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COVER: Dressed in his best, a Rabari boy looks after his family's camels—main transport for this semi-nomadic people of northwest India. Photograph by Dilip Mehta.

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Jubilant Slovaks fill the streets of Bratislava in the early hours of 1993 to celebrate an independence that eluded them for a thousand years. Czechs, after decades as the dominant partner in a marriage of convenience, accept the breakup cheerlessly.

The Velvet Divorce

Czecho Slovakia

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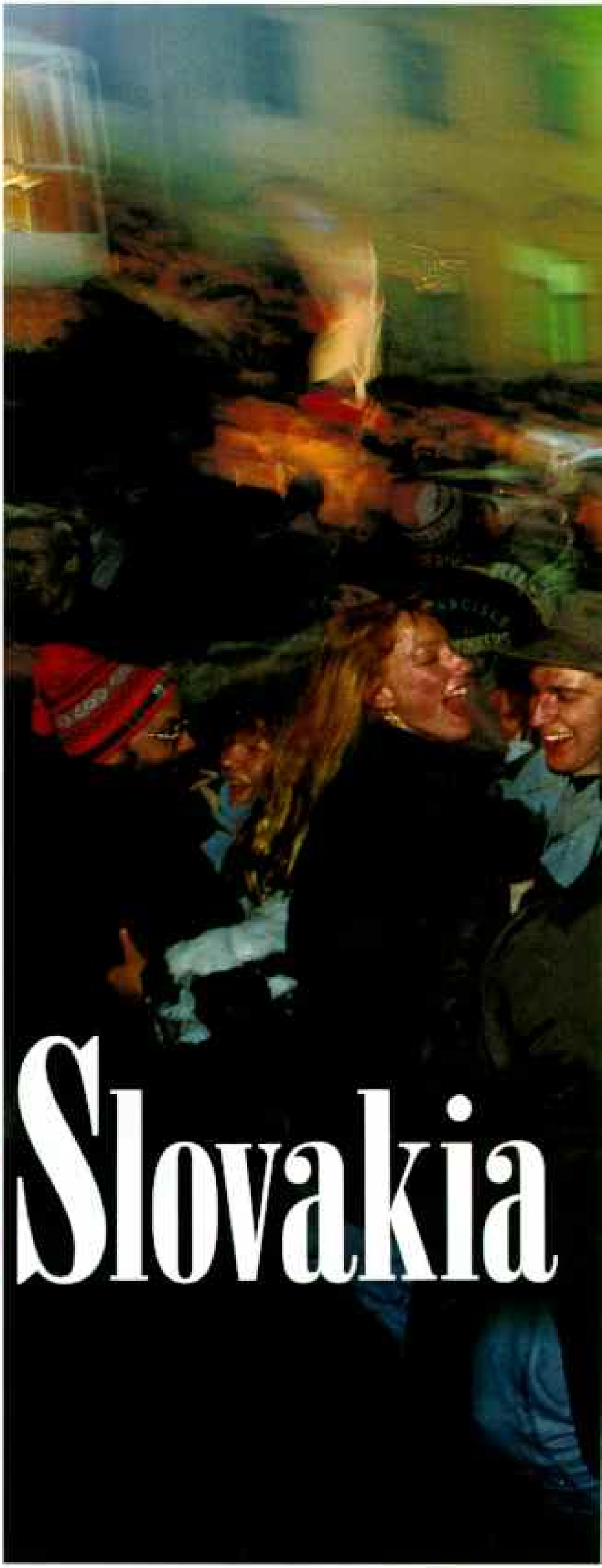
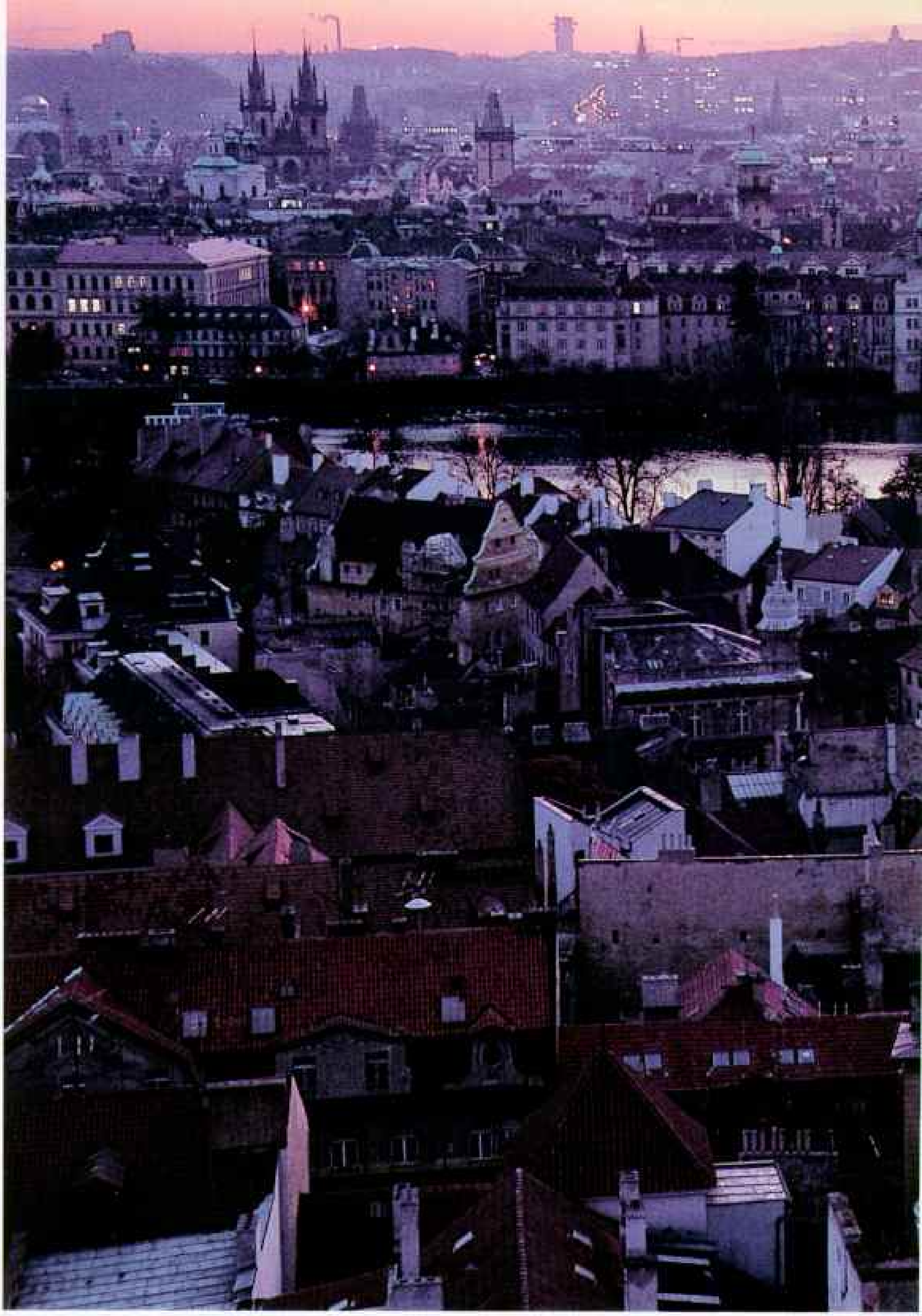
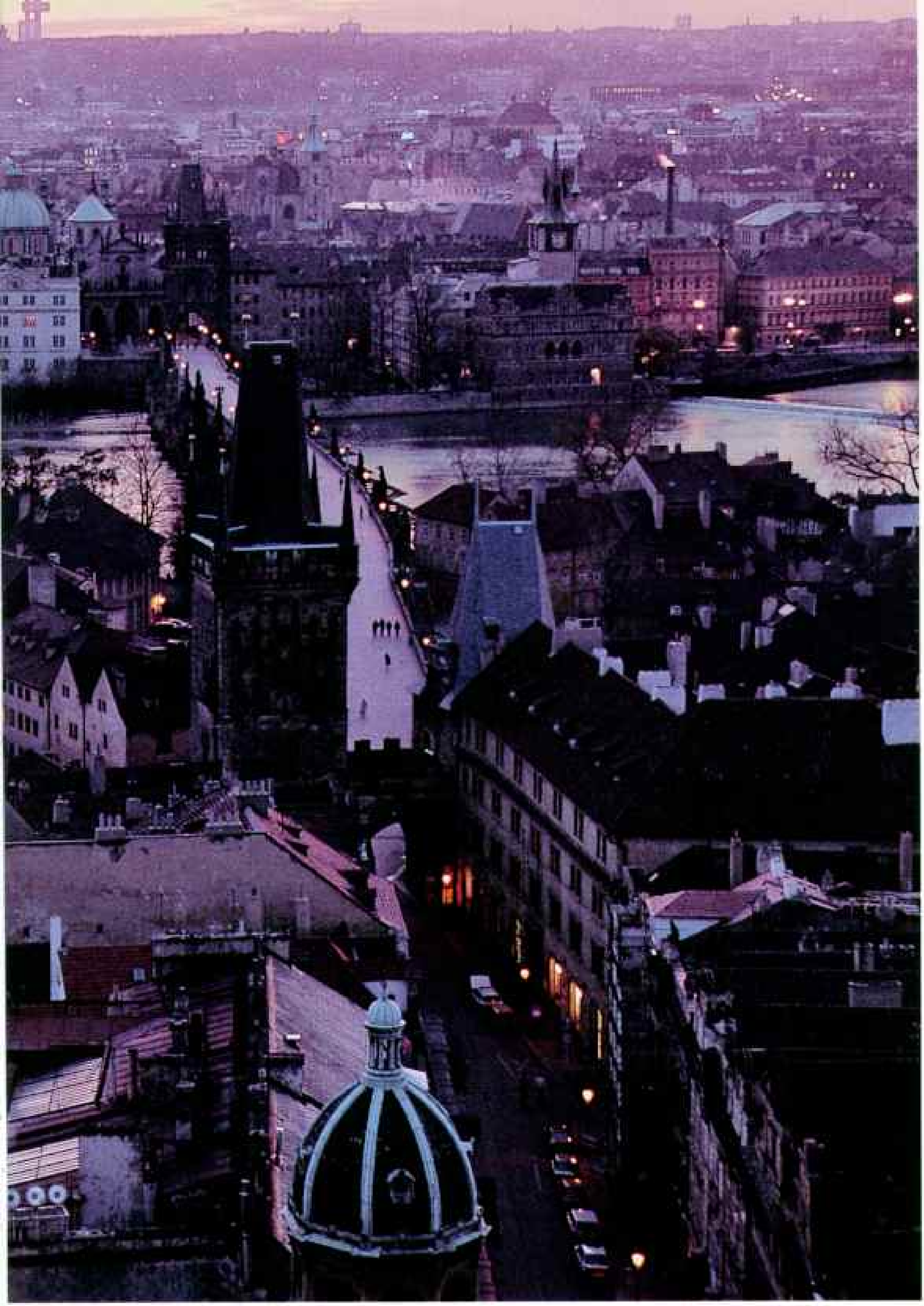
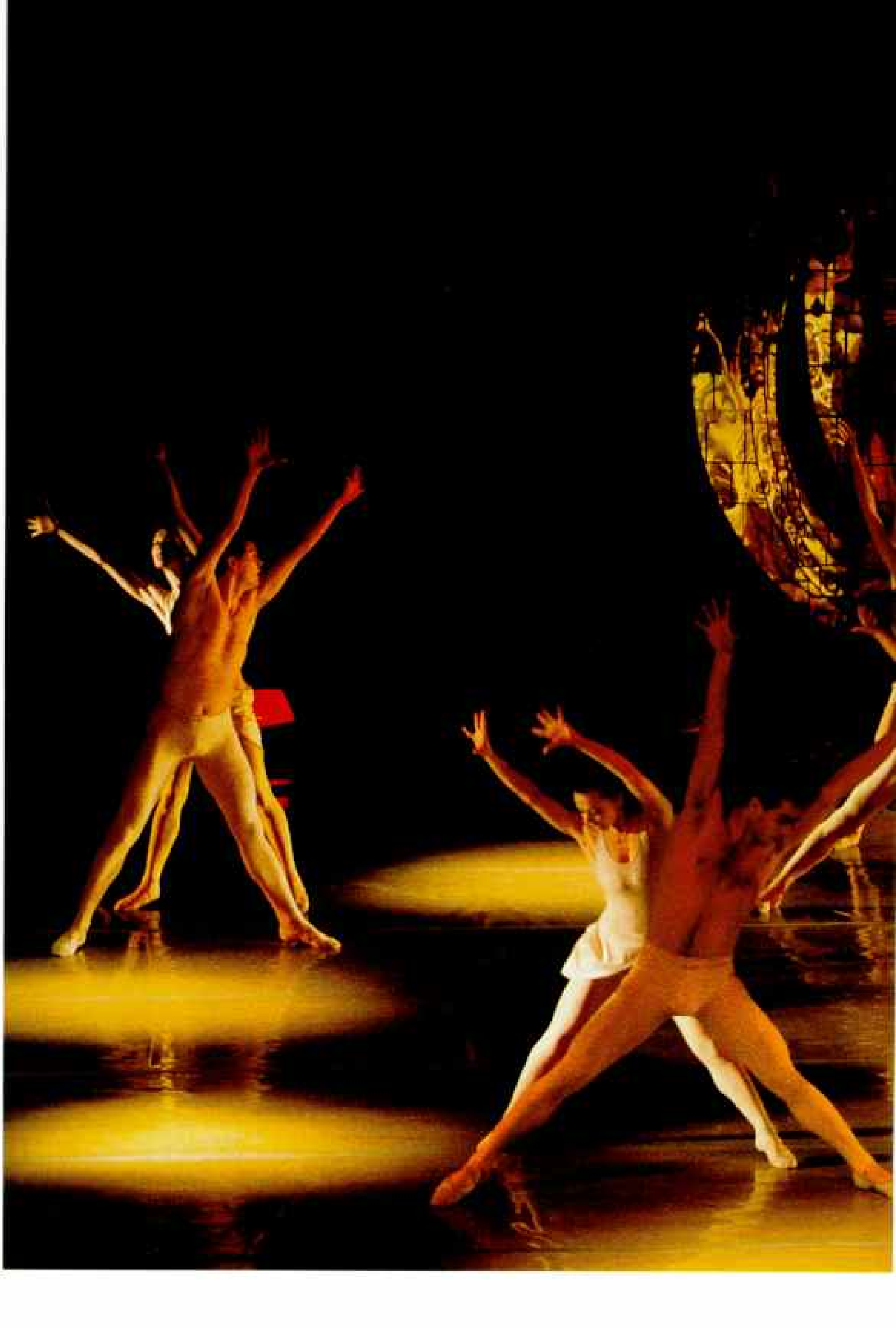
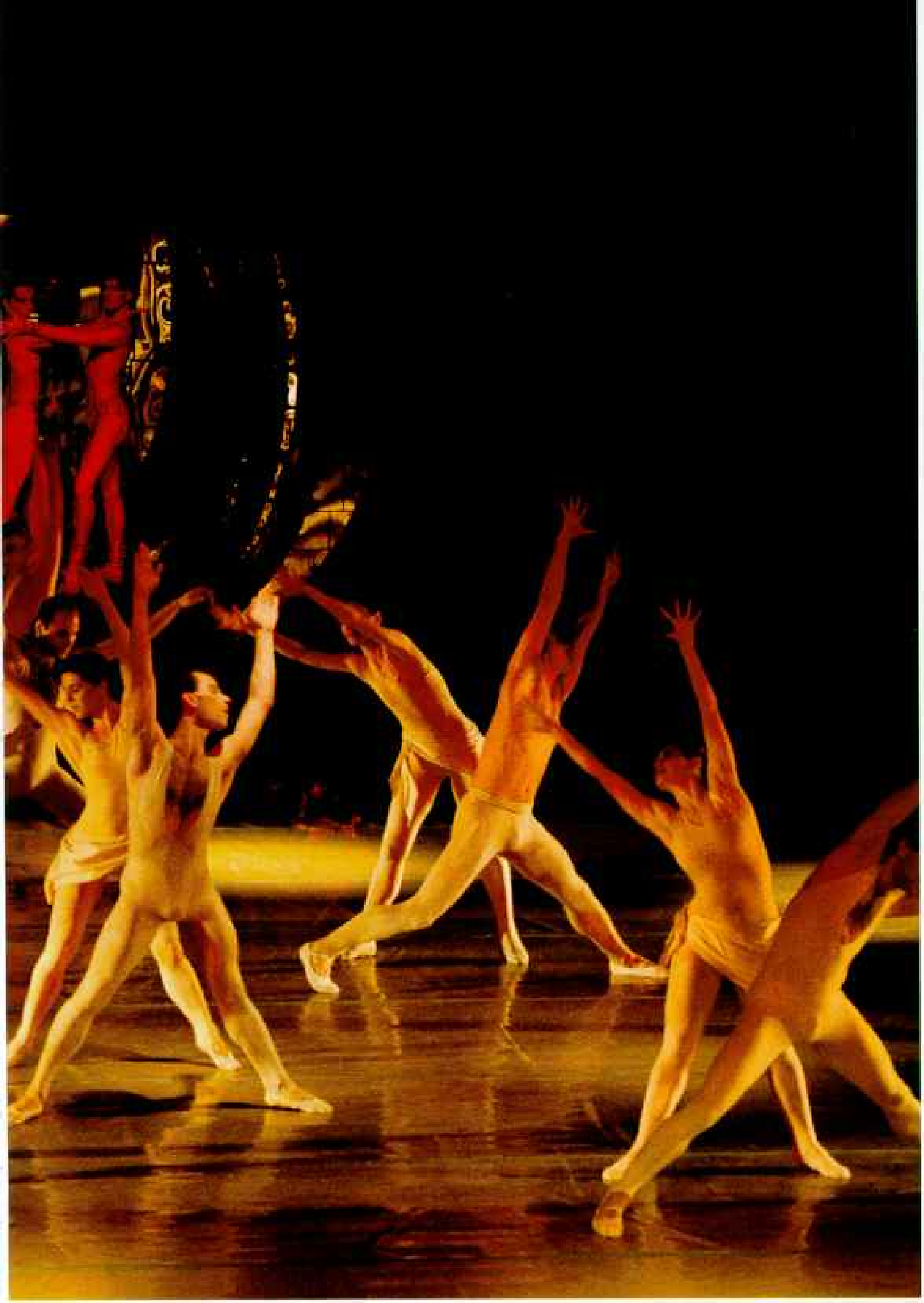






Revered symbol of Prague, Charles Bridge, with its promenade of sculptured saints, crosses the Vltava River into Old Town (background). Home of central Europe's first university, the city of a hundred spires is recapturing its heritage as a vibrant seat of culture.





Showplace for the avant-garde, the Laterna Magika theater hosts inventive dance productions. While the recently unfettered Prague art scene sizzles with innovation, survival without socialist funding has become a major problem for local artists.

IN THE CHILL waning hours of 1992, the winding back streets of Bratislava were dim and strangely quiet on this momentous evening. At midnight Bratislava would become the capital of Europe's newest small nation, the Slovak Republic.

I followed slippery cobblestones of the old city by the Danube up past St. Martin's Cathedral, where nearly a dozen Hungarian kings were crowned. I made my way through towering Michael's Gate and crossed the old city moat into the high-rise reality of today's Bratislava, still decked with Christmas lights. Dodging trams and traffic, I drifted with the gathering crowd toward Slovak National Uprising Square.

The streets were already littered with champagne bottles, and more corks were popping. Shouting over the din, a young couple raised a toast to the historic moment, passed me the bubbly, then poured the dregs over our heads. I pressed on into the throng, everyone wrapped in heavy coats and scarves, gathered around a black coffin topped with a wilted bouquet.

"On December 31, at the age of 74, died our unloved stepmother. . . ," read a placard edged in black.

Shortly before midnight the crowds parted for a platoon of goose-stepping Slovak soldiers bearing the new white-blue-and-red striped flag emblazoned with the Slovak cross. Firecrackers banged and skyrockets swooshed to light the sky with bursts of color.

Then church bells and the boom of a distant cannon marked the birth of the new year—and a new country. The republic's prime minister, Vladimír Mečiar, mounted a small stage. "Slovakia is yours!" he shouted, as the jubilant crowd of some 50,000 cheered approval.

Loudspeakers blaring the familiar strains of "On the Beautiful Blue Danube" set the crowd swaying; even total strangers suddenly found themselves waltzing together.

"The Slovaks have waited a thousand years for this night," said a lady in a fur coat and Russian-style hat who whirled me

Divorce lawyers for their nations, Slovak Prime Minister Vladimír Mečiar (top) and his Czech counterpart, Václav Klaus (above, at left), negotiated the terms of the separation. Klaus, touring a Škoda plant in Pilsen, seeks rapid free-market reforms for the Czechs; Mečiar favors a gradual approach. Leader of free Czechoslovakia for its first years, Václav Havel (opposite) has accepted the post of Czech President, though he battled to preserve the union.

Czechs and Slovaks

Branches of the same family, the Czechs and the Slovaks speak similar tongues. Slovaks endured Hungarian rule for most of their history; Czechs enjoyed power and influence before bending to Habsburg control.

1378

Under Charles IV, Bohemia's first Holy Roman Emperor (1355–1378), Prague flourished as his imperial capital. The Slovaks remained under Hungarian rule as they had since the tenth century.

1648

After the Thirty Years' War the Catholic Habsburgs solidified control over the Czechs, who lost more than half their population, a vibrant Protestant culture, and most of their nobles. Slovaks were divided between two Hungarys after the expansion of the Ottoman Empire.

1920

After generations of fealty to the Austro-Hungarian Empire, Czechs and Slovaks forged a joint Czechoslovakia in 1918 as the old empire collapsed in the aftermath of war. Ruthenia, an extension of present-day Ukraine, became part of this First Republic in 1919.

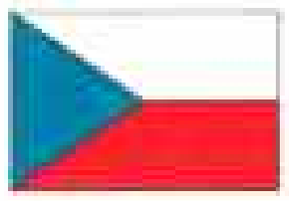
1989

Split apart during World War II, the reunited republics fell under Soviet tutelage when local communists wrested control in 1948. Following massive demonstrations in the winter of 1989, Václav Havel was acclaimed president. The first free elections in 44 years were held in 1990.

Selected castle or fortress

0 50 MILES

NGS CARTOGRAPHIC DIVISION



Czech Republic

AREA: 30,449 sq mi. **POPULATION:** 10.3 million. **CAPITAL:** Prague, 1.2 million. **LANGUAGE:** Czech. **RELIGION:** Roman Catholic (39%), Protestant. **ECONOMY:** industry, tourism, agriculture. **CROPS:** corn, wheat, potatoes, hops.

Slovak Republic

AREA: 18,921 sq mi. **POPULATION:** 5.3 million. **CAPITAL:** Bratislava, 441,500. **LANGUAGES:** Slovak, Hungarian. **RELIGION:** Roman Catholic (60%), Protestant. **ECONOMY:** heavy industry, agriculture. **CROPS:** wheat, barley, corn.

through the celebration at dizzying speed.

Not all Czechs and Slovaks reacted so enthusiastically to the dissolution of their country, I learned during my visits there before and after the split.

"We're a sovereign nation now—for better or worse," a Slovak friend said, with a shrug. "At least the parting was peaceful; that's something."

Czechs and Slovaks are products of the same central European geography and similar in language and culture. "The nation was cobbled together after World War I from provinces of the defeated Austro-Hungarian Empire," explained Martin Bútora, a Slovak sociologist who teaches in the Czech capital, Prague. "Slovakia had been occupied by Hungarians for a thousand years. The Czechs were influenced more by Austria and the West."

Recently they rejoiced in the same victory over 41 years of communist rule, a nonviolent triumph led by intellectuals from both lands: the 1989 Velvet Revolution. Barely two years later, they had sued for a "velvet divorce."

"The split is mad," an economist told me in Prague. "All of Europe is straining for unity, and we're dividing ourselves in two. Slovakia, smaller, less developed, will suffer the most."

A Bratislava psychologist disagreed. "The Czech population is ten million, twice that of Slovakia; the Czechs are richer, more industrialized—and they have always lorded this over us. It is time to step out of Prague's shadow," he insisted.

"Let them go," said a Czech bookseller. "It will avoid bloodshed. Look what happened to our neighbors in Yugoslavia."

Many in both regions of Czechoslovakia prepared for the split in advance. A young Slovak I met at Charles University had already applied for her Czech passport—one of some 40,000 to do so before the separation. "Prague is where the future will happen," she said.

"The truth is, at one time 85 percent of the people—Czechs and Slovaks alike—were against the breakup," said Ivan Tomek, a

Staples for Prague's street capitalists, Soviet military insignia and other souvenirs are fading reminders of the Cold War. Meanwhile, swamped by foreign visitors, the city's hotels and restaurants are thriving.

Mirth of a nation, and its ironical soul, finds expression in the Czech antihero immortalized in *The Good Soldier Schweik.* At a pub in Prague a two-man band celebrates the character created by writer Jaroslav Hašek to mock Austrian control over the Czechs.

Czech superhero: 1992 decathlon gold-medal winner Robert Změlík trains in Prague with an eye to the next Olympics. Like many Czechs and Slovaks, the 24-year-old athlete thinks the country's breakup was "stupid."

professional pollster in Prague. "No referendum was ever held. It was the government in Bratislava that pushed Czechoslovakia over the brink."

With freedom, the Czechoslovak federation had inherited a ramshackle mansion with closets full of skeletons. Its industry, once the envy of the communist bloc, was a technological antique. Markets vanished with the collapse of the U.S.S.R. Idled factories raised unemployment to as high as 20 percent in some Slovak communities. New taxes—and inflation—ate into workers' wages that averaged barely $150 a month. Strip mining, chemical plants, and coal-fired power stations poisoned air and water, turning a third of the countryside into an environmental disaster.

Yet nothing seems to blight the indomitable spirit of the Czech and Slovak people. Rich in avant-garde art, literature, and music, flowering in a landscape of Gothic and baroque, this part of the world gave birth to Dvořák, Smetana, Freud, Mendel, Rilke, and Kafka. Here originated soft contact lenses and Bata shoes, as well as the polka and gourmet Pilsen beer.

EVERY GREAT CITY in Europe—Paris, London, Rome—is a spectacle, pulsing with drama. Prague, I decided, is a lyric opera.

The strains of an overture drifted through the window of my room most mornings, a lone saxophonist rendering "Hello, Dolly!" and "Chattanooga Choo Choo" for tourists' coins. The melodies would draw me out onto the set: Pařížská street, a pretentious corridor of art nouveau apartments, their flamboyant balconies and towers guarded by angels, roaring lions, nymphs, and Greek gods spotlighted by the rising sun. From a niche on his church, a marble St. Nicholas with gilded staff leaned out to bless the cast assembled at center stage, Prague's Old Town Square.

This 11th-century marketplace, hemmed by a gallery of churches, palaces, and the Old Town Hall, has long witnessed acts of high drama: processions of Bohemian kings, public beheadings, Nazi shelling, Soviet tanks, communist speeches. Today's free enterprise is restoring the square's original role as an entrepôt at the crossroads of central Europe.

On fine mornings blacksmiths, carpenters,

and potters set the square clattering. Merchants fill booths with embroidery, gingerbread, wooden toys, and Bohemian crystal to the accompaniment of a lively Czech jazz band cranking out Basin Street blues at the Staroměstská café. Here, coffee comes with an orchestra seat.

"We have always had a strong tradition of music," declares Charles University musicologist Jarmila Gabrielová. I found it is a rare Czech who doesn't play some instrument—or at very least sing.

Musicians, artists, and writers had a key role in bringing the communist government to its knees, playing protest music, holding underground exhibitions, and creating resistance literature. Czechoslovakia's most famous dissident, Václav Havel, wrote plays for Prague's theater of the absurd.

His plays were banned in the late 1960s, but he continued to circulate them by *samizdat*, or self-published manuscripts, with a typewriter and a dozen carbons. Translations of Havel's works opened in Vienna, Paris, and New York. Threatened, interrogated, jailed, he kept on writing about the importance of "living in truth," and the "responsibility of the individual." Through his writing he became the conscience of the nation.

In November 1989 students—and later factory workers—began peaceful protests, some offering flowers to the riot police. Soon Wenceslas Square swelled with 300,000 demonstrators, and by year's end the Velvet Revolution had broken the communist government. To the cry of *"Havel na Hrad!*—Havel to the Castle!" he was acclaimed president of Czechoslovakia.

Less than three years later Havel resigned in response to the coming split, but he returned to the castle in February, this time as president of the new Czech Republic.

"We were all amateurs at governing," President Havel told me at his modest apartment on Rašínovo Nábřeží overlooking the Vltava River. "Writers, doctors, philosophers, economists were suddenly pressed into service. Forty years of totalitarian rule had left us with no politicians experienced in democracy." Through the lace curtains of the window behind us, I saw the gray water tower where for years the secret police had maintained a post to scan Havel's movements.

Some have compared the Czech leader to Plato's ideal, the philosopher-king. He lit another cigarette and dismissed the analogy.

"I am neither philosopher nor king," he said. "Just a playwright who had responsibility thrust upon him."

President Havel's responsibilities are enormous. The country is economically strapped, its political institutions are just emerging, and its energies are divided by the split with Slovakia. Yet the lesson of Yugoslavia has not been lost on the Czechs.

"I'm driven by hope," President Havel said. "Despite the dangers, this is the best chance in a lifetime that Europe may break out into a hotbed of peace."

HOPE, HARD WORK, and a restored free-market economy fill Prague with unusual success stories. On Jilská street I walked into the eclectic bookshop run by Regula Pragensis, a "secular monastic order" that handles curiosities as well as tracts on philosophy, religion, games, and cooking. The order is dedicated, according to its manifesto, "to the encouragement of the traditional hospitality of Bohemia and the Czech lands, incense, creeds of the East and the West, kites, somersaults, village pubs, and erecting odd structures in the tops of trees."

"We Bohemians sometimes act a little, well, bohemian," said the shop's philosopher in chief, Viktor Faktor, pouring me a cup of strong Turkish coffee.

"Perhaps the greatest bohemian of all was our Jaroslav Hašek, who wrote *The Good Soldier Schweik* back in the twenties," Viktor said. "Schweik has already found a place among classic heroes like Don Quixote and Candide."

A Czech conscript in the Austro-Hungarian Army, Schweik shows how, with simple guile, courage, and nonchalance, one survives an insane totalitarian bureaucracy. My eye roamed over the bookshop's clutter: antique dolls, amber jewelry, a brass pump from a fire truck.

"We began publishing a samizdat journal back in 1977, mostly absurdist tracts. The government rarely bothered us," Viktor said. "The censors probably couldn't figure out what we were talking about."

Prague elected its first post-communist mayor, Jaroslav Kořán, in 1990. This puckish, multitalented writer had also made films and translated Henry Miller and Kurt

Unscathed by bomb or bulldozer, seven centuries of history crowd the narrow streets of Český Krumlov. Seen here from its castle, this Czech national cultural monument on the Vltava River draws legions of tourists to the wooded countryside of southern Bohemia.

Vonnegut, Jr., into Czech before communist authorities packed him off to prison, then to a steel factory. After his release he was assigned work in the city's sewers.

"I learned municipal management, you might say, from the bottom up," he said.

I found him hunched over a word processor at a new job in the Lucerna building just off Wenceslas Square. He had recently left public office to return to his first love, publishing, as editor of the Czech edition of *Playboy* magazine.

"Prague endured a thousand years of war and pestilence with hardly a scratch," Kořán said. "But 41 years of communist neglect was hard on our city. Houses, shops, churches were appropriated by the state; most were poorly maintained.

"My first priority as mayor was to sort out just which buildings belonged to whom," he said, "and to begin restoring property to its rightful owners."

We continued the interview, straphanging across town in Prague's gleaming subway. Kořán was hurrying to his next appointment, the installation of a longtime friend as chief rabbi in Prague's Jewish Quarter.

"We survived the Russian dark ages," he said as we emerged from Staroměstská station. With a sweep of his hand underlining the busy district—the old house where Franz Kafka lived, the tilted tombstones of the Old Jewish Cemetery, a gallery of cubist paintings, a crew of masons repairing a rococo shop front—he added, "Our latest renaissance is going well."

A charnel house in the village of Nížkov cloisters thousands of human bones—product of two 18th-century wars between Austria and Prussia fought largely on Bohemian soil.

During the Thirty Years' War (1618-48), in which Bohemia was a major battleground, more than 500 Czech towns and villages were obliterated.

RETURNING PROPERTY confiscated by the state is often a tangled affair, I discovered at the once powerful monastery in Želiv, a bucolic Bohemian village 60 miles southeast of Prague. For centuries the monastery employed most of the villagers in its farms and forests, its mills and warehouses, its brewery. Here sheep still graze the green banks of the meandering Želivka River, lined with willow and linden and patrolled by fleets of honking white geese.

"The monastery grew up around St. Mary's church, built by the Benedictines in 1139. The church was leveled, then rebuilt—twice—during the 15th-century Hussite reformation," said Brother Tomáš, one of a handful of monks who had moved back in.

"Under Nazi occupiers the monastery became a divisional army headquarters. Later the Red Army took it over. But it was the local Czech communists who ravaged the property," Brother Tomáš added bitterly. They burned paintings and furniture, sent rare manuscripts to be recycled at the nearby paper mill, painted over many priceless frescoes. For a while the monastery was used as a prison for dissident Czech priests.

Since 1956 the monastery had served as a government asylum for mental patients. Most had already been evicted. The hundred or so who remained were being led past us to the noon meal. The hallways were still lined with food trays and stainless-steel hospital cabinets.

At her nearby flat, government social worker Olga Němcová voiced her chagrin. "I am hardly a supporter of the former regime, but, to its credit, it did create a much needed hospital here," she said.

"Now, to turn out 500 patients to house half a dozen monks, well, that seems unfair. They are serving God. What better way than allowing this hospital to continue?"

The monastery was offering to rent space to the hospital until its chronic cases could be placed elsewhere.

Ownership becomes more complex as foreign investment and joint ventures arrive to shore up former state enterprises in both republics. Shell and Exxon plan strings of modern gas stations to compete with the sparse network of state-owned oil stations. Kmart has purchased 13 stores; Volkswagen has bought into the Škoda automobile works at Mladá Boleslav. Smaller entrepreneurs have changed the face of Prague with pizza parlors, laundries, copy centers.

To ease Czechoslovakia away from its long dependence on military production, President Havel promoted sharp cutbacks at arms factories and "swords to plowshares" conversions. Many factory towns in the federation were hard hit, especially in Slovakia. Ján

Star of the coronation jewels, the royal crown of Bohemia was given a rare public display for President Havel's inauguration in 1993. A gold diadem adorns the thousand-year-old skull of St. Wenceslas, Bohemia's patron saint.

Ilgo, assistant manager of the mile-long ZTS plant in Martin, arranged a visit.

"The contract with our military customers forbids outsiders on the tank assembly line," Ilgo explained, as he led me along rows of shiny red Zetor farm tractors that ZTS markets in 50 countries. Only from a distance did I see the olive green behemoths taking form under showers of welders' sparks, part of a consignment of 250 Soviet-designed T-72 tanks ordered by Syria.

"For 30 years we toiled night and day to keep up with demand," a worker stamping serial numbers on the tractors said. "Now everyone is worried about losing his job."

"Our major market, the Soviet Union and the Warsaw Pact countries, is gone," general manager Viliam Dubovický said, back in the main office. "But there is still a demand for our T-72 tanks. At about a million dollars apiece, they cost less than half as much as those of our American and British competitors. For the profit from one tank, we have to sell 86 tractors."

At Nový Jičín, 50 miles across the border into the Czech Republic, another huge complex also works on tanks—dismantling them.

"All during the Cold War we kept Soviet T-54s running," said electronics engineer Oskar Šima, manager of Military Repair Plant No. 025. "No one knows these tanks better than we do. After the recent arms limitation agreement, we won contracts to destroy 3,000 of them. This will keep us busy for three years. We have begun to convert about 150 for a different kind of battle: Our radio-controlled Firefighter 55 can attack forest fires too hot for human firemen."

In a dramatic demonstration a steel-treaded mammoth, painted bright red and white, rumbled over the factory proving ground and played its water cannon over a pile of blazing tires. By remote control the "driver," several hundred yards away, put out the fire. Then, confidently, he spun the 45-ton monster around and brought it hurtling toward himself at 30 miles an hour, braking it right at his feet.

In the Moravian town of Zlín, a peasant shoemaker named Tomáš Bat'a had built up the world's most modern shoe factory by the 1930s. The giant plant now sells 300,000 pairs a week. ("We ship cows in one end, shoes out the other," factory spokesman

Jaroslav Stokláska put it.) The son of Tomáš Bat'a has returned to reclaim property taken over by the communists and has purchased 45 retail stores and a shoe factory in a joint venture with the Czech government.

Pilsen's landmark industry also faces the future with a smile. Its oldest brewery, Pilsner Urquell, the "old source" Pilsner, exports around the world. Its smooth frothy brew, rich in hops, often imitated, has made "pilsner" the dictionary entry for fine light beer.

"In 1295, when the town was granted its royal charter, 260 families were given brewing rights here," said Petr Žižkovský, director of Pilsen's Brewery Museum.

On our way to Pilsner Urquell we joined a crowd in Republic Square celebrating the brewery's 150th anniversary. We sampled pints from tank trucks that deliver brew to pubs across the land and munched *lángoše*, flat bread laced with cheese and garlic. An oompah band warmed the autumn air and a tipsy quartet locked shoulders in song:

A Bohemian lass, a golden beer,
Such joys only Czechs know. . . .

We joined a busload of revelers for a tour of the brewery. Inside the pungent boiling room, day-shift boss Václav Janouškovec, in a spotless lab coat, controlled flows and temperatures of the hops simmering in 6,500-gallon copper kettles—16 altogether—with a stainless-steel panel of blinking lights and a row of antique brass faucets.

I asked Janouškovec what 700-year-old alchemy converts such aromatic mush into Pilsner's famous "beer of gourmets."

