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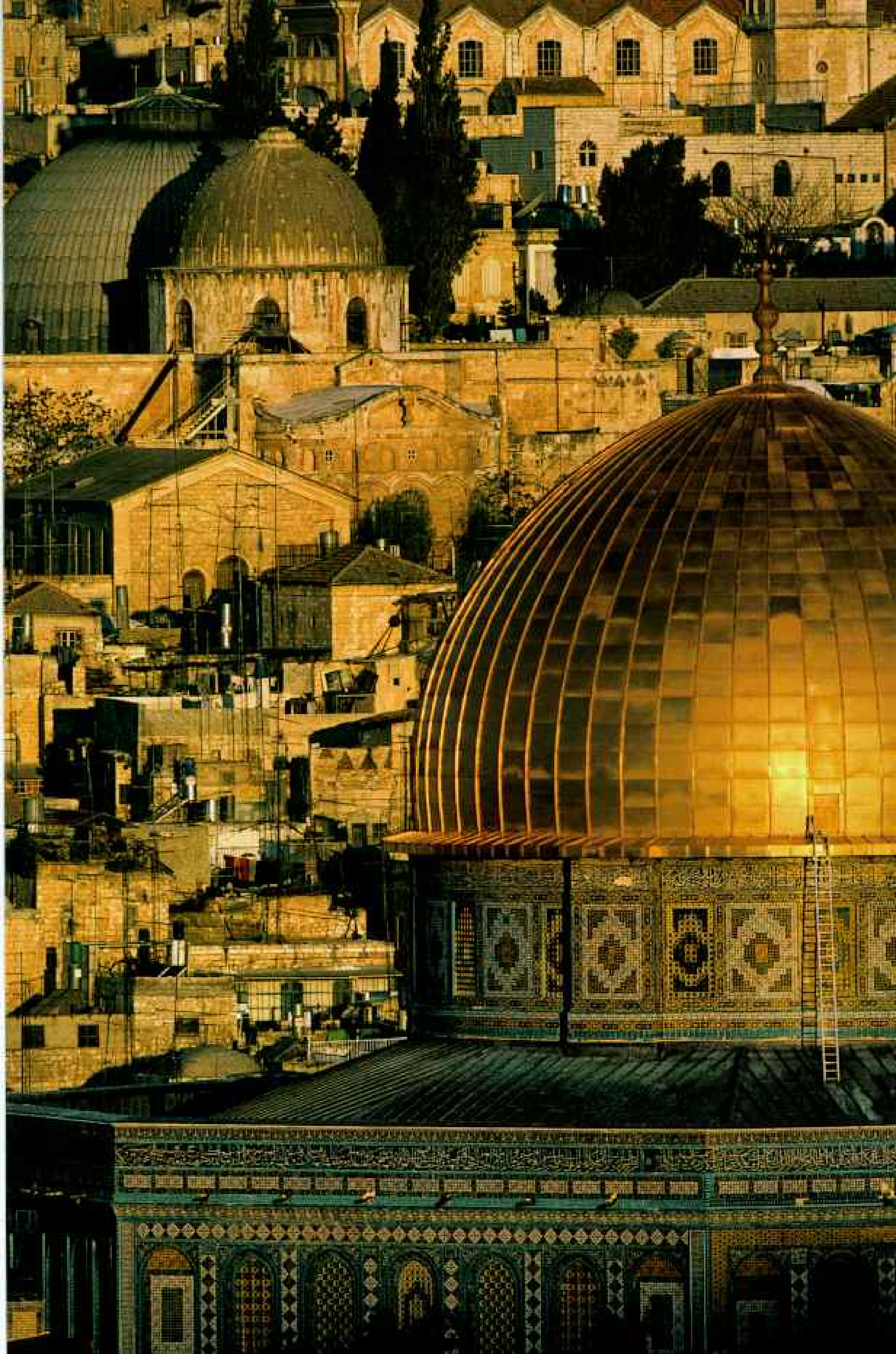
The Three Faces of Jerusalem

Beckoning the faithful of three religions, Jerusalem forces them to worship their God on common ground: Christianity's gray-roofed Church of the Holy Sepulchre lies just beyond Islam's golden Dome of the Rock (opposite); nearby, Jews approach the revered Western Wall. For all, Jerusalem is a glorious enigma—a cradle of hope, where the final clash of civilizations seems always at hand.



By **ALAN MAIRSON**
NATIONAL GEOGRAPHIC EDITORIAL STAFF

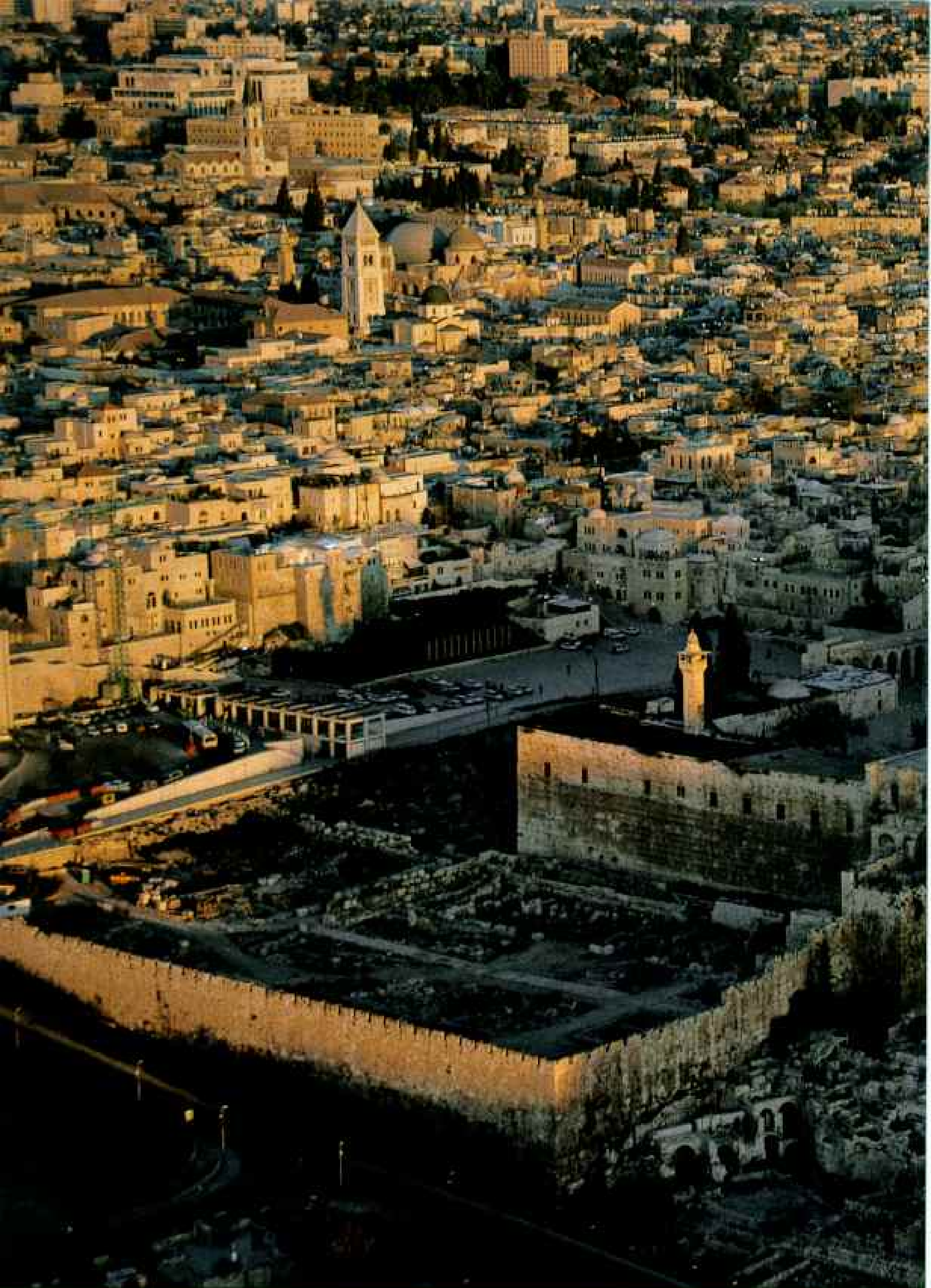
Photographs by
ANNIE GRIFFITHS BELT



Robes and rented crosses fill Jerusalem during Holy Week, as thousands of foreign Christians visit, many of them to retrace the route of Jesus through the Old City along the Via Dolorosa, or Street of Sorrows. "My faith became gigantic," reports Tala Santos, at center. She led a group of two dozen Brazilian pilgrims from Porto Alegre last Easter. "We felt Him walking among us."







Daybreak illuminates the walled Old City, a settlement that has been besieged, desecrated, burned, and rebuilt numerous times over 4,000



years — and never lost faith. “The air over Jerusalem is saturated with prayers and dreams,” says poet Yehuda Amichai. “It’s hard to breathe.”



"Mecca for Muslims, Rome for Christians, Jerusalem only for Jews" (above) is a slogan of Israel's religious right and the goal of powerful ultrareligious sects that seek hegemony over the ancient Jewish capital. Secular Jews, such as an off-duty soldier (right), still outnumber the ultrareligious—but rarely match their resolve.

FROM A DISTANCE the hills of Jerusalem seem to roll like waves in a stormy sea. New Jewish settlements crown the hills like whitecaps. In the middle of it all, bordered by palm trees, stand the high stone walls of the Old City, the heart of Jerusalem that holds monuments sacred to Jews, Christians, and Muslims. Here the weight of history and the power of memory create a kind of cosmic eddy that often forces people to confront the big questions about the meaning of life and the existence of God.

