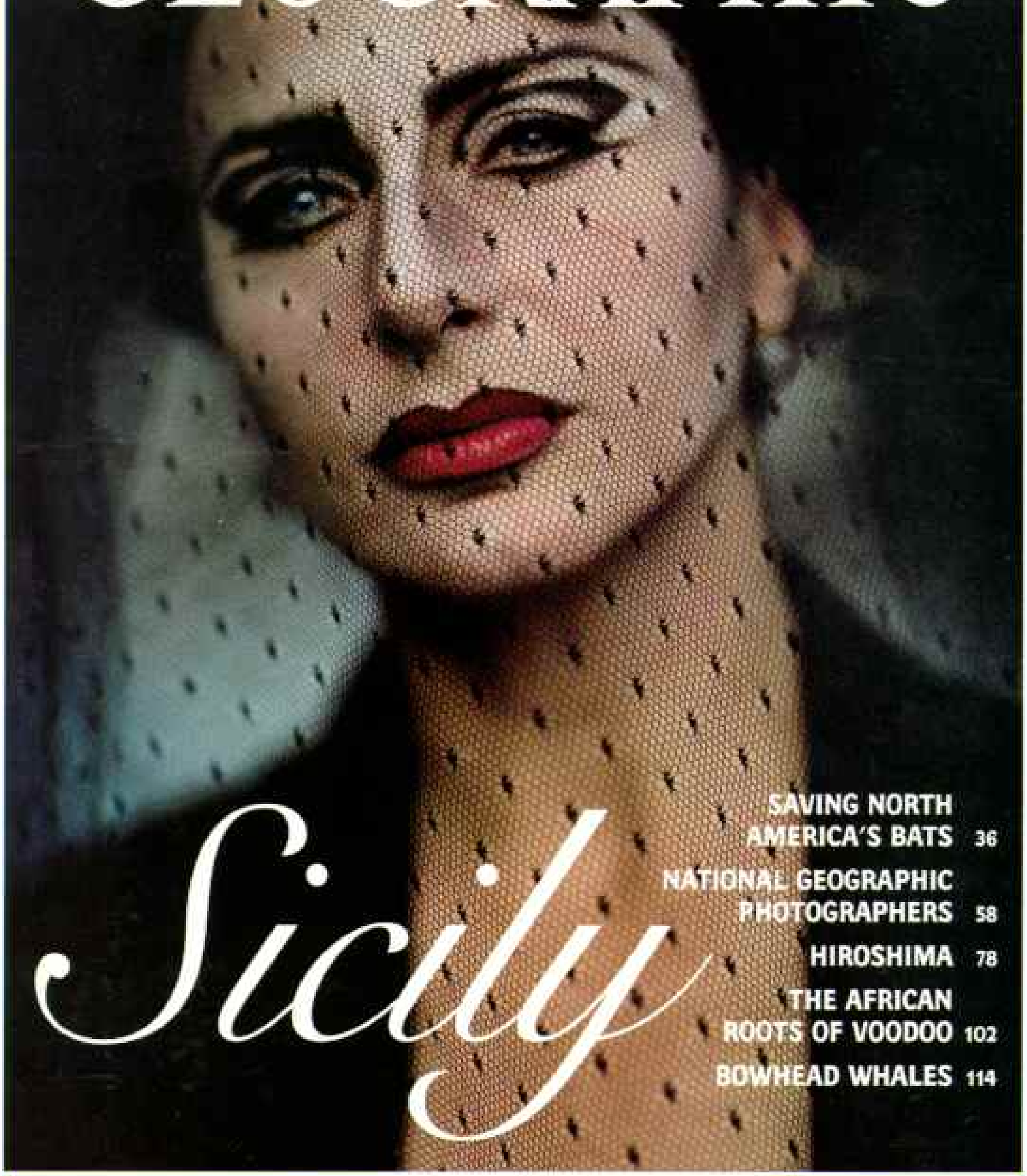
VOL. 188, NO. 2 AUGUST 1995

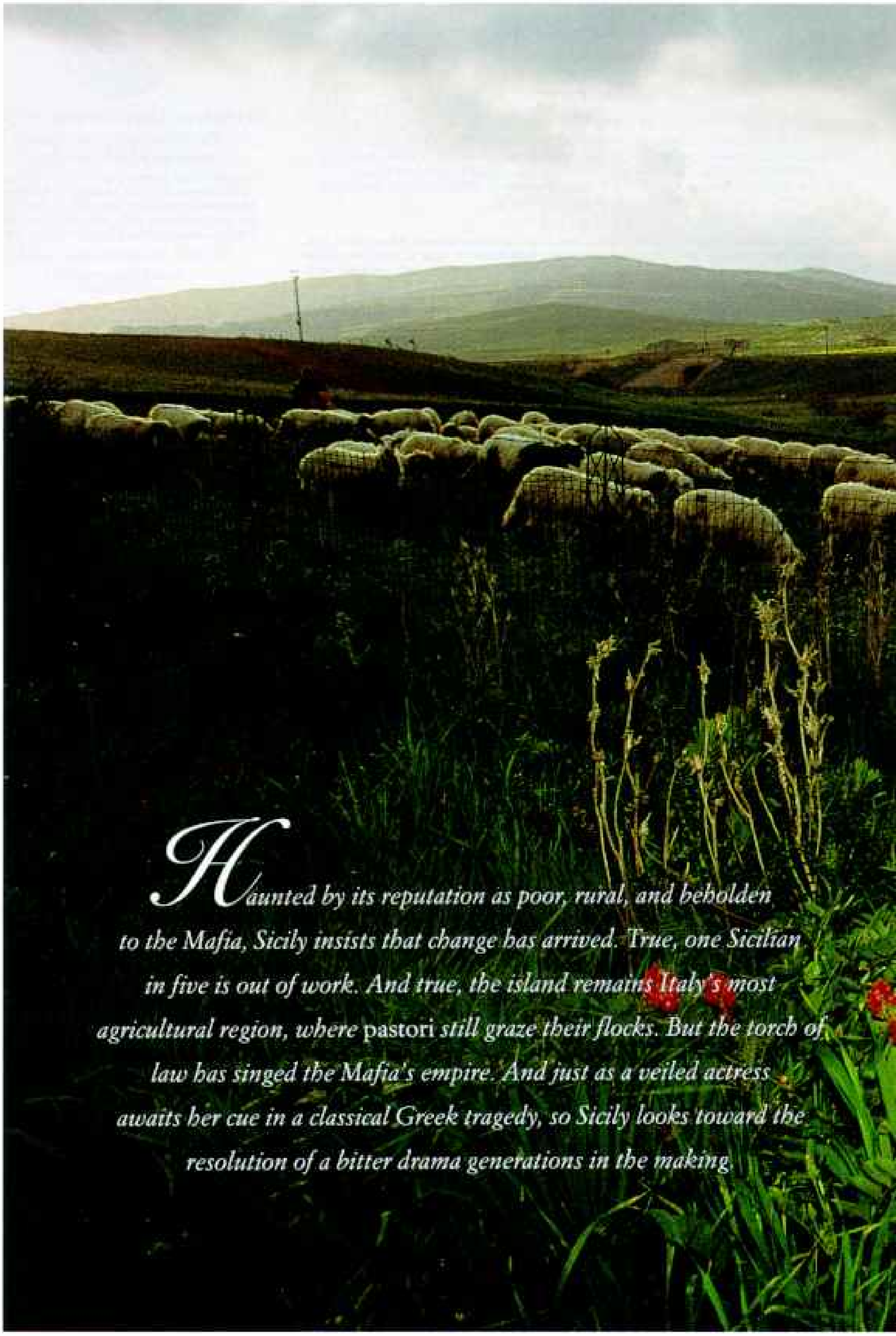
NATIONAL GEOGRAPHIC



Sicily

OFFICIAL JOURNAL OF THE NATIONAL GEOGRAPHIC SOCIETY WASHINGTON, D.C.

NATIONAL GEOGRAPHIC MAGAZINE



Haunted by its reputation as poor, rural, and beholden to the Mafia, Sicily insists that change has arrived. True, one Sicilian in five is out of work. And true, the island remains Italy's most agricultural region, where pastori *still graze their flocks. But the torch of law has singed the Mafia's empire. And just as a veiled actress awaits her cue in a classical Greek tragedy, so Sicily looks toward the resolution of a bitter drama generations in the making.*

Italy Apart

Sicily

By JANE VESSELS
ASSISTANT EDITOR

Photographs by WILLIAM ALBERT ALLARD

Like startled doves, linens and underwear flap in the Mediterranean sun baking old Palermo's rugged Albergheria neighborhood. "We get angry when it rains," says a native Palermitan. "It's an insult, and we take it personally."

ONE CHILLY FEBRUARY MORNING in 1994, Giuseppe Cipriani, the mayor of the western Sicilian town of Corleone, opened his front door. The severed head of a calf gazed up from the doorstep. Corleone has always had a powerful Mafia presence, and the 32-year-old Cipriani, having been elected mayor only two months earlier on a strong anti-Mafia platform, knew that he was supposed to be afraid. But he wasn't afraid. He was angry.

"I told myself, 'I refuse to be intimidated by these people who are trying to terrorize us. I'll show them this system no longer works,' " he recalled. "We are not so impressed by their antics. We have more important things to do."

There has always been important work to be done in Sicily, but for most of history everyone but the Sicilians themselves were in control. Large, fertile, and at the center of the Mediterranean, Sicily has invariably been somebody else's prize or, as one man put it to me, "the cradle of invasion." About the size of Vermont, it was first overrun by the Sicels (an ancient people who left many stone tombs and the root of the island's name) and the Sicans. The Greeks arrived in the eighth century B.C., establishing important colonies whose ruined temples and theaters remain some of the island's great tourist attractions. The Romans made it the first province of their empire. Arabs left a flourishing legacy of crops: oranges, lemons, melons, pistachios, and a new breed of wheat. The Normans contributed castles, cathedrals, and blue-eye genes. Centuries of Spanish and Austrian nobles exploited the island from their palaces in Palermo; the lack of a national government left a void of power that was easy for local strongmen, *mafiosi,* to fill. They were just the last in the long line of conquerors when they took over the island in this century. "And then," one woman told me, "we were colonized by corruption."

Cultivating the rugged terrain, isolated by mountains, at the mercy of earthquakes and volcanic eruptions, Sicilians have long been masters of apathy, fatalism, and distrust. Sicily became part of Italy in 1861 but remained poor and isolated. The combination of exploitation and neglect created a chronic poverty and conservatism that virtually defined the term Sicilian. But now a new emotion has arisen, and Sicilians are redefining themselves. "Anger," said one man bluntly, "is what made people change." Anger at the oppressive hand of the world's most famous crime organization. Anger at corrupt politicians who, as the saying goes here, have "eaten all the money." And more anger at revelations of the links between the Mafia and politicians throughout Italy, which contributed to the election last year of a new national government. "It's not that we hadn't suspected it," said one Sicilian of the scandal. "But even we were shocked at the extent of it."

Anti-Mafia feeling began to build in the early 1980s, and modest demonstrations across the island were followed by something new: trials and convictions of Mafia members. When two Palermo judges were assassinated in 1992, Sicilians reacted in spontaneous revulsion. In the glare of the publicity, outsiders were astonished to see that Sicily, far from having remained superstitious and backward, had been undergoing great social and economic change. The transformation is

Crowned with thorns and preparing to die, a mournful Christ is escorted through the streets of Marsala on Holy Thursday. Dozens of Sicilian towns stage elaborate pageants during Holy Week. Marsala's dates from the 17th

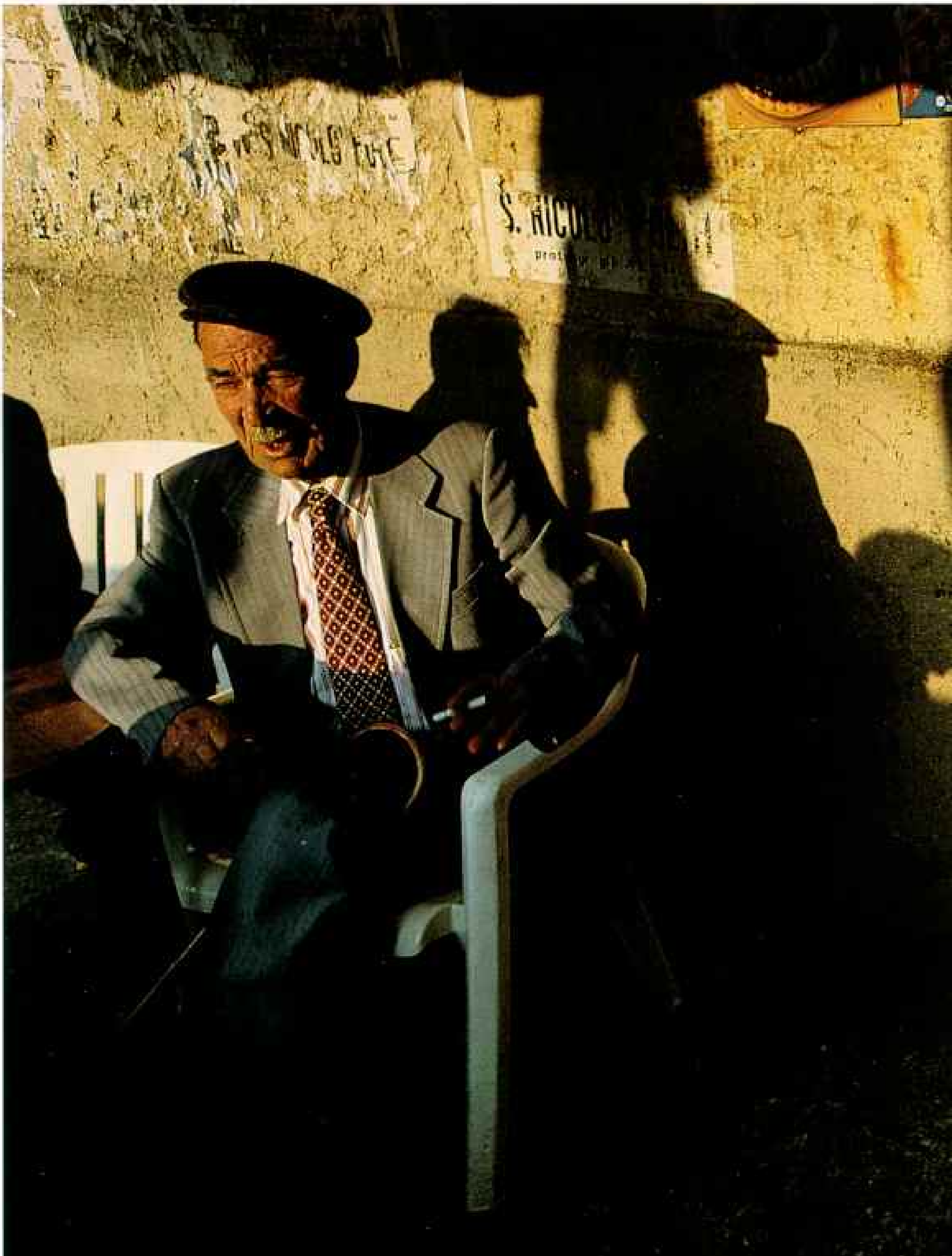
WILLIAM ALBERT ALLARD recently received the University of Minnesota Outstanding Achievement Award, an honor he shares with Garrison Keillor and Eric Sevareid. This is his 24th GEOGRAPHIC article.

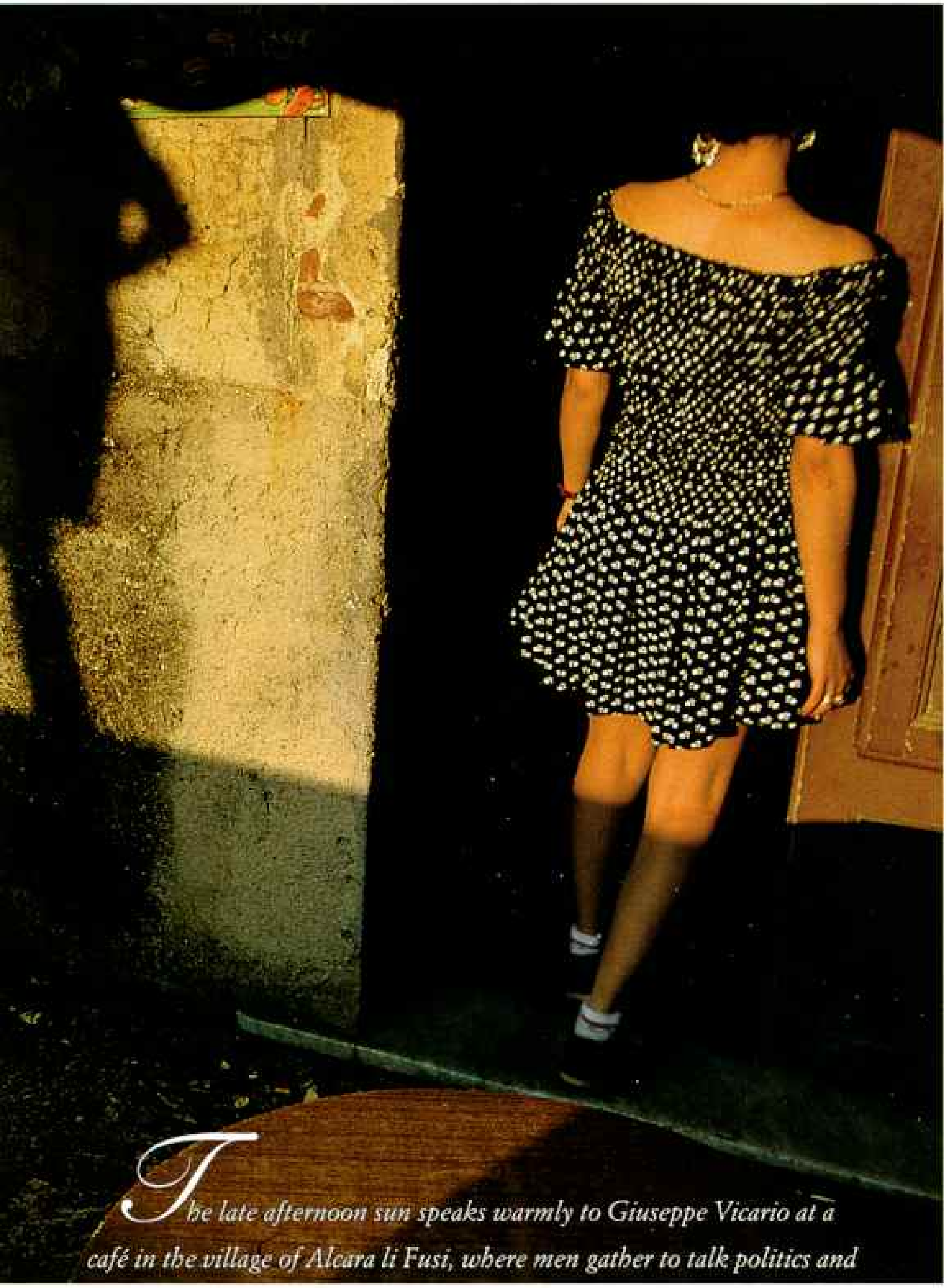
century, when masks worn for key roles were sculpted of wax; the face of this Jesus is crafted of papier-mâché. The town's name itself is holy: Muslim settlers in the ninth century called it Mars al Allah—"port of God."

the result of rising national prosperity in the 1970s and '80s, better education—especially for women—and the effect of television and the spread of popular culture. Discos are common in most towns, and the fashions are indistinguishable from those worn in Milan and Rome. An entrepreneurial spirit is replacing the old habit of taking one job and keeping it for life. And the equally old habit of accepting massive national subsidies for endless failed public projects is under fire from Sicilians who are beginning to demand accountability from their politicians.

The contrasts are still new enough to fascinate Sicilians. "I taught in the United States between 1982 and 1984," said a professor from the University of Palermo. "When I came back, I saw for the first time women riding the bus, alone, at night."

And it took me forever to find a widow in a black dress, once the hallmark of the strict obligations that bound women to church and family. I eventually met one running the family produce stall in Randazzo, a small town on the slope of Mount Etna, at 10,902 feet Europe's highest active volcano. Her 23-year-old daughter was wearing tight jeans and a fashionable wraparound sweater.





The late afternoon sun speaks warmly to Giuseppe Vicario at a café in the village of Alcara li Fusi, where men gather to talk politics and soccer while their wives cook and clean house. In the cities women are emerging from the shadows. "I'm not sure men have changed," says Valeria Ajovalasit, founder of a feminist group, "but women have."

I asked the daughter her name. "Irene Ferralore," she answered.

Her mother gasped: "You told her your last name?"

"Mama, come on," Irene said. "Things are changing."

I asked Salvatore Butera, director of economic studies at the Bank of Sicily in Palermo, about these changes. "The Sicilian society *has* undergone deep modernization, and Sicily is basically homogeneous with the rest of Italy now," he told me. "But all this prosperity is not the fruit of a well-developed economy; it is the fruit of private consumption through a thousand forms of compensation: pensions, more or less deserved, and various programs to aid people. So we have an apparent prosperity—trips, clothes, cars—that isn't balanced by productivity. The economy is very dependent on outside help."

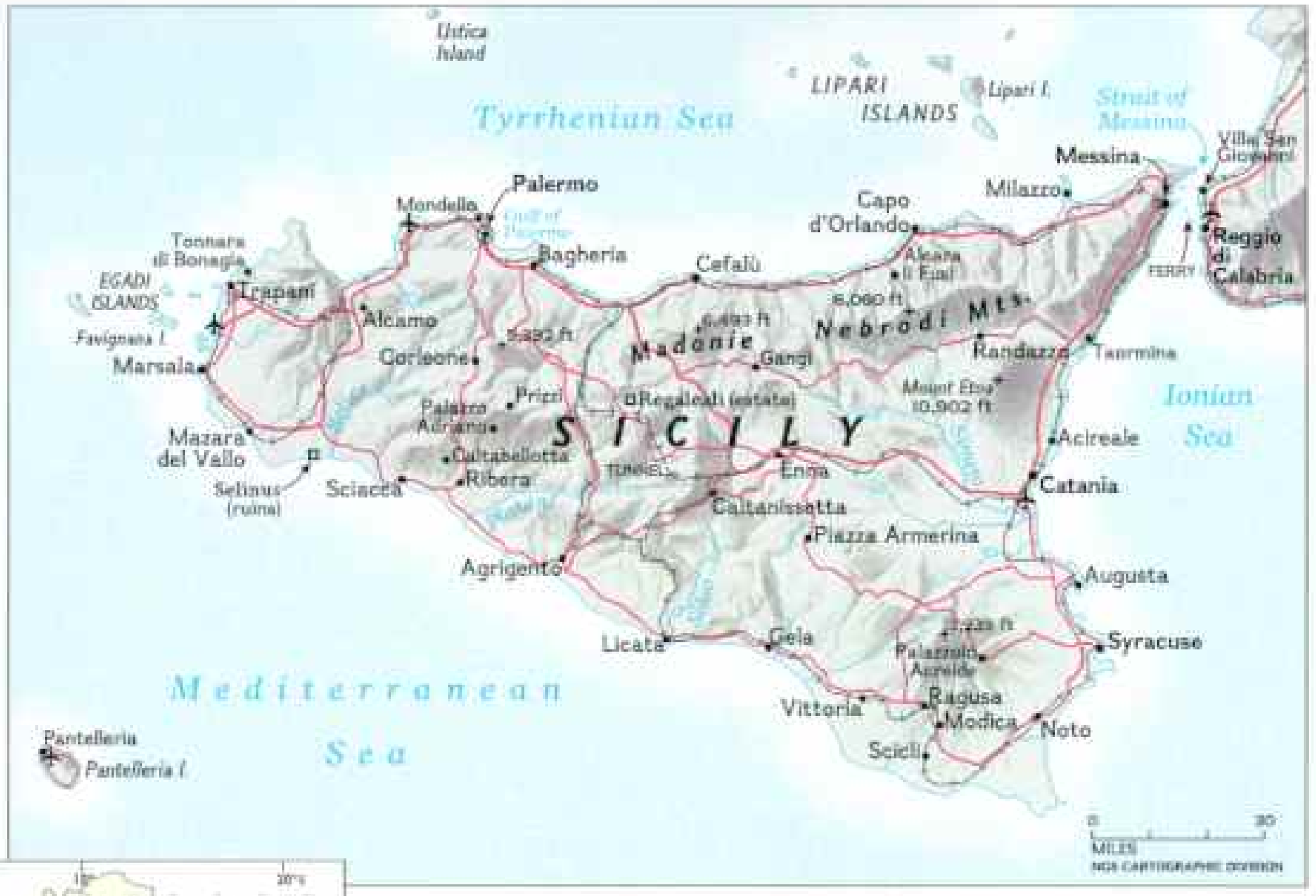
I asked him why the world had been so surprised that changes were occurring. "Some people have assumed that Sicily is completely still, is not capable of progress. This idea first came from *The Leopard*, the historical novel set in Sicily by Giuseppe Tomasi di Lampedusa."

Di Lampedusa wrote, for example, "Sicilians never want to improve for the simple reason that they think themselves perfect; their vanity is stronger than their misery. . . ."

"People made a bible of that book," Butera continued. "It is a great literary work, and in a certain sense it also says the truth. But in reality it is not all true."

As I traveled through Sicily in the spring, I was often confused. ("We are very good at creating confusion," one man cheerfully agreed.) Life was so serious, yet life was so joyful. I had thought people would avoid talking about the Mafia; they brought it up before I did. Along with frustration I found hope; there was abundance, yet there was still intense poverty. I saw the creamy almond blossoms finally fall, and the grapevines just begin to glow with green. I also escaped an

The serene Gulf of Palermo offers refuge from the frenetic energy of Sicily's raucous capital, with its warren of alleys, its jumble of architectural styles, and its exuberant disorder. A multiethnic center of learning in medieval Europe under Arab and Norman rule, the city is now home to 700,000 of Sicily's five million people.



Closer to Africa than to Rome, the Mediterranean's largest island was colonized first by the Greeks in the eighth century B.C. Outsiders ruled uninterrupted until Italy's unification in 1861.

attack on my car by a gang riding Vespas in a poor neighborhood of Catania, who shattered the passenger window.

Yet as I reflected on all the changes in Sicily, it seemed that they were really just the accumulation of changes in individual Sicilians—small personal revolutions over the past generation in which a person chose to depart from the well-worn path of habit.

In Catania, Tino Sciuto's father was just such a minor rebel. "My father had to address his father as *vossia*, meaning, roughly, your majesty," Tino, 31, told me. "And he could kiss him only on the hand. But my father wanted me to call him dad and to kiss him on the cheek—he tried to be a friend."

Said a small-town doctor in her late 40s, "My mother wasn't allowed to study when she was a girl." Yet that mother had taken courage in hand to help her daughter enter medical school. "She told me that even if she had had 50 daughters, she would have sent them all to university."

This woman was the only Sicilian I met who did not want to be named in an article that dealt with the Mafia, though she has not been directly involved in any anti-Mafia protest. Her emphatic no was a reminder of how deep fear of the Mafia runs.

TWO MONTHS after he received the calf's head, Mayor Cipriani was speaking out again, this time in the town square. In Corleone you can see almost everything of the old and the new Sicily: the small rituals that continually retie the knots of community—ice cream and flirting and gathering in the square as evening draws on—while at the same time the bracing new resistance to the Mafia casts a new light on the old, familiar landscape.

On this Sunday evening in April, Cipriani and other speakers were

Barren town square in Palazzo Adriano evokes old Sicily—so much so that director Giuseppe Tornatore used it as a backdrop for his Cinema Paradiso, *an affectionate look at postwar Sicily that won a 1989 Academy Award. Most of the town's 3,000 residents appeared as extras in the film about a little boy enchanted with the magic of movies.*

Fingering the evidence, a detective examines a gun after a gangland hit on a busy Palermo street. Sicilians have risen up against the Mafia in recent years, but Cosa Nostra remains Sicily's most profitable industry, with an estimated annual income of 3.5 to 6 billion dollars.

addressing a rally, urging the people to sign a petition that, it turned out, eventually saved the town's hospital. To lose the hospital would have meant a two-hour drive to Palermo, the capital, first on rural roads shared by sheep and goats, then on secondary roads that might be broader and smoother if the money allocated for that purpose had somehow found its way to the right hands.

Golden light bathed the square even as green-black clouds menaced the horizon. Sunday afternoon had passed in Corleone in the usual way, which meant that everyone was already in the square. The coffee bars and ice cream parlors reopened after the one to four siesta—a multicourse family lunch followed by a nap. Almost everyone had taken to the street. Young adults and teenagers made their *passeggiata*, strolling down the main road talking and joking, then turning like a school of fish and strolling back. Men in their 60s and older sat in groups around the square, dapperly dressed in crisply ironed shirts, sweater vests, tailored jackets, and wool caps. (Their wives were probably at home, where they still prefer to socialize, meeting to play cards or sew.)

"Corleone can now be proud of what it is," Cipriani shouted into the microphone. "Corleone has shown that it is different from what the rest of Italy thought it was."

The idea of change, especially in Corleone, almost inevitably focuses on the Mafia. It is impossible to speak of anything in Sicily without eventually speaking of this organization. Its 5,000 or so local members have touched, to one degree or another, every aspect of Sicilian life, scooping money from the flow of public funds, controlling politicians and judges, intimidating, extorting, and killing.

The contrast between attitudes in Corleone is particularly powerful. It is the hometown of the Riina family; Salvatore "Totò" Riina was until recently the most powerful and ruthless Mafia boss. Yet it is also

"Only a madman would live this kind of life," says Palermo's sash-bedecked mayor, Leoluca Orlando—surrounded, as always, by several bodyguards. But, says the crusading mayor, "I cannot dream, or smile, unless I fight the Mafia."

the home of Dino Paternostro, editor of a defiantly anti-Mafia monthly newspaper called *Città Nuove*—New Cities. In his line of work you might think he would cultivate a certain nondescript air. The day I met him he was wearing a peach-colored shirt, a blue-checked jacket, and an extremely floral tie. His eyeglass frames were red.

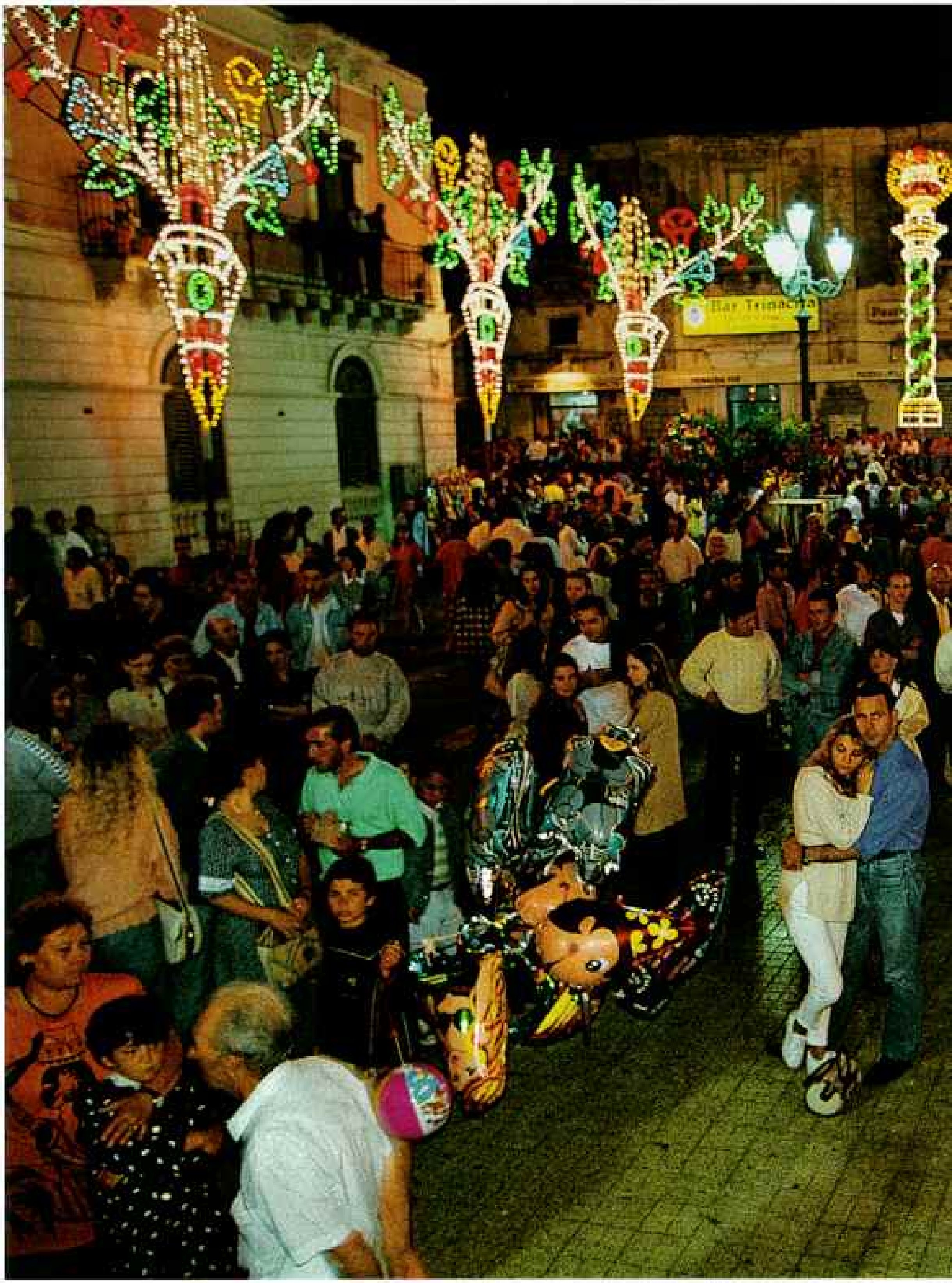
"There used to be a popular way of thinking that the best way to fight the Mafia is to pretend it doesn't exist," he told me in his low, intense voice. "We started the paper six years ago to fight this concept."

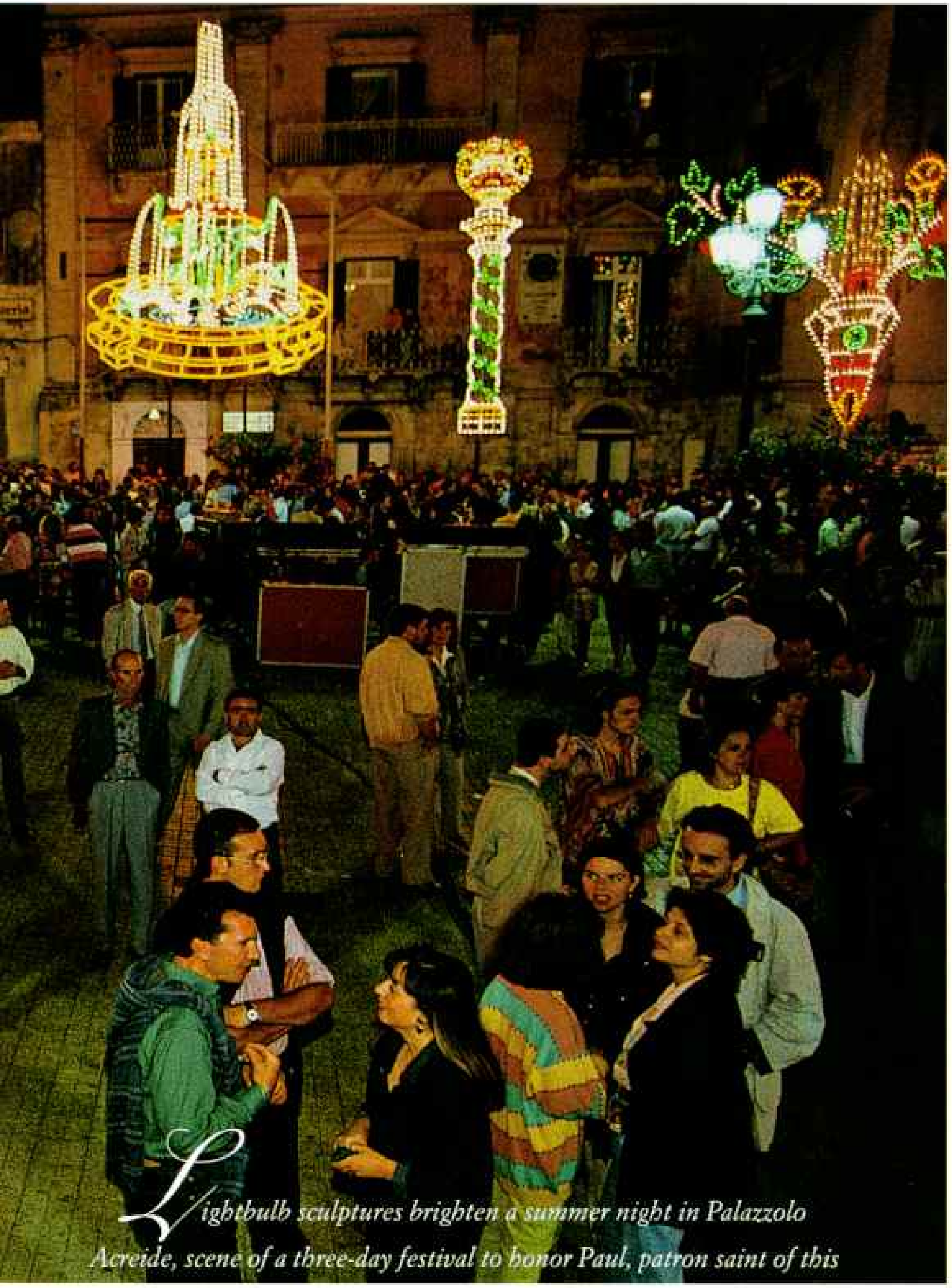
The Mafia's control over economic development has been total. Paternostro told me that the lavish government subsidies keep finding their way into businesses with Mafia connections or "fatten the pockets of the politicians." If by some miracle projects are eventually built, they usually are seriously flawed. He described two unfinished dams and a never opened dairy. "If Corleone today had the dairy, the two dams irrigating fields so agriculture could improve, if it had a better road network—as was financed, but never realized—our economy would be much better off. There's no accounting for the millions of dollars that the government has invested here.

"We must be against the Mafia not only for moral reasons," Paternostro said, his voice rising urgently, "but also because the Mafia has obstructed our development."

The origin of the word "mafia" is uncertain, but it was used in the Sicilian dialect to mean beautiful, proud, something worthy of respect. Under the feudal land system, strongmen who collected rents for landowners and helped settle disputes in the absence of local government or courts came to be called mafiosi.

Mafiosi themselves became landowners after the unification of Italy in 1861 brought land reform. By 1875 the strongest political power on the island was the hierarchy of bosses and underlings that eventually





Lightbulb sculptures brighten a summer night in Palazzolo Acreide, scene of a three-day festival to honor Paul, patron saint of this mountain village. "With Easter, Christmas, saints' days, and other religious holidays, we have a festival here every month except October," says local hotelier Antonio Finocchiaro. "In October we rest."

was known as the Mafia. To their previous work they added delivering votes and protection services against bandits, and ultimately against themselves. When they moved from the countryside into the burgeoning cities, infiltrating industries and bureaucracies, they became the de facto power of the entire island.

Events leading to what has been called the Palermo Spring of 1992 began, in part, in Corleone in the early 1980s, when Totò Riina launched and won a brutal war to become Sicily's *capo dei capi*—boss of bosses. But he broke time-honored rules by also killing family members of his rivals. In revenge the losers broke the code of silence and began to talk to authorities. With the testimonies of these "penitents," a pool of prosecutors led by Giovanni Falcone, a Palermo judge, won convictions of nearly 400 mafiosi.

Then, on May 23, 1992, Falcone was returning to Palermo from Rome on what was supposed to have been a secret trip. He was driving toward the city with his wife and several bodyguards when someone watching from the coastal hills used a remote device to set off powerful explosives along the highway, blowing up Falcone's car. Others who had fought the Mafia—judges, businessmen, journalists, priests—had

Young lovers attract a curious eye at Mondello, a popular beach hangout outside Palermo. In the sun-broiled Sicilian summer, says one beach regular, the seashore is "the only place we can get even a hint of a breeze."

The well-to-do pay hundreds of dollars for summer passes to private beach clubs. The more frugal work on their tans at Mondello and other public beaches.

been assassinated, but Falcone's death galvanized Sicily. Thousands marched in Palermo shouting "*Basta!* Enough!" One woman recalled, "It was as if a light had been switched on in a dark room."

Two months later a bomb killed Falcone's judicial colleague, Paolo Borsellino, as he arrived at his mother's Palermo apartment for Sunday lunch. This was "basta" for Tommaso Buscetta, a mafioso who had provided information to both judges, whom he came to admire. Now he told his greatest secrets: how the Mafia was being protected by many of Italy's politicians. These revelations, and others, ultimately brought down the national government. Riina's driver then gave information finally leading to the arrest and imprisonment of the boss of bosses, a man even his own followers had called the Beast.

No one expects the Mafia to vanish soon. (The series of retaliatory killings recently claimed a 12th relative of Tommaso Buscetta.) It controls a multibillion-dollar empire in drugs, weapons traffic, and money laundering. And it still extorts protection money from thousands of small businesses.

But something fundamental has shifted in the social acceptance of its existence, especially with the piercing of the famous shield of *omertà* ("I didn't see anything, and if I was there, I was sleeping"). In 1990 business owners in the small beach resort of Capo d'Orlando on the northeast coast refused demands for money from a regional Mafia family looking to expand its territory. A group of 31 formed an association to work with authorities to fight extortion.

"Now there are more than 20 such groups in Sicily," said Tano Grasso, one of the founders, since elected to the national parliament. "In Palermo almost all businesses pay extortion. If only one person spoke out, he could be killed. That's why it's important that we stand together, not alone, not afraid. They can't kill all of us."

I ASKED VIRTUALLY EVERYONE I met whether they considered themselves Italians first, or Sicilians. The answer was overwhelmingly "Italian," followed immediately by, "Of course, I feel deeply Sicilian too." In attempting to discover what it means to be Sicilian, I had to look beyond some persistent stereotypes.

Northern Italy, for one thing, tends to look at southern Italy as a scruffy boot bottom, and at Sicily as an object appropriately poised to be kicked. "Stupid, lazy, thieves; that's how I've heard them described," said a friend of mine. "During the 1990 World Cup soccer tournament there was a sign in the Rome stadium about the Italian team's leading scorer: 'Great Play, Too Bad He's Sicilian.' "

Scorned by northerners as *terroni*, or people of the earth, Sicilians retaliate by calling northerners *polentoni*, after polenta, a northern cornmeal mush—"Meaning," explained a young woman, "they have no flavor."

She had just received her degree in languages and literature from the University of Catania. "Actually, I don't mind being called terrona," she said. "I think it means I'm closer to my roots."

Sicilian roots are firmly embedded in their extraordinary countryside, which they love with a passion: its moody mountains looming out of the wintry thunderclouds, the sweep of blossoming lemon and orange groves, the dusting of tiny wildflowers that can seem like snow in the shadows of dawn. They also have kept their religious traditions, which have altered yet remained strong over the centuries.

Little man in a big world, eight-year-old Calogero Amoroso shows off his double-breasted best for a wedding in Sciacca. Once known for its large families, Italy now has the industrialized world's lowest birthrate. Sicily's rate, though higher than that of the nation as a whole, has fallen by almost half since 1950. Sicilian women today have an average of 1.7 children.

But the core of everything Sicilian remains the family. Nobody even imagines that this could ever change.

"A Sicilian's first fortress is the home," Lucia Pappalardo told me as we stood on the terrace of her house overlooking the Ionian Sea near Catania. The spring breeze blew from the cobalt water, and the tropical trees gave the house a sense of seclusion. Her three grown daughters, like most Sicilian children, were still living at home; the Pappalardos were building a small house nearby on their property for the one who was about to be married.

Even when young people move away, they don't really leave their families behind. Salvatore Giuliana, 27, moved to Milan to work in advertising, but after seven years he hasn't given in to the lure of the big city. He still misses his hometown of Enna—the food, his friends, his family—and comes back six or seven times a year. His mother and father call their only child every morning from Sicily to wake him up at seven o'clock.

"But," his mother told me, "I know he rolls over and keeps sleeping, so I call him again at 7:30."

Families, as Sicilians see it, are supposed to be close. Even if they don't live together, most of them eat together—several nights a week, if not every night. The notion of doing something by yourself strikes Sicilians as odd, even inexplicable.

When Salvatore suggested that I have coffee with him and his fiancée, Elena di Natale, I had been in Sicily long enough not to be surprised that we were also joined by his mother and father and her mother and sister. Soon some aunts, uncles, and cousins dropped by. It hadn't occurred to anyone that such a conversation might be private. I ended up learning as much about Salvatore from his family as I did from him, which is exactly the way Sicilians think it ought to be.

Young fans thrill to Italy's World Cup soccer team. Seven people live in matriarch Maria Anastasi's three-room apartment in a poor Catania neighborhood. Says 16-year-old Marilena Pecoraro, at far left: "I don't like being Sicilian. Work is too scarce here."

To be Sicilian is, in a sense, to consider it part of life's purpose to avoid, subvert, or ignore the rules—any rules. "It's not that we *want* to break the law," one young man explained. "It's just that there are too many of them."

The way they drive is a good illustration of the result: anarchy, something between an art form and a blood sport. It was clearly best to have my interpreter, Mirella Giuffrida, at the wheel. When she seemed dismayed by the Milan license plate on my rental car, I asked if it would be a problem. "Oh no," she said. "They will know I'm Sicilian by the way I drive."

She lived up to her promise, escaping congestion by deftly creating a third lane where my limited vision saw only two. "Eat or be eaten," Mirella explained as we took to the road with a blasting of horns and a bellowing of insults, all of which she taught me on the first day, so I could be part of the process. And on open stretches of divided highway she inevitably drove down the center of the road. "Why not," she shrugged. "There's no one in front or behind me."

Even Sicilians willing to risk bouts of optimism in today's atmosphere of change still won't let their feet stray too far onto the sunny side of the street. They worry, they complain. "We think it's so funny that Americans respond to 'How are you?' with a big smile and say, 'Fine, wonderful, thank you,' " one woman told me. "In Sicily the answer is usually '*Così così*—So-so,' or 'I've seen better times.' As a matter of fact," she said, "it's bad luck to say 'good luck.' "

And there are traditions enacted through elaborate rituals that even the most modern Sicilians have no desire to abandon.

Enna is an ancient citadel city of 29,000 built on the summit of a 3,200-foot mountain in the center of the island. The modern highway joining the two main cities of Catania and Palermo runs past just

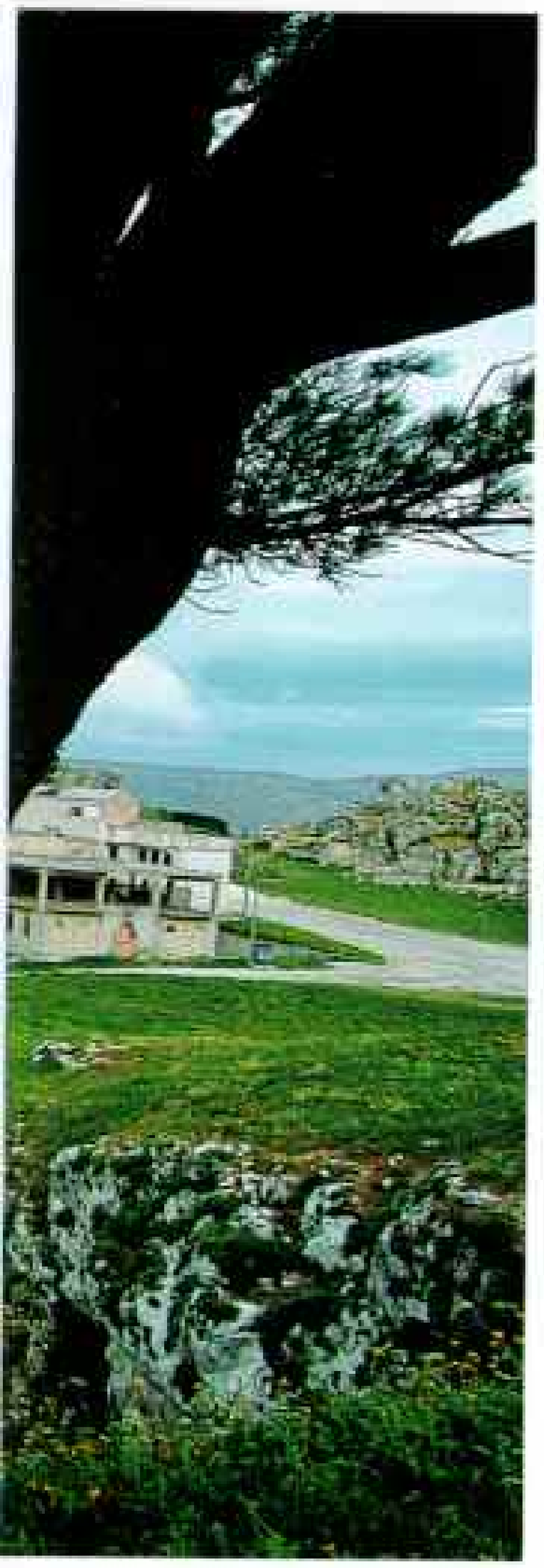
below, and from either direction Enna rises on the horizon like a mythical kingdom. "Our happy highland," the Ennese call it. No delinquency, no slums, no—Mafia? "Well, much less than in other places," one man allowed.

Here, as in many towns throughout Sicily, the Holy Week ceremonies preceding Easter are rich and complex. The rituals are religious, certainly, but they seem to have almost equal importance as a community tradition. In Enna, everyone joins in the array of processions and dramas that commemorate the death and resurrection of Christ.

On Good Friday, Luigi Barbarino, 38, closes his café-bar to shoulder the Urn of the Dead Christ. As a member of the confraternity of San Salvatore, he is one of 60 men who carry this glass coffin holding a wooden statue of the crucified Jesus.

Luigi was a boy when he joined his father's confraternity in 1966; three years ago he was elected a bearer. This is a great honor, as it is for the 80 men of another confraternity who carry the six-foot-tall statue of the Madonna of Sorrows. Joining the procession are 15 other confraternities, with nearly 3,000 men and boys. "We are very attached to our traditions," Luigi said.

Pretty as a postcard and just as lively. "Our young people are bored," says Caltabellotta administrator Maria Giuseppa Ferrante of her village of 5,000. For decades the restless and the desperate have fled Sicily's



small towns. More than a million emigrated to the United States between 1876 and 1930. Later waves sought out factory jobs in Germany, Switzerland, and northern Italy.

Enna's ritual, a legacy of 17th-century Spanish rule, begins at 5 p.m. The air is cool and the shadows are lengthening. The opulent Urn of Christ, to my Protestant American eyes, looks a bit gaudy. But as the men muscle the coffin into a narrow stone street and a funeral dirge swells from an accompanying brass band, I find myself unexpectedly blinking back tears. Luigi and his fellow bearers are not ashamed of theirs. "Christ's death for us is a very important moment," he tells me later. "Carrying his coffin, we express our pain."

All of Enna lines the route or hangs from balconies as the confraternities in a rainbow of capes and white hoods begin the five-hour march through town to the cemetery, then back to the 14th-century cathedral. With them walk young girls dressed as nuns or angels, giving thanks to Mary for a blessing or praying for one.

As darkness falls, the temperature drops also, into the 40s. The hooded men light their torches—battery-powered colored lanterns these days instead of flames. (On the windy plateau their sleeves too often caught fire.) When the procession climbs the hill back to town, it is to the sound of the beat from a lone snare drum. "All we can hear are whispers and the sound of marching feet," says Luigi. I can hear people making plans for dinner, the stray car alarm blaring, and pocket cellular phones ringing. I'm waiting for them in a street I hoped would be full of mysterious medieval gloom, but it is bright with the glare from spotlights jury-rigged onto balconies. "But it's nice that they do that," a bystander comments. "People can get better shots with their video cameras."

SICILIANS ADAPT to these dislocations between old and new with panache. There are new contrasts too in the world of economics, as Sicily struggles with recession, subsidy cutbacks, and unemployment that has reached 22 percent (it is 11 percent elsewhere in Italy). The idea of changing jobs scarcely exists, mainly because they are so few and so precious. If a Sicilian does change jobs, people assume he was fired or that his boss needed to give the job to a relative. Now, despite the economic problems, Sicilians are discovering ambition.

"There is a new class of people—a small group—who are a force for economic renewal on the island," said Rossano Zappalà, director of a cheese factory on the slopes of Mount Etna. "Sicilians now realize that they have to take the future in their hands and not expect anyone else to do it for them."

Elegant and blond, Giovanna Tamà started Boomerang, an advertising agency in Catania, 13 years ago. "Some people describe Sicilians as mollusks: They attach someplace and want to live and die there. And of course some people are like that," she said as we sipped espresso and she smoked yet another slim brown cigarillo. "The true force behind our economy is small companies like mine, with people who can decide to work 24 hours a day if they want to improve their situation. This is the part of the economy that takes work seriously."

Daniele Tudisco decided to quit his position as head of the western Sicily division of a national investment firm ("I didn't sleep for a week before I did it"). He wanted to set up his own business in tourism development. Not to add another new hotel to the concrete veil falling across the island's superb coast; not to run another bus tour of Greek ruins. Daniele dreamed of developing what he felt would be a "real Sicilian product."

A mirror makes two stalls out of one in the Vucciria, Palermo's partly covered marketplace, where locals gather to shop and exchange the latest news. Palermo is hardworking, despite its distractions: "We wake up in the morning," says a businessman fondly, "it's warm, and we can see the ocean and smell the flowers."

Tomorrow's sashimi is carted to shore by fishermen from the island of Favignana, off Sicily's western coast. The men use an intricate system of nets to trap spawning bluefin tuna

So he went to the tiny western village of Tonnara di Bonagia, on the wild shores of Trapani Province. Here he and three partners are creating a small resort from an abandoned 15th-century *tonnara*, a compound of houses built around a courtyard where tuna fishermen once lived and processed their catch. The men still go out each May and June to catch them, using a method called the *mattanza* introduced by the Arabs in the ninth century.

"We have saved a piece of Sicilian architecture," Daniele said as he showed me the renovations under way at the tonnara. Nearby, the fishermen were assembling the nets, ropes, and anchors that they would soon set offshore in a labyrinth to guide the tuna into a "chamber of death," where men in boats spear them and pull them aboard.

"I kiss your hand," Daniele respectfully greeted 72-year-old Salvatore Solina, the chief of the fishermen. "He's the one who decides when it's time to take the tuna," Daniele explained.

"After Jesus Christ," Salvatore corrected him.

Because the 66 units will be offered on a time-share basis, the visitors will stay long enough not only to see the mattanza but also to enjoy the rocky beauty of the untouched coast and the tranquillity of the

in an ancient ritual known as the mattanza*—from the Spanish word for "slaughter." Most of the thousand tons caught each year end up in Japan.*

village. Although the villagers may not be overtly enthusiastic at the prospect (they are Sicilian, after all; something will probably go wrong), they are cautiously positive at the idea of finding some new ways to support themselves.

"We won't see immediate results; we need time," Daniele continued. "We'll know in two months if we are pioneers or idiots. But I'm doing this because I love Sicilian traditions."

Daniele is only one of several entrepreneurs I met who want to show their love for their island and to dedicate themselves to its future. That love and dedication are nowhere more clear than at an estate called Regaleali, where Count Lucio Tasca d'Almerita is making Sicilian wine to confound all previous notions of Sicilian wine.

THE ROAD TO REGALEALI winds upland an hour southeast of Palermo to nearly 2,000 feet above sea level. Beyond the city the scenery rapidly reverts to countryside, fields and olive groves punctuated by small villages. The paler green of vineyards beginning to leaf stretched up the hillsides, with splashes of red poppies and towering stalks of wild fennel topped with starbursts of yellow flowers. As we reached the Tasca d'Almerita estate, I felt that we were reaching back to the heart of Sicily, into a life that was abundant, close to the land; a tiny universe composed of family, sustained by simple but marvelous food, organized according to the dictates of nature and suffused with its fragrance.

Tall, lean, and handsome at 55, Lucio Tasca looks the part of a count. But "I never use that title," he said with a wave of his hand. "I'm just Lucio Tasca. Of course, it means a lot to my father, and my son seems to like using it, and it does look good on a wine label."

In Sicily vineyards rise almost everywhere (grapes trail only citrus in agricultural production). But most wines have not been, to put it kindly, notable. In the late 1960s, Lucio's father, Count Giuseppe Tasca, set out to improve the estate's grapes and fermentation process—to make "good wine." Now, under the direction of Lucio and his 31-year-old son, Giuseppe, the estate produces 2.4 million bottles of ten different wines yearly, exporting a third of it. In 1991 his Chardonnay was judged by one critic "the best white wine made in Italy."

As usual lunch with the Tascas was a family gathering, and as usual it was wonderful. "Nothing formal," Lucio said, as eight of us gathered around a small table in the family dining room. Beyond the open door the courtyard was scattered with his grandchildren's toys and scented by climbing roses.

Pasta was first, fettuccine in tomato sauce, and Lucio poured a crisp white table wine made from, among others, a grape called Tasca because it was first found growing on their property. "No one knows what it is," he said. "Well, I think I do now, but I don't want to say."

Then came a salad of celery, onions, parsley, anchovies, oregano, and the estate's own green olives and olive oil; also a wheel of pecorino cheese made from the estate sheep's milk. "Sicilian flavors," sighed Lucio as a platter of lamb and potatoes roasted with rosemary arrived and he opened a bottle of the best Regaleali claret. Then coffee appeared, with a cake of sweetened ricotta and a blackberry tart. "Really, it's all too much," someone said. "Yes," agreed Lucio. "But what would you leave out?"

Later, as we walked along a dirt road near the stone farmhouse, I learned about some things Lucio Tasca would like to see changed.

For instance, the crushing taxes that hinder prosperity at every step. Half of Tasca's earnings go to pay taxes. "That's what the Italian government does to our economy," he said.

Then there are the irritations of government-regulated freight costs. "I went to Varese, north of Milan, to order the metal caps we need to cover the necks of the wine bottles," he told me. "I asked the man to pay for shipping, and he said he couldn't. It costs him less to send these caps to California than to Sicily."

There are also the economic strictures of the European Union. EU grants helped the Tascas build a modern winery. Now it would pay them to take out part of their cultivation. Lucio has declined. "I've worked too hard."

A breeze swayed the branches of eucalyptus trees lining the road. "When I was a child," Lucio said, laughing, "I thought the wind came because the trees were moving." Like the changes in Sicily, I thought; it wasn't always clear which was cause and which was effect.

RETURNING TO PALERMO, I clung to the memory of Regaleali; it was the pastoral side of Sicilian life, nurtured and protected despite the struggle with taxes, politics, the grinding pressure of deciding what to keep and what to change. Palermo is a picture of what can happen to a place without any protecting hand, at the mercy of those who take and give nothing back. When this century opened, Palermo was one of the most beautiful cities in the Mediterranean; now it's ugly and barely functioning, ruined by Mafia corruption. Its slums are among the worst in Europe. But through it all, the Sicilian essence abounds.

The city is full of markets brimming with the island's bounty—glistening fish, glorious fruits and vegetables. Energy and flashing wit were on display with everything else when I walked through the market one morning, the men throwing good-natured insults at one another with a skill born of long practice. The favorite slur is *cornuto*, meaning "horned," or "cuckolded."

"You are cornuto!" one shouts—"and bald, so we can see your horns better!"

"Your fish are expensive!"

"Your horns are expensive!"

Palermo is a wonderful city for walking, despite the crushing congestion and chaos. During one traffic jam, a woman sat in her car honking her horn. "Why are you honking?" a man yelled from another car. "I love the music," she replied, continuing to honk. "I'm going to break your husband's horns," the man shouted. She retorted, "I can put them back on."

The city is set on a harbor of the sapphire Tyrrhenian Sea, against a backdrop of low, ragged hills. Some buildings still show touches of the Arab culture; the Spanish laid grand boulevards over the tangle of old alleyways and built baroque palaces. Bourbon aristocrats built elegant villas. Now all are swallowed up in the urban sprawl. When I asked one man to give me an example of the collusion between the government and the Mafia, he said, "Look at the new buildings of Palermo."

A building boom that began in the fifties funneled vast amounts of government money to the city to restore the historic center; by the time it found its way through Mafia hands, the resulting concrete horror surrounding the city was called "the sack of Palermo." Yet if you need a movie set for 1943, Palermo has neighborhoods to oblige. More than

Once-in-a-lifetime luxury surrounds high school teachers Vincenzo Restivo and Tiziana Ferrantello (standing) at their wedding celebration in Palermo's Palazzo Butera—a 17th-century landmark rented out for parties. "Ours was a typical Sicilian wedding," says Vincenzo. "Elegant but not exaggerated."

Stately ruins of the Greek Temple of Hera keep company with the wildflowers at Selinus more than two millennia after its dedication.

At least seven temples once stood here, the westernmost outpost of Greece's presence in Sicily. Attacked in warfare and toppled by earthquakes, two of the temples were partly reconstructed earlier this century.

a few of the buildings bombed by the Allied forces in World War II are still half standing, with people living in them.

Baroness Renata Pucci Zanca is a driving member of a small group called To Save Palermo, as well as a descendant of the once important aristocratic class that into this century made Palermo a great center of European culture. The degradation of the city enrages her. For example, the Teatro Massimo used to be one of the most magnificent theaters in Europe. It has been closed for restoration for 19 years. "Now they're restoring the restoration," she said acidly. The trouble started when a water pipe broke. "All they had to do was call a plumber. Instead, they destroyed the theater looking for other broken pipes."

I awoke every day in Palermo to the sound of police sirens: The judges were going to work, with their bodyguards and police escorts. The Mafia trials continue. Young soldiers stand guard on the streets with automatic weapons. (If you see a soldier standing guard before an apartment building, you can bet that a judge lives there.) The first fires of anti-Mafia outrage have cooled since the Palermo Spring, but dogged prosecution has piled success on success.

THE CHURCH HAS BEGUN TO PLAY an important part in the struggle. Pope John Paul II has been speaking out against the Mafia since his first visit a decade ago. "In the present historic moment there is no time for cowardice or inertia," he told a crowd of thousands at Catania's cathedral last year.

Beyond pronouncements, I discovered the church hard at work in a poor Palermo neighborhood called Albergheria. At San Francesco Saverio, the Reverend Cosimo Scordato in 1986 established a social center to try to help the neighborhood help itself. "Not to expect bread from the sky," as he put it to me. And in the process, to pull the neighborhood from the grip of the Mafia. In 1993 another anti-Mafia priest, Father Giuseppe Puglisi, was murdered in Palermo. A sign commemorating his death hangs by the entrance to the church.

"When I spoke out against the Mafia 20 years ago, my mother said I shouldn't—that I should have nothing to do with them," Father Scordato told me. "The true fight against the Mafia is to give people confidence in legal institutions. To have confidence to go to the mayor and the city council."

This fight, more internal, lacks the drama of street demonstrations, yet it is just as important. One Palermo woman, Alessandra Nicolicchia, described the traditional way of getting things done: "The answer is, 'Do you have a friend?' " she told me. "It's like this because we think of the state as the enemy. So the problem is not only the corrupt politicians. We ask a friend, could you do me a favor? That's our mentality. If you think you won't pass your university exam, you might ask your father to talk to your professor. We call this the 'white Mafia,' the Mafia you have inside you. So we should change too."

When Father Scordato and several other priests moved to Albergheria, they knew they had to offer real alternatives. One group has been formed to run a small magazine; another gives tours of the neighborhood. And at the Trattoria al Vicolo, business is booming. Father Scordato helped seven young men form a cooperative to start the restaurant, and now professors from the nearby University of Palermo walk through this still somewhat unsavory neighborhood to eat lunch.

Francesco La Barbera is president of the trattoria's cooperative. "We believed in Father Scordato," he said. "To live in Albergheria

Small-town dandies, arms linked in the traditional Sicilian manner, stroll past murals in the center of Prizzi. "Today's Sicilians," says town councillor Vincenzo Giannini of neighboring Palazzo Adriano, "are 100 percent Italian and 100 percent

European." Yet la bella Sicilia *remains unique, a place where, wrote author and statesman Luigi Barzini, "every Italian quality and defect [is] magnified, exasperated and brightly colored."*

isn't easy. That doesn't mean I don't love it, but there's no work here, no culture. I'm lucky that my father worked; he kept a bar and made us go to school. I try to set a good example for young people."

I swirled spaghetti drenched with cuttlefish ink as he periodically came out of the kitchen to talk. In the airy, whitewashed room there was a thoroughly professional bustle.

"Here, near the church, Father Scordato has made it a community," Francesco told me. "When we said we wanted to move to a newer area, he got angry. He said we should restore a house and stay here."

Father Scordato knows that saving the neighborhood will be a long-term project, but he has patience. "We have all come to understand that the Mafia is catastrophic for Sicily," he explained. "But we aren't so much confronting the Mafia directly. We just want to take the land away from under their feet." And so he continues, measuring this process in steady inches. "Our work here is God's work," he said simply. "We are the ants of history. Day by day, a little at a time."

For Sicilians—accustomed to the dramatic gesture, the sudden exploit, and then returning to the old passivity—this new outlook may turn out to be the biggest change of all, day by day, a little at a time. □

BUG KILLER
Almost nothing escapes the notice of a California leaf-nosed bat. Huge ears pick up its returning echolocation signals, which can detect objects as fine as a human hair.

MACROTUS CALIFORNICUS

Saving North America's Beleaguered BATS

Article and photographs by
MERLIN D. TUTTLE

No stealth aircraft could be more sophisticated than this California leaf-nosed bat. It swoops so quietly through the desert night that it is called a "whispering bat." Its eyes can spot a sleeping insect, and its huge ears can pick up the sounds of a caterpillar's munching jaws. Only on the darkest of nights does this bat activate its ultimate detector: Through its nose it emits high-frequency, low-intensity echolocation signals created by contracting muscles in its larynx. Sound waves return to its ears after bouncing off doomed prey.

This amazing bat is one of 44 North American species studied by the author. He has long emphasized the beneficial nature of bats, which feed voraciously on insect pests that yearly cost farmers and foresters billions of dollars in losses. Bats also pollinate plants and disperse their seeds. Although many myths have been dispelled, bats still need protection from vandals and from the growing practice of sealing up caves and mines that the animals need to survive.

FOR A WILDLIFE CONSERVATIONIST trying to make a convert, there's nothing more helpful than a good object lesson in economics—especially if the animals in need of protection have been maligned as much as bats.

In 1968 I was a young zoologist in Tennessee studying bats and attempting to change public misconceptions about them. I had banded thousands, and while observing their migratory movements, I met an old farmer near Knoxville who had a cave on his property that sheltered a large colony of gray bats, a species that had dwindled alarmingly because of persecution. When I asked permission to investigate his cave, he said, "Fine, but please kill all the bats you can find." He gave no specific objections. He simply didn't want bats on his land.

I found the cave and its bats and saw immediately why this particular colony had been little disturbed—a deep stream flowed into and through the cave.

I needed a rubber raft and chest waders to make it inside, where I found about 50,000 gray bats, mostly females nursing their young. Beneath their roost I also discovered numerous insect wings, including those of potato beetles. Next to the cave lay a large field of the farmer's potatoes.

When I showed a handful of the wings to the farmer, he knew exactly which insects they belonged to and how damaging they were to his crop. But he had no idea that the bats were eating the beetles. He suddenly realized what an asset he owned, and it completely changed his attitude about bats. When I saw him again years later, he was still keeping a watchful eye on that cave.

Of the world's nearly 1,000 species of bats, 44 sweep across the night skies of North America. I have concentrated on many of these species the past few years, although I have studied bats around the globe. North American bats are essential to keeping populations of night-flying insects in balance. Individual bats can catch hundreds hourly, and large colonies eat tons nightly, including countless beetles and moths that cost farmers and foresters a fortune, not to mention mosquitoes in our backyards. A colony of just 150 big brown bats can eat enough cucumber beetles each summer to protect local farmers from 18 million of their rootworm larvae. This pest alone costs U. S. growers a billion dollars annually.

Bats in the deserts of the U. S. Southwest perform an invaluable service by pollinating the region's most important cactus species, feeding on nectar and transferring pollen from plant *(Continued on page 46)*

Caves and mines are winter bedrooms and summer nurseries for bats. To prevent human disturbance, gates have been installed across some entrances to keep people out but let bats pass. Tennessee's Hubbards Cave (above) shelters 250,000 bats. Vandals killed many before 1985, when the

MERLIN D. TUTTLE is the founder of Bat Conservation International, organized to protect bats worldwide. For more information write Bat Conservation International, Inc., P.O. Box 162603, Austin, TX 78716. For a contribution of any amount, a copy of the author's *Bat House Builder's Handbook* will be sent.

author helped local groups erect the 30-ton gate.

Nearly a million bats were saved in Michigan's Millie Hill Mine. It was scheduled to be backfilled until a local caver found the bat colony and called the author. Now a community project, a steel cage, covers its vertical shaft (right).

TWILIGHT FLIGHT
Living clouds of as many as 50 million Mexican free-tailed bats emerge from three nursery caves near San Antonio, Texas. With pups to be nursed, these females eat roughly a million pounds of insects a

TADARIDA BRASILIENSIS

night to fortify themselves. Males form their own colonies. Freetails ride 60-mile-an-hour winds, fly as high as 10,000 feet, and have been observed on airport radar. Impressive, but 19th-century migrations were undoubtedly more so. Gray bats of the southeastern U. S., in fact, once rivaled the now extinct passenger pigeon in number.

A

B

C

D

SUPER PREDATORS

"O death, where is thy sting?" A centipede has a poisonous bite but still meets death in the jaws of a pallid bat. These fearless bats of the western U. S. and Mexico often tackle such tough prey as scorpions and centipedes. Photographed in the author's laboratory, this pallid bat (**A**) has heard enticing footsteps, dozens of them—dead giveaway of a centipede. The bat pounces and attacks its prey's head (**B**); the centipede's bite could easily injure the bat. As its victim flails helplessly, the bat picks it up (**C**) and carries it away (**D**) toward a perch for devouring.

A cricket on a cactus is an easy target for a California leaf-nosed bat (right). This species consumes an insect smorgasbord: grasshoppers, beetles, flying ants, and cockroaches. It also duels with moths, which can hear a bat's echolocation signals and flee. To avoid tipping off their prey, these bats usually keep their sonar turned off, relying instead on their incredible vision and the ability to eavesdrop on even the faintest sounds of prey.

ANTROZOUS PALLIDUS (ABOVE); *MACROTUS CALIFORNICUS* (FACING PAGE)

ADAPTABLE BATS

Insect-eating bats often have large ears, but the Mexican long-nosed bat's small ears (below) fit better into flowers of cactuses and agave plants (right). Bats are pollinators and seed dispersers of several cactus species, feeding on their nectar and fruit. They pollinate about 60 species of agave, including those upon which the Mexican tequila industry is based.

Long stiff hairs on the foot of a pocketed free-tailed bat (left) may help it feel nooks and crannies. Among the most abundant of bats, freetails have been drafted several

times in support of U. S. war efforts. During the Civil War a gunpowder factory obtained a key ingredient, saltpeter, from free-tailed bat guano mined near San Antonio. In World War II the same caves were guarded as part of top secret Operation X-Ray. The U. S. military hoped to train the bats to carry small incendiary bombs and release them in Japanese buildings. During one test, bat bomb carriers escaped and set fire to barracks and a general's car; the project was later scrapped.

CHOERONYCTERIS MEXICANA (BELOW AND RIGHT); *NYCTINOMOPS FEMOROSACCUS* (LEFT)

(Continued from page 38) to plant by night, just as insects do by day. Bats also feed on cactus fruits and disperse their seeds in flight with their droppings.

THE IMAGE OF BATS has become a lot more appealing since the founding of Bat Conservation International (BCI) in 1982. Many myths have been largely debunked—that bats are blind, will tangle in people's hair, and are usually rabid.

None of these statements is true.

In fact, the odds of contracting rabies from a bat are extremely remote for anyone who simply leaves them alone. Even sick bats rarely attack people or pets, although they may bite in self-defense, like any wild animal, and should be handled only by experts.

Increased awareness of bats' beneficial nature has stimulated some protection. I have often worked with pest-control operators who previously poisoned bats, instructing them on how to exclude unwanted bats from buildings by hanging netting loosely over their entrance and exit holes. This allows bats to leave but prevents their return. BCI has also worked with leaders in the cave exploration community, and many spelunkers now avoid caves when bats are present.

Yet serious threats remain, including outright killing of bats, destruction or disturbance of their cave habitats, and, recently, increased closing of abandoned mines. Six bat species in the U. S. are endangered, and 18 others are candidates for addition to the endangered species list. With 24 species out of 44 in such dire straits, bats as a group rank as the most endangered land mammals in the U. S.—even though a few individual colonies number in the millions.

EFREM/CUS FOSCHI

Age-old prejudice against bats lives on in an abandoned Michigan mine. Biologist Bob Doepker (below) examines big brown bats killed by vandals who ignited a stream of hair spray and burned the animals. Bats are also driven from caves or mines by people who build fires in the entrances. In Mexico such fires are often intentionally set by those who believe every bat to be a vampire bat.

Caves sometimes bring out the worst in people. In Alabama, where I did my doctoral research, Hambrick Cave once sheltered a colony of 250,000 gray bats, many of which I banded. Suddenly, in 1973, they all vanished. I discovered that visitors had built fires in the cave entrance, suffocating many of the bats, and Fourth of July revelers had exploded fireworks inside, apparently killing the rest.

My reporting of this and similar calamities helped lead to the gray bat's addition to the endangered list. Fortunately, there is a happy ending. The Tennessee Valley Authority, which owns the cave, blocked the entrance to humans but left a way for new bats to enter, and today the Hambrick Cave gray-bat colony has rebuilt to 300,000.

Disturbances need not be extreme to be fatal, for bats are very sensitive. Most North American bats use caves to hibernate, from September

Because bats form the largest colonies of all mammals, vandals can easily wipe out huge numbers. Indiana bats, an endangered species (right), hibernate at a density of 300 per square foot in a Kentucky cave.

to April or May, and many also raise their young in them during summer. Bats reproduce at a slower rate than any other small mammal, with most females giving birth to just one pup each year. In winter even conscientious cave explorers can wake up hibernating bats. Each time a bat is awakened, it loses roughly two months' worth of its stored fat and thus may not survive until spring.

When nursing, mothers and pups cluster in huge colonies, warming the cave with their body heat. A disturbance often breaks the colony into smaller groups. Then the temperature drops, and the young may not grow fast enough to survive.

MYOTIS SODALIS

As their roosts are disturbed, bats are forced to move into fewer caves in greater and greater numbers, making them even more vulnerable to disaster. During the 1950s dozens of caves in Florida sheltered colonies of a few thousand bats each. I watched as one cave was buried beneath a town's new city dump and others were bulldozed shut by landowners worried about personal-injury lawsuits. One cave was opened to public exploration; another was commercialized.

By the 1980s the remaining bats were crammed into only a few caves, which were partly flooded and thus less disturbed by people. Those caves became death traps in the devastating flood caused by tropical storm Alberto in July 1994. About a quarter of a million bats drowned in just one cave.

Inexorably, bats are running out of space, funneled from natural habitat into artificial substitutes that are effective but risky, like abandoned

mines. Shut down when their pay dirt played out or by hard economic times, hundreds of thousands of these mines pit the U. S., especially in the West, the Great Lakes region, and the Northeast, as well as Canada and Mexico. For many bats, mines have become shelters of last resort. Roughly half of more than 6,000 mines recently surveyed showed signs of bat use. Ten percent of mines in the West contained important colonies; for mines in the North and East the figure is almost certainly higher.

While abandoned mines provide good shelter for bats, they pose hazards for people. Mines regarded as dangerous have long been boarded up or filled with earth by bulldozers, seldom with regard for any bats inside.

Millions of bats, which create the largest colonies of any mammal, have already been buried by this practice or been forced to seek shelter elsewhere. This dilemma is becoming acute, because many states, spurred by human accidents in such mines, have stepped up the closure rate.

To protect both people and bats, over the past five years more than a hundred sturdy gates have been constructed at mine entrances, allowing bats to pass through but keeping people out. Millions of bats have been saved by these gates, often built jointly by BCI, mining companies, and government agencies. In fact, some closed mines previously occupied by bats have been reopened and gated. This happened near Altoona, Pennsylvania, where a mine in Canoe Creek State Park now boasts the state's largest hibernating bat colony, which includes five different species.

Perhaps BCI's best experience in helping to save an abandoned mine

for bats came in the town of Iron Mountain, Michigan. In November 1992 local cave explorer Steve Smith had descended by rope into the 300-foot-deep vertical entrance of the Millie Hill Mine, scheduled to be closed within months. Where iron ore had once been excavated, he discovered the second largest hibernating population of bats in North America—nearly one million little brown and big brown bats. Steve immediately called BCI to help save them.

When I arrived in Iron Mountain, I sensed suspicion in the air. When Bob Doepker, a Michigan Department of Natural Resources biologist, and I telephoned city and mining officials, no one returned our calls. We were sure they feared an attack by aggressive environmentalists, so we set about trying to reassure the community. I arranged to speak to classes at two elementary schools and to introduce the children to live bats (I seldom travel without at least one for show-and-tell purposes).

The kids were immediately fascinated by the bats. I promised to show them even more if they would bring their parents to another talk I had arranged for the next night at the public library.

To everyone's surprise about 300 parents and children showed up. By the end of the evening minds were open, and bats had new friends. Businesses offered to donate materials, and volunteers offered their labor to build a heavy steel cage over the Millie Hill mine shaft. Now the people of Iron Mountain are very proud of their bat sanctuary.

Equally important, local mine inspectors are now cooperating to locate and protect other mines where bats live.

On the federal level, last year BCI and the U. S. Bureau of Land Management jointly funded a partnership called the North American Bats and Mines Project. The goals: to educate landowners and land managers to survey for bats before mines are closed and, if important colonies are present, to construct more of those bat-friendly gates.

How to protect bats?

Many biologists have little experience with them, so Bat Conservation International recently began sponsoring workshops to train personnel from dozens of federal and state agencies. Participants learn how to protect bat habitat, identify and census bats, and educate the public. This group's classroom is an old mine in Canoe Creek State Park in Pennsylvania. It had been bulldozed shut for safety, but when authorities learned that endangered Indiana bats wintered in the mine, its three entrances were quickly reopened and fitted with gates.

THIS IS THE KIND OF EDUCATION BCI has always promoted. One of our earliest achievements was to persuade people to quit poisoning bats in Wisconsin buildings, keeping them out instead. This happened in the early 1980s, when I was curator of mammals at the Milwaukee Public Museum.

Milwaukee's phone book listed an entry under "Bats"—my number, often called by people alarmed by a bat encounter. One morning I took a call from a woman paralyzed with fear. She said she and her husband had spent the previous night barricaded in their home, blocking every possible entryway into the house against attacking bats that had nearly "gotten them."

I asked her to describe the bats. "Small and orange," she said. Hmmm. I quickly deduced that the winged creatures that had terrified the couple were not "attacking bats" but hundreds of monarch butterflies that had paused to rest in their yard during the fall migration.

On another occasion, a county park superintendent told me that four people had been attacked by bats in one of his parks. The victims were receiving rabies inoculations and were threatening to sue the county. When I investigated, the demon bats turned out to be a female screech owl guarding her nest low in a tree. When passersby came too close, she struck their heads from behind. This happened always at dusk, and the victims blamed their ambush on the bats they saw swooping nearby, rather than the unseen owl.

Avoiding controversy and promoting partnership have always been at the heart of BCI's philosophy, and *(Continued on page 56)*

MOTHER LODE
World's largest colony of bats—20 million female Mexican freetails and their pups—crowds Bracken Cave near San Antonio. Elsewhere in North America this species has declined alarmingly—

TADARIDA BRASILIENSIS

in New Mexico, Carlsbad Cavern's colony of freetails has dwindled from 8.7 million to less than a million.

Harsh conditions prevail in Bracken Cave, which is owned by BCI. Each animal radiates at 102°F, and the cave walls are like a space heater. Pups must avoid numerous midair collisions when learning to fly.

NIGHT STARS

Close-up, North America's bats present diverse portraits. Pocketed free-tailed bats (below) zoom over Southwest deserts on fast, narrow wings. Red bats (**A**), found throughout North America, mate in flight. Females bear two to four young; most species bear just one. Spotted bats (**B**) may dissipate the heat of desert haunts through their huge ears. Silver-haired bats (**C**) live in tree cavities and migrate between Canada and the southern U. S. Gray bats (**D**) are endangered. Many of their year-round caves in the U. S. South have been disturbed or flooded. Ghost-faced bats (**E**) of the Southwest have eyes located almost in their ears and use strange mouth flaps to amplify their echolocation signals. Hoary bats (**F**) are among the hardy few that can stand frigid weather, hibernating on tree trunks in the southern U. S. and Mexico.

NYCTINOMOPS FEMOROSACCUS

LASIURUS BOREALIS **A**

EUDERMA MACULATUM **B**

LASIONYCTERIS NOCTIVAGANS **C**

MYOTIS GRISESCENS **D**

MORMOOPS MEGALOPHYLLA **E**

LASIURUS CINEREUS **F**

DIP AND SIP
Drinking on the wing, a western big-eared bat slakes its thirst from a tiny pond in the Chiricahua Mountains of southeastern Arizona. Many bats drink in flight this way, but most need open water six to ten feet across,

PLECOTUS TOWNSENDII

and less maneuverable species require a hundred feet of water to get a drink. Loss of surface water in the West, exacerbated by improper land management, threatens many bat populations.

Some bats also feed over water, such as the gray bat, which skims hatching mayflies and mosquitoes from the surface.

(Continued from page 49) it's usually worked . . . eventually. Bats are often much easier and less costly to protect than other animals. Many live in large groups in well-defined locations, such as caves, mines, and bridge crevices, where a little protection can go a long way.

Bats just need a little kind attention, but it's hard to come by. According to a recent University of Chicago study, the federal government spends nearly five million dollars trying to save one Florida panther, $184,000 for each grizzly bear, more than 1.5 million dollars per California condor—and less than three dollars on an endangered gray bat. Given their ecological and economic value, bats are an especially good investment.

As BCI WORKED to raise public awareness in Milwaukee, a greater opportunity was unfolding a thousand miles to the south in Austin, Texas. Spanning Town Lake on the Colorado River, Austin's downtown Congress Avenue Bridge was renovated in 1980.

Many Mexican free-tailed bats had lost their caves in the area, and it didn't take them long to find the new crevices under the bridge—just the right size to let them squeeze in.

There they snooze during the day, between 750,000 and 1.5 million of them, the largest urban bat colony in North America. At night they emerge to hunt insects, creating swirling skeins visible for miles around—a spectacle as grand as Carlsbad Cavern's famed New Mexico colony, which has declined to less than a million.

At first the people of Austin saw a nightmare instead of a spectacle. As the bats took wing, all the old bat bugaboos arose from the populace. Newspapers ran headlines like "Bat Colonies Sink Teeth Into City." People eagerly signed petitions demanding that the bats be exterminated, and the Texas Department of Transportation began research into ways to evict the bats.

To me the situation represented a tremendous opportunity. In 1986 I moved BCI to Austin and began trying to reduce fear with reason. Skeptics abounded. Upon our arrival a Texas magazine joshed us with a Bum Steer award. But as I introduced Austinites to their bats through lectures, talk shows, and audiovisual programs for schools, people quickly changed their minds.

For example, the Texas Department of Transportation has come full circle. After I spoke at a bridge designers conference, the department funded major research to design more bat-friendly bridges. "We have about six million bats already living in 59 Texas bridges," says structural engineer Mark J. Bloschock, "and we'll be building 15 to 20 new bridges a year that together will accommodate a million new bats."

Now when the bats stream out of the bridge at dusk, it's cause for celebration. Awaiting the event, bat-watchers spread blankets on the riverbank; above it, restaurants are packed with onlookers. Curious tourists come from around the world to this self-proclaimed Bat Capital of America to view the bats. Outdoor parties feature bat detectors, electronic receivers that can be tuned to ultrasonic frequencies emitted by bats. When the detectors beep, guests scan the sky.

Some Austinites who feared the bats a decade ago are among BCI's members, now nearly 13,000 strong. Our projects have been fruitful. We bought Bracken Cave, 60 miles southwest of Austin, to protect 20 million Mexican free-tailed bats, the world's largest colony of bats. We sponsor workshops nationally to teach wildlife managers and conservationists how to protect bats. We also have developed partnerships with state and

"Bat Capital of America," Austin, Texas, has proudly declared itself. In the early 1980s hundreds of thousands of Mexican freetails moved into the renovated Congress Avenue Bridge. New underside joints proved ideal roosts. At first citizens reacted with alarm—some signed petitions to exterminate the bats. The author convinced people of the bats' benign nature and pointed out that the colony eats 27,000 pounds of insects on an average night. Now, in August, picnickers celebrate the bats' evening emergence from the bridge.

federal agencies. We're working with Mexican officials to gain better protection for several species that winter in Mexico before migrating to the U. S. for the summer.

We publish special bat-house plans for both backyard amateurs and professional biologists, many of whom participate in our North American Bat House Research Project. They share information and experiment with new designs and locations for the houses. Some individuals have attracted 2,000 to 10,000 bats apiece.

More than ten years ago, when I was still in Milwaukee, an Oregon farmer named Tony Koch called me seeking information about bat

houses. He had already reduced his need to use pesticides by building more than 800 birdhouses. He hoped to cut down the pesticides—and the insects—even more by attracting bats.

Tony built three bat houses. After three years, he finally found five little brown bats in one house. Then he began trying different kinds of wood, aged wood, and different locations. Now he has four bat houses of varying designs on his barn, nine nursery boxes inside the barn, and eight boxes on wooden posts around his fir trees. They are occupied by several thousand contented little brown bats.

Once Tony's corn crop was infested with corn earworms, with an average of one to four of those destructive moth larvae per ear. For the past several years he has had none. The farmer's friends have come home to roost. □

Reel to Real

By CATHY NEWMAN
NATIONAL GEOGRAPHIC SENIOR WRITER

So there's this guy Robert Kincaid. Photographer.

Drives a pickup truck. Plays guitar. Doesn't eat meat but smokes Camels. Goes out to Iowa to shoot the covered bridges of Madison County for NATIONAL GEOGRAPHIC magazine. Romances a farmer's wife. Loves her. Leaves her.

An off-the-charts best-seller. Nine million sold and still counting. Now it's a movie with Clint Eastwood as Kincaid.

Is that how it is with our photographers on assignment? Hardly.

When hundreds of our readers wrote to ask when we published that story on the covered bridges, we had to say we didn't. (We have done the Brooklyn Bridge.)

But *The Bridges of Madison County?* Pure fiction. All make-believe, especially the part about getting the assignment.

Clint Eastwood squeezes off a frame as fictitious GEOGRAPHIC photographer Robert Kincaid in the film* The Bridges of Madison County; *authentic shooter Dave Harvey works a parade in Spain.

KEN REGAN/CAMERA 5 (OPPOSITE); DAVID HORNBACH

Rule 1: Get close to the subject. Jodi Cobb (above) made friends with a group of Bedouin women outside Riyadh while shooting a story on Saudi women. "Photography is taboo in the culture," Cobb reports. "These women would let me photograph them, but they wouldn't let any man see me photograph them."

Joel Sartore's camouflage (right) protects eagles, not him. The suit keeps captive birds wild by preventing them from imprinting on humans.

STEVE MCCURRY (BELOW LEFT); KENT J. KOBERSTEEN, NGS STAFF

Another day at the office. David Doubilet settles into a steel cage and waits for his first meeting with a great white shark off the coast of Australia. With a dedicated assistant, Steve McCurry keeps calm and drier than otherwise while covering monsoons in Nepal. Some days it's just one volcano after another—Chris Johns records the geologic split of Africa's Great Rift.

MARY MCBRIDE (TOP); DAVID DOUBILET

Robert Kincaid, Imaginary Hero, caught the attention of NATIONAL GEOGRAPHIC editors because of a photograph he took for a calendar. When he called the magazine, he was told: "We're ready for you anytime."

Our troops hoot at that one.

"Nothing against calendar shots, but ours is a different game," says Kent Kobersteen, associate director of photography. He means that a single photograph—no matter how beautiful—isn't a foot in the door.

"We need to see an entire body of work. We're looking for real moments of real people doing real things."

Competition for space in the magazine is unbelievably fierce. Each year we receive hundreds of story ideas. Each year we publish about 70. Even with the most promising portfolio, the path to the GEOGRAPHIC is paved with heartbreak.

To test a young photographer named David Alan Harvey, now retired director of photography Bob Gilka sent him to Cooperstown, New York, on a trial assignment. After three weeks, Harvey sent in his film.

"Dave, I'm glad you're young and strong, because what I have to tell you is going to make you feel sick and old," Gilka's letter began.

He was right: The coverage had been superficial "postcard photography," and both of them knew it. Years later on his first assignment—Tangier Island—Harvey got it right.

For David Doubilet, an underwater photographer, Gilka was the lord of nightmares.

"There is nothing new here," Gilka rumbled after reviewing the best of Doubilet's early work. Doubilet slunk out.

A year and many new pictures later Doubilet got his first assignment. Then another. And another. After 24 years he has 38 stories to his credit.

The job never gets easier. "An assignment is a mighty mountain that you climb, mostly alone," says Sam Abell, a staff photographer. "The older I get, the more the mountain seems to incline backward over my head. It doesn't become smaller. It becomes taller."

JOEL SARTORE

He . . . went through his mental checklist: two hundred rolls of assorted film . . . tripods; cooler; three cameras and five lenses. . . .

—*THE BRIDGES OF MADISON COUNTY*, BY ROBERT JAMES WALLER

ONCE THE ASSIGNMENT is approved, there's a gantlet of budgets, story conferences, research, research, research, making contacts, planning itineraries, procuring traveler's checks, travel approvals, film, equipment, passports, visas, immunizations, tickets, making lists, lists, lists, packing.

For the 1994 story on cotton, Cary Wolinsky read 65 books and dealt with 160 contacts. His itinerary landed him in 11 countries; the schedule factored in such variables as the dates of the cotton harvest in Mexico and the ginning of cotton in India. (Even so, who could have predicted that Wolinsky's Mexican driver would back his vehicle into the river or that his plane would be grounded by fog three mornings in a row while he was trying for aerials in California?)

Does luck—good or bad—have anything to do with it? Just in case, Wolinsky carries a "lucky bean." It's a tree seed that fell into his camera bag on his first assignment. He's kept it there ever since.

Before heading out, a photographer packs film—lots of it. In 1993 our photographers shot 46,769 rolls, about 1,683,600 frames. That year 1,408 pictures were published. A .001 batting average.

Next, cameras and other gear. For a 1993 story on dinosaurs Louie Psihoyos and his assistant, John Knoebber (who helps with lighting, travel arrangements, and hauling equipment around), logged 250,000 miles with 42 cases of checked luggage and six carry-ons, including nine cameras, 15 lenses, 25,000 watts of strobe lights, and a football-field-long roll of black velvet as a backdrop for photographing museum pieces. The excess baggage fees ran close to six figures.

But Dave Harvey—who tends to cover places like Oaxaca, Chile, Spain, and Vietnam rather than subjects like dinosaurs that demand complicated setups—travels light. His standard gear, two cameras and three lenses, fits in a black nylon backpack.

The heavyweight champion of gear is deepwater photographer Emory Kristof, who shipped 15 tons of equipment (one million dollars' worth) to Lake Baikal, in Siberia, for a 1992 story. The shipment, 171 crates, included a satellite dish ("we had our own country code," he recalls), a complete color lab, a rubber boat, two remotely operated vehicles for photographing deep-sea vents in the lake, and a diesel generator. Six photographs were published.

Then there's the business of what to wear. Yes, there's The Vest—tan with a million pockets. Robert Kincaid wore one.

Annie Griffiths Belt does not. Too obvious. "I want to blend in. The last thing you want people to think is: 'Oops! A photographer is here.' "

For the same reason, Steve McCurry wears sneakers, khaki pants, a blue-striped Oxford shirt. "It makes me look like a tourist," he says. In winter he ties black garbage bags around the sneakers to keep out rain and snow.

William Albert Allard (who scribbles notes to himself on the back of his hand with a ballpoint pen) wears cowboy boots. Sam Abell wears a battered fedora he bought secondhand in Texas and Birkenstock sandals (with socks in winter).

But there's one thing no photographer dares leave home without: "Duct tape. The kind with cloth in it," advises one.

In the course of field work, duct tape has patched a hole in a canoe, closed a gash in a hand, and served as a sling for a broken arm.

In Panama, for a story on the rain forest canopy, Mark Moffett, a natural history photographer, duct-taped his feet to the platform of an observation tower so he could lean over and photograph entomologist Edward O. Wilson at work below him.

"The tape helped hold my balance," Moffett explained. "Though I suppose if I had fallen, the tape might not have actually held my weight. At least my shoes would have stayed put."

Getting there is half the hassle, particularly when carrying enough gear to fill a skiff. "It's just part of the job," says Steve Raymer, here headed across Kachemak Bay on assignment in Alaska.

STEVE RATHER, RSO STAFF

Grab second camera with faster film . . . climb tree behind bridge. Scrape arm on bark—"Dammit!"—keep climbing.

The perils of photography come seen and unseen. Eric Valli hangs on a rope to photograph a Nepalese honey hunter at work. Karen Kasmauski is checked for radiation contamination at the National Institutes of Health in Bethesda, Maryland, following exposure to radioactive material in Brazil. She passed the exam and soon went out to cover deadly viruses—and after that an earthquake.

SCRAPED ARM? Tell that one to Steve McCurry, who was flying in a small plane that flipped into an alpine lake in Yugoslavia. The pilot swam away unscathed, leaving McCurry submerged upside down in freezing water. McCurry managed to squeeze under the buckled strap and escape. He suffered a detached retina.

There was the time Joe Scherschel fended off hippos with a paddle on the Nile, Loren McIntyre was jailed in Venezuela, Dean Conger was placed under house arrest in Damascus, a Bedouin chief nearly abducted Jodi Cobb in Jordan (colleague Tom Abercrombie ransomed her for a fistful of dinars), a gorilla tossed Michael "Nick" Nichols down a hill in Rwanda ("I felt this big hand on my shoulder. . . ."). Or the time Chris Johns was singed by lava in Zaire, Sam Abell was mugged in Dublin, George Steinmetz nearly lost his vision to a *loa loa* worm that infected his eye in central Africa ("It's not the big animals that cause problems. It's the tiny ones," adds Frans Lanting, who almost died of cerebral malaria), David Doubilet was chased by a great white shark, Bill Curtsinger was mauled by a gray reef shark, George Mobley was bitten by a penguin.

In Oregon, Joel Sartore got pummeled by a lumberjack. He'd finished shooting part of his 1994 federal lands story when a man demanded to know if he was working for NATIONAL GEOGRAPHIC. When Sartore said "yes," the guy started yelling that a 1990 old-growth forests story (photographed by someone else) was "nothing but lies" and started punching.

"I kept thinking that this hurt far less than the back pain

FRANS LANTING, MINDEN PICTURES (RIGHT); PETER WILKINS

Blasted by the nature he so painstakingly puts on film, Frans Lanting struggles through mud in Hawaii. A thunderstorm grounded the helicopter hired to pick him up, stranding Frans overnight in the heavily forested crater of a volcano. A garbage bag doubled as sleeping bag. To show deference and avoid provoking a 400-pound male gorilla in Zaire, Nick Nichols sank to his knees in a submissive posture. Through it all, Lanting and Nichols keep on shooting.

I'd had the week before on a runaway horse during a cattle drive in Idaho," Sartore says. Loading his car not long afterward, the pain brought him to his knees. He was bedridden for three days.

Flood, fire, earthquake, war, parasites, snakes, lightning, hurricanes, mobs, strafing, terrorist bombs, elephants, rhinos, musk oxen, killer bees, customs agents ("worse than white sharks," a photographer swears)—we've survived them all (knock wood).

"Of course," points out Sisse Brimberg, "just waiting around for the light to improve can be dangerous."

She recalls sitting in the town square of a Mexican village when an argument erupted between a dignified older man and an inebriated younger one. The old man ran off and returned, angrily waving a pistol; his young antagonist ducked behind Sisse, using her as a shield. Sisse froze, until bystanders persuaded the old man to put down the gun.

But the worst peril, any photographer agrees, is self-doubt. That black shroud of depression. The Arctic chill in your stomach. The insidious whisper that convinces you 20 years of brilliant photographs were a lucky aberration—the next time the gods won't be so kind.

"Cold sweat time," Cary Wolinsky calls it. That "this-is-the-day-they-find-out-what-a-phony-I-am" feeling. Which is why even an old hand like Bill Allard can be heard to mutter in mid shutter snap: "This could be great, Allard—if you don't screw it up."

Because you *can* screw it up. Wrong camera; wrong lens; wrong light; wrong film (sometimes, even, *no* film). The irretrievable moment, the picture that got away.

Then, suddenly, the world takes a quarter turn. The stars align. The improbable happens. Magic happens.

"The moon rises," says Sam Abell. "The blossoms fall. The peacocks display. The shadow lingers on the tent. The gondola slides into the light."

Photography redeems itself.

When he pulled into the yard, a woman was sitting on the front porch. . . . He stepped from the truck and looked at her. . . .

ROMANCE?

In the real world you can't count on it, but it happens.

"I'm standing on the steps of a church in Ayacucho, and I see this young woman go by with an attractive face," says Bill Allard, who was covering Peru for a story published in 1982.

"I was 43, just separated from my wife. The last thing I needed was a serious relationship. And it was the first thing that happened. I go to a country, fall in love with a woman who doesn't speak my language and lives a zillion miles away."

He pursued her. Ani and Bill married two years later and live in Virginia with their seven-year-old son, Anthony.

The story of romance on the road rolls on. Sam Abell met his wife, Denise, on the Pacific Crest story. Steve Raymer met wives number two and three on assignment. Chris Johns met his wife, Elizabeth, in Ethiopia while doing a story on the Great Rift.

But the poignant, and more typical, reality is that the long stretches away from home (photographers spend as long as four months at a time in the field) can strain a marriage and family bond to the breaking point.

"When I first came to the GEOGRAPHIC in 1964," Bruce Dale recalls, "eight out of twelve staff photographers had been divorced."

On the day he retired, B. Anthony Stewart pulled Dale aside. "Bruce . . . it's been an absolutely marvelous 42 years . . . but if I had to do it again, I wouldn't. . . . I have a son that I not only did not know—I never even met him."

Cautionary tales abound. Some are funny. Many are not.

"I'd been gone so much my dog growled at me when I got back," says Joel Sartore.

"If those pictures of yours are so important," snapped Dave Harvey's ex-girlfriend, "let's hear about it now, so I can bring them to you on your deathbed for you to hug."

"The men in my life have often been jealous," says Jodi Cobb. "The person left behind doesn't have the shared experience. You have a life in the field. You know everyone in town from the king to the hotel housekeeper. You come home. You feel extraneous. You don't have a mission. You have housework and unpaid bills."

On the road, again. And again. And again. Exciting, yes. Glamorous, no.

"In the field," explains Tom Kennedy, director of photography, "photographers live totally in the present. They push every other aspect of their lives into the background. It's liberating. And dangerous."

After his first marriage failed, Cary Wolinsky resolved that his second one wouldn't. He travels with his wife, Barbara, and son, Yari—an arrangement that has worked well, except for the time in Peru when a mugger knocked Cary down while Yari rode on his shoulders. When he heard the sickening crack of his son's skull against stone, he thought: "I've got to quit this job."

Yari escaped unhurt. Wolinsky continues to work for the magazine and travel with his family.

For others the juggling act is too complex.

Most of the time Karen Kasmauski leaves her two children home. "The places I'm in are too dangerous. Medical care may be poor. The water may not be drinkable," says Kasmauski, recently exposed to all manner of threats on a story about viruses.

Even when all is done, tensions persist. Coming home solves some problems and creates others.

"He'd be on assignment for three months, and I had three small children," recalls Joyce Dale, speaking of her husband, Bruce. "I'd spend the day he was coming home cleaning house and grooming the kids. We'd go to the airport to meet him. I was ready to eat out. He only wanted to go home, have dinner there. The last thing I wanted to do was go home and start cooking. We never did resolve that one."

Reflections on the photographer as mother and wife: "I live separate lives," says Sisse Brimberg, mirrored in a Montreal hotel room window. "My first priority is my children. But in the field, I'm immersed in the story; the family fades."

Level camera on tripod head. Set lens to f/8. Estimate depth of field, maximize it via hyperfocal technique.

SHUTTER SPEED. Shmutter speed. If it's just a matter of setting dials, how come you and I aren't shooting for NATIONAL GEOGRAPHIC magazine? The richness of a picture depends on everything but. It rides on an ability to see, really *see*. It hinges on knowing how to dance with subject and light, how to anticipate the ephemeral moment that will flicker before your eyes for a millisecond and vanish.

For Sam Abell, images are a magic to be conjured. His work is contemplative, lyric. A Shaker village floats in heavenly mist. Chalk cliffs glimmer in moonlight.

For Dave Harvey, photography is choreography. He tries to sense the ballet of street life, positioning himself at the center of the whirl: a protest in Chile, a disco in Spain.

For Jim Stanfield, photography is obsessive. The quest for perfection. "You don't want failure," he says, darkening at the word. A colleague comments: "Stanfield worries a story to death." For his coverage of the Vatican he reshot pilgrims at the statue of St. Peter 44 times (the last attempt was the winner). In the search for an aerial of Istanbul, he trudged up the 200 steps of a minaret 15 times. "Finally, they just gave me the key."

Underwater photographer David Doubilet daydreams his pictures. They arise out of a series of poetic images that float through his mind. While diving in the Cayman Islands, the words "stingrays and clouds" popped into his head.

"I looked down at the white sand, flying stingrays, and clear water; I looked up at the white clouds in the blue sky," he remembers. The resulting photo has the quality of fantasy.

Flip Nicklin, who photographs marine mammals, envisions himself as a hunter. He once spent three days crossing sea ice in a snowmobile for a picture of narwhals.

"It's not just finding them," says Flip, "it's watching, understanding, then getting close enough to get the story."

Technical aspects—film speed, exposure, camera lenses—are the least of it.

"People always ask about the f-stop and shutter speed of my pictures," says natural history photographer Frans Lanting.

"I tell them: 'The exposure for that photograph was 43 years . . . and one-thirtieth of a second.' "

Make contact; then make pictures. It took Jim Stanfield months to get permission to photograph the Vatican from places like a rooftop above St. Peter's Square. Flip Nicklin, nose-to-nose with an Atlantic spotted dolphin off Grand Bahama Island, free-dives with a snorkel to avoid spooking his subjects with the noise and bubbles of scuba gear.

DAN GAMMON (BELOW); JAMES L. STANFIELD

Like I said, the traveling is good, and I like fooling with cameras and being out of doors.

YES, THE TRAVELING IS GOOD, but the living isn't always easy. Along with "camera fooling" come dreary motel rooms and hopeless, rainy days without the chance of a single shot. Government bureaucrats who say "you can't go there" and 80-hour weeks.

"When people tell me they'd love to have my job," says Louie Psihoyos, "I think: 'If you only knew.' "

So, what's the motivation?

"To make people care . . . about the disappearing rain forest or great apes. I have a sense of mission," says Nick Nichols.

"To pass along that sense of curiosity that I feel. Open your eyes; there is no end to the world," says Cary Wolinsky.

"For the experience," says Robert Madden. "To say you were on the aircraft carrier when they pulled the Apollo 11 capsule out of the drink."

There for the funeral of Churchill. The opening of a Maya tomb. The fall of Pinochet in Chile. The rise of Yeltsin in Russia. *You were there. A witness.*

For others, the drive to capture an image springs from some other place.

"To show that even with all

A café window in Paris frames a couple and mirrors the quiet intrusion of photographer Bill Allard. "We're takers," he says. "Look at our language. We 'capture' this, 'get' that." Photographers give too. Their images inspire. Instruct. Give hope.

WILLIAM ALBERT ALLARD

the pain, life will go on," says Dave Harvey.

To peel back a curtain. "I like intimate stories that show a closed world, whether it's Japanese geisha or Saudi women," says Jodi Cobb.

"To show that people have the same needs; the commonality of joy, sorrow, hope, fear. The more I travel, the more I see we're all alike, whether Bombay or Boston," says Karen Kasmauski. "We show who these people are. . . ."

They're us, of course. The grand continuum of humanity. A world rich in diversity—animals, fish, birds, people.

And in searching for the light to illumine them, there is joy.

"I remember being in the middle of the Sahara on a 14-day trek with 500 camels," muses Jim Stanfield. "Five hundred camels, trailing to the horizon." Even four years after publication of his story on the explorer Ibn Battuta, Stanfield radiates wonder. "It was the happiest I've ever been."

When covering a story on poet Walt Whitman, Maria Stenzel immersed herself in the man's work, finding inspiration for her pictures—and herself—in the poetry. In the field, she carried Whitman's *Leaves of Grass* and would call a picture editor back at headquarters from a phone booth. "Listen," she would say, and launch into a poem. Her voice glowed.

"I find myself laughing out loud when I'm taking pictures," says Jodi Cobb.

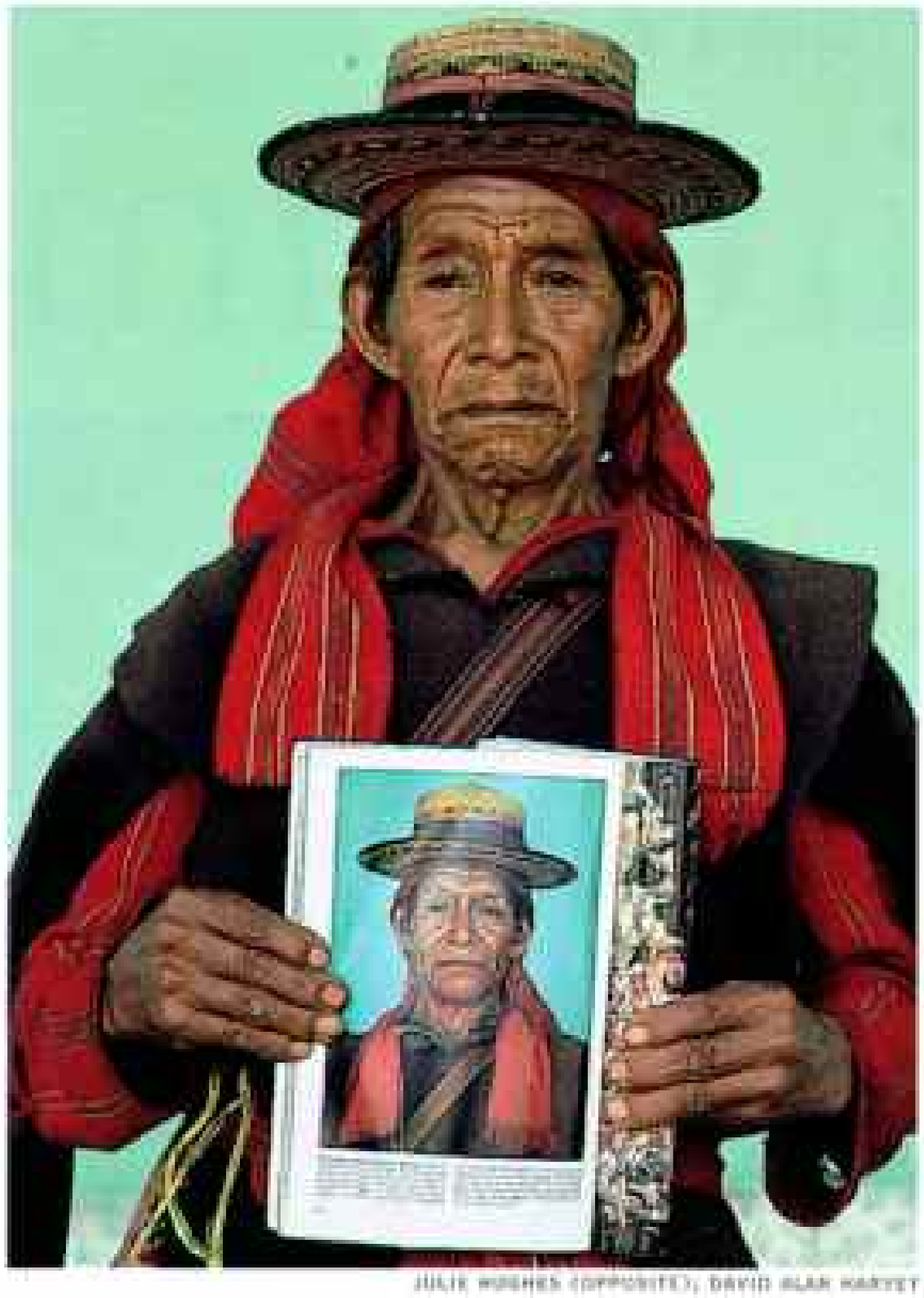
"I find myself cheering sometimes," says Annie Griffiths Belt.

Crying too. "Some things you can't even photograph," says Robert Caputo. He recalls the dying child in famine-cursed Somalia cradled in its mother's arms. Each breath more raspy and halting than the one before. He put his camera away for the rest of that day.

In sorrow and in joy, once the process of covering a story starts "it begins to overwhelm and rule your life," says Frans Lanting.

A calling. A lifestyle. A passion. Staff photographer Win Parks, a hard-drinking, chain-smoking man who died at 43, once messaged from Rome: "The water supply has been shut off, a strike has cancelled the post and long-distance telephones, civil employees are striking, and the mayor has resigned. . . . We're making good headway in the coverage."

Long after the Kincaid story fades into memory, that passion will endure. "Here, the true romance," says Bill Allard, "is the job." □



JULIE WORKMAN (OPPOSITE); DAVID ALAN HARVEY

Making pictures, making friends. "A photograph is a record of a relationship," says Bob Caputo, here with a baby chimp in Zaire. Twenty years ago Dave Harvey photographed the mayor of a Guatemalan village. "I said I'd come back." He did, 13 years later, and photographed the man again (above). "He was waiting for me."

For more on the lives and work of our photographers, read *National Geographic: The Photographs*. This 336-page volume is available to members for $34.95, deluxe edition $46.95, plus postage and handling.

Up From Ground Zero

Hiroshima

Fifty years ago, 1,900 feet above this quiet street in Hiroshima, Japan, the world's first atomic weapon exploded in a cataclysmic flash—obliterating what was then a garrison city in a nation at war with the United States. World War II ended nine days later. Today a modest plaque, at right, marks ground zero. Reborn from rubble and ash, the city is an advocate of global peace.

By TED GUP
Photographs by JODI COBB
NATIONAL GEOGRAPHIC PHOTOGRAPHER

IT IS ON THE THIRD FLOOR of Hiroshima's Funairi Mutsumi Nursing Home that I first hear the name of Akiko Osato, spoken by her 85-year-old mother, Shima Sonoda. A frail, dignified woman with close-cropped black hair, she closes her eyes to remember that distant summer morning in 1945.

Shima, a widow, had asked her three elder children to mind the stationery shop in the front of their wood-frame house while she and Akiko, her four-year-old daughter, readied a wartime breakfast of soybeans, radish leaves, and rice porridge. Shima did so with a sense of relief. A few minutes earlier the air-raid sirens had sounded the all clear, and she and the children had climbed out of their makeshift bomb shelter, a shallow pit behind the house. So far Hiroshima had been spared the firebombings that had disfigured Tokyo, Yokohama, and other cities. It was as if Hiroshima enjoyed some special immunity.

On that morning, as on so many before, Akiko pleaded with her mother to open the coveted tin of tangerines that had been set aside in the event of an aerial attack. "No," Shima told her daughter, "we must save the tangerines."

At the moment the atomic bomb exploded, Akiko was in her mother's arms, less than a mile from ground zero.

Tears run down Shima's wrinkled cheeks as she recalls her children digging her out of the rubble. Her eyes are tightly closed, her hands uplifted as if in supplication. "I prayed, 'I have four children, please save me!' and I heard the command 'Stand up!' It was the voice of my long-dead husband." When she was free they began a frantic—and vain—search for Akiko before the firestorm reached their neighborhood, forcing them to flee barefoot toward the Ota River.

Like so many, Shima has always wondered why she lived and her daughter did not. Not a single photograph of Akiko survived, but Shima still carries her image everywhere, just below the surface, like the tiny shards of glass embedded in her scalp. "My greatest regret," she says, "is that I didn't let my daughter have the tangerines." And so every morning the mother kneels at the

(Continued on page 90)

It would not be an exaggeration to say that half a century after the bomb, Hiroshima

ON AUGUST 6, 1945, a U. S. B-29 pierced cloudless skies nearly six miles above Hiroshima and dropped a single bomb. Forty-three seconds later, at 8:16 a.m., one chunk of uranium slammed into another inside the plummeting shell. The resulting explosion seared the earth like a falling sun—and a city vanished.

Two months after the world's first atomic bombing, photographer Shigeo Hayashi stood atop the remains of a roof more than half a mile from ground zero. He tilted his camera downward and shot these 18 frames, making a 360-degree arched portrait of devastation. Other than a scattering of ruined concrete hulks "there was nothing," says Hayashi, now 77. "Just one bomb did this. I was amazed." So was the world.

Hiroshima had been a wartime workhorse, its factories feeding Japan's military machine, its port on the Inland Sea a staging area for forays into China, Korea, and Southeast Asia. Headquarters of Japan's Second Army, the city housed 43,000 military personnel, 20,000 Korean forced laborers, and some 280,000 civilians.

Then it became a target. Those who survived have forever remembered a blinding white flash, incinerating heat, concussive shock wave, and a towering cloud that cast day into darkness. Homes of paper and wood ignited. Steel twisted and stone glowed. Raging winds born of the blast spread a conflagration. Fat drops of ash-blackened radioactive rain—brewed in the rising mushroom cloud—pelted the ground. The six fingers of the Ota River that cross Hiroshima overflowed with survivors seeking escape from fire and relief for blistered flesh.

At dawn the next day four square miles around the hypocenter were flattened and charred, and 70,000 buildings were destroyed. Some 80,000 people died in the wasteland. By the end of the year 60,000 more would succumb to burns, wounds, and radiation sickness.

is not one city but two: one that can never forget and the other that can never know.

Hours after the blast President Truman revealed that a new weapon—an atomic bomb—had hit Hiroshima. He promised a "rain of ruin" unless Japan surrendered. It did not. Though some of Japan's leaders sought peace, militarists continued to urge death over defeat. Twenty-eight million war-weary civilians had been trained to wield bamboo spears in a final defense of the mainland.

On August 9 a second atomic bomb destroyed Nagasaki. Japan surrendered six days later, the emperor citing the bomb in an unprecedented address. It was the first defeat in Japan's history.

Americans greeted news of the bombings with cheers and unhindered relief. Beaten was the brutal aggressor that had cruelly oppressed Asia and attacked the U. S. fleet at Pearl Harbor in 1941, drawing America into war. The war was over; the troops, spared a bloody invasion of Japan, came home.

Relief has turned, for many, into unease as years have passed and nuclear arsenals have swollen. Some question the necessity and morality of the atomic bombings, arguing that Japan—crippled and facing famine in 1945—was near surrender; that an Allied invasion with massive casualties was unlikely; that the bombs were dropped to intimidate the Soviets and avoid postwar concessions; that a demonstration of atomic force would have moved Japan to peace without slaughter.

After 50 years the bomb's legacy is one of fierce debate, of grief and of hope. For Hiroshima, said then acting mayor Shichiro Kihara in 1946, it meant the end of entrenched militarism and "the opportunity of being reborn as a peaceful symbol."

Rebirth has been rapid and sure. Planners conceived a modern city pledged to peace and dedicated a large wedge of ravaged earth as a peace park. Thousands gather there each year on August 6 to honor the dead—and to hope for a future that has learned from the past.

FLECKED WITH FIRE, the atomic cloud—photographed five miles from Hiroshima—rises to 40,000 feet above the ruined city. Bundled against the blaze, survivors flee an inferno ignited by the bomb's heat—millions of degrees at the detonation point. They seemed "a procession of ghosts, passing under a strange rainbow" wrote survivor Toge Sankichi.

MITSUO MATSUSHIGE, *CHUGOKU SHIMBUN* (LEFT); FPG INTERNATIONAL

FACING HIS NATION'S PAST, a Japanese schoolboy gazes at bomb victims portrayed in Hiroshima's Peace Memorial Museum. Visitors move silently here, as did survivors so badly burned that skin and clothing hung in rags.

"Children are learning what happened," says Hiroshi Harada, head of the museum, which last year opened a new exhibit about Hiroshima's militaristic history. The boy's T-shirt hints at today's harmony between nations.

WITHIN STRIKING DISTANCE of ground zero and the Aioi Bridge—the bomb's intended target—fans cheer the Hiroshima Toyo Carp, whose 32,000-seat stadium was built on a former garrison site. The lush Peace Memorial Park, at left, stirs quieter passions for this city of one million, set at the base of the Chugoku Mountains.

(Continued from page 80) Buddhist altar by her bed and offers up a can of tangerines to the soul of her lost daughter.

For Shima Sonoda and countless others in Hiroshima and throughout the world, 1995 is an anniversary of special significance—the 50th year since the epochal first use of an atomic bomb. The commemoration of this event provides a somber occasion to take stock of losses. It also gives an opportunity to explore the rebirth of Hiroshima, which stands at once as a symbol of humanity's capacity to destroy and of its indomitable will to rebuild.

Shima Sonoda is one of the 100,000 *hibakusha*—bomb survivors—living in Hiroshima today. An ever shrinking minority in this city of more than a million, they mingle with the young and with newcomers drawn to a vibrant metropolis, a place almost entirely devoid of physical scars.

"Have Fun in Hiroshima," invites a brochure put out by city boosters, a collage of images of enthusiastic Westerners amid red azaleas, bottles of sake, fireworks, smiling Japanese children giving the peace sign. "Hiroshima," these promoters write, "has so much to offer: beautiful parks, ancient shrines, engaging museums, breathtaking landscapes, and exciting nightlife."

Yet for all this, ultramodern and full of promise as the city surely is, it is something else too—a place of deep and abiding sorrow. Indeed it would not be an exaggeration to say that half a century after the bomb, Hiroshima is not one city but two: one that can never forget and the other that can never know.

FOR AN ENTIRE generation of Japanese and Americans the circumstances of 50 years ago are remote. Some find it hard to imagine how the decision to bomb Hiroshima could have been made. But the world was at war, and the A-bomb was said to be a way to hasten an end to the conflict, thereby saving the lives of American servicemen who might otherwise have been doomed in a protracted invasion of the Japanese homeland. Japan's capitulation on August 15, 1945—nine days after the bombing of Hiroshima and six days after the bombing of Nagasaki—confirmed the efficacy of the decision.

Though I had never been to Hiroshima, it

TED GUP's articles on how the U. S. planned, during the Cold War years, to survive a nuclear attack have appeared in *Time* and the *Washington Post*. This is his first story for NATIONAL GEOGRAPHIC.

felt as if I were returning. As a boy I had read *Hiroshima*, John Hersey's account of the bombing, and I had always wondered what became of the city and its people. I was not alone. Last year more than 65,000 Americans visited Hiroshima.

Like many of them, I am drawn to ground zero, a narrow street in the heart of the city where I stand before a simple red granite monument festooned with thousands of tiny paper cranes folded by schoolchildren. (In Japan the crane is a symbol of longevity.) Behind me shoppers sweep past, oblivious of the monument and its brass engraving of a city flattened by the bomb. In front rises the rebuilt Shima Surgical Clinic, where some survivors come for treatment. I look up into a cloudless sky and feel, with a shiver, 50 years gone.

August 6, 1945. Eight-sixteen in the morning. Nineteen hundred feet above Hiroshima a single uranium bomb dropped from the B-29 *Enola Gay* detonated with the force of 15,000 tons of TNT. Where I stand, the temperature rose almost instantly to 5400°F. Then came the shock wave, firestorm, cyclonic winds, and radioactive rain as black as ink. Some 80,000 men, women, and children died. Among them were at least 23 American prisoners of war and thousands of Koreans whom the Japanese had forced into wartime labor. Nature compounded the misery when scarcely more than a month later the Makurazaki typhoon raked Hiroshima.

By the end of the year the city's death count had reached 140,000, as radiation, burns, and infection took their toll. The population then

stood at 137,000, down from a wartime high of 419,000. Seventy thousand buildings—hospitals, police stations, post offices, and schools as well as houses and apartments—had been reduced to rubble. Survivors scanning the atomic wasteland concluded that no plant would take root in the poisoned earth for 70 years or more.

Yet even that first spring the blackened stumps of camphor and willow put out new growth. Buds and blossoms reappeared, offering hope. Shacks sprouted along the Motoyasu River. Limited trolley service boosted morale, despite the fact that most residents had no place to go. A black market flourished.

Although Americans with the Allied Occupation Force provided technical help, financial assistance for reconstruction was not forthcoming: The United States was committed to helping rehabilitate its allies in Europe. By November 1946 plans had been drafted for new roads and parks. Schools were open again, albeit in temporary buildings, and movie theaters and dance halls were doing a brisk business. By 1953 the water and sewage systems had been fully restored. A decade later Hiroshima had grown to half a million people.

Today lush pink and white oleanders line broad avenues, and stately sycamores and ginkgo trees extend their shade to pedestrians wilting in the August heat. Out of the ashes has arisen a fully modern city with an unwavering sense of destiny. Before the bomb Hiroshima had been a seat of Japanese militarism; its port, bristling with wartime industry, had dispatched relentless invasions, notably of

"NEW HUMANS," as Japanese born after 1970 are called, cruise Hondori arcade, the city's largest shopping area in 1945 and today. Here they can indulge a taste for Western fashion and slang at jeans shops like Pick-Up. "They have never experienced war," says mall president Tokihiko Hara. Yet the past is always near: Two-thirds of Hondori's original shops were rebuilt here after the bombing.

China and Korea. The new Hiroshima is a self-proclaimed City of Peace, with a towering skyline, cosmopolitan shopping arcades, and more than 700 manicured parks. Its port sends out to New York, Shanghai, and London not soldiers but the latest in consumer and industrial products. Last year the city was host to the Asian Games, marking its coming of age.

HIROSHIMA STRETCHES from the Inland Sea across the broad plain of the Ota and up into the foothills of the forested Chugoku Mountains. It occupies the site of a castle town that emerged in the late 1500s, replacing earlier farming and fishing villages in the Ota Delta.

On the southern side of the city, near the sea, rises a single peak, Ogonzan, with a serpentine road to its summit. From an overlook where vendors hawk souvenirs, I scan the spreading quilt of neighborhoods and commercial areas. To the south the gargantuan headquarters of Mazda, one of the world's largest auto production sites, can turn out 830,000 vehicles a year. Beyond my sight to the southwest is another behemoth, Mitsubishi Heavy Industries, Ltd., which produces bridge girders, boilers, turbines, and machinery used in manufacturing iron and steel. When the bomb fell, this plant was part of the Mitsubishi powerhouse of wartime shipbuilding and machine manufacturing—manned in part by forced laborers from Korea.

It is not only heavy industry that busies the city. Workers turn out soccer balls, intricately carved Buddhist altars, elegant *fude*, or writing brushes used for calligraphy, even sewing needles, an item that has been made here for more than 300 years.

When I first arrived in Hiroshima on the highway from Osaka, I searched the skyline for the skeleton of the Industrial Promotion Hall—better known as the A-bomb Dome—which I had expected to be a prominent landmark. But my eye was drawn to the familiar signs of home, a rotating golden arch and a blazing Coca-Cola sign. Overhead zipped cars of the ASTRAM, Hiroshima's ultramodern electric transit system. In the distance a gigantic bowling pin loomed amid convenience stores and shopping malls.

I drove along one of the six deltaic fingers of the Ota, on whose banks the dying had once clustered, salving their burns in the cool water. On these same banks joggers now weave among luxuriant public gardens. On one street corner I spotted a National Football League shop, with a jersey of the Kansas City Chiefs and a poster of ace quarterback Joe Montana displayed in the window.

Finally I reached the A-bomb Dome, a puny structure of twisted concrete and steel that resembles a parasol stripped of its cover by a

gust of wind. As one of few buildings near ground zero to have partly withstood the blast, it is cordoned off, preserved for all time as a cautionary statement, a plea for restraint in a nuclear world.

SCIENTISTS WHO FIRST CAME to Hiroshima to study the effects of the bomb plotted concentric circles of destruction from ground zero. Today different circles mark the lingering impact—rings of memory spreading out from August 6, 1945. Japan claims some 333,000 registered atomic bomb survivors, including those from Nagasaki. In Hiroshima, many of the 100,000 hibakusha cling tenaciously to their memories.

Take Yoshiki Yamauchi. Yamauchi is one of Hiroshima's estimated 5,000 A-bomb orphans, a hundred of whom were brought to the island of Ninoshima, 20 minutes away from the city by ferry. Over the years Ninoshima came to be known as the "island of boys." A peaceful spot only 15 miles in circumference, it strikes me as an oasis: Shiro palm trees and Susuki grass fringe the shore, giving way to the verdant slopes of a lone peak, Little Mount Fuji.

By midmorning, when I meet Yamauchi at Ninoshima Gakuen, the school that now occupies the orphanage where he grew up, the sea breeze barely nudges the summer heat. Yamauchi works as the school's maintenance man. Wearing loose-fitting green trousers, he is a muscular 60-year-old with a bull neck and stringy hair slicked down with sweat. But his manner is childlike.

That morning in 1945 his widowed mother had boarded a trolley for the ill-fated Industrial Promotion Hall. Yamauchi, who was then ten years old, was standing near the Hiroshima railroad station when the bomb went off. Even now Yamauchi puts out his hands to break the fall in his mind's eye. Sand filled his mouth. Heat seared his limbs, and he leaped into one of the tubs of water for use in an emergency fire.

His memory of the turmoil that followed is hazy. Days later, in the confusion, he became separated from his sister. It would be 29 years before they found each other, following her emotional appeal on television.

After the blast he wandered the stricken city, scavenging for food and earning what he could by shining shoes. He slept in empty train cars. One day in the fall of 1946, he and other parentless children were rounded up by the police and brought to the orphanage. Yamauchi sets a dog-eared photo album on the table in front of me and opens it as reverently as if it were an ancient scroll. "There I am," he says simply, pointing to a snapshot of a boy with a baseball bat across his lap.

"I wanted to get married when I was 25 or 30," he continues. Then, as if to ask, "What woman would have me?" Yamauchi shows me the scar from a fibrous tumor that was removed from his leg. I am reminded of Philoctetes, the archer in Greek mythology whose shipmates abandoned him on an island because they were repelled by a wound that would not heal. The difference, though, is that Yamauchi's continuing exile is in some measure self-imposed.

These days he often plays softball with the schoolchildren, many of whom are mentally retarded or disabled. "I envy these children because they have a parent," he says. "I am an orphan. No one ever came to visit me with a box or a gift."

When it is time for me to leave, Yamauchi insists on showing me the way to the ferry. He pedals his bicycle furiously, keeping well ahead of my van on the twisting road. At the harbor turnoff he waves good-bye, smiling for the first time, much like a lonely child who at last has had a visitor.

Even hibakusha who sought to integrate themselves into society often concealed their identities as bomb survivors. Many employers refused to hire hibakusha because they were prone to cancer and other ailments or because they suffered from exhaustion and depression. They also carried a social stigma. People went out of their way to avoid marrying either hibakusha or their children, for fear of genetic abnormalities induced by radiation.

It was not unusual for some parents to hire private investigators to find out if prospective in-laws were hibakusha. And although researchers at the city's Radiation Effects Research Foundation in Hijiyama Park insist they see no evidence of intergenerational effects of radiation, they concede that current analytical techniques are not refined enough to detect variations. The foundation is therefore collecting cells from a thousand hibakusha families and preserving the samples in huge stainless steel vats of liquid nitrogen, to be thawed sometime in the future, when more precise methods are at hand.

UNCONSCIOUS IRONY: Named for a comic-book hero and not for the atomic bomb—*genshi bakudan* in Japanese—the Atom pachinko parlor glows in downtown Hiroshima. Players of the immensely popular pinball-like game can trade their points for candy, cigarettes, even computer software.

FURTHERANCE OF PEACE is a recurrent theme in Hiroshima. People like Akihiro Takahashi, who was a 14-year-old schoolboy at the time of the bomb, now lecture on the subject as part of an outreach program in a building in Peace Memorial Park, bordered by the hundred-yard-wide expanse of Peace Boulevard. "We have to tell what happened," he said. "This must be handed down from one generation to the next."

Takahashi and those like him are on a mission to bear witness in the name of peace. They constitute a powerful lobby, whose influence gives city politics a global reach. No nuclear test anywhere in the world is reported without a telegram of protest signed by the mayor of Hiroshima; at one time or another the leaders of China, France, the U. S., and the former Soviet Union have all received such telegrams. And in the heart of the peace park a flame will be kept burning until the world is free of nuclear weapons.

Peace education is an integral part of the curriculum in public schools throughout the city, and schoolchildren on field trips are frequent visitors to the Hiroshima Peace Memorial Museum. "I want to make Japan a peaceful country," said 11-year-old Maho Shichijo, pulling up her Mickey Mouse socks.

When I met Maho, she was standing with her mother in the playground of the Fukuromachi Primary School, where 300 children had died in the nuclear inferno. Maho has read more than ten books on the bomb, written school reports about it, and badgered the custodian of her apartment building, a hibakusha, to tell her all about how he survived. Her mother, Tomoko Shichijo, who moved here from Nagasaki, nodded approvingly at this interest. "This is the best peace education. To know the reality. If we lived somewhere else, we would never feel it firsthand."

I met another newcomer, Sakiko Ume, a housewife from the island of Shikoku, who also told me that to be in Hiroshima is to feel its

"LET'S GO HOME, FATHER," said Midori Nakamura as she received her father's ashes at the Atomic Bomb Memorial Mound. They had been unclaimed for 49 years because of a misspelling. "I felt so overwhelmed with memories," says Nakamura, age 20 when her father was killed. "He's with me now." The ashes of more than 70,000 unidentified people remain in these solemn rooms.

past. "On the surface," she said, "Hiroshima looks bright, but deep inside it's sad."

At no time is the sadness more palpable than on the day of remembrance. Early in the morning of August 6, 1994, I join thousands of hibakusha gathering in the peace park, a triangular swath of green between the Honkawa and Motoyasu Rivers. Here the idea of peace is enshrined in numerous monuments—among them fountains, clock tower, bell, and cenotaph. The throng presses toward the altar at the Cenotaph for the A-bomb Victims, in front of which rises a mountain of flowers. Every few minutes attendants cart off armfuls of bouquets to prevent the mound from collapsing under its own weight. Mourners, many dressed in black and clutching prayer beads, drift like apparitions through a white veil of incense. "Forgive me! Forgive me!" sobs one aged woman, dropping to her knees. Is she, perhaps, blaming herself for having survived?

Behind a sign that reads A-bomb Survivors (With Invitations), we take seats to hear the remarks of dignitaries. At precisely 8:15 there is a minute of unearthly silence. I am aware only of the sound of cicadas. The Peace Bell tolls, and a cloud of doves is released beside the cenotaph. The flutter of their wings fills the void left by 50,000 silent prayers.

IN THE HONDORI SHOPPING ARCADE, 200 yards or so from ground zero, it is business as usual this morning at Cats Pachinko Parlor. Cats is a hot spot for young people, who congregate here to while away the hours amid a barrage of flashing lights and throbbing music. Part pinball, part slot machine, pachinko is a mesmerizing game: Every one of the scores of machines is in play. Drawers full of silver balls, representing winnings, are neatly stacked on the floor. Outside, knots of youths trade compact discs and take stock of one another's outfits.

On the opposite side of the arcade, in a trendy clothing boutique, Mieko Nagafuji folds shirts to the beat of the Rolling Stones. "I never think about the A-bomb," says Mieko, a pixieish 21-year-old wearing a necklace of pewter beads.

For her, World War II must seem as remote as the time of the shoguns. Although she has lived in Hiroshima for three years, she knows no hibakusha and has never set foot in the peace museum. Even Peace Memorial Park, where the anniversary observations are still going on a few blocks away, is merely a romantic retreat: She and her boyfriend take quiet walks there on Sunday afternoons. I ask Mieko if she knows when the bomb fell. "I learned it in school," she says, blushing, "but I've forgotten. Was it 1935?"

Enough time has passed now for Hiroshima to feel at ease with its new affluence. Indeed

the city is something of a sybaritic haven, celebrated for its fine sake and delectable oysters, best eaten in winter.

Nightlife centers on the downtown districts of Nagaregawa and Yagenbori, warrens of narrow streets and alleys awash in the neon light of more than 3,500 bars, restaurants, and discos. In Yagenbori my interpreter, Kunio Kadowaki, and I duck through cotton curtains into a smoky little café. We join patrons, many of them regulars, who come here to indulge their taste for grilled octopus from the Inland Sea, marinated chicken on a skewer, or crispy fried lionfish. Late into the night, as the sake and beer flow, the level of laughter rises. Smoke from the grill and the ubiquitous cigarettes forms a thick cloud. This is the other Hiroshima, vital yet relaxed and congenial.

Many transplants are drawn to this city by its proximity to the sea and to ski resorts. Yukihiro Masukawa makes a tidy profit selling sportfishing vessels, which well-to-do clients ply in the Inland Sea in pursuit of bonito, mackerel, and marlin. In his office by Hiroshima Bay we sip barley tea with Koichi Aoki, owner of a computer-supply business. Aoki, 46 and already silver haired, gazes out the window at his $500,000 boat, *Marici*, in dry dock for cleaning. "That's like my religion," he laughs. Above us, tacked to the ceiling, is a white sheet with the inked outline of one of Aoki's recent catches—a 440-pound marlin. His retriever, Tabasa, curls up at his feet. "Life is good," he says, patting his ample belly.

Even for those of ordinary means Hiroshima

A DAY OF REMEMBRANCE, August 6 last year drew 50,000 people to the peace park to lay flowers and burn incense at an annual ceremony. "People pressed forward in a torrent of grief," says author Ted Gup. Each year new

names are added to a list of those who have died since their exposure to the bomb. Last year 5,104 names joined 181,836 others. Nearby a Flame of Peace will burn until the world is free of nuclear weapons.

offers abundant diversions. Just north of the A-bomb Dome is the 32,000-seat baseball stadium, home to the Hiroshima Toyo Carp. Every season more than a million fans show up for the games. Among those they come to see is a 31-year-old American named Luis Medina, who at six-foot-three dwarfs his Japanese teammates. Medina, a first baseman, is the sole Yank on the team; only three foreigners are allowed under the rules. He once played for the Cleveland Indians and has moved 37 times in the past decade.

After a stint in the outfield shagging flies in hundred-degree heat, Medina decides to take a break. He stoops to clear the dugout's ceiling. "Yesterday I hit my head four times," he says with a grin. He is happy to be a Carp—not only because he signed a lucrative two-year contract but also because he and his wife could unpack their bags at last. During games Medina is coached through an interpreter, but the fans don't mind. Sometimes they jump to their feet, yelling *Med-in-a!* He admits to being moved.

"Here, in the place we bombed 50 years ago, it sort of freaks me out to get up at bat and see there's somebody out there, a Japanese, waving the American flag. It's a really good feeling."

When I met him Luis Medina had not yet joined the 1.5 million people who stream through the halls of the peace museum each year. Half a million of them are students, and all but 80,000 are Japanese. On my first visit I stood behind Yoshihisa Hirano and his daughter, Mariko, and son, Hiroyuki.

IN MORNING SILENCE 12,000 chairs await *hibakusha*—bomb survivors—invited to last year's memorial ceremony. Because there wasn't room for all 100,000 of Hiroshima's hibakusha, only the most severely injured received invitations to sit, though all were welcome. Mayor Takashi Hiraoka pledged to "focus the energies of the people of Hiroshima for the building of a world of peace."

"It's scary," said Hiroyuki, transfixed by a diorama depicting a woman, a girl, and a boy picking their way through a fire-ravaged landscape. "I think all nuclear weapons should be abolished as quickly as possible," added his father, who, it turned out, is a nuclear-reactor operator with the Chugoku Electric Power Company. His reactor is one of two that supply a sixth of the area's electricity.

Many visitors record their impressions in a book on a table near the museum exit. American remarks vary. Some wonder how many more Japanese civilians might have perished had the war continued. "Maybe the Japanese should visit the Pearl Harbor Museum," suggested a U. S. marine. Another American wrote, "I never really knew the full effects of the bomb until now. I am sorry."

In the basement of the museum complex, stretching along the length of the wall, a catalog of index cards is displayed every August. Each card has the name of someone who died as a result of the bombing. The clerk offers to search out one name for me. I choose Akiko Osato, the girl remembered daily in her mother's prayers. Minutes later he returns with a pink card. It has Akiko's name on one line, and on the next, under the heading "cause of death," is the word "crushed." On the line below that is the name Yoshiharu Agari—apparently the man who found Akiko's body.

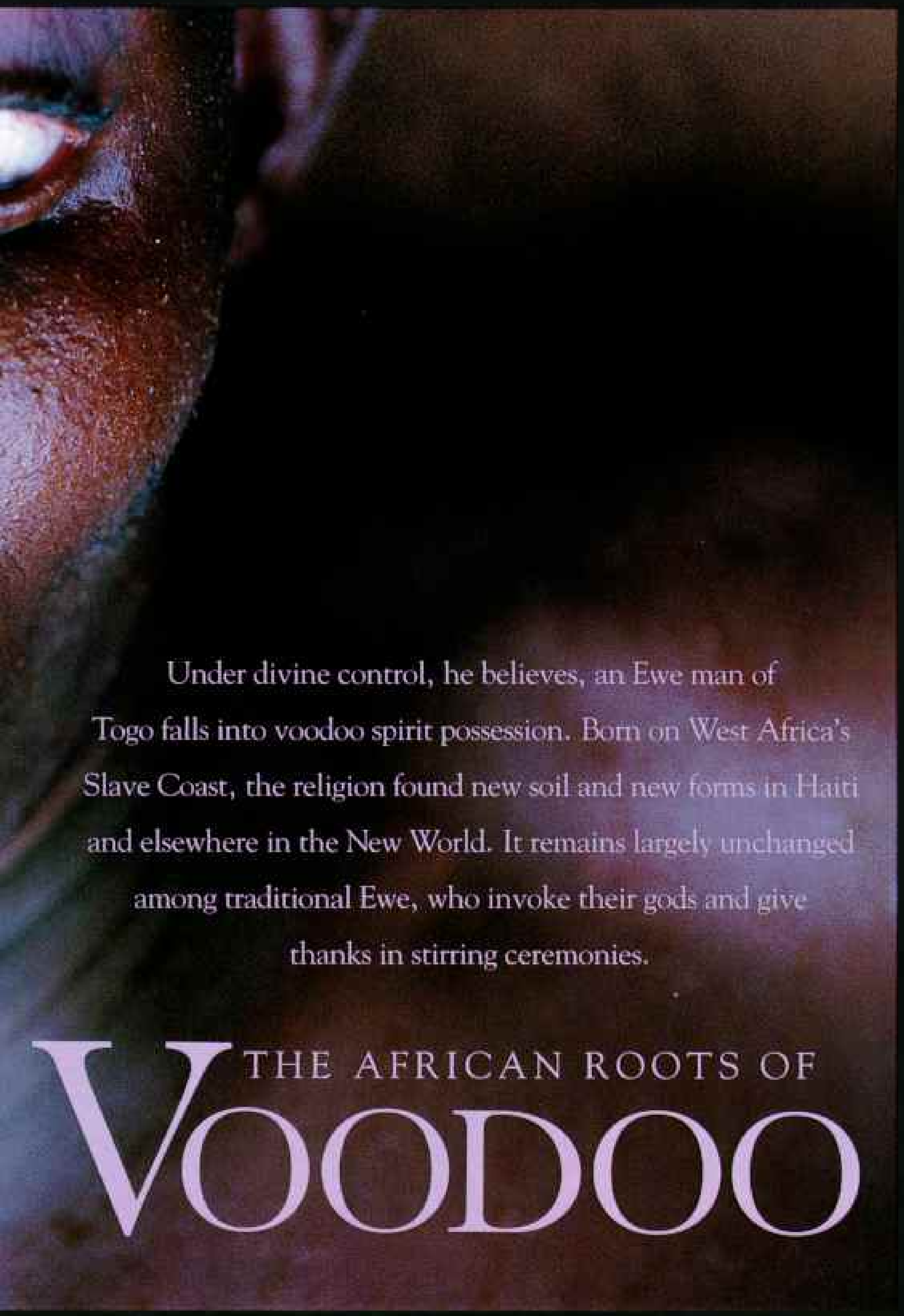
I cannot bring myself to tell her grieving mother about the card. Her pain still seems too deep.

HEALING, for many, comes with faith, and that is the concern of Shoin Aso, a Buddhist priest at the medieval Fudoin Temple. Except for a few lost roof tiles, this national treasure, which is located on the northern fringe of the city, escaped the bomb. In August, during the season of remembrance, Aso invites the grieving to participate in the traditional Bon dance, through which the faithful welcome the souls of the dead and send them on to a place of greater peace. Aso hears many stories of loss. "Year by year we forget the grief, but the guilt of surviving doesn't disappear even as the years pass."

On a hill overlooking the temple are the graves of some of those who died in the bombing. Many of the funeral urns contain only rocks, because no remains of the deceased were ever found.

The extent of the losses—in some instances the elimination of entire bloodlines—explains why the past still hangs in the air over the City of Peace. But, Aso insists, "People shouldn't think Hiroshima is a sad or sorry town. We should overcome self-pity. We cannot live unless we think about the future. Hand, eye, and nose are all forward looking." □

Article and photographs by


Under divine control, he believes, an Ewe man of
Togo falls into voodoo spirit possession. Born on West Africa's
Slave Coast, the religion found new soil and new forms in Haiti
and elsewhere in the New World. It remains largely unchanged
among traditional Ewe, who invoke their gods and give
thanks in stirring ceremonies.
THE AFRICAN ROOTS OF
VOODOO
CAROL BECKWITH and ANGELA FISHER

VOODOO

SHAKING a cow-tail whisk, priest apprentice Tatavi Heduvou bends low (below) to start his daily ritual at a voodoo healing hospital in Séko, near Togo's capital of Lomé. Goudjo Heduvou, keeper of the hospital's shrine of Gabara, grasps Tatavi's hand as he sways into a trance. Together, they call upon Gabara—the cigarette-smoking, gin-drinking, perfume-scented goddess of love (right)—to cure a heartbroken woman.

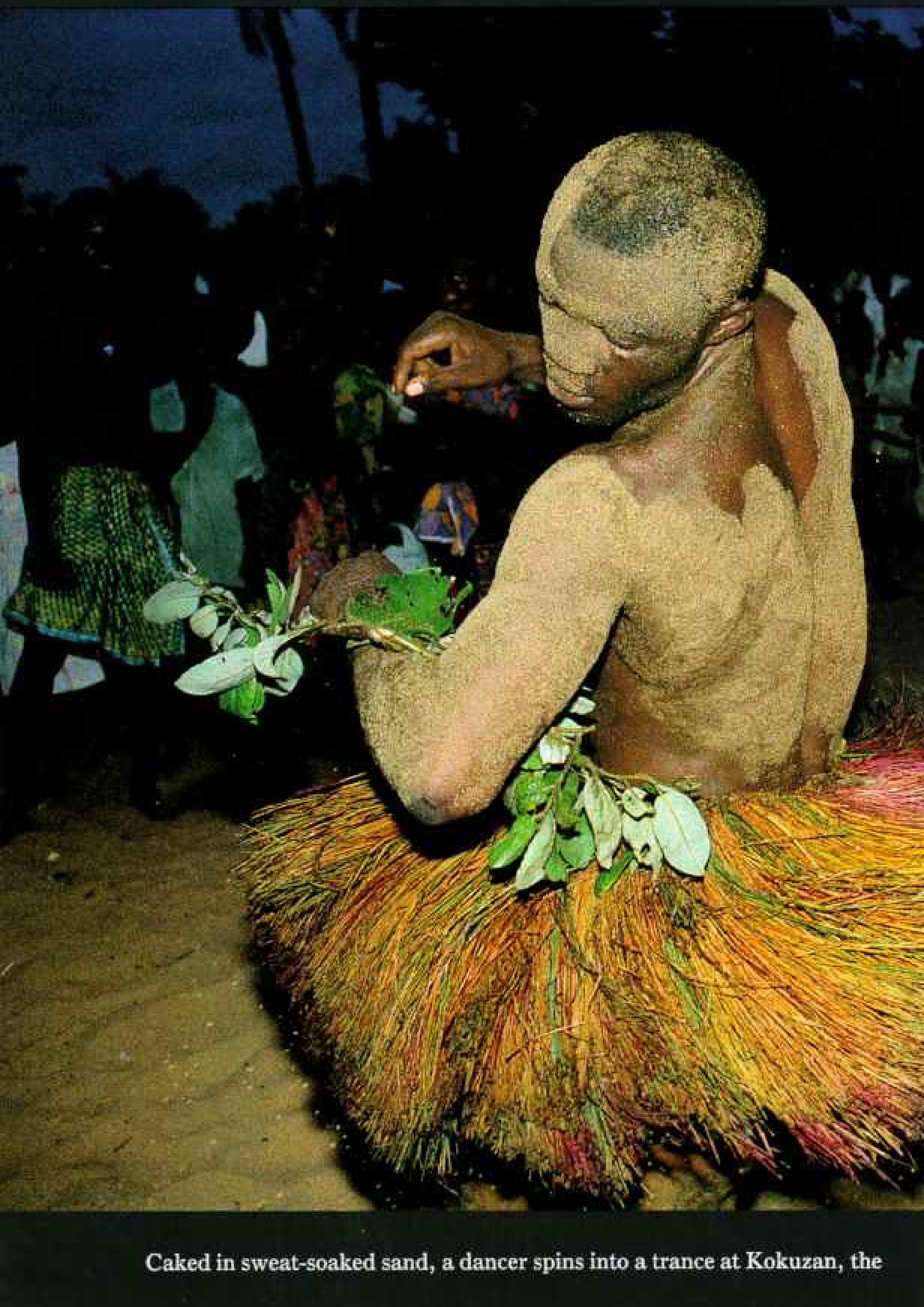
A friend had led us to the hospital, famed among traditional Ewe in southern Togo and southeastern Ghana for its cures of everything from leprosy to paralysis. It took several offerings of schnapps, a favorite of voodoo deities, to enter this mysterious world. But the gods, by way of the chief priest, finally showed favor. Our introduction to voodoo had begun.

Before coming here, we, like many others, thought voodoo was a Haitian invention. In fact, the religion was first called voodoo in West Africa and bears many names in the Americas: *vodou* in Haiti, *candomblé* in Brazil, and *obeah* in Jamaica. The word "voodoo" originated with the Fon people, relatives of the Ewe, and means "spirit."

Followers rely on unseen forces to govern their world and their very lives. Most of West Africa's 2.5 million Ewe are devout believers.

We witnessed that devotion as Tatavi (right) received a psychic prescription from Gabara for the lovesick woman, who waited anxiously outside.

Mindful of our curiosity to learn more about this often misunderstood religion, John Agbeve, an Ewe friend, baited us: "To experience voodoo, you must go to Kokuzan."



Caked in sweat-soaked sand, a dancer spins into a trance at Kokuzan, the

celebration for the deity Flimani Koku, near Aflao on the coast of Ghana.

VOODOO

PULSATING DRUMS greeted us as we trudged the sandy path to the beach-side clearing where Kokuzan was at a crescendo. Hundreds of worshipers from area villages had left their thatch-roofed homes for the seven-day celebration, held every three years in May. In undulating dance, rapturous song, and animal blood offerings, devotees paid homage to Flimani Koku, the healing god.

Worship of Flimani Koku began here about one hundred years ago when Ewe forebears brought his fetish—a large calabash holding 14 sacred knives—from Benin to Aflao. Guarded by a priest, it was now displayed across the arena.

We were distracted by a man teetering on the edge of possession. Grabbing a wooden mortar, he dropped to the sand and braced the vessel on his chest. Four men in turn slammed a pestle into the container (left). We wondered if the man's chest would be badly injured from the blows. Yet he sprang up, flung the mortar aside, and danced away unharmed.

We were even more mystified when four men drew knives from the calabash fetish and pointed them at a chicken held atop a boy's head. Within seconds, the bird collapsed, snatching a few shivering breaths before dying (top right). When the chicken was cooked in a calabash (right), the flammable gourd did not catch fire.

How can we explain what we witnessed? We can't. Yet for voodoo followers, explanations aren't needed. Faith is enough.

VOODOO

ALL AROUND US the celebrants at Kokuzan seemed to push the limits of pain: A woman splashed sand into opened eyes, a man cut his belly with shards of glass but did not bleed, another swallowed fire (right).

Nearby a believer, perhaps a yam farmer or fisherman, heated hand-wrought knives in crackling flames (below). Then another man brought one of the knives to his tongue (left). We cringed at the sight and were dumbfounded when, after several repetitions, his tongue had not even reddened.

"The gods protect us," explained Doavu Hayibor Atsivi, the chief priest presiding over Kokuzan. "They direct our actions and tell us which medicines to take so no harm can come to us."

Taken early in life by all followers, a mixture of water, seeds, and ground nuts is believed to give protection against evil spirits into old age. To reinforce the concoction's effect, Doavu told us, Kokuzan participants follow the deities' command: Do not have sex or eat goat meat for two weeks before the celebration, and come with a clean heart.

VOODOO

DRAWN by the contagion of twirling trance dancers, we were blocked only by the demands of our work from being swept into the convulsive reverence of Kokuzan.

When Carol wasn't looking, a dancer spun into her, sending her camera flying. Seconds later a woman whipped past (left), as if whirled by a blast of wind. What really propelled her, the people said, was the power of a voodoo divinity. Perhaps it was Hevioso, the god of thunder and lightning, or Mamy Wata, the goddess of wealth.

They, along with Flimani Koku and others, are second in importance only to Mawu, the creator god. Ancestors come next in order of worship. Sacred regard for fetishes and amulets completes the hierarchy.

We tried to show our respect for belief in deities whom we could not see. Imagine our confusion—and embarrassment—when a man crawled toward us on all fours, clawed at our feet, and cried, "*Dé wò afokpa! Me le bubu de tefea ñu oh!* Take off your shoes! You are desecrating the voodoo area!"

The coastal people learn from childhood to honor their divinities. Parents use voodoo to teach their children how to behave and what the community expects of them. Each morning worshipers make an offering to the local god, asking for guidance. "I pour a libation of gin and water before using a new loom," said Bobbo Ahiagble, a weaver from the village of Denu, near Aflao. "The gods bless me with inspiration."

We were increasingly moved as drum song throbbed into the night. There were no zombies here, no dolls with pins, no evil rituals ordered by malevolent gods—though we were told that the deities are capable of inflicting great harm. Instead we found a people who maintain their ties to the earth, who worship with such fervor that they, like this woman (below), completely abandon themselves to possession, the highest state of being for those who believe. As outsiders, we wondered what we were missing. □

CAROL BECKWITH and ANGELA FISHER will cover voodoo in their book *African Ceremonies and Rituals*, to be published by Harry N. Abrams, Inc., in 1997.

Bowhead Whales

Leviathans of Icy Seas

Article and photographs by FLIP NICKLIN

With summer abandon, juvenile bowheads bask off Canada's Baffin Island. After weeks of dodging pack ice, these endangered baleen whales linger to feed and socialize, raising black-and-white chins to an ocean of sky. Almost erased by commercial whaling, bowheads have been protected since 1935. A slow but steady comeback in the western Arctic allows Alaska Eskimos to pursue their ancient prey.

KERRY FINLEY nudged me with the tip of his paddle. "That's him, all right," he said, directing my gaze across the gun-metal sea. "That's Adlaalook, the Big Stranger." A giant bowhead whale had surfaced off our kayak's starboard side, and Finley, a Canadian biologist who has been studying these rare and endangered creatures for more than a decade in the coastal waters of Baffin Bay, greeted the appearance of this particular cetacean as though he were presiding at the homecoming not of a stranger but of an old friend.

Suddenly the bowhead slapped the water with his huge ivory white tail. A sound as of a cannon shot came to us across the water. We paddled closer. Another slap of the tail. And another. The pounding continued as we cautiously approached. Then old Adlaalook rolled over and down and disappeared in a swirl of ice water.

Finley had already told me that the Inuit elders in this part of Baffin Island believe Adlaalook to be the leader of the Bowhead Nation, that the great whale's arrival each September is a good omen, a promise that more whales are certain to follow, a harbinger of the autumnal feast.

The bowhead, so called because of its great arching head, lives today in two separate populations—a western group of some 7,500 animals ranging from the Beaufort Sea to the Sea of Okhotsk and an eastern group of about 500 inhabiting such icy fingers of the North Atlantic as Baffin Bay.

Once, before the coming of commercial whalers from the lands of the tall ships, the feasting in Baffin Bay had been by the Inuit, the skin-boat people who savored virtually every part of the bowhead. But the Europeans in their square-riggers soon changed all that, killing whales by the thousands for the oil, not the meat. Now so few bowheads are left in these waters that there is no permissible killing at all. Now the feasting is left to Adlaalook and the bowheads remaining, and what sustains them in the Arctic's nearly barren seas is a creature little bigger than a grain of rice.

I had come to Baffin Bay to join Finley in his study of bowhead behavior. He had introduced me to the species four years earlier, and I was grateful for that, because when I first started photographing whales in 1979 it seemed improbable that I would ever see a bowhead, much less be in the water with one.

"Under us," Finley whispered hoarsely. I peered over the gunwale of the kayak in time to see the ghostly blur of a white tail. And then it was gone. But we would see the Big Stranger again in the days ahead. And even if this whale did not truly turn out to be

Polar Passages

Heavily scarred by scrapes with ice and possibly killer whales, a 50-foot adult performs a side roll off the east coast of Baffin Island. It is one of an estimated 8,000 bowheads, among the smallest populations of any great whale species. Encased in blubber up to 20 inches thick, the whales migrate farther into the Arctic in summer to feed as ice retreats (map).

FLIP NICKLIN's fascination with underwater life is evident in the ten articles he has photographed for NATIONAL GEOGRAPHIC magazine, most of which feature whales. This is the second article he has both photographed and written.

Range of bowhead whales

0 800

MILES

NOS CARTOGRAPHIC DIVISION

Mean minimum extent of sea ice

Mean maximum extent of sea ice

Spitsbergen (NORWAY)

EUROPE

RUSSIA

North Pole

Arctic Ocean

Bering Sea

Chukchi Sea

Beaufort Sea

Barrow

Alaska (U.S.)

North Pacific Ocean

Greenland (DENMARK)

ICELAND

North Atlantic Ocean

Baffin Bay

Clyde River

Baffin Island

Nunavut (Home to Inuit Territory)

Northwest Territories

Hudson Bay

Labrador Sea

Labrador

CANADA

180°

170° E

160° W

150° W

140° W

130°

120°

110°

100°

90°

80°

70°

60° W

50° W

40°

30° E

chief of the Bowhead Nation, then surely, Finley said, it had to be the king of the "rocknosers."

"The what?"

"The rocknosers," Finley said. "The old British whalers called them that because the whales loft their tails in the air and appear to do headstands on the bottom. It's still a mystery what they're doing, though it seems to have something to do with courtship."

In *The Origin of Species*, Charles Darwin called the bowhead the Greenland whale. It was, he wrote, "one of the most wonderful animals in the world." And a rightful wonder it remains to this day. An adult bowhead can span 60 feet in length and weigh 80 tons, with up to half of its weight vested in a blanket of blubber and as much as a third of its length taken up by that huge head with the cavernous mouth. The mouth is equipped with multiple plates of fine-fringed baleen, the better to trap the tiny crustaceans on which it feeds.

Some of these characteristics proved to be responsible for the bowhead's fate at the hands of commercial whalers. Its blubber rendered more oil than that of any other cetacean, as much as 6,000 gallons from a single adult. Its feeding habits inhibited speed; its temperament precluded aggressive behavior. Thus did

Hunting by the Rules

Saved by its size, a 50-foot bowhead swims past Inupiat Eskimos in a sealskin boat near Barrow, Alaska. At the time, no bowhead more than 43 feet—the size at sexual maturity—could be killed. Cows with calves remain off-limits. Eskimos in Alaska took 34 whales in 1994, seven below quota. Frederick Brower makes a ceremonial first cut.

Specimen on Ice

A rare chance for hands-on whale research takes place on the frozen sea near Barrow as scientists examine a freshly hunted bowhead. Tissue and organs will be sent to labs across the United States. From

its jaw juts a row of baleen, long, brushlike plates through which bowheads strain their food. It was the market's hunger for oil and baleen—for whalebone corset stays—that incited slaughter of the bowhead.

the bowhead whale become an easy mark—and a profitable one.

Basque whalers started the commercial quest in the 1500s, taking whales off the coast of Labrador. Dutch and British seafarers came to dominate the hunt in the 17th century, decimating bowheads from Spitsbergen to Hudson Bay for the oil that lighted the lamps of Europe. Even as other fuels became cheaper in the mid-1800s, the demand for baleen to make corset stays and dress hoops sustained the slaughter.

Finally, in the North Pacific, American whalers in search of right whales discovered bowheads pasturing freely in the Bering and Okhotsk Seas, and followed them into the Arctic Ocean. By 1914 this western population that may once have numbered nearly 30,000 animals had been reduced by 90 percent.

ONLY IN ALASKA is the bowhead still legally hunted, and only by Eskimos. The takings are regulated by an annual quota—41 last year—sanctioned by the International Whaling Commission. Barrow (population 3,900), a large Inupiat Eskimo community at the meeting of the Beaufort and Chukchi Seas, was allotted the opportunity to take and use 18 animals. As it turned out, only 14 were landed.

I was there in springtime for the start of that hunt, three miles out from Barrow at Eugene Brower's camp, on the ice. The crew numbered seven, including one of Brower's sons. One of the sealskin boats rested on a block of ice, poised for fast launch should a whale be sighted. The sun was up all day and much of the night, but the thermometer hardly ever cracked zero. The men wore white snow shirts for camouflage over their down jackets. On watch, they stared across the ebony waters, as their ancestors had for centuries before them.

Brower spoke of muktuk, the bowhead's skin and outermost layer of fat, rich in vitamin C and highly nutritious. "It is the lifeblood of my people," he said. Then he told of his dying father, a few years back: the father sending the son away from his hospital bed to rejoin the hunt, because the son, one of Barrow's whaling captains, owed it to the community to be at the edge of the ice when the whales arrived.

Brower and his crew did not get their whale while I was in Barrow, but they would the day after I left—a 27-footer.

The world of the bowhead and of the people who are drawn to it is altogether different eastward of Alaska, across the iced rim of Canada's Northwest Territories to the waters of Baffin Island. Here there is no legal hunting of the animals, for they are so few. But it is a good place to watch for them and observe their behavior, as Kerry Finley has done nearly every summer since 1983.

Finley's effort to study the dynamics of the eastern bowhead population is underwritten by the World Wildlife Fund and the Canadian government. With two assistants, he is based at a camp of small sheds at Isabella Bay, a remote fjord halfway up the east coast of Baffin Island. Beyond the rockbound coast the gray waters of Baffin Bay are speckled with icebergs—Iceberg Alley, the old-time whalers used to call it.

"The summer I began my work was almost a wipeout," says Finley. "Only two whales appeared."

We are standing on the rocks, scanning the bay for blows. The

Dividing the Kill

For their hard work in butchering a whale, Inupiat Eskimos on Alaska's North Slope load sleds with shares of meat. The largest share goes to the boat crew that landed the first harpoon. Little is wasted. Even a "stinker" in the background—a decaying whale lost for three days under the ice—has been stripped of its still edible skin.

Paul Nader (bottom), a visiting scientist, removes a brain that would otherwise have been eaten. "We give the captains a wish list before the hunt," says one researcher. "The Eskimos are supportive, as long as the parts go for science."

Eskimo whaling captains had long insisted that the western bowhead population was greater than biologists estimated. In recent years acoustic monitoring proved their point, doubling the tally to some 7,500.

wind is shrieking. I can barely hear him. "I wouldn't have returned if it hadn't been for the advice of some Inuit elders," he says. "They told me to expect change and above all to have patience. And they were right."

Here are selected field notes from my 1994 summer with Finley at Isabella Bay:

August 26. There are a number of sleeping whales north of camp, close to shore. David [one of Finley's assistants] and I are out in my kayak. As we pass close to the side of a whale, I'm standing for a better look, and I can see that the eye is closed. Though we try to stop, my shadow glides across the eye, and the whale is awake at once. Rather than flee, it looks us over, then resettles 100 yards away.

August 28. We are in a Canadian Coast Guard helicopter, put at Finley's disposal for one day. In a small cove just north of camp we have counted 62 bowheads. 62! That could be 20 percent of the Baffin Bay population. Right now, below us, I can see a dozen whales in the shallows, rolling over one another. In the stirred-up water, a glow of white chins.

September 2. Fourth day of high winds. Many whales, but too windy to go out. See polar bear on climb to lookout.

September 5. Gray and threatening at 5 a.m., but whales close and no wind. Get going at 7:30, electric-powered kayak works great. Young whales in sex play with very nice light. Head back by 10 a.m. as sky gets very dark. See bears on beach south

No Rest for the Wary

Caught napping, a young bowhead summering in Baffin Island's Isabella Bay will awake the moment the photographer's shadow, lower right, passes across its eye. The Inuit, or Canadian Eskimos, plan to

resume a limited traditional hunt in 1999 with the advent of Nunavut, a self-governing Inuit homeland. Scientists caution that the eastern bowhead population—about 500 animals—needs more time to recover.

of camp. Strong winds return. No resupply yet. Low on fuel.

September 9. Some whales but only one roll of film. Supplies arrive in p.m. We'll break camp and leave tomorrow. . . .

OF ALL FINLEY'S OBSERVATIONS of bowheads, perhaps none is quite so fascinating as his analysis of their feeding activity. He calls it the Calanus Connection.

The *Calanus* copepod is a tiny crustacean at the epicenter of the Arctic food web in Baffin Bay. It is bread and butter for the fish that feed the seals that feed the bears. But there are no middlemen, no fish or seals, between the copepod and the bowhead. The bowhead with its gaping mouth and filter-feeding baleen has short-circuited the system and, with great efficiency, closed that great mouth directly around the food web's basic link.

And what exactly is the Calanus Connection? It is Finley's discovery that the autumn gathering of bowheads at Isabella Bay coincides with a massive migration of copepods. The feasting is initiated when the northerly gales of late summer help propel the copepods out of the fjord into the deeper bowl of Baffin Bay. Those not eaten by bowheads will hibernate while slowly moving north on a deep bay current. As the ice melts in spring, they rise to feed and drift back toward Isabella Bay. But during years affected by the global climatic phenomenon El Niño, Baffin Bay

Small Craft Warning

Who's studying whom? wonders Canadian biologist Kerry Finley, as a giant head suddenly elevates his outrigger kayak in Isabella Bay. Finley had been eavesdropping on bowheads, one of the most vocal of whales. His hydrophone picked up "grunts, groans, buglings, and sounds like elephants trumpeting."

After ten summer

seasons of work at Isabella Bay, aided by local Inuit from Clyde River, Finley in 1994 received visual proof of his long-held theory as to why bowheads come here to feed, diving as deep as 700 feet. As viewed by a miniature submersible, remotely operated by the Canadian Coast Guard (left), the depths teem with crustaceans called copepods (below, twice life-size). It is estimated that a bowhead can ingest 50,000 a minute.

stays colder and thaws later, reducing the *Calanus* population—and thus the number of bowheads that can feed here. That was the case in 1983, the year Finley saw only two whales.

Finley suspects that the bowheads are attracted to this particular fjord because, in addition to the Calanus Connection, its shoals provide some measure of security against attacks by killer whales. Still, many of the bowheads Finley has observed close-up bear scars from killer whale attacks, and one distinctive individual is missing a third of its tail. Some researchers, including Finley, believe that such predation—on top of a low birthrate—may account for the stock's apparent inability to recoup more than a fraction of its historic numbers.

One bright and windless day at Isabella Bay, I asked Finley what he thought it might take to bring bowheads back to Baffin Bay and the North Atlantic in numbers as viable as those sustaining western populations in the Bering and Beaufort Seas. "A lot of time," said Finley. "And a lot of luck. If the bowhead population could get up past a certain number—and we don't yet know what that number might be—then over the long term, a real recovery just might occur. The return of Adlaalook each year is a hopeful omen." □

Whales at Play

Swirling and twirling, a trio of bowheads sports in the shallows of Isabella Bay. "It's sex play," says Kerry Finley. "The female lying on her side in the middle would slap her flipper and get the young males excited. Then off she'd run, and they'd follow in hot pursuit. Typical adolescent behavior."

Some 60 to 70 whales gather in August off the east coast of Baffin Island. Despite constant sex play, it is not the mating season, which occurs earlier, during spring migration.

Hunted longer and more intensively than the western bowhead population, the eastern group has in the past century shown almost no growth. Finley believes that a slow reproductive rate—a single calf every three to five years—largely accounts for the stalled recovery.

Though naturally cautious, a bowhead (below) makes a bold sweep past photographer Flip Nicklin. The long curve of its head above a white eye ring explains why whalers gave *Balaena mysticetus* its evocative name.

FLASHBACK

OSCAR D. VON ENGELN

■ FROM THE ARCHIVES

"Every Negative on the Strip Perfect"

It has never been easy being a photographer for NATIONAL GEOGRAPHIC. In 1909 Oscar D. von Engeln squatted "in seawater among the icebergs" to develop his film during a Society expedition to study Alaska glaciers. Von Engeln knew that the region's high humidity could quickly ruin exposed film. So he developed it on the spot in metal tanks and washed it in clear streams or in the sea. Average water temperature: 44°F. His photographs of glaciers in Yakutat Bay and Prince William Sound appeared in the January 1910 GEOGRAPHIC.

Ford F-Series. Built tough for the ultimate dog race.

Alaska: The perfect place to test a sled dog. And a truck. That's why champion dogsledder DeeDee Jonrowe always counts on the toughness of Ford F-Series to get her dogs out to the wilderness. And back again. Toughness. One more reason why F-Series has been the best-selling truck 18 years running.

Ford

And the fast-paced human race.

Ford F-Series.
The Best-Selling Trucks Are
Built Ford Tough.

PATRICIA ARQUETTE

Truth has a witness.

A FILM BY JOHN BOORMAN

BEYOND RANGOON

CASTLE ROCK ENTERTAINMENT PRESENTS A PLESKOW/SPRINGS PRODUCTION A FILM BY JOHN BOORMAN

PATRICIA ARQUETTE "BEYOND RANGOON" FRANCES McDORMAND SPALDING GRAY HANS ZIMMER

SEAN RYERSON ALEX LASKER AND BILL RUBENSTEIN RON LOYD ANTHONY PRATT JOHN SEALE, A.C.S.

ALEX LASKER & BILL RUBENSTEIN BARRY SPRINGS, ERIC PLESKOW AND JOHN BOORMAN JOHN BOORMAN

CASTLE ROCK R AT THEATRES SOON COLUMBIA PICTURES

NATIONAL GEOGRAPHIC

AUGUST 1995

The Cover

Actress Benedetta Buccellato prepares to take the stage in Sicily for a modern version of Aeschylus's Greek drama Prometheus Bound.
Photograph by William Albert Allard

Cover printed on recycled-content paper

For membership please call
1-800-NGS-LINE

Special device for the hearing-impaired (TDD) 1-800-548-9797

Behind the Scenes

MAXIM RUSHETSKY

If the Price Is Right

GUARDING HIS GEAR at all costs, contract photographer Gerd Ludwig sleeps on camera cases at the airport in Kiev, Ukraine. Earlier in a town in Russia's Far East, he returned to his hotel room to find that some of his camera equipment, worth $12,000, was missing. Police made a halfhearted attempt to take fingerprints but admitted that it was probably hopeless.

Gerd suggested offering a reward of $600. The police were flabbergasted at the sum, many times their monthly salaries, and put the news on television. Two days later all the equipment was returned. Russian friends later told Gerd he could have gotten it back for much less.

Waiting for Whales

WINDS HOWLED, polar bears prowled, and Flip Nicklin spent "an extremely frustrating month" waiting for good weather on Baffin Island last August. The natural history photographer, who has swum with whales for 16 years, was grounded in a tent set up *inside* a shed "for extra protection," he recalls. "We had a total of three days of clear weather to photograph bowheads for this issue."

Flip's hard-won images also appear in the Society's *Whales, Dolphins, and Porpoises*, to be published in November. He was a consultant for the 232-page book, which features color photographs or paintings of all 80 species of the creatures.

Magical Honey?

SWEET SOUVENIRS, jars of wild honey presented to friends by Diane Summers and Eric Valli from their coverage of Nepalese honey hunters appeared to have an unexpected effect. "Several women who ate the honey got pregnant within weeks!" says Eric. Diane herself was not immune: Their daughter Sara was born the following year.

ERIC VALLI AND DIANE SUMMERS

BUT A FIVE STAR EXPERIENCE IS JUST A PHONE CALL AWAY.

1-800-677-5STAR

The finest sales and service experience available for your Chrysler Corporation vehicle is now only a phone call away. Because that's all it takes to find your nearest Five Star dealership. Fewer than one in five dealerships earn the Five Star Award for Excellence. Through continuous evaluations and surveys, people like you, our valued customers, have rated these dealerships to be among the top in the country. It's your assurance of satisfaction–and a very good reason to make a Five Star Dealer your choice for your next Chrysler Corporation vehicle purchase or service needs.

CHRYSLER CORPORATION

CHRYSLER · PLYMOUTH · DODGE · JEEP · EAGLE

Opening Our Treasure Trove

"FINS, FANGS, FUR, stones, and bones"—those subjects sell, according to Maura Mulvihill, director of our Image Collection. For the first time, editors, publishers, and art directors can draw on the Society's collection of more than 10.5 million photographs and artworks to illustrate books, articles, and advertisements.

Some requesters seek the specific—and impossible: "I need a photograph of Julius Caesar." Others ask for an illustration of a concept: "spirituality" or "the competitive edge." When asked to narrow the subject, one potential customer said, "Just send whatever you find."

For orders large or small, standard industry fees apply, from several hundred to several thousand dollars.

Good Timing

WILDLIFE PHOTOGRAPHER George Grall—and our reputation—inadvertently struck a blow for conservation in Mexico last fall. George, photographing unusual desert springs near Cuatro Ciénegas (below) for the October issue, met the local mayor, Susana Moncada. She, in turn, informed the governor of Coahuila that the GEOGRAPHIC would be featuring the region. The governor, a longtime Society member, became so enthusiastic that he persuaded the then president of Mexico to declare the springs a natural protected area, something conservationists had been urging for 30 years.

Test of Nerves

IN A MILITARIZED AREA of Irian Jaya, a province of Indonesia on the island of New Guinea, staff writer Tom O'Neill abruptly braked his motorbike when an armed soldier in the road motioned for him to stop. Fearing arrest, Tom stood at attention as the soldier barked: "Walk your bike past this school. The students are taking a spelling test!"

Welcome Visitor

THE TRIBUTE PAID by member Dorel Jurcovan touched receptionist Pat Tobin at our Washington, D. C., headquarters recently. The Romanian businessman told her he stopped by because he "wanted to express how we Romanians feel about NATIONAL GEOGRAPHIC, but there just aren't words. During all the difficulties—communism, wars, economic hardships—you gave us hope."

JESUS LOPEZ

■ FOR INFORMATION

Call:
1-800-NGS-LINE
(1-800-647-5463)
Toll free from U. S., Canada
8 a.m.–8 p.m. ET Mon.–Fri.
Special device for the hearing-impaired (TDD) 1-800-548-9797

Write:
National Geographic Society
1145 17th Street N.W.
Washington, D. C. 20036-4688

We thought of everything.

Chapter Three

By taking our cab-forward design philosophy a step further, we reduced the coefficient of drag to .36. Which means Caravan slips through the wind more easily.

We gave it a sleek shape to minimize wind noise and ended up with the quietest Caravan ever.

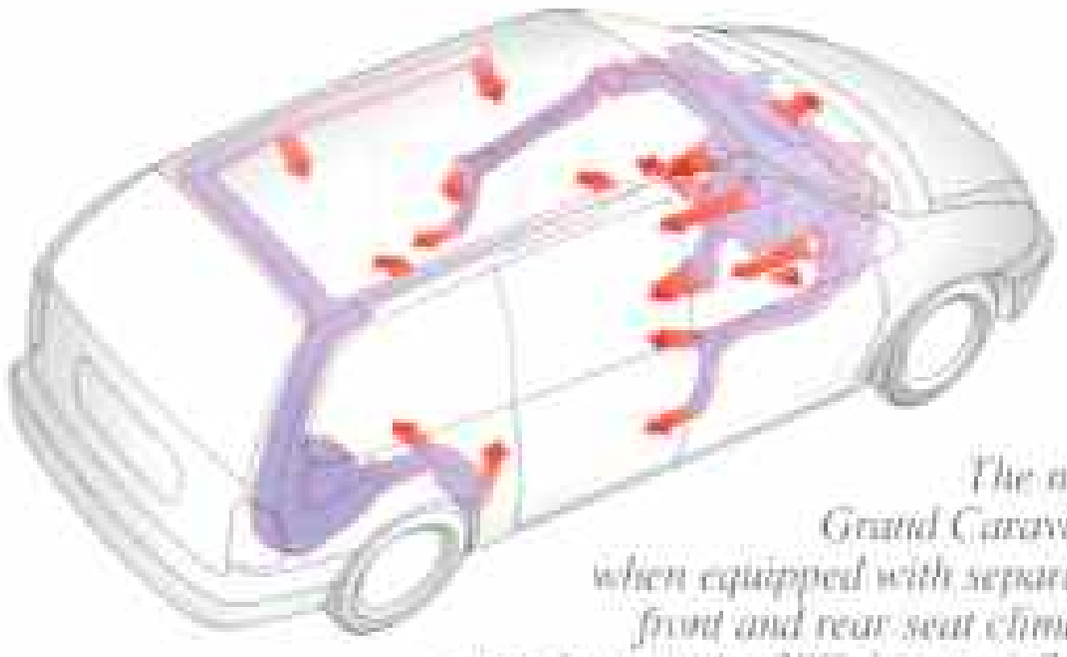
By changing the way Caravan looks,

Our clever designers found a way to make the new Caravan's side-view mirrors both larger and less wind resistant.

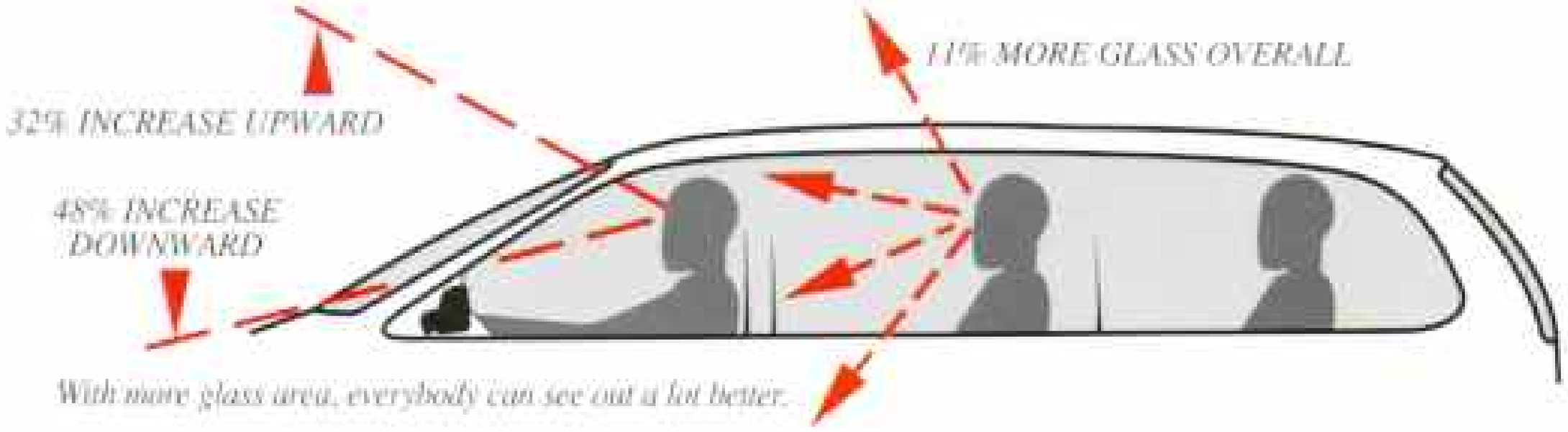
We designed all the important controls to be easy to see and reach. After all, it's those little touches that matter most.

63"

We moved the wheels farther apart, resulting in greater stability and even more car-like handling.

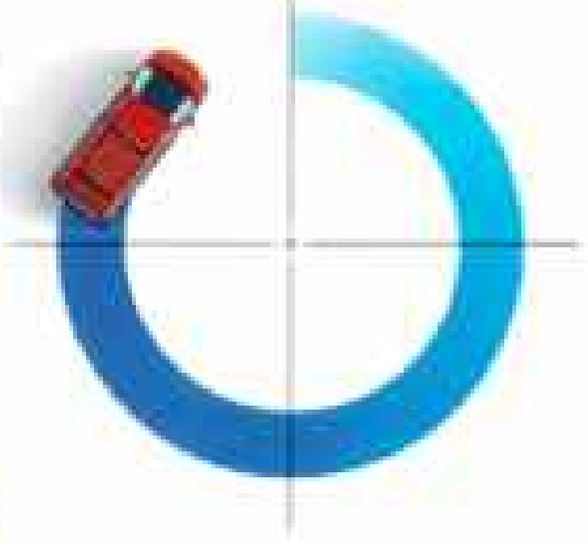


The new Grand Caravan, when equipped with separate front and rear seat climate controls, provides 28% better airflow.



With more glass area, everybody can see out a lot better.

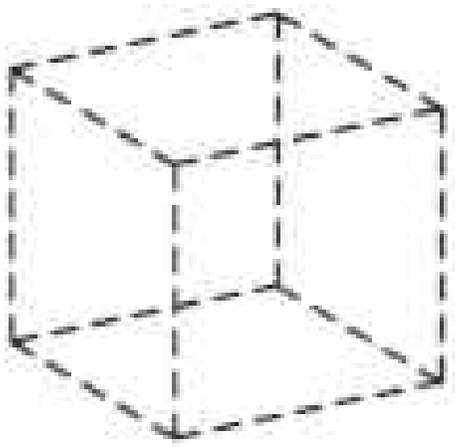
A significantly smaller turning circle makes the new Caravan more maneuverable.



We rounded the corners for a more aerodynamic shape, and still found a way to get more room inside.

There's room for 28 2x4s under the back seats. Plus, we've made the liftgate easier to lift and to close.

we've improved the way it works.



There's 34 cubic feet more room inside the new Caravan. You'll enjoy discovering where we put it.

100000

The 3.3L and 3.8L engines available in the new Caravan are so advanced, they can run 100,000 miles before a scheduled tune-up.

With our new optional driver-side sliding door, you can spend less time running around. A lower step-up height adds to the convenience.

The New Dodge Caravan

We think you'll agree, we thought of everything. But if you can think of anything else you'd like to know, call 1-800-4-A-DODGE. And we'll send you all kinds of information.

The New Dodge Caravan

Just as original as the original.™

Always wear your seat belt.

Forum

California Earthquakes

The excellent combination of appropriate photographs, first-class, uncluttered graphics that clearly explained the scientific background, and text that encompassed the physical, social, and economic aspects of earthquakes (April 1995) impressed me, a geography teacher of some 40 years. It is geography at its best!

MICHAEL REGINALD JOHN KIRBY
Coalville, England

I was in my second-story studio apartment in west Los Angeles on January 17, 1994, and my second thought after the initial shaking subsided was "Well, I know I have water." I had eight half-gallon bottles of water, enough for four days. I also had canned food, canned milk, a manual can opener, a flashlight, candles, a battery radio, and a bicycle. (I have never heard of a bicycle being included in a survival plan, but think about it: If the roads are closed to autos, the next best transportation is a bike.)

Officials alone cannot handle a disaster of that magnitude. Every individual must be prepared to care for himself, his family, and pets for at least 72 hours after a quake.

My husband and I now live in Palm Desert, surrounded by faults. But we're prepared for the next one. I'd rather have an occasional earthquake than six months of blizzards.

BARBARA J. AUGSDORFER
Palm Desert, California

Occasionally our office deals with post-quake stress with humor. After the Whittier Narrows quake (5.9), I contributed this poem to help calm our jitters.

Between the dawn and the daylight
When the sun is trying to flower,
Comes a jolt in the day's preparations,
Which is known as the Earthquake Hour.

NANCY J. RAY
La Habra, California

It has been convenient after earthquakes to make welding a scapegoat for what is actually poor design. In fact, perfect welds would probably not have saved many connections. The public should not be led to believe that a building can ever be damage proof in severe earthquakes.

Living in seismic areas carries a price that society must be willing to pay in terms of dollars, not lives. If this is understood, steel buildings that survive with cracked connections and no lives lost can only be considered successes.

HARDY CAMPBELL III
Miami, Florida

There is a third method of assessing the severity of a seismic event. The Mercalli scale classifies quakes by the amount and types of damage caused to people and property. It emphasizes that most central of geographic concepts: location of human communities in relation to natural events.

BRIAN WILDFONG
Guelph, Ontario

My house in Oakland is somewhere among those hills in the background of the picture on pages 32-3. I've been looking at the Golden Gate Bridge these 49 years, but I've never seen it from THAT perspective before. Fantastic! No one can look at that picture and not feel at least a twinge of acrophobia.

JOHN HAMILTON
Oakland, California

Something to ponder: How much of the information for your article originated from research done by the U. S. Geological Survey? I notice its name appears 12 times in your article and 4 times on the accompanying map. Citizens need to know the danger of ignorance in the absence of this agency's valuable work. Let us hope Congress doesn't vote it out of existence.

THOMAS M. SWARTZ
Berkeley, California

The supplement map set the epicenter of the 1906 San Francisco quake near Daly City, south of San Francisco, when in fact it was in Olema, just below the F in the label Rodgers Creek Fault. The Earthquake Trail at Point Reyes National Seashore confirms this fact.

JEFF ZIMMERMAN
Petaluma, California

The National Geophysical Data Center has plotted the epicenter of the 1906 quake southwest of San Francisco. However, the greatest lateral displacement along the San Andreas Fault (16 to 21 feet) did occur on the Point Reyes Peninsula.

The New Saigon

As a Vietnamese American, I enjoyed this article very much, as it brings back the memory of Vietnam, not just as a war but as a country. This city did remarkably well even under the tremendous pressure from the north and under the embargo. Capitalism never died but is alive and well. As the economy takes off, the government's grip on its people begins to crumble, though painfully slowly. Vietnam is heading in the right direction.

THIEU TRAN
Garden Grove, California

A Vietnam vet, I have suspected for some time that the North Vietnamese might turn out to be the real losers. After more than 30 years of conflict, more than a million lives lost, and billions of dollars in expense, they find they must restore what they set out to destroy.

The real irony is they must appeal to former enemies for assistance. I refer to the Americans,

Australians, South Koreans, Japanese, Thais, and South Vietnamese.

NORMAN ROBERTS
Fort Collins, Colorado

After the fall of Saigon some of the many Vietnamese who fled Vietnam migrated to the Philippines. While visiting Vietnam in 1993, Philippine President Fidel V. Ramos agreed to repatriate refugees back to Vietnam. Some threatened to commit suicide if they were forced to go back. Even the growing economy of Ho Chi Minh City cannot encourage them to return for fear of being persecuted.

JOSE ANGELITO P. ANGELES
Pasay City, Philippines

The article managed to avoid the hype of both Vietnamese officials and entrepreneurs that the city is a great investment. As long as the city and country are governed by the rule of man—in the form of the Communist Party—and not by the rule of law, the city's future is murky at best.

MANFRED GROTH
San Antonio, Texas

Unfortunately some of the "old" abuses continue, namely the imprisonment of Buddhist monks. Thich Khong Tanh, Thich Tri Luc, and Thich Nhat Ban were arrested in November 1994 for bringing food to flood victims in trucks belonging to the Unified Buddhist Church. Other monks are detained solely for the nonviolent expression of their beliefs. The more people know, the less likely it is that Prime Minister Vo Van Kiet will allow these human rights abuses to continue.

ROBERT D. REED
Minneapolis, Minnesota

Mountain Goats

How refreshing to read an article that is full of affection and admiration for the mountain goat! Here in the Pacific Northwest it is currently a hot subject. The National Park Service just released its long-awaited Draft Environmental Impact Statement, in which it recommends shooting the remaining 225 to 350 mountain goats in Olympic National Park. The impact statement says the goats have the *potential* to impact rare and fragile vegetation. Douglas Chadwick's article comes through loud and clear about just how extraordinary these animals are.

ANTJE GUNNAR
Langley, Washington

Regarding the Olympic Peninsula, the Park Service says mountain goats were introduced by humans in the 1920s. It is perfect goat habitat, almost identical to the Cascades, from which the imported goats came. The Park Service has already reduced a once robust population of around 1,200 and is still at it. I am surprised that environmentalists are making little fuss about it.

J. MARVIN CHASTAIN
Port Angeles, Washington

Your article refers to male goats as billies and females as nannies. These are popular names. But males properly are referred to as bucks and females as does.

CLAIRE SMITH
Las Vegas, Nevada

Mountain goats are correctly called nannies and billies. Barnyard goats, which are not closely related, are called does and bucks.

Koalas

Those readers who have visited my country, Australia, and enjoyed its unique natural heritage have the right to be concerned. The koala is part of our global heritage. You have done the koala a great service by highlighting its plight.

RICK HUMPHRIES
Göteborg, Sweden

Your opening caption—"Now Australians are rallying to the rescue"—is unfortunately valid for some Australians only. Today's *Courier Mail* announces the Queensland government's decision to go ahead with a new motorway right through koala country. A physical barrier, such as this road, could cause a sharp decline in the population, which could lead to local extinction.

HANS EMMENEGGER
Cornubia, Australia

While visiting a game preserve outside Adelaide, my wife, Annie, and I came upon a koala in a small tree. Apparently wanting to be held, the koala climbed into Annie's arms. As endearing as this seemed, it was like holding a stuffed toy. It was not the least bit affectionate and hardly moved. A park ranger told us koalas get stoned on the eucalyptus, which explains their lethargy.

RANDY SITTON
Aurora, Colorado

Nearly all scientists reject the idea that eucalyptus leaves intoxicate koalas. A more likely reason for the animals' lethargy is that their nutrient-poor diet leads to a slow metabolism.

Earth Day

Your article praises an activist for preventing development near her home by buying adjacent land (page 128). What has buying property to ensure continuation of one's preferred lifestyle to do with environmental protection and with Earth Day in particular? The property that is now "protected" was supposed to be used for building houses for people like you and me. Now such people will not live in the "green-and-gold valleys . . . of central New Hampshire."

JOSEF R. MANKOWSKI
London, Ontario

Letters for FORUM *should be sent to National Geographic Magazine, Box 37448, Washington, D. C. 20013-7448, or by fax to 202-828-5460, or via the America Online computer network to ngsforum@aol.com. Include full name, address, and daytime telephone. Letters selected may be edited for clarity and space.*

ASK YOUR DOCTOR FOR A TRIAL OF
CLARITIN®-D

Nondrowsy prescription relief for runny noses; itchy, watery eyes; sneezing; and stuffy, congested noses.

Clear relief from seasonal nasal allergy symptoms including nasal congestion.

Clear relief that won't make you drowsy. In studies, the incidence of drowsiness, 7%, was similar to placebo (sugar pill), 4%, at the recommended dose.

Clear relief for 24 hours with convenient *twice-a-day* dosing (every 12 hours).

Clear relief with a low occurrence of side effects.

Common side effects of CLARITIN®-D are sleeplessness, 16%, and dry mouth, 14%—the only two side effects that occurred more often with CLARITIN®-D than with placebo (sugar pill). Other side effects, including headache, sleepiness, and nervousness, occurred about as often as with placebo (sugar pill).

CLARITIN®-D contains pseudoephedrine sulfate, which also is in many over-the-counter (OTC) and prescription medications. Too much pseudoephedrine sulfate can cause nervousness, sleeplessness, dizziness, and other related side effects. Therefore, be sure to tell your health-care provider if you are taking any OTC or prescription medications, including decongestants.

There are some people who should not take CLARITIN®-D. Other people need to be especially careful using it. Therefore, be sure to tell your health-care provider if you have high blood pressure, heart disease, diabetes, glaucoma, thyroid or liver problems, or difficulty urinating, or if you are taking MAO inhibitors (prescription medicines that treat depression), or if you become pregnant or are nursing a baby. Also, CLARITIN®-D must not be chewed or broken.

Available by prescription only. Call 1-800-CLARITIN (1-800-252-7484) for a $5.00 coupon and important FREE information about relief from seasonal nasal allergies including nasal congestion.

Consult your doctor for important information concerning this product.

Twice-a-day

Claritin®-D

(loratadine 5 mg/pseudoephedrine sulfate, USP 120 mg)

Extended Release Tablets

Clear Relief

Please see adjacent page for additional important information.

Schering / KEY

CLARITIN®-D

brand of loratadine and pseudoephedrine sulfate, USP

Long-Acting Antihistamine/Extended Release Decongestant Tablets

BRIEF SUMMARY (For full Prescribing Information, see package insert.)

CAUTION: Federal Law Prohibits Dispensing Without Prescription

INDICATIONS AND USAGE: CLARITIN-D Tablets are indicated for the relief of symptoms of seasonal allergic rhinitis. CLARITIN-D Tablets should be administered when both the antihistaminic properties of CLARITIN (loratadine) and the nasal decongestant activity of pseudoephedrine are desired (see **CLINICAL PHARMACOLOGY**).

CONTRAINDICATIONS: CLARITIN-D Tablets are contraindicated in patients who are hypersensitive to this medication or to any of its ingredients.

This product, due to its pseudoephedrine component, is contraindicated in patients with narrow-angle glaucoma or urinary retention, and in patients receiving monoamine oxidase (MAO) inhibitor therapy or within fourteen (14) days of stopping such treatment (see **Drug Interactions** section). It is also contraindicated in patients with severe hypertension, severe coronary artery disease, and in those who have shown hypersensitivity or idiosyncrasy to its components, to adrenergic agents, or to other drugs of similar chemical structures. Manifestations of patient idiosyncrasy to adrenergic agents include: insomnia, dizziness, weakness, tremor, or arrhythmias.

WARNINGS: CLARITIN-D Tablets should be used with caution in patients with hypertension, diabetes mellitus, ischemic heart disease, increased intraocular pressure, hyperthyroidism, renal impairment, or prostatic hypertrophy. Central nervous system stimulation with convulsions or cardiovascular collapse with accompanying hypotension may be produced by sympathomimetic amines.

Use in Patients Approximately 60 Years and Older: The safety and efficacy of CLARITIN-D Tablets in patients greater than 60 years old have not been investigated in placebo-controlled clinical trials. The elderly are more likely to have adverse reactions to sympathomimetic amines.

PRECAUTIONS: **General**: Because the doses of this fixed combination product cannot be individually titrated and hepatic insufficiency results in a reduced clearance of loratadine to a much greater extent than pseudoephedrine, CLARITIN-D Tablets should generally be avoided in patients with hepatic insufficiency. Patients with renal insufficiency (GFR < 30 mL/min) should be given a lower initial dose (one tablet per day) because they have reduced clearance of loratadine and pseudoephedrine.

Information for Patients: Patients taking CLARITIN-D Tablets should receive the following information: CLARITIN-D Tablets are prescribed for the relief of symptoms of seasonal allergic rhinitis. Patients should be instructed to take CLARITIN-D Tablets only as prescribed and not to exceed the prescribed dose. Patients should also be advised against the concurrent use of CLARITIN-D Tablets with over-the-counter antihistamines and decongestants.

This product should not be used by patients who are hypersensitive to it or to any of its ingredients. Due to its pseudoephedrine component, this product should not be used by patients with narrow-angle glaucoma, urinary retention, or by patients receiving a monoamine oxidase (MAO) inhibitor or within 14 days of stopping use of an MAO inhibitor. It also should not be used by patients with severe hypertension or severe coronary artery disease.

Patients who are or may become pregnant should be told that this product should be used in pregnancy or during lactation only if the potential benefit justifies the potential risk to the fetus or nursing infant.

Patients should be instructed not to break or chew the tablet.

Drug Interactions: No specific interaction studies have been conducted with CLARITIN-D Tablets. However, loratadine (10 mg once daily) has been safely coadministered with therapeutic doses of erythromycin, cimetidine, and ketoconazole in controlled clinical pharmacology studies. Although increased plasma concentrations (AUC 0-24 hrs) of loratadine and/or descarboethoxyloratadine were observed following coadministration of loratadine with each of these drugs in normal volunteers ($n = 24$ in each study), there were no clinically relevant changes in the safety profile of loratadine, as assessed by electrocardiographic parameters, clinical laboratory tests, vital signs, and adverse events. There were no significant effects on QT$_c$ intervals, and no reports of sedation or syncope. No effects on plasma concentrations of cimetidine or ketoconazole were observed. Plasma concentrations (AUC 0-24 hrs) of erythromycin decreased 15% with coadministration of loratadine relative to that observed with erythromycin alone. The clinical relevance of this difference is unknown. These above findings are summarized in the following table:

Effects on Plasma Concentrations (AUC 0-24 hrs) of Loratadine and Descarboethoxyloratadine After 10 Days of Coadministration (Loratadine 10 mg) in Normal Volunteers

	Loratadine	Descarboethoxyloratadine
Erythromycin (500 mg Q8h)	↑ 40%	↑46%
Cimetidine (300 mg Q6h)	↑103%	↑ 8%
Ketoconazole (200 mg Q12h)	↑307%	↑73%

There does not appear to be an increase in adverse events in subjects who received oral contraceptives and loratadine.

CLARITIN-D Tablets (pseudoephedrine component) are contraindicated in patients taking monoamine oxidase inhibitors and for 2 weeks after stopping use of an MAO inhibitor. The antihypertensive effects of beta-adrenergic blocking agents, methyldopa, mecamylamine, reserpine, and veratrum alkaloids may be reduced by sympathomimetics. Increased ectopic pacemaker activity can occur when pseudoephedrine is used concomitantly with digitalis.

Drug/Laboratory Test Interactions: The *in vitro* addition of pseudoephedrine to sera containing the cardiac isoenzyme MB of serum creatinine phosphokinase progressively inhibits the activity of the enzyme. The inhibition becomes complete over 6 hours.

Carcinogenesis, Mutagenesis, Impairment of Fertility: There are no animal or laboratory studies on the combination product loratadine and pseudoephedrine sulfate to evaluate carcinogenesis, mutagenesis, or impairment of fertility.

In an 18-month oncogenicity study in mice and a 2-year study in rats loratadine was administered in the diet at doses up to 40 mg/kg (mice) and 25 mg/kg (rats). In the carcinogenicity studies pharmacokinetic assessments were carried out to determine animal exposure to the drug. AUC data demonstrated that the exposure of mice given 40 mg/kg of loratadine was 3.6 (loratadine) and 18 (active metabolite) times higher than a human given 10 mg/day. Exposure of rats given 25 mg/kg of loratadine was 19 (loratadine) and 67 (active metabolite) times higher than a human given 10 mg/day. Male mice given 40 mg/kg had a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) than concurrent controls. In rats, a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) was observed in males given 10 mg/kg and males and females given 25 mg/kg. The clinical significance of these findings during long-term use of loratadine is not known.

In mutagenicity studies with loratadine alone, there was no evidence of mutagenic potential in reverse (Ames) or forward point mutation (CHO-HGPRT) assays, or in the assay for DNA damage (Rat Primary Hepatocyte Unscheduled DNA Assay) or in two assays for chromosomal aberrations (Human Peripheral Blood Lymphocyte Clastogenesis Assay and the Mouse Bone Marrow Erythrocyte Micronucleus Assay). In the Mouse Lymphoma Assay, a positive finding occurred in the nonactivated but not the activated phase of the study.

Loratadine administration produced hepatic microsomal enzyme induction in the mouse at 40 mg/kg and rat at 25 mg/kg, but not at lower doses.

Decreased fertility in male rats, shown by lower female conception rates, occurred at approximately 64 mg/kg of loratadine and was reversible with cessation of dosing. Loratadine had no effect on male or female fertility or reproduction in the rat at doses approximately 24 mg/kg.

Pregnancy Category B: There was no evidence of animal teratogenicity in reproduction studies performed on rats and rabbits with this combination at oral doses up to 150 mg/kg (885 mg/m^2 or 5 times the recommended daily human dosage of 240 mg or 185 mg/m^2), and 120 mg/kg (1416 mg/m^2 or 8 times the recommended daily human dosage), respectively. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, CLARITIN-D Tablets should be used during pregnancy only if clearly needed.

Nursing Mothers: It is not known if this combination product is excreted in human milk. However, loratadine when administered alone and its metabolite descarboethoxyloratadine pass easily into breast milk and achieve concentrations that are equivalent to plasma levels, with an AUC_{milk}/AUC_{plasma} ratio of 1.17 and 0.83 for the parent and active metabolite, respectively. Following a single oral dose of 40 mg, a small amount of loratadine and metabolite was excreted into the breast milk (approximately 0.03% of 40 mg after 48 hours). Pseudoephedrine administered alone also distributes into breast milk of the lactating human female. Pseudoephedrine concentrations in milk are consistently higher than those in plasma. The total amount of drug in milk as judged by the area under the curve (AUC) is 2 to 3 times greater than in plasma. The fraction of a pseudoephedrine dose excreted in milk is estimated to be 0.4% to 0.7%. A decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. Caution should be exercised when CLARITIN-D Tablets are administered to a nursing woman.

Pediatric Use: Safety and effectiveness in children below the age of 12 years have not been established.

ADVERSE REACTIONS: Experience from controlled and uncontrolled clinical studies involving approximately 10,000 patients who received the combination of loratadine and pseudoephedrine sulfate for a period of up to 1 month provides information on adverse reactions. The usual dose was one tablet every 12 hours for up to 28 days.

In controlled clinical trials using the recommended dose of one tablet every 12 hours, the incidence of reported adverse events was similar to those reported with placebo, with the exception of insomnia (16%) and dry mouth (14%).

REPORTED ADVERSE EVENTS WITH AN INCIDENCE OF ≥2% ON CLARITIN-D IN PLACEBO-CONTROLLED CLINICAL TRIALS

	PERCENT OF PATIENTS REPORTING			
	CLARITIN-D n=1023	Loratadine n=543	Pseudoephedrine n=548	Placebo n=922
Headache	19	18	17	19
Insomnia	16	4	19	7
Dry Mouth	14	4	9	3
Somnolence	7	6	5	4
Nervousness	5	3	7	3
Dizziness	4	1	5	3
Fatigue	4	6	3	3
Dyspepsia	3	2	3	1
Nausea	3	2	3	2
Pharyngitis	3	3	2	3
Anorexia	2	1	2	1
Thirst	2	1	2	1

Adverse event rates did not appear to differ significantly based on age, sex, or race, although the number of non-white subjects was relatively small.

In addition to those adverse events reported above (≥2%), the following less frequent adverse events have been reported in at least one CLARITIN-D treated patient:

Autonomic Nervous System: Abnormal lacrimation, dehydration, flushing, hypoesthesia, increased sweating, mydriasis.

Body As A Whole: Asthenia, back pain, blurred vision, chest pain, conjunctivitis, earache, ear infection, eye pain, fever, flu-like symptoms, leg cramps, lymphadenopathy, malaise, photophobia, rigors, tinnitus, viral infection, weight gain.

Cardiovascular System: Hypertension, hypotension, palpitations, peripheral edema, syncope, tachycardia, ventricular extrasystoles.

Central and Peripheral Nervous System: Dysphonia, hyperkinesia, hypertonia, migraine, paresthesia, tremors, vertigo.

Gastrointestinal System: Abdominal distension, abdominal distress, abdominal pain, altered taste, constipation, diarrhea, eructation, flatulence, gastritis, gingival bleeding, hemorrhoids, increased appetite, stomatitis, taste loss, tongue discoloration, toothache, vomiting.

Liver and Biliary System: Hepatic function abnormal.

Musculoskeletal System: Arthralgia, myalgia, torticollis.

Psychiatric: Aggressive reaction, agitation, anxiety, apathy, confusion, decreased libido, depression, emotional lability, euphoria, impaired concentration, irritability, paranoia.

Reproductive System: Dysmenorrhea, impotence, intermenstrual bleeding, vaginitis.

Respiratory System: Bronchitis, bronchospasm, chest congestion, coughing, dry throat, dyspnea, epistaxis, hemoptysis, nasal congestion, nasal irritation, sinusitis, sneezing, sputum increased, upper respiratory infection, wheezing.

Skin and Appendages: Acne, bacterial skin infection, dry skin, eczema, edema, epidermal necrolysis, erythema, hematoma, pruritus, rash, urticaria.

Urinary System: Dysuria, micturition frequency, nocturia, polyuria, urinary retention.

The following additional adverse events have been reported with the use of CLARITIN Tablets: alopecia, altered salivation, amnesia, anaphylaxis, angioneurotic edema, blepharospasm, breast enlargement, breast pain, dermatitis, dry hair, erythema multiforme, hemoptysis, hepatic necrosis, hepatitis, jaundice, laryngitis, menorrhagia, nasal dryness, photosensitivity reaction, purpura, seizures, supraventricular tachyarrhythmias, and urinary discoloration.

Pseudoephedrine may cause mild CNS stimulation in hypersensitive patients. Nervousness, excitability, restlessness, dizziness, weakness, or insomnia may occur. Headache, drowsiness, tachycardia, palpitation, pressor activity, and cardiac arrhythmias have been reported. Sympathomimetic drugs have also been associated with other untoward effects, such as fear, anxiety, tenseness, tremor, hallucinations, seizures, pallor, respiratory difficulty, dysuria, and cardiovascular collapse.

OVERDOSAGE: In the event of overdosage, general symptomatic and supportive measures should be instituted promptly and maintained for as long as necessary. Treatment of overdosage would reasonably consist of emesis (ipecac syrup), except in patients with impaired consciousness, followed by the administration of activated charcoal to absorb any remaining drug. If vomiting is unsuccessful, or contraindicated, gastric lavage should be performed with normal saline. Saline cathartics may also be of value for rapid dilution of bowel contents. Loratadine is not eliminated by hemodialysis. It is not known if loratadine is eliminated by peritoneal dialysis.

Somnolence, tachycardia, and headache have been reported with doses of 40 to 180 mg of CLARITIN Tablets. In large doses, sympathomimetics may give rise to giddiness, headache, nausea, vomiting, sweating, thirst, tachycardia, precordial pain, palpitations, difficulty in micturition, muscular weakness and tenseness, anxiety, restlessness, and insomnia. Many patients can present a toxic psychosis with delusions and hallucinations. Some may develop cardiac arrhythmias, circulatory collapse, convulsions, coma, and respiratory failure.

The oral LD_{50} values for the mixture of the two drugs were greater than 525 and 1839 mg/kg in mice and rats, respectively. Oral LD_{50} values for loratadine were greater than 5000 mg/kg in rats and mice. Doses of loratadine as high as 10 times the recommended daily clinical dose showed no effect in rats, mice, and monkeys.

Schering Corporation
Kenilworth, NJ 07033 USA

Rev. 1/95 1/798625-J65

CANCER

Your second
reaction
should be to send for
this book.

Maybe the idea of cancer scares you. Or maybe you find it too terrifying to even think about. But chances are, cancer will affect someone you know. And when it does, it affects you.

Send for your free* copy of our HelpBook. You'll find it very helpful. And very hopeful. It provides the information you need on dealing with cancer. Whether your family has a history of cancer or not, you'll find it an important book to have on hand. Because you never know.

Please write Cancer Research Institute HelpBook, F.D.R. Station, P.O. Box 5199, New York, New York 10150-5199.

CANCER RESEARCH INSTITUTE

*$2 postage and handling for each copy.

CONSERVE CASH.

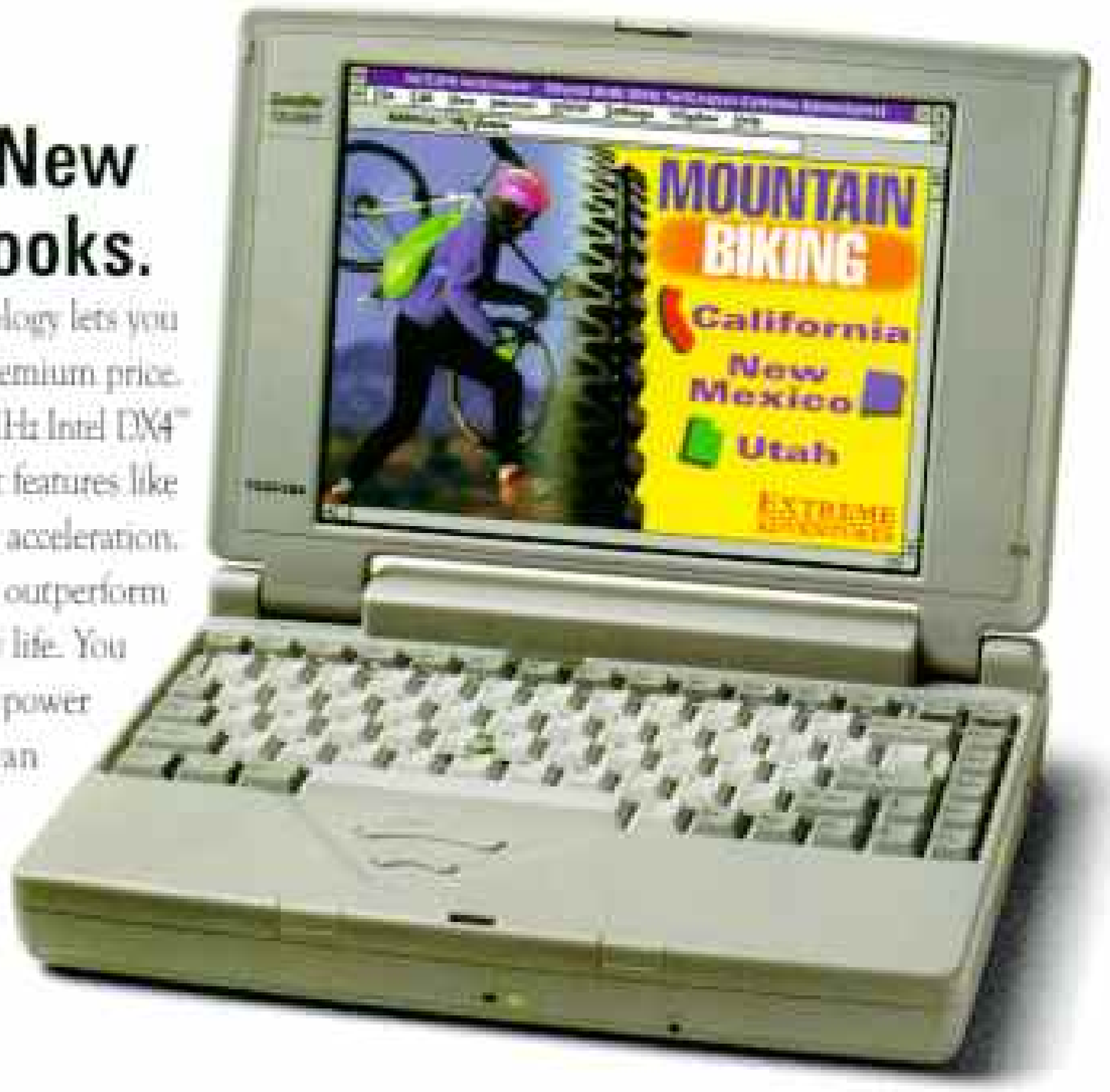
SPLURGE ON POWER.

TURBO 75

Introducing the New Satellite® Notebooks.

The new Satellite® with Toshiba's Turbo 75 technology lets you enjoy premium performance — without paying a premium price. The new Satellite® notebooks combine a powerful 75MHz Intel DX4™ processor with speed-enhancing and power-efficient features like fast-page RAM access, local-bus video and graphics acceleration. The result? Blistering system performance that can outperform 100MHz systems while optimizing precious battery life. You also get a big 10.4" diagonal color display, a built-in power supply so there's no bulky external AC adapter, an AccuPoint™ integrated pointing device, Plug and Play expansion, rugged construction and more.

Call 1-800-457-7777 for your nearest dealer.



Satellite®

T2100CT*:
- 10.4" dia. color TFT-LCD active matrix display
- 520 Million Bytes (=500MB) HDD
- 8MB of RAM expandable to 32MB

T2100CS*:
- 10.4" dia. color dual-scan STN display
- 520 Million Bytes (=500MB) HDD
- 8MB of RAM expandable to 12MB

T2100CS*:
- 10.4" dia. color dual-scan STN display
- 350 Million Bytes (=330MB) HDD
- 4MB of RAM expandable to 28MB

ALL MODELS:
- 75MHz Intel DX4™ processor
- Integrated math coprocessor
- 16KB cache
- Two stacked PC Card slots (one Type II or one Type III)
- Plug and Play connectivity
- NiMH battery with Toshiba MaxTime® Power Management
- Built-in power supply
- AccuPoint™ integrated pointing device
- 3.5" floppy disk drive
- Under 7 lbs.
- Optional Port Replicator
- Pre-installed software: DOS, Microsoft® Windows® and Fn-ease™
- 1 yr. limited warranty

Microsoft Windows Compatible

intel inside

In Touch with Tomorrow

TOSHIBA

Toshiba. The World's Best Selling Portable Computers.

*T2110CS. Reseller prices may vary. All prices and specifications are subject to change. *The T2130CT, T2130CS and T2110CS are sold at selected resellers as the T2135CT, T2135CS and T2115CS with additional pre-installed software.

NATIONAL GEOGRAPHIC
Geographica

Wartime Love Affair Lives On . . . in a Smile

BROOKS WALKER

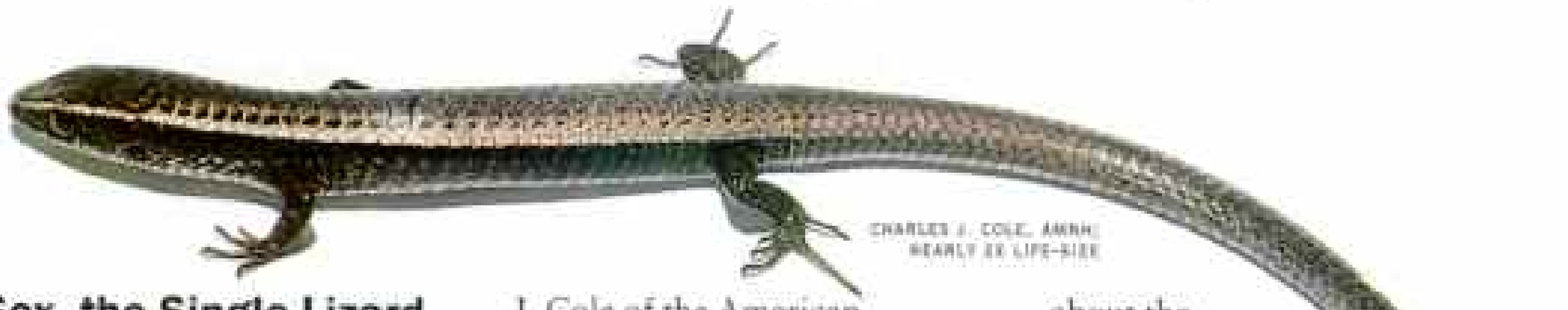
EVEN AT AGE 89 René Huyghe is passionate about the woman with whom he spent World War II—chauffeuring her from her Paris residence to safety, hiding her in his office, even sharing a bedroom with her. She was "Mona Lisa," masterpiece of Leonardo da Vinci and a centerpiece of the Louvre. He was the chief curator of paintings there.

Foreseeing the Nazi drive across Europe, Huyghe began planning in 1938 to hide his charges. When Germany invaded Poland a year later, Huyghe's trucks took Louvre paintings to refuges far from Paris. "Mona Lisa" rode in a car, "always accompanied by a curator, sometimes by me," he recalls.

She was shuttled from abbey to museum to château out of well-founded fear. Bombs could strike her hiding place; fire could consume her; she could end up in a German collection.

Once, as Nazi troops passed her last refuge, Château de Montal, a Resistance fighter inside fired at them. Fearing retaliation, Huyghe shouted to the man, "You're crazy! Stop it at once!" The troops moved on and the following day razed an entire village nearby.

At war's end "every single work was back in the Louvre," Huyghe says. "Mona Lisa" herself returned, in triumph, in a curator's private car.



CHARLES J. COLE, AMNH; NEARLY EX LIFE-SIZE

Sex, the Single Lizard, and the Missing Parent

A BIZARRE all-female species of shiny lizard found in the West Indies and South America reproduces without male contact, laying unfertilized eggs that develop into identical females generation after generation. Such lizards derive from hybrids of two species that reproduce normally. Herpetologist Charles J. Cole of the American Museum of Natural History and his colleagues identified the parents of this species, *Gymnophthalmus underwoodi*, by unraveling its genetics.

Supported by a National Geographic Society grant, the team found that half the genes in the female subjects came from *G. speciosus*, but the other half did not match any known lizard species. "We knew everything about the other parent, but we'd never seen it," says Cole.

Allan Markezich, a biology professor at Black Hawk College in Illinois, read of Cole's search and sent him lizards he collected in Venezuela. Their genes matched the prediction; the missing parent is a lizard named *G. cryptus* (above).

Heated Mirrors with tilt-down feature. When reverse gear is engaged, both mirrors automatically lower to show what's directly behind the rear wheels.

Smart Locks prevent the doors from being locked with the engine off and the key in the ignition.

Easy Entry/Exit Driver's Seat automatically moves back two inches when ignition key is removed.

Memory Profile System remembers two drivers' settings for 12 functions, including steering effort, ride firmness, radio stations, seat and mirror positions.

Four-way Lumbar Adjustment for driver and front passenger. Not only inflates/deflates but can also be moved up or down.

*Two-way Heated Seats give driver and front passenger the choice of cushion and seatback, or seatback-only heating, plus five temperature settings.**

*Flip-up, Hands-free Cellular Phone.**

*Six-disc Compact Disc Changer conveniently located inside the console.**

More New Ideas Th
Can Shake A Dr

Mirror-integrated Electronic Compass.

Virtual Image Instrumentation.

MicronAir® Filtration System removes pollen and other impurities as small as three microns.

Adjustable Steering and Suspension System lets the driver choose from eight different combinations of ride firmness and steering effort.

Delayed Accessory Power allows operation of accessories for ten minutes after the ignition is turned off.

145-watt JBL Audio System can simulate five different acoustic environments.

an Our Competitors awing Board At.

The New Lincoln Continental

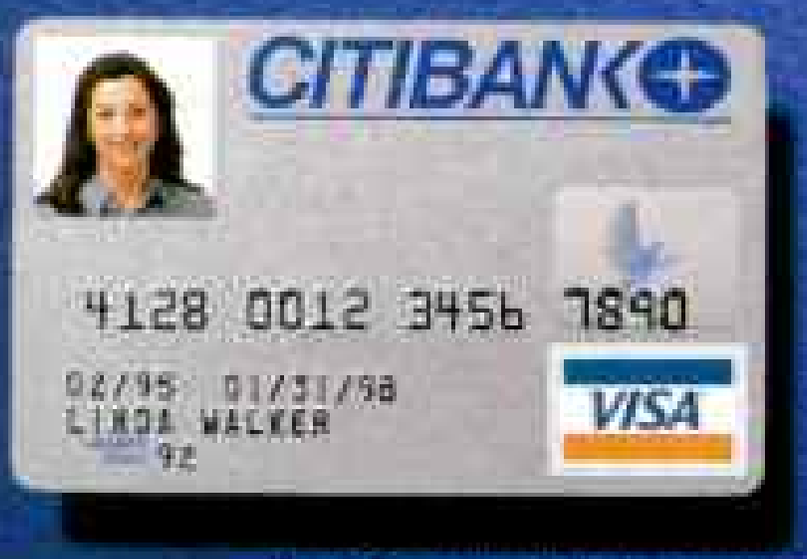
It's the perfect balance of luxury and technology. Powered by the 32-valve V-8 InTech™ System which goes 100,000 miles before its first scheduled tune-up. Trimmed in fine leather and burl walnut. And loaded with enough surprising innovations to seriously tax the supply of midnight oil at every other luxury-car manufacturer. For more information, call 1 800 446-8888.

LINCOLN

What A Luxury Car Should Be

It took you
6 months
to find it.

It took him
2 seconds.



BUYER'S SECURITY™ can't guarantee that accidents won't happen. But it can pay you back the cost of repair or replacement. It's one more reason to carry The Citibank Card. To apply call 1-800-CITIBANK.

THE CITI NEVER SLEEPS.

Buyer's Security protects the things you buy for 90 days from purchase date. See your "Summary of Additional Program Information" for all conditions and exclusions.

Got your Citibank Card?

Enlisting Tree Sausage in the War on Cancer

WELL-KNOWN IN AFRICA south of the Sahara, the sausage tree is aptly named for its pendulous fruit, a treat to such animals as elephants and baboons. When Nigerian scientist Dora Akunyili told her colleague at King's College of the University of London, pharmacological researcher Peter Houghton, that local healers use the tree's bark to treat skin lesions, he took a scientific interest.

He alerted Spyros Retsas, a cancer specialist at London's Charing Cross Hospital, who tested extracts from the roots, bark, and fruit on cancerous cells in a lab dish. Indeed something in the tree—no one yet knows what—killed melanoma,

KJELL B. SANDVED, PHOTO RESEARCHERS

a deadly skin cancer. "We are light-years away from potential human use," Retsas warns, "but we're seeing encouraging signs."

Salves made from the bark of the tree, *Kigelia pinnata*, have also long been used in Malawi and Zimbabwe to treat lesions, perhaps even melanoma, Houghton says.

Geography's Mirthful Mouthful

WARNING: Attempting to pronounce the longest place-name in the annals of the U. S. Board on Geographic Names, a hill in New Zealand, could be hazardous to your health—Taumatawhakatangihangakoauotamateaturipukakapikimaungahoronukupokaiwhenuakitanataha.

The 83-letter tongue twister is a variant of the official name, a mere 57 letters long, which Maori dictionaries define as "the brow of the hill where Tamatea who sailed all round the land played his nose flute to his lady love."

The longest place-name in the U. S. belongs to a lake near Webster, Massachusetts, whose official name, Chaubunagungamaug, pales next to a variant with 49 letters, 17 of them g's. Chargoggagoggmanchauggaugagogg-chaubunagungamaugg, a Nipmuck Indian word, means a neutral fishing place near a boundary. But some translate it as "you fish on your side; I fish on my side; nobody fishes in the middle."

RICHARD THOMPSON

BRUCE F. MOLNIA, USGS

A Glacier's Surge Brings a Mighty Flood

OF THE WORLD'S 100,000 glaciers, fewer than 300 advance periodically in dramatic surges. A surge last summer of Alaska's Bering Glacier produced a flood that blasted open a channel hundreds of feet wide (above).

Surges begin when sediment under the ice blocks the drainage of water. So much water builds up that the glacier loses contact with bedrock and starts to skid. Eventually the water blasts out.

The Bering, North America's largest glacier outside Greenland, stretches 140 miles westward from the St. Elias Mountains. Ordinarily the ice descends about a foot a day. But the surge sent it surfing along, sometimes 300 feet a day. Its leading edge moved six miles before the ride slowed with the awesome flood of July 26, 1995. "The force of the water blew house-size blocks of ice off the glacier's face," says glacial geologist Bruce F. Molnia of the U. S. Geological Survey. The glacier resumed its surge this May.

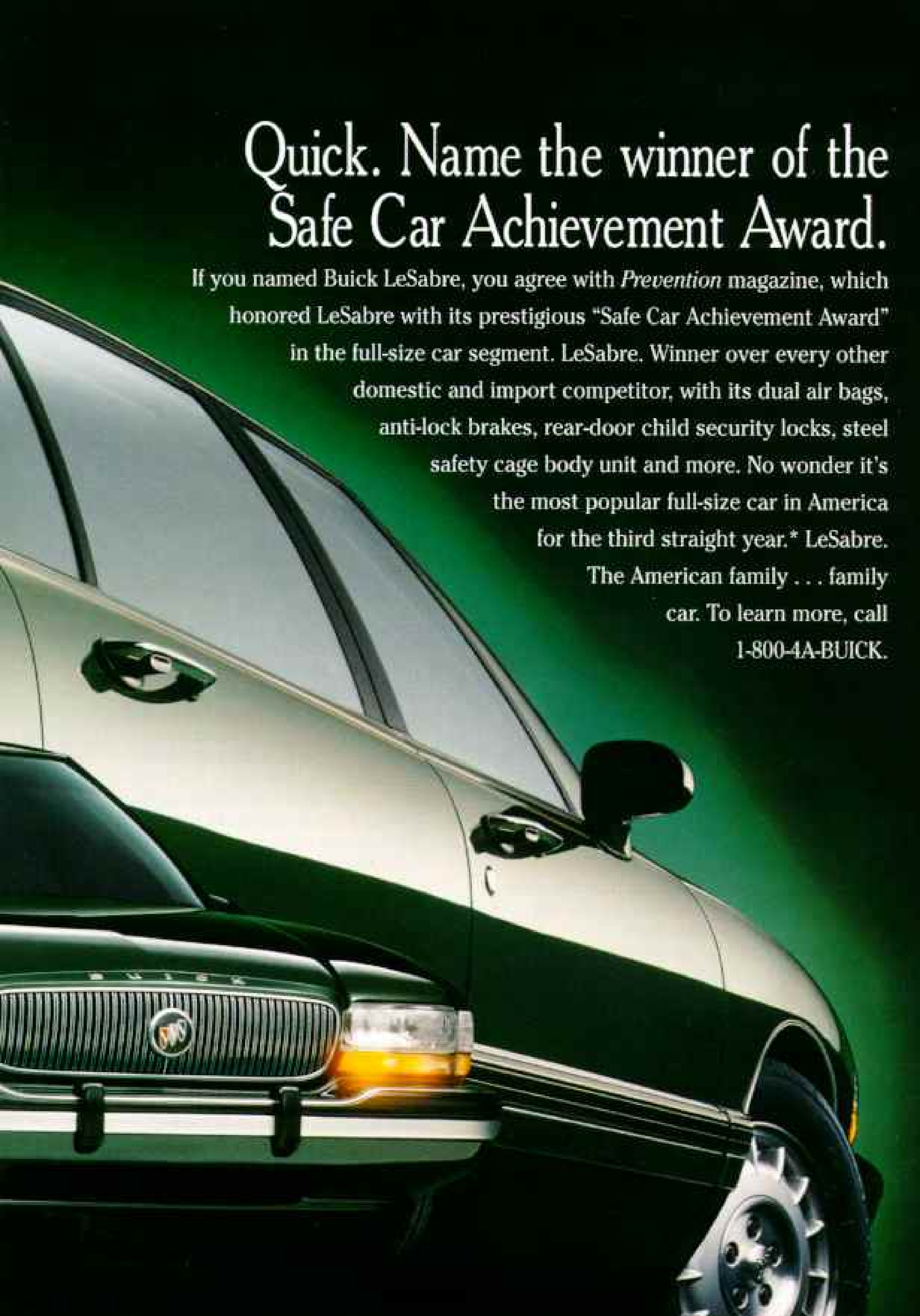
—BORIS WEINTRAUB

*Based on 1992 through 1994 model year sales.

Buckle up, America!

Quick. Name the winner of the Safe Car Achievement Award.

If you named Buick LeSabre, you agree with *Prevention* magazine, which honored LeSabre with its prestigious "Safe Car Achievement Award" in the full-size car segment. LeSabre. Winner over every other domestic and import competitor, with its dual air bags, anti-lock brakes, rear-door child security locks, steel safety cage body unit and more. No wonder it's the most popular full-size car in America for the third straight year.* LeSabre. The American family . . . family car. To learn more, call 1-800-4A-BUICK.



Give National Geographic junior membership to a child – and give the world

NOW you can enroll youngsters as *Junior Members* of the National Geographic Society.

Kids will receive their own copies of WORLD magazine—a delightful publication designed especially for girls and boys ages 8 through 14!

Nationally acclaimed, this bright, colorful magazine is packed with adventure every month. Kids love to read about interesting people and places...animals and art...science and sports. There's something for everyone—12 times a year. *Plus*, Junior members receive...

- a wallet-size membership card
- a 10% discount on selected Society products
- an iron-on membership emblem
- an official membership certificate.

WORLD appeals to a youngster's natural curiosity...encourages a child's powers of observation...provides appealing games, mazes, and fun-filled activities each month of the year. And some issues of WORLD magazine include poster-size photographs and collector's cards to save and trade.

Membership also gives children the great feeling of belonging to a very special club where members are learning more about our world...its people, animals, and environment.

To enroll a youngster as a National Geographic Junior Member, call...

toll free, 1-800-447-0647

(TDD: 1-800-548-9797) in the U.S. and Canada, 24 hours a day.
Or write to the address below.

All for only
$14.95*

1975-1995: 20 Years of Adventure

NATIONAL GEOGRAPHIC SOCIETY
JUNIOR MEMBER

*Annual dues in the U.S. In Canada, $19.50 U.S. funds ($23.60 Canadian funds). In other countries, $22.75 U.S. funds.

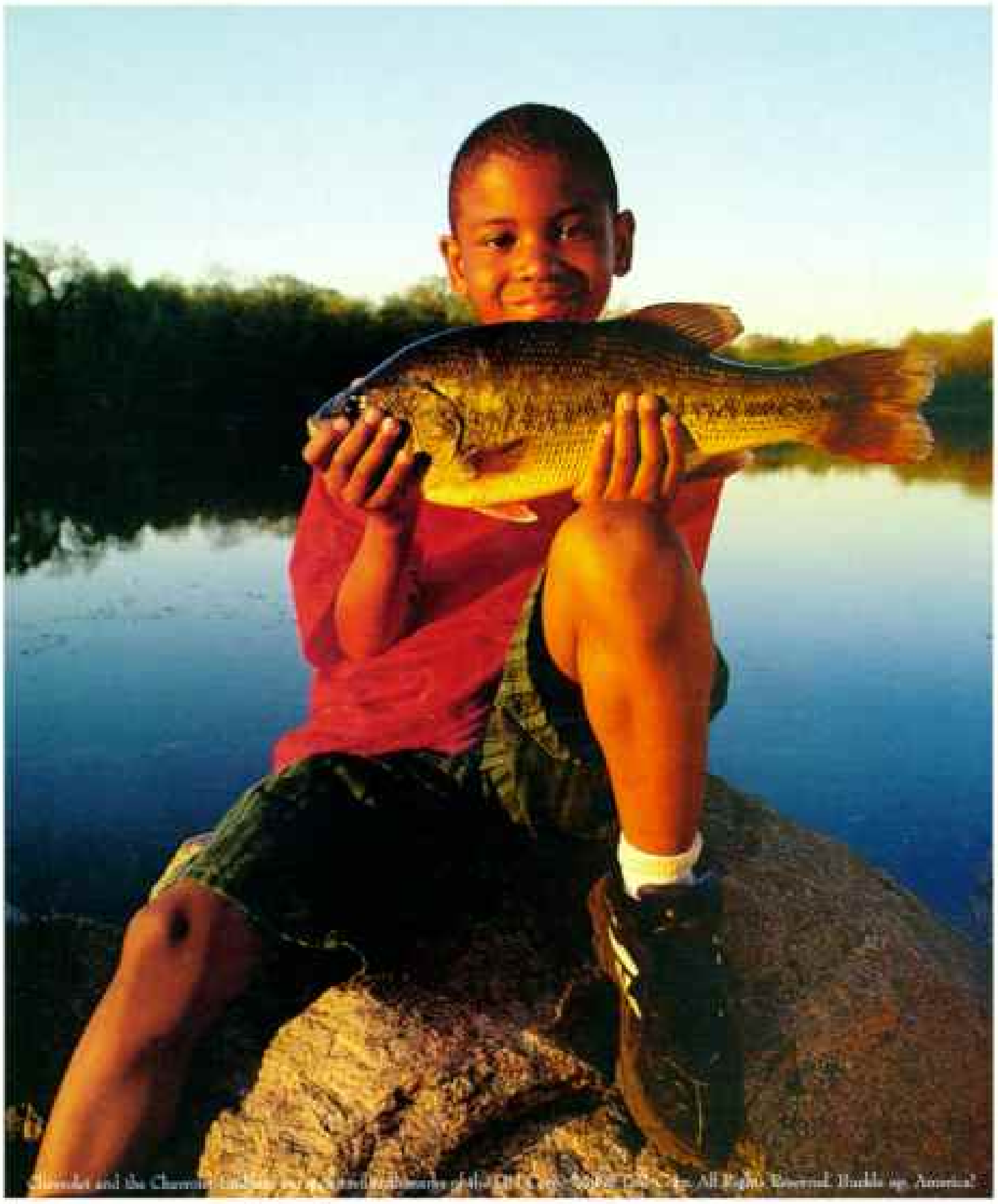
SAVE WITH TWO-YEAR JUNIOR MEMBERSHIP (U.S. and Canadian addresses only): In the U.S., $35.00 U.S. funds; in Canada, $33.95 U.S. funds ($43.05 Canadian funds).

Please add sales tax for orders sent to these areas: DC, 5.75%; MD, 5%. Canadian dues include 7% GST.

NATIONAL GEOGRAPHIC SOCIETY

P.O. Box 2330
Washington, D.C. 20013-2330

Boy Has Mind-Expanding Experience.



He never saw a forest or lake and thought fish just came in sticks until his "Fishin' Buddies!" took him fishing.
And the result is written all over his face. "Fishin' Buddies!" teaches hundreds of inner city kids what nature is all about and how to take care of it.
That's why they won our **Chevrolet Outdoor Conservation Award.**
And became part of the family of environmental groups we support. To find out what you can do for the environment, call 1-800-873-3436.

GENUINE CHEVROLET

Spoon-billed Sandpiper *(Eurynorhynchus pygmeus)* **Size:** Length, 15 cm **Weight:** Average, 29.5 g **Habitat:** Breeds in coastal lowland tundra in northeastern Siberia; winters in Southeast Asia **Surviving number:** Estimated at 2,000–2,800 pairs Photographed by Staffan Widstrand

WILDLIFE AS CANON SEES IT

Distinct with its paddlelike bill, a spoon-billed sandpiper wades through marshes catching crayfish and small invertebrates. The sandpipers nest in a very specific coastal zone habitat along the Bering Sea. By August they migrate south to islands in the Bay of Bengal and other unknown sites. With low numbers and limited distribution, the best safeguard for this little-known wader is protection of its wetland habitat. To save endangered species, it is vital to protect their habitats and understand the role of each species within the earth's ecosystems. As a global corporation committed to social and environmental concerns, we hope to foster a greater awareness of our common obligation to ensure that the earth's life-sustaining ecology survives intact for future generations.

Fundus Camera
Exemplifying Canon's contribution to health care, the CF-60UVi fundus camera features a unique 60° wide angle which provides greater ease and accuracy in the diagnosis of ophthalmic and other diseases.

NATURE
Watch "NATURE" on PBS. This program is funded, in part, by Canon U.S.A., Inc.

Canon

NATIONAL GEOGRAPHIC

On Television

E. R. DEGGINGER, PHOTO RESEARCHERS

■ EXPLORER, AUGUST 27, 9 P.M. ET

Smokejumpers Skirmish With Wildfires

"THE BLAST I GOT HIT BY felt like a bomb going off," recalls smokejumper Sabiño Archuleta (right) of the wildfire that erupted near Glenwood Springs, Colorado, on July 6, 1994. Fanned by 30-mile-an-hour winds, a 200-foot wall of flame burning as hot as 2000°F raced up a rise and took the lives of 14 firefighters—one of the deadliest such incidents ever recorded.

The dry summer of 1994 saw many more wildfires than usual. The "Fire!" segment of EXPLORER's fall premiere follows the exhausting season of an elite corps of 400 men and women of the U. S. Forest Service and the Bureau of Land Management. Parachuting out of airplanes onto the perimeter of forest fires, the smokejumpers dig

SARAH DOEHRING

trenches to cut blazes off from the fuel that feeds them. The film captures the camaraderie among jumpers, a sense of looking out for one another that begins early in jump training and extends into the heat of battle.

■ "PHOTOGRAPHERS" VIDEO

Lives of the Photographers

NATIONAL GEOGRAPHIC has been revealing life around the world for generations of readers. But who are the people behind the cameras? A new home video, *The Photographers*, profiles the world's best, their successes and trials. One scene from the video: Nick Nichols in the insect-ridden Ndoki forest of central Africa, his arms covered with welts. "Sometimes the toughest part can be surviving the environment."

■ PROGRAM GUIDE

National Geographic EXPLORER
TBS. Sunday, 9 p.m. ET
August 6: "If Hitler Had the Bomb"; "Search for the Battleship Bismarck"
August 13: "The Ants From Hell"; "Gorillas in the Midst"
August 20: "Bear Attack"; "Seasons of the Cobra"; "Crittercam"
August 27: "Avalanche!"; "Fire!"; "Volcano!"

National Geographic Videos and Kids Videos Call 1-800-343-6610.

ALL-NEW AQUATRED II.

New Aquatred II.

- *Deeper, wider AquaChannel sweeps water away for superb wet traction.*
- *All season tread with a new 65,000-mile limited treadlife warranty. See dealer for details.*
- *Advanced tread pitch design for reduced road noise.*

IT HAS A DEEPER, WIDER AQUACHANNEL.™

Goodyear introduces the next generation all-season radial for superb wet traction. The all-new Aquatred II® It has a bolder, wider, deeper AquaChannel™ to sweep even more water away than our original Aquatred. For outstanding traction in the rain.

AND A NEW 65,000-MILE TREADLIFE WARRANTY.

A new, more durable compound adds treadlife. And value. With a 65,000-mile warranty. The all-new Aquatred II.

New AquaChannel. New warranty. **Only from Goodyear.**

THE BEST TIRES IN THE WORLD HAVE GOODYEAR WRITTEN ALL OVER THEM.

NATIONAL GEOGRAPHIC

EarthAlmanac

DEAN J. KOEPPLER, TACOMA NEWS TRIBUNE

No More Is Ivan the "Mall Gorilla"

FOR NEARLY THREE DECADES a gorilla named Ivan was confined to this grim room in a Tacoma, Washington, shopping center (above). As an infant in 1964 he had been taken from the Congo by a wildlife trader and sold to the man who built this mall. Along with other wild animals, Ivan was displayed in a circus-like atmosphere.

Such purchases were legal before the Endangered Species Act of 1973. Ivan became a cause célèbre among animal rights activists, but not until last year did he find a decent home. He was given to Seattle's Woodland Park Zoo, which sent him on permanent loan to Zoo Atlanta last October. After a quarantine period, Ivan explored his new surroundings in March (left). For nearly his whole life, Ivan had never seen another gorilla; now he is happily adjusting to two female companions.

MICHAEL A. SCHWARZ

"Before the Endangered Species Act, anyone with the money could buy a baby gorilla," says Zoo Atlanta Director Terry Maple. "It was obviously wrong, but it was legal."

Sea of Trouble in the Galápagos

GRIM REALITY has sullied the archipelago that Darwin revered as a pristine laboratory of evolution. To a growing tide of poor immigrants from mainland Ecuador, which governs the islands, the Galápagos are the promised land, where fishing offers a chance to make a living. The influx of newcomers—many of them illegally squatting on national park land—has tripled the islands' population to 12,000 in the past decade. On one island they poached dozens of the famed Galápagos giant tortoises. At sea they depleted sharks and lobsters, then turned to sea cucumbers, bottom feeders prized in Asia. In December 1994 officials closed the sea cucumber fishery because of overharvesting. Angry fishermen armed with machetes then occupied the Charles Darwin Research Station and national park headquarters. Ecuadorian troops restored order; new fishing rules are pending.

OUR DESIGNS ARE CONSTANTLY CHANGING BUT OUR *PHILOSOPHY* REMAINS THE SAME.

Ford Designers: Ian Kang, Robert Bauer

At FORD MOTOR COMPANY, we work with one basic premise: the design of a car or truck must go beyond how it looks. This philosophy has taken many shapes over the years, from the Model T, to the Continental, Taurus, Explorer, and Mustang: cars and trucks celebrated for their design. Which might explain why FORD MOTOR COMPANY has five of the ten best selling vehicles in America today. Right now we're applying the latest technology and the most DETAILED CRAFTSMANSHIP to every aspect of every automobile we create. By working with the automotive industry's most powerful supercomputer, our worldwide design team are indeed becoming the CRAFTSMEN OF THE FUTURE.

• FORD • FORD TRUCKS • Ford • LINCOLN • MERCURY •

QUALITY IS JOB 1.

ED HOMICH, BAKERSFIELD CALIFORNIAN

Boot Camp May Help Freed Condors Survive

EARLY ATTEMPTS to reintroduce the nearly extinct California condor to the wild ended in alarm. Five of the first 13 zoo-bred birds released in 1992 and 1993 died: Three crashed into utility poles, one was electrocuted by power lines, and one drank antifreeze in a parking lot. Last February 8, six more condors were released in Santa Barbara County, including number 99 (above), a young male. But first the birds underwent a two-month survival course in the Los Angeles Zoo designed to teach them a critical lesson—fear of humans.

"Biologists sneaked up behind the condors and turned them upside down, which makes them really uncomfortable," says Marguerite Hills of the U. S. Fish and Wildlife California Condor Recovery Program. A mock power pole gave the birds a mild shock when they landed on it. The birds have avoided three similar low-voltage poles erected where they were released. Researchers feed the released condors calf carcasses at widely spaced sites, hoping they will learn to forage on their own.

African Plant Kingdom Besieged by Invaders

WHERE DID THAT king protea you ordered from your local florist originate? From the *fynbos*, a magical botanical area in South Africa's Cape Province (below). The fynbos hosts more than 8,500 plant species, two-thirds of which grow only there.

But natives are being choked out by taller invaders such as pines and acacias. A long-standing control program to uproot the upstarts has been cut by the government, which budgets people's needs first. Now the Jonkershoek Forestry Research Centre has found links between native plants, the aliens, and Cape Town's scarce water. The city depends on mountain runoff that flows from the fynbos. The invaders absorb rainfall greedily, diverting runoff from waterways. If control measures are not restored, Cape Town could lose 30 percent of its water supply. Next year parliament may reconsider the program that protects native plants and brings water to people.

NIGEL DENNIS, ARDEA PHOTO LIBRARY

New Tortoise Found After 30-Year Quest

"IT'S VERY RARE to discover a new genus among vertebrates," says the University of Utah's John M. Legler. He and his Australian colleague John Cann have classified their find, the Mary River tortoise, not only as a new Australian species but as a new genus—*Elusor*, "to escape notice."

JOHN CANN, NATURE FOCUS

In 1963 Cann found unfamiliar tortoise hatchlings in Sydney pet stores. Where did the adults live? The retailers wouldn't talk, first because they feared competition, then later because the trade was outlawed. Eventually Cann located the sole supplier, in Queensland, who was incubating eggs from the Mary River, where Cann found an adult in 1990. He asked Legler to help write the scientific description, which notes a 15-inch-long shell and an unusually long, thick tail, half the body length.

—JOHN L. ELIOT

Addicted to beauty... obsessed with adventure... driven to make history...

The true stories of the world's greatest adventurers.

ORIGINAL FOUR-PART MINI-SERIES

SEEKERS *Of The Lost* TREASURE

PREMIERES SUNDAY, JULY 30 9-11PM

CONTINUES MONDAY, 9-11 PM

Trace the mysterious disappearance of Michael Rockefeller among Stone Age tribesmen.

Dive into the Mayan Well of Sacrifice with Edward Thompson.

Relive the tragedy and curse of Lord Elgin's Marbles.

Join circus strongman Giovanni Belzoni as he blasts his way into the "Valley of the Kings."

Share the adventures of four extraordinary men who risked their lives and fortunes for treasures that now fill museums around the world.

THE Discovery CHANNEL

EXPLORE YOUR WORLD

NATIONAL GEOGRAPHIC

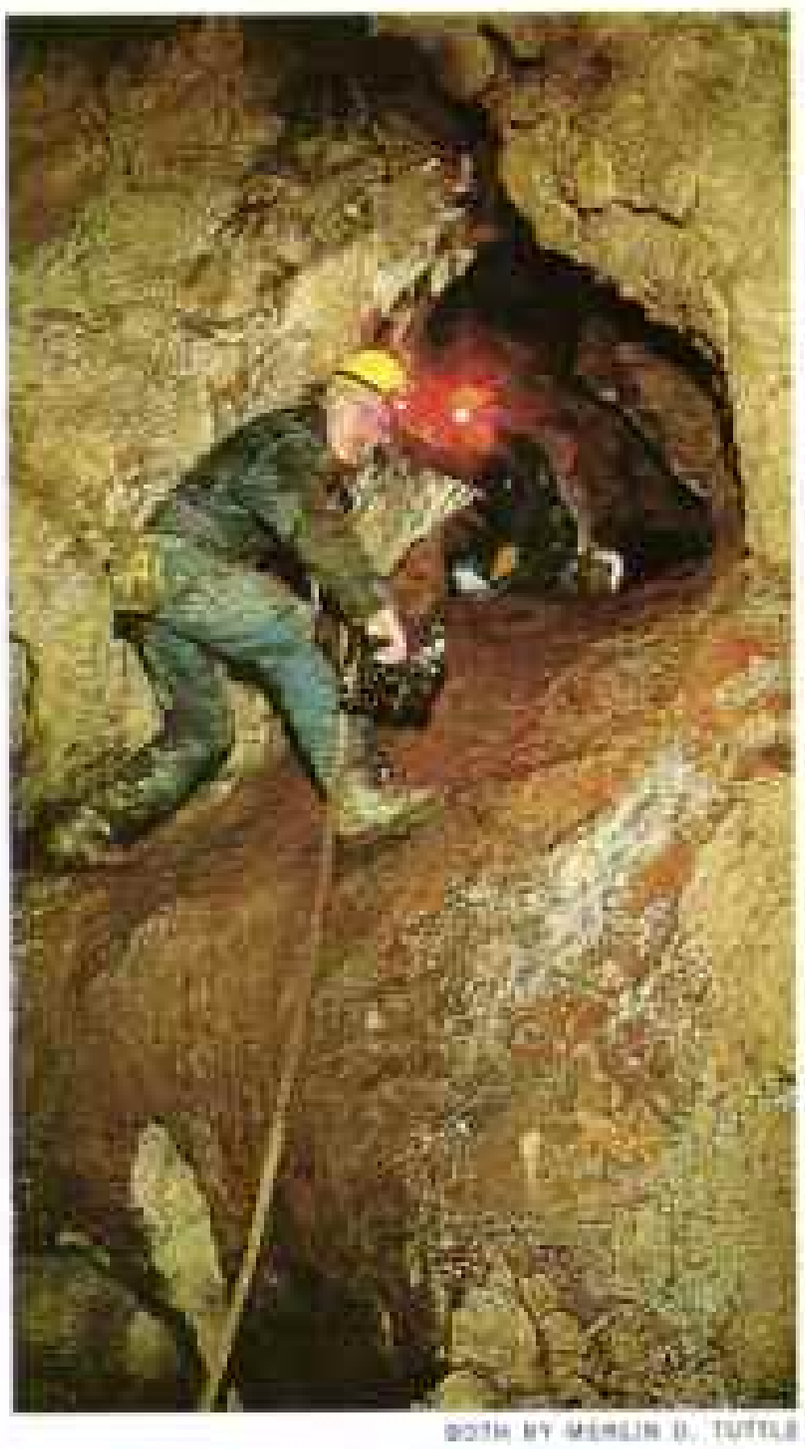
On Assignment

■ NORTH AMERICAN BATS

Capeless Crusader for Bat Conservation

"BATS AREN'T DANGEROUS, but their caves can be," insists real-life batman MERLIN D. TUTTLE, who for decades has studied and sought protection for the flying mammals. Here he climbs a guano-slick cave in Tennessee with assistant Donna Hensley in search of bats.

Hours after photographing baby Mexican freetails in Texas in 1983 (below), Tuttle was hospitalized for ten days with ammonia poisoning. Breathing through a faulty respirator mask, he had inhaled toxic fumes—a by-product of guano-eating beetles—while working a total of 60 hours in 100°F heat and near 100 percent humidity. "The doctors said I could end up an emphysemic invalid for life. They told me never to go into such a cave again," says Tuttle. But he did—with a working respirator—48 hours after leaving the hospital and soon recovered completely.



BOTH BY MERLIN D. TUTTLE

Tuttle began his career behind the camera after writing a chapter about bats for the Society's book *Wild Animals of North America*. He was shocked that only ferocious images of bats were available to illustrate his text. "They contradicted everything I'd written," he recalls. So he shot his own pictures for the book. Some 100,000 frames later, Tuttle has photographed a third of the world's nearly 1,000 bat species and their behavior. "You do need patience," says the man who often waits an entire night to snap one picture.

NATIONAL GEOGRAPHIC (ISSN 0027-9358) IS PUBLISHED MONTHLY BY THE NATIONAL GEOGRAPHIC SOCIETY, 1145 17TH ST. N.W., WASHINGTON, D. C. 20036-4688. $25.00 A YEAR. $3.00 A COPY. SECOND-CLASS POSTAGE PAID AT WASHINGTON, D. C., AND ELSEWHERE. POSTMASTER: SEND ADDRESS CHANGES TO NATIONAL GEOGRAPHIC, P.O. BOX 2174, WASHINGTON, D. C. 20013.

Pick your best shot.

Introducing the Kodak photofile index system. Order it when you have your Kodak film developed, and get a handy record of every picture. The photofile index comes right in the envelope along with your prints and negatives. So it's easier than ever to find the moments you want to reprint or enlarge. Ask about the Kodak photofile index system where you have your Kodak film developed. And start making the most of your moments.