"No secrets at all," he insisted. "Just the pure water from our own deep wells, selected hops from nearby Žatec, fermentation in oak casks—and constant attention to detail.

"No one 'manufactures' great beer," he added. "Brewing is a precision craft."

AN EARLY SHOWPIECE of the industrial revolution, the northern Czech borderlands—part of a region known as the Sudetenland before nearly three million German-speaking inhabitants were expelled after World War II—long produced coal, steel, chemicals, machinery, and fine crystal. Communist five-year plans stoked the factory towns to their limit while ignoring the growing pall settling over the 250-mile belt that arcs from the coalfields around Chomutov to the steel mills of Ostrava, near the Polish border.

"Ostrava's schools had to limit children's outdoor play," said František Lukáš, who once lived in the town. "We kept windows closed, even in summer; otherwise soot blackened walls and curtains."

A communist song of the seventies extolled: "How much beauty surrounds . . . smoke from the factories and . . . children playing in the sand. . . ." Another patriotic chimney scene still decorates the Czech hundred-crown note.

On my way through Teplice, 60 miles north of Prague, the gray winter air, acrid with sulfur dioxide, seared my eyes and throat. Teplice was once a fashionable spa town. Beethoven, Goethe, and Chopin took the waters here. Today life expectancy in Teplice is three years shorter than in the rest of the Czech Republic.

From the bare, acid-poisoned forests in the Ore Mountains, I looked out over the city hidden under a blanket of smog 2,000 feet below. Only a few conical hills, one shouldering the ruins of Doubravka Castle, and a dozen tall smokestacks spewing grit poked up through the deadly veil to outline Teplice and its surrounding no-man's-land of coalfields.

The brown coal, or lignite, that fuels Czech factories and power plants is also the country's major polluter. Huge strip mines show as blank spots on the region's maps; during the past four decades monster mining machines have chewed up a hundred villages and towns.

At Libkovice, near Teplice, debris from bulldozed houses, a bakery, even a church litter orchards. "We were a village of a thousand people," Mayor Stanislav Břicháček told me. The Havel government had ordered the state coal company to desist, but the order was lost somewhere in the state bureaucracy.

While sulfurous clouds make parts of the republics barely livable, energy alternatives—nuclear power plants and hydroelectric stations—stand shackled by controversy.

An hour southeast of Bratislava, where the Danube forms the border between Slovakia and Hungary, a vast hydroelectric scheme languishes half complete amid a tangle of politics. In 1978 the communist regimes of Hungary and Czechoslovakia began joint construction of the *(Continued on page 28)*

A Realm of CASTLES

Windows into an extravagant past, hundreds of castles in various states of repair grace the Czech countryside. Once commandeered for a Nazi garrison, Bouzov Castle (above) is today often used as a movie set. On the gate of Hluboká Castle, a crow attacking a Moor recalls the Austrian-Ottoman wars of the 16th century. Its opulent interiors reflect the great wealth of the Bavarian Schwarzenbergs, long one of the most powerful families in Bohemia.

The party never ends at Český Krumlov Castle, where a carnival unfolds in giddy illusion on the frescoed walls of the ballroom (left). Figures seem to climb out of the murals and peer into real mirrors, one of which reflects the photographer's assistant, Zora Valanská (below left). At Hluboká Castle, the vaulted reading room (right) is but one of more than 140 chambers decorated in high romantic style.

Famous for its ornately carved wood panels, the castle also claims a wealth of stained glass, like this 17th-century panel bought by a Schwarzenberg noble in Switzerland.

(Continued from page 21) Gabčíkovo-Nagymaros project: two dams, one fed by a high-banked canal. It would carry the waterway over a plain where the river thins to a skein of shallow rivulets before pulling itself together below the town of Gabčíkovo.

A decade later, citing dozens of environmental studies, Hungary pulled out of the costly project. The same studies caused Czechoslovakia to hesitate. But an independent Slovakia, ignoring pleas from environmentalists around the world, has pushed the dam at Gabčíkovo to completion.

There, site manager Jozef Herman drove me out across the concrete spillway to view the huge turbines and the controversial canal, now filled with water from a reservoir some ten miles away.

"Our dam's 720 megawatts will double Slovakia's hydroelectric capacity," Herman said. "At the same time, it will control rampaging high waters that often flood this flat stretch."

Environmentalists are outraged by the threat of a costly side effect of the giant project: far-reaching damage to the largest aquifer in central Europe.

"The dam will do more harm than good," said Josef Vavroušek, a former minister of environment for Czechoslovakia. "For the short run we will have to depend on nuclear power plants—but only after bringing them up to international standards."

"We have to spare Czechs and Slovaks the deadly effects of the low-grade fossil fuels. I speak not just of the future generations, mind you. The danger is here and now."

ALSO WATCHING the Danube dispute are the 600,000 ethnic Hungarians who live along the new republic's southern border. Recent bans on bilingual signs in the towns and restrictions on the Hungarian language over national radio and television have further raised their concern.

Slovakia's second largest city, Košice, maintains strong ties to Hungary. Today nearly a quarter million people inhabit the steel-mill town, most in the stark apartment-block suburbs that ring its medieval center. Downtown, around the cathedral, faces reflect the cosmopolitan minorities—Hungarians, Ruthenians, Gypsies, Poles—that make up 14 percent of Slovakia's population. Hungarian was the second language on menus; Hungarian bookshops offered Tolstoy, Graham Greene, and the Ninja Turtles in translation. Posters at the Thália, a Hungarian theater, announced coming attractions: *Figaro Házassága* and *Romeó és Júlia*.

When the Thália took one of its productions on the road, I followed the troupe to nearby Turňa nad Bodvou, a town of ethnic Hungarians just three miles from the border. Here it performed a lively musical comedy, *An Old Summer Love*, set in the cabarets and drawing rooms of Budapest in the twenties. The tangled plot, unfolding in Hungarian, was completely beyond my grasp, but the irresistible music brought me to my feet along with the cheering audience in the town's small theater.

"Beneath the songs and the laughs the musical poses deeper questions," explained László Csendes, the show's director and handsome leading man, twisting his bushy mustache. "Where are we coming from? Where will all this lead us? The show is especially popular these days."

With no cultural homeland to look to, another minority that spread throughout Czech and Slovak lands has suffered persecution for centuries: the Gypsies, or Romanies, as they prefer to be called.

Descendants of Indic-speaking nomads who arrived in Europe as early as the 1100s, Romanies lived on the fringes of society as itinerant horse breeders, tinkers, and blacksmiths. During World War II thousands perished in Nazi death camps; under communism most were forcibly settled in the slums of factory towns. In recent factory cutbacks Romany workers were often the first to lose their jobs. Despite constitutional guarantees, they are barred from restaurants, pubs, and movie theaters—even public buses. Some have been attacked on the street by neo-Nazis and skinheads.

"The 1991 Czechoslovak census counted 120,000 Romanies, but *we* estimate our population is at least five times that," said lawyer Emil Ščuka, chairman of an organization of Romany groups.

"Democracy has given us new hope," Ščuka said. "Our Romany language is no longer forbidden. We publish newspapers now and a magazine and broadcast an hour a week on national radio. In Brno we have opened a Romany museum."

I witnessed firsthand the indignities—and dangers—Romany families face during a visit to Česká Lípa, a small manufacturing town in northern Bohemia, where I met Alois and Maria Tulejovi. Tension was high in the chilly, two-room apartment the couple and their three children share with a nephew and his family. Alois, a man in his 40s with a full black beard and tired eyes, passed around cigarettes. Maria pointed to broken windows patched with rags and cardboard.

"Roughnecks pitched bricks through the glass the day before yesterday," she began angrily. "They are getting bolder. The police never hesitate to arrest a Romany, but when we are victims, they do nothing. My husband is away all week, working at the only job he can find, two and a half hours away in Prague," she said. "I worry about the children, that they might. . . ."

She was stopped in mid-sentence by shouting outside in the street. *"Heil Hitler!* Gypsies to the gas chambers!"

Following the family's example, I hunched behind the sofa, expecting a shower of glass. The youngest child began crying. But the chants faded, and after a cautious peek Alois sounded the all clear.

Maria cursed under her breath. "You see how it is. We never know when we might have to run for our lives.

"We sleep with our shoes on," she said.

THE IDYLLIC COUNTRYSIDE is a healing balm after the grit and cross fire of the crowded industrial towns. I often retreated with Czech and Slovak friends escaping office and factory to tramp through forests of golden beech, to help fill buckets with the plump Vavřinec grapes from Moravian vines, or to watch villagers seine placid ponds, harvesting giant carp, the traditional Christmas Eve dinner.

My favorite hideaway was Zuberec, set among Slovakian meadows and spruce forests on the western flank of the Tatras.

"Suchen Sie nach ein Zimmer?" a smiling face had asked through the car window when I first entered the village: "Are you looking for a room?" My car had Austrian plates.

On his bike the man led me down a row of

Dismantling a Cold War economy, Czech workers at Nový Jičín convert battle tanks into radio-controlled fire fighters. Slovakia, where heavy arms production was concentrated, suffers the economic brunt of demobilization.

traditional village houses, built of dovetailed timbers and brightened with window boxes of geraniums, to the new brick-and-stucco chalet he had just completed. We left our shoes at the door—Czechoslovak custom, in city and country alike—and climbed to a balcony view of the peaceful hills from the tidy upstairs apartment. Daily rate: about eight dollars, the price of a fancy coffee in Vienna.

My new friend and landlord, Štefan Škerda, was born in Zuberec. He said he had worked for 15 years at a television factory in nearby Nižná but left the job to teach German classes at his village school. He also patrols the surrounding hills with the town's mountain rescue team.

"I'm far happier with the village life," Štefan told me. He showed me the small tractor he had just bought; it shared the barn behind his house with the family cow, pigs, and chickens. "In the spring I'm planting potatoes and barley on a small plot owned by my father."

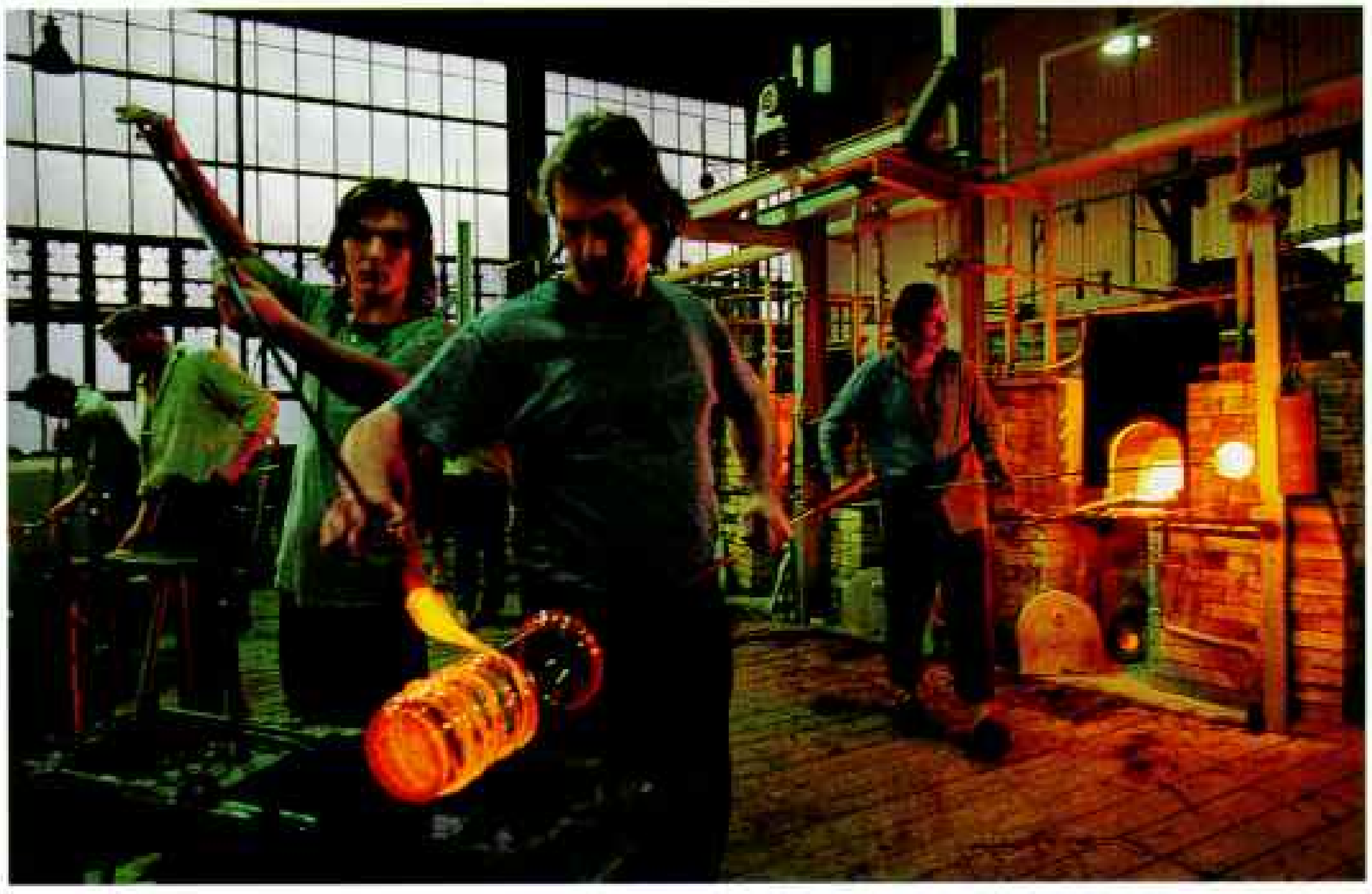
I HAD ALWAYS HEARD that religion plays a greater role for Slovaks than for their Czech cousins, but Sunday morning's first bells brought only a handful of kerchiefed grandmothers to the gray stone Catholic church across from my room. But wait. A quarter of an hour later the older menfolk appeared, one by one, crisp in their Sunday best and carrying missals in their rugged hands. Soon younger couples, then whole families and groups of freshly scrubbed teenagers livened the street below. By the time the priest parked his red Škoda to hurry in for the 9:30 Mass, the church was packed. Fifty or more pressed around the doors outside.

"During the four decades of atheist rule church attendance could cost a man his job, but we kept the faith," Father Edmund Bárdoš said, after the service. "I was often persecuted. Seminaries were closed—leaving us now with a shortage of priests.

"I'm minding two churches, Zuberec's and

Beneficiary of Czechoslovakia's mass privatization in 1992—the East-Slovakian Steel Mill outside Košice (left) reflects the former nation's role as the workshop of the communist Eastern bloc. Overreliant on heavy industries, the Slovaks now need to diversify their economy.

At the Czech crystal factory in Poděbrady, engraver Marie Líbalová helps satisfy the demand for Bohemian crystal. In Nový Bor a glassblower at the Crystalex works tries out a new design for the Christmas season.



one in the next village," Father Bárdoš said. "A priest has been sent over from Poland to help with all the baptisms, funerals, weddings. We are joyously busy."

The church was full again the next Saturday as Father Bárdoš sealed the vows of a double wedding when the Zúbeková sisters, Jana and Viera, married Peter Klimek and Branislav Habó. Through splashing rain, the couples marched to the church trailed by an army of guests, the brides' white gowns shielded by a canopy of umbrellas.

Midafternoon the feasting and dancing started at Zuberec's Dom kultúry, or House of Culture, where the newlyweds presided from behind a steaming roast pig and a tall white cake shaped like the church.

"Mnoga ljeta! Živijo!" the banquet crowd toasted the couples: "Many years! Long life!"

After dark the second seating arrived for more soup, steak and rice, wine, frosted pastries, and glasses of homemade slivovitz, a potent plum brandy. Folklore fiddlers, rosin flying from their bows, accompanied a traditional Slovak ceremony as the brides surrendered garlands of pearls, tokens of innocence, and covered their heads with kerchiefs, symbols of womanhood. Folksinger Ján Pilarčík belted out a local song:

Zuberec, swept by cold winds,
But its girls are like flowers. . . .

Old ways linger in both new republics, and—happily for Czechs and Slovaks—their rich history and scenic preserves draw growing throngs of tourists. Each year 800,000

From behind a window on the wrong side of the tracks, a mother shows off her children in a Gypsy settlement outside Richnava in eastern Slovakia. Urbanized but not assimilated under communist rule, the Romanies, as Gypsies call themselves, are often the first to lose jobs in hard times. Since separation, thousands have migrated from Slovakia to the Czech Republic.

visit Český Krumlov in the wooded hills of southern Bohemia. Moated by a loop of the Vltava River and defended by a fairy-tale castle, the centuries-old town is making a steady recovery from decades of neglect.

"My phones are ringing off the hook, investors calling from Austria, America, Canada," said Mayor Jan Vondrouš in his office on the arcaded town square. A former banker, he helps oversee a 20-million-dollar tourist and cultural development project, funded by local grants and foreign investors.

"The town manages 50 of our largest architectural monuments, but we plan to sell 250 Renaissance and baroque houses to private businesses for restaurants, pensions, boutiques," Mayor Vondrouš said.

"We are moving very carefully, to avoid damage to the character of the town—we are listed as a national cultural monument—and the fragile environment around it."

I CLIMBED to Český Krumlov's main attraction, its castle, built on a cliff above the town. The oldest section, a 250-foot tower, dates back to the early 1200s. As I entered, keepers were pouring barrels of apples down to the two lazy brown bears that roam the dry moat under the main gate.

Jingling a hoop of iron keys, Jana Chlupová of the castle restoration staff showed me through some of the 400 rooms in the sumptuous fortress: A salon walled with rose velvet, a long gallery hung with Dutch masters, the marble chapel, the spectacular ballroom painted with figures dressed for a masquerade, and the castle's showpiece, a rococo theater, complete with all the trappings.

For Czechs and Slovaks no outing seems complete without a pilgrimage to one of the castles, palaces, or citadels that anchor their past to the landscape. Some 2,500 noble landmarks are listed—enough for a different visit each day for seven years.

Gothic Karlštejn Castle, a Disneyesque fantasy, was erected by Charles IV, who became the first Bohemian Holy Roman Emperor, to house the coronation jewels. At a more modest baroque château in Duchcov, Casanova wrote his simmering memoirs. Slovakia's Spiš Castle, once the biggest fortress in central Europe, kept Tatars and Turks at bay. Gutted by fire two centuries ago, its chalk white towers and crenellated battlements still hang like a necklace on a mile-long green hilltop.

A spiked portcullis and a drawbridge lead into the somber Moravian castle of Bouzov, for 240 years the headquarters of the Order of Teutonic Knights. Its arsenal of pikes and muskets and suits of gleaming armor—not to mention the windlass that lowered prisoners to starve to death in its deep dungeons—

Spiš Castle looms high above the coal-fire haze in the Slovak village of Spišské Podhradie. Stronghold for generations of Hungarian princes, the largest fortress in central Europe was destroyed by fire in 1780. It is now being restored.

After their wedding in a country church, Ján and Ivana Motyčákovi walk to the bride's house in Bílčice—a Moravian town north of Olomouc. Born as communized Czechoslovaks, they now have new lives as free Czechs. Both here and in Slovakia most Czechs and Slovaks seem too enamored of their recent liberties to harbor resentments over their velvet divorce.

appealed to Nazi SS boss Heinrich Himmler, who commandeered the castle for his private retreat.

A visit to the isolated bastion of Čachtice, in Slovakia, also chills the spine. Layered in mists under black winter clouds, its crumbling vaults and towers seem like a setting for a Dracula story. And so they are: Here in the late 16th and early 17th centuries Countess Elizabeth Báthory tortured hundreds of peasant serving girls to death by biting flesh from their necks and breasts, then bathed in their blood.

Much closer to our time are the atrocities committed at Terezín, north of Prague. The star-shaped garrison town named for Austrian Empress Maria Theresa was built in the late 1700s as a bulwark against the Prussians to the north. In 1941 the Nazis converted the walled citadel into a transit camp for Jews on their way to the death camps. Here, and in the attached Gestapo prison, 37,600 people died.

"For a while Terezín was a showpiece ghetto," said František Lukáš, Sr., an 80-year-old cubist painter, one of the few who survived the camp. We met in his gallery across from Prague's Old-New Synagogue.

"We were mostly artists, composers, writers. We painted, wrote—turned out plays. But one by one my friends were sent 'to the East': to death camps," he said.

Before he was shipped out, he hid 80 paintings under prison floorboards. Lukáš managed to stay alive, illustrating German medical reports and, for a time, defusing bombs. When he returned after the war, he found Terezín ransacked.

"In the early sixties a woman found a dusty portfolio in her attic with my name on it. Bless her, she called me," Lukáš said, a tear in his eye.

A haunting blue still life, some portraits—and a quiet street scene in Terezín—all from the lost collection, hung on the gallery walls.

Across the river is Prague Castle, the country's largest. More than just the focus of the past, as the seat of the presidency for the new Czech Republic it stands as a foundry of its future. Around the president's office vast ramparts enclose a cathedral, museums, libraries, concert halls, restaurants.

Dusk. The domes and spires and pointed roofs of old Prague cluster under its great castle like a congregation waiting for a miracle.

After dinner Old Town Square is already half-dozing, its stones weary from speaking their tales. Revelers have departed for the cheer and smoke of their favorite back-street pubs. From iron lamps, trapezoids of light glare off lonely cobblestones. Intense shadows muffle a faint melody challenging the gloom from a park bench

near the steps of St. Nicholas's. Such a scene could inspire Kafka—and probably did. He grew up on this square.

Nearly every evening old Jiří lingers here until late, squeezing a soft tune from his battered concertina. Often I joined him and a friend or two on his bench to talk about the world and to drop a few crowns in his cup.

"I don't play for the money," he said. "It's just that my wife hates the accordion."

This is Prague, for the brief span of a man's life the capital of Czechs and Slovaks, who all wear the ravages of their history with pride. And when their world tilts too much toward the pessimism of Kafka, they take a page from *The Good Soldier Schweik*. "Not to worry" was the philosophy of this Czech Don Quixote.

And what of the future? Taking the long view, some political leaders are not surprised by the split-up of Czechoslovakia; look at once united Sweden and Norway, they say. Like them, the new republics share many common interests and a powerful ancient kinship that augurs close alliance even under separate flags.

In any event, other fracturing nations can only envy the ease of the Czechs and Slovaks in coping with history's caprice.

"Look, I was born in Austro-Hungary," said one of Jiří's cronies, a man in his 80s. "I grew up in Czechoslovakia, suffered from Germans, spent 40 years in a colony of Russia—without ever leaving Prague! Now we're Czechs again, like we've been for a thousand years. What's so bad about that?" □

Tinged by an autumn sunset over Sena, New Mexico, the Pecos River makes its arduous run toward the Mexican border. The river, long a water-rights battleground, feeds the hopes of sturdy souls along its banks.

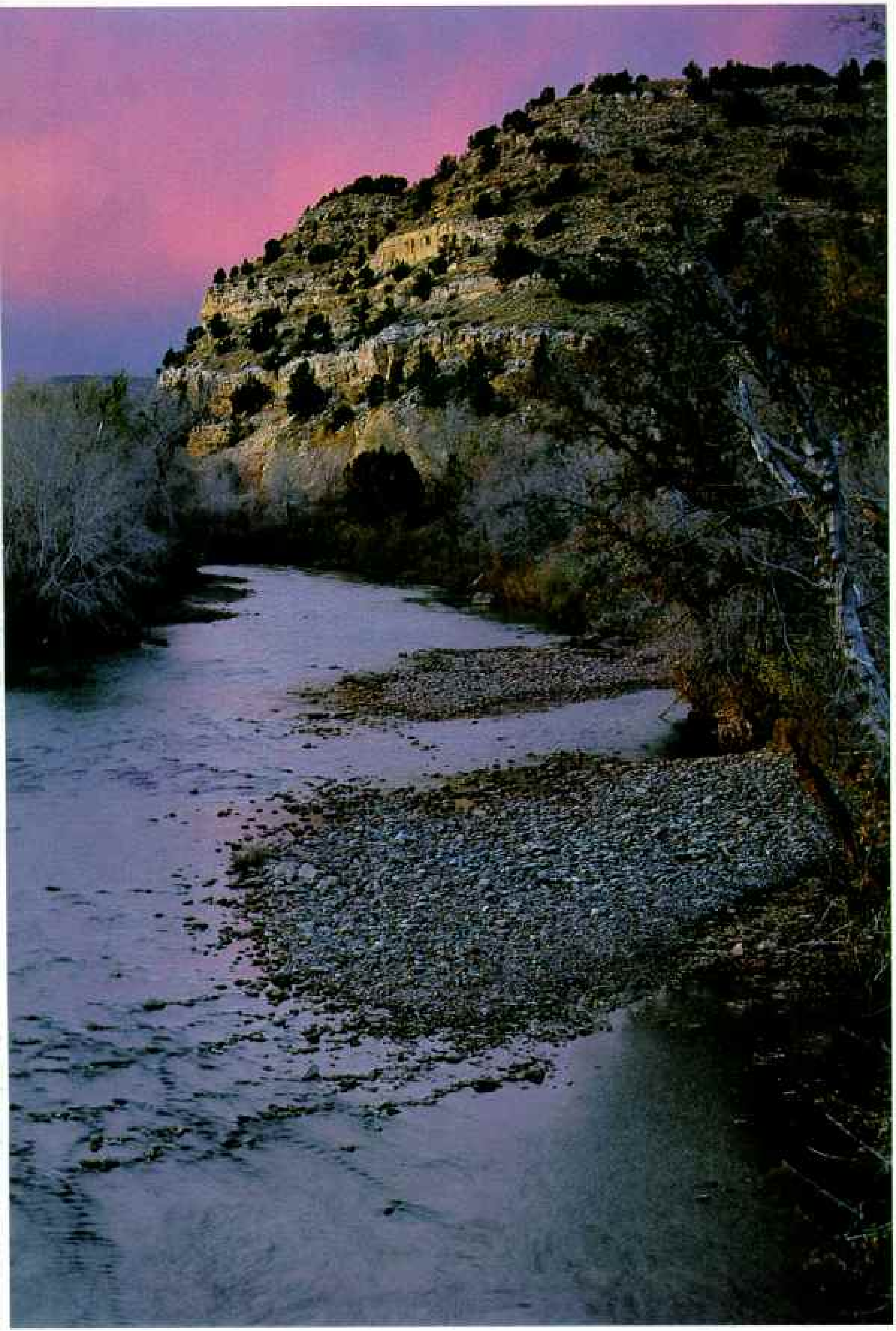
By CATHY NEWMAN

Photographs by BRUCE DALE

BOTH NATIONAL GEOGRAPHIC STAFF

The Pecos

River of Hard-won Dreams



THE PECOS RIVER is no place for sissies. Even the buffalo hunters dreaded it. "When a bad man dies, he goes either to hell or the Pecos," they said.

I am not dead but dragging low in the summer heat of El Cerrito, a northern New Mexico village looped by a silver thread of the Pecos. To get here I've traveled a bone-rattling dirt road that started narrow and dwindled to barely a squint. A faint line on a map, it was hard to find, and I suspect those who live in this tightly shuttered town prefer it that way.

Finally, in the shaded doorway of an adobe house, I find someone who'll talk rather than just glare at me—a short, black-haired woman with a spider tattooed on the back of one hand.

"It's going to be a snake summer," says Gloria Quintana.

"How do you know?" I ask edgily. Five brands of rattlesnake call the Pecos home.

"Wet year."

"I'll get a pair of snakeproof boots," I offer.

She looks at me with pity.

"Won't help. They aim high."

Some places are meant for the few, for a tough strain of humanity who, by fate or choice, live out their span in harsh isolation. Pecos River country—distant, dry, unforgiving—is such a place.

To an eastern eye the Pecos is barely a creek. For most of its 900-mile run through eastern New Mexico and West Texas it is by turns narrow, sluggish, salty, easily waded. In some places it vanishes altogether, disappearing into limestone outcrop.

The Pecos begins in mountain wilderness

A DAPPLING SHOWER cools trail horse Mr. Woody and guide Huie Ley—hat bagged in plastic "to keep the felt from gettin' soaked"—near the headwaters of the Pecos River in northern New Mexico. Born and raised in Terrero, population ten, Ley took over his father's outfitting business in 1972 at age 15 and has never tired of his backyard, the 224,000-acre Pecos Wilderness. "A lot of people can't handle the solitude out here, but I could stay in the woods all the time." Yet tourists descend in the summer to spy the bighorn sheep. "Then it's more like Jellystone Park," says Ley.

Snow in the mountains (below) melts into Pecos waters that fill centuries-old acequias, ditches used to irrigate fields downstream.

and ends in furnace desert with not much in between but long horizon and hard blue sky. Born of snowmelt at 13,000 feet in the Sangre de Cristo Mountains northeast of Santa Fe, it surrenders to the Rio Grande on the Texas-Mexico border, draining 35,000 square miles along the way.

"Graveyard of the cowman's hopes," Charles Goodnight called it. In 1866 he drove 2,000 cattle along the river and lost more than 300 to thirst. The following year his partner, Oliver Loving, lost his life to a Comanche bullet.

It is the graveyard of many hopes—of Coronado and conquistadores who came looking for gold in the 16th century, of 19th-century homesteaders lured by dreams of land ripe for the plow, of 20th-century wildcatters seduced by the whisper of oil.

Though short on water—"dinky," one hydrologist calls it—the Pecos has always been long on mythology. Here, folktale cowboy Pecos Bill, who cut his teeth on a bowie knife, rode a mountain lion while twirling a live rattlesnake lariat. Real-life cattle king John Chisum employed cowhands so accustomed to the alkaline taste of Pecos water, it is said, that they carried salt in their saddlebags to doctor any fresh water they found. Gunfighter Clay Allison drew fast and shot true and, according to his gravestone in Pecos, Texas, "never killed a man that did not need killing."

"Pecos" even got to be a verb. To "pecos" someone meant to deep-six him.

"As in?" I prompted Paul Patterson, a cowboy poet who explained this. He thought a moment.

"As in 'he *pecosed* the danged varmint.' "

Trickle through time

On its crooked 900-mile trek to the Rio Grande, the Pecos River carves a course straight through history. Pictographs of ancient peoples mark riverside caves, dialects of Spanish settlers linger in northern villages, and faint wagon-wheel ruts hint at traders' crossings.

A TANGLE OF MOUNTAIN STREAMS has been gathered into the Pecos over 14 miles by the time it slips past John Rivera's cabin just above Terrero, which is less a village than a road sign. The Rivera house sits on ten acres of private land in the Santa Fe National Forest. It is the first year-round home you come to on the Pecos.

"We eat off what we raise," explains John's wife, Lee Neille, who has just finished bringing in the longhorns.

We are standing outside the corral that fronts their small cabin, bare of electricity and running water. "There must have been some tough years," I venture. "Every year," corrected Lee Neille. "We've hung on through thin and thin. Before 1984 we didn't even have a vehicle. We bummed rides. When things are good, we enjoy it. When they're bad, we tighten our belt."

She pauses. "John's grandfather had it worse. In 1904 the river flooded in the middle of the night. The barn floated by, crowing roosters and all. He lost everything. That didn't stop him. And nothing has stopped us."

Why longhorns? I ask, knowing most ranchers prefer the beefier Angus or Hereford.

"They're tough," John replies, fingering his longhorn belt buckle. "They survive."

Thirty miles downriver the Pecos changes from clear mountain stream to water muddied by arroyo runoff. The landscape tapers into mesa farmed by Pueblo peoples in the ninth century, settled by Spanish in the 19th.

The imprint of Spain lingers. Adobe villages are filled with the lilt of Spanish; the land is laced by irrigation ditches called *acequias*. Here in fields, some only a few acres in size, alfalfa, corn, and beans are coaxed from red soil.

I arrived in El Ancon for *la limpia*, the annual spring ditch cleaning. The village, a cluster of trailers and adobe houses, sits less than

TAKING A DIP is a routine chore for Monte and Johnny Rivera, who haul water for cooking and washing to their family's cabin—the most northerly year-round home on the river. No electricity means no TV, but "they never say, 'I'm bored,' " says their mother, Lee Neille. "Their imagination has not been robbed." Fans of books on wildlife, the boys are also deadeyes with bow and arrow.

two miles from where wagons lumbering along the Santa Fe Trail crossed the Pecos. Of the 28 community irrigation ditches on the upper Pecos, El Ancon's is one of the smaller—five miles long, with 14 *parcientes*, or users.

Once the *mayordomo*, who oversees the ditch, walked it daily. That tradition, like many, has faded with the passing of an older generation. Now, El Ancon's mayordomo, Joe Garcia, checks it every other week.

As I walk the six-foot-wide ditch with Joe, he notes several groundhog holes. "They must be filled, or the ditch will collapse." He points to clumps of thorny locust and grass. "They soak up water and must be pulled out."

It is a time of challenge for parcientes. The state is deciding who holds rights to what water. In New Mexico, water rights are separate from ownership of land. They can be bought and sold. Over time, claims have blurred.

Now each user must prove entitlement—a battle that pits neighbor against neighbor. As if this weren't enough, there is a battle brewing against developers who would buy up water rights to green the fairways of golf courses and the lawns of subdivisions.

The encroachment offends. In these tiny communities nourished by the Pecos, cultural roots run deep. They are embedded in the soil. And this trade in water, says Nicasio Romero, a sculptor whose stretch of ditch we are cleaning, goes against Hispanic tradition.

"Water is not a commodity to be bought or sold," he tells me, eyes flashing. "This is not economics. It's tradition. No. More than that, it's spiritual."

Water, holy water. In some villages, says Nicasio, a priest blesses the ditch in spring. "The ditch binds the family and community," he says.

The ditch divides as well. "A fight doesn't really get good until the men go for their hoes," one man told me only half jokingly.

In El Cerrito, where 25 people live, a family

QUIET MOMENTS with granddaughter Desiree Valdez brighten life for Gloria Quintana. Her ties to El Cerrito, New Mexico, go back seven generations, she says, to a Spanish ancestor "buried in full armor" under the church. After 14 years of roaming, Quintana returned to raise her three children in the house where her father was born. It's an isolated life (the mailbox is 18 miles away), yet she smiles: "I guess I feel safe here."

In El Ancon, Bonifacio Montoya still stokes his horno—an adobe oven like those used by Spaniards and Pueblo Indians—to make chicos, dried kernels of steamed corn. "People live out of a can," says Montoya. "They need to know the way we lived before; the way things taste from nature."

that owned land along the river denied another family access to the water. Their dispute has lingered for decades.

"No one owns the river," Gloria Quintana says indignantly as she shows me around.

"It's a beautiful place; too bad we can't get along. You know about the Hatfields and McCoys? Our Hatfields live here." She indicates a row of houses. "McCoys there. It gets bad."

As we stroll past the "Hatfields," her dog Loco lunges at and grabs a rooster.

Gloria snatches the bird away, leaving the bewildered dog a mouthful of feathers. Suddenly, a door slams open, a stocky, bearded man bursts out toward us, fury in his eye.

"The rooster's fine," Gloria tells him.

The man's glare darkens.

"I'm sorry, I'm sorry," she adds.

The man takes a menacing step toward us.

We move on.

Despite its dark side, there is a sweetness to life here. For years the population dwindled as people left to work in Colorado steel mills or the mines of western New Mexico. Now those who can afford to are returning, as Gloria did 11 years ago. "I left when I was 17 and swore I would never come back. Now I'll never leave. When I hit that dirt road, I say [crossing herself] thank God, I'm home."

Many towns throughout the upper Pecos Valley have dried up and blown away. The counties the Pecos flows through at its start, Mora, San Miguel, and Guadalupe, suffer an unemployment rate among the highest in the state. With no jobs to sustain them, the young leave.

The malaise affects Colonias, 50 miles

downstream from El Cerrito. Only nine families remain in this village of red dust.

It has been three years since the bells of San José rang in celebration; the church stands vacant and decaying. But now the New Mexico Community Foundation is helping restore it. On the day I visit, the task is to repair the roof where water has seeped in, leaving the adobe walls on the verge of collapse.

Foundation supervisor Steve Peart shakes his head. Only four volunteers are here. "I made many calls; people are too busy," says church caretaker Fabiola Saiz.

As I watch, she mixes earth and water in a trench in the ground and fills a large can with the adobe. "Our ancestors built this. How can we let it go?" she asks.

She was married here. Her parents are buried here. "And my son Gerard is buried there." She indicates a mound of earth bearing pink and yellow plastic flowers.