This spiritual swirl gripped John Wiggins, a 50-year-old computer consultant from Bowie, Maryland, who found the city disorienting when he first visited four years ago on vacation. He returned a year later to search for the source of his uneasiness. Wiggins, who had been raised a Methodist but was never especially devout, walked the streets, read Scripture, and questioned Jerusalemites about their faiths and disagreements. He could not

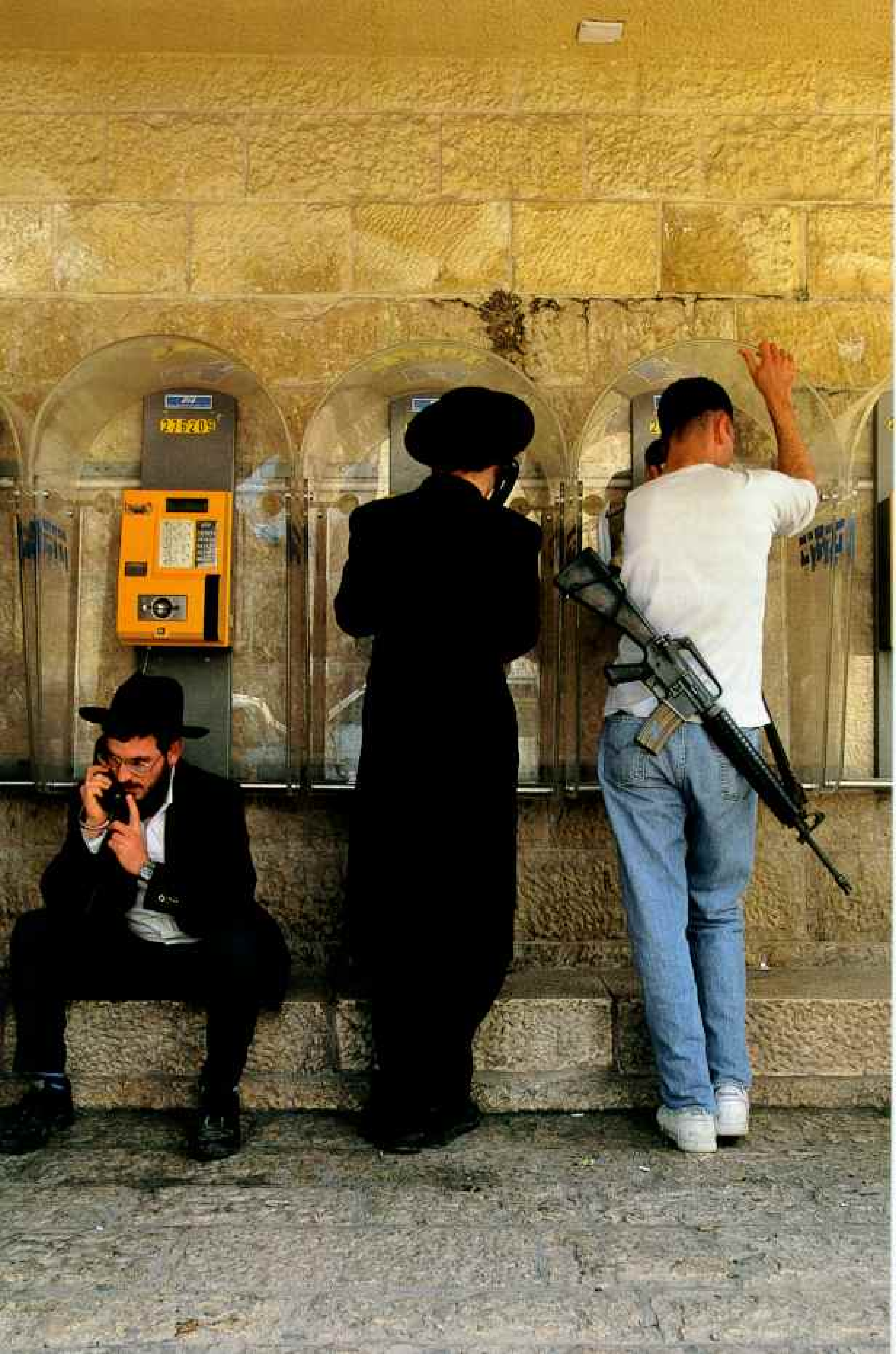
understand why the City of Peace was anything but peaceful.

"On my third trip here, I tried again to understand it all, and that's where I got lost," Wiggins said. "How could I be in the Holy Land with all this fighting and conflict? Well, one day, just outside the Old City, I quite literally lost it and started throwing up. I came back to my hotel, went to sleep, and did not get out of bed for 36 hours."

You might think Wiggins would have returned home for good, but his spiritual quest keeps pulling him back to the holiest of cities, a place that both fascinates and repels him. He no longer looks too closely at why he lost his sanity. He lives here now for six months of every year, spending much of his time visiting religious sites.

Wiggins is not alone. I've come across many others who are caught in Jerusalem's spiritual current: like the young American couple who rejected their secular life in a Minnesota suburb and fled to Jerusalem to live with a group of like-minded Christian pilgrims in tents just outside the Old City or like Wajeeh Nusseibeh, a Muslim whose family settled here in the year 715, not long after

ANNIE GRIFFITHS BELT has photographed more than two dozen magazine and book projects for the Society. Her most recent assignment was "Israel's Galilee" (June 1995).



the Prophet Muhammad is said to have received the wisdom of the Koran from Allah. Nusseibeh lives his life by that wisdom.

Whether Christian or Muslim or Jew, thousands of such people are drawn to Jerusalem. Their faith is what animates Jerusalem's soul and makes the city different from any other in the world. Yet many, like Wiggins, cannot reconcile their ideal Jerusalem with the reality of this tense city.

I know how John Wiggins feels. Ever since I first visited Jerusalem in 1984, when I was a 25-year-old filled with wanderlust, the city has held a peculiar fascination for me. I was heading east on a round-the-world trek, but I never made it past Jerusalem.

Back then I explored the city and searched for my Jewish roots. I discovered a place where people rarely stopped talking. The conversation was often about the meaning of God. After weeks of such talk I was convinced that I had the answer to world peace. Only when I returned home to my friends and family did I come to my senses.

This time I vowed to stay focused on the issues at hand. Big issues. The Israelis were preparing to celebrate the 3,000th anniversary of King David's establishment of Jerusalem as the capital of the Jews. Meanwhile, peace negotiations between the Israelis and Palestinians were once again placing the city in the international spotlight.

I figured that the peace process could help heal a city split by religion and inspire Jerusalem's inhabitants to get along, but I found less tranquillity than 11 years before. Now not only were the Jews and Arabs fighting, but the Jews were quarreling more often than not among themselves. The dialogue was intense, opinionated. People argued about whether streets and restaurants should be

closed on the Jewish Sabbath, whether women should dress modestly, whether non-Orthodox Jewish rabbis should perform weddings. The big issues were being played out in small ways.

Several months later more violent rhetoric became reality when Israeli Prime Minister Yitzhak Rabin was assassinated by a Jewish extremist in Tel Aviv. Hundreds of thousands of people filled the streets of Jerusalem, Rabin's birthplace, to mourn his passing.

Next month the peacemakers will take up the question of whose Jerusalem this is—whether to grant a part of it to Palestinian administration—waiting until the final stages of negotiations to address what may be the most sensitive issue in the Middle East. Yet when I arrived in Jerusalem last year, I was drawn again toward people who speak of peace not in political terms but in spiritual ones. So I turned to rabbis, ministers, and muftis and the people they lead for a vision of Jerusalem's past, present, and future.

It's easy to be a cynic here. History almost demands it. In the past 4,000 years these hills at the edge of the Judaean desert have been soaked in blood with monotonous regularity. The city has been conquered by pharaohs, Jebusites, Israelites, Babylonians, Persians, Greeks, Romans,

Arabs, crusaders, Ayyubids, Mamluks, and Ottomans. Each time the newcomers reshaped the city in their own image.

Ya'akov Billig, archaeologist and Orthodox Jew, helps lead a team of archaeologists that is slowly revealing layers of this past in the Old City. The excavation touches the Western Wall, a retaining wall of the Jewish Temple begun by King Herod in 20 B.C. and destroyed by invading Romans 90 years later.

"The Temple Mount has been the nucleus



Pivot point: the Temple Mount, called Haram al-Sharif by Muslims, 200,000 of whom pray at the Dome of the Rock during Ramadan (right). Completed in 692, this shrine shelters the stone that served in ancient times as sacrificial altar in the Canaanite city of Urusalim. This is also the rock upon which Jews believe Abraham made his covenant with God; around it Solomon and Herod built temples.





At the first glimpse of dawn Muslim women offer prayers at Id al-Fitr, the end of Ramadan, in the Dome of the Rock—the spot from which Muslims



believe Muhammad journeyed to heaven. "One prayer in Jerusalem outweighs a thousand elsewhere," the Prophet is quoted as saying.

of the Jewish religion ever since it was born more than 3,500 years ago, and it's quite a focal point for Christianity and Islam too," Billig said. The Bible says that Abraham almost sacrificed his son Isaac here, before God ordered that the boy be spared. It was here that Jesus drove the money changers from the Temple and here that the Prophet Muhammad ascended to heaven to meet God, according to Scripture.

The massive wall rose above us, its height amplified by our descent into the excavation pit 90 feet below. Billig pointed to a cross section of earth that revealed stone walls from Muslim palaces built in the eighth century. Beneath us, still unseen, lay streets from early Roman times.

During this early Roman period the Old City was a walled Jewish community, with markets, homes, and the great Temple. Today it is home to 30,000 Jews, Christians, and Muslims, who live in a claustrophobic maze of streets, shops, and religious monuments. Atop the Temple Mount stand two Muslim shrines—al-Aqsa Mosque and the majestic Dome of the Rock. So as not to disturb—or provoke—the Muslims, Christians

and Jews are forbidden from praying there.

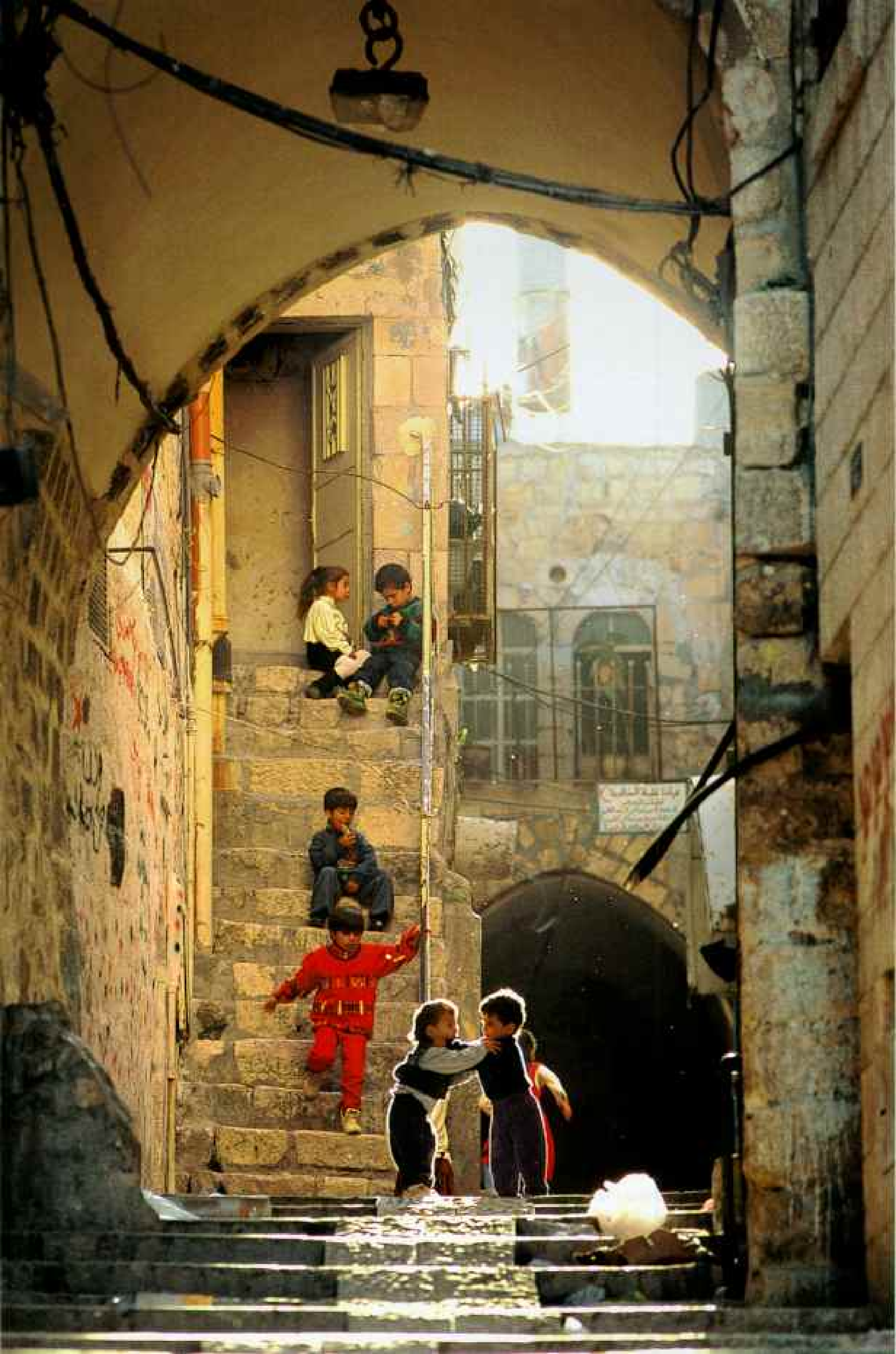
But the Western Wall, as befits the holiest spot of Judaism, is visited daily by the faithful. A sea of men in black suits and white prayer shawls congregates there, praying loudly and piously bowing their heads; women pray quietly in a separate section. In the narrow crevices between the Wall's massive, rectangular stones, slips of paper, each one inscribed with a prayer, are densely packed like mortar.

For Billig, the Wall and his work are physical reminders of spiritual hope and faith. "I view the events of the past few decades as some sort of foreshadowing of a God-guided destiny," Billig says, referring to the Jews' return to the Old City after Israel's Six Day War in 1967. After almost 2,000 years in exile, after generations of closing the traditional Passover meal with the words "Next year in Jerusalem," the Jewish nation had been restored to its ancient homeland and capital.

"The Temple Mount has been the focal point of Jewish hope—coming back to the homeland and rebuilding the Temple—for hundreds of years," Billig says. "It's like a dream come true."

Part maze, part playground, the Muslim Quarter is home to 20,000 Palestinians, including Aba Hisham Rafabi (below), who raises six children while her husband, convicted of terrorism, serves time in prison. Another 135,000 Palestinians live in East Jerusalem, captured from Jordan by Israel in 1967, as was the Old City.







THAT DREAM assumed the faint outline of reality early in this century. Following World War I and the collapse of the Ottoman Empire, Britain ruled by mandate the land called Palestine, the hills and coastal plain between the Jordan River and the Mediterranean Sea. But the Jews and Arabs battled the British and each other.

In 1947, with their grip on Palestine slipping away, the British relinquished their mandate. In its place the United Nations proposed partitioning Palestine into separate Jewish and Arab states and placing Jerusalem under international control. The Arabs rejected the plan, and when the fighting began, Israel declared its independence.

After the war's end in 1949, Israel proclaimed Jerusalem its capital, but most nations still refuse to recognize it as such and keep their embassies in Tel Aviv. Jerusalem was divided, with the west governed by Israel, the east by Jordan. Since the 1967 war, it has been uneasily reunited under Israel.

Today Jerusalem's fate lies with the peacemakers. Rabin's successors and the Labor government have offered to exchange land—parts of the Gaza Strip and the West Bank—for peace with the Palestinians.

If Arab sections of the city are given to the Palestinians, Jerusalem would be divided once again. But the split is already there. West Jerusalem is a modern array of neighborhoods radiating from an older downtown



Street smarts and stolen kisses set the tone in Zion Square, a popular gathering place for the young and secular in the heart of West Jerusalem's business district. The west is predominantly Jewish, just as East Jerusalem is Arab, and few cross over the line. Partly as a deterrent to terrorists, soldiers in the Israeli Army, even off-duty sergeants kissing girlfriends, are required to carry their weapons at all times.

Islam. In the ideal ending to this story, the children of Abraham, Muslim and Jew, find common ground and learn to live together.

But, as is frequently the case in Jerusalem, history is interpreted differently. Scripture says God commanded Abraham to sacrifice one of his sons on a hilltop in what is now the Old City to prove his faith. But which son was to be sacrificed? Jews believe it was Isaac, their biblical father, while Muslims believe it was Ishmael, from whom Arabs say they descend. Seconds before the sacrifice, God intervened to stay the hand of Abraham, who killed a ram instead.

Modern Muslims remember that reprieve each year during the Feast of Sacrifice. On a sparkling spring morning I went to a small Arab village just outside Jerusalem to join the al-Hafez family for the feast's sacrifice. On a concrete patio beneath some lemon trees, Fatha Hamdan, a butcher in a white robe, held a knife above a goat's throat and said a prayer: "Oh God, this is from you, and for you. Believe this as you believe in our father, Abraham." The butcher slit the goat's throat, a stream of blood shot from the animal's neck, and its life drained away.

I must have looked pale, because one of the neighbors, Ali al-Jariri, gently tapped my arm. "It's instead of Ishmael," he said.

The family later gave much of the goat meat to relatives and the poor. "Sharing symbolizes peace," al-Jariri said. "The feast is a social occasion for the village, and it's the keeping of a tradition."

FOR JERUSALEM'S growing number of Orthodox Jews, history and the traditions of Abraham are essentially the same thing. Devotion to the rules of the Torah and to rabbis are at the core of their lives. The tone and politics of this once tolerant city are changing as Orthodox Jews replace the secular Zionists.

One cool, cloudless evening on Ben

of shops, office buildings, museums, parks, and hotels.

The Arab districts of East Jerusalem are poor by comparison. The cars are old and rusty. Paint is peeling off the buildings. On the outskirts, the houses of new Israeli settlements stand shoulder to shoulder, set back from the streets. The sight lines are long, as if to protect the inhabitants from attack.

To many very religious Jews, who believe the land of Israel was given to them by God, the idea of giving up East Jerusalem is infuriating. For the religious on each side, resolutions to the Arab-Israeli conflict are often found not in politics but in a mutual history that goes back 4,000 years to Abraham, the patriarch of Judaism, Christianity, and



Shining with Jerusalem stone — the cream-colored limestone required by city code — a new housing complex rises from a hill west of the Old City.



Such projects, strategically placed to bolster Jewish populations and often built on Arab land, expand the “Greater Jerusalem” claimed by Israel.

Yehuda Street, Jerusalemites enjoyed a night on the town. Young couples strolled arm in arm, and parents bought ice cream for their kids, while off-duty soldiers, guns slung at their sides, lounged at outdoor cafés. But religion entered the scene when a young man with glassy eyes and a green knit skullcap unfolded a small table on the sidewalk and carefully laid out prayer books, skullcaps, and prayer shawls. Every few minutes a pedestrian stopped at the table to put on a cap and shawl, open a prayer book, and murmur a prayer.

Hadar Mlihi, the man with the folding table, was there to share his discovery of the Torah, the five books of Moses that are the centerpiece of Judaism, by offering passersby an opportunity for prayer. He told me that he had been in the army, had traveled around the world, but the only thing that mattered to him now was his spiritual life and the Torah.

"With Torah you go up, up, up," Mlihi said blissfully. "It's like too much coffee, all the time."

Mlihi is part of Jerusalem's increasingly powerful community of religious Jews, which includes the Orthodox and the even more strict ultra-Orthodox, many of whom have flocked here from around the world. With an average birthrate of six children per family, the ultra-Orthodox population in Jerusalem is surging. Today roughly 30 percent of the city's 420,000 Jews are ultra-Orthodox, as are 50 percent of the schoolchildren.

If trends continue, the ultra-Orthodox population will increase by 70 percent here by the year 2010 and will exert significant influence on the city's destiny.

No one knows this more clearly than Teddy Kollek, the legendary mayor who ran Jerusalem from 1965 until 1993. He worked tirelessly to turn the city into a safe, forbearing, world-class hub of cultural attractions.

But Kollek learned too late that increasing numbers of ultra-Orthodox voters were not interested in liberal universities and big-name opera stars. In the last mayoral election they threw their support behind Ehud Olmert, a member of the conservative Likud Party, who had promised them an active role in city government. Kollek, now 84, lost his bid for reelection for the first time in his career.

Tired of being on the outside under Kollek, ultra-Orthodox Jews wanted the power to pass laws enforcing their conservative

Many streams of Judaism converge in Jerusalem: At a downtown park a family of Sephardic Jews celebrates Maimuna, the festive post-Passover holiday honoring Maimon Ben Joseph, the father of Jewish philosopher Maimonides.

Born ultra-Orthodox, hours-old Nechama Bar-Tov was named for the late rabbi Menachem Mendel Schneerson, whose photograph adorns her crib. As longtime leader of the Lubavitch movement, Schneerson counseled parents to place blessings such as Psalm 121 ("The Lord is thy keeper") in the crib.



religious views, which forbid activities such as driving or working on the Sabbath or eating nonkosher foods. They demanded the establishment of a Torah Culture Department and a Torah Education Department, with a combined annual budget of more than 20 million dollars. They wanted more money for their religious schools, and they wanted all roads shut down on Saturdays.

"I'm not antireligious," Kollek told me when I asked about the more conservative Jews. "But what I can't take is if they want to dictate how we should live. We came to an agreement—in more than half the city there were cinemas and restaurants, and everything was open on Friday evening and on Saturday. In Orthodox neighborhoods it was not like





that. We lived comparatively peacefully.”

The friction between the secular and the religious is particularly evident in Ramot, a neighborhood perched on the hills in Jerusalem’s northwest corner. Ramot was a secular community until religious Jews began moving in ten years ago. Back then the ultra-Orthodox in the neighborhood wanted to close the main road on Saturdays. Motti Winter, a secular Jew who is the chairman of the neighborhood community organization, led a local battle to keep it open.

The secular residents won that victory, but since then Winter has watched as more Orthodox families moved into Ramot and began to dominate parts of the neighborhood. “The Orthodox move to a secular area,” he said. “They settle down, step by step, 10 families, 20 families. The young couples have

a lot of children, and they always need more apartments, more religious schools, more synagogues, more and more and more. They have self-confidence in their power because they have a lot of children. They say, ‘We are the future of Jerusalem.’ The only possibility that could work is for us to be separate.”

Living separately is unthinkable for Teddy Kollek, who has spent most of his life trying to build an amicable Jerusalem.

“I only know that we have to try everything in this city to make people get along,” he said. “We opened the zoo two years ago, and 300,000 people have visited each year: ultrareligious, free thinkers, Arabs, Jews—all mixing. All through the summer I saw children jump into a beautiful large fountain in one of the city parks—Arab children, Jewish children, their mothers standing next



Life in a shtetl, or eastern European ghetto, is replicated in Mea Shearim (left), an enclave of Hasidic families in West Jerusalem. Near the Western Wall—remnant of the last Jewish Temple, destroyed in A.D. 70—two Hasidic students (below) debate the rebuilding of the Temple on the site occupied by the Dome of the Rock, as prophesied by Isaiah. Some argue for storming the Temple Mount, although most Hasidim believe the Messiah will lead the way.

Meron Benvenisti, former deputy mayor of Jerusalem, calls the competing Jewish and Muslim claims to the Temple Mount "a time bomb . . . of apocalyptic dimensions."

to each other, rubbing shoulders. It works."

When I asked Kollek for his view of the future, he balked but finally said, "I think that the ultra-Orthodox society will break down in the next 10 or 15 years. Women will start working and will not have 10, 12, or 14 children. Should we be successful in solving the problem of people getting along here, then the word would come out of Jerusalem again." And what, I asked, would that word be? "There's hope. There is a future."

BUT WHAT DO "hope" and "future" really mean in Jerusalem? For Muhanna Arab, a Palestinian who was driven from his home by Israelis in 1984, those abstractions may be all he has left to cling to. His family home was razed to make way for new housing, mainly for Orthodox Jews and thousands of Jewish immigrants.

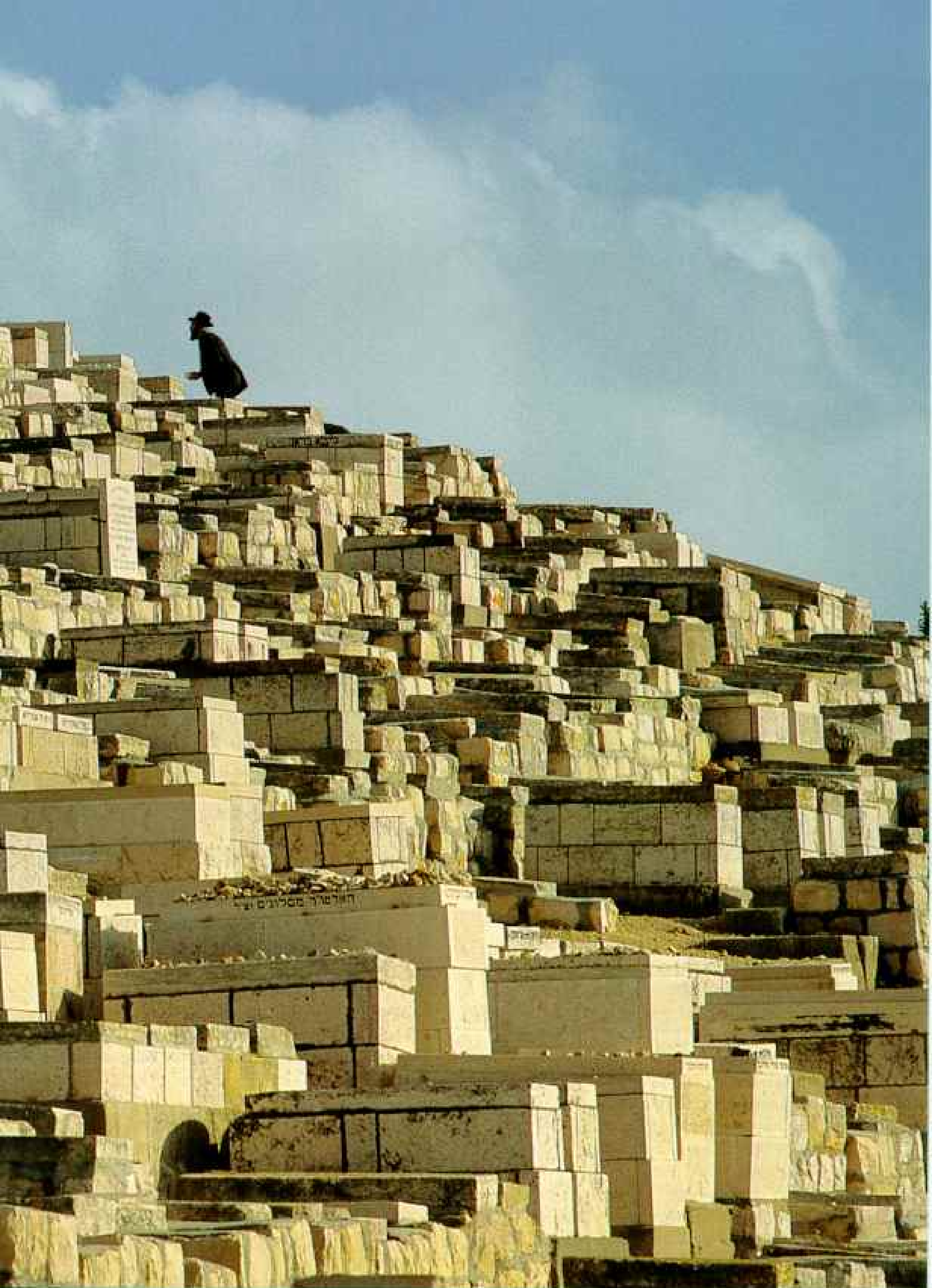
Muhanna Arab, a short, muscular man with black hair clipped down to stubble, tells me his story. "The original owners of this land left for America in 1930, and that's when my family settled here," he said. "Jordanian law said that if you cultivate the land and live and work on it for 30 years, then you are entitled to half the land if the original owners return."

But in the 1967 war, Israel captured East Jerusalem, and Jordanian law no longer applied. Arab took his case to court, but his claim was rejected. When the bulldozers came to destroy Arab's home, there was





Peace reigns on the Mount of Olives, where Jewish tombs share a hillside with Christian and Muslim cemeteries — although they, too, play a part in



the battle for Jerusalem. Tombs are often destroyed when the city changes hands; 50,000 Jewish graves were defaced here during Jordanian rule.



nothing he could do. Today on a corner of his old homesite, beside big concrete pipes, pallets of drywall, and some half-finished homes, Arab hangs on in an old dilapidated bus. In Hebrew, Arabic, and English, on every surface inside the bus and out, he has scrawled "Peace . . . justice . . . oh, God, where are the rights of Man?"

Construction has progressed slowly, but soon it will overtake Arab's small homestead. "Very soon, whether I like it or not, the Israelis will tell me to go away," he says, his voice rising.

Arab stares at me. "You don't need just one tape recorder, you need a million to tell our story," he declares. "We are just like the roots of trees. We cannot be taken out of this land."

He shows me a photo album with pictures

of his mother and father, of himself tilling his fields years ago, and of bulldozers demolishing his house. There is a sympathetic letter from Teddy Kollek. On page after page Arab has written the same question, "Why was my house destroyed?"

Muhanna Arab's house was destroyed to make room for people like Israel Silman, a 75-year-old who lost several family members in the Holocaust and for whom the Jews' prophetic dream of returning to Jerusalem became a reality.

One warm April evening I joined Silman, a few of his friends and relatives, and thousands of others at a special ceremony celebrating the 50th anniversary of the defeat of Nazi Germany.

We were quietly walking with the crowd along a tree-lined boulevard to the Wall of



Upstairs exiles, Ethiopian Orthodox monks and nuns have lived on the roof of the Church of the Holy Sepulchre since the mid-1800s to press their claim to a portion of the sanctuary below. Barred from the building by a rival Christian sect, the Egyptian Copts, Ethiopians trace their claim back to a gift Solomon made to the Queen of Sheba.

In the adjacent Armenian Quarter of the Old City, kindergartners (below) are the latest generation in a community that has endured since the fourth century.

Remembrance at the Yad Vashem Memorial when Silman, his eyes moist and his voice steady, told me about his family.

In 1937 Silman had left his hometown of Warta, Poland, with his father to work in Australia. The rest of the family remained behind. "When the war broke out, my father and I couldn't get back to Poland," he said, "and my mother, brother, sister, and cousins couldn't get out. When the war was over, my father and I sent letters to the Red Cross and to the town hall in Warta to find out about our family. My father kept working hard, saving up every cent to get a place for the family when they would join us one day. But eventually we discovered that the Nazis had killed them all."

Silman stayed in Australia, where he married and had children, but decided in 1972 to move his family to Jerusalem, the heart of his people's spiritual universe. "There are better places to live," he said, "but there's no place like home."

At the wall, survivors of concentration camps described their liberation. The mood was solemn, and the crowd was quiet until everyone rose to sing the Israeli national anthem — "Ha-Tikva," or "The Hope." As the audience shuffled slowly toward the plaza exits, Silman got caught in the crowd, which carried him off in another direction. Weaving and sidestepping against the flow, he slowly worked his way back to us.

"Stick together," he said. "Stick together, or we'll get lost."





Crowd control is vital on Good Friday, when barricades go up along the Via Dolorosa. Inside the Church of the Holy Sepulchre, which marks the tomb of Christ, five sects jealously guard their precincts—sometimes coming to blows. Sighs one priest, “The frailty of humanity is nowhere more apparent than here.”

ON DAYS WHEN Jerusalem’s endless contradictions seemed too much to bear, it was a relief to retreat to the city’s secular side. Eating a cheeseburger, watching a movie, or reading a trashy novel was an escape from the city’s relentless spiritual crush. One Sabbath evening I found a small indoor mall in Talpiot, on the city’s south side. Though most of the shops were closed, Kapulsky’s restaurant was doing brisk business. A little before 10 p.m. most of the diners headed upstairs to the Rav Chen multiplex to see *Miami Rhapsody*, *Pulp Fiction*, or *Dumb and Dumber*. I could have been in any city in the United States.

But unlike most American cities, Jerusalem, despite its reputation for political violence, is surprisingly safe. Seattle, Washington, for instance, has roughly the same population as Jerusalem but a murder rate seven times higher.

“It’s very safe for the kids here in the Old City,” says Sonia Sandrouni, who owns a craft shop with her husband, Garo. The children of refugees—their families fled here

from Armenia soon after the Turks massacred 1.5 million of their countrymen in 1915—Garo and Sonia now have two young daughters of their own.

“We will teach them to stay here with us,” says Garo. “It’s not like in the States, where the girls get to be 18 or 20 years old and want their own house, so they leave their families. Here, it’s against the rules. She stays at home until she gets married.”

Like many families in Jerusalem, the Sandrounis live a quiet, conventional life, relatively untouched by the religious and political passions surrounding them. In the morning Garo walks his daughters to the Rosary Sisters’ school near Jaffa Gate, then strolls a few blocks away to open the shop. At noon he often shops at the markets in the Muslim Quarter.

In a narrow alley there I passed by Islamic butcheries filled with slabs of goat and lamb and spice shops that scented the air with the aroma of garlic, cinnamon, and lemon. The shopkeepers stood out front, calling prospective customers to come inside. Some,

capitalizing on the city's Christian tourists, offered crosses and crèche scenes carved from lustrous olive wood. Others sold T-shirts emblazoned with images of Mickey Mouse or Yasser Arafat.

Such contradictions between what I expected Jerusalem to be and what it is were often depressing. But other times daily life in Jerusalem was a blessing, a way to keep from floating away on the city's spiritual updraft.

THE DISTANCE between the ideal and the real in Jerusalem can often be painful, and the gap leads some visitors down the path to an illness known as Jerusalem syndrome. John Wiggins and I may have experienced it, and so have many others. How does the city exert this strange power over people?

"Jerusalem is a magnet," explained Yair Carlos Bar-El, who specializes in the syndrome at Kfar Shaul Hospital, a small psychiatric facility on the northwest side of the city. "For a lot of people who grow up in the

Judeo-Christian culture, it is the center of the world. Jerusalem compels people to make some form of introspection about life. And Jerusalem is the catalyst, the detonator."

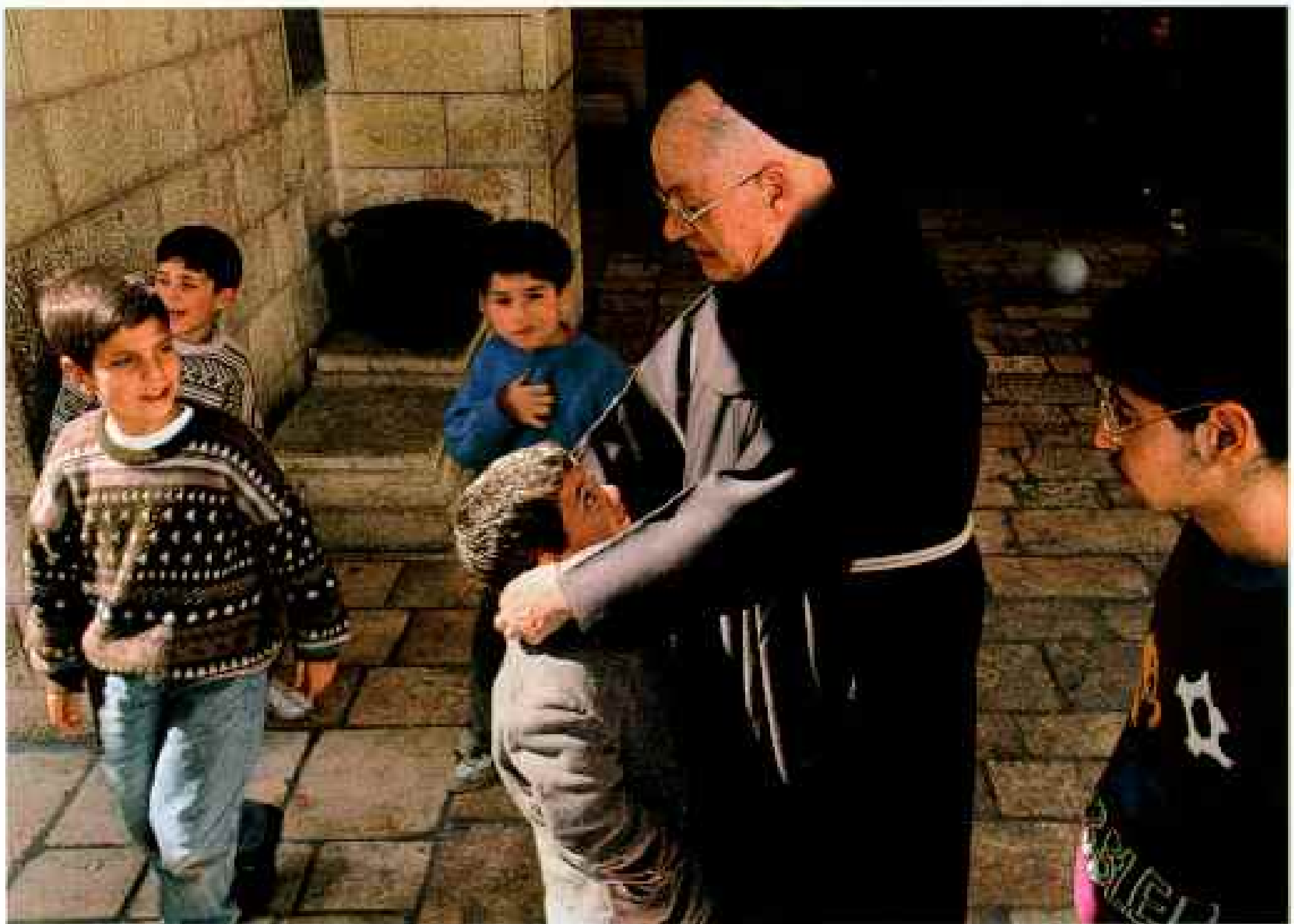
Patients admitted to Dr. Bar-El's hospital exhibit several different types of behavior. A visitor might arrive with a tour group but soon become nervous. He seeks solitude at his hotel, where he bathes to purify himself. Then he puts on white clothes and walks to one of the city's holy places to sing psalms or plead for world peace.

"All my recent patients were from families that were very religious," said the doctor. "We suppose that they developed an ideal subconscious image of Jerusalem, and the shock between this ideal image and Jerusalem today causes a break. They are unable to cope. They develop this psychotic reaction as a means to make a bridge between the ideal and the reality."

How do you distinguish between psychiatric illness and religious vision? I asked.

"We have no clear-cut boundaries,"

Good shepherd, Franciscan priest Anthony Foley came to Jerusalem in 1946; two years later, during Israel's War of Independence, he led 70 orphans to safety from the Old City, where war raged, to Bethlehem five miles away. "God was our guide," he recalls. Now 75, he runs Terra Sancta Boys Home in the Christian Quarter.





Dr. Bar-El replied. "If you use strictly scientific criteria, you can say that all the people in the Bible are mentally ill. They believe such strange things—the visions."

IN JERUSALEM conflicting religious visions press in from all sides, as I learned when I met three religious leaders, each of whom was convinced his was the only correct one.

The first was Mayer Yehuda Getz, then the chief rabbi of the Western Wall. In a small office overlooking the Temple Mount, Getz sat at his desk, waiting for the Messiah who, he believed, would rebuild the Temple. "We're waiting for the miracle to happen," he said. "The Temple will come from heaven."

Below the rabbi's windows, Gershon

Salomon, a former soldier in the Israeli Army, is often exhorting Jews to demonstrate against the Muslims' refusal to let them pray at the Temple Mount. Unlike Getz, Salomon dreams of rebuilding the Temple by hand, and he leads a group of more than 10,000 members devoted to his cause.

"Our vision is to move the mosque, to move the Dome of the Rock, and to have them rebuilt in Mecca," he declares. "The mount must become again the center of the Israeli nation."

But one man's dream can be another's nightmare, as I learned from Akrima Sa'id Sabri, the Palestinian mufti of Jerusalem. "We do not accept that once they had something here," he said. "It is God who makes this al-Aqsa Mosque. There is no way of any negotiation concerning this place."



Bearing her faith in a whispered prayer, a Greek pilgrim relives the pain of Christ on Good Friday in the Praetorium, a grotto where tradition says Jesus was imprisoned. The stones of Jerusalem are worn smooth by such hands, seeking the reassuring touch of God—and yet in every age they have echoed with the sound of humans rallying for war. “Pray for the peace of Jerusalem,” sang King David, who made it his capital. Three millennia later Jerusalem remains at the vortex where politics and religion meet—a city, in the words of novelist Amos Elon, “wondrous and at the same time quite psychotic.”

There was no less conflict among the city's Christians, who are also splintered in myriad ways. Nowhere was that more obvious than at the celebration of the holy fire, the day before Easter Sunday on the Orthodox Christian calendar.

On Friday night, pilgrims from all over the world began congregating in the courtyard outside the Church of the Holy Sepulchre, which enshrines the tomb of Christ. Four Orthodox denominations—the Greeks, Armenians, Copts, and Syrians—cordoned off a section of the church for their own members.

By noon Saturday the courtyard and the surrounding streets overflowed with the faithful. Policemen leaned against metal barricades to control the crowd. Greek and Armenian priests guarded the church's huge arched doorway.

I worked my way through the crowd, up to a balcony reserved for Armenian VIPs. On the floor below us, crowding toward the tomb, thousands of worshipers were packed together as tightly as the bunches of thin, unlit holy candles they clutched in their hands. Just when it seemed impossible for the place to hold any more people, the Syrians came in a great wave, chanting and banging drums in a loud, primal rhythm. Throwing their fists into the air, they led their countrymen in a boisterous celebration of the Virgin Mary and the imminent arrival of the holy fire, a symbolic representation of the light of Christ.

Men carrying lit candles raced from the tomb to each corner of the church, lighting the candles thrust forward by the faithful, who in turn passed the light to their neighbors. Within minutes gloom gave way to a golden glow, as a thousand candles flickered in the dark.

It was beautiful, but the scene reminded me of a cross between a soccer match and a barroom brawl. And the three men's conflicting visions of Jerusalem's future—waiting for the Messiah, rebuilding the Temple, denying the Temple's existence—all struck me as intolerant. Walking the streets, I began to have the same sinking feeling I had experienced years before.

But maybe something more than chaos was happening here. In the church people of different denominations were at least worshipping under the same roof. I remembered Teddy Kollek's idea that if you get people to live side by side, sooner or later they will have to get along.

“I had a very difficult time adjusting here,” said Father William De Biase, a Franciscan priest who arrived in Jerusalem in 1994. “But I've come to realize the real world is sometimes very difficult. Maybe what Jerusalem is asking me to do is see that my belief must be lived, not in some ethereal existence but right down in the nitty-gritty of life. My faith has to exist in the real world.”

Sometimes in Jerusalem—on those afternoons when waning sunlight strikes the buildings at dusk, painting everything in gold—I had the feeling that Wiggins had it right. The gap between reality and perfection was there, but you could still savor the fleeting perfection of a moment's peace. □

Flying high in the Himalaya, Mike Lilygren swings home to a hanging tent 2,000 feet above the ground on Trango Tower in northern Pakistan. For two months a team of free climbers from Wyoming matched gymnastic skill and cowboy courage against the unforgiving rock.

STORMING

By TODD SKINNER

Photographs by BILL HATCHER



THE TOWER

A golden dagger of granite, Trango Tower's windswept East Face taunts climbers with a 3,000-foot vertical ascent—one of the world's tallest sheer walls. Storms delayed the team's progress to the knife edge of winter.





“If we need rope ladders to ascend a peak,
then we’ve climbed our ladders,
not the mountain itself.”

—TODD SKINNER

TIME WAS RUNNING OUT. It was our 43rd day on Trango Tower, a 3,000-foot tooth of granite that rises like a bad dream out of the Karakoram Range in Pakistan. Clouds to the south were as black as oil. Winter was closing in.

“Man, this storm looks scary. Let’s vamoose,” said Mike Lilygren, the most levelheaded climber on our team of cowboys from Wyoming. Together with Bobby Model and Jeff Bechtel, Mike and I were stuffed into hammock-like tents hanging off the rock face. There was nothing



BOBBY MODEL

between us and the ice 2,000 feet below.

Our tents were creaking and popping in the wind. For safety we’d clipped almost everything to the wall, including ourselves. A dropped toothbrush would be gone forever.

“I say we stay up here one more day and see what happens,” I argued. I was desperate to keep climbing. “If we climb only one hour, we might not get that hour again.”

“Maybe not, but we’d be safer at Shoulder Camp,” Mike said, referring to our two tents perched on a narrow ledge a thousand feet below. “We don’t have a lot of fuel left.” Jeff and Bobby were quiet,

The reach exceeding his grasp, Mike searches for an edge in the rock as he pushes up into thin air 2,500 feet above Dunge Glacier. Using only their hands and feet to climb, the team pioneered a new route up the East Face, each person doing his share of pitches, or climbing segments. At Shoulder Camp (above) Todd Skinner debates strategy.



Room with a view, Shoulder Camp perches on a ledge, serving as sick bay and storm shelter. The team was mesmerized by “oceans of vertical rock.”





but I could tell they agreed with Mike. Without fuel for our stove we couldn't melt snow for drinking water.

"OK, you win," I grumbled. "Let's go." An icy, granular snow was swirling around us as we rappelled down the cliff. By the time we reached the ledge, the blizzard was stinging our faces. We could barely see one another an arm's length away as we trudged across the icy slope to Shoulder Camp. If we had waited much longer up above, our ropes would have frozen solid to the rock, sealing our escape route.

The storm howled for nine days, killing seven people on K2, the world's second tallest mountain, 20 miles to the east. A mile away on another peak, a fellow climber froze to death in a hanging tent like ours. If we'd stayed up on the wall, we might have shared his fate.

We could have been home safe and warm now if our goal had been only to get to the top of the tower. Using traditional climbing techniques—hammering spikes into fissures in the rock and climbing rope ladders—we could have reached the needle-like pinnacle in five days. But we were free climbers. We'd come to scale the peak using only our bare hands and our feet. To protect us if we fell—which we did often—we used safety ropes on the big wall. We also used fixed ropes to haul supplies and to commute up and down the rock. But otherwise we were on our own.

Compared with most expeditions in the Himalaya, our cowboy team was a complete anomaly. Having grown up on ranches, we'd spent our share of days riding horses and living

outdoors before taking up rock climbing. What set us apart was our gymnastic, sport-climbing style. To prepare for our ascent of the tower, which soars 20,469 feet above sea level, we didn't slog through waist-deep snow on similar high-altitude peaks. Instead we trained on boulders no taller than 15 feet in the Texas desert. We figured if we could climb any six feet of the rock face, we could climb the whole mountain, piece by piece. Traditional mountaineers were skeptical.

"We couldn't believe you brought sport climbers to Trango," a British mountaineer later told me with raised eyebrows. "We thought that was pretty cheeky."

No one had climbed the tower until 1976, when a British team reached the summit by way of the Southwest Face, using traditional techniques. A German team made the first free climb in 1988 on the South Face. The more difficult East Face had never been free climbed.

HELD PRISONER by the blizzard, I began to doubt our chances of success. After nine claustrophobic days in our tents, we were tired of gin rummy, disgusted with paperback novels, and intolerant of even the best cowboy stories. Jeff was down to telling tales about classic horse-trailer wrecks.

Meals were nothing to look forward to either. Freeze-dried stroganoff had long ago lost its appeal, especially when mixed with powdered potatoes. Nor was it any fun to step outside and get our eyes frozen shut while tending the camp stove.

We knew that the scarcity of oxygen at this altitude would slow our recovery from physical exertion, but we were surprised at how quickly our muscles wasted away. We all fell ill too,

suffering chills, fevers, and rocky stomachs.

My teammates were tough though. They took everything in stride. I recall the first time Jeff ventured out onto the treacherous incline between Shoulder Camp and the base of the wall where our fixed ropes led up to our hanging tents. The 21-year-old had never before worn crampons, the metal spikes mountaineers strap to their boots to climb on ice. Beginners often catch the crampons' sharp edges on their pant legs, losing their balance and falling.

If Jeff tumbled on this slope—much steeper than an expert ski slope—he'd slide 40 feet to the edge, then sail 1,500 feet to the ice below. We couldn't give him a rope for safety, since the edge was too close. There wouldn't be time for a partner to sink an anchor into the snow before Jeff flew over the edge, taking his partner with him.

"Still want to go across?" I asked Jeff. His first time would mean life or death.

"Heck, yes. Let's give her a shot," he said, with John Wayne bravado.

"OK then, watch yourself. You don't get two chances."

Mike and I carefully crossed the 200-yard slope, climbed partway up our ropes toward Hanging Camp, and looked down. We knew if Jeff didn't make it, no one would ever forgive us.

His first steps were stiff, like a beginner's, as he marched, knees high, in our footsteps. A hunting guide back in Wyoming, Jeff had never intended to join us up on the wall. He didn't even like rock climbing, having tried it only twice before. His brother Steve, a talented climber, was supposed to be our fourth teammate. Jeff had tagged along as our Base Camp manager. But Steve was hit by crippling headaches at Base

TODD SKINNER is a professional rock climber who lives in Lander, Wyoming. BILL HATCHER, from Flagstaff, Arizona, specializes in adventure photography.

TRANGO ASCENT

To free climb the East Face, the team followed long vertical cracks in the soaring granite. Trango Tower, also known as Nameless Tower, is part of the Trango Group, which juts like shark's teeth from the Karakoram Range. To reach the remote pinnacle, the team hauled 4,000 pounds of gear by bus, jeep, and porters through a military-controlled region near a disputed border with India. A blizzard forced the team to retreat from Hanging Camp down to Shoulder



Camp, where they were snowbound for nine days. The same storm killed seven climbers on K2, the world's second highest mountain, 20 miles away. Misfortune also struck at Base Camp, where a cook's assistant drowned in a lake and an air blast from an avalanche blew away the tents. In all, the team lost 23 days to storms.

© 1999 CHLOE (TOP)

Camp and flew home. Jeff took his place.

Halfway across, Jeff's crampons filled with snow, and he started to slip. Inching around the steepest corner, he stepped off the trail into softer snow. He fell forward, and pieces of ice slid down the slope and off the side of the tower.

Helpless from above, we held our breath as Jeff picked himself up and started again. A few minutes later he reached the other side.

"Brave kid," said Mike, shaken.

WHEN THE STORM finally cleared, the pressure on our team became larger than life. The Pakistanis are strict about visitors to the disputed border region, controlled by the military. At night we saw flashes of mortar fire, silent as heat lightning, off to the southeast, where Pakistani soldiers traded volleys with Indian troops in the big passes.

"You must come down," our liaison officer, Maj. Adnan Hafeez, told us on the radio. The second extension on our expedition permit had run out. "It is illegal for you to be here now. I am sending for the porters."

"It's not safe for us to descend right now," I said, to buy more time. I couldn't tell him we'd rather go to jail at this point than abandon our effort.

We'd divided our route up Trango Tower into 34 pitches, as mountaineers call individual segments of a climb. Each pitch could be no longer than a rope length, or about 150 feet, since that was as far as a climber could go before waiting for his partner, who was holding the other end of his safety line, to follow on a fixed rope. No individual would free climb all the pitches. Instead we would each do our share. When all the



In a tight jam on double cracks shooting 150 feet up the wall, Bobby Model fights for every inch high above Hanging Camp. On four previous attempts he fell often, taking real "whippers" on his safety lines. This time he made it.

Bloody hands holding a gri-gri—used for rappelling and controlling safety ropes—never healed at high altitude. Feet, repeatedly wedged into cracks, were swollen and numb from the cold, making it dicey to try footholds no wider than a coin's edge. Nylon ropes nicked by falling rocks grew dangerously frayed on the sharp-edged granite.









Night-light on the haunting spire, a beam illuminates a paperback at Hanging Camp, where almost everything, from novel to stove to sleepy climber is clipped to the rock face. Dissension nearly broke out among teammates when someone lost chapter seven of a favorite book they had split up to share.

pitches were completed, our team would have climbed the whole mountain. We had a dozen pitches left to go.

The first time I saw the “crux” pitch, the most difficult one, I wasn’t sure it could be free-climbed. I would have to traverse a blank expanse of granite that stretched 30 feet between two long cracks, which we were climbing like vertical freeways.

Before attempting the pitch, I went up a fixed rope to scout it out. I stared at it for 20 minutes before I saw a faint pattern of flakes waving across the wall with dime-edge handholds. On the rock-climbing scale of difficulty, which has a maximum of 5.14+, I figured it was a 5.13.

The sun was getting low as I reached for the first handhold, no wider than the spine of this magazine. Grabbing the edge

with my fingertips, I slid my thumb up over my fingers in a “crimp” to give them more strength.

There wasn’t room for both shoes on the tiny foothold, so I crossed my feet and— with nothing but a quarter mile of Himalayan air beneath me— extended my toe toward a flaw in the granite.

Shifting my weight onto this edge, as thin as a credit card, I crossed my hands and caught another flake with my fingers. In this way I crept across the face of the rock, never stopping for more than a few seconds. If I did, I knew I’d lose my concentration and fall.

When I reached the other side, I was exhilarated, brimming with confidence and raw energy. This was exactly the kind of climbing we had trained for. I wanted to leap

onto the next pitch, a tricky climb up a crack into an overhanging corner. It was snowing now, and Mike, holding the other end of my safety rope, was shivering.

“Check out the shadow, Todd,” he said, nodding toward the dark wedge of Trango’s summit creeping up the opposite peak, the closest thing to a watch we had with us.

“I know. It’s late. What do you think?” I asked.

“Up to you,” he replied. He wasn’t going to complain.

“Let’s keep going,” I said.

The crack ran straight up a hundred feet. I stretched up, slid my fingers in, twisted them tight, and pulled myself up. The crack was too narrow to jam my foot into, so I pasted the soles of my shoes against the flat rock on either side of me. To reduce the length of a potential fall, I slid a



ROBERT MOELL

Feeling on top of the world, Jeff Bechtel, Mike, Todd, and Bobby (clockwise from lower left) raise a cheer at the summit. Jeff, a hunting guide back home, had climbed only twice before; he joined the team when his brother took sick at Base Camp. Hauling supplies on his back, a climber (right) rappels down a rope lifeline.

spring-loaded cam into the fissure and slid my safety line through it. Mike payed out the rope as I went. If I fell, he would stop me.

My forearms were burning with fatigue by the time I reached the most impossible part of the overhang. My torso was rigid with tension. All my muscles were seizing up, and I was close to falling.

"Shake it out," Mike shouted, telling me to keep blood flowing into my hands. "You can do it."

I had 20 feet to go to reach the lip of the overhang. I was gasping for air. My heart muscle felt as if someone were poking me hard in the chest. Sparks were popping in front of my eyes. My options were shrinking fast.

I decided not to attach any more safety gear, even though my chances of falling were

greater than ever. I simply didn't have the strength. There was only one thought in my mind: If I could finish this pitch, I'd never have to do it again.

A surge of adrenaline shot through my body. To get better leverage, I raised my left foot as high as I could onto the wall, shifted my weight onto that foot, and pushed off toward the edge of the overhang. In a desperate grab, I caught a lip of the rock in my right hand.

"Get some gear in up there," Mike called, urging me to put a cam into the rock. I was dangling from the lip, trying to pull myself up. "Take your time. Get some gear in."

Gasping for breath, I got my elbow up onto the ledge, slid a cam into the rock, and clipped my line to it. Then I leaned against the mountain and laughed. I had made it.

WE HAD ONLY FIVE pitches to finish now. But Bobby was struggling. For nearly a month he'd been wrestling with a pitch on the upper wall at 19,800 feet. The route followed a magical pair of cracks that looked as if they had been cut by a laser into the golden granite. He'd failed four times to climb it.

Bobby didn't look healthy. The six-foot-one 22-year-old had lost 25 pounds. For weeks I had listened to his deep, gurgling cough, which sometimes forced him to his knees.

A light snow was falling on September 11, the 56th day of our climb. We were now the last expedition in the Karakoram. Another wall of storms had appeared on the horizon.

Cold, tired, and sick, Bobby headed up the cracks once more,





A natural high inspires Todd during a luminous Karakoram sunset: "No other climb will ever be so raw or require such commitment," he says of the ordeal that cost his team their strength and health during two months at high altitude. "We also had a heck of a lot of luck."

A tribute to tenacity, the free ascent of Trango Tower was the fulfillment of a cowboy climber's dream.

quickly reaching the zone where he had fallen earlier. His fingers smeared blood on the rock from a deep cut.

In one way or another, all our hands were battered and bloody. Nicks and scrapes from our first days on the rock were still with us weeks later, since our skin wasn't healing in the thin, oxygen-poor air.

I'd seen Bobby fall the previous day. It had been a real winger. He'd grabbed the edge of an icy crack and his hand popped off, launching him headfirst into a long, slow swan dive that I thought would never end. But it did when his safety rope yanked taut, slamming him

like a rag doll against the wall, bruising his ribs.

Now, as I watched him from a fixed rope nearby, I could see that he was tiring. He was taking too much time. There was nothing for him to stand on except the jagged edge of the cracks. Yet he had more than 30 feet to go.

Suddenly his feet skidded out from under him, and he was dangling by the fingers of one bloody hand.

"Get your feet in," I shouted. "Relax. Keep breathing, man."

Bobby's shoes scraped across the rock, desperately searching for a foothold, but the rock was as smooth as a monument. Then



BOBBY HOUEL

somehow he found the fissure with his toes and jammed in his shoe. At that moment I knew he was going to make it.

Two days later we finished our last pitch on Trango Tower.

WE'D VISITED the summit earlier that week, climbing to the top of our fixed ropes before wading through a mushroom cap of new snow on the summit ridge. Chunks of ice breaking loose from the ridge strafed us as we ascended. A fragment the size of a bowling ball hit me on the back, glancing off my pack, narrowly missing my helmet. It

could have knocked me out.

Getting to the top was a thrill, but it didn't mean as much for us as it might have for traditional mountaineers. Every pitch was as important to us as reaching the summit. Still, the view was inspiring: Masherbrum, Gasherbrum IV, even the tip of K2 peaking from behind Muxtagh. Jeff was moved to make a speech.

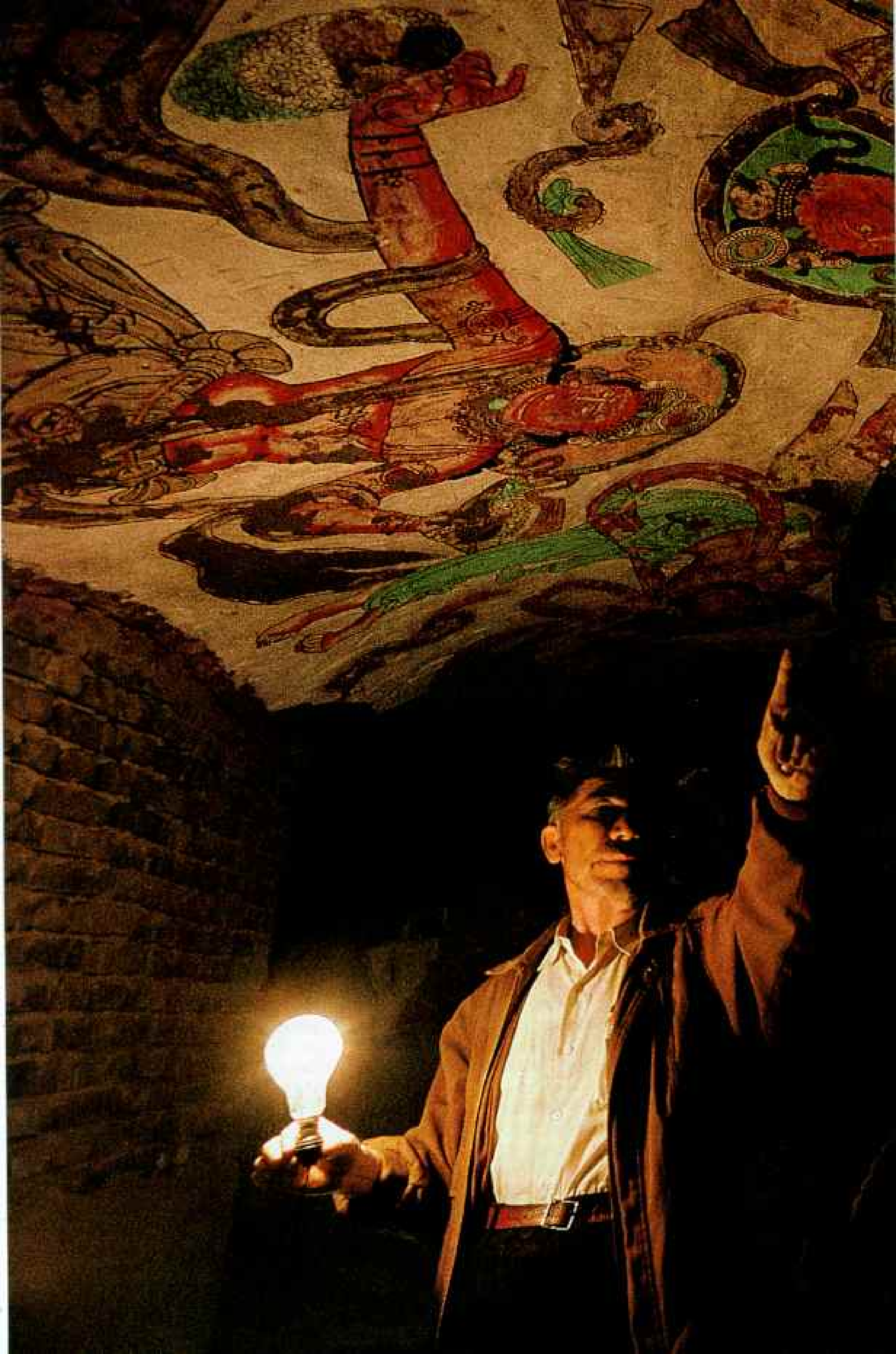
"I donate this climb," he began, holding his cap over his heart.

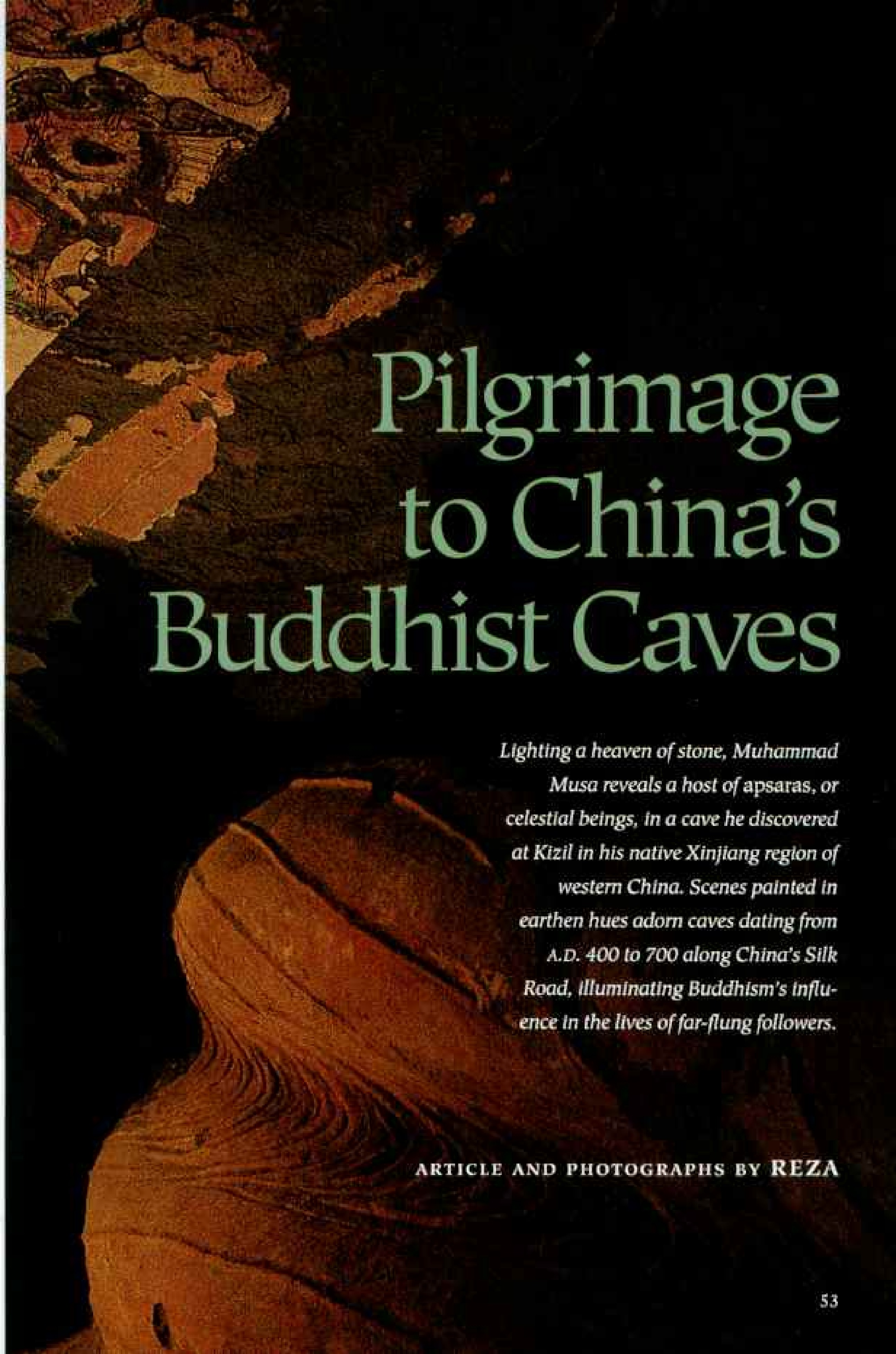
"You mean dedicate," I said.

"Right. I mean, I dedicate this climb up Trango Tower to the great state of Wyoming."

For an elk-hunting guide with

no climbing experience, Jeff had done awfully well for himself, carrying out the dream his brother Steve had been unable to fulfill. Cowboys don't cry, of course, but I thought I saw a tear in the corner of his eye. In a way Trango Tower had surprised us all. When we'd started, we'd figured it would take us three weeks to reach our goal. In the end it had taken us almost nine. Through luck and sheer stubbornness we had succeeded. But by the time we finished, we felt less like rodeo heroes than battered bronco riders who'd grabbed hold of something wild and held on just long enough to go home with the big prize. □





Pilgrimage to China's Buddhist Caves

Lighting a heaven of stone, Muhammad Musa reveals a host of apsaras, or celestial beings, in a cave he discovered at Kizil in his native Xinjiang region of western China. Scenes painted in earthen hues adorn caves dating from A.D. 400 to 700 along China's Silk Road, illuminating Buddhism's influence in the lives of far-flung followers.

ARTICLE AND PHOTOGRAPHS BY REZA

THE CART HORSE reared out of the water—spooked by something I never saw—and all of my concentration narrowed down to a single screaming thought: Save the load!

I threw my arms over the cargo. Cameras, film, an aluminum ladder, custom-cut mirrors, 1,540 feet of electrical wire, and a generator were threatening to topple into the silt Kuqa River (below right). Close to panic, I sputtered orders to the horse in French, Italian, Arabic, Turkic, and my native Persian. To my surprise—and relief—he quieted and continued along the way to the Buddhist caves at Kumtura.

While working in other parts of central Asia in years past, I had learned of the caves—hundreds of them dug by hand at Kumtura and Kizil—just north of the Taklimakan Desert along the Silk Road, an ancient conduit linking China and the West where caravans traded jade, spices, and the fabric for which the route is named (map).

As early as the fifth century A.D., caves were carved into the sandstone cliffs of the Tian Shan range as shrines and places of worship for devotees of Buddhism. Indian monