailov, a farmer at the edge of town, invites me for a special lunch. As Ismailov barbecues a lamb he slaughtered the day before, his children prepare plates of tomatoes, cucumbers, watermelon, cheese, and freshly baked olive bread.

CUNEIFORM SIGN
"reed"

"My youngest son is learning French and English in school," Ismailov says, speaking in Azerbaijani. "He is the only one in the family who knows the Latin alphabet."

He asks his son, nine-year-old Bakhish, to join us. "Good afternoon, how are you?" Bakhish says in English. He then shows me how he writes his lessons.

As Bakhish writes, I'm struck by the frequency of the upside-down *e* that I'd noticed all over Azerbaijan. Why select the Latin alphabet because it is used in most international trade and computer transactions and then give yourself a letter no one else has?

"It's the sound somewhere between *a* and *e*, like 'hat' and 'cat,' and is the most common sound in our language," Anar Rzayev, one of Azerbaijan's leading writers and a member of parliament, explains the next day in Baku. "What you call the upside-down *e* dates back to early in our history. We kept it even when we had the Cyrillic alphabet. Maybe it's stubbornness, but it's a symbol of Azerbaijan." Shortly after independence, he says, Azerbaijan's parliament debated eliminating the ə but decided to keep it.

Azerbaijan is a newly independent country with tremendous problems. Development of oil resources is still a dream, and the country's annual per capita income is about $500, making it one of the world's poorest nations. To have its own alphabet seems a strange indulgence.

"There's nothing new about what's happening in Azerbaijan," Anar says. "An alphabet is a symbol of a country just like a flag. Why do you think different alphabets have appeared in the first place?"

Pride in his nation's writing system helped give Wei his Chinese identity. That most Chinese written characters have remained essentially unchanged for more than 2,000 years provides an emotional and a practical tie to the past.

Many of his letters were to China's leaders, whom he criticized. As punishment, authorities sometimes took away the pen they had given him, but other prisoners took apart pens, often stolen from guards, and smuggled them to Wei.

Nike Pulls Shoes That Irked Muslims

Heel Design Resembled Arabic Word for Allah

By Carrie Murphy
Washington Post Staff Writer

Nike Inc. has agreed to stop selling a new line of basketball shoes because they bear a logo resembling the Arabic word for Allah, or God, which some Muslims found offensive, a company official said yesterday.

The Arabic word for Allah

Nike's action came after weeks of negotiations with the Washington-based Council on American-Islamic Relations (CAIR), an Islamic advocacy group that had threatened to urge a boycott of Nike products by the world's 1 billion Muslims.

The Beaverton, Ore.-based company will call back more than

"Why write?" the guards asked. "No one will ever see your letters."

In late 1993 authorities told Wei he would be released. They were trying to win international support for acting as host of the year 2000 Olympic Games. Wei, who had been in jail for nearly 14 years, refused to leave his cell without copies of his letters. "They've been lost," he was told.

"You can find them," he replied. Twelve hours later, the warden returned with his letters.

Six months later, after the Olympic Committee rejected China, Wei was re-arrested. State security seized his papers but failed to find the computer disks onto which his letters had been transcribed.

Tong Yi, the young woman who transcribed Wei's letters onto computer disks, had extraordinary courage. She also had to master the Latin-alphabet keyboard, which requires up to five keystrokes for one Chinese character.

The extra work needed to enter Chinese into a computer raises an important issue. China may become the wealthiest country in the world; it already is a major factor in the international economy. As this economy relies more on computers, does the Chinese writing system put it at a disadvantage?

Usama Fayyad, a senior researcher at Microsoft Corporation, whose job is to think about the long-term future of computers and data storage, says technology will eventually offer efficient and economical ways to bypass keyboards. Voice and handwriting recognition, he tells me, could make it irrelevant which writing system is used. We're in an office on Microsoft's 260-acre campus near Seattle. A painting of clouds floating through a blue sky covers one wall.

MAYA GLYPH
"plate"

Fayyad also says that the distinction between an alphabet and Chinese characters does not matter in terms of how a computer operates. He explains that when you hit a letter on the keyboard, the computer enters that action into its memory as a number. Each letter is a different number, and a sentence inside the computer is a string of numbers. It's up to the computer program to interpret the string of numbers as instructions.

Fayyad warns me not to get too romantic about computers. "They're great at bookkeeping," he says, "but not yet great at recording impromptu ideas, thoughts, feelings. For that, paper is still far superior. You can hold it, fold it, put it in your pocket, look at it again later when it's convenient."

Fayyad's praise of paper leads me to Joseph Jacobson, a professor of physics at the Massachusetts Institute of Technology. He helped found a company, E-Ink, whose technology is trying to transform ink from a permanent medium to something that can change electronically.

"Paper is fantastic," Jacobson tells me as we tour E-Ink offices in Cambridge, Massachusetts. "If books or newspapers on paper had not already been invented, if we lived in a world only with computer screens, then paper would be a breathtaking breakthrough. But the way we use paper is incredibly wasteful."

Jacobson shows me the E-Ink technology he hopes will someday supplement ink on paper. It prints electronic letters on squares of plastic that can be erased and reused.

No keyboards clack as deadline approaches at the *Daily Tej* in Delhi, India. Editor Peter Masih (above, at right) reads English-language news stories from a wire service and rewrites them in Urdu. Calligraphers copy his translations into the artful script of the language spoken by 37 million Indians. Pasted up, the stories are photographed for printing on an offset press.

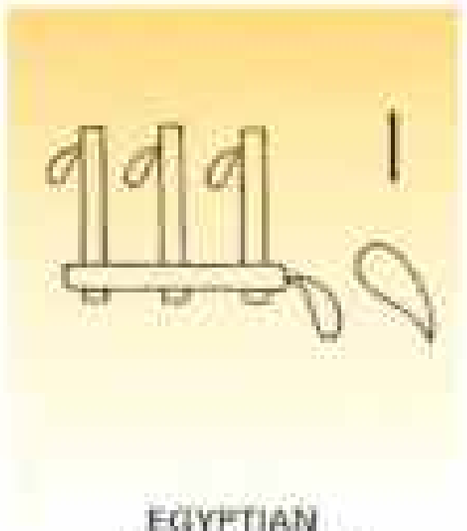
"There's a great thirst for the written word in China," says photographer Wolinsky. In Chengdu (facing page) children rent books from a street vendor.

Proud author Carmen Craig (below) holds a story she wrote for her Brookline, Massachusetts, kindergarten class, which is just learning to read. With today's endless audio-visual onslaught, it may be easy to overlook this recurrent miracle: a child's first act of writing—putting thoughts and emotions on paper.

I ask Jacobson why he uses plastic. "Paper tears too easily," he replies. "We're working on a plastic substance that looks and feels like paper. You could photocopy it, even underline on it with a special pen."

"Isn't that a lot of trouble to solve a problem that doesn't exist?"

"A problem does exist," Jacobson says. "Paper needs to be taken into the digital age. We need writing that changes on paper. Think about all the information people download from the Internet. They don't want to read it on a computer screen, so they print it on paper. The demand for paper is soaring. Think of all the savings in cost and the pollution prevented if you needed less paper."



EGYPTIAN HIEROGLYPHS "love"

As I watch the E-Ink letters blink, I feel as if I'm back in the cave at Sarabit el Khadim—looking at a piece of the future.

After Wei's re-arrest in 1994 he was placed back in solitary confinement. Two walls of his new cell were glass, so constant monitoring could ensure he did not write. For more than six months not even his family knew whether he was dead or alive. In 1997 a book of Wei's letters, The Courage to Stand Alone, *was published in the United States. Tong Yi, who transcribed his letters, had been sentenced to two and a half years in a labor camp. After serving this time, during which she was sometimes beaten, she was allowed to leave China.*

In the summer of 1997 I read *The Courage to Stand Alone* and follow news accounts of Wei's treatment. He is frequently beaten and denied adequate health care. I fear he will die soon.

Then in November 1997 the Chinese government releases Wei, largely in response to international pressure, and puts him on an airplane to the United States. A few weeks later I meet him at his office in the Center for the Study of Human Rights at Columbia University.

I am startled by Wei's smile and how well he looks. He explains that he can eat only soft food until his teeth are fixed, and sips tea as we talk.

"Writing," he says, "kept me alive. I sometimes thought about a letter for a week before writing anything. It's something that you must do even if you do not have the leisure of being in prison. To write, you must work methodically, forming your thoughts and prompting other people to think as they read. Writing requires work at both ends. That's what makes it special."

Wei plans to write a book about the experiences, feelings, and ideas he could not put in his letters, which he knew would be read by prison officials.

"I wish I could read it in Chinese," I say.

Wei laughs. "You can learn," he says, writing 友谊.

"It means 'friendship,'" Wei says. □

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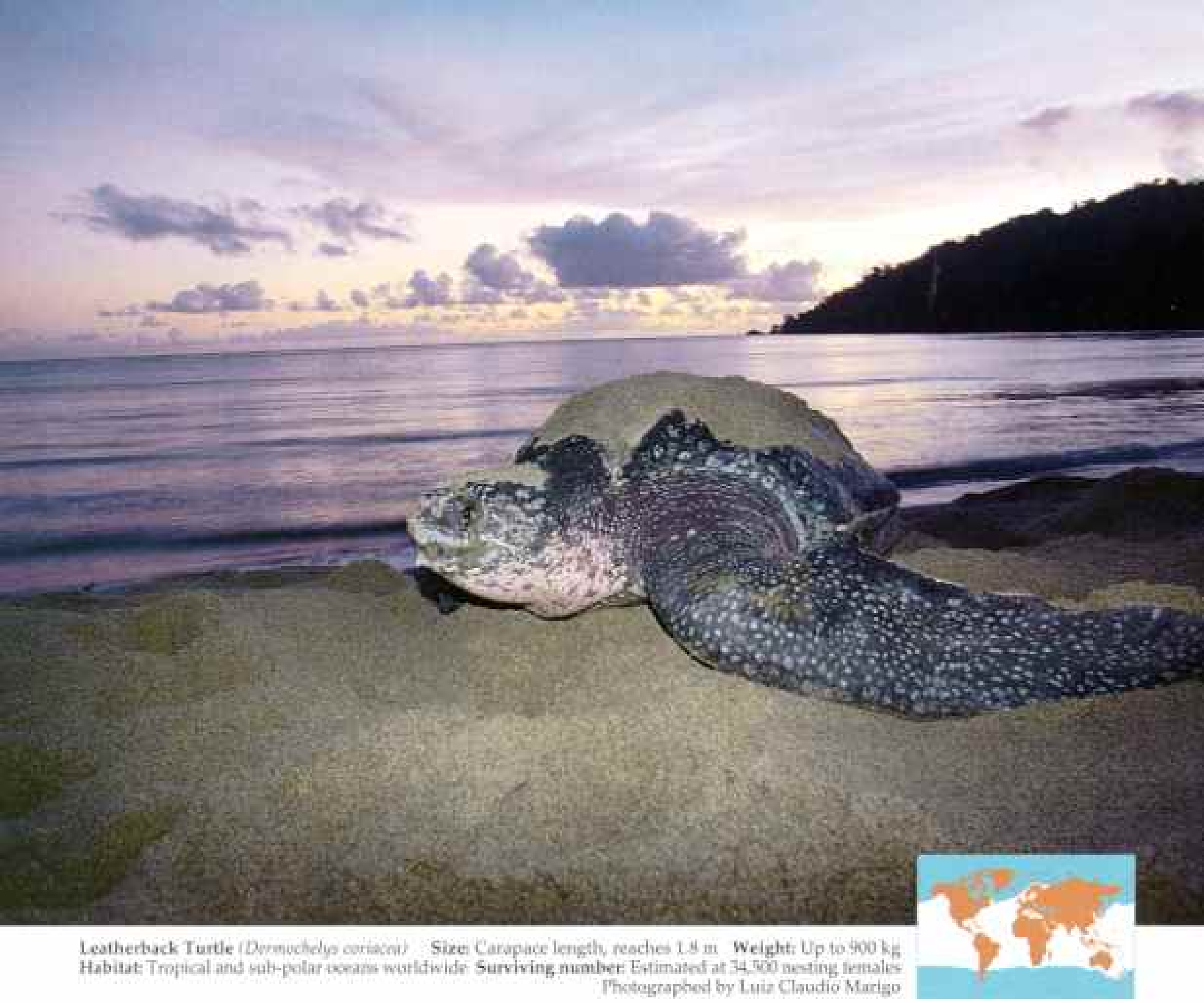

Leatherback Turtle *(Dermochelys coriacea)* **Size:** Carapace length, reaches 1.8 m **Weight:** Up to 900 kg
Habitat: Tropical and sub-polar oceans worldwide **Surviving number:** Estimated at 34,500 nesting females
Photographed by Luiz Claudio Marigo

WILDLIFE AS CANON SEES IT

Largest and most pelagic of all sea turtles, the leatherback ranges the world's oceans. A thick and oily dermis offers protection in cold sub-polar waters. The leatherback nests on reefless tropical beaches with deepwater or muddy approaches. A female goes to the same beach multiple times in a single nesting season to bury a clutch of eggs, then does not return for two to three years. The number of females returning to many regular nesting sites has declined dramatically in recent years. The leatherback is endangered worldwide due to egg harvesting, killing of nesting females, and incidental catch by offshore fisheries. As a global corporation committed to social and environmental concerns, we join in worldwide efforts to promote greater awareness of endangered species for the benefit of future generations.

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NATIONAL GEOGRAPHIC

AUGUST 1999

The Cover

Seemingly a world apart, a fashion model poses with her more traditionally garbed mother in Mumbai (Bombay), India. Photograph by Joe McNally

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NATIONAL GEOGRAPHIC

On Assignment

■ GLOBAL CULTURE

Exercising Her Options

An American who lives in Europe practicing tai chi in Shanghai? "Mrs. Jiang took me in hand," says Erla Zwingle, at right, of the woman who pulled her in to join other early exercisers. "She made me feel as if I belonged there. Journalists are so often on the outside, looking in." In Venice, Italy—where Erla lives—people do tai chi now too. "But there's something special about doing it where its roots are deepest," she says.

JOE MCNALLY (TOP); NATIONAL GEOGRAPHIC PHOTOGRAPHER MARK THIESSEN

■ WRITING

Putting Pen to Paper

"We met soon after his release from a Chinese jail," says Joel Swerdlow, at left, of dissident Wei Jingsheng, imprisoned 18 years for writing about democracy. With a fellow writer's concern, says Joel, "I'd followed the story of his imprisonment for years." When Joel's assistant, Michele Callaghan, asked Wei for an autograph for her kids, they got more than a name. They got advice. "Look over this world well," he wrote, "for it is home for all of us."

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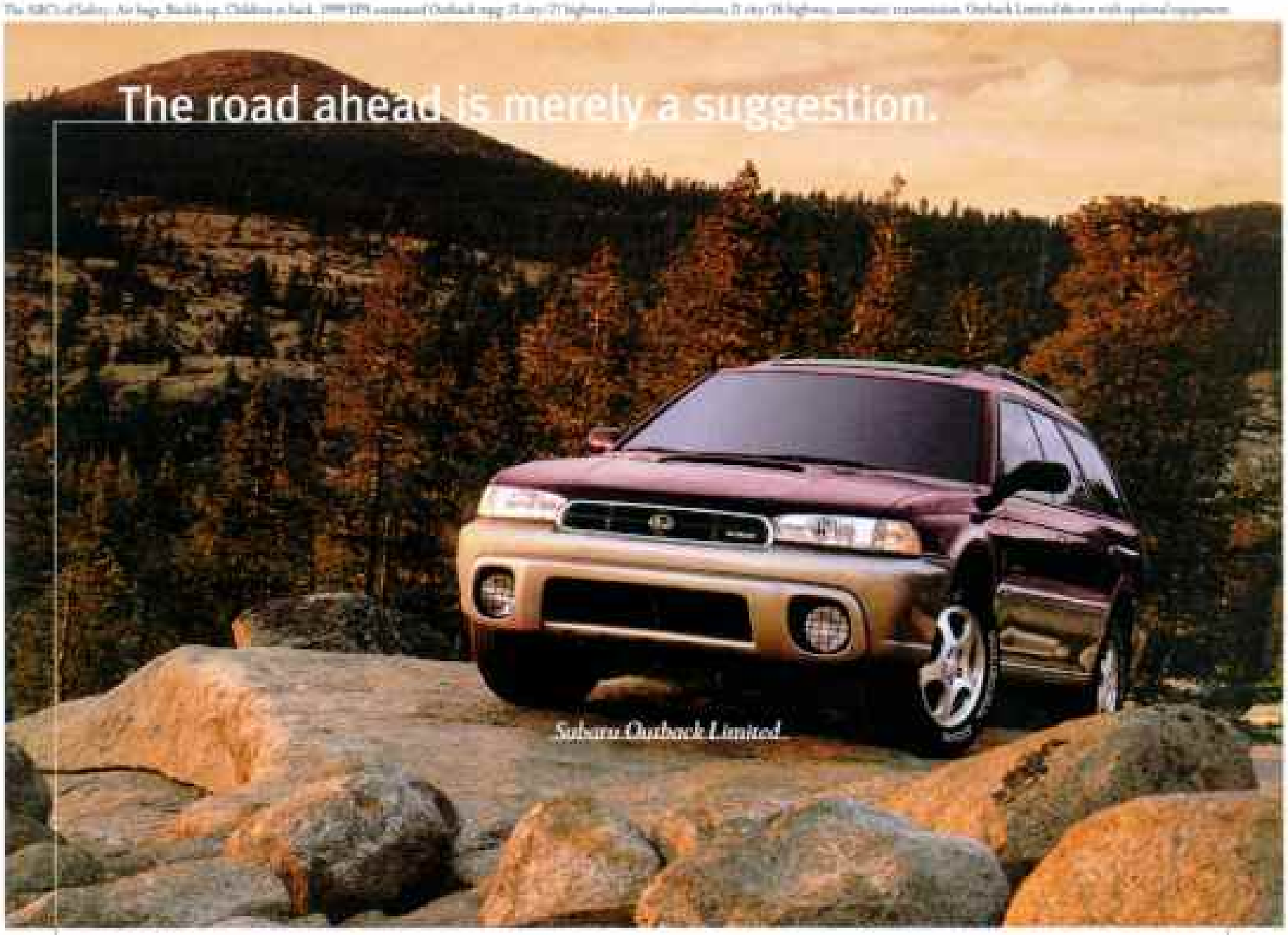

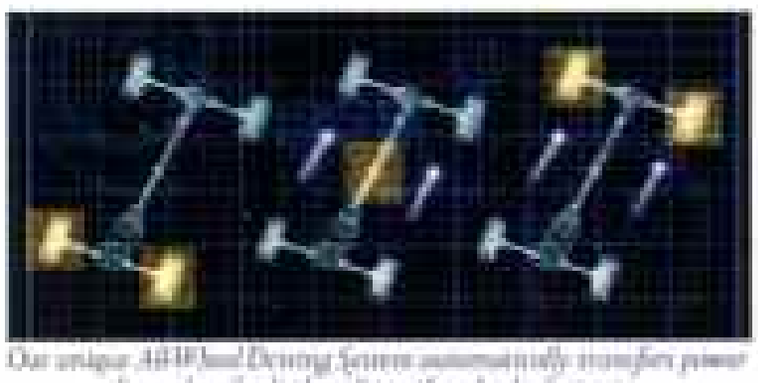

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NATIONAL GEOGRAPHIC'S

Millennium Moments

Cultural Reality, Near and Far

Discover America, the Editor of NATIONAL GEOGRAPHIC told Polish photographer Tomasz Tomaszewski and his wife, writer Malgorzata Niezabitowska. And so they did. "Without plans, research, or even advice from friends, we went on the road to see what would happen," Niezabitowska wrote in their memorable January 1988 report. "Here is the America we saw, and here are some of the Americans we met." One was this Mardi Gras celebrator in New Orleans. "My name doesn't matter. I'm just an American," he told the pair. "I love my flag, and I'm very proud of it."

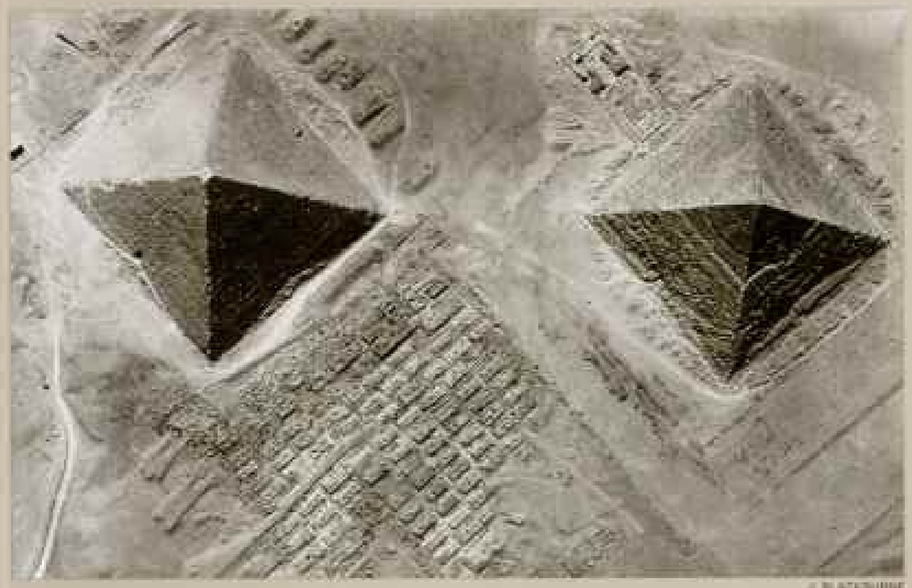
Throughout the magazine's history, its writers and photographers have ventured out to do what the Polish couple did in the United States: to discover and convey the reality of civilizations and cultures, past and present. As the new millennium nears, here are a few samples from more than a century of such discoveries.

JOHN S. ZUMBRUN

WINFIELD PARKS

GLORIES OF ANCIENT WORLDS
Car lights ring the 1,900-year-old Roman Colosseum (above) in a fitting mixture of old and new. For, as the caption beneath this June 1970 photograph noted, the city itself is a composite of the ages. Numerous GEOGRAPHIC articles have chronicled the world's great civilizations, often from unusual perspectives. This image of the Great Wall of China (bottom left) shows the mountain pass at Gubeikou, one of the highest points along the barrier. It appeared in the February 1923 issue, along with a foldout photograph in which the wall seems to stretch out forever.

In February 1925 the magazine provided this view of pyramids in Egypt (below), including the Great Pyramid of Khufu (Cheops), at left, at a time when civilian aerial photographs were a novelty. Tombs of nobles, commanders, and court engineers lie in rows between the pyramids. The magazine's first report on ancient Egypt appeared in November 1901.



J. BLACKSHIRE

Cultural Milestones

- **4000 B.C.**
  Among the earliest known people in China, the Yang-shao domesticate dogs, pigs, and perhaps cattle and horses.
- **3200**
  First writing: Sumerians keep records in cuneiform symbols on clay tablets.
- **1500**
  Sacred scriptures of Hinduism are composed.
- **1200-800**
  Olmec of Mesoamerica erect colossal carved stone heads.
- **660**
  Jimmu Tenno establishes Japanese imperial line.
- **550-539**
  Persian Emperor Cyrus II conquers Media, Lydia, and Babylonia.
- **528**
  Siddhartha Gautama founds Buddhism.
- **438**
  Greeks consecrate the Parthenon in Athens.
- **Circa A.D. 4**
  Jesus of Nazareth is born.
- **70**
  Romans destroy Israelite temple in Jerusalem.

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VESTIGES OF THE PAST STILL RESONATE TODAY

Three thousand years ago the Olmec, who dominated the sweeping coastal plain where the Mexican states of Veracruz and Tabasco now meet, worshiped the jaguar as the powerful lord of their spirit world. Today their descendants become jaguar dancers to bring rain, like this young boy smeared with clay and stamped with ashes by a ubiquitous modern artifact. Pictured in the November 1993 GEOGRAPHIC, the ritual shows that in an age of globalization the cultural practices of the past tenuously live on among the descendants of indigenous peoples. The tale of nomadic Lapps—who call themselves Sami—was told in a November 1939 article. This family (below) stored its supply of dried reindeer meat and other provisions on a platform of sticks built close to their tent for easy access but high enough to be out of reach of their pet dogs, who roamed with them north of the Arctic Circle and often guarded their babies.

KENNETH GARRETT

BORIS MELTON

- **250**
  Maya city-states arise on the Yucatán Peninsula.
- **400-700**
  Kingdom of Aksum in Ethiopia becomes the dominant trading center in northeastern Africa.
- **476**
  Germanic chief Odoacer ousts Romulus Augustulus, last Roman emperor.
- **Circa 610**
  Muhammad receives revelations later recorded in the Koran, the sacred book of Islam.
- **700-1700**
  Mound-building Mississippian culture dominates eastern North America.
- **800**
  Charlemagne is crowned Holy Roman Emperor.
- **1096-99**
  Europeans try to recover Arab-conquered lands in the First Crusade.
- **1206**
  Genghis Khan begins to create history's largest land empire, stretching from Mongolia into eastern Europe.
- **1215**
  Magna Carta, signed at Runnymede in England, limits the rights of kings.
- **1300-1400**
  Traders of Great Zimbabwe rule southern Africa.
- **1325**
  Aztecs establish powerful empire in central Mexico.
- **1407**
  Chinese complete 11,095-volume encyclopedia; three copies are made.
- **1455**
  Gutenberg Bible, first book published in cast-metal movable type, launches a cultural revolution.
- **1492**
  Columbus sails to Western Hemisphere, linking Old and New Worlds.
- **1517**
  Martin Luther sparks Protestant Reformation.
- **1532**
  Spanish explorer Francisco Pizarro conquers Inca Empire in South America.
- **1557**
  Süleyman the Magnificent completes mosque in Istanbul, Ottoman capital.
- **1604**
  The Golden Temple, chief shrine of the Sikh faith, is built in Amritsar, Punjab.
- **1740-1810**
  Height of the slave trade: 80,000 Africans a year are enslaved and shipped to the Americas.

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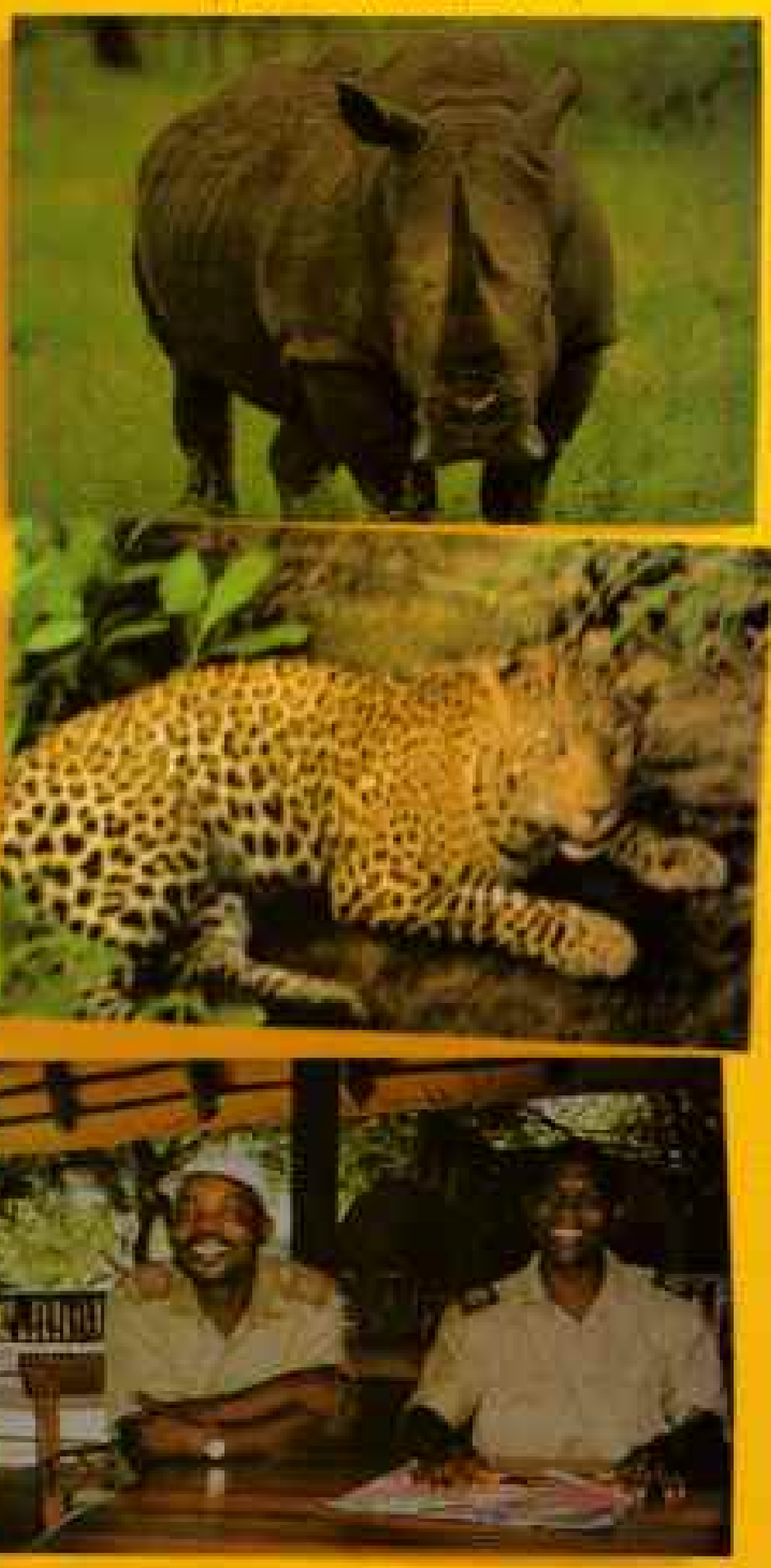
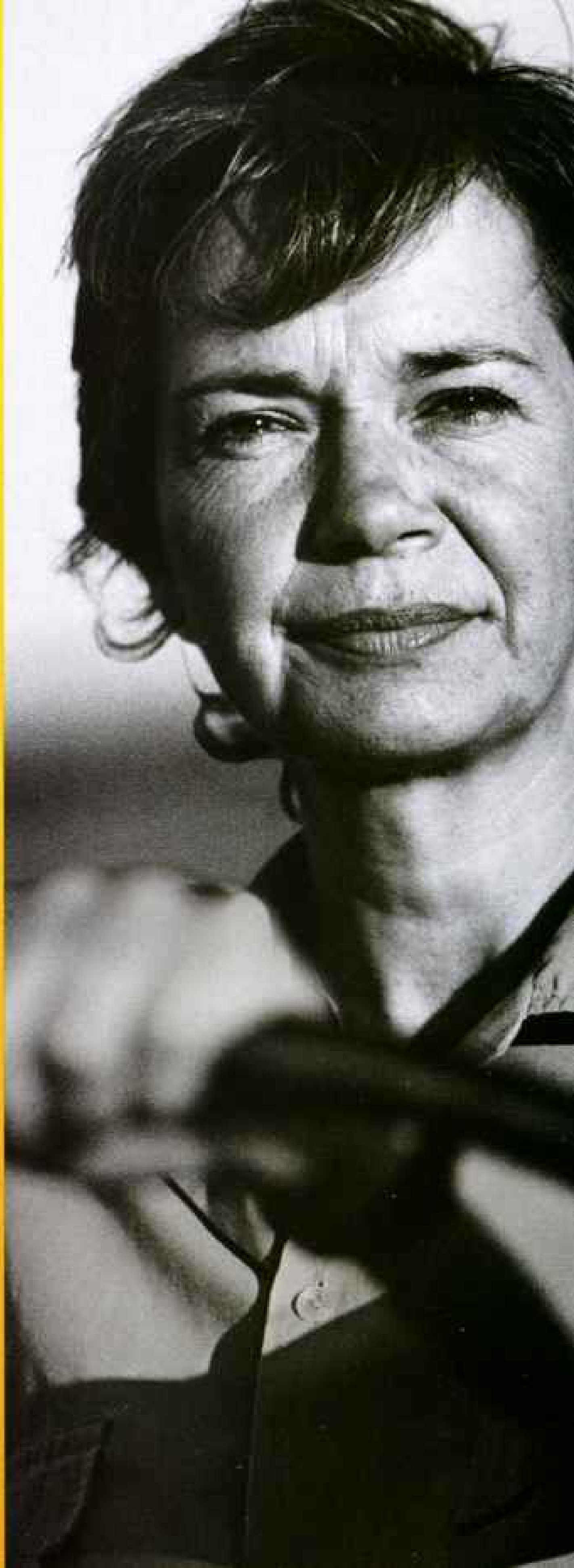
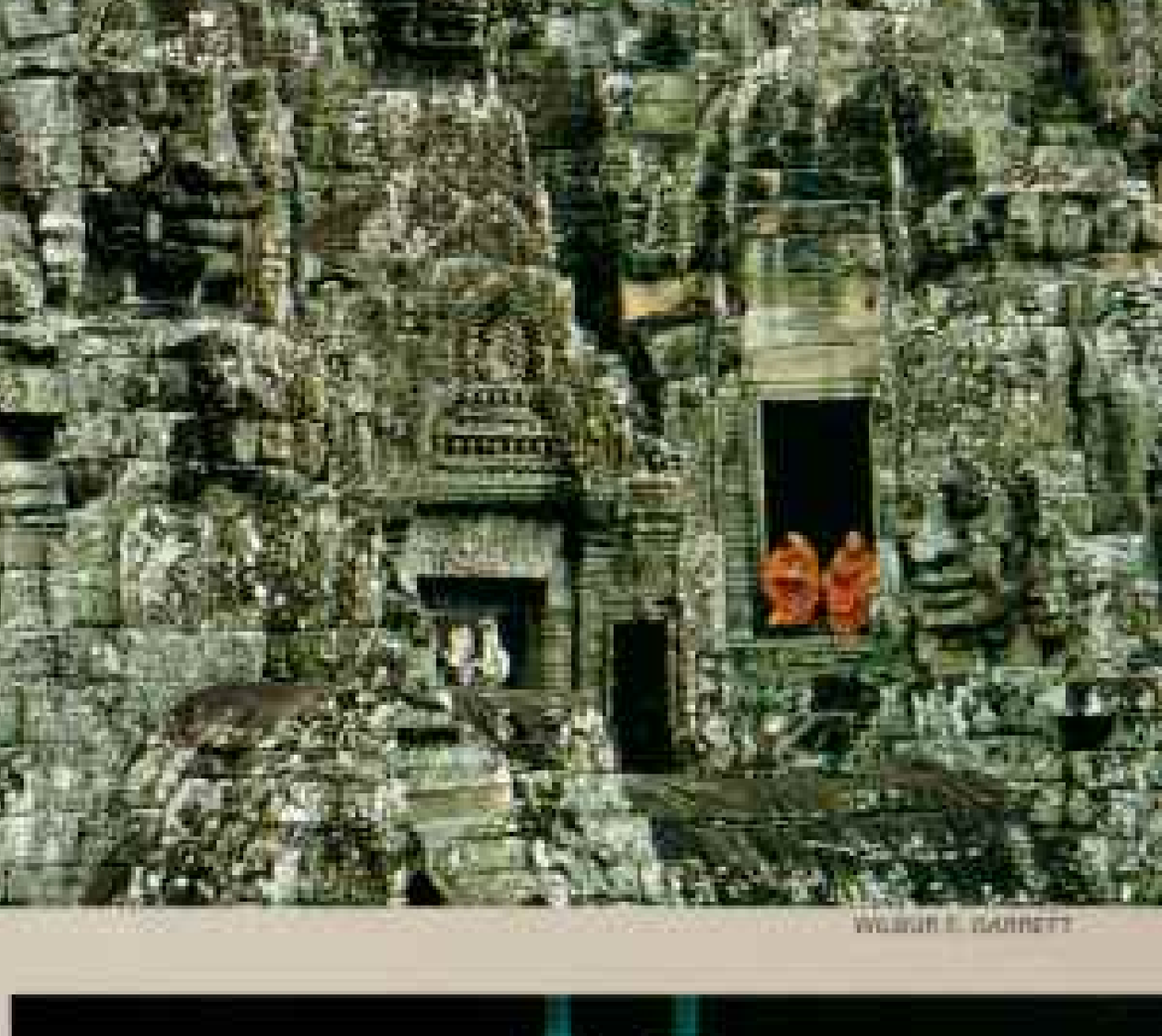




- **1776**
  American colonists proclaim independence from Great Britain.
- **1789**
  French Revolution overthrows King Louis XVI.
- **1810-1830**
  Zulus absorb surrounding tribes into military kingdom in southern Africa.
- **1821**
  Simón Bolívar wins independence from Spain for Venezuela.
- **1914**
  Archduke Franz Ferdinand of Austria is slain; World War I begins.
- **1929**
  U.S. stock market crash is followed by worldwide economic depression.
- **1939**
  German chancellor Adolf Hitler invades Poland, launching World War II.
- **1945**
  U.S. drops atom bombs on Japan, ending WW II. United Nations founded.
- **1957**
  Ghana becomes first sub-Saharan African colony to win independence from European power.
- **1991**
  Soviet Union crumbles.

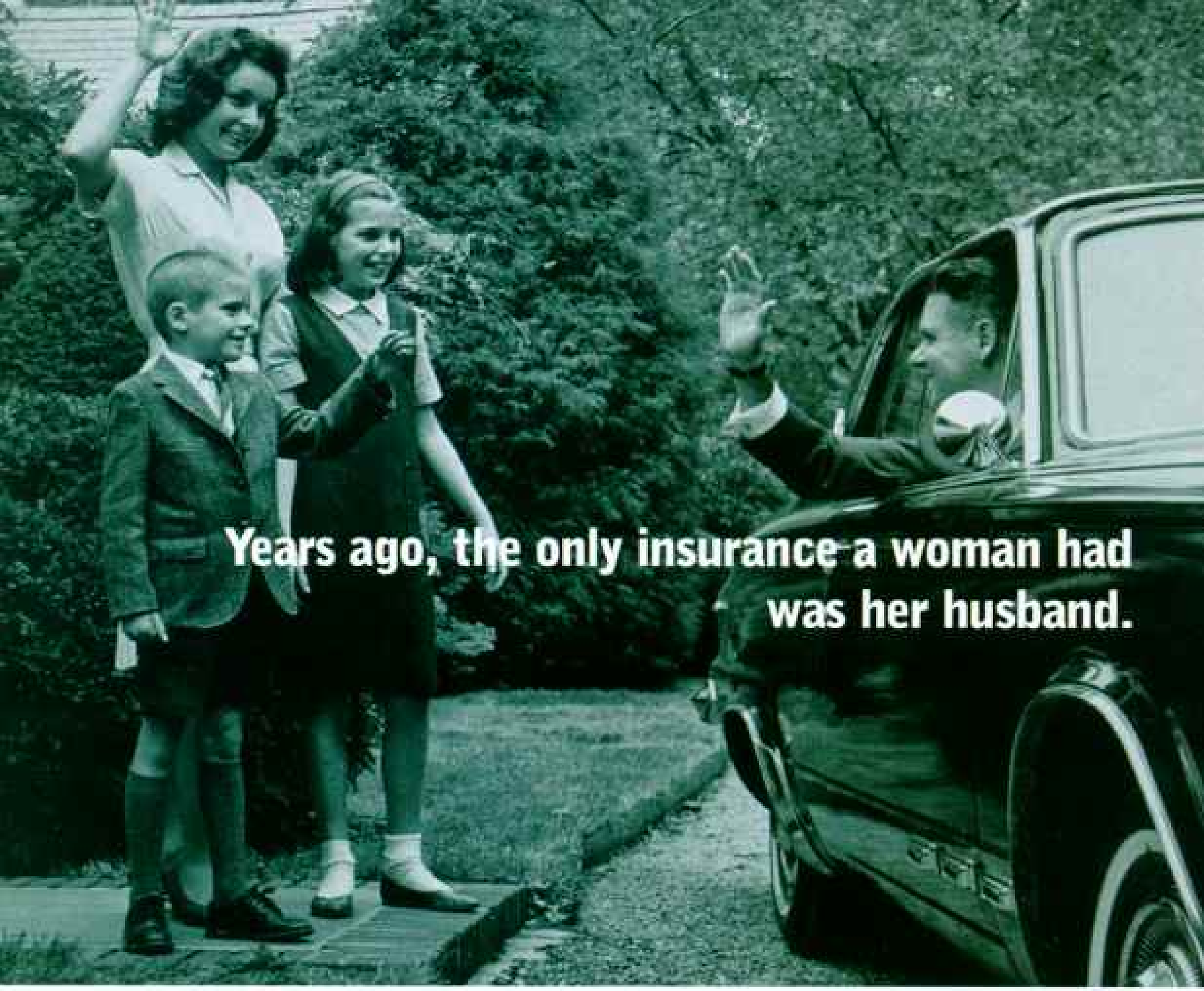
WILBUR E. GARRETT

JOHN SCOFIELD



MICHAEL KENNA

WORSHIP TAKES MANY FORMS
Stony, ghostlike faces of the past surround two Buddhist monks who lend a touch of color to the Bayon (top), most grandiose of the thousand-year-old temples at Angkor, a Cambodian World Heritage complex. The December 1968 photograph highlights a subject to which the magazine often turns—the world's great religions. In an image that appeared in December 1952 a Greek Orthodox priest is bathed in what seems to be holy light at Bethlehem's Church of the Nativity (left), built over the grotto where tradition says Jesus was born. Muslims circle the Kaaba (above) before ending their pilgrimage to Mecca, depicted in the November 1978 GEOGRAPHIC.



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NATIONAL GEOGRAPHIC
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New Breed of Cat

Every once in a while science finds something that scrambles the established order, like this million-year-old saber-toothed cat skull. Until recently only two kinds of saber-toothed cats were known. One—with narrow canine teeth about seven inches long—had short legs and probably ambushed its prey. The other—with broader, four-inch-long canines—had long legs and most likely chased its prey down. But then John Babiarz, an Arizona fossil collector, called paleontologist Larry D. Martin of the University of Kansas. Babiarz had obtained a skeleton of a cat found in a Florida sinkhole littered with the bones of ancient pigs.

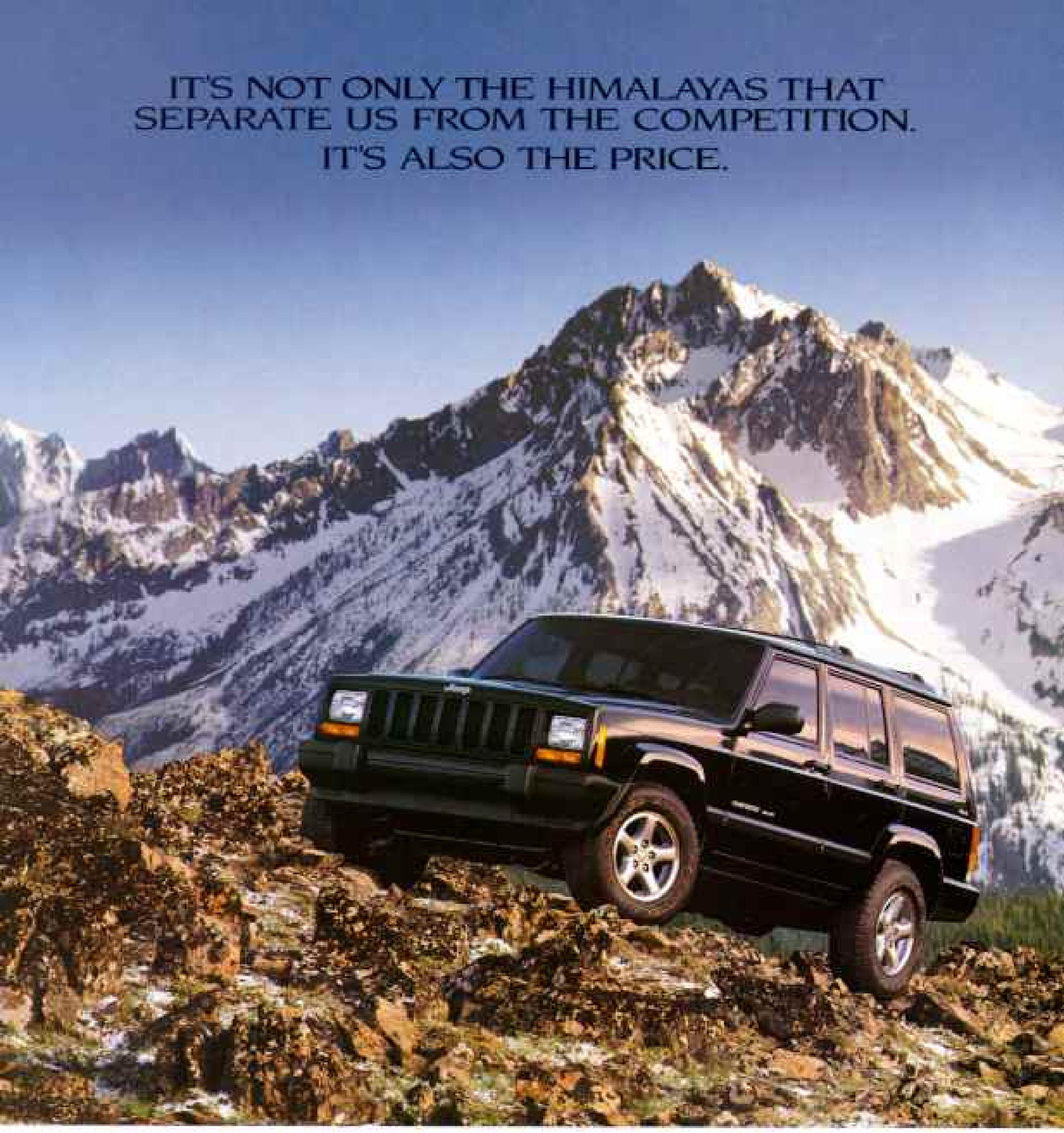
"When I saw the skull, I thought it was a long-legged cat," Martin says. "But when I saw the short legs, I knew that this was not only a new genus but also a new way to build saber-toothed cats." Martin believes the new variety used the sinkhole as a den. "I think the cats were bringing home pork to their kittens."

JERRY STARK (TOP); MIKE ARNAL

Malaria Ravages the Yanomami

A Yanomami child in Venezuela's upper Orinoco River region (GEOGRAPHIC, April 1998) receives a shot as part of an effort to boost the health of a people plagued by malaria. Some 90 percent of the Yanomami bear signs of past or present infection; each receives more than 16,500 bites a year from malaria-transmitting mosquitoes. Gold miners who bring in new malaria strains worsen the situation, and the Yanomami system of trade and food-gathering helps spread infection, says Carlos Botto of the Amazon Center for the Research and Control of Tropical Diseases, a Venezuelan agency struggling to introduce medicine and mosquito control.

IT'S NOT ONLY THE HIMALAYAS THAT SEPARATE US FROM THE COMPETITION. IT'S ALSO THE PRICE.



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TOM TRIGWER, NASA AMES RESEARCH CENTER

From Kitty Hawk to NASA and Back

Linking two eras, a replica of Orville and Wilbur Wright's flying machine enters the wind tunnel at NASA Ames Research Center in California. Tests of the replica, built by the American Institute of Aeronautics and Astronautics, provide the first full-scale aerodynamic data for the plane that made the first sustained piloted motorized flight. Pilot Fred Culick, a Caltech professor, hopes to take a slightly modified version aloft at Kitty Hawk, North Carolina, on December 17, 2003—the 100th anniversary of the Wrights' conquest of the air.

New Window on Shaker Life

The common image of the Shakers, the utopian religious sect whose heyday came in the mid-19th century (GEOGRAPHIC, September 1989), is of an ascetic group of plain people who exhibited little vanity and shunned the outside world's sinful ways. But excavations at Canterbury Shaker Village in New Hampshire, once a leading Shaker community, paint a different picture. In turn-of-the-century garbage dumps, a Plymouth State College team led by David R. Starbuck unearthed combs, gaudy dishes, and bottles that once held perfume, hair restorer (below), and—most surprisingly—wine, beer, and whiskey.

Starbuck's first dig at a dump near a home used by hired men left the possibility that outsiders brought in the unexpected items. But digging elsewhere yielded similar artifacts. "No one wants to attack the Shakers, but the reality is that they were often part of mainstream America," he says.

TEXT BY BORIS WEINTRAUB

DAVID R. STARBUCK

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NINA SAID

Cultural Mix, Daring Focus

Michelle Yeoh, co-star of the James Bond film *Tomorrow Never Dies*, was the perfect Hollywood actress to work with to create this image for our article on how local cultures are spreading globally. To portray the popularity of Asian actors in Tinseltown, I wanted to convey Michelle's fearlessness and her athletic grace, creating the feeling that she is literally flying over Hollywood. I needed the depth and dimension of a wide-angle lens to encompass the Hollywood sign with Los Angeles behind it. Hence I put both of us on the same helicopter so I could go with a wide field of view and be with her for this dangerous stunt (pages 6-7).

—JOE McNALLY

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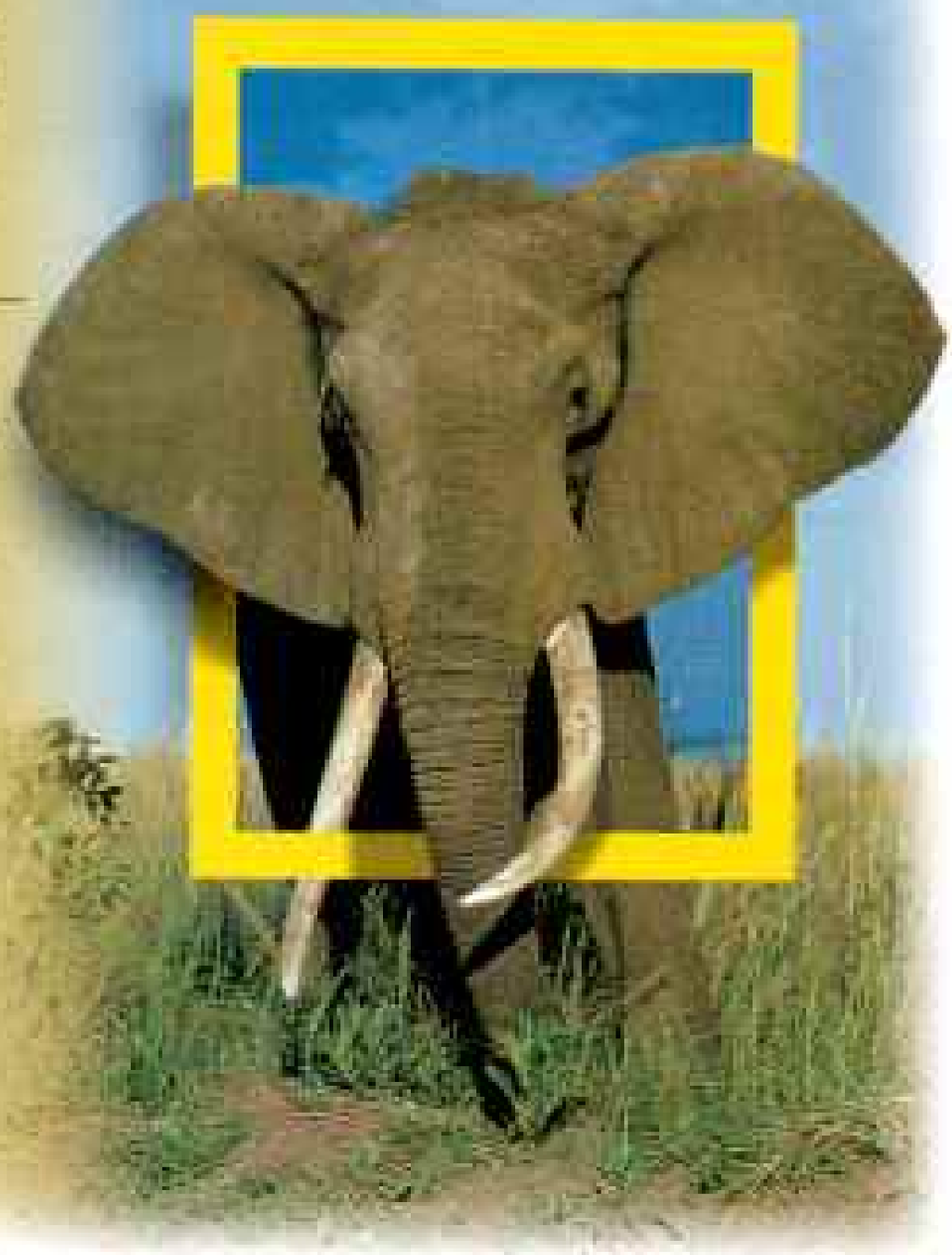

Forum

Many readers of the April 1999 issue wrote of their experiences during the Battle of Midway, featured on our cover. Others reminisced about when they lived in the Texas Hill Country or traveled the blues highway. Said Warren A. Williams, of Santa Ana, California, the writers of those articles "provided a rich understanding of what is best about the human condition."

Galápagos: Paradise in Peril

Recently I read that a Galápagos tortoise captured by Charles Darwin in 1835 and taken back to England for study is still alive and living in the Australia Zoo. It is just mind-boggling to think that she was handled by Darwin.

ANNETTE DORMAN
Wendell, North Carolina

Regarding the photograph on pages 8-9, even minor road improvements can make a huge change in the way people live. There are very good reasons for paving roads, and some of them are actually health reasons. Less standing water, fewer mosquitoes. We've fought mud in this country, and we've done a good job at it. I don't see any reason why people in other countries can't fight the same fight.

KIERNAN HOLLIDAY
Juneau, Alaska

Benevolent ecologists and conservation stewards should be commended for their preservation endeavors on the Galápagos Islands. However, the barbaric slaughter of 200,000 feral goats is an atrocity. Settlers introduced the goats. Invariably other species pay the lethal consequences of human folly.

BRIEN COMERFORD
Glenview, Illinois

The image on pages 18-19 of a hunter with two dead goats leaves out the impact of the feral animals on the giant tortoise population. If the photographer had shown a tortoise baked to death within its carapace (because the goats have eaten all the vegetation under which the tortoise once found shade), the article would have shown both sides of the issue.

JACK STEIN GROVE
Tavernier, Florida

I was privileged to visit the Galápagos on three occasions during the time I lived in Ecuador, from 1986 to 1989. The unforgettable highlight was the opportunity to snorkel and swim with the sea lions in the small bay at Santa Fe Island. Your article mentions them toying underwater with the iguanas, but I found they had just as much fun toying with me! They loved doing their twists and turns all over, under, and around me. I was surprised and even a bit unnerved when I felt a small, gentle nibble on the back of my leg. That curious sea lion wanted to know what I was made of.

JON L. HILL
Provo, Utah

Traveling the Blues Highway

There is only one way to tell a story, and Mr. Cobb demonstrates this well when he lets the Delta language shine through. His accuracy concerning the historical lyrics of blues music is reflected in hundreds of slave narratives. Thank you, Mr. Cobb, for an excellent article, and tell Mama Rene not to worry, we "young whites" are richer in soul because of her culture.

NANCY MCGILL
Omaha, Nebraska

Your April 1999 editorial asks: "How do you evoke in words and pictures something as ethereal . . . as music?" But the article never addresses what blues music sounds like. An odd musical feature of the blues: The slow instrumental beat is steady, but the vocal delivery quite unsteady against it.

JOHN BECKWITH
Toronto, Ontario

Your article provided a great road map (or river map) of our country's enduring musical legacy. Mr. Cobb took on the formidable task of gaining insight into this earthly music through words and the spectral images of the blues' turbulent past. It reminds me of the phrase "talking about music is like whistling about chickens," conjuring the difficulty in articulating this sublime and potent art form.

SEAN HICKEY
Cliffside Park, New Jersey

In 1994 my life took a rocket slide to hell, and I made a pretty good try at drinking myself to death. One bitter cold night I wandered into an old biker bar on the north side of Sacramento. My only want in life was more whiskey. After a while I had to lean over to the guy sitting next to me and ask, "What kind of crazy music is the band playing?" He looked at me like I was from Mars and said, "That's the blues!" I replied, "Whatever it is, it won't leave my soul alone." I've been chasing the blues ever since.

JOE "BLUES ANIMAL" STEPHAN
Avila Beach, California

Journey to the Copper Age

The ancient warrior depicted on page 76 has his nocked arrow on the wrong side of the bow. Bad as that may be for his chances of a good shot, when he reaches for another arrow from his quiver, he'll be chagrined to find he's slung it over the wrong shoulder. We'll hope our warrior's only at Monday morning target practice.

STAN SHIMER
Toms River, New Jersey

We based the archer's pose on a Sumerian stela from 3000 B.C. Ancient archers of the Middle East often used

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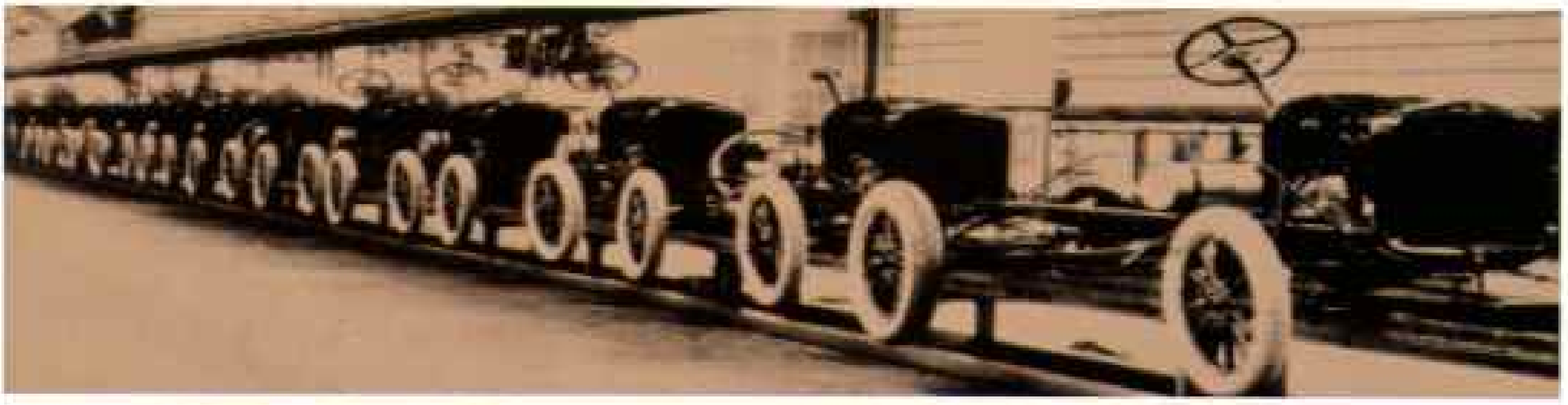

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this position, with the arrow on the right side of the bow. However, we goofed on the quiver.

The Battle of Midway

Congratulations on your article. Indeed, history is the story of ordinary people doing extraordinary things. Your coverage speaks vividly to the darkness war casts over the soul and to the very human capacity to heal.

TOM BRANNON
Gulf Breeze, Florida

It is true that the Japanese Imperial Navy lost the Battle of Midway because of "the incredible performance of U.S. code breakers." I was drafted into the Imperial Navy while I was a university student in Tokyo, and after a year's hard training I was attached to a code-breaking team. It was successful in decoding some aircraft codes but failed to break the U.S. Navy's strip ciphers, which were used in transmitting top-secret messages. I later heard that a mathematics professor of the Japanese Naval Staff College theoretically proved that strip ciphers were unbreakable.

MITSUHARU ITO
Tokyo, Japan

Of all the pilots who fought and died during the battle of Midway, only one, Marine Capt. Richard Fleming, was awarded the Medal of Honor. On June 5, 1942, he led his squadron of dive-bombers in an attack against the Japanese cruisers *Mikuma* and *Mogami*. His plane was hit shortly after it began its dive, and at 350 feet Fleming released his bombs and then followed them down. No one knows if his action was intentional, but the plane crashed directly into the *Mikuma*. The remains of his plane are scattered over the aft gun of the *Mikuma*, as seen in the photograph on page 89.

NORMAN J. DEPTULA
Webster, Massachusetts

I would like to add some detail to the detection of the Japanese fleet by PBY flying boats on June 3, 1942. As your article states, it is true that PBY pilot Ens. Jack Reid was first to discover the main body of the fleet, but he was not the first PBY pilot to make contact with approaching Japanese vessels. My uncle, Lt. James P. O. Lyle, flying the southwest sector in his PBY, spotted two small gray patrol boats steaming toward Midway. He investigated, got a burst of antiaircraft fire, and flashed the first report of contact with enemy ships at 9:04 a.m. It was not until 21 minutes later that Ensign Reid flashed his contact report: "Main Body." During the waning days of the war in 1945, Lieutenant Lyle was killed when his Martin Mariner flying boat lost power on takeoff and crashed into San Diego Bay.

GEORGE B. LYLE
Mission Viejo, California

Thomas B. Allen states on page 103 that "the Japanese Navy would never again launch an offensive." If he is referring to the type of offensive designed to win a war, a case can be made in support of his statement. However, the Japanese Navy undertook numerous offensive actions after Midway. The action at Leyte stands out particularly.

AARON A. KRISS
Westminster, Colorado

The fierce fighting at Leyte was precipitated by a U.S. offensive on the Japanese-occupied Philippine island.

Texas Hill Country

Thank you for the wonderful article on the Texas Hill Country. I was born there and still have Guadalupe River water and limestone cliffs in my blood.

LOU REIDEL
Fallbrook, California

The Texas Hill Country isn't best represented by old pickups, a young man readying himself to ride the rodeo, a fair, a pen of Angora goats, or a catfish destined for the frying pan. The Hill Country is magnificent views from the top of Enchanted Rock. It's a drive down canyon roads where blocks of jagged limestone rise up steep walls and the deep green of thick brush accents the scene.

CAREY W. TEMPLETON
Rosharon, Texas

Your magazine has been a much appreciated part of my life for over 60 years. However, no article has thrilled me as did "Texas Hill Country." John Graves and Vincent Musi captured the essence, the heart of what is most meaningful about the Hill Country.

THOMAS C. PALMER
Fort Worth, Texas

In the sixties my college buddy and I helped his cousin, Robin Giles, with some roundup work at the Comfort Ranch. Mohair prices were not great even then. Robin had the deer hunting leased to a corn-chip manufacturer out of Dallas. The previous season a top executive non-Texan had shot an Angora billy goat "trophy." The other hunters, not wanting to embarrass the boss, offered Robin $50 to keep quiet. He told them for that price per head, the guy could have all the "trophies" he wanted.

JOHN BOTTER
San Antonio, Texas

Letters for FORUM should be sent to National Geographic Magazine, PO Box 98198, Washington, DC 20090-8198, or by fax to 202-828-5460, or via the Internet to ngsforum@nationalgeographic.com. Include name, address, and daytime telephone. Letters may be edited for clarity and space.

OnScreen

■ NGT EXPLORER

EXPLORER's Moving—and Packing Some Friends

Corralling a parcel of snakes is all in a day's work for our EXPLORER field specialist, herpetologist Brady Barr (above), as he prepares for EXPLORER's move this September to CNBC. Draped with slithering snakes for this photograph—including pythons, boa constrictors, king snakes, and milk snakes—Barr, who has studied reptiles and amphibians since childhood, claims, "I was in heaven. I just had to make sure they didn't eat each other.

"I go to schools all the time, and I try to show people that snakes are not evil creatures. They're beneficial to the planet. It's OK to be afraid of them, but we shouldn't harm them."

Earlier this year on EXPLORER Barr got up close and personal with enormous saltwater crocodiles in Australia and deadly fer-de-lance snakes in Costa Rica. In the coming season he will go on a hunt with snake catchers in Burma who track some of the country's deadliest reptiles. There promises to be no shortage of snakes in Barr's future.

JIM VECCHIONE

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(The name comes from

the American word that means,

"Bright Idea.")

CHEVY SUBURBAN LIKE A ROCK

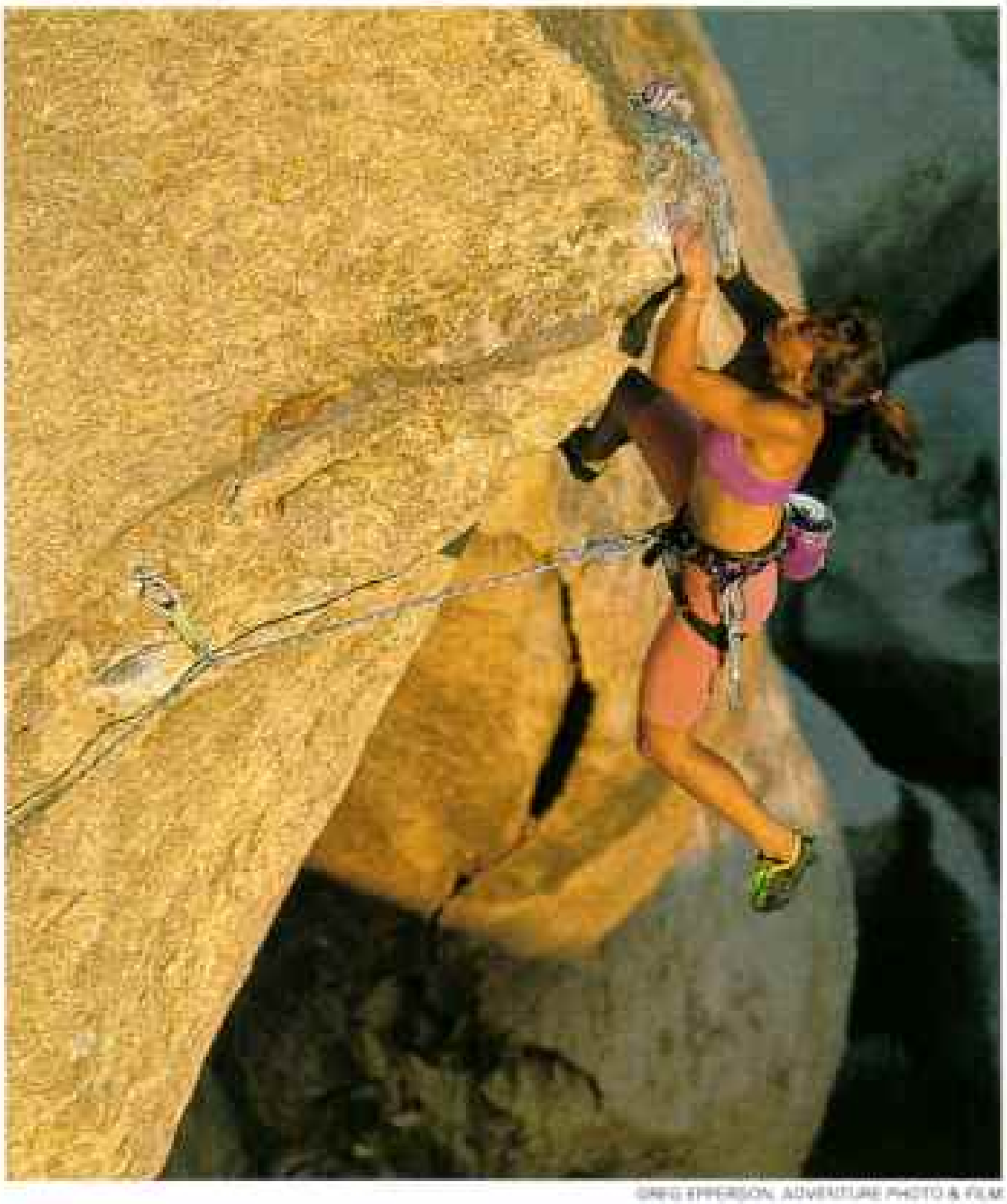
NATIONAL GEOGRAPHIC

EarthAlmanac

Nuts and Bolts of a Climbing Compromise

With 5,000 climbing routes, such as Double Dogleg and Walk on the Wild Side, California's Joshua Tree National Park attracts about 140,000 enthusiasts a year to test their skill on granite boulders. But some visitors view their metal bolts as defacements hammered into rocks.

New and replacement bolts had been temporarily prohibited in park wilderness areas since 1993. Last year, after park officials proposed banning all bolts permanently, climbers sent them a loud message. "We had 1,200 responses, so we went back and revised our thinking," says assistant superintendent Mary Risser. A plan expected to be issued soon will allow climbers to replace worn bolts—safety hazards—in non-wilderness areas. In wilderness new bolts will require a permit and will have to be camouflaged, and some existing bolts may have to be removed.



GREG EPPERSON, ADVENTURE PHOTO & FILM

Everything's Fair Game for New Zealand's Keas

The insatiable curiosity of New Zealand mountain parrots, called keas, has led to warnings for visitors in national parks like Westland (below). Keas "try to eat almost everything, and they practice manic play and exploration," says zoologist Judy Diamond, who studies the birds with her husband, Alan Bond, aided in part by National Geographic research grants. Cars often have rubber moldings removed (above), windshield wipers ripped off, and seats and wiring attacked.

JOHN CANCALOSI (ABOVE RIGHT); CLYDE H. SMITH; PETER ARNOLD

Keas sometimes feed on sheep carcasses and even wound live sheep—behavior that could spring from old habits. The parrots may have once scavenged carcasses of giant flightless moas, birds that became extinct before ranchers imported sheep around 1840. Bounty hunters killed 150,000 keas before they gained full protection in 1986. Only about 3,000 remain. Authorities relocate keas if they harass sheep.

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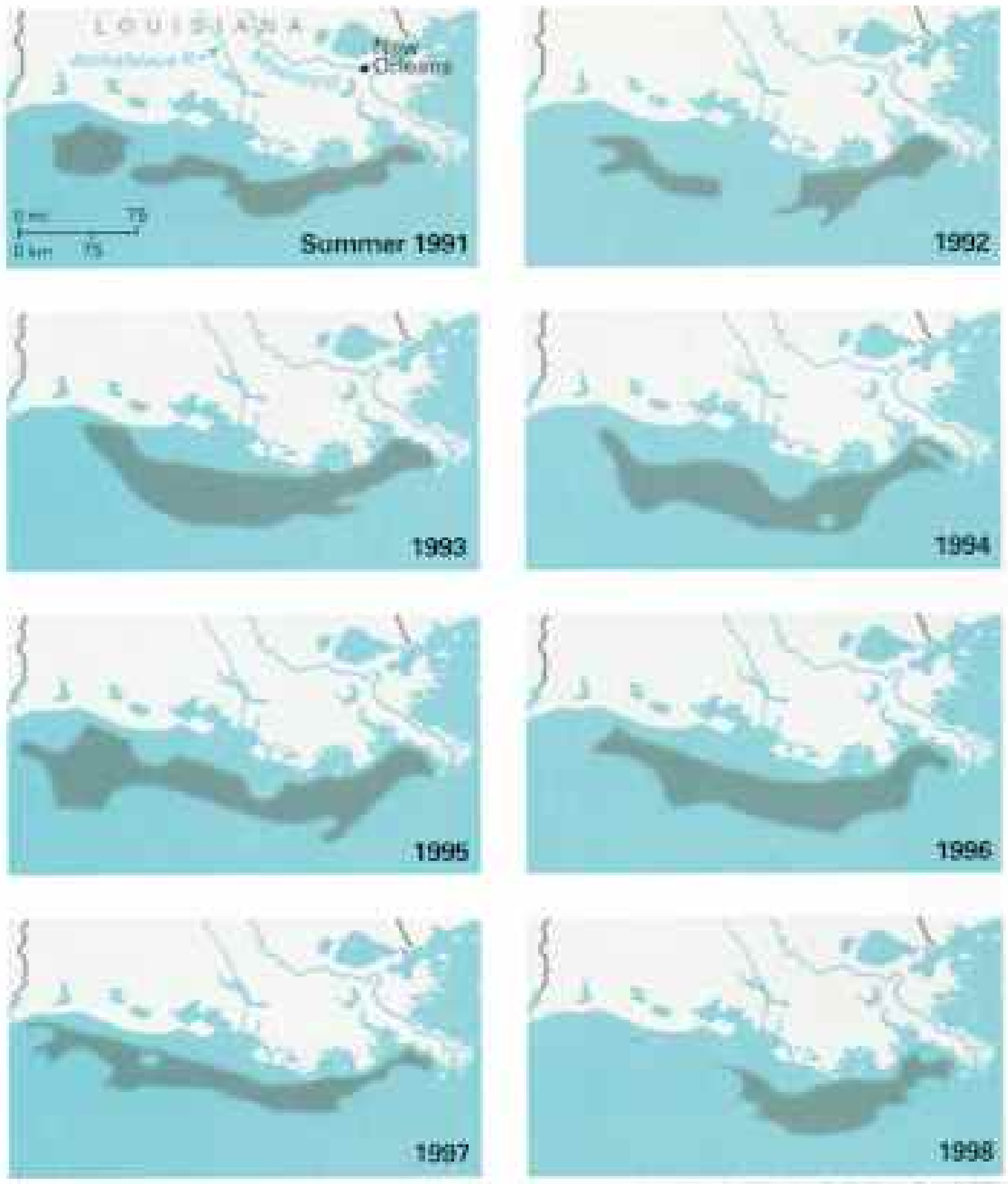
"Dead Zone" Choking Gulf of Mexico's Life

The Mississippi River Valley exacts a toll for its agricultural bounty. In its runoff flows some of the seven million tons of fertilizer used in the valley annually. Spring rains and snowmelt deliver it to the Mississippi's mouth and into the Gulf. Nitrogen-fed algae create vast blooms that deplete so much oxygen in deep Gulf waters that nothing can live there—a condition called hypoxia. This dead zone can cover 7,000 square miles. Flood or drought can change its size and shape.

"Fish and shrimp can avoid the zone, but it kills bottom life like clams, starfish, snails, and worms," says Nancy Rabalais of the Louisiana Universities Marine Consortium. The shrimp have dispersed and become harder and more expensive to find. Rabalais advocates reducing nitrogen levels and restoring natural systems such as wetlands.



NG MAPS, SOURCE: NANCY RABALAIS, LUMCON

A Real Fish Story—on Ice

"Hey, you didn't throw out that blue pike, did you?" Jim Anthony always kidded his wife when she defrosted their freezer in Conneaut, Ohio. He caught his fish in Lake Erie in 1962 and saved it because the species was already rare. The blue pike was declared extinct in 1975 due to pollution and overfishing. Scientists hoped that Jim's "blue pike" might prove to be genetically identical to bluish fish reported in other northern lakes and that those fish could be used to restock Lake Erie. But recent DNA tests by Case Western Reserve University biologist Carol Stepien suggest that the frozen fish was a walleye–blue pike hybrid—bad news for blues.

TEXT BY JOHN L. ELIOT

LYNN ISCHAY RIDDLE AND JOHN KUNTZ, BOTH CLEVELAND PLAIN DEALER

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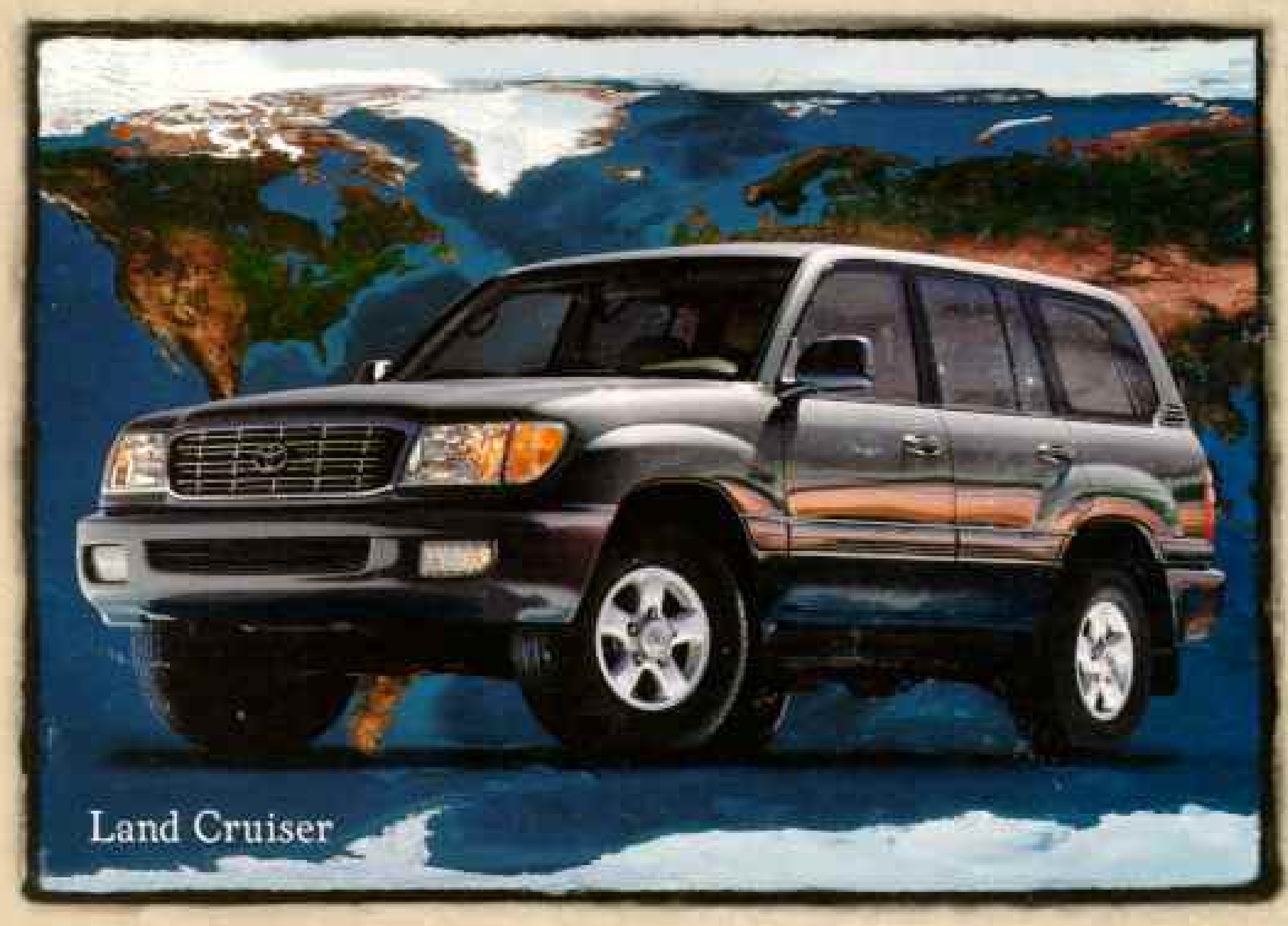

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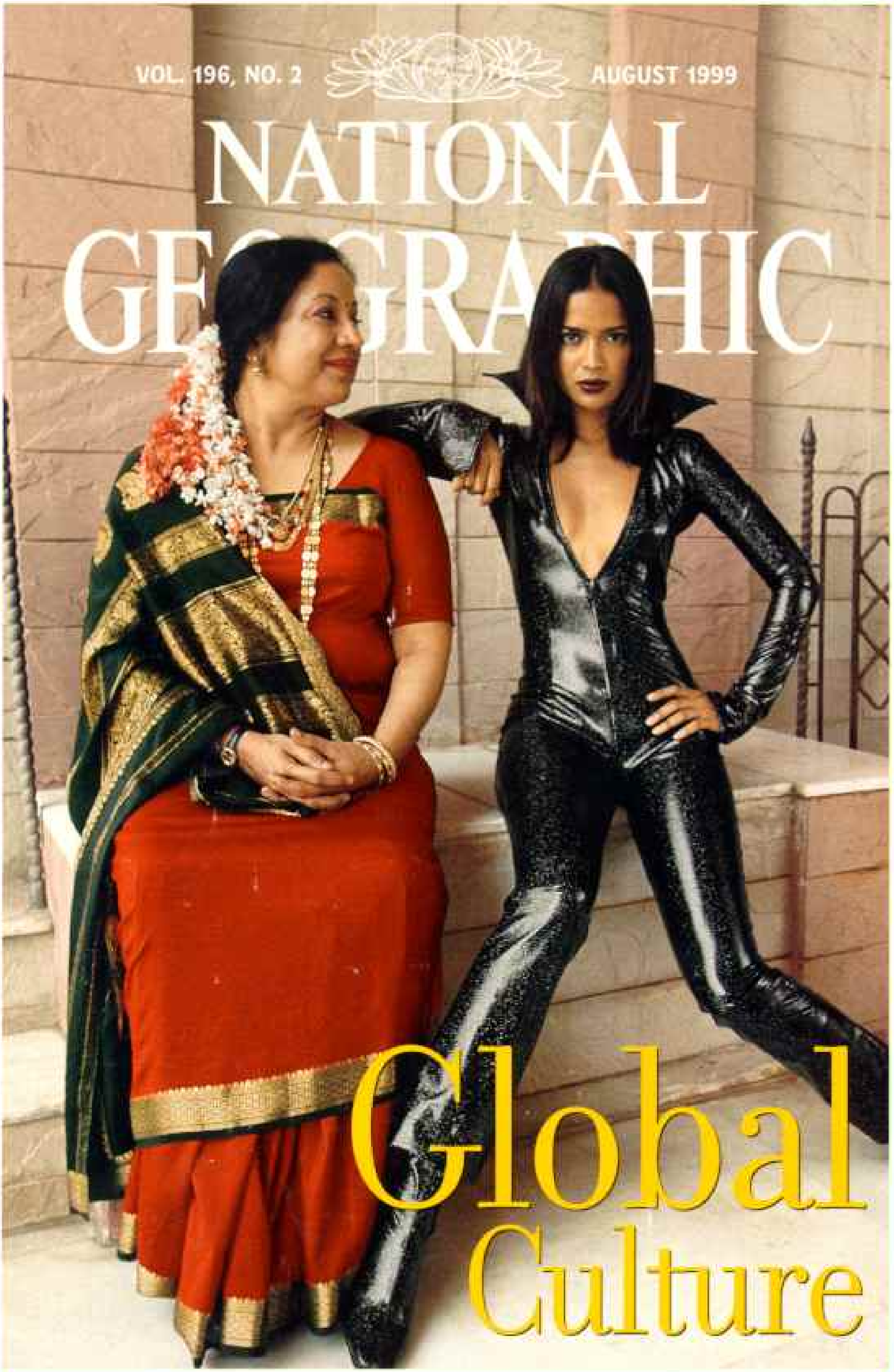

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■ FROM THE GEOGRAPHIC ARCHIVES

Inflammatory

Words turned to ashes on May 10, 1933, when German students torched "un-German" writings looted from libraries and bookstores across the country. Some 40,000 people gathered on Berlin's Opernplatz that night to hear Nazi propaganda minister Joseph Goebbels speak. "Even if this young generation has been impoverished materially, it has profited spiritually," he told the crowd as it cheered at the flaming of the books, which included works by Einstein, Hemingway, and Helen Keller. "See these flames not only as a symbol of the end of an old epoch, but also as the beginning of a new one."

Goebbels himself knew well the power of the printed word; before the book burning he ordered German news organizations to downplay the event.

This photograph has never before been published in the magazine.

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BARBARA EMMEL WOLINSKY

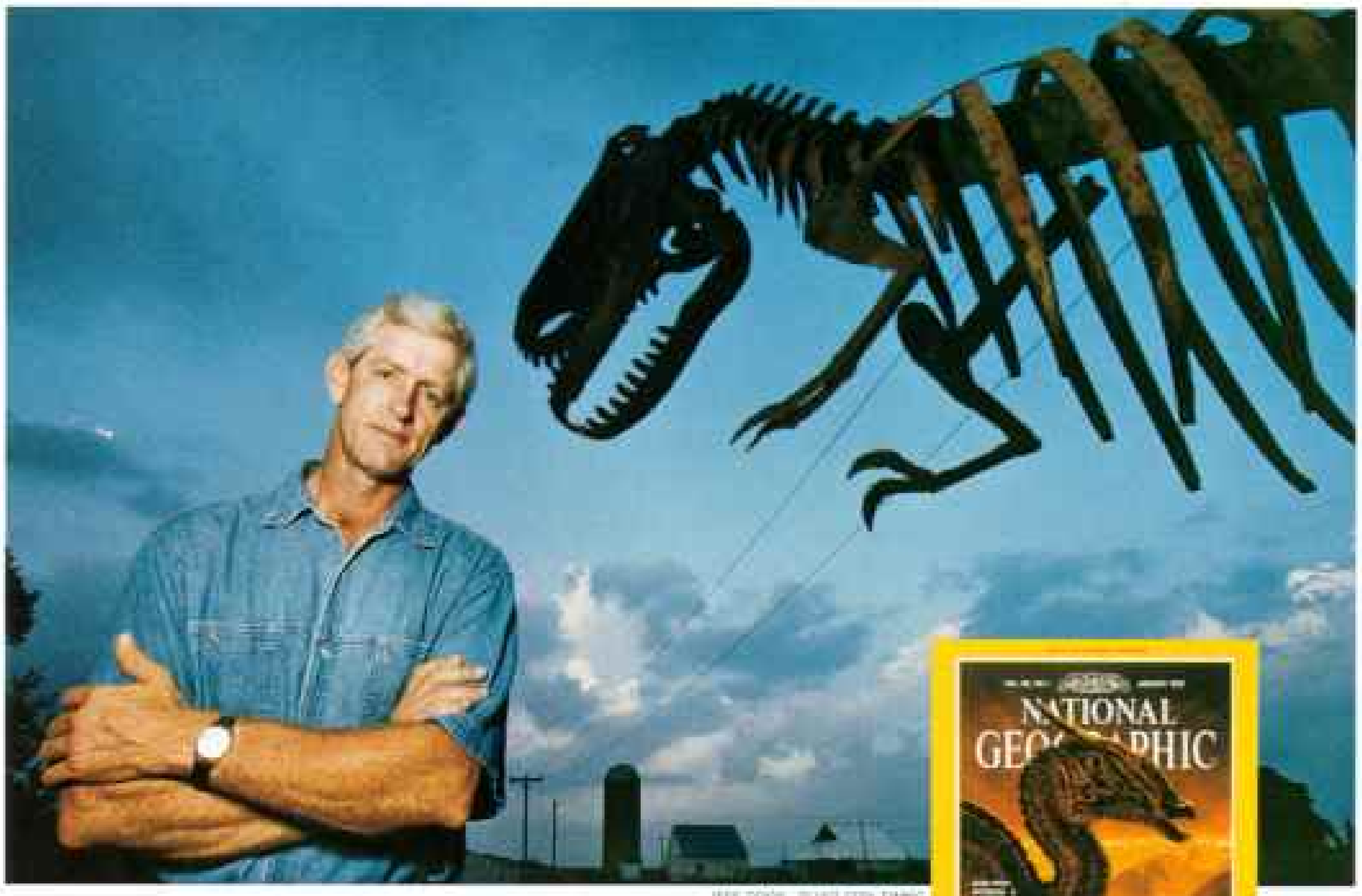
Picturing the Words

While contemplating a statue of Ramses II in a dimly lit corner of the Egyptian Museum of Cairo, all the mind-numbing explanations I had read about Egyptian hieroglyphs suddenly clicked. The sculpture contained visual symbols, some having phonetic values in the Egyptian language. Wondering if it would work in English, I wrote a sentence that could be interpreted entirely in images. My model patiently posed for two eight-hour sessions as I photographed the scene in small sections—an eye, a toe, a few inches of wall at a time. An inexpensive one-hour processor developed the 77 rolls of film. In my hotel room I tiptoed among 2,772 small prints to select the 400 that make up the four-by-six-foot photomontage on pages 111-12.

—CARY WOLINSKY

NATIONAL GEOGRAPHIC

Behind the Scenes

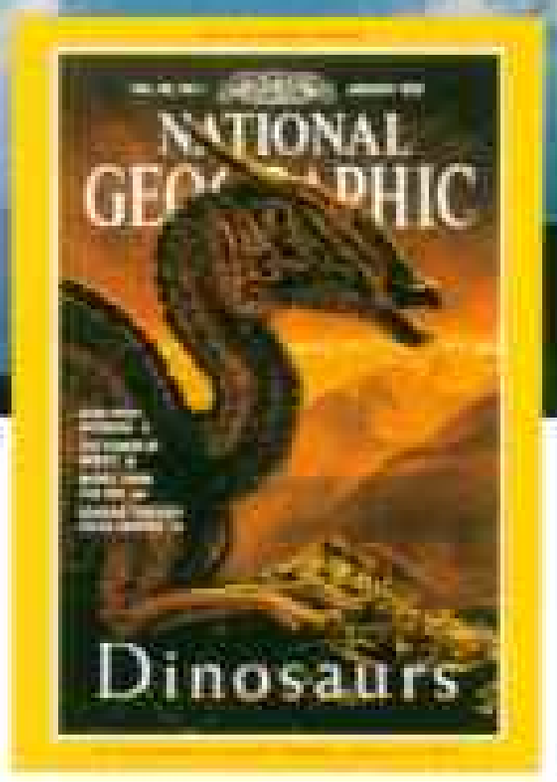


JEFF COOK, QUAD-CITY TIMES

His Jurassic Spark

Millions of years ago *Tyrannosaurus rex* stalked North America. Now he's back. Farmer—and artist—Chad Randall of Alexis, Illinois, turned to the January 1993 GEOGRAPHIC to help design the life-size scrap-metal dinosaur sculpture he named Rusty Rex. He paged through the magazine to calculate the size of his dinosaur and figure out its anatomy. It took a year of spare-time work to finish.

"I don't consider myself an expert welder," says Chad, who had used his cutting torch only for farm repairs before crafting the creature. "But I've always been interested in making things. I knew I wanted pieces from a hay bale feeder for Rusty's ribs. I used an old cabinet for his



head, and I put tractor weights on his feet to keep him steady."

It worked; the dino even survived a tornado last summer that uprooted a few of the Randall family farm's century-old oaks.

Don't Tell Him to Break a Leg

Making the film *Savage Mountains* proved to be a wild time for David Hamlin, the EXPLORER TV producer covering climber Heidi Howkins's K2 summit attempt last August. While he hiked along the slippery shale on Pakistan's Baltoro Glacier, "my leg went one way and my body went another," says David. The tumble ripped the cartilage of his knee, which then locked into a bent position. Packing glacial ice onto his leg to numb the pain and using trekking poles as crutches, David waited while expedition members improvised a stretcher (right) to hoist him above their shoulders for the torturous 12-hour journey to the K2 base camp. Luckily, a Pakistani Army helicopter was in the area to retrieve a stranded hiker, and it touched down to pick up David too. Even in pain, he was still on the job. "I shot great aerials from the rescue helicopter. It was some of my best footage!"

David's injury didn't sideline him for long. He returned to the U.S. to see an orthopedist, had a cast put on his leg, and was back on a plane—to shoot a different EXPLORER show in Iceland—within 20 hours.

This past spring David returned to K2 to follow Heidi Howkins on more daring climbs. He came home with all bones intact.

DAVID HAMLIN

BILL STOCKER

Geo Olympiad

This month in Toronto a team of finalists from the United States National Geography Bee go up against the best geography students in the world at the International Geography Olympiad. Eleven countries will compete for gold, silver, and bronze medals at the biennial competition.

Botanical Garden's Raven Flies to Society

Peter H. Raven has been named chairman of the Society's Committee for Research and Exploration. A CRE member since 1982, he will hold the new post while continuing as director of the Missouri Botanical Garden in St. Louis. Environmental issues will be a major focus of Dr. Raven's CRE work. "I'm interested in bringing conservation ideas into the future," he says. Raven was born in China, grew up in northern California, and has always been fascinated by plants and biogeography. He taught at Stanford University before going to Missouri in 1971. Raven is also a member of the President's Committee of Advisors on Science and Technology.

TEXT BY MAGGIE ZACKOWITZ

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■ ONLINE

Noah's Flood: Science Beneath the Surface

You may have read this: "And the waters prevailed exceedingly upon the earth; and all the high hills . . . were covered" (Genesis 7:19). You may not have read this: "Swiftly it mounted up; the water reached to the mountains" (Mesopotamian *Epic of Gilgamesh*). Spurred by recurring Middle Eastern stories of a catastrophic deluge, explorer Robert Ballard is seeking archaeological evidence in the Black Sea off the coast of Turkey. Join the expedition at *www.nationalgeographic.com/blacksea*.

■ Why write? Read "The Power of Writing" and opine online at . . . */ngm/9908*.

■ TRIVIA TREK

What's on Her Mind?

Puzzled by the rebus on pages 111-12 in this issue? The reclining woman is thinking of someone famous, but who is it? Once you've guessed, tell us at . . . */trek*. If you're still stumped, head to . . . */ngm/9908* for the answer.

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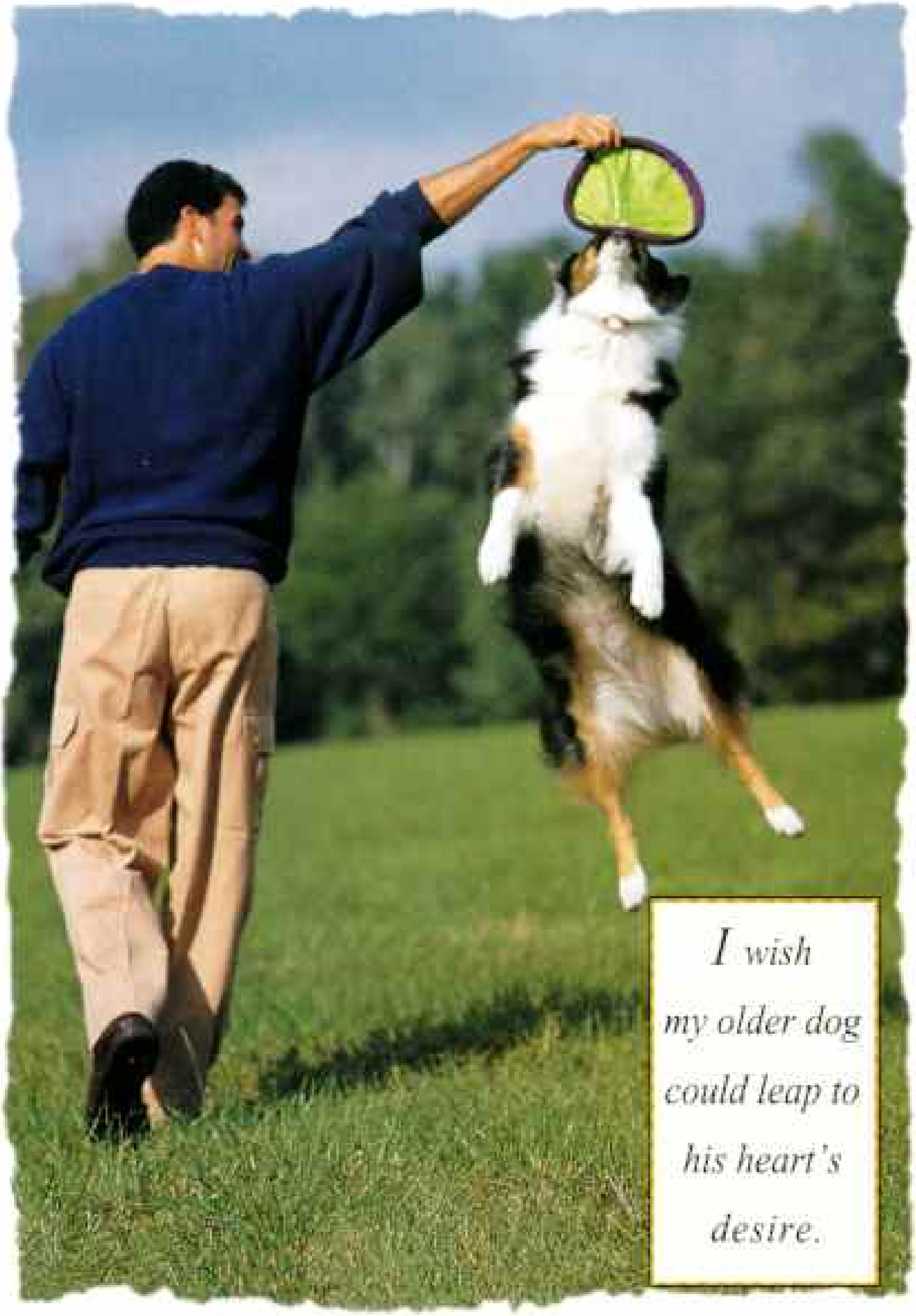

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