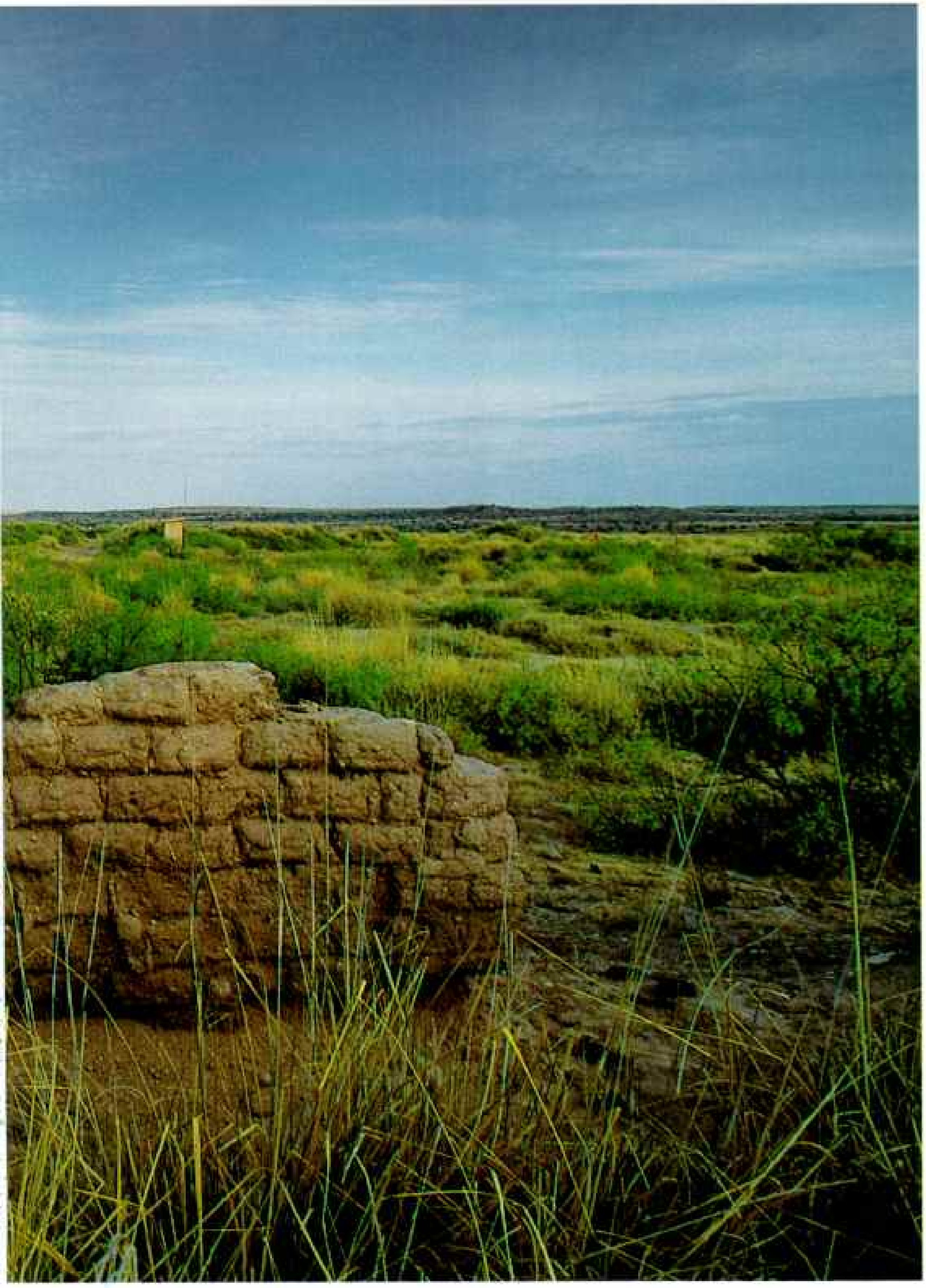
"He was handicapped. I took care of him 27 years. I miss him very much."

There is nothing to say. I reach for a trowel and a handful of adobe, adding a prayer of my own for the church of San José.

As if with a sigh of relief, the river emerges from canyon walls into plains an hour south of Colonias. Red rock disappears, replaced by the pale green of shortgrass prairie. Here in its middle basin, the river is at its most productive. For the rest of its run through New Mexico, the Pecos stitches together fields of alfalfa and cotton and the pastures of cattle ranches.

Much of the water that reaches the river here originates as violent summer storms.

PHOTOGRAPHED as a baby on his grandfather's knee, Edward Trujillo, 77, sits atop the remains of his grandparents' home in deserted Guadalupe, New Mexico. "I graduated from the eighth grade over there. . . . I used to play baseball right there," he says, pointing at ruins and empty spaces. Near Fort Sumner, this was



Billy the Kid's turf. Trujillo recalls tales of the outlaw. "My granduncle won a horse race with Billy. He put flowers on the horse and paraded around the village. Billy said, 'OK, you won, but if you parade that horse one more time, I'm gonna kill him.' " Trujillo maintains the church, built in 1890 by his great-grandfather.

Unusually heavy rains during my stay had prodded seeds that lay dormant in drier years into a profusion of wildflowers. The transformation was dramatic. South of Puerto de Luna, I stood with a rancher and watched cattle lazily graze the tender green shoots of grass. With a smile of satisfaction he pointed to a vivid carpet of purple verbena and yellow globe mallow. "The land," he said, "is wearing its Sunday best."

At high noon I drive into Fort Sumner, near where the Pecos bends into a seven-mile stretch of tree-bracketed valley known as the Bosque Redondo. Here there are two (count 'em) Billy the Kid museums.

Is the town big enough for both?

"No," says Don Sweet. He isn't smiling.

Sweet owns Billy museum number one —the one on Highway 84. Displays include "pots Billy cooked from," a curtain from the house where he was killed, and a grave marked REPLICA.

When I ask Don's mother, Jewel, what is in the other Billy the Kid museum, she purses her lips: "Just a bunch of documents, if you know what I mean."

Seven miles away is Billy museum number two, the Old Fort Sumner Museum, which boasts the "authentic grave," and the aforementioned documents—photocopies of letters written by Billy. Asked about the competition, owner Joe Bowlin looks grim. "If you can call that a Billy the Kid museum."

The object of this rivalry—Billy the Kid, born Henry McCarty—hung out in Fort Sumner, where he was shot dead at 21 by Sheriff Pat Garrett on July 14, 1881. Legend says the kid with the choirboy face killed 21 men. Fact says it was no more than ten.

Long after he was supposed to be dead, Billy, the Elvis of his time, was reported to be living in Mexico. Or was it Texas?

Whichever, Bowlin maintains Billy got a bum rap. "A victim of circumstance. Billy never robbed a bank or stagecoach. Worst that could be said was that he rustled a few cattle."

There are hundreds of books and 40 movies about Billy. His granite gravestone has been heisted twice. Bowlin is sure its travels are over. He showed me the marker, inside a steel cage, strapped down by two inches of iron.

Rest in peace, Billy.

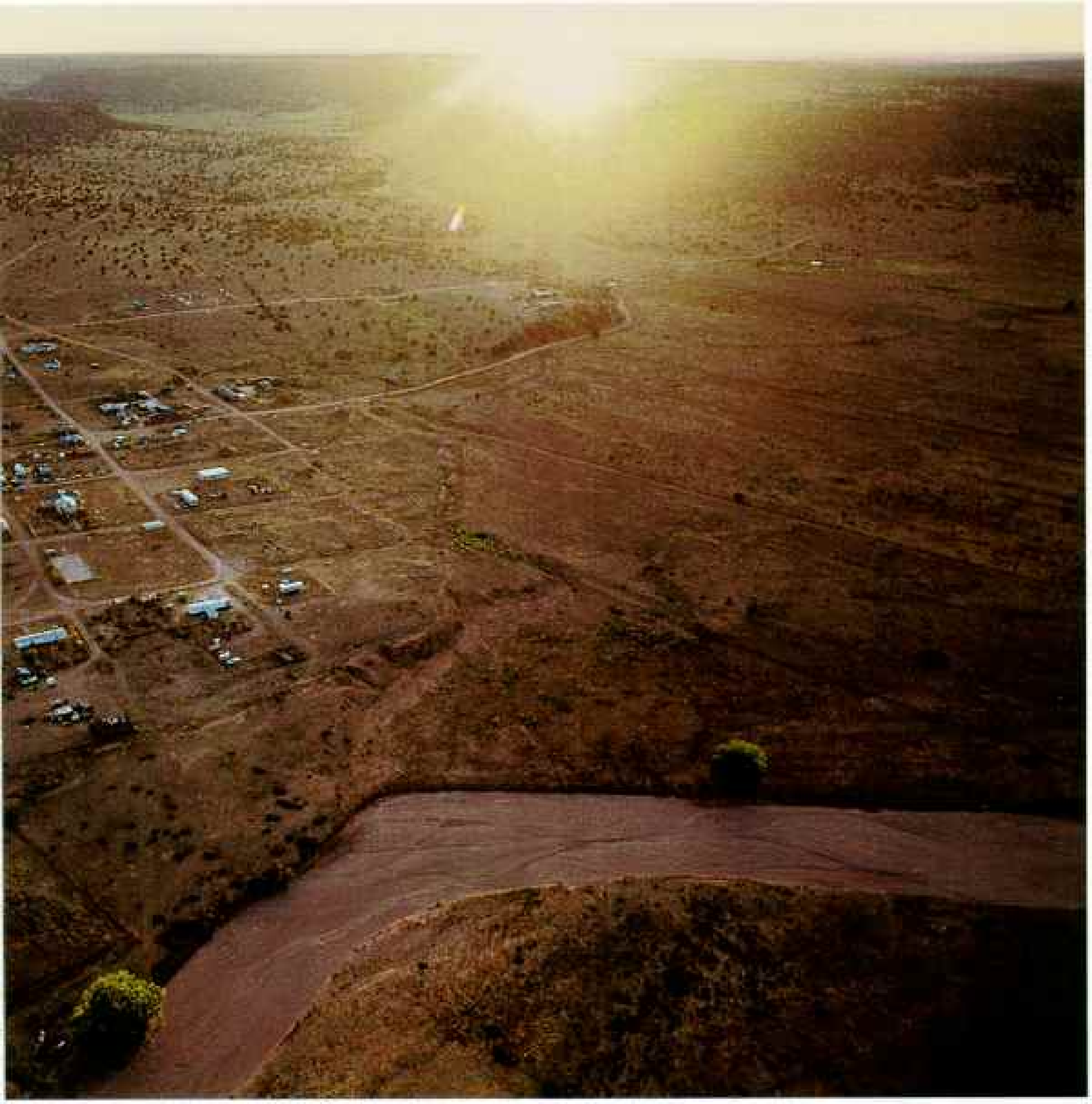
Fort Sumner's dark legend encompasses a chapter far more tragic than Billy's melodrama. Beginning in 1863 the United States Army

rounded up 10,000 Navajo and marched them 350 miles from their homeland to the Bosque Redondo. Everyone marched: the old, the young, the infirm. Only 8,500 arrived, joining 450 Mescalero Apache.

Fort Sumner held the Native American prisoners. There was never enough food. Disease claimed hundreds.

In 1868 the Navajo returned home. The next year the fort was abandoned.

Pearl Sunrise, a curator at the Museum of Indian Arts and Culture in Santa Fe, described their agony for me. "Thousands of my people died. Our hearts were torn out. When you go, you can feel their spirits lingering."



THE PECOS VANISHES underground at Colonias, New Mexico, during much of the year, leaving only ghostly traces on the sand. Colonias itself has faded to just a handful of families and a crumbling adobe church, which residents struggle to restore. "It's kinda quiet now, and sad," says Adela Sisneros, who raised eight children here. "But it's real peaceful, and there's no place like home."

At Fort Sumner State Monument the feeling is palpable. Near the turn of the river, I stood before a grouping of stones brought from the reservation by Navajo in 1971 to commemorate this place of sorrow. Occasionally, a visiting Navajo adds a feather, a button, another rock.

The sorrow lives on.

It's 84 miles of two-lane blacktop highway from Fort Sumner to Roswell, largest (population 45,000) city along the Pecos. The ribbon of road cuts through terrain that looks drier and drier. When I turn off to check on the Pecos, I see a river hemmed in by mesquite and salt cedar, a shrub introduced to retard soil erosion.

Salt cedar has a thirst for Pecos water. An acre of the feathery shrub can suck up a million gallons of water a year. The cedar,

"MY DAUGHTERS SAID, 'That's Jesus in there!' They convinced me," recalls Eduvijen Guillen (left, at left). Both she and Maria Rubio of Lake Arthur, New Mexico, have enshrined homemade tortillas that, to some, portray the face of Christ. "It didn't really change my life," adds Guillen.

On Good Friday in Villanueva, Roy Gallegos bears the first pine cross in the half-mile trek to a hilltop grotto honoring the Holy Family. He upholds the 36-year tradition "so the community won't die."

which defies eradication, grows like a weed.

Salt cedar isn't the only environmental challenge the Pecos faces. I'm up to my knees in the river, north of Roswell, fishing for another. Heavy rains have turned the water muddy brown. Jim Brooks and Matt Brown of the U. S. Fish and Wildlife Service are at either end of a seine net, taking a fish survey.

They sweep through the water toward a bank, deftly scooping the net up and out. Picking out a red shiner, a sunfish, a crayfish, they toss them in a collecting jar. Then Matt cups a flash of silver in his hand. "There's a bluntnose," he says, surprised.

The bluntnose shiner, restricted to a stretch of water between Sumner and Brantley Dams, represents one of the smaller struggles for survival I encountered on the Pecos. A threatened species, it is imperiled in part by dams—there are four big ones on the New Mexico length of the Pecos—which hoard water for agricultural use, instead of allowing the river to flow naturally.

Downriver in Carlsbad, tall, gray-haired L. A. Johnson has come in from spraying his alfalfa for insects. He calls the shiner "that itty-bitty fish."

"The government ought to declare us farmers endangered," he says. "This year is no problem. Reservoirs are full. But some years we get scarcely ten inches of rain. The river's over-allocated as is. Too many people taking honey out of the pot. And now the shiner! If a crop is dying and we have to release water for that fish, there'll be some mad souls."

L. A. is president of the Carlsbad Irrigation District, largest block of farmers on the Pecos. The 565 of them, mostly alfalfa growers, account for 25,000 acres of irrigated land.

The shiner doesn't have the only claim on Pecos water. There's Texas to the south. In 1988, after a 16-year courtroom shoot-out, Texas won a suit in which it charged New Mexico with hogging more than its share of water as agreed to in a 1949 compact.

The U. S. Supreme Court affirmed that Texas was due 46 percent of the water and ordered New Mexico to pay 14 million dollars in

A SPRING-FED STRETCH of the Pecos River, bracketed by dams at Carlsbad, New Mexico, defies the surrounding arid plains. Such an oasis would be mere mirage just south in Texas, where growers have pumped many freshwater springs dry to irrigate thousands of acres of alfalfa and pecans.

damages. Now Texas has its water. But no one in New Mexico pretends to be happy about it.

It's classic western water warfare. "Suppose you were in a life raft with another person and had only one jug of water. You'd look at each other pretty carefully, wouldn't you?" says Bill Moody, Pecos River commissioner for Texas. He and Walter Gerrells, his New Mexico counterpart, meet periodically to discuss problems regarding compliance.

Over the years, Moody explains, New Mexico farmers drilled too many wells in the Roswell Artesian Basin. As the Pecos dried up, so did dozens of Texas farms downstream.

"Water runs downhill. Those at the top like to use all they can," Moody tells me.

I see Moody's point when we tour Water Improvement Districts No. 2 and 3—a 144-square-mile piece of land about a hundred miles south of the Texas state line. In 1943 there were 28 farms here. Fourteen remain.

"Unlike New Mexico, in Texas if you own the ground, you own the water," he says as we drive by the irrigation ditch that carries water from Red Bluff Reservoir at the state line to the last field watered by the Pecos 118 miles away.

He might have added, if there's water to be owned. As we view a series of abandoned, mesquite-choked fields, his face clouds. "That was some man's dream," he muses when we stop at a deserted farm. In his mind's eye it is plowed and planted once more.

I see the dream of a man compelled to turn brown fields green as he reaches down and rubs the flour-fine dirt between thumb and forefinger. "This soil will grow anything," he says. "All it needs is water."

EVEN IN TEXAS, size isn't everything. Consider Mentone (population 20), 45 miles from where the Pecos slips over the state line.

You can drive through Mentone (observing all the traffic laws) in 15 seconds flat. The road

runs past the pink-stone courthouse, the post office, a one-pump gas station, the A & G Cafe. That's it. You've left the town behind.

Mentone is the seat of Loving County (population 100). It's also the only town in this least densely populated county in the contiguous United States.

"We have seven square miles per person and use every inch," county appraiser Mary Belle Jones told me proudly.

Mary Belle is married to Sheriff Elgin "Punk" Jones, a tall, soft-spoken, straight-line-between-two-points kind of guy who took office in 1965 with 65 votes. During his first year as sheriff he wrote Mary Belle a speeding ticket, then, as her husband, paid the fine.

Punk and Mary Belle moved to Mentone in 1953 when he took a job with an oil company. It was hardly love at first sight. "I knew I'd come to the end of the earth," says Mary Belle with the warmth of a confiding friend. "I cried and cried. But it grows on you. I've never been west of the Rio Grande or east of Shreveport, and that's just fine with me. We have rattlers and coyotes in the yard, but I was never so scared as when I had to go to Austin."

Let us count Loving County's blessings: one elevator, one farmer, highest voter turnout in Texas (87 percent), and 402 oil leases. Other blessings: no unemployment or lawyers. There's never been a criminal trial here. Try finding a jury of disinterested peers in a county of a hundred people.

Because Loving County has no cemetery, practically the last person buried there was cowboy Shady Davis in 1929.

"He was drugged to death," says Mary Belle.

Overdose? I ask.

Mary Belle pats my hand.

"Drug by his *horse*. Got hung up in his stirrup."

The A & G Cafe is owned by Ann Hogue, a small, wiry woman with hair the color of a dried chili pepper. By my third cup of coffee Ann has cued me in on Mentone folks. "We're tough on the outside, marshmallows inside."

The toughest marshmallow in town is Punk Jones. Once he had to arrest a friend. It tore him up so bad he cried. But he did what a man's got to do.

The sheriff pulls out a shoehorn-size key and offers to show me the jail. It's your basic decor: two barred windows, bunk bed bolted to the floor, sink, urinal, shower. At that, it looks better than some of the motel rooms I've slept in recently.

I look at the bunk. It is 20 miles to the nearest motel. Can I spend the night in jail?

"Don't know," he says. "We have regulations. I'd have to check you every two hours."

"As sheriff, don't you have the final word in Loving County?" I counter.

That evening I check into jail. I snuggle under a blanket and fall asleep. Sort of. Every so often I waken to the rattle of drums. Must be quite a party, I think. I toss and turn, hoping someone reports the racket to the sheriff.

Next morning Punk sets me straight about the noise. "Just an old oil-well pump jack outside town," he says, then springs me.

I walk across the street to join Kathy the postmaster and half a dozen others at the A & G for some sourdough biscuits.

How does Mentone stack up to the rest of the world? I ask.

A man speaks up.

"Well, I been in Paris, France, for two days and didn't much like it," he says. "Mentone has something Paris doesn't."

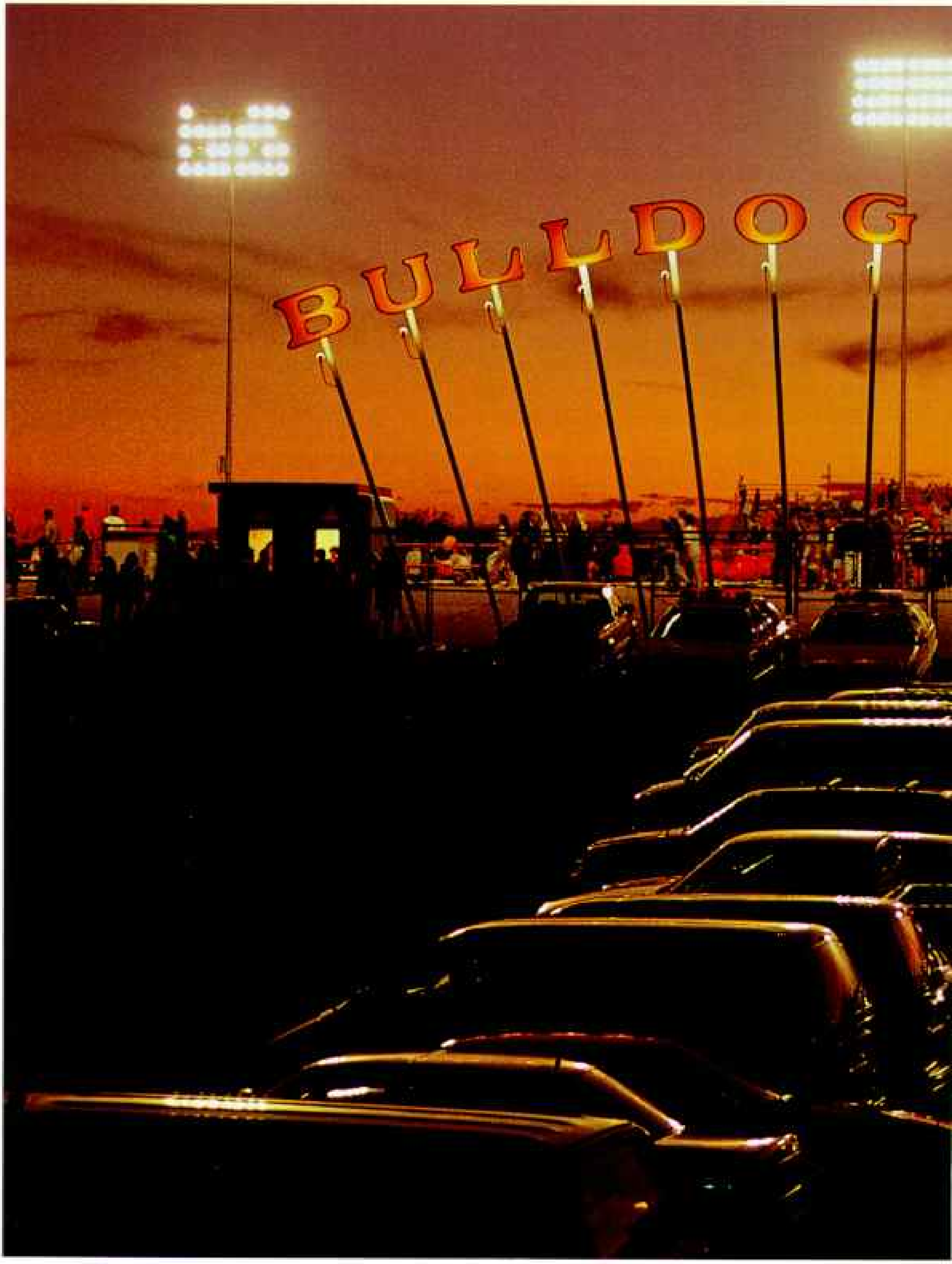
What? I want to know.

"Good friends," he replies.

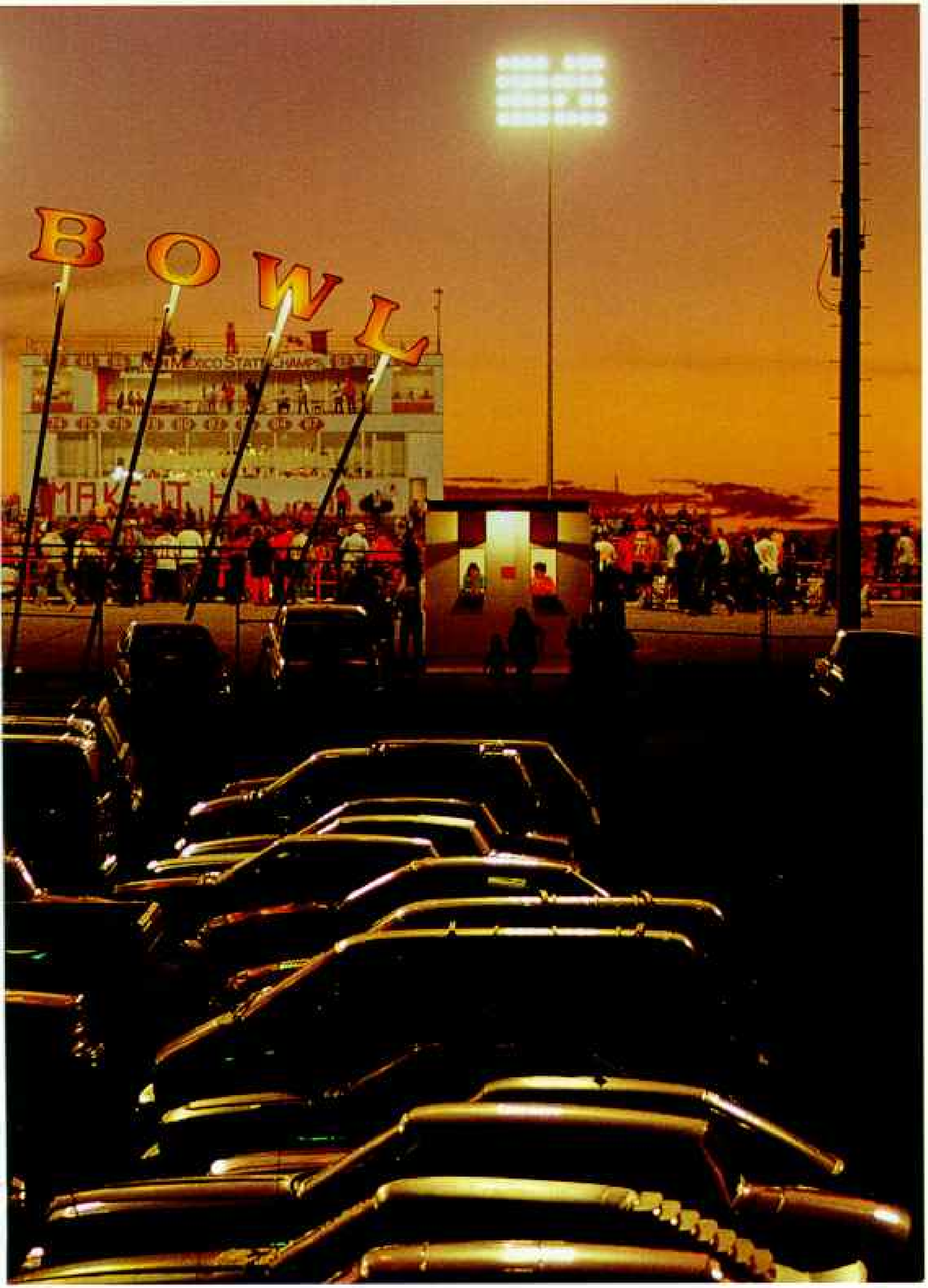
IN THE HAND dealt by the Pecos, a wild card turns up—a dream comes true. For Ira and Ann Yates that moment came on October 28, 1926, when I. G. Yates oil well number one blew in, repealing the law that said there was no oil west of the Pecos.

There was an ocean of it. The Pecos runs right through the Permian Basin, a 125,000-square-mile limestone and sandstone sponge of oil and gas laid down about 500 million years ago when the area was covered by sea. The land that Yates, a grocer, bought for $2.50 an acre has produced one billion barrels of oil with no end in view. A site nearby, two-thirds of the way along the river's run through Texas, was named Iraan in honor of Ira and Ann. Today the Yates field, an iron orchard of bobbing pump jacks, is run by Marathon Oil.

Iraan has 1,300 residents, one stoplight, and two doctors. The senior physician, Edd Franks, has delivered 1,650 babies in 32 years. On the day I follow him around, he bounces between office and hospital, where he tends to an epileptic child, a weekend cowboy's broken arm, and a woman in false labor ("I'm going to faint," she says and promptly does).



FIRED BY A PASSION FOR FOOTBALL, Artesia, New Mexico, dotes on its high school Bulldogs, state champs 16 times, including 1992 when they whupped 10 of 13 opponents. For big games the school's Bulldog Bowl swells with up to 10,000 fans—as many people as live in the entire town.



"The team's the most important thing in this town," says tailback Danny Jones. "I guess they feel like we're heroes." From the press box, KSVP "Voice of the Bulldogs" broadcasts over 300 square miles. "If we didn't do the games, there'd be no need for a station in Artesia," says manager Gene Dow.

Between swollen tonsils and the drama of the emergency room are moments of poignant humor. "Miss Emmie," Dr. Franks says to a patient with Alzheimer's disease, "do you know where you are?" "Doctor," she says, "you don't need to know where you are to be there."

In his waiting room I notice the women—each tougher than the next. There is Dorothy Askins, who's driven a hundred miles from Langtry for a checkup and impatiently taps her foot. Clearly, she wants to get on with it. "Here's the situation," she tells Dr. Franks. "I should be on a *horse* working *sheep*."

She is 70. There are others. The 94-year-old woman with an infected leg, whose husband had drifted into Iraan in 1929 with the oil boom. She'd raised three kids in a tent. The retired teacher with a heart condition. She'd hitched up her skirts, galloped off on her horse, and taught six grades in one room.

Hard? I ask.

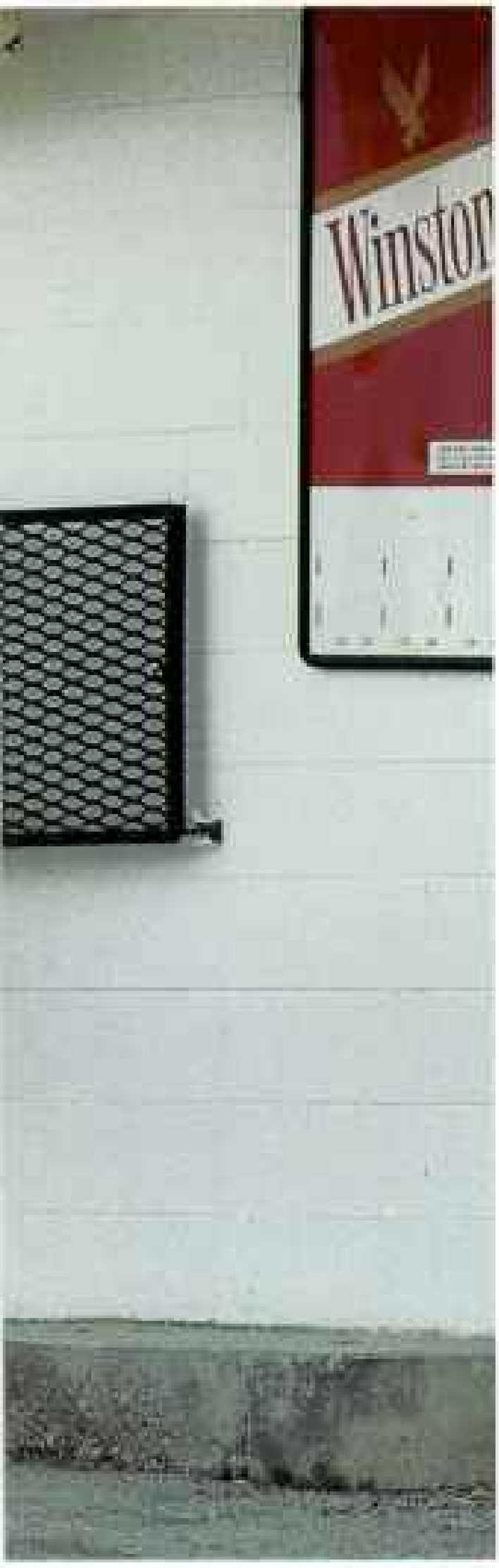
"Just try it."

Then there were the ranchers' wives. Often they'd roped and branded alongside their husbands. Or done whatever.

"I've done everything from run bordellos to build fences, and out here 'tain't none of it easy," a Pecos, Texas, woman used to say. And she had done it all. A madam at 17, she ran a bar and, as bouncer, dispatched any drunkards herself.

None of it was easy.

I understood that better the day I stopped at the R & S gas station in Sheffield, near Iraan, for a barbecued-beef sandwich from short, stocky, tough-as-boot-leather Sue Johnson. For the better part of a day I watched her



RIDE-THROUGH CUSTOMER Leman Barmore picks up some cold ones at the Cut Rate liquor store in Pecos, Texas—self-proclaimed home of the world's first rodeo, in 1883. "I should have been born back in horse-and-buggy days," says Barmore. "People didn't worry about getting someplace so fast." A plumber, Barmore doubles as a member of the sheriff's posse, unarmed but ready to ride on the rare search for a lost hunter or child.

Keith McBee of Odessa prefers a pickup to tote his four-month-old daughter, KaSandra. "That's my pride there," says McBee, an oil-truck driver whose kin drove cattle between treacherous Horsehead Crossing and Castle Gap. Pure Texan, KaSandra now loves riding the family pig, Boss Hog.

tend the barbecue, fix engines, change tires.

Was there anything she couldn't do?

"Nothing," she said. "I've birthed pigs, bossed oil-rig crews, butchered cows, broke horses, worked in sewers.

"Worst thing I ever did was shovel pig manure. But we needed the money."

Not true. Worst thing she ever did was pick up the phone seven years ago and hear the sheriff say there'd been an accident at her daughter's boyfriend's house.

When she arrived, there was blood everywhere. Her daughter's. She'd been shot.

Sue rushed to the hospital.

"I've seen it all," Sue said wearily. "Slaughterhouses, oil-field accidents. Nothing prepared me for that."

"That" was Eva wired to monitors, tubes everywhere. They'd had to amputate the arm.

As Sue stood by her bed, Eva opened her eyes. "Don't worry, Ma," she said. "You learned me to be tough."

"Not that tough," Sue said softly.

AS THE PECOS nears the Rio Grande, the Chihuahuan Desert, which shadows the river south of Roswell, tightens its grip.

Out here, they say, everything stings, bites, or sticks. Beware of scorpions in your shoes in the morning. Of snakes in your sleeping bag at night. Of a malevolent litany of cactuses: catclaw, devil cholla, horse crippler.

And yet, when dusk soothes the skyline, you nearly forget. The fever of day breaks. The light softens. The caliche road glows. As if to amend for its harshness, the desert ever so slightly relaxes.

ELEGANT IT'S NOT, but the Girvin Social Club in Girvin, Texas, is a friendly haven for folks who may drive 70 miles or more to sit around and gab. In the saloon school bus seats serve as benches, cow skulls stare from creaky walls, and the wood stove glows with mesquite brought by patrons. "Everyone's a friend, even if I've only met 'em once," says 74-year-old Mildred Helmers, owner of the club since it opened 36 years ago. "But I don't like drunks." Gentle but firm, Helmers forbids gambling and fights.

"It was comfortable, like family," recalls Amy Smart (below), a regular at the pool table before moving north. "They hardly changed the music in the jukebox. We'd sit and talk forever. Seems it'll always be the same."

But I know not to relax. It is land that will not tolerate a bad guess: how much water to carry, distance to the next gas pump, interval from storm to flash flood. There's no margin for error.

"It looks so innocent; that's what scares you," says Pancho Brotherton, whose family ranched the lower Pecos for four generations. We chat in a café in Comstock, not far from where the Pecos digs into the limestone canyon that embraces it until the end of its journey.

"All those side canyons drain into the river. There's nowhere for water to go. It may rain 12 inches upriver, and you'd never know until a 30-foot wall of water showed up." Pancho was four years old the stormy night in 1954 when the Pecos rose to 96 feet. The Pecos highway bridge near Langtry, 50 feet above the river, vanished.

The Pecos can still turn mean in a flash. "When that river floods, better run for it," Pancho warns me. "That river'll getcha."

Dangle a worm in the river, and you're likely to be greeted by a fish with a mouth like the business end of a vacuum cleaner and a body like vulcanized rubber. I'm talking about the Pecos River catfish.

"Honey, the catfish is the best eatin' fish around. You can have your salmon or red snapper," catfish guide Dave ("Catfish no trash fish") Ross tells me in a voice like a rowboat dragging over gravel.

What about bass? I asked, knowing the river harbors some lunkers.

He shoots me a look of disdain. "Honey, anything with scales I throw back."

Sending a long arc of tobacco juice downwind, he steers the talk back to catfish.

"Caught a record 86-pounder once. That catfish pulled me around 'fore I got my feet on the ground. It was as long as me."

Well, I thought, if that's not the way it was, that's the way it should be.

In Langtry, lean Jack Skiles, rancher and retired school superintendent, filled me in on another Texas-size tale: Judge Roy Bean, self-proclaimed "law west of the Pecos."

Skiles is former director of the Judge Roy Bean Visitor Center, the big (and only) attraction in this dusty ranching town of 20 residents.

In 1882, Bean, a San Diego saloonkeeper, heard they were building a railroad (the Southern Pacific), headed for Langtry, and set up the Jersey Lilly bar. Until the day he died in 1903, he swore he'd named the town for British actress Lillie Langtry.

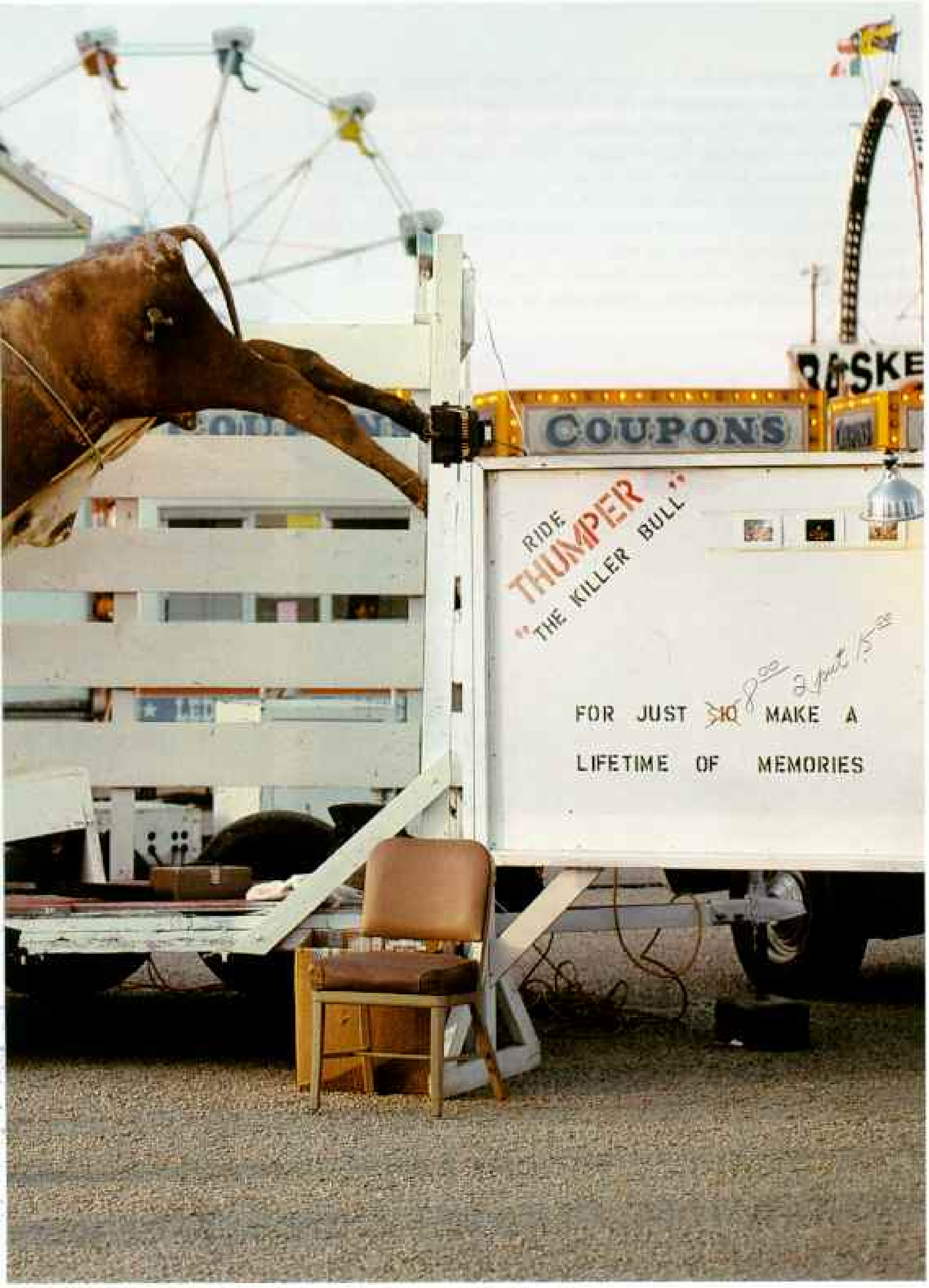
"Baloney!" Skiles says. "It was probably named for a railroad man."

Bean dispensed justice from the porch of his saloon, often mandating a round of drinks for the jury as part of the fine. His props were a seldom opened copy of the Texas statutes and a six-shooter. He was foulmouthed and fat, and he kept a pet bear named Bruno who, no doubt, prompted double takes from drunken defendants sobering up for trial.

"Of course, the old reprobate was a drunk himself," says Skiles, "but he sure could put on a show."

Quickened by the rush of waters from side canyons, the final stretch of the Pecos widens to a thick green current flanked by rose and buff limestone walls several hundred feet high. In nearly every niche of the canyon walls, nature finds a toehold—here a nest of

RODEO WANNABES catch a safe thrill aboard Thumper the Killer Bull at the Eastern New Mexico State Fair in Roswell. Drawing 90,700 visitors over its six-day run last year, the 71-year-old fair offers everything from old-time roping to newfangled bungee jumping. "That's the real bull on the



outside," says Thumper's owner, Tim Britten, who bought the stuffed Brahman from Billy Bob's Bar in Fort Worth. "He makes me some walkin'-around change." Britten cut the snapshot fee from ten to eight dollars "to make people feel they were gettin' a good deal."

A DESERT SENTRY in cedar and limestone, Lee Kidd's Pandale, Texas, getaway sits 500 feet above the Pecos River, 60 miles from its confluence with the Rio Grande. This is tough country. His longhorns know. Wanting a few cattle to graze the land, Kidd struggled mightily to prod four steers into a trailer at his ranch in Tyler for the ten-hour drive west to Pandale. After setting them free in their new 5,400-acre home, Kidd heard a clamor. "I'll be doggoned if all four of 'em hadn't loaded back up. Everybody teased me that they wanted to go back to standin' belly deep in lush grass." Kidd treasures the solitude and sunset views from his tower swing. "There's something almost mystic about this country. I feel a little bit closer to God."

herons; there the sinister coil of a rattlesnake or the spiky pads of a prickly pear. Dozens of rapids rough up the last 50 miles of river. It is not, I was told, a place for amateurs.

Suitably cautioned, I asked Ray Hammond, a ranger at Amistad National Recreation Area, to canoe a short section with me. Now we're eyeing a frothy run of rapids 12 miles or so from where the river meets the Rio Grande head-on and ends. A string of linebacker-like boulders blocks our way, their gray shoulders high above roiling water.

"Your job," Ray says carefully, "is to fend us off those rocks." A 20-mile-an-hour wind erases my yelp of protest. I asked for a taste of Pecos canoeing and am about to get it.

Swinging into the current, we sweep toward a sliver of skylight between rocks. The river bucks like a mustang, tossing a white mane of spume past our shoulders. We leap and dodge the protruding rocks. Thoughts of fending off fade. My fingernails dig into the gunwales.

With no help from me we shoot past the angry boil and glide into calm water. My stomach has done several somersaults, but I am intoxicated by my taste of Pecos white water.

THE SPANISH CALLED the prickly Chihuahuan Desert that hems in this stretch of river the *despoblado*—the unpopulated place. They were wrong. The canyon I am paddling through sheltered ancient peoples as far back as 10,000 years ago. Then they left. No one knows why or when.

The next day I climb up the canyon toward the half-opened eye of a cave with National

Park Service archaeologist Joe Labadie. "The caves were perfect shelter for those who lived here," Labadie explains. "The river furnished mussels, fish, turtles."

Archaic peoples, the first to learn the lessons of Pecos survival, had a spiritual life. Labadie showed me a painting of a shaman. His white rectangle of a body was outlined in red, with arms outstretched in silent ecstasy—a sight to make the hair stand on end.

When Amistad Dam was built on the Rio Grande in 1969, it backed up the Pecos for 18 miles and flooded several of these caves. Some 250 remain, covered by a reverie of snakes, panthers, and deer in red, yellow, and black.

The pictographs have faded and will continue to do so. Sooner or later water, wind, and sun will erase them. Another Pecos dream, longer lasting than most, will vanish.

I thought of all the Pecos dreams I'd heard about, some incinerated by drought, others swept away by floods. In parched times, even the river itself could turn into pure illusion. Why do people live here? Perhaps they find something of themselves in the lean, spare landscape.

"We just do whatever it takes," Margaret Woodward told me the day I watched her husband's crew round up a thousand sheep on their ranch near Bakersfield, Texas. Out beyond the swirls of red dust kicked up by livestock, the thin green line of river was snaking its way through rock and sand.

Wave after wave of pioneers had crossed this river with hope. Many had left with a broken heart. Through it all there echoed a Pecos refrain, constant as the sighing wind.

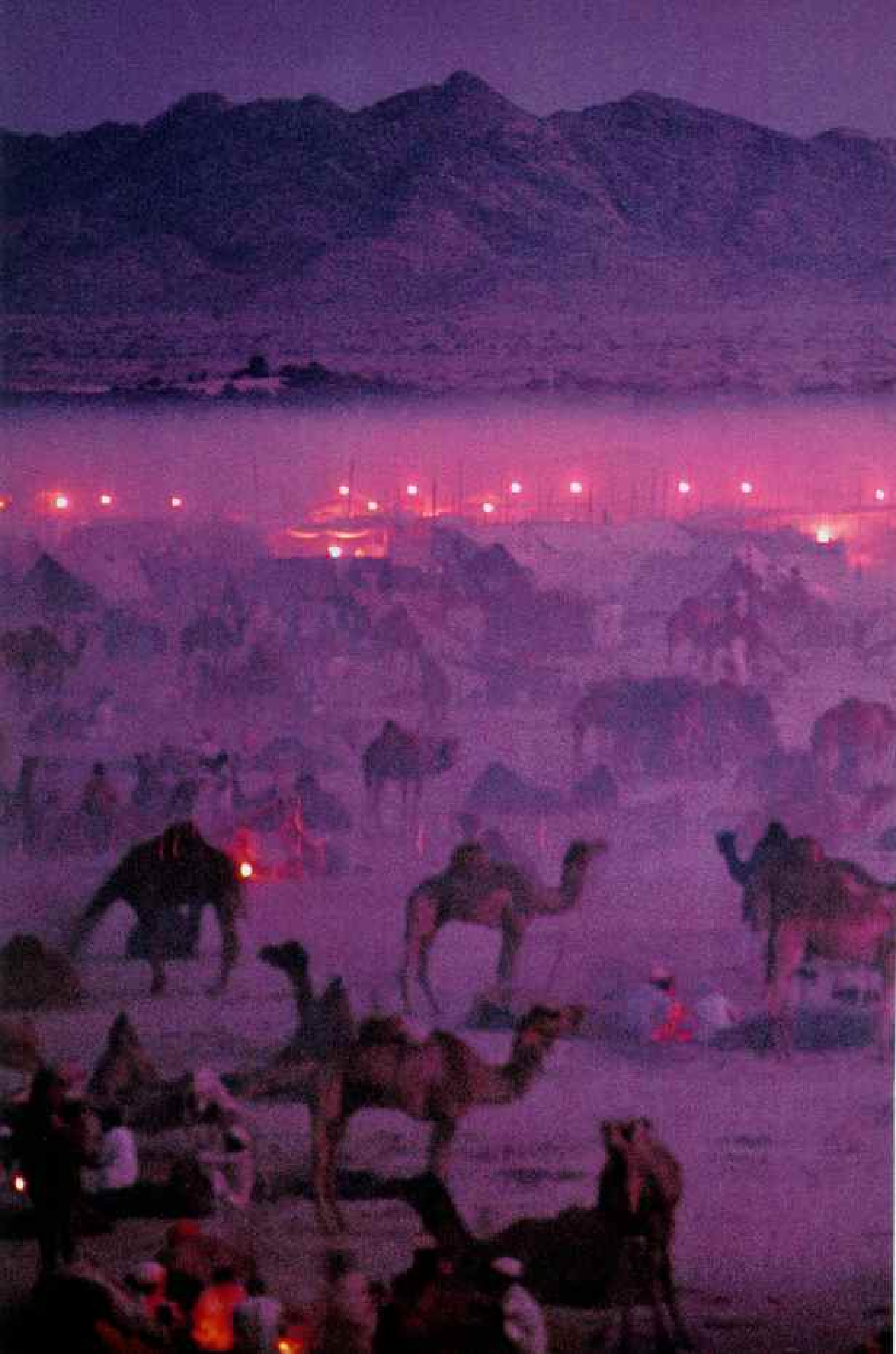
Whatever it takes. □

Wandering With India's

By ROBYN DAVIDSON *Photographs by DILIP MEHTA*

Rabari

In morning chill a tailor finishes clothes for a Rabari wedding. This caste of sheep-and-goat herders crisscrosses northwestern India to find dry-season grazing as growing settlements limit access to traditional lands.



Up at dawn, camel traders prepare for action at a Rajasthan livestock fair. Here the author shopped for camels to carry her gear while she traveled with the Rabari and their animals.

Too frightened to find comfort even in her mother's arms, a child bride accompanies her husband to his family's home. After calling on her in-laws for a few days, she will return to live with her parents until she reaches adulthood.

EARLY MORNING in Gujarat.

Only a tarpaulin shelters us from the poisonous sun of northwest India. A baked wind rushes under it as I sit and wait with my companions, pastoralists called the Rabari—those "outside the way." The plowed field where we have camped stretches flat to the horizon, and the day's mirages are gradually forming.

A herd of goats appears, creating an optical illusion. The hundreds of legs look like the legs of one creature—a monstrous millipede—flowing across the shimmering background, followed by a lone goatherd.

It is mid-October and my sixth day on the annual migration called the *dang*, when groups of Rabari (from five to fifteen families) set out with their livestock in search of green pasture. They wander from autumn through the following spring, during the dry months between the southwest monsoons.

Hour upon hour of boredom weighs on me as we wait to shift camp and follow the herds, perhaps five miles today, perhaps 20—I have no way of finding out. The wall of language is unscalable, a defeat. I am unable to communicate my needs, as helpless as an infant. I bury myself in a book, while pressed up against me the ladies stitch, blow their noses, and spit and belch like football players. There are a couple of men under the tarp with us, shivering with fever. One crawls out to vomit. Baby goats covered with sores drink from our water pots and urinate on our mats. What am I doing here?

I try to take notes, but the words seem to evaporate into the blue. I hear my name; the women are talking about me, but they speak in Gujarati, a language related to Hindi. They think my name is ridiculous, so they call me Ratti Ben (Sister of Blood). My eyelids are growing heavy, and in that forest between sleep and wakefulness I understand, with immeasurable relief, all their words. I try to fix them in my brain for later, but my everyday mind closes over that fertile ground like parking lot concrete. I find myself suspended in a vast loneliness. I drift into sleep.

The ladies are addressing me. I want to grab my head and shake the concrete out. They shout as if to a deaf person or an idiot. They put a pen in my hand, indicating that I should write and remember names—uncles, cousins, mothers' sisters' husbands—admonishing me like a pack of crows.

Then I hear, "Ratti Ben, *cha pio*—have some tea." Nakki, wife of the migration leader, is leaning over me with a cup of tea in her hand and a worried smile on her face. I must not sleep there, she motions—scorpions.

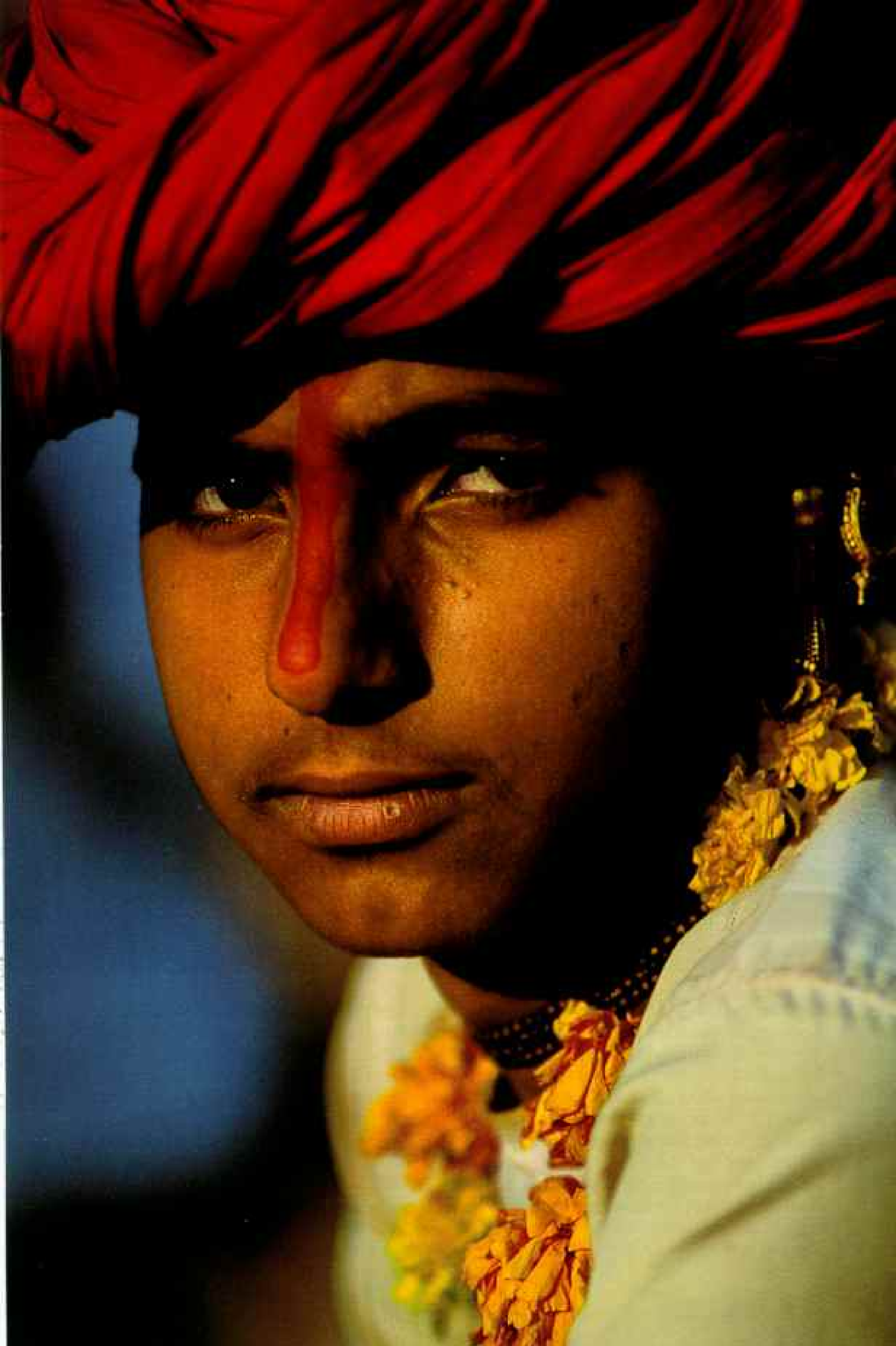
The Rabari are one of perhaps a dozen castes of livestock-breeding seminomadic peoples of northwest India. Their origins are unknown, and old census reports dismiss them as camel rustlers, cactus-eaters, and stealers of wheat. According to one tradition, all the Rabari once lived in Rajasthan—in Jaisalmer, in the Great Indian Desert (map, page 73). Over the centuries they spread into many other states, integrating themselves into Hindu culture as they went, splintering into countless subcastes, but retaining always their Rabariness, their "otherness."

I first met the Rabari in 1978 in Pushkar, Rajasthan, during a Hindu festival. Thousands of camels were tethered in the hills, and among them cooking fires glowed through lavender dust. A woman called me over for tea. Her silver ornaments scintillated with the flames, and when she moved, she rattled. She wore a veil over what looked like a pixie's hat. Had she pulled out a wand and offered me three wishes, I could not have found her more fantastic.

When I returned 12 years and several lifetimes later to write about the Rabari, my plan was simple. I would travel around the arid regions of Rajasthan until I found a group with whom I felt a strong rapport. Then I would buy myself a camel or two, live with these Rabari in their village, and leave with them on migration. Photographer Dilip Mehta would rendezvous with us occasionally as we traveled.

I purchased a jeep in Jodhpur and drove

A dash of red paint and a garland of flowers adorn a young groom before his wedding. The Rabari celebrate such ceremonies in the summer monsoon season, when good grazing allows them to stay home.



until the Persian Gulf war erupted and gasoline became scarce, at which point the plan to buy camels did not look eccentric. Being a foreigner, I automatically paid top rupee for two females at the camel *mela*, or fair, in Tilwara. On the way home I visited many villages, gathering bits of information.

One thing was clear—the remaining Rabari, who number 250,000 or more, are in trouble. Throughout India grazing land is rapidly shrinking. Previously farmers and nomads enjoyed a symbiotic relationship—graziers providing the farmers with dung fertilizer in exchange for grazing privileges. There was enough room for everyone—the farmers tilling the arable land, the graziers feeding their herds in the "jungle," as uncultivated land is called. Today newly irrigated fields clog old migration routes, and small-scale farmers are often close to destitution. They still want the animals' dung, but they do not want the herds eating the crop standing between them and financial ruin.

In the jungle, wolves, jackals, and hyenas

"You can never be alone, no matter how empty the landscape," says the author, whose appearance attracts attention on a road in the traditional Rabari homeland of Rajasthan. Historically a caste of camel breeders and messengers for great feudal armies, the Rabari, who number at least 250,000, now often keep only a few camels for transport. Many earn a living by selling sheep and goats for meat, dung for fertilizer, and wool. With open land filling up and conflicts with settled people increasing, more and more Rabari are forced to give up their herds and look for other work.

After a year of searching, the author found a group in Gujarat who agreed to take her on the dang, *or migration.*

attack the herds, and the forests are crawling with *dacoits,* bandits. Fights between the Rabari and local folk are common, and people are killed. I was told that a pistol or a rifle would be essential for my safety; most Rabari have only their staffs and slings. Last year, one man told me, the dacoits kidnapped a Rabari man and broke his legs because his family could not afford the ransom. Besides stealing animals, he said, the bandits often capture women for their

A timeless train of camels leaves the village of Bhopavand to graze nearby. The shape of things to come, a bright new concrete temple nestles amid traditional thatch-roofed Rabari huts.

pleasure: "And you would bring a big price."

The police routinely side with the villagers, from whom they skim an illicit income. And, in a system rife with corruption, there is no law the Rabari can trust, no social safety net beyond the bonds of family and caste.

FEAR AND SUSPICION met me everywhere as I moved among the Rabari. In one village, after it was agreed that I "could never make it," I was beset by a chorus of women:

"We'll take her with us if she'll agree to be tattooed—neck, face, hands, and legs."

"If she'll have large holes made in her ears, for the silver."

"If she can drink ditch water that's green or black."

"If she can go for days with no water at all, with nothing but sheep or camel milk."

A crone stopped the taunting, took my hand in hers, and said, "You see, we cannot take you, because it is too hard and too dangerous for you. Besides, others will think we have kidnapped you. They'll put us in jail."

When I crossed the border into the state of Gujarat, however, I had the good fortune to meet Dr. Ramakrishnan, deputy director of the Gujarat Sheep & Wool Development Corporation. Through him I met Phagu Bhai, the leader, or *mukhi*, of a group of Rabari who were about to leave their village in the district of Kutch. They would migrate south in a rough loop, through a labyrinth of sea and desert, into the fertile farmlands of the neighboring Saurashtra region, then back to Kutch at the advent of the monsoon. It was decided that I would travel with them, under the protection of Phagu and his family.

But my camels were back in Jodhpur, and I was held up in Bhuj, the old capital, until I could acquire yet another—a sturdy but smallish young male named Ram Rahim. Migration waits for no one, and the dang left without me. The shepherds with their flocks, the women and children with their pack camels, about 60 people in all, pushed along at more than 20 miles a day; there was little feed or water in the broad salt flat known as the Little Rann of Kutch. As soon as I completed my purchase, I dumped all my gear in the jeep and headed off with Ramakrishnan and some friends. Ram Rahim would follow, by truck.

We caught up with the dang, already five days out, as they were pulling into a camp in a dry riverbed near the town of Morbi. Night was falling, and women, dressed in black, were bringing huge bundles of thorn in on their heads for the cooking fires, then thrashing the pile with ten-foot sticks to blunt the two-inch-long prickles. Other women had walked a mile to a well and were carting back brass pots, stacked on their heads. The men were bringing in the sheep, all 5,000 of them.

Each family clustered around one or two large string cots on which all the gear, food, and saddles were placed to protect them from termites, whose appetite, it was said, could reduce leather to dust overnight. The women and children slept on this gear, two to five to a bed, using handmade quilts for warmth, as the animals milled around them. The men slept on the ground outside the flock, taking turns guarding it. Each family camp was maybe 20 yards away from the neighbors, close enough that a shouted joke could be appreciated. Three rocks in a triangle formed the stove. In front sat the women, rolling, slapping, patting, pounding millet dough. Around them stood sheep and goats so tired and stupid they singed their noses in the fire.

I was told where to place my fold-up cot, near the women. On one side of me were Phagu's wife, Nakki, a weathered but still graceful lady, and their daughters Jaivi, Latchi, and little Hatti. On the other were Phagu's niece Parma, and her aunt, Lakhmi. In their silver jewelry and elegant black, they were as striking as a stormy day. I felt underdressed, wondering if I shouldn't have packed some pearls among my sensible cottons.

Ram Rahim arrived later that evening and was tethered close to me for the night. When my jeep and friends headed back to Bhuj, I turned to face my "family." We had perhaps 20 words in common.

Day One I have far too much luggage for one small camel. I mime concern. Phagu waves his arms about, mimes back that we have no choice. We will pack it all, but he and I will take a short route, through the center of Morbi. The rest of the dang will go the long way, thereby avoiding paying bribes to

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Australian adventurer ROBYN DAVIDSON reported on an earlier trek by camel in "Alone Across the Outback" in the May 1978 issue. This is the first GEOGRAPHIC assignment for photographer DILIP MEHTA of New Delhi and Toronto.

the officers "guarding" the roadside forests.

The road is a maelstrom of trucks, buses, scooter rickshas, cows, and carts. Three times the saddle swings under Ram Rahim's belly, scattering pots, pans, and bedding over the road. He bleeds at his nose peg, where the lead is attached. I lose a chunk of shin. An audience has gathered by the time we reach the dang, which is camped on the outskirts of town, on a patch of earth littered with broken bricks and human excrement.

Magically, everyone knows just what has happened to us. Phagu points to Ram Rahim, indicating that I should unload the luggage. But when I obediently turn to do this, they all burst out laughing. "No, you rest," Phagu motions, as Nakki starts to unpack the camel. He pats me on the shoulder, then walks away, cackling to himself.

There is an urgency to getting all the work done by nightfall. The women run barefoot over stones and thorns, chasing lambs. I try to help them, but as soon as I touch the animals, the dogs attack me, especially one psychotic brute with yellow eyes. A boy dressed in turban, purple silk, and silver embroidery pulls me around by the hand, trying to explain which lambs belong to which camp. When I go to a well with the women, townspeople follow like a pack of howler monkeys.

Day Two Woken from a two-hour sleep by men whistling and hooting their music to the flocks. All night those on patrol took

With gentle firmness a herdsman gets a reluctant nanny to suckle a kid on the dang in Gujarat. By day he guards his own animals separately, directing them with distinctive whistles and calls. At night he herds them together with other men's flocks for protection against thieves.

turns hitting the ground with their staffs, rattling things, or giggling at me punching and cursing the sheep, which rubbed themselves against my cot without cease.

Each shepherd has slightly different calls, variations on a theme. There are morning calls to move out, a call to bring the sheep to water, and so on. Each man knows his own sheep and vice versa, and his particular flock will disentangle itself from the larger flock and move out behind him in the morning.

As the sky lightens, we gather at the fires for tea. Nakki motions to ask if I've cleaned my teeth, handing me a stick of acacia for the job. Chew and spit, chew and spit for half an hour, to the rhythm of dough being slapped into shape. Every morning the same—piping hot millet *roti*, a type of flat bread, with a delicious soup of buttermilk, spices, and salt, cooked in ghee. At night, the same. Fresh goat milk, of course, and the inevitable tea, drunk as an aperitif, so strong and sweet it is like an injection of amphetamine.

Phagu clips the goats and winds the hair into skeins to sell for ready cash in town. After breakfast he sends the shepherds off with their flocks and instructions. The camels are let go for feeding under the charge of the camel *wallah*, or caretaker.

Around midday we load up to go. I leave half my luggage behind, with a trustworthy villager, to retrieve later. As I take my place in the line of women, children, and camels setting off into nowhere, some ancient part of my spirit stirs in recognition and says, "This was what our species was built for."

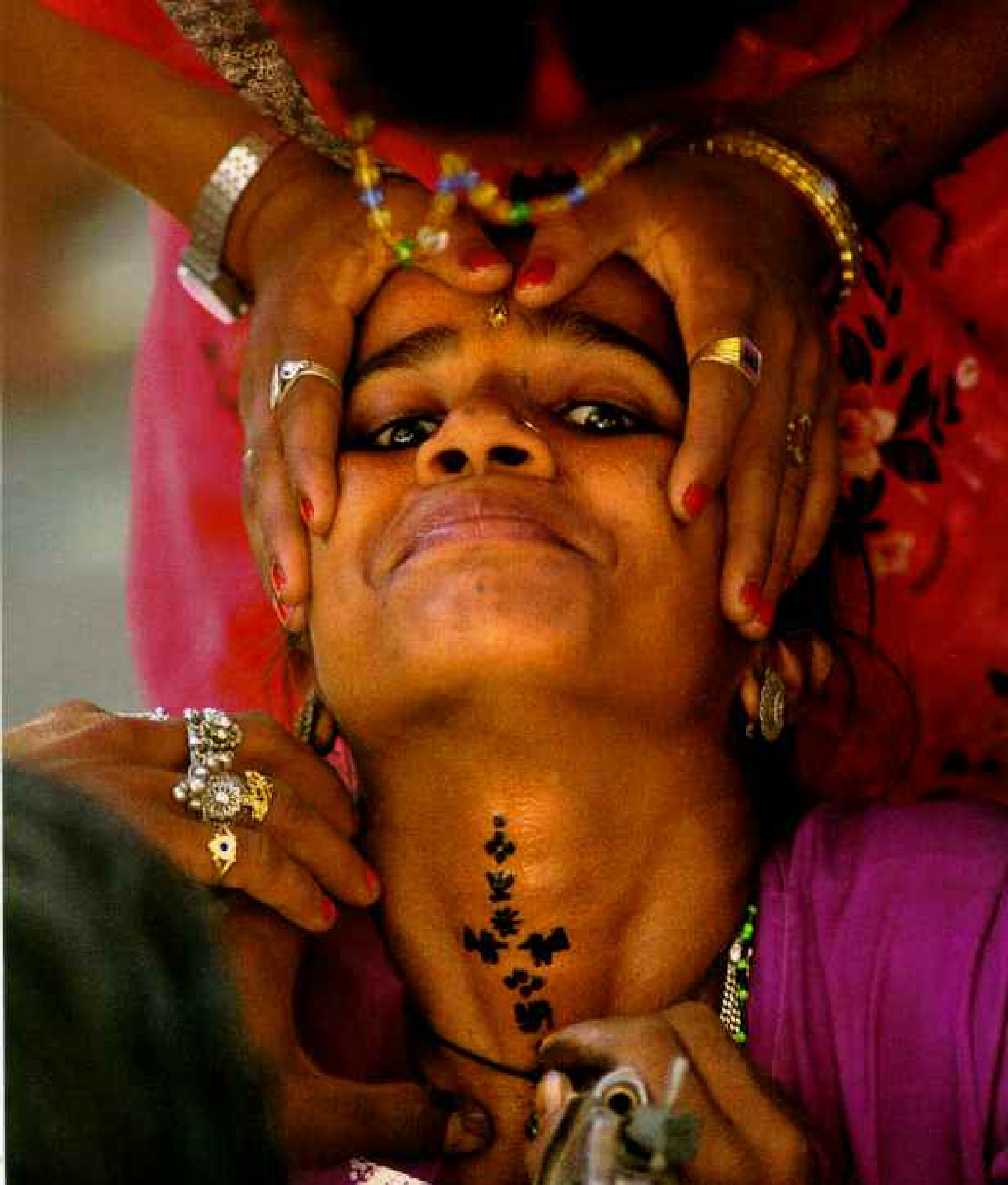
The procession moves along like a train on its tracks, halting only at its destination—a withered valley beside a dam reservoir in which water buffalo defecate and people wash themselves or their clothes or their bicycles. Our drinking supply.

Day Six I tried to take a bucket bath yesterday, but the children followed to watch. Sacrificing cleanliness to modesty, I kept my pants on. Today I learn how to do it by watching Nakki. She sits outside the tarp, rubs her hair with ghee, then fills a basin with water and a little buttermilk. She takes off her blouse but keeps her skirt on throughout. Then Jaivi pours the mixture through her mother's hair and over her back. Nakki washes the upper part of her body and her legs and feet, then squats over the basin to wash beneath her skirt. After her bath she combs out long gray curls that turn into ringlets in the sun. She must have been a beauty in her youth, what there had been of it. I thought she was in her mid-70s. She was 48, just six years older than I.

Hatti, her ten-year-old daughter, plays with a green plastic doll that she has dressed in bits of rag. She drags it around in a leather clog with upturned toe—a chariot traveling across continents, worlds perhaps. Dried bits of camel droppings tied in scraps of plastic bag are the doll's precious gems.

Hatti is the most loved (and the most spoiled) of children. She orders everyone about, hand raised in a fist, chin out, flouncing her skirts imperiously. Her older sisters plait and decorate her hair, encouraging her already overdeveloped vanity. And at night, when the older boys come in, the first thing they ask for is Hatti, who leaps onto their

Beauty is a brief pain in the neck for a young woman whose new tattoos include customary symbols of prosperity and well-being. Rabari women display such decorations on their legs, arms, and faces as well. They also wear much of their family's wealth, passing down valuable jewelry from mother to daughter. For a wedding, a guest has put on her finest silver (above).



knees, climbs all over them, sasses them. Her rudeness is seen as a charming independence of mind—a necessary training in stubbornness, admired among Rabari.

The dang is a training ground for children. The little girls have their own pieces of play embroidery and carry small brass pots on their heads. At night they make pretend roti. The youngest boys smoke tobacco from a *chillum*, a small clay pipe, and stand looking into the distance with their hands on their hips. When they are eight or nine, they begin leaving camp in the mornings with the men.

Most of these children are already committed in marriage. Child marriages are illegal in India, but among some castes it is a matter of shame if a daughter reaches puberty in her parents' home. Consequently girls begin producing children while still children themselves. However, among the Rabari, married girls are kept at home with their families until after maturity. Indeed, with the Rabari of Kutch, sometimes into their late 30s.

Some would judge that Rabari women have a hard time of it, but I think differently. Their value as human beings is reflected in the heavy bride-price. They own property (receiving sheep from the husband's family at marriage and inheriting their mothers' jewelry), and although they do not sit in *panchayats*, or councils, no one doubts that they are equal partners back home. Their work is as valued as the men's. They can shop and do business in town without being chaperoned and without covering their faces. The power between the sexes is balanced, producing a confidence and sauciness in the women and a humorous appreciation in the men.

I REMEMBER when I returned to Rajasthan three years ago and met my first group of Rabari women, in their village. We sat together in a *jhumpa*, a round stone-mud-and-dung dwelling. I had on cotton pajamas, my hair was pulled back in a bun, and I wore neither makeup nor jewelry. I looked as alluring as a cowpat, and crammed into that tiny room were 20 of the most glamorous creatures imaginable, with kohl-rimmed eyes, perfect white teeth, bangles up to the armpits, earrings and nose rings, silver balls dangling here and there, a couple of pounds of silver around each ankle, red-pink-yellow-blue muslin *ordhni*, shawls, stitched with silver, and from each of those Valkyries a reined-in energy that made one feel that if one lit a match, the whole *jhumpa* would explode.

A senior woman shushed everyone and turned her attention to me. She did not believe that I couldn't understand what she said, so she pushed her face close to mine and repeated questions in a well-articulated scream. But gestural language is universal, so, slowly, we came to understand one another. No, I did not have children. (Consternation and muttering.) Why? I thought rapidly. Because my husband had died young. (Sighs of commiseration and nodding heads.)

Parents? Both dead. (General murmuring.) And how many brothers? One sister. What, no brothers? No brothers. (A sense of tragedy in the air.) Does your sister have sons? Four daughters. There was respectful silence in the presence of one so persecuted by bad luck. I let out one of those noises that speak of suffering bravely endured, then leavened the mood by lighting a badly needed cigarette.

I already knew that a woman smoking was considered beyond risqué, but when the riot had subsided, I received hugs powerful enough to knacker horses and friendly shoves that toppled me over. Suddenly we were

While camels bear the burdens, women shoulder the responsibilities of moving camp. In the morning, once the men and animals have left, women do chores and purchase supplies. By afternoon they have packed up and set off for the new camp—usually a farm where harvesting has left stubble for grazing.

Weathered far beyond her 48 years, Nakki tempers toughness with loving concern for the author's welfare, exerting great influence as the wife of the migration leader.

talking, or rather miming, about sex, amid ribald guffaws and explicit gestures: "Would I be permitted to take a new husband?" Half an hour later I staggered out of that jhumpa drenched in sweat but holding the tree-bark-rough hands of many new friends.

Later I discovered that they thought I was a man in drag and that it was not proper that I travel with them. The Rabari came up with many reasons to turn me down, but this was the most personally deflating.

Day Seven I hate them. For a week I have not slept more than two hours a night. Thanks to the dust, my throat is infected and I have a soaring temperature. They taunt me about going back to Bhuj. Do they really want me to leave? What are they saying? How must I behave?

The night before last I set up my tent, hoping for sleep, but the sheep spent all night jumping on it, and two spent the night inside. Last night I dragged my sleeping bag about 15 feet outside the flock and fell into sweet unconsciousness. No one saw me, as they had gone to an uncle's camp to sing. But I was awakened by the women—black ghosts against a background of stars. They ordered me back to my cot. I seethed with rage. Didn't they understand that I could not keep going without sleep? They laughed, pecked at me. "If you sleep out here, Phagu will send you back to Bhuj!"

All night the sheep and goats chewed and digested and coughed. They are so full of disease they are barely alive, yet they chew the country into dust. The great grinding stomach of India, everything feeding off everything else. I am full of loathing.

Day Twelve I sleep flat on my back, palms up—the position of terminal exhaustion. Through the jelly walls of sleep, I feel something cool and heavy on my left palm. I think, "To hell with them. Putting a clod of earth on my hand in the middle of the night, it's just too much." I throw it off, and see it change into the primeval shape of an S.

The snake lands somewhere around my feet, among the baggage. By flashlight it is an innocuous-looking thing, staring at me in a trusting kind of way. It had crawled into my palm seeking warmth. I have no stick, so I call to one of the men. Using sign language, I indicate that he should hold the snake down with his staff, while I pick it up behind the head to throw it out. He must have misunderstood, because, a moment later, blood and scales are spattered all over the walls. I draw what is left of it for identification.

Later I discover that I have slept with a krait, among the deadliest of snakes.

Day Twenty-four We walk a long way today, 16 miles or so, passing other groups of Rabari with their flocks and strings of camels. There are many dangs behind and many in front, wave after wave of sheep spilling out of Kutch. Overhead are migrating

cranes, following the crops, just like us.

Today two field officers who work with Ramakrishnan arrived by jeep. Oh blessed contact with the outside world! They offer to be interpreters for me and the Rabari. At last to be able to communicate without struggling. The end of confusion and paranoia.

The Rabari had only joked about my going back to Bhuj, the visitors tell me, because they thought I needed cheering up. I did not look happy; they were worried about me. They liked having me with them, but I must not sleep outside the dang unless I have a pistol. A compromise is reached. I can sleep in

"The women loved to have me dress up. My presence provided a break from the sameness of village life," says the author, here trying on a skirt amid the giggles of sisters-in-law. These family members are at home for one of life's milestones—a birth. The decision about who will accompany the dang often depends on such personal circumstances.

the tent, just on the outskirts of the flock. But I must keep a staff with me, just in case.

That night, after the field officers have gone back and we have settled by the fire for the evening meal, Phagu casts me a roguish grin and says, "So after Divali [the Hindu festival of lights] I suppose you had better go back to Bhuj." Everyone waits expectantly. I pretend to burst into tears, rubbing my eyes like a child, and yell, "Please, please don't send me back to Bhuj." When they stop laughing, Phagu wipes his eyes with the end of his turban and says, "No, no, Ratti Ben, you can stay with us as long as you like."

Day Thirty-three After Divali, the winds start, just as Phagu said they would. To me they are the sweet breezes of an English summer. To the Rabari they are arctic blasts, bringing disease. Many on the dang are suffering from malaria or influenza. If we are near a town or village, people walk miles in to see a doctor. If not, they simply keep going. I too feel ill and eat handfuls of antibiotics, but I have learned not to dwell on misery but to dismiss it, as they do, or to use it as material for comedy routines.

One day we walked five miles to the local medical clinic—a tiny room filled with shivering gray-skinned people. On one side was a trestle littered with old needles and a few bottles of antibiotics and chloroquine.

"They don't feel they've had their money's worth if I don't give a needle," said the

In the glow of oil lamps, a newborn rests near his mother (at right) and aunt. He was born on the floor of this small room with his father's mother acting as midwife. Just before delivering, his mother swept the compound, milked sheep, and tended her other children as usual.

doctor. "People want to feel better in an hour, so we treat the symptoms, I'm afraid, not the cause." He put the syringes into a sterilizer that looked like a Woolworth toaster. Yes, he knew about AIDS, but there were "more pressing problems in India." Our sick ones received their injections; then off we went to do the shopping.

Inevitably, people gathered around me, cutting off air. When my companions understood how much I hated these crowds, they used all their skills to defend me from them. After all, the Rabari themselves are often greeted by village children howling *"Bhut! Bhut!*—Ghost! Ghost!"

We hurried back with sacks of millet flour, a few onions, a present for Hatti, sweets for the children. Parma smiled as she readjusted the heavy load on my head. "So, Ratti Ben, now you are a bhut like us."

Day Thirty-eight Eight women sit with me in a circle under the tarp, sewing tiny stitches into my *gudio*, a three-by-five-foot quilt. My hand is already cramped, but if anyone slackens, Nakki cries *"Karo!*—Keep going!" as if we were climbing a mountain. There is a deep feeling of solidarity, lots of laughter, storytelling, whispered tales. I never thought I'd enjoy a sewing circle.

Since they are helping me, it is expected that I provide the tea. I bumble around and jag my skin on a thornbush. Latchi casts me that look reserved by teenagers for particularly dim-witted adults, takes the matches from me, and orders me back under the tarp. It has taken this long for her to deign to notice me. Now she's my best pal. Even that yellow-eyed dog came out from under the bed the other day and gave me two psychotic wags.

They tell me why they wear black. Long ago, when all Rabari lived in Rajasthan, the raja of Jaisalmer fell in love with a beautiful Rabari woman. But her family said, "Even though you are our king, she cannot marry outside caste." This did not please the king. The Rabari knew they would have to flee, and, sitting together in a circle, they threw salt into a cup of water and drank it, vowing never again to taste the salt of that country.

Off they went, the raja's soldiers in hot pursuit. There was a massacre, and, rather than succumb to the king, the young woman prayed to Mother Earth to save her. The goddess obligingly opened and swallowed her. Ever since then the Rabari who made it to Kutch have worn black as a sign of mourning, and the place where the woman died is sacred to them. There are virtually no marriages now between the Rabari of Rajasthan and those of Kutch. Once you have left a place that hurt you, you sever all connections.

We have a break from our sewing for tea and the inevitable snuff, to which the old women seem addicted. Then they pull out tiny glass vials of white crystal. They rub a fragment into their eyes, causing them to water copiously. Naturally I have to try. It is rather like having a heated dagger thrust into the eyeball and twisted. Only out of sheer mastery of will do I not cry out in agony. What is it for? I ask. To "clean" the eyes. I ask them why they did not take more useful medicines with them on the dang—quinine tablets or antibiotics. "Oh, we will, Ratti Ben, if you say so," they lie, humoring me.

They are far more likely to take medicine for the sheep, which suffer from foot rot, toxemia, and worms.

Later some Muslims arrive to buy a couple of sheep for slaughter. It is done somewhat surreptitiously, as it is against the Rabari's Hindu moral code to eat meat or even handle it. But migration demands a somewhat cavalier attitude to rigid forms of worship. Among the Rabari, there was a sense of solidarity with other pastoralists, Muslim and Hindu alike, and economic considerations were more important than religious dogma.

Day Forty-one Last night, after the lighting of the incense, we visited another camp for *bhajans,* devotional songs. One man starts the first line of a song, his companions joining in. Then the women begin, huddling together under their black wool, competing with the men, keening their lungs out, laughing when someone gets the words wrong. They drink tea and sing until the stars swing past midnight. It is as if they take a spiritual bath in the music—their troubles washed away with songs as old as India. And I am struck once again at their intimacy—the bonds among them continually strengthened, like calcium laid down in a bone. How comforting it must be to pass through life's storms always with the support of the group, infusing every thought with one voice extending down through the generations, saying, "It is

Balancing stacks of brass pots, women carry water back to their camp on a Gujarat farm. They know down to the drop how much they will need for the evening's cooking and washing.

all right. We are all here. There is no such thing as alone."

When life is so brutal, the harmony of the group is essential to survival. Here Phagu's genius as a mukhi shines. He keeps them laughing, knowing that if they let life's problems get them down, they'll be dead, since their lives are nothing but problems.

Phagu has to think ahead, plan and worry for them all, knowing that one wrong decision—leading the animals into a flood or a district where feed is too scarce—could mean the end of everyone's income. Sometimes, when he thinks no one is looking, his face sets into lines of anxiety, yet in his demeanor there is not a trace of self-pity.

At night when he comes in, his eyes sunk in exhaustion, it is clear how deeply they respect him. Once I saw Parma, whom I'd secretly christened the "iron virgin" because of her uncompromising toughness, adjusting the folds of his smock without his knowing; all her concern and love for him allowed this fleeting but most tender of gestures, recognizable across cultures, across eons.

Day Sixty A full moon sets this morning as I wake up. Hundreds of cranes fly in watery formations low over our camp—a van Gogh painting in browns, blacks, grays, and the dusty yellow of the sky. Parma sees me watching them and says, "They are from across the sea, like you. Soon you'll go back to your country and forget about us."

Every day now, angry farmers tell us to get off their land, shaking their staffs at the women. One comes to camp and threatens to bring his mates and make trouble. Phagu gives him five rupees—about 20 cents—and tea. The mukhi of another dang comes to visit, and there is a heated exchange, in which Phagu points to the other man's stomach and then to his own: "We must all eat." It ends amicably, and soon they are laughing and gossiping together like old friends. Nevertheless we must move on.

Day Seventy-four Phagu has decided that our dang must split into three. Smaller flocks will be less threatening to local farmers. This throws my own plans out of whack, and I have to decide whether to stay with them or walk Ram Rahim back to Jodhpur, 400 miles away. I decide on the latter and immediately feel a well of sadness opening up.

The dang is miserably reduced, and they have several months to go before returning home, after wandering hundreds of miles. Now that there are so few people, the work is increased threefold. The most sleep the shepherds can hope for is three hours a night, sometimes less. Nakki, Jaivi, Parma, and I go to do some shopping. The local schoolteacher invites us into his house, saying to me, "These are poor people but good people; they don't anger anyone. You must do something for them."

Nakki and company preen themselves under his praise. "Yes," they agree, "we are liberal people; we do not judge others but let

Brandishing sticks in a dance called dandi, *men celebrate the Hindu spring festival of Holi in a Rajasthan village near their homes. As afternoon darkens into evening, the dancers reel under the influence of an opium drink taken from the open palm of a friend. Like others in northwestern India, the Rabari share this drink on all auspicious occasions.*

everyone be." They strive to look long-suffering, but it doesn't work. The twitch of Rabari cheek breaks through, spoiling their act. The teacher hands them ten rupees each, which they graciously accept, Nakki's eyes luminous with satisfaction.

On my last evening with them the wall of language seems to collapse, and I have my first almost fluent conversation. Arjun, Phagu's son, surprises me with his words. He has admired my jeep, he tells me, on several occasions when friends have used it to bring me mail. He wants to be my driver.

"But I already have a driver, and anyway you can't drive," I protest.

"You can teach me."

"But why do you want to leave your flocks? Is it the money?" No, not money.

"Then, is it the difficulty and danger of the work?" No, he did not mind hard work.

It was the constant fights and trouble, he explained. There was no peace for them, night or day. The farmers threatened them; the police harassed them. Politicians demanded bribes to let them graze where they had freely grazed before.

As another Rabari said, "Once we were like kings; now we are treated like dogs."

Day Seventy-five On my last day the women come to say good-bye, carrying ceremonial pots on their heads and singing. I am close to tears. They tease me, of course. They are the most unsentimental of people. All morning Phagu has been walking around holding my hand. He wants to buy Ram Rahim, but I refuse. They want to extract as much as they can from me before I leave, but it is also true that their fondness is genuine. After all, didn't I provide them with some good laughs? A vehicle occasionally? Money? And wasn't I, in the end, almost as tough as they? The yellow-eyed dog, which had ended up sleeping in my tent, comes to say good-bye, even allowing me to pat his head. Phagu says, "Take the dog and leave us the jeep."

Then there are hugs all around, the kissing of palms, and more hugs. I depart to the sound of singing.

I HAVE NEVER DONE ANYTHING in my life as demanding as traveling with the Rabari. I did not have a decent sleep or wash in months. I was sore in bones I didn't know I had. I harbored infections that were impervious to drugs. I killed scorpions with my shoe. But I could go back to comfort and security; the Rabari could not.

My admiration for them was boundless, and while I hated them sometimes, I never disliked them. They endured everything without complaint, and they would often walk 20 extra miles to a temple in order to thank the divinities for life. I never saw any one of them commit an act of cruelty. And there was *nothing* servile about them. They asked for neither charity nor an easy life, only recognition of the value of their expertise and the same kind of government support that Indian farmers automatically receive.

I do not wish to glorify them. They are as capable of underhandedness as anyone in their struggle for survival, and their herds and flocks do untold damage. But no more so than the plows and poisons of the farmers, and not as much as the venality of the politicians and police who exploit them. Perhaps in a country as desperate as India it is absurd to single out one group for better treatment. Yet something invaluable will be lost if their migrations cease, because it is mobility that engenders the qualities that so distinguish them—tolerance, wiliness, independence, courage, wit.

Sometimes, when it was particularly hard for me, they would pause in their work to smile, knowingly and kindly, or to whisper into the darkness, "Go to sleep, Ratti Ben," or to call, "Ho, Ratti Ben, come drink tea," a phrase with which they might convey an ambiguous and difficult affection. It was at those moments that the shadow of something infinitely remote touched us, fleetingly uniting me with them so that I too could hear the faint echo from our common, immeasurably distant past: "It is all right. We are all here. There is no such thing as alone." □

With a confidence born of open spaces, a young herder tends his family's camels in Gujarat. His chances of holding on to this unfettered life into adulthood diminish with every fence and every angry farmer who chases Rabari herds from his fields.

Britain's

HEDGE

They still border fields and byways like this road near Robin Pickering's home

By BILL BRYSON

Photographs by SAM ABELL
NATIONAL GEOGRAPHIC PHOTOGRAPHER

ROWS

in Wales, but hedgerows are in decline after centuries of service.

When spring comes to Somerset in southwest England, sheep amble within paddocks rimmed by hedgerows. A beech along a foggy road near Hawkridge confirms the opinion of a local landowner: "Anyone with a sense of beauty will let some trees grow."

Seasons of a hedge

While meeting the practical need of enclosing land, hedgerows gladden the hearts of nature lovers and twine through the nation's lore and verse.

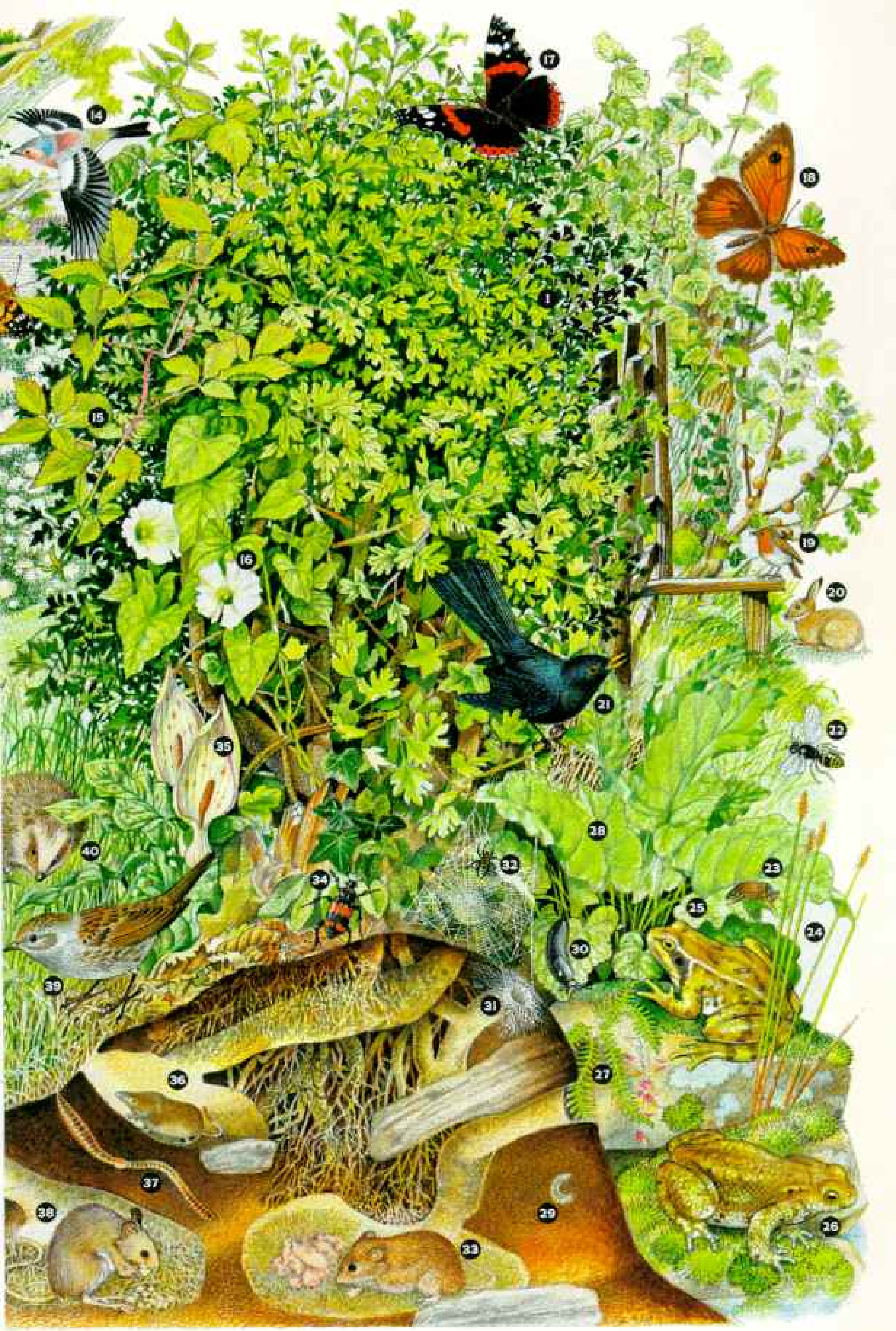
After World War II's privations, Britain began "grubbing up" hedgerows to increase farming acreage for national self-sufficiency. Today, however, the rate of hedgerow removal has slowed, thanks to ardent conservationists and government grants to farmers for maintenance and renovation.

The most common hedge plant, the wickedly spiked hawthorn, confines cattle on a Midlands farm in winter (above). Come spring, branches take on color and sprout a nebula of May blossoms. Birds act as landscape architects, planting wildflowers by dropping seeds from other fields.

Inside a bank, burrowing animals are safe from the owl and kestrel. Come summer, butterflies flit above a hedgehog, inspiration for the tiny washerwoman who did laundry for her animal friends in Beatrix Potter's "The Tale of Mrs. Tiggy-Winkle."

PAINTING BY ERIC THOMAS

1. Hawthorn
2. Kestrel
3. Fieldfare
4. Wood pigeon
5. Cow parsley
6. Stoat
7. Soldier beetle
8. Little owl
9. Woundwort
10. Common oak
11. Small tortoiseshell butterfly
12. Great spotted woodpecker
13. Painted lady butterfly
14. Chaffinch
15. Blackberry
16. Hedge bindweed
17. Red admiral butterfly
18. Gatekeeper butterfly
19. Robin
20. Rabbit
21. Blackbird
22. Mason wasp
23. Cockchafer beetle
24. Common spike rush
25. Common frog
26. Common toad
27. Hard fern
28. Broad-leaved dock
29. Cockchafer larva
30. Great black slug
31. Mesh web spider's web
32. Garden spider
33. Bank vole
34. Burying beetle
35. Lords-and-ladies
36. Common shrew
37. Earthworm
38. Wood mouse
39. Dunnock
40. Hedgehog
41. Violet ground beetle
42. Stinging nettle
43. Common violet
44. Red-tailed bumblebee
45. Knapweed
46. Common red fox
47. Ladybird
48. Wren
49. Dandelion
50. Cardinal beetle
51. Hawkweed
52. Lesser celandine
53. Orange-tip butterfly
54. Hogweed
55. Blue tit
56. Hedge garlic
57. Ground ivy
58. Common wasp
59. Primrose
60. Hedge snail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DEEP IN DORSET, on the edge of the Blackmoor Vale, stands a lonely eminence called Bulbarrow Hill. It is a long walk to the top, but worth it, particularly on a sunny May morning when the world feels freshly laundered and the English countryside takes on the sumptuous colors and vivid clarity of spring: deep blue sky, drifting clouds as white as bed sheets, a landscape soaked in a hundred shades of green.

From the summit the whole of Britain seems to unfold before you, a billowy checkerboard of soft hills and small fields stretching away to a distant horizon lost against a mountain of cumulus. Winding lanes, squeezed by plump hedgerows, wander among farmsteads, groves of woodland, and villages whose names seem bred in whimsy: Fifehead Neville, Hazelbury Bryan, Okeford Fitzpaine, Droop. It is a scene of rare beauty, and it is getting rarer.

In other countries, discussions of the landscape begin with geology; in Britain they begin with man. It is easy to forget, in a landscape so fetching and at one with nature, that the beauty of the British countryside is largely accidental, the mere by-product of centuries of practical pursuits. The features that ennoble it—the neat fields, the meandering stone walls and hedgerows, the village greens and duck ponds—were put there for a purpose but also functioned as adornments, and for hundreds of years this happy symbiosis held sway.

In much of Britain it still does, but the question is, for how much longer? A revolution in the technology and economics of farming, myopic government policies, and the inexorable creep of suburb and shopping mall have together subjected swaths of Britain's shrinking countryside to more upheaval in a single lifetime than in perhaps the whole of the preceding 500 years.

Since the late 1940s Great Britain has lost up to half of its ancient woodland, 95 percent of its flower-rich hay meadows, most of its lowland heaths, and many of its lowland ponds. But the feature that is perhaps most vulnerable to change and most central to the character and beauty of the countryside is the one that has been disappearing fastest—the honorable and all too often unsung hedgerow.

For well over a thousand years, hedgerows have been a defining attribute of rural Britain, the stitching that holds the fabric of the countryside together. From a distance, as at Bulbarrow Hill, they give the landscape form and distinction. Up close they give it life, filling fields and byways with birdsong and darting butterflies and the furtive rustles of small mammals. The wildflowers that spill from their base—foxgloves, feverfews, buttercups, fleabanes—dust the air with scent and transform country lanes into cottage gardens. Hedgerows don't merely enhance the countryside. They make it.

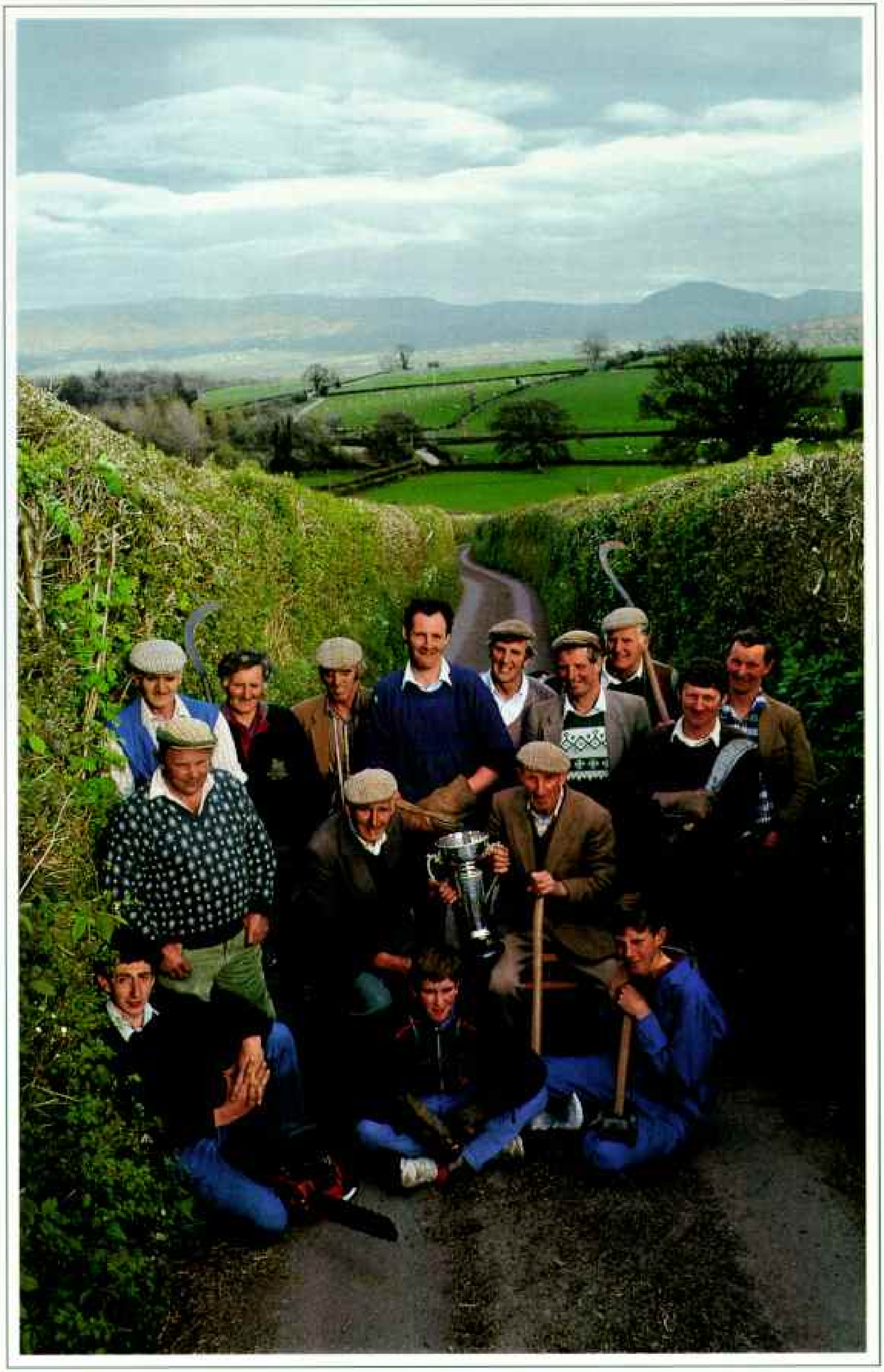
Yet they have been disappearing at a rate that many find alarming. In England alone, roughly a quarter of the hedgerows—96,000 miles, enough to girdle the earth nearly four times—vanished in the forty years to 1985. A further study covering the period 1984 to 1990 showed a net decline of more than 53,000 miles.

The reason for the loss is poignantly straightforward: Hedgerows aren't much needed any more.

"Essentially you have a traditional landscape feature trying to survive in a 20th-century environment," says Lord De Ramsey, President of the Country Landowners Association and himself a farmer. "In practical terms, they are an anachronism—an attractive luxury."

De Ramsey farms 7,000 acres on the edge of the rich, flat fenlands of East Anglia, a region standing between Cambridge and the North Sea. The land has been in his family since the 1700s. "At the end of the war we had 35 miles of hedgerows on the farm," he recalls. "Now we have 14. But it still costs us £4,000 [$6,200] a year to maintain them"—

The Davies clan of Brecon, Wales, shares a family mastery of hedge laying, the manipulation of branches to create a dense barrier. Gwyn Davies, wearing hedging gloves, won the British national trophy being held by his father and uncle, both former Welsh champions.



that is, keep them trimmed and healthy.

And do they have any economic value to him? "None whatever," he answers with regret but not hesitation.

FOR DE RAMSEY and most of Britain's 250,000 other farmers, life has changed almost beyond recognition in a generation. Until the 1950s most British fields were small and regularly rotated between crops and pasture. Hedges played a central role in containing and sheltering grazing animals. But with the development of modern fertilizers the need to rest the land was removed. Throughout much of lowland Britain, especially in the fertile, loamy flatlands of East Anglia, farmers sold off their livestock and turned to producing endless cycles of a single crop.

"There used to be hundreds of cows around here when I was a boy," De Ramsey told me. "Now there are just seven dairy herds in the whole of Cambridgeshire. Once you no longer have animals, you don't need field boundaries. Potatoes, after all, don't wander across the road."

In such an environment, traditional features like hedges and small woods are not just unnecessary but a positive nuisance. Encouraged by a government that wanted a Britain self-sufficient in food, farmers drained their ponds and marshes, swept away any nonproductive clumps of greenery, and created a landscape on which ranks of harvesters could rumble unimpeded from horizon to horizon. Within two decades much of eastern England became a wheat-field prairie—"like Kansas with pubs," as one observer put it.

Today Cambridgeshire is the least wooded county of Britain—even Greater London has more woodland per acre—its few remaining hedges standing as forlorn relics. But much the same loss of loveliness has affected other areas as monoculture farming has spread across the countryside. The loss has been devastating, not just to beauty but also to wildlife. More than 800 kinds of plants, from the common cowslip to rare ferns and orchids, have been found in hedges or verges. And most of Britain's woodland birds use hedgerows at least some of the time, as do most of its small mammals.

"Some of them have no choice," says Tom Tew, a zoologist with the United Kingdom's Joint Nature Conservation Committee. For six years, using live traps and radio monitors, Tew tracked the life of small animals in two adjoining fields in Oxfordshire. "Harvest mice," he says, "used to overwinter in corn ricks, but corn ricks have disappeared from the landscape, so hedgerows have become a fairly crucial alternative for them. House mice, dormice, shrews, weasels, voles all depend on hedgerows as places to breed or hunt or shelter. Almost the only small mammal that doesn't use hedgerows extensively is the hedgehog. In modern Britain it's essentially a suburban creature."

No one knows exactly when hedgerows first became a feature of the British landscape. Parish records from well over a thousand years ago commonly refer to them, and archaeological excavations give clear evidence that they existed in Roman Britain as

"Not a first-prize winner," pronounced Derek Smith, revisiting a hedge he judged earlier in a contest at Walton on the Wolds, England.

In the laying of a hedge, live branches are cut partway through, leaving a section "about as thick as a lamb's tongue." They are then bent over and held in place by "ethers," twined stems secured by stakes.

All in all, Smith said, "a good workmanlike job" that should keep cattle off Six Hills Lane.

BILL BRYSON, an American living in England, is the author of several best-selling books, including his look at English, *The Mother Tongue*. His most recent article for the magazine was on the Main-Danube Canal (August 1992).

early as the second century A.D. Older still are the hedge banks—rock and earthen barriers that are sometimes, though not invariably, topped with living shrubbery—on the Land's End peninsula of Cornwall. Dating from the Bronze Age, these banks are, as one historian wrote, "among the world's oldest artefacts still in use."

Despite the depredations of recent decades, hedges of considerable antiquity still dot the landscape. Bordering the western edge of De Ramsey's farm, at a place called Monk's Wood, I found a hedge so old that it has a name. Called Judith's Hedge, it was planted by a niece of William the Conqueror sometime in the second half of the 11th century.

It was early spring when I arrived, and Judith's Hedge was slowly waking from its winter's sleep, its densely interlaced branches showing only the still tight tips of hawthorn buds, but already it swarmed with life. Above the canopy hung a haze of tiny hover flies. At its base, bees and other insects browsed and flitted among primroses and anemones, magpies and chaffinches hunted among the tall grass, and there was the leafy rustle and half-glimpsed dash of a shrew or vole startled by the crack of a branch beneath my foot.

Nothing about its shape or structure hinted at a particular antiquity, but Judith's Hedge is very old indeed—as old as Windsor Castle, older than Salisbury Cathedral and York Minster, older in fact than most of the buildings of Britain. For 900 years, through the reigns of 40 monarchs, through the ages of Chaucer and Shakespeare, of Milton and Pepys and Defoe, Judith's Hedge has been quietly going about its business, marking the boundary of a little-known wood, providing a habitat for wildlife, lending distinction to 400 yards of an essentially anonymous byway.

No statute stands between Judith's Hedge and its destruction. If the road needed widening or the owners decided they preferred the property to be bounded by barbed wire, it would be the work of but a couple of hours to bulldoze away 900 years of history.

As I passed along its length, I thought of something an environmentalist named Andy Wilson had said to me a few days earlier: "No one would think of tearing down a quarter of England's medieval churches, but that's precisely what we've done with our hedgerows. Just because they aren't as imposing as a castle or cathedral doesn't mean they are any less historic."

For Judith's Hedge the future appears secure. By happy coincidence it stands on the grounds of the Institute of Terrestrial Ecology, a leading center for the study of Britain's hedgerows. It was there, in a modern brick building, that I found Max Hooper, a reflective and genial scientist regarded by many as the doyen of hedgerow studies.

Though a passionate defender of hedgerows, Hooper has some sympathy for those who have removed them. "If I were a farmer, I probably wouldn't have hedgerows," he says bluntly, and briefly enumerates the more notable of their many shortcomings: "They're expensive to maintain. They're a breeding ground for weeds and diseases. They shade the margins of fields, which can cause grain along the edges to ripen unevenly. And they take up otherwise productive space—for every mile of hedge you remove, you gain about an acre of cultivatable land, more if it's a big hedge. Their only real value is aesthetic and historical, and, naturally, those aren't paramount considerations for many farmers."

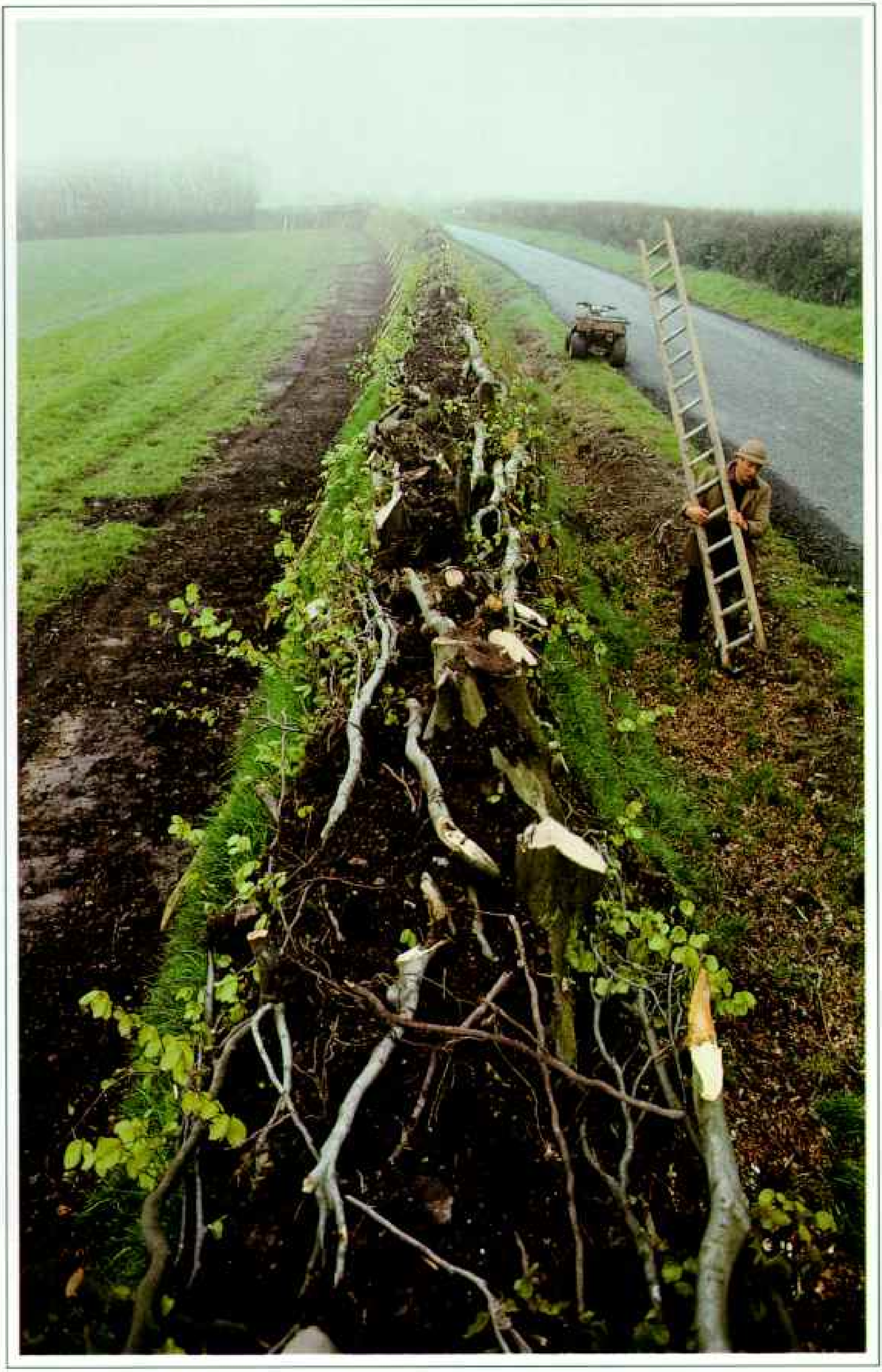
"It's odd work for little money," says champion hedge layer Allan Morgan of Cwmdare, Wales. He gets two or three pounds—less than five dollars—for each yard of hedge. Somerset cattle breeder David Bawden (facing page) got a 75 percent government subsidy for renovating a hedge on newly purchased land.

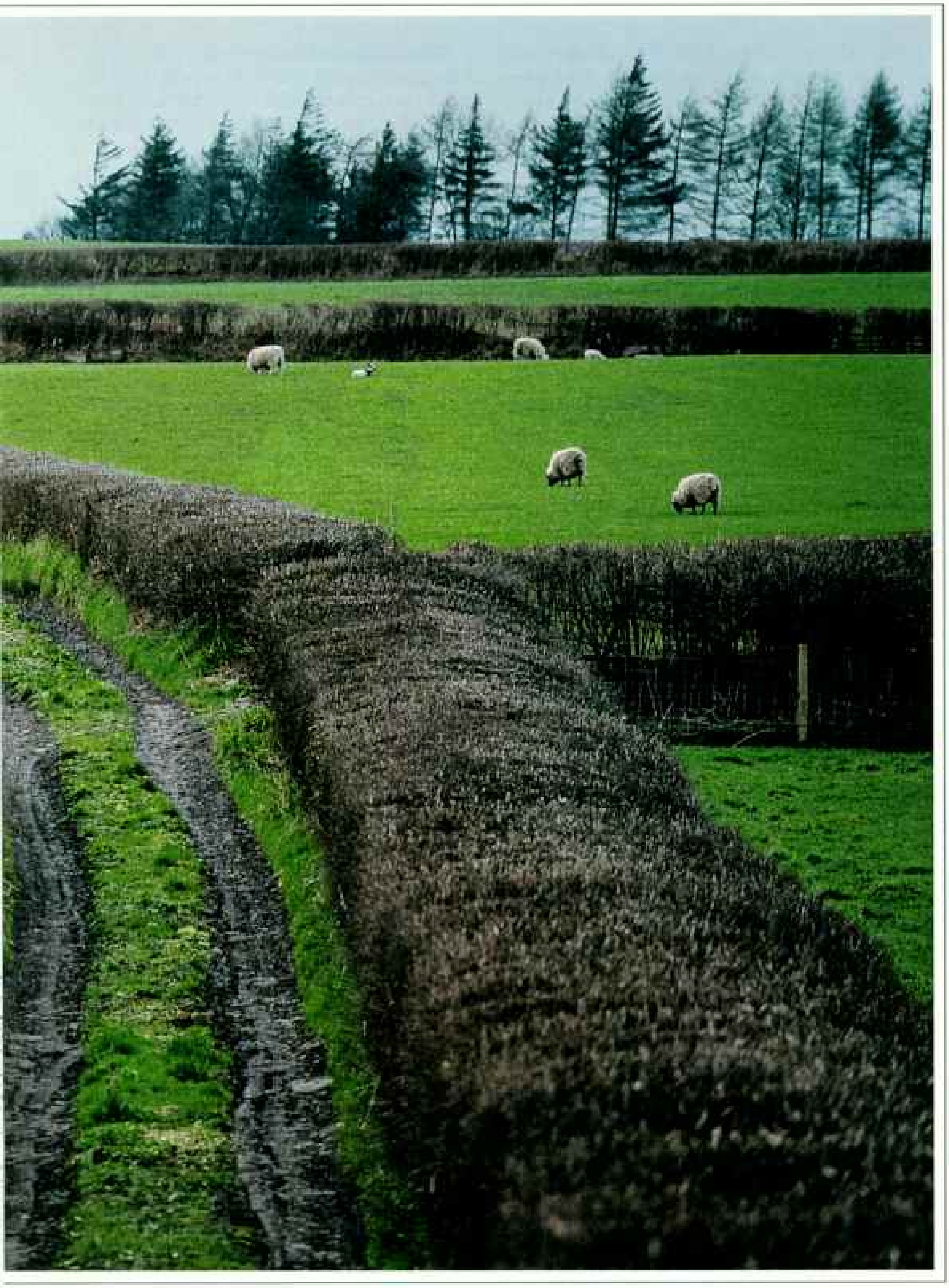
HOOPER, who is now retired, secured his fame in the mid-1960s by devising a method for dating hedges so dazzling in its simplicity that others in the field still speak of it with a measure of awe.

Because hedges constantly renew themselves, they offer few clues to their age in the way that, say, trees leave rings. But Hooper, noticing an unexpected correlation between the known ages of certain hedgerows and the number of species growing within them, came up with a formula that has come to be known as "Hooper's hypothesis." (Strictly speaking, it isn't a hypothesis, but the alliteration has proved irresistible.) This states that for each species of tree or shrub found in any hundred-foot length of hedge you can assume one century of agedness: Find eight species and you have an 800-year-old hedge.

Using Hooper's formula, field-workers found that Britain's stock of ancient hedgerows was very much larger than most people had suspected. Far from being largely a phenomenon of the enclosure movements of the 18th and 19th centuries, as many textbooks had it, about half of Britain's hedgerows were considerably older. In southern England alone, perhaps as many as one-fifth of all surviving hedgerows date from Saxon times, a living link with the Dark Ages. Some even date back to Roman times.

"Because they are older than almost every other man-made thing in the landscape, they





Sporting new haircuts from mechanical blades, twin hedges in Wales were rounded to slough off snow. During stormy weather the lee side provides important shelter for lambs, though some farmers fault hedgerows for blocking early morning and late afternoon sun.

can tell us a lot about the past," Hooper says. "A hedge may reveal the outlines of a Roman or medieval field system, or the course of a parish boundary. If trees in the hedge have been coppiced or pollarded"—routinely cut to make charcoal, say, or spindles for furniture—"it can reveal how people lived in the ancient past.

"But," he added hastily, "it's unrealistic to expect farmers to maintain their hedges just because historians find them useful or because others consider them attractive. You have to give farmers an incentive to keep them. For most of the past 40 years we've been doing almost exactly the opposite."

To say that government policy toward hedges has been inconsistent is to engage in kindly understatement. During one notably indecisive period, the Ministry of Agriculture offered farmers one grant to plant hedges and another to remove them. The last of the grants for destroying hedges were withdrawn eight years ago, and, to its credit, the government has in recent years begun to make funds more freely available for planting and restoring hedges.

In 1992 it unveiled a Hedgerow Incentive Scheme—3.5 million pounds (5.5 million dollars), spread over three years, to be spent on restoring neglected hedgerows. Most environmentalists welcomed the program, though complaining, perhaps inevitably, that it wasn't nearly enough.

One factor likely to slow restoration efforts is a shortage of people with the skills to do the job, as I learned one raw winter's day when I ventured onto a hillside in Leicestershire to talk to the father and son hedging team of Derek and David Smith.

The Smiths could scarcely have chosen a less appealing day to be out. A cold rain battered the landscape and was made worse by the kind of piercing north wind that seems to have traveled hundreds of miles with no other purpose than to slip inside your clothing and stab you in the back.

"There's not many of us left," Derek said, taking off a thick leather mitten, protection against the lacerating thorns, to wipe sleet from his brow. "Young people aren't interested in hedging. They'll jump onto a tractor seat fast enough, but show them some manual labor and they tend to vanish."

A hedgehog courts danger as it forages along a road. Some 500 of the creatures are brought to Lincolnshire's Hedgehog Hospital each year; 70 percent survive. Founders Elaine Drewery and Nigel Brockelsby, whose cradled pals include an albino, offer toys and T-shirts, but the boot wiper on the stoop is just to fool visitors.

Standing sodden in the merciless rain, I had every sympathy with their reluctance. Hedging, as I was learning, is not just skilled work but also cold, rugged, muddy, and backaching. The two men, wielding chain saws and billhooks, assaulted the hedge with a kind of rhythmic ferocity, selecting branches with a glance and cutting away everything else with a series of economic thrusts.

I asked why on earth they didn't do this in more agreeable weather. "Always been a winter job," Derek called out between rips of chain saw. "You're too busy the rest of the year with other jobs, and anyway the cutting has to be done when the wood is dormant. Otherwise you could kill the hedge."

Depending on how you classify them, there are anywhere from a dozen to 50 or more types of hedge, including such jauntily named specimens as the Midland bullock, the Welsh border, the crop and pleach, and the double brush. Some are built on earthen banks, some incorporate ditches; some are cut square, some are chamfered; some are supported with

square stakes and some with round. Each type is as distinctive and as historic as the county in which it stands.

Essentially, however, all are designed to do the same thing; thwart nature by making a horizontal, ground-hugging barrier out of material whose deepest instinct is to be vertical. Left alone, any hedgerow will eventually become a line of trees. Hence the need to lay them—in effect reweave them—every 10 to 30 years. The Smiths can lay about 2,700 yards a season, far short of demand. "We're already booked for the rest of this winter and the whole of next," Derek told me.

Hedges have survived in Leicestershire and neighboring counties better than elsewhere because it is prime shooting and fox-hunting country. Fox hunters like hedges for the thrill that comes with jumping them, while shooting enthusiasts favor them because they are good breeding grounds for partridge and pheasant, and because a line of hedges forces driven birds to fly upward into gunsights rather than skimming along the grass line.

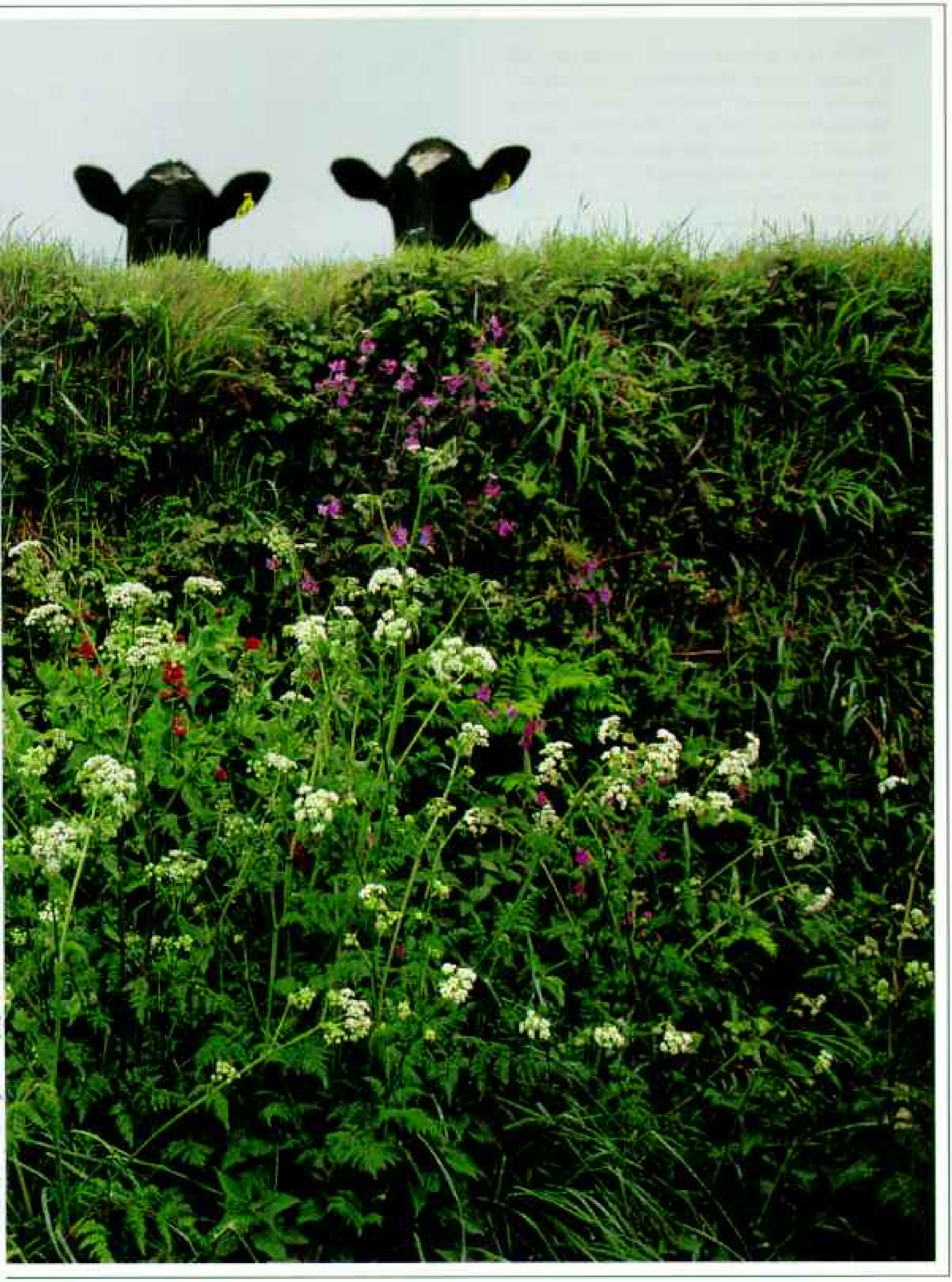
Even so, the amalgamation of fields has led to the loss of hundreds of miles of hedge, and Derek Smith expects more to go. Government grants are, in his view, so saddled with restrictions and paperwork as to be almost a deterrent. "There are more grants about," he agrees, "but they all have different rules about what proportion of the costs will be paid and how many yards of hedge you must lay and so on, and it all involves paperwork—ten pages of instructions for a Ministry of Agriculture grant, for instance.

"You have to be a bloody professor to run a farm nowadays," he says wryly. "Getting a grant is only half the battle. Then you've got to find somebody to do the work. *That's* the hard part."

If there is a shortage of skilled hedgers, you would scarcely guess it from the turnout at the National Hedgelaying Championships held each October. When I arrived for the 1992 competition, held on a mild Saturday on a farm near the slumbering backwater of Norton Bridge, Staffordshire, cars from all over the country were already filling a parking lot in a field. The roadside was lined for nearly a mile with ready competitors, each positioned in front of a measured ten-yard-long strip of overgrown hedge, waiting for the signal to start.

Spectators in waxed jackets and Wellington boots—the uniform of the British farmer—roamed the roadside surveying prospects with knowing nods or nosed around among stalls where exhibitors were promoting everything from the newest chain saws to the achievements of the Staffordshire Wildlife Trust. The scene had the friendly, day-out ambience of a county fair, and the mood among competitors and onlookers alike was engagingly unearnest.

"Can you make anything of that?" I asked a contestant from Sussex, who stood with hands on hips surveying a 12-foot-high wall of seriously intractable-looking hawthorn. He grinned doubtfully. "Come back in five hours and we'll see," he said.



With mild curiosity, three bossies look up from their grassy breakfast. Their pasture lies behind a lush hedge bank in Cornwall bedecked with tiny red valerian, purplish ragged robin, and cream-colored sprays of wild chervil, locally known as cow parsley.

"Oh, aye, it looks relaxed, but underneath it's dead serious, dead serious," a compact, friendly bundle of tweed and muscle named Howell Davies told me. A Welshman now in his mid-70s, Davies was once—indeed, he leaves you in no doubt that he still could be if he wished—one of Britain's top hedgers. "No one could touch me in thorn," he informed me confidentially. "Hazel sometimes, but thorn—never."

In more than 50 years of competing—he retired after winning the veterans class of the All-Wales Championship at the age of 70—Davies not only won more titles than he can remember but also founded something of a dynasty. Two of his nephews are former British national champions; son Elwyn won the national junior championships in his first attempt and never competed again, while Davies's other son, Gwyn, has a houseful of trophies and was here today as defending national champion.

THE CONTEST BEGAN, and the still morning air was rent with the emphatic roar of chain saws. I asked Davies—shouted in his ear actually—if he missed the days when the work was done manually, and quietly, with billhooks and handsaws. "Not a bit!" he answered with the vehemence of the converted. "Used to be sometimes the contests didn't finish till nearly dark. I've seen judges making their inspections by torchlight. Now, you just watch, everyone will be finished by two—that's nearly half the time."

I did watch, and he was right. For five hours I ambled up and down the long line of rhythmically working hedgers watching as a hundred lengths of tumbling, unkempt foliage slowly, almost magically, metamorphosed into neat, tightly bound barriers of wood and leaf.

The process appeared straightforward enough. Most of the growth is laboriously hacked away to leave a line of upright stems, called plashers, pleachers, or steepers, which are each given a deep incision near the base and bent over at a severe angle to form a layered barrier. Stakes are driven between the laid stems every two feet or so and whiplike rods of coppiced wood, called ethers, woven through the top of the stakes to give the whole stability.

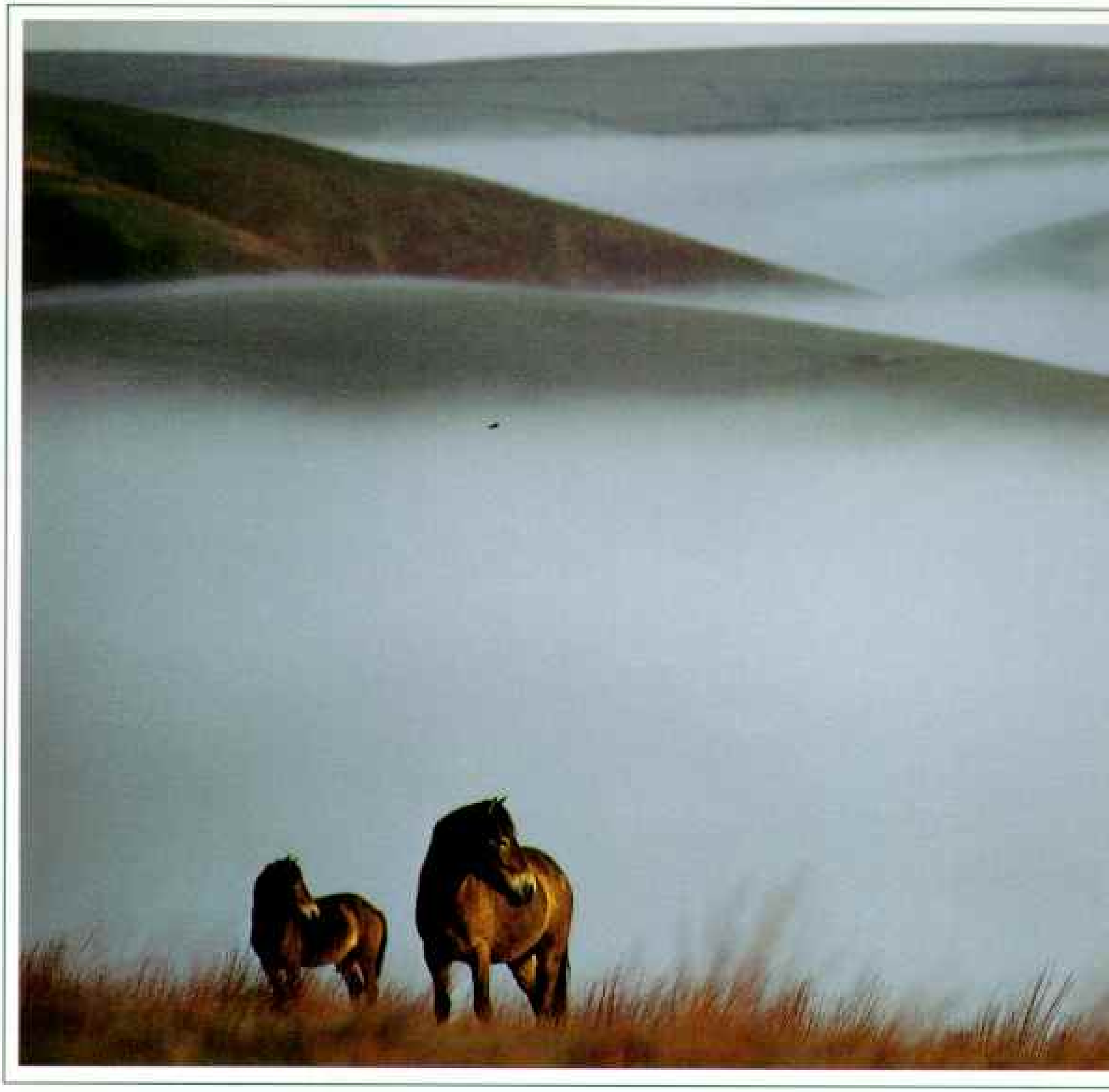
An experienced hedger makes it look easy. But in fact the business of transforming a tangled, random mass of living material into something as strong and straight as a fence, yet as trim and comely as a stretch of topiary, takes not only skill but also a generous measure of artistry.

"Every hedge is different," Gwyn Davies remarked to me as he tied off the last of his ethers. "I'm 39 now, and I've been hedging since I was 14—a quarter of a century—but I'm still learning. You always think you can make the next one that little bit better."

As with most things, progress has brought with it unexpected consequences. "Consider aphids," says Steve Wratten, an insect ecologist at the University of Southampton. "They're a chronic pest for cereal farmers. Spiders and ground beetles living along field margins can keep their numbers in check.

Stark, utilitarian "sheep netting" fence, going up at a Welsh agricultural fair, wins over farmers with its relatively easy maintenance.

In Lincolnshire a field once subdivided by hedgerows is plowed for wheat, reflecting a trend away from crop rotation and toward monoculture farming.



But fields are so large nowadays that the spiders and beetles are slow to get to the middle of them, so the aphids have a free run.

"As a result, farmers have had to pour more pesticides onto fields to fight a problem that was once largely dealt with naturally."

Wratten came up with an idea he calls beetle banks. These are one-meter-wide strips of grass sown at 100-meter intervals across fields. "They are simple and cheap. A farmer can plant 500 meters of beetle bank in an hour for about ten pounds," he says. After two years the average beetle bank will be home to 750,000 predator insects. If each eats ten aphids a day, that's 52,500,000 fewer aphids a week per bank without the addition of a single drop of pesticide.

"The irony is that the Ministry of Agriculture paid for the research," Wratten says, "but now that we have come up with results, they are doing nothing to promote the scheme. We *have* managed to produce a leaflet, but—here's another irony for you—it was paid for by one of the chemical companies that manufacture the pesticides that the scheme is meant to reduce. It was their way of establishing 'green' credentials, you see."

Like many others concerned with the rural environment, Wratten believes that government spending on agriculture should be shifted from production to conservation. As Andy Wilson of the Council for the Protection of Rural England, an environmental group, puts it: "In Europe we spend a huge amount

"Uncheckt shadows of green brown and gray," poet John Clare wrote of the moors, land that "never felt the rage of blundering plough." On Exmoor, hedge banks faintly trace the far hill. Supporters hope they won't vanish over the horizon of time.

on agriculture—almost 60 percent of the total European Community budget. The environment gets just 0.5 percent of agriculture's share. We simply want a more equitable distribution."

The feeling that not enough is being spent on the countryside is widespread. "There are 100,000 miles of neglected hedgerows in this country," notes Max Hooper. "Three and a half million pounds is enough to restore 500 to 600 miles a year. You don't need to be a genius to work out that that is a small drop in a big bucket."

But he cautions that it is easy to overstate matters. "I remember in 1966, when I was younger and rasher, standing up at a meeting and warning that at the present rate of destruction all of Britain's hedgerows would be gone by 1990." He permits himself a small smile. "I was wrong."

He is right, however, that the problem can easily be exaggerated. By the standards of most nations, much of the British countryside retains the look of an effortless arcadia, unspoiled, tidy, and prosperous. More than 250,000 miles of hedgerows still grace the landscape. In the period 1984-1990, without a great deal of official incentive, 16,000 miles of new hedgerows were planted—not enough to avoid a net loss but sufficient to slow appreciably the overall rate of loss. There are grounds to hope that, little by little, things are getting better.

But equally there is no room for complacency. A balance must be struck between the long-standing dilemma of deciding whether to regard the countryside as a food factory where production must be kept up at all costs or as a kind of public park, maintained at public expense for the benefit of everyone.

I remember something that the hedger Gwyn Davies said to me one day when I visited him on his farm overlooking the Brecon Beacons of Wales. He had been explaining how the tiniest details—the angle of a cut, the selection of just the right pleacher—could make all the difference between a well-laid hedge and an indifferent one. "And it matters, you know," he said with a sudden hint of passion.

"I mean, you look at that view," he went on, indicating with a proprietorial sweep of his arm the rolling hills and flawlessly manicured fields that rolled away below us. "It's glorious, don't you think? And the reason it's glorious is that people cared to make it that way. I'd hate to see the day when we'd lost that." □

New Sensors Eye the Rain Forest

MIGUEL FAIRBANKS (ABOVE)

By THOMAS O'NEILL SENIOR EDITORIAL STAFF

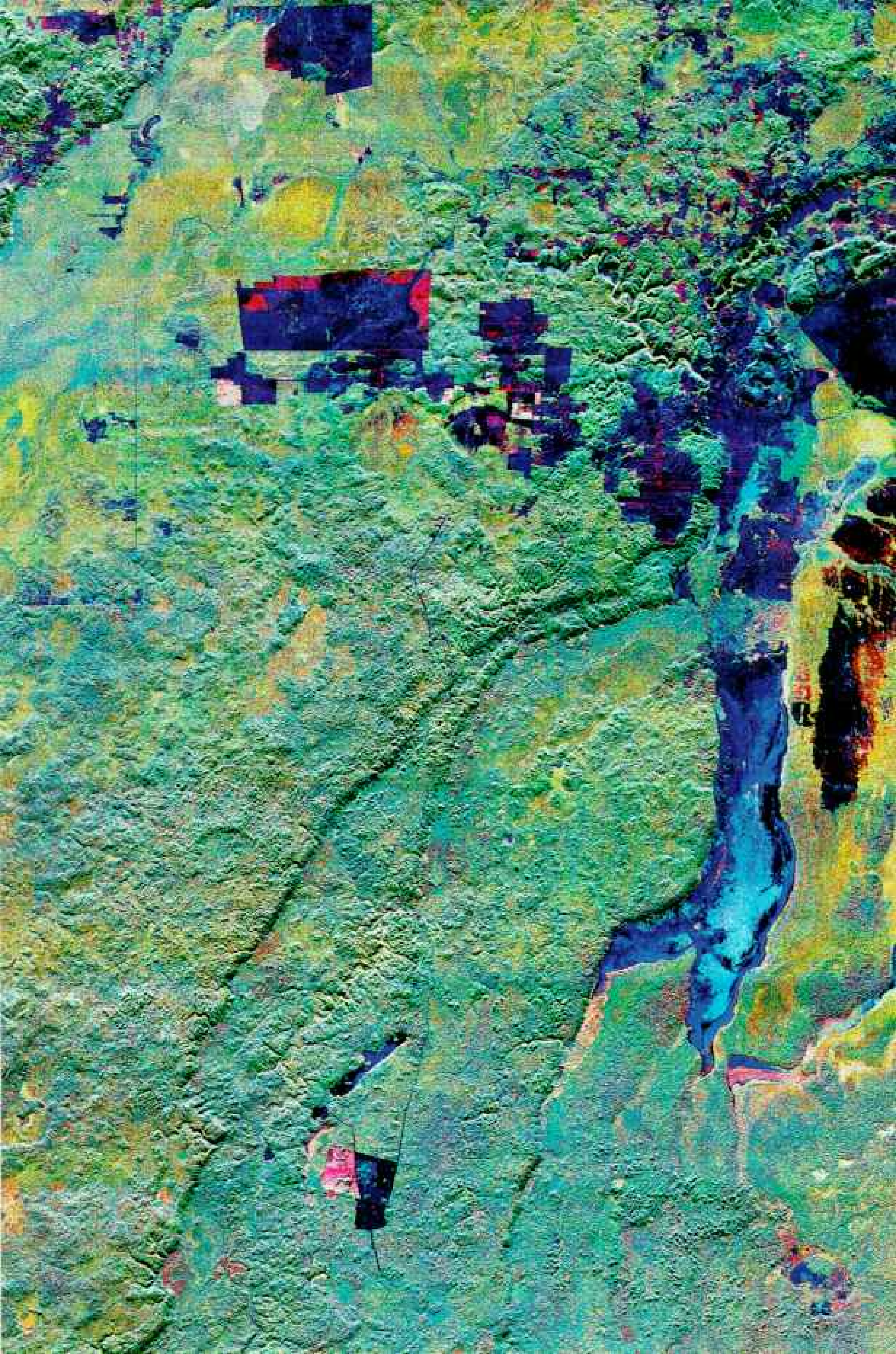
Images by NASA/Jet Propulsion Laboratory

Another stand of tropical rain forest turns to fiery embers (above) to make way for a cornfield. Just how much damage can this ecosystem sustain and still recover, as it did after the Maya farmed here centuries ago?

Questions like this are being raised all over the earth. To help answer them, an ambitious experiment was recently undertaken in Belize. Three advanced remote-sensing devices were flown over the forest on NASA research aircraft to develop new ways of examining landscapes.

The devices, designed by Caltech's Jet Propulsion Laboratory (JPL), were used in the Tropical Rain Forest Ecology Experiment (TREE), a project supported by NASA, the Seaver Institute—a frequent contributor to National Geographic projects—and the Society. Similar sensors are candidates to go into space after 1998, when NASA plans to launch a new series of earth-monitoring satellites.

Covering an area 40 miles long by 30 miles wide, a false-color radar mosaic (right) depicts a variety of vegetation, from savanna and cleared land (deep blue) to upland broad-leaved forest (bluish hues) and lowland swamp (yellow).



JON SCHNEEBERGER, NGS STAFF (LOWER RIGHT); KENNETH GARRETT

Testing airborne sensors against rain forest reality

While airborne sensors registered data remotely, down on the hot forest floor two dozen researchers gathered ground data. Measuring and monitoring plant specimens and locations, they supplied facts against which the instruments were calibrated and the images interpreted.

JPL ecologist Reiner Zimmermann (upper right) stands at the head of the "octopus"—his name for a data recorder wired to an array of solar-charged devices scattered about a plot. The team took readings of temperature, precipitation, and water use by trees, and collected leaf and soil samples.

Weather gauges were placed a hundred feet high in the canopy by local residents skilled in scaling the tall trees to harvest chicle, an ingredient of chewing gum. "Other than ants crawling into the computer and termites eating the table legs, everything worked," said Zimmermann.

Matching ground features with radar image, Wendy Weiher, a graduate student at Duke University, notes a mound that hides a Maya structure, possibly a burial site (above). Normally, encountering unexcavated ruins would have thrilled field researchers. These were simply in the way.

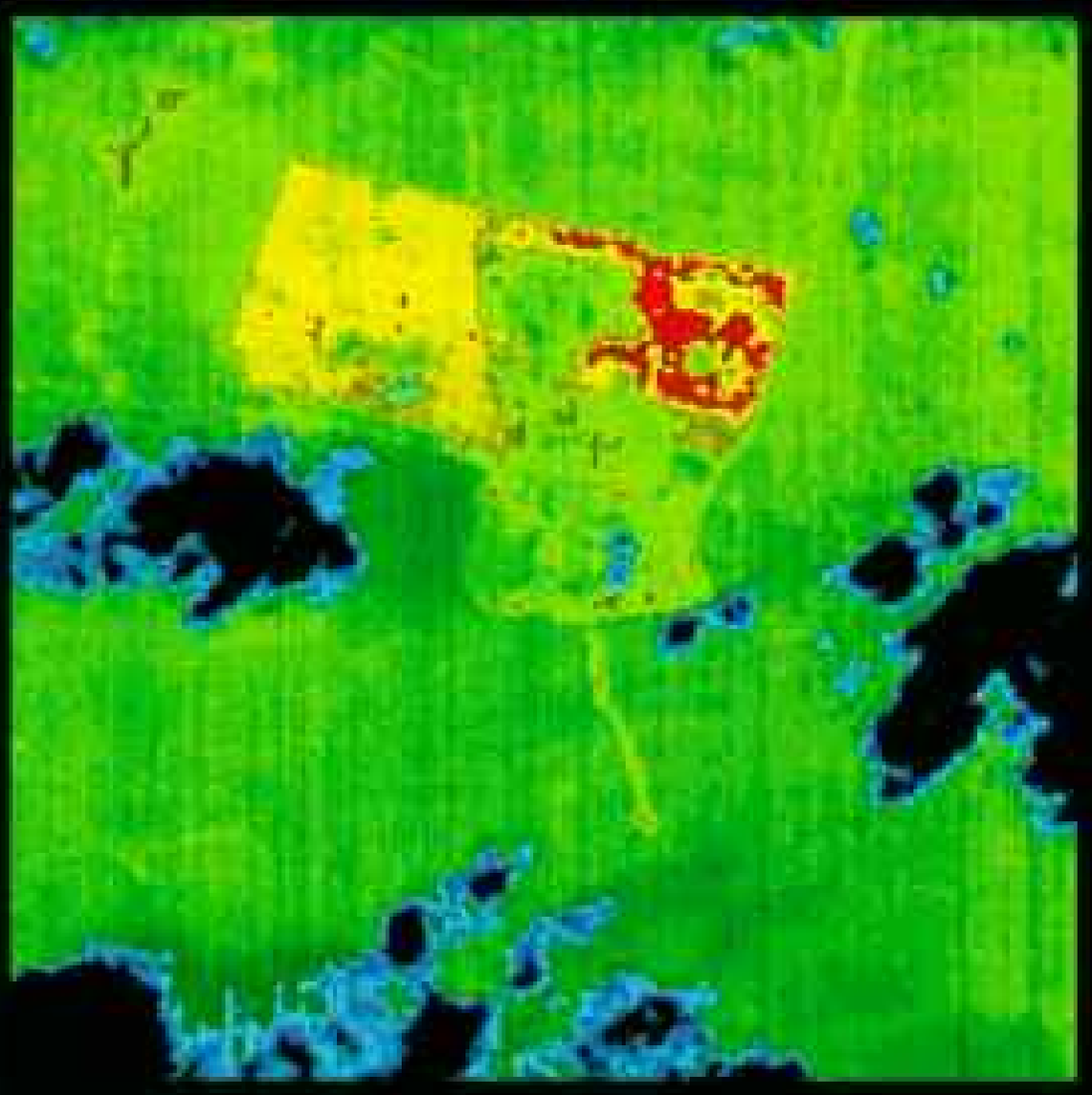
"We needed plots of pure vegetation, but everywhere we looked, we found something Maya," said Duke ecologist Ram Oren, chief scientist for TREE and designer of the ecology experiments. "Finally we had a plot that seemed right, and we began to dig for soil samples. Then we heard *clank clank*. Can you believe it? We apparently hit stones of a Maya courtyard."

Some 30,000 feet overhead flew a DC-8 research aircraft, its cabin stocked with gear (right) to operate the synthetic-aperture radar, a system powerful enough to detect standing water under the forest canopy. By correlating ground data with digital data from such sensors, scientists work toward the creation of computer programs to interpret future images.

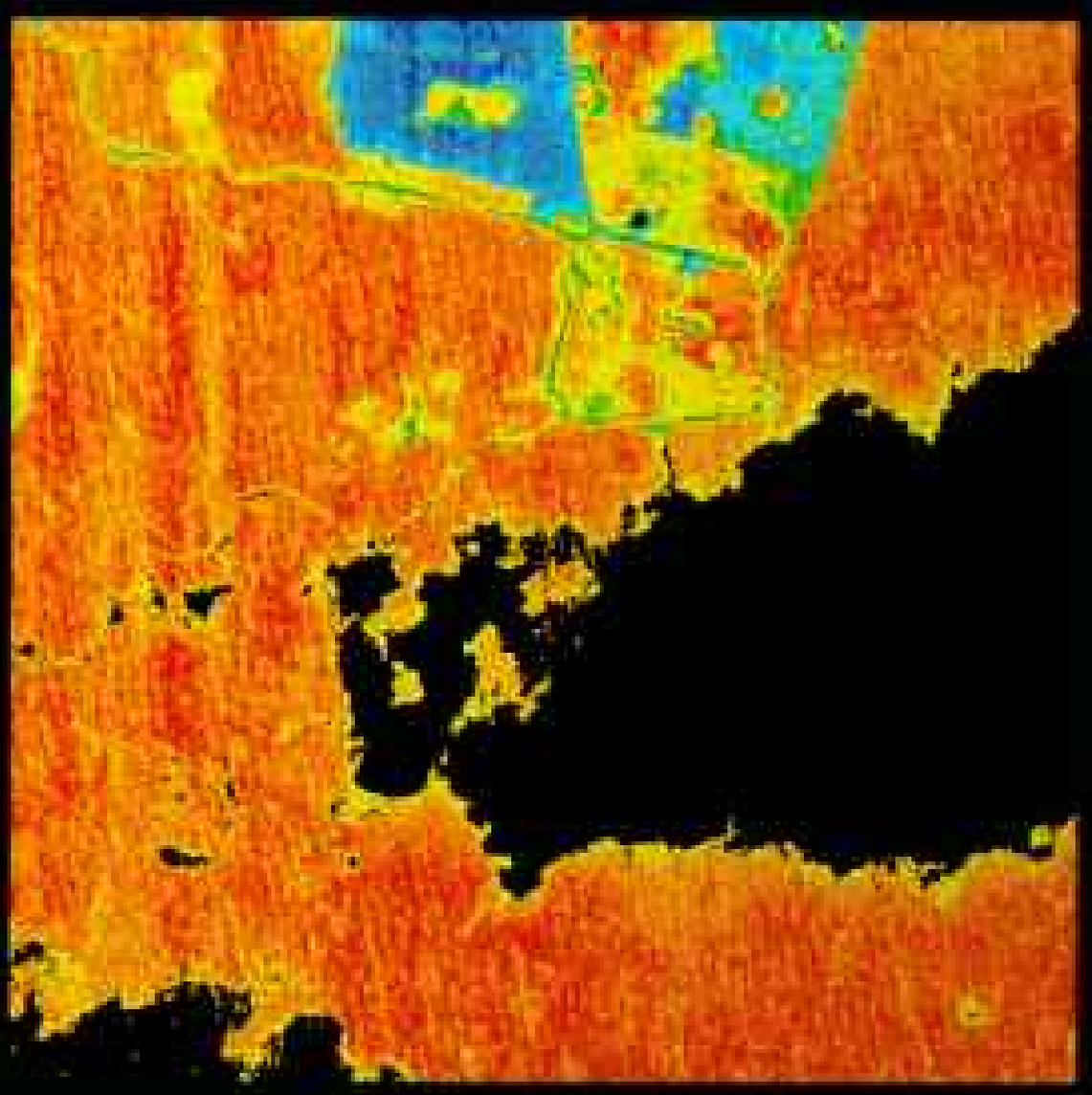
Four electronic eyes focus on a farm in the rain forest

LANDSAT
Landsat began monitoring earth's surface in 1972. Landsat 5 takes readings of reflected sunlight and surface temperature, which, when processed, distinguish forest from fields. This false-color image of 2,200-acre Gallon Jug farm in northern Belize is shown for comparison with images from TREE's newer remote sensors.

RADAR
Seeing through clouds from 30,000 feet, the Airborne Synthetic Aperture Imaging Radar (AIRSAR) gathers information from three wavelengths, providing both a relief map and a vegetation map. AIRSAR is able to detect crops under native trees, as well as fallen logs (yellow) on a recently cleared field.



THERMAL SCANNER
The cool of the canopy and the heat of cleared fields come into view from surface-temperature readings provided by the Thermal Infrared Multispectral Scanner (TIMS). TIMS picks out differences between crops (light green), areas of recently felled trees (yellow), and bare fields (red). Various shades of green in the forest reflect how much water vapor the trees pass into the atmosphere.



IMAGING SPECTROMETER
The Airborne Visible and Infrared Imaging Spectrometer (AVIRIS) registers data from 224 bands of the electromagnetic spectrum, compared with seven for Landsat. AVIRIS depicts, among other things, vegetation densities, from thick forest (reddish yellow) to cleared land (blue). Yellow indicates less vegetation, including a coffee plantation beneath the canopy.

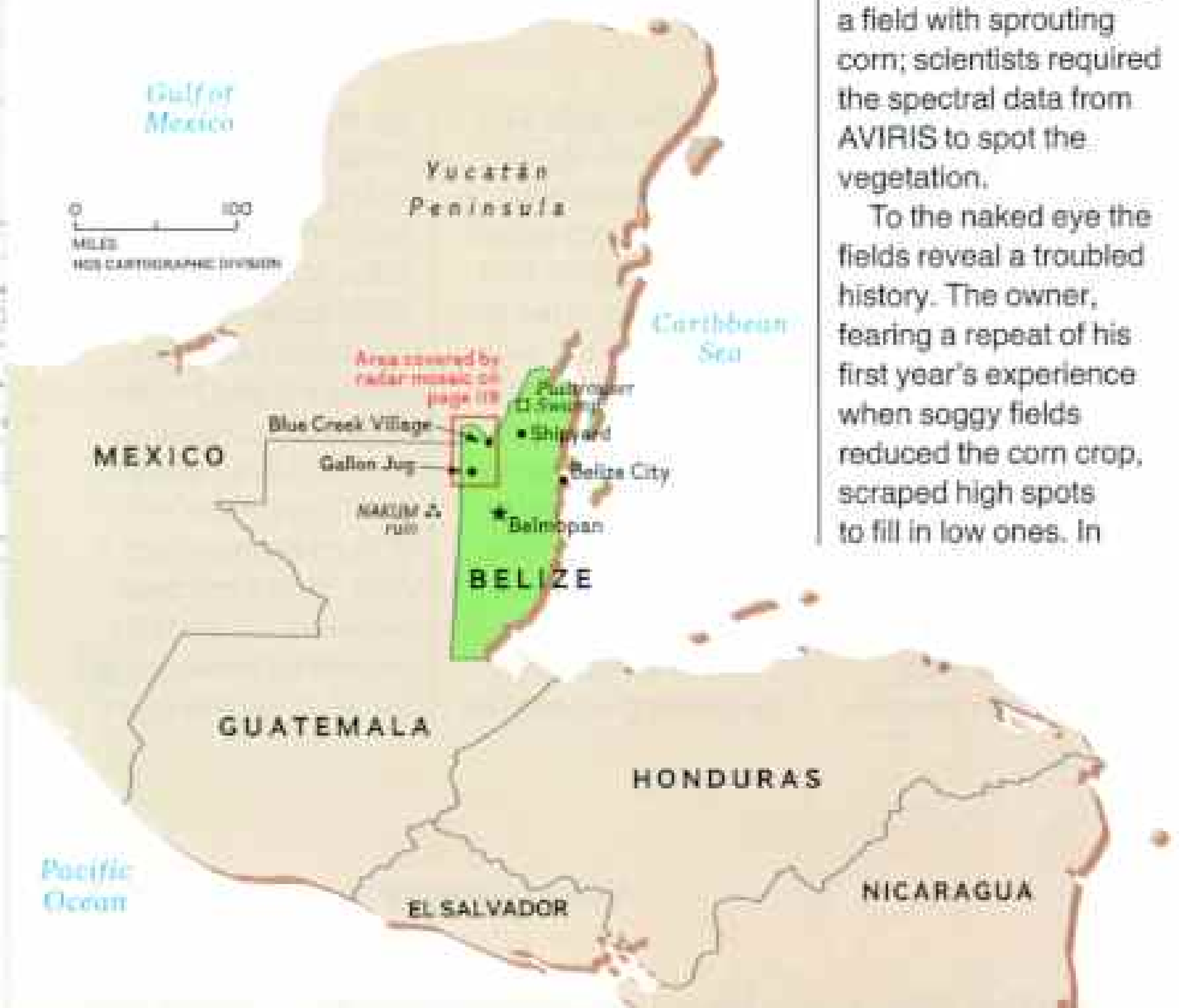
KENNETH GARRETT (ABOVE); JOHN C. STENNIS SPACE CENTER, NASA (FACING PAGE, TOP LEFT)

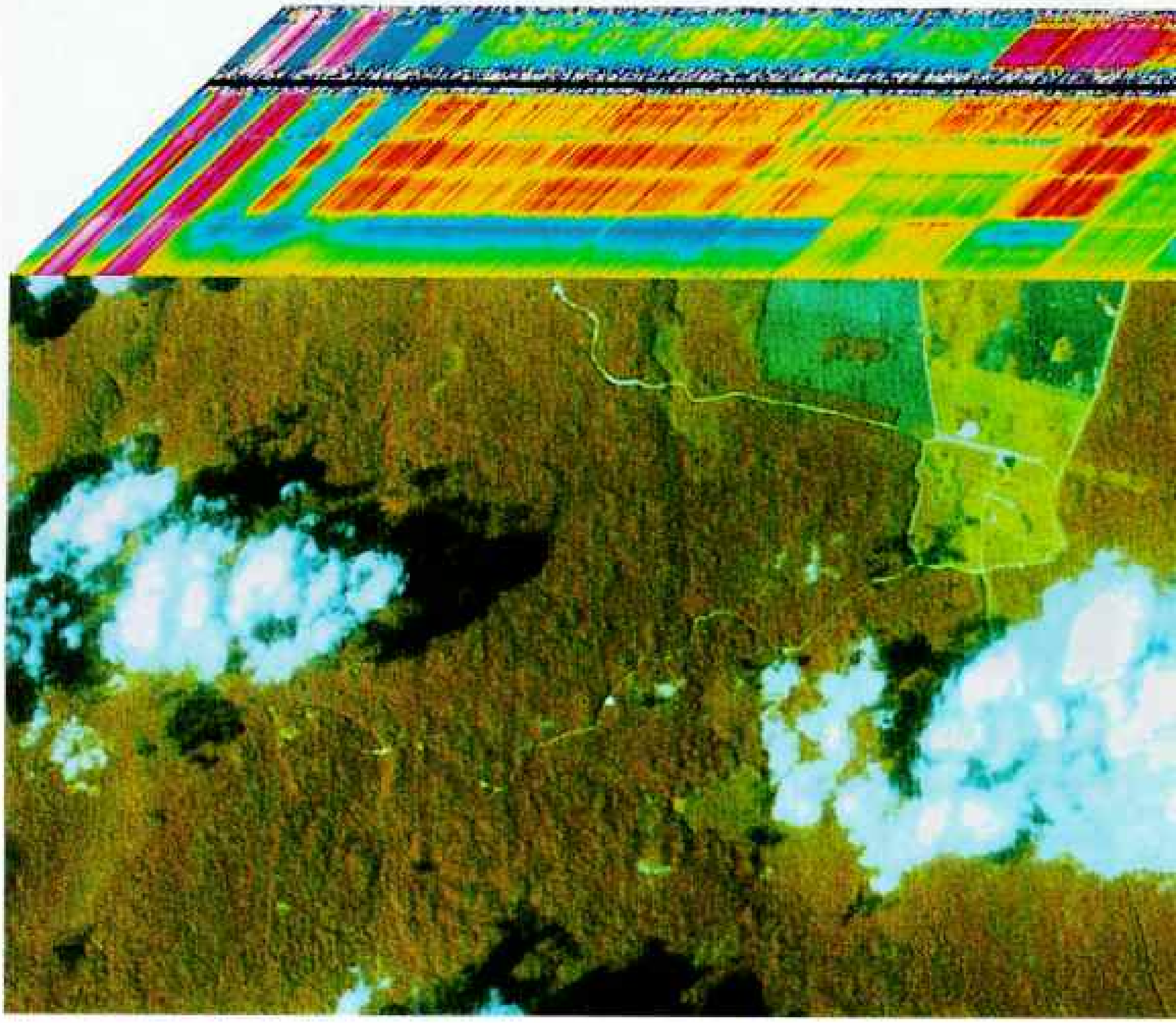
Scientists harvest data from a cleared piece of land

Seen in its true colors, the farmland of Gallon Jug, an unmistakable shape on the remote-sensing images, appears raw and naked in the midst of thick forest. The scientists chose Gallon Jug—here seen looking south—so they could compare instrument readings of the natural landscape with those of altered areas such as cattle pasture. They soon concluded that no sensor by itself provides a complete picture. The radar, for instance, could not distinguish between a freshly plowed field and a field with sprouting corn; scientists required the spectral data from AVIRIS to spot the vegetation.

To the naked eye the fields reveal a troubled history. The owner, fearing a repeat of his first year's experience when soggy fields reduced the corn crop, scraped high spots to fill in low ones. In doing so he bared large patches of infertile limestone. Ideally, farmers could take advantage of remote-sensing images to identify areas for farming that would be more easily worked and have less impact on the environment.

The TREE study area—a region of forest, swamp, and savanna in northwestern Belize—is part of the most extensive rain forest left in Central America. It is not virgin forest. To feed a large population, the Maya cleared most of this area, which is filled with signs of their presence. Sponsors of the TREE project were curious as to whether the airborne sensing devices could detect undiscovered ruins beneath the canopy. So far, any ruins have stayed hidden.





Multilayered, multicolored stack of spectral data

A treasure chest of information awaits scientists analyzing images produced by AVIRIS, the new multispectral sensor. The instrument scanned a five-by-ten-mile swatch of land across Gallon Jug farm. AVIRIS separates sunlight reflected from the surface into 224 wavelengths across the electromagnetic spectrum. Processing the data, TREE project head Gregg Vane and his team at JPL produced a stack of 224 images, rather like a deck of cards where each card represents a single spectral band.

Since materials have spectral signatures, based on their chemical composition, scientists can match the signatures to specific plant properties, such as the chlorophyll, lignin, and water content of leaves, and infer how the vegetation will respond to changes in its environment. Thus data about plant chemistry can be gathered from regions too large or remote to allow ground surveys.

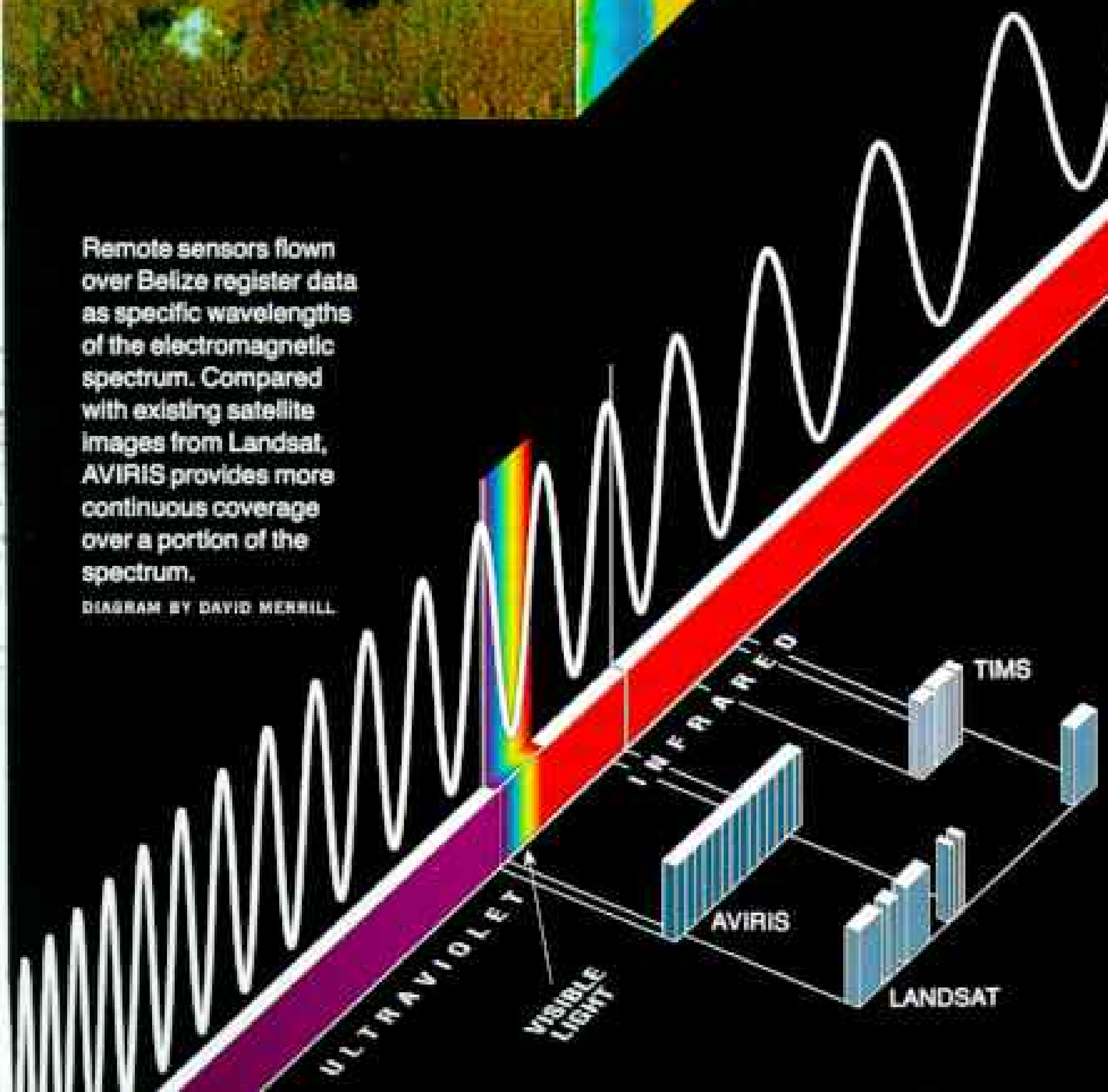
The JPL team and cooperating universities are working to devise computer programs that will rapidly access the information embedded in the AVIRIS data. While some programs are already available, others will take months or years to complete.

"Yes, it is a treasure box," says Ram Oren about the unabridged data, "and it has been unlocked, but we have more to do before we get the lid all the way open."

Extracting data from various combinations of 224 spectral bands, scientists generate false-color images from AVIRIS, each one depicting different vegetation properties.

Remote sensors flown over Belize register data as specific wavelengths of the electromagnetic spectrum. Compared with existing satellite images from Landsat, AVIRIS provides more continuous coverage over a portion of the spectrum.

DIAGRAM BY DAVID MERRILL



KENNETH GARRETT (ABOVE); MIGUEL FAIRBANKS

When rain forest is turned into wide-open spaces

Clear the forest, and the result looks like Kansas. In a land of jaguars, toucans, and venomous fer-de-lance snakes, a scarecrow (lower right) guards against garden variety creatures—blackbirds and woodpeckers—as it presides over sorghum in the Mennonite community of Shipyard.

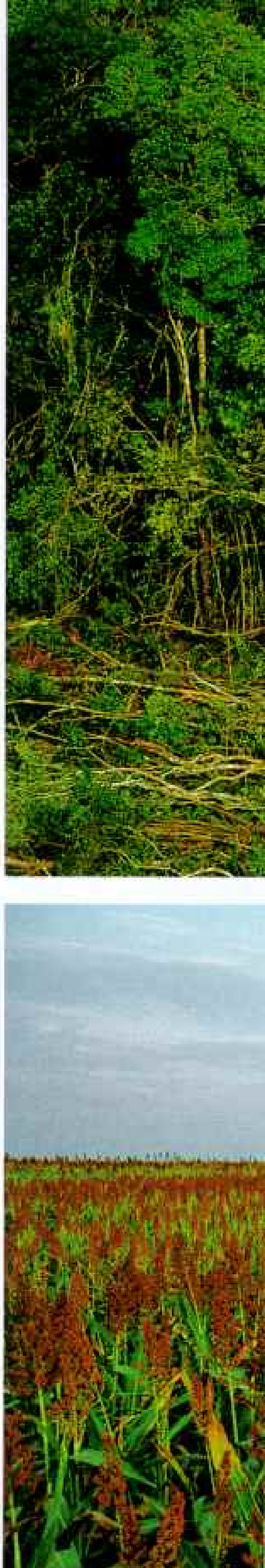
Mennonites have become the leading farmers of Belize. Members of the German-speaking Protestant sect began immigrating here in the late 1950s, arriving from Mexico, Canada, and the United States in search of land. Highly industrious, they have transformed large blocks of rain forest into farms and dairies.

Often persecuted in other countries for their refusal to serve in the military, Mennonites were welcomed in Belize. Their farms provide the country with the bulk of its poultry, eggs, and animal feed. Though conservative settlements like Shipyard still favor horses and buggies, when it comes to cultivating the earth, only machines will do.

Bulldozers crunch down the trees (upper right) to keep pace with the commercial demand for crops as well as the needs of their own population, now estimated at about 7,400. A radar image of northern Belize from 1978 showed only one percent of the land cleared. In 1990 a TREE image showed 10 percent.

"Right now we're sprinting against the Mennonites to buy land," says a consultant for the Río Bravo Conservation and Management Area, a 202,000-acre wilderness preserve in two parts north and east of Gallon Jug. "We need to connect our two blocks to provide wildlife corridors. Otherwise we'll have a fragmented ecosystem."

Clearing land is no guarantee of success in the rain forest, where thin topsoil requires heavy use of fertilizer. In addition, farmers must deal with insect pests. At Gallon Jug the owner, a businessman from Belize City, combated a moth infestation in his cornfield with repeated dustings of pesticide (above).



Rooting out a water problem: cut trees and sealed soil

While verifying information provided by images from the TREE project, ecologist Oren (above left) soon found himself in the dirt in search of answers to a perplexing question: Why do fields flood in northern Belize when the trees are gone?

The answer lies partly in the soil, says Oren, who points to cracks in a test pit made on Gallon Jug farm. A clay soil, it swells shut when wet and blocks drainage.

That's not a problem in unaltered rain forest, where the canopy acts like a cupped hand. Much of the rain evaporates directly from the leaves. Rain that does reach the forest floor is absorbed by trees and recycled to the air through transpiration, or it runs off into seasonal swamps called *bajos*.

In the dry season—January to June—the trees continue to pump moisture up from the ground, causing the clay to dehydrate and shrink. The soil cracks, and any surplus rainfall drains through to the underlying limestone. The region, including most of the bajos, dries out.

When the trees are cut, this self-regulating system breaks down, Oren says. Water collects on the surface, flooding fields and drowning tree roots in the bajos. Without the trees to pump water from the soil, vertical drainage is impaired even in the dry season.

To eliminate standing water, Mennonite farmers of the Blue Creek community use an excavator to dig a channel along a field (right), which will be leveled and

MIGUEL FAIRBANKS (BELOW); KENNETH GARRETT

corrugated with narrow drainage ditches. This diverts water from the field to low-lying forest, bajos, or streams.

Despite extensive drainage work, the owner of Gallon Jug farm found himself stuck when heavy rains fell before he could harvest his corn crop (above right). With the corn in danger of rotting, workers had to collect ears by hand and carry them to the mired combine.

MARTY COOPER (TOP); MIGUEL FAIRBANKS

A rise in sea level and the subsequent high water table may have forced these ancient farmers to gradually abandon the land.

Inland on the Yucatán Peninsula, an area prone to acute seasonal droughts, the Maya found it necessary to conserve water. An ancient reservoir brims with water at the Nakum ruins in Guatemala, near the Belize border.

Now the latest crop of farmers have arrived to bend the land to their use. Whether their efforts are short-lived and destructive or sustaining and beneficial may ultimately hinge on how well the dynamics of the rain forest are understood. The new class of remote sensors will surely help. □

Lessons learned by the Maya

A patchwork of fields and ditches, still visible after more than a thousand years, marks a site where Maya grew corn and possibly cotton in northern Belize's Pull-trouser Swamp. Drawn to the rich organic soils, the Maya dealt with waterlogged fields much as their successors do, by digging a web of drainage ditches. Excavations reveal that the Maya farmed these wetlands, some 15 miles from the coast, much earlier than once believed—during the Preclassic period of 2000 B.C. to A.D. 250.

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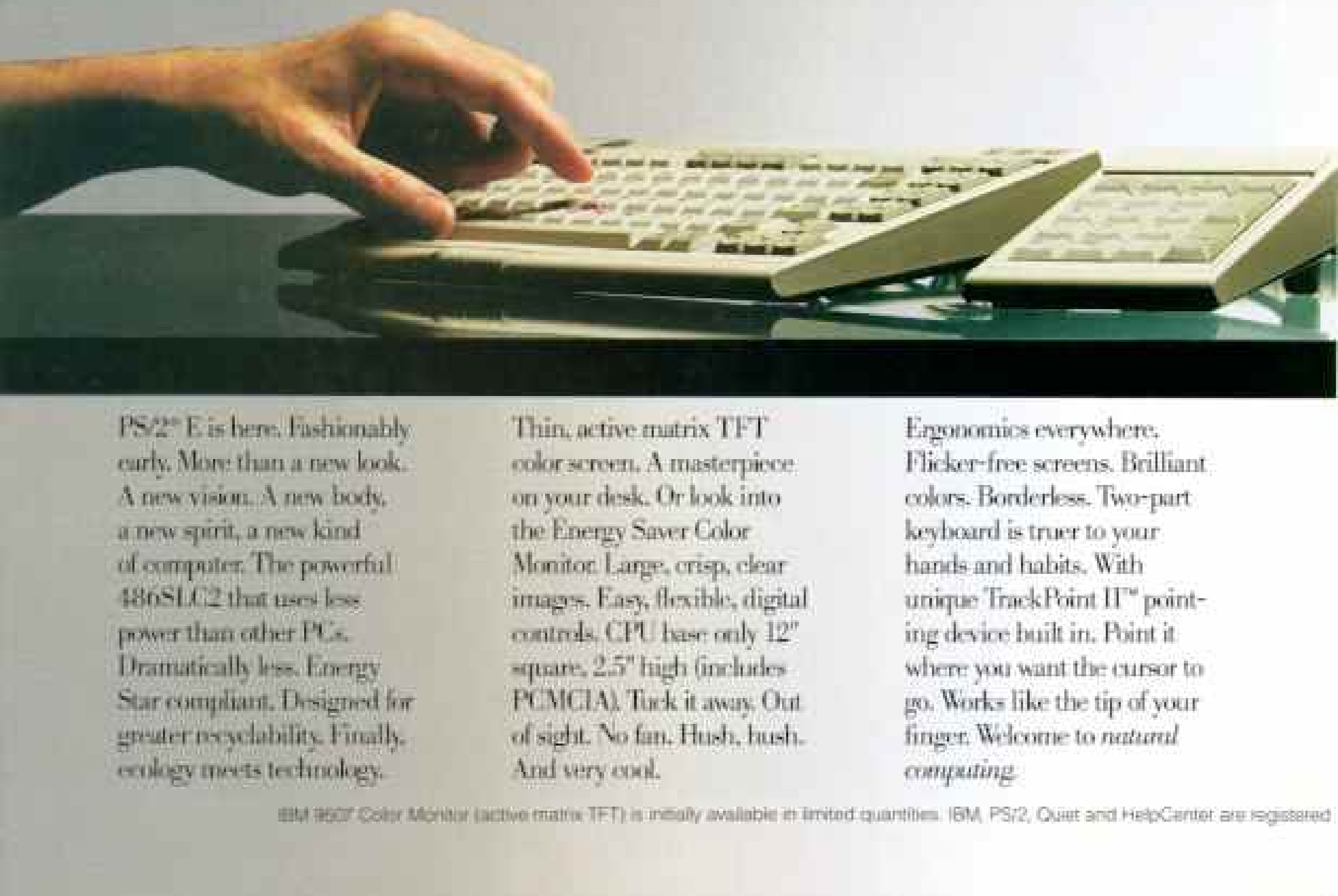

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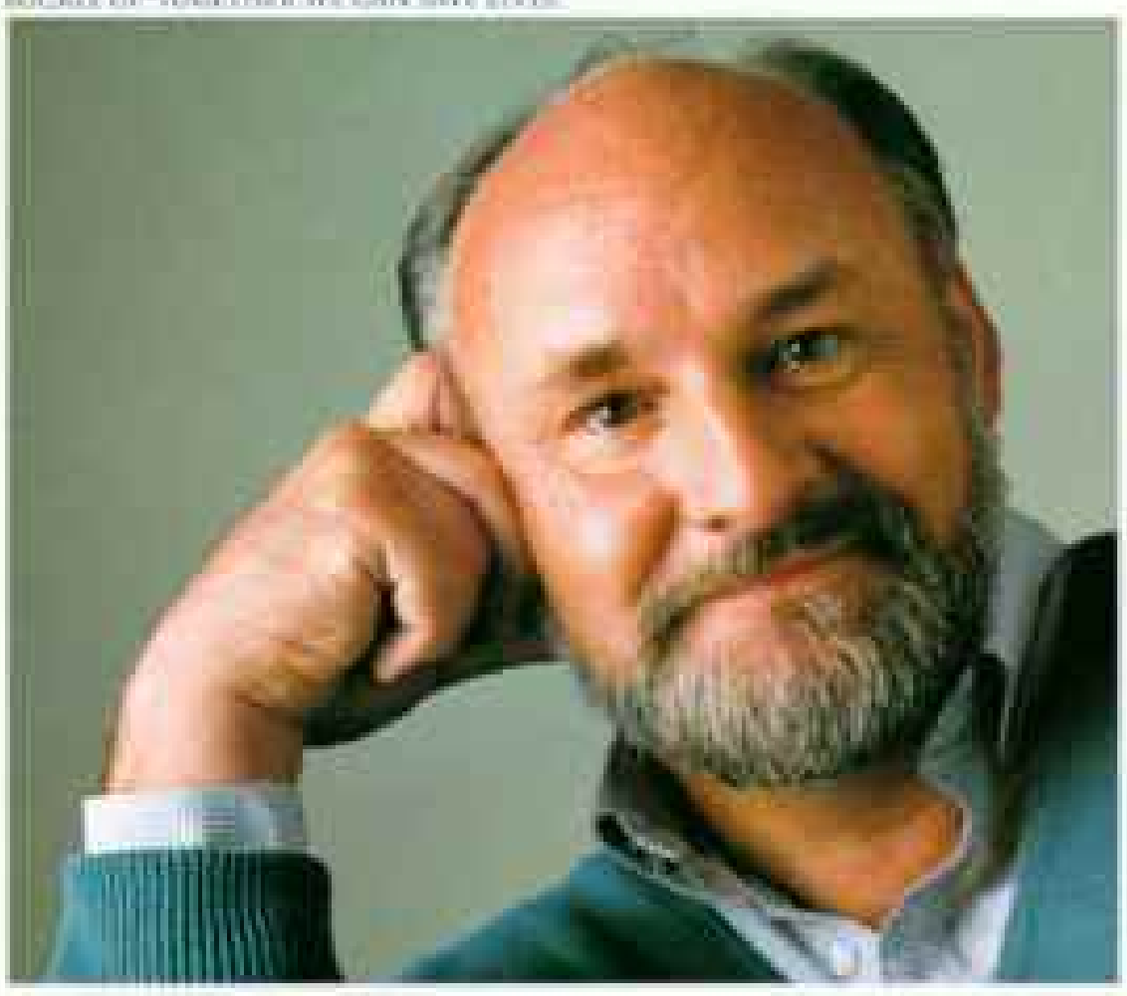

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Report from the President

SUSIE BRINBERG (ABOVE); NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH H. LAVENBURG

Geography Students Get a Lesson in Fun

"We don't do normal things in here," says ten-year-old Amber Evans of her geography class. Thank goodness—otherwise she and her Cairo, Georgia, classmates might never have created their 25-panel quilt illustrating the five themes of geography.

Certainly Amber's geography teacher Dany Ray has taken a colorful approach to the subject. It's just one example of how youngsters are finding new excitement in geography.

The third and fourth graders pictured above holding the quilt—Amber is on her teacher's left—did most of the illustration work. Students in other grades helped put the quilt together. For those who need a quick review of geography's five themes, this sampling of quilt panels, clockwise from left, shows: MOVEMENT (a hot-air balloon), PLACE (a map of Florida), LOCATION (a neighborhood street with mailboxes and addresses), REGION (bright-hued fish representing the oceans), and HUMAN INTERACTION (a city encroaching on farmland).

Teachers everywhere are finding delightful new ways to teach geography. Students paint huge United States maps on their schoolyards. Some 450 classes, participating in a contest sponsored by the Society's children's magazine, WORLD, have for two years running created their own globes—one of them large enough to climb inside.

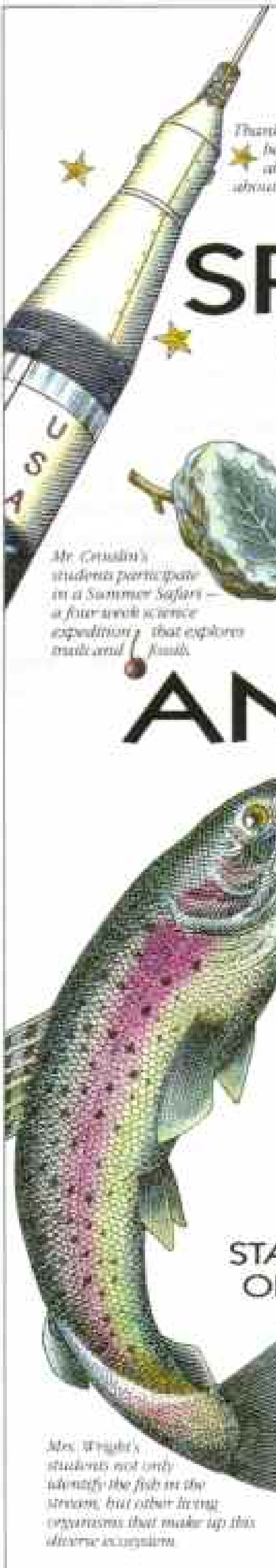
"Approaches like these really develop enthusiasm for geography," says Ray, who has participated in Society teacher workshops in Georgia and Washington, D. C.

For proof of her assertion, just ask these rural farm community grade-schoolers to name their favorite places on earth. No theme parks here: Their answers range from New Zealand and Madagascar to Ireland and the Arctic.

Or better yet, chat with nine-year-old Ivy Rieger. "When I grow up, I want to explore the world," she declares. "I want to see what's out there."

Gilbert M. Grosvenor

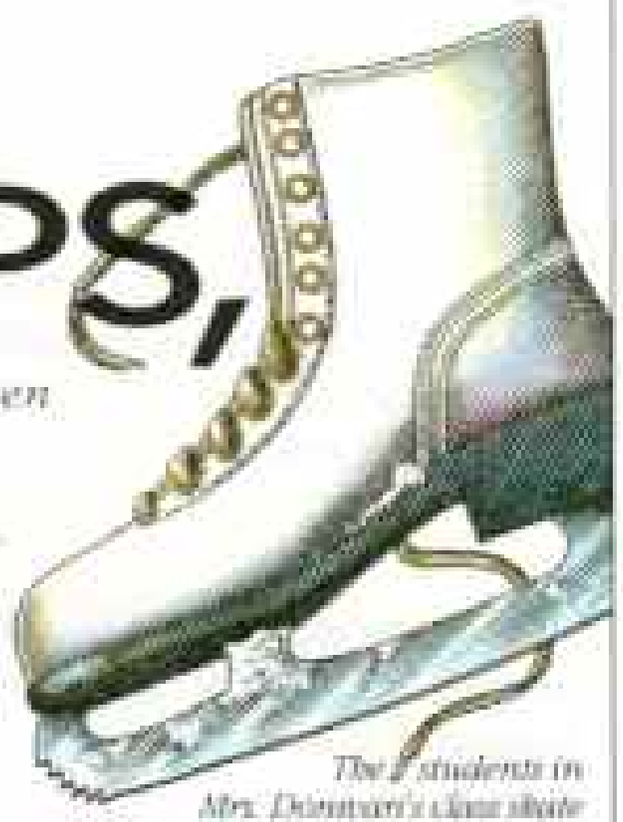
National Geographic, September 1993



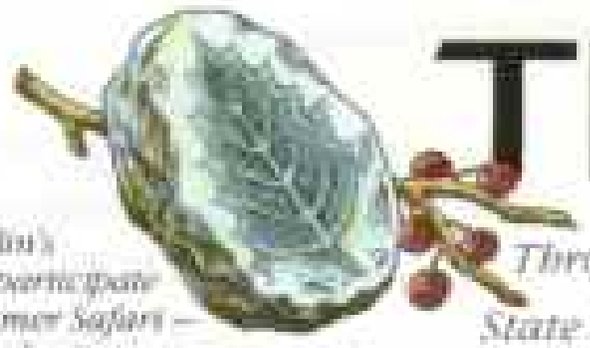
Thanks to Mrs. Blume's interest in flight, her students channel their excitement about flying into an excitement about science.

SPACESHIPS,

These six enterprising teachers, from kindergarten through high school, have found a better way to help further the cause of quality education.



TRAILS



Mr. Cressler's students participate in a Summer Safari — a four-week science expedition that explores trails and fossils.

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The 3rd students in Mrs. Dolman's class relate through science as well as Newton's Laws of Motion.

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In Bob Burch's class, students use frisbees to learn about the principles of physics.

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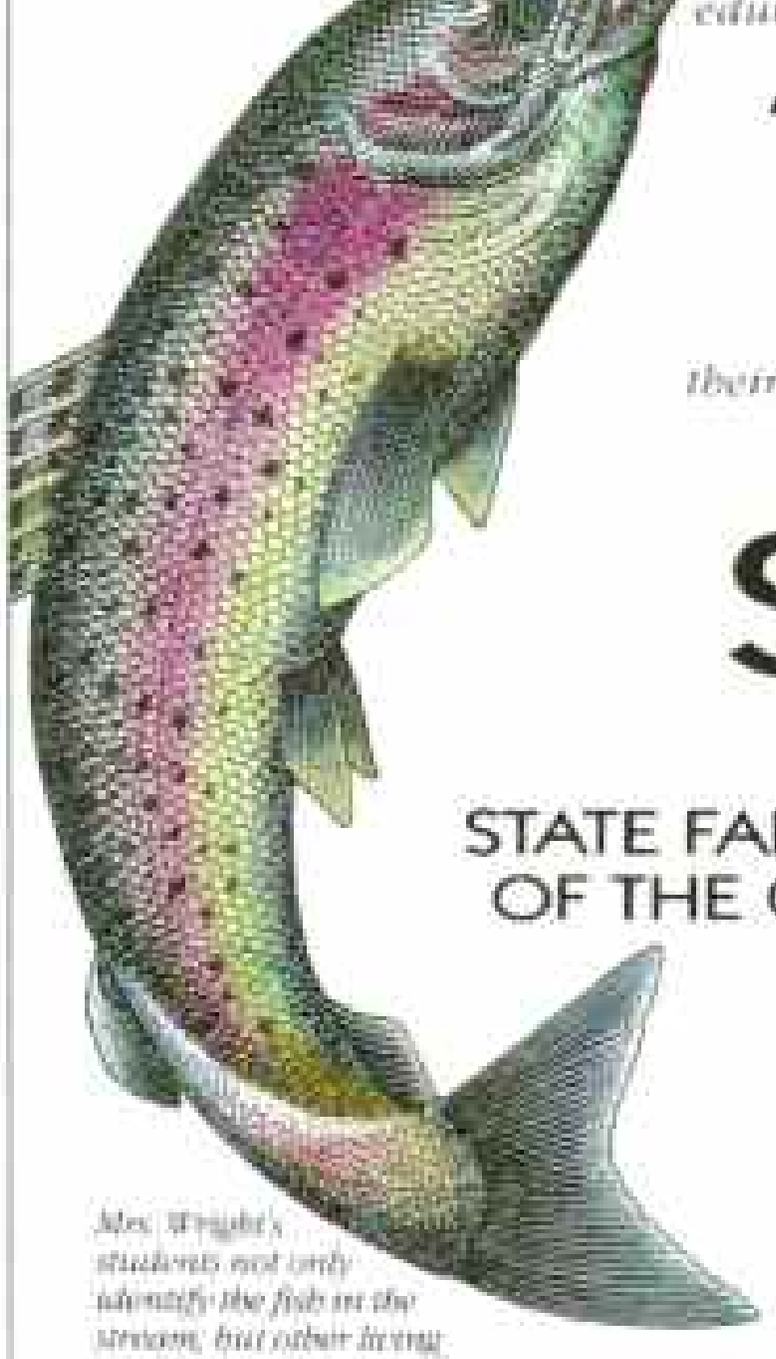

Mrs. Wright's students not only identify the fish in the stream, but other living organisms that make up this diverse ecosystem.

Cindy Dixon's students learn how collecting live specimens can help them study the ecology of the Delaware Bay.

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Central Park

I really enjoyed Joel L. Swerdlow's article (May 1993), which finally dismissed Central Park's reputation as a crime-infested rathole and showed how beautiful it really is.

AGUSTIN SILVANI
Potomac, Maryland

Although circumstances have placed me in Pacific Grove, California, a place some think the most beautiful in the world, I sometimes achingly miss New York and especially "my" park. For six years I lived on West 82nd Street. From the New Year's Eve parties at Bethesda Fountain during John Lindsay's mayoralty to jogs around the reservoir and picnics with my community center kids from Harlem near 110th Street, I miss it all.

JUNE MALAMENT
Pacific Grove, California

It has long been usual to give top billing to Frederick Law Olmsted with only a mention of his partner Calvert Vaux as codesigner of the park. Yet Vaux was the partner with professional training in architecture, the plan was drawn in his office, and he was responsible for most of the original architecture, including graceful Bow Bridge (pages 18-19).

Many blacks who enjoy the park today may not realize that Vaux's principal assistant, Jacob Wrey Mould, was of part-African descent. That discovery was made recently by London historian J.M.L. Booker. Mould's naturalistic carvings on the Bethesda Terrace are now considered "a major achievement of Ruskinian Gothic ornaments." Mould's ancestry should give added interest to the contemplated restoration of the glazed tiles he designed for the Bethesda Fountain area.

ARTHUR CHANNING DOWNS, *President*
Downing & Vaux Society
Newtown Square, Pennsylvania

Middle East Water

The informative article contained a statement that warrants further discussion: "When nations share the same river, the upstream nation is under no legally binding obligation to provide water downstream."

The idea is comparable to the infamous Harmon Doctrine of the 1890s, which stated that the U. S. could do what it pleased with the Rio Grande, irrespective of downstream consequences. That doctrine was universally criticized and later was repudiated by the U. S. in a dispute with Canada over the Columbia River, in which the U. S. found itself in the downstream position.

Precisely because of tensions surrounding international water resources, the UN International Law Commission in 1991 adopted a set of 32 draft articles on the subject for consideration by member states. Article 5 provides that all states sharing an international watercourse have an obligation to use it in an equitable and reasonable manner. And according to Article 7, all states have an obligation not to use an international watercourse in such a way as to cause harm to other states sharing it. Virtually all experts agree that these rules codify already existing international legal obligations. As part of "customary international law," they are not dependent on treaties.

STEPHEN C. MCCAFFREY
McGeorge School of Law
University of the Pacific
Sacramento, California

One should recall that on January 13, 1964, a summit of Arab leaders in Cairo decided that in response to Israel's National Water Carrier [tapping the Sea of Galilee], the Arabs would divert the sources of the Jordan River in their territory. The National Water Carrier was opened in 1964, and the Syrians started to prepare diversion ditches. In 1965 the Lebanese joined in. Later that year Israeli artillery and tank fire damaged the heavy equipment used in the diversion. In 1966 Israeli warplanes destroyed the equipment, and the Syrians abandoned diversion efforts. Miles of diversion ditches can be seen in the Golan Heights even today.

A. BASSIS
Haifa, Israel

While author Priit J. Vesilind accurately describes Israel's superior water-management techniques, the photos and caption on pages 66-7 present an unfair juxtaposition of a beautiful Israeli swimming pool and an ancient well used by Arab villagers. Hundreds of Arab villages are integrated into the Israeli system and are thriving.

DOUGLAS BAUM
Ottawa, Ontario

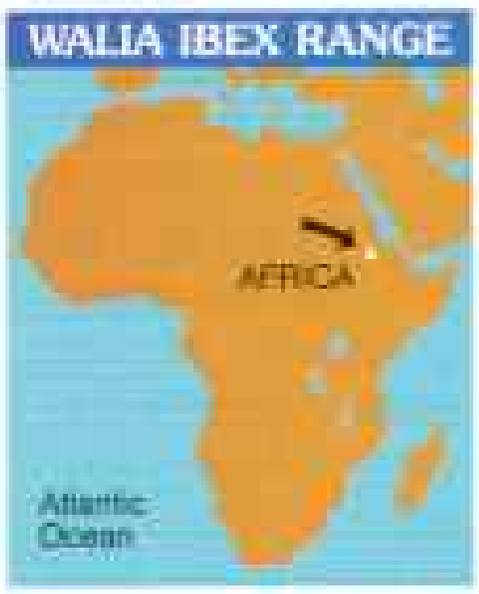
On the map (page 52) red hatching that shows "rain-fed aquifers" stops for unexplained reasons at the latitude of Beirut in Lebanon. Yet rain-fed aquifers extend north, of course, all over the Mount Lebanon range and into coastal Syria.

MICHAEL F. DAVIE
Monthazon, France

U. S. Beekeepers

In 1945-46 I was station manager for Eastern Airlines at Albany, Georgia, the center of a large beekeeping industry. Looking for potential cargo, I learned of the pollination industry, which was shipping bee colonies to Michigan fruit growers by

WILDLIFE AS CANON SEES IT



Walia Ibex
Genus: *Capra*
Species: *walie*
Adult size:
Length, 130 – 160 cm;
height, 80 – 110 cm
Adult weight: 30 – 110 kg
Habitat: Afro-alpine vegetation in the Simien Mountains of Ethiopia
Surviving number:
Approx. 200
Photographed by
Bernhard Nievergelt

Walia ibex roam the dramatic precipices of Ethiopia's rugged mountains. Legends trace their ancestry to the Near East, the species having migrated to the African continent thousands of years ago. Today, a small population survives precariously on a mountain range surrounded by villages. Despite protection within this national park, agricultural encroachment and poaching continue to threaten the walia ibex. To save endangered species, it is essential to protect their habitats and understand the vital role of each species within the earth's ecosystems. Color images, with their unique ability to reach people, can help promote a greater awareness and understanding of the walia ibex and our entire wildlife heritage.

rail, a three-day trip. We tried filling the rear compartment of a DC-3 with packages of bees and making delivery in about 12 hours. The next year we doubled the quantity and connected with a DC-4 cargo plane in Atlanta. The shippers loved it, as they could extend the shipping area to reach midwestern alfalfa and clover. Unfortunately the crews and passengers did not like the idea, and the experiment failed.

L. G. Schaefer
Charleston Heights, South Carolina

My father was a specialist in queen bee rearing and, with two of my brothers, established the Bessonet Bee Company, which sold queens and bees to northern beekeepers before World War II. Working with bees is tough, hot, and painful work, but it's worse at night when bees move out like ants and crawl up your legs.

If government policy forces beekeepers out of business, agricultural productivity will suffer. The extensive use of chemicals has killed off most of the wild bees in areas needing pollination.

Elwood E. de Bessonet
Baker, Louisiana

Does anyone else think it's bizarre to transport bee hives thousands of miles every year because farmers have killed off local pollinators with pesticides? I think the answer is not to subsidize beekeepers but to promote sustainable agriculture and eliminate the use of pesticides. That way, no matter where a farmer is, he won't have to worry about importing pollinators. If he grows it, they will come.

Paul W. Birkeland
Toppenish, Washington

Immigrants to Europe

"Europe Faces an Immigrant Tide" is very interesting, especially as I am currently reading Thomas Pakenham's *Scramble for Africa: The White Man's Conquest of the Dark Continent from 1876 to 1912*. Europeans forget their recent past. They had no problem colonizing the far reaches of the globe, supplanting the local cultures, oppressing the inhabitants, and exploiting resources to the hilt for their own economic gain. Now we have a reverse colonization by individuals seeking economic relief and escape from oppression. Shouldn't Europeans allow those they used to exploit an opportunity to better their lives? Isn't it only fair that they allow their cultures to be altered and possibly improved by the additions? Maybe this is a step toward making a global "community."

Richard Mendell
Ventnor, New Jersey

Few would argue against the fact that peoples of Africa and Asia had the right to throw out European colonists in the name of national self-determination and in defense of their people and culture. If this is so, then the peoples of Europe also have the right to struggle against and expel the alien millions.

Bruce Blomberg
Bowie, Maryland

As a first-generation German American who had to endure a share of anti-German sentiment while growing up in America, I take exception to the idea of Germans undergoing sensitivity training to improve cross-cultural rapport. With what we hear on the news every day, it appears everybody could use some of this training.

Barbara Peitzmann Ellis
Fair Oaks, California

Don't overlook Portuguese migration. Nearly 650,000 Portuguese live in France and about 85,000 in Germany. I'm told you hear Portuguese more than any other language on the streets of Geneva. Portugal itself after the 1974 revolution received almost a million people from former colonies. This represented nearly 10 percent of our population.

João Eduardo Cabral
Porto, Portugal

Asylum seekers receive the same social security in Germany as the German poor, which means more money than any other country pays for their refugees and asylum seekers. For most Germans, I think, the problem is not xenophobia or neo-Nazism; it's just the question of how many more social-benefit receivers we can take until German social achievements and her economy crumble.

Gerd Breternitz
Syke, Germany

The immigrant tide facing this young democracy is interesting and important. Immigrants think of the Czech Republic, Poland, and Hungary only as transit routes. Some 10,000 immigrants from the former Yugoslavia are now in the Czech Republic, and more than 29,000 abortive illegal attempts to cross into Germany have occurred during the first five months of this year. There are whole families with no money or homes. The intensity of their desperation can be seen in the abandoned babies found by border police in the forest: Illegal penetration of the border is not possible with crying babies. There are also deserters from the Serbian army who would be shot if they were to return. The situation is complicated by Germany's ratification in May of a new law that provides for the return of asylum seekers emigrating from such "safe states" as the Czech Republic, Hungary, Poland, and Slovakia.

Otakar Pluhař
Prague, Czech Republic

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††MSRP 1993 Crown Victoria LX with PEP 114V excluding title and tax. Cash back not available on models with PEP 114V. See participating dealer for details.

HAVE YOU DRIVEN A FORD LATELY?

Ford

Geographica

BJELL OVE STORVIK

Not So Wild a Dream: Skiing Solo to the Pole

Sitting in a business meeting last year, Oslo attorney Erling Kagge daydreamed of skiing to the South Pole—alone. A few months later he fulfilled his fantasy.

Kagge's was no idle fancy: he and another Norwegian had skied, unassisted, to the North Pole (NATIONAL GEOGRAPHIC, March 1991). Still, the idea of a solo trek across Antarctica, hauling 264 pounds of food and gear on a sledge for 800 miles over mountains, through howling winds and minus 31°F temperatures—well. . . .

"I had big doubts before I went," Kagge admits. "But when I was there, I felt fairly confident." He averaged 17 miles daily on the 50-day trip from Berkner Island on the Weddell Sea. Munching a diet of dried meat, raw bacon, oatmeal, and chocolate, he downed 6,000 calories a day. He took books—Oscar Wilde, J. D. Salinger, and fairy tales—but no radio receiver or extra clothing. He beamed his location via satellite to family and friends.

Kagge skied into the U. S. base at the South Pole on January 7, 1993. "They had never seen anyone come in alone before," he declares with a chuckle.

Historic Russian Enclave Seeks Future Riches

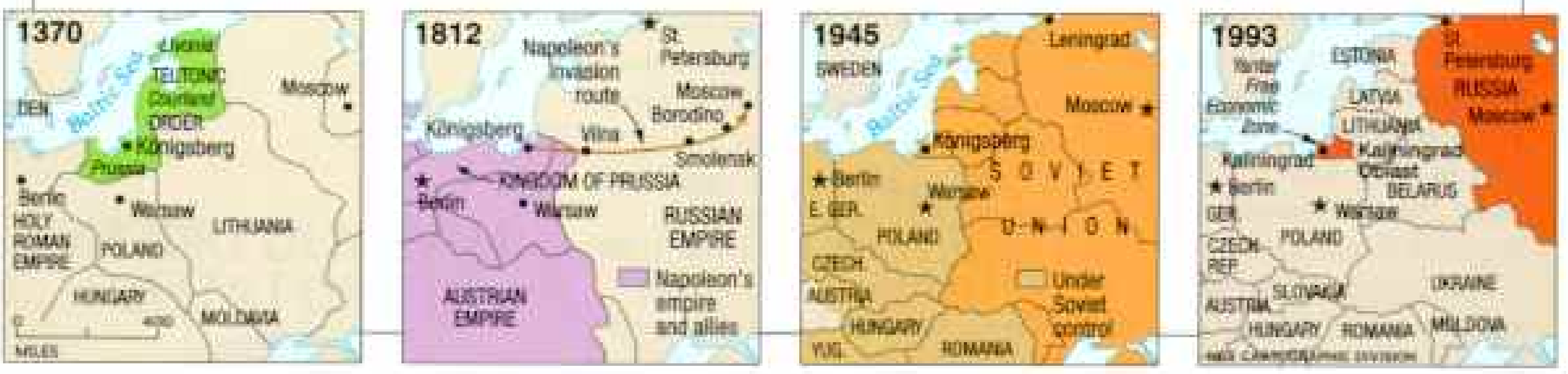
Separated from the rest of Russia by Lithuania and Latvia, the Connecticut-size oblast of Kaliningrad harbors hopes of eventually becoming the Hong Kong of the Baltic Sea.

The region's chief city, earlier known as Königsberg, spread from a fortress founded by Teutonic Knights in 1255. Within a hundred years it had become an important trade center for merchants of the Hanseatic League. Later a major city in the Kingdom of Prussia, it gained fame as an intellectual center, home of philosopher Immanuel Kant.

The area was trampled by Napoleon's army on its way to and from Russia in 1812. During World War II, its German residents fled Soviet bombs; Stalin claimed the area at the Potsdam Conference of 1945.

Today Kaliningrad provides Russia with a major year-round ice-free port, an established transportation network, and the Baltic's largest fishing fleet. Here Russia has created the Yantar (Amber) Free Economic Zone—amber has always been abundant on Baltic shores—and hopes that duty-free imports and exports and low taxes will fuel an economic boom. Already firms from Germany, Poland, and elsewhere have formed some 400 joint ventures with Russian partners, but investment is limited by political and economic instability in Russia.

Once a major military center for the Soviet Union, Kaliningrad now plays host to forces heading home from bases in formerly communist Eastern Europe.



National Geographic, September 1993

A very important half-second, though.

But while the lifesaving benefits of automotive air bag systems are well-known,

keep food fresh and safe. And shatter-resistant plastic bottles. • To learn more about how plastic can make a world of

Some Benefits Of Plastic Last For Only Half A Second.

what isn't well-known is that many components, including the bag itself, are all made of plastic. • Of course, plastic makes a lot of things safe. Like packaging that keeps medical equipment sterile. And harmful medicines out of the hands of children. Plastic wraps and trays that

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TAKE ANOTHER LOOK AT PLASTIC.

Geographica

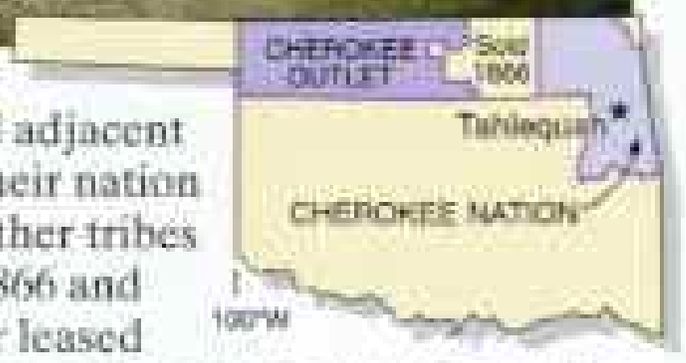
OKLAHOMA HISTORICAL SOCIETY

Land Was the Goal in Oklahoma Rush

Many call it "the most competitive race in history." But no garland of roses or medal awaited the winners, no purse of gold. The prize, a century ago this month, was cheap land in the most spectacular of the Oklahoma land runs.

The race was for the Cherokee Outlet, or Strip, a 58-mile-wide band up to 175 miles long in what is now northern Oklahoma. At noon on September 16, 1893, more than 100,000 would-be settlers set off on horses, in prairie schooners, aboard trains, even on bicycles, to vie for 42,000 160-acre parcels.

The original Outlet was ceded to the Cherokee in an 1828 treaty as a route from their territory to hunting grounds on the western plains; the western border of the United States in this region, then known as Indian Territory, ended at the 100th meridian. The Cherokee sold Outlet land adjacent to their nation to other tribes in 1866 and later leased grazing rights in the western section to cattlemen. But land-hungry farmers agitated for a federal takeover. In 1891 the U. S. paid the Indians roughly $1.40 an acre and two years later opened the land. Competitors claimed acreage by pounding in a stake. The centennial is being marked by a new stamp, cattle drives, and re-creations of the run.



Can Hunter Magic Help Treat Brain Diseases?

Deep in the Amazon rain forest, a frog, *Phyllomedusa bicolor*, secretes mucus used by Indians who believe it makes them better hunters. Something in it may one day help treat brain diseases.

The Mayoruna, who live on the Brazil side of the Javari River, and the Matses, their Peruvian "cousins," harass the frog and scrape the mucus off its skin, says Katharine Milton, an anthropologist at the University of California at Berkeley supported by the National Geographic Society. When a hunter wishes to "take frog," another man burns the hunter's skin with a hot twig, mixes saliva with the mucus, and applies it to the burns. The hunter becomes violently ill, then falls into an agitated sleep, only to wake the next day eager to hunt.

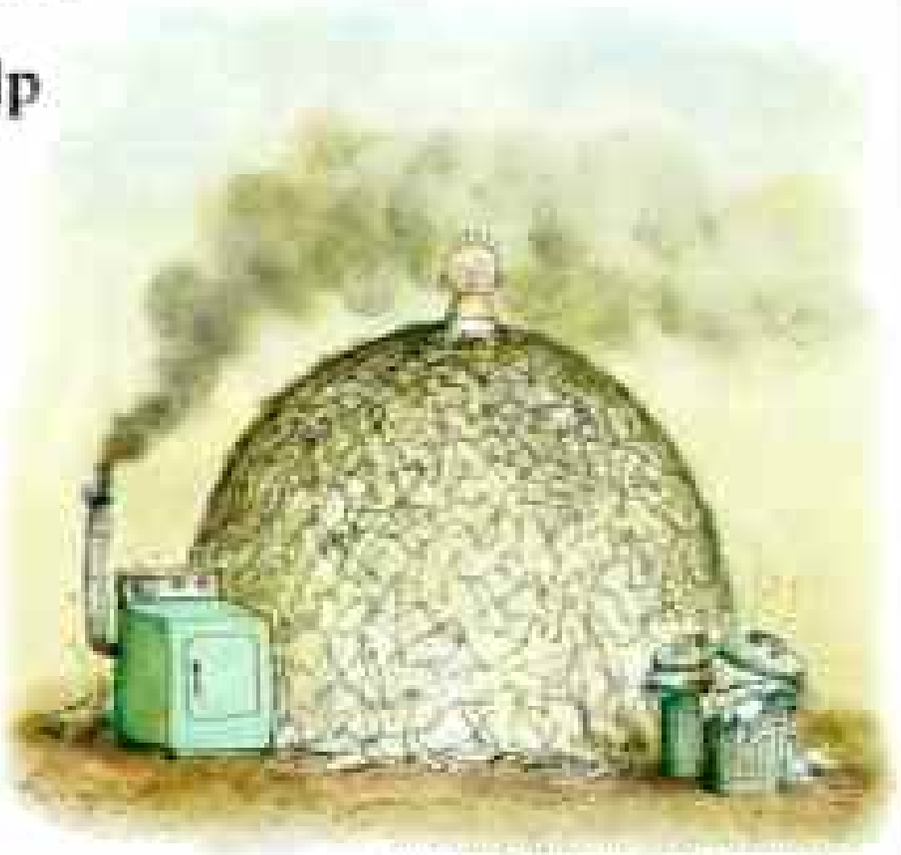
Scientists at the National Institutes of Health found that the mucus contains a peptide that enhances the action of adenosine, a brain chemical that reduces the effects of strokes and perhaps Alzheimer's disease and depression. They are studying the peptide as a possible medication.

Is Cloth or Disposable the "Greener" Diaper?

After years of mucking through landfills analyzing garbage, William L. Rathje considers the debate between disposable and cloth diapers "a wash"—neither, he says, is environmentally superior to the other. Still, environmental groups won't throw in the diaper: Many gave 1993 Earth Day awards to the reusable cloth variety, despite the energy costs involved in manufacturing and laundering them.

Rathje, head of the University of Arizona's Garbage Project (GEOGRAPHIC, May 1991), found that disposable diapers represent about 1.2 percent of a landfill's contents. That's "small potatoes," he says, compared with paper waste (40 to 50 percent) and construction debris (20 to 30 percent).

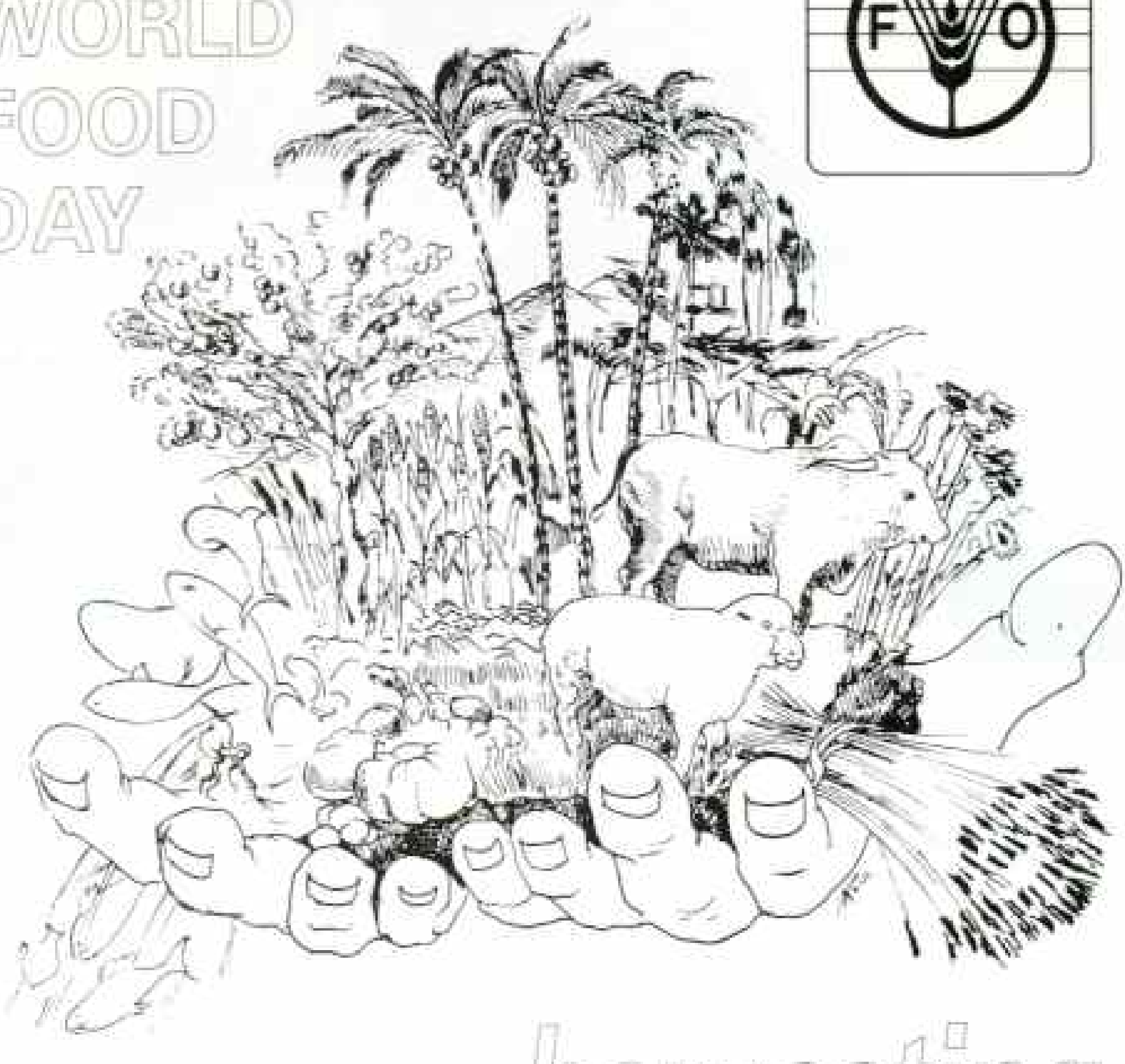
But environmentalists argue that even one percent of a landfill adds up to billions of diapers.



RICHARD THOMPSON, JANT SAUVANET, PHOTO RESEARCHERS (LEFT)

National Geographic, September 1993

October 16*
WORLD FOOD DAY



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GOODYEAR

Geographica

RAYMOND GEHMAN (ABOVE); IRA BLOCK (BELOW LEFT); STAMP DESIGNED BY PETER TROBLER

A Bubble Gum Flavor to Send Geese Packing

There's no accounting for taste: You may love the flavor of grape bubble gum or soda; some birds can't stand it. This fact may come to the rescue of landscapers, golf course managers, and anyone in charge of grassy expanses in cities and suburbs overrun by an exploding population of Canada geese. Graceful in flight, the goose is a loud, aggressive, voracious eater that can leave about a quarter of a pound of droppings a day.

The bubble gum flavor comes from methyl anthranilate (MA), a chemical that occurs naturally in Concord grapes and citrus blossoms. In synthesized form MA serves as a tasty food additive. Now it's proving to be a goose repellent.

Given a choice between untreated corn and kernels with MA, caged geese in experiments overwhelmingly rejected MA-laced kernels, says John Cummings, a wildlife biologist with the U. S. Department of Agriculture's Denver Wildlife Research Center.

Cummings is helping to develop an MA-flavored microcapsule that can be sprayed on grass and remain viable for 40 days, compared with today's limit of 15. Long-lasting MA is needed to ward off both resident birds like these (above), which live on the Yale University golf course, and migratory geese that join them spring and fall.

Pre-Columbian Finds in Jamaica

Chiefs of the Taino, the natives who welcomed Columbus to the Caribbean, carried wooden staffs surmounted by the likeness of a deity, according to the Spanish priest assigned by Columbus to study the Taino. Such symbols of office have since vanished. Now a six-foot staff and two smaller carvings have turned up—all believed to date from the 11th century.

"This is the first Taino staff to be seen in Jamaica since the time of Columbus," says anthropologist Tony Aarons, who identified the image atop the staff (left) as Youcahuna, the supreme Taino deity. The other carvings depict a pelican bearing a shallow bowl and an ebony spoon with the image of a guardian spirit. The Spanish observed such ritual items in use during the *cohoba* ceremony, in which the Taino inhaled snuff in an effort to induce hallucinations—messages from the gods.

The Taino predominated in the western Caribbean when Europeans arrived. Up to 300,000 Taino lived in Jamaica alone, Aarons estimates. They grew cassava, sweet potatoes, and corn and were potters and weavers. Their distinct culture vanished in the 16th century because of assimilation, slavery, and introduced diseases.

The carvings were found in a cave in the 1940s by villagers, who hid them for half a century before giving them to the Jamaican National Heritage Trust. They are now on display in the National Gallery of Jamaica.

Dinosaur Stamp Honors the Geographic

A turkey-size dinosaur that lived in Australia 110 million years ago will come to life on a stamp to be issued by Australia Post next month. *Leaellynasaura amicagraphica*, named in part for the National Geographic Society, will also appear on a sheet depicting six dinosaurs, three of them discovered at a site known as Dinosaur Cove (GEOGRAPHIC, January 1993).

For nearly a decade the Society helped sponsor expeditions to the site, where researchers resorted to explosives to expose the fossil-bearing rocks. Thomas Rich of the Museum of Victoria in Melbourne and his wife, Patricia Vickers-Rich of Monash University, christened the new genus for their daughter, Leaellyn, and the species for the Society and for the Friends of the Museum of Victoria.

—BORIS WEINTRAUB

National Geographic, September 1993

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Bringing Back Arizona's Thick-billed Parrot

Raucous squawks once echoed through the mountains of southeastern Arizona, the only home of the thick-billed parrot in the United States. Then miners discovered what easy targets the birds were and how good they tasted, and loggers cut down their habitat. The last wild parrot was seen in this country in 1938.

In 1986 Arizona officials began reintroducing the parrot to the Chiricahua Mountains. Many of the birds have been supplied by the U. S. Fish and Wildlife Service, which confiscates wild birds smuggled from Mexico to be sold as pets. Some of the released birds had been captive-raised and did not survive. To prepare the birds for release, caretakers keep them in large cages where they can exercise their flight muscles and respond as a flock when hawks dive-bomb the cage.

ROBERT RATTNER

Eight of the parrots now survive in the wild, but they face a formidable gantlet of enemies like goshawks and tree-climbing carnivores called ringtails. "In Arizona you're talking about country loaded with hawks and other hungry animals that are out all the time looking for something to eat," says Rory Aikens of the Arizona Game and Fish Department. "To establish a viable population, a hundred or more parrots will need to be released."

GARY CAMPBELL

Dogging Faulty Pipelines, Labradors Sniff Out Leaks

Worse than major ruptures that make headlines are the tiny leaks in underground pipelines that may cost industry tens of millions of dollars a year and cause insidious, invisible pollution. To find such pinholes in lines that carry oil, natural gas, and chemicals, Canada's Imperial Oil Resources Limited uses more than a dozen four-footed troubleshooters—Labrador retrievers. A yellow lab named Sarge works with Jay Bissell at Imperial's Natural Gas Processing Facility near Calgary (left).

The dogs are on call worldwide. When a pipe springs a leak, the owner tests the suspected section by pumping in a liquid containing a foul-smelling chemical developed by the Canadian firm. Then the retrievers go to work. They can sniff the chemical escaping from pipes buried as deep as 18 feet. In a Louisiana swamp Sarge and other dogs stood on small boats and detected the odor from leaking chemical lines under six feet of water and five feet of earth.

In 136 leaks so far, the dogs have only failed twice, according to Imperial Oil's Ron Quaife, who invented the leak-detection technique. So odoriferous is the chemical and so sensitive are the dogs' noses, "that if a basin roughly the size of Washington State was filled with water a foot deep and just one drop of the chemical was added, the dogs would detect it," Quaife says.

National Geographic, September 1993

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I'll always remember that face. The smile bordering on a tear. Silence as powerful as music. Eyes as lively as the diamond I nervously slipped on her finger. And now that we have come so far together, perhaps now is the moment to celebrate that love, once again, with a diamond as exceptional as our love.

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LARRY CARVER

Saving a Choked River—California's Feather

Drowning in silt, the East Branch of the North Fork of the Feather River suffers severe erosion from livestock overgrazing, logging, mining, and road building. Eight years ago, 12 private and public groups united to shore up this thousand-square-mile watershed north of Sacramento, using one especially forlorn stream, Red Clover Creek, as a pilot project.

"It's been in poor shape since the early 1900s," says Larry Carver of Pacific Gas and Electric, which participated because four million tons of river sediment had piled up in the utility's Rock Creek Reservoir. When Larry photographed Red Clover Creek in 1985 (above), "it was just a brown trickle," he says, its banks gouged by erosion. By 1992 (above right) new fences kept out cattle, red clover and meadow grasses slowed erosion, and four small rock dams reduced the velocity of floods and helped replenish groundwater.

Disease-carrying British Badgers Still at Risk

Beloved by Britons raised on *The Wind in the Willows*, badgers are under the gun in southwest Britain. Some of the area's 80,000 badgers carry bacteria that cause tuberculosis in cattle. Since 1975 more than 20,000 badgers have been exterminated, despite protests by the National Federation of Badger Groups.

Recently a new strategy has been proposed—trapping and blood-testing badgers—to end indiscriminate killing. Those infected, perhaps 15 percent, are to be killed, the rest freed. But test results are in dispute, jeopardizing the program.

Exams show that about 350 cattle are infected with TB annually, most likely by badgers. Ironically, cattle contracted the disease long ago and probably transmitted it to badgers, which are now giving it back.

UWE WALZ, BRUCE COLEMAN, LTD.

To Spread Their Seed, Some Plants Go Ballistic

To reproduce, some plants and fungi cast their fate to the wind. With various internal engineering devices, they fire, snap, or fling their seeds or spores into the air to catch a breeze or an animal wandering by that will carry them to a happy medium. In a puffball called an earthstar (below), tension builds as internal layers dry out, until the merest breath of wind provokes an explosion and millions of spores shoot out like smoke.

"These techniques have evolved as a way of making sure that the offspring are widely dispersed and don't get crowded out by adults," says Paul Simons, author of *The Action Plant*. As another example, Simons cites the delightfully named squirting cucumber. It produces a fruit that blasts as far as 40 feet off the plant's stalk. But the champion rocketeer is a dwarf mistletoe whose berries burst and expel seeds at speeds up to 60 miles an hour to a distance of nearly 50 feet.

—John L. Eliot

GERSTMEIER TRIPLEX; HEATHER ANGEL

Dairy farmer Louise Ihlenfeldt values NUCLEAR ENERGY as a way to keep the *air* clean. (And the milk fresh.)

The nuclear power plant a mile up the road has been generating electricity for 19 years. The Ihlenfeldt family has been working their Wisconsin farm for 125.

Nowadays, modern electrical equipment keeps the cows milked and the milk cold. And the nuclear plant keeps creating electricity without creating air pollution. "We've never had a problem with the plant," Louise says. "It's a clean, safe power source."

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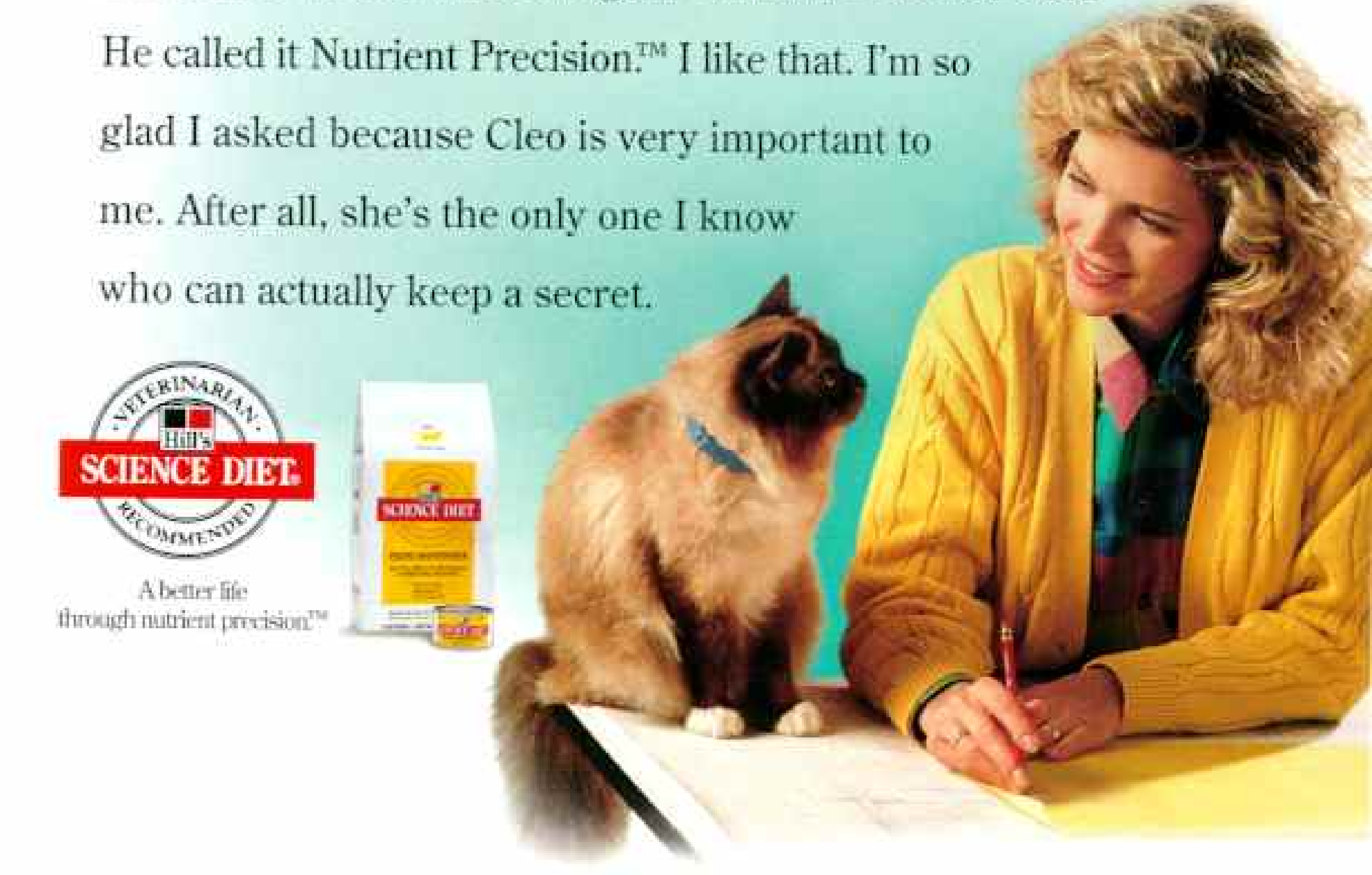
I admit it. I talk to my cat. And I don't mean just talk. I mean TALK. Real meaningful

conversation. In fact, more satisfying conversation than I have with most people. Naturally, I want to do everything I can to keep Cleo her healthy best. So, I asked my veterinarian what food he recommends. Without skipping a beat, he said, "Hill's® Science Diet®." He said just as I have to eat a proper balance of foods to keep healthy, Cleo has to have a balance that's right for her. That's exactly what she gets with Hill's Science Diet.

He called it Nutrient Precision.™ I like that. I'm so glad I asked because Cleo is very important to me. After all, she's the only one I know who can actually keep a secret.



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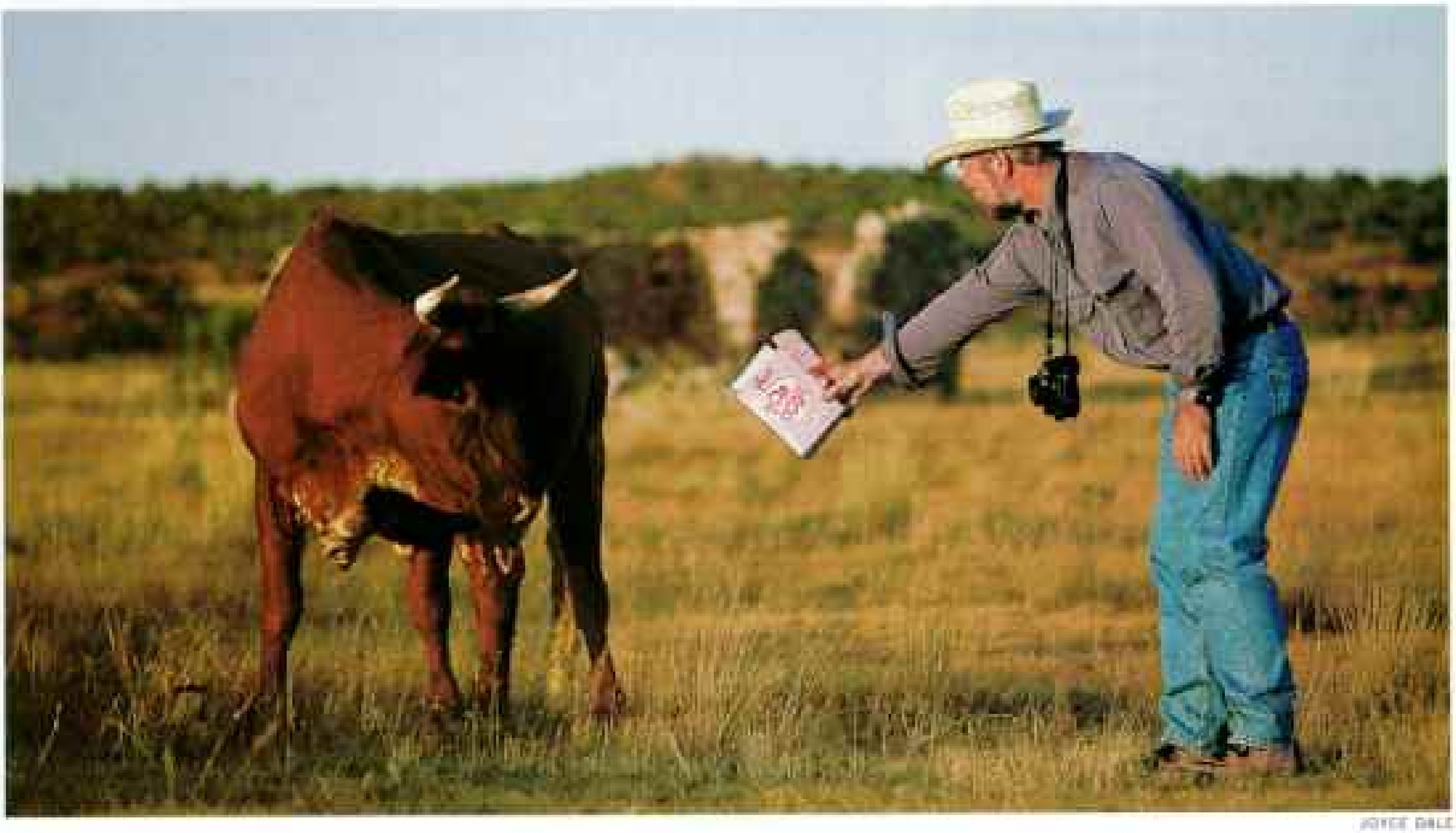

JOYCE DALE

Buttering up a bullheaded subject, staff photographer BRUCE DALE befriends a visitor to his Pecos River campsite (above). "It was a peace offering," he explains. "We were on its territory." Though he has traveled to more than 75 countries in his 29-year career at National Geographic, Bruce's own territory has lately been the American West, where recent assignments have included the Santa Fe Trail, Geronimo's Southwest, and the Pecos.

Ohio-born Bruce went professional while still in high school, selling photographs to his hometown newspapers. At 25 he joined the Geographic staff. "I thought I'd be here for two years at most," he says.

Bruce won the White House News Photographers' Association Photographer of the Year award in 1988 and has twice been named Magazine Photographer of the Year by the National Press Photographers Association and the University of Missouri. The secret of his success? "The best images are serendipitous," says Bruce. "I plan on the unplanned picture."

For his first 25 years at the Geographic, THOMAS ABERCROMBIE (below, at left) did double duty as writer and photographer. In 1985 he hung up his camera in deference to the written word. This month's article on the breakup of Czechoslovakia marks Tom's 40th assignment.

Weeks before the historic "velvet divorce," Tom interviewed the former leader of Czechoslovakia, playwright Václav Havel, in his home, where they were surrounded by aides. "He smoked cigarettes, and I smoked a pipe," says Tom. "Our smoke screen was the closest thing we had to privacy." Havel has since accepted a more limited role as president of the new Czech Republic. "I think he realized that the days when intellectuals could govern the country were passing," Tom says. "It was time for professional politicians to get involved."

JAMES L. STANFIELD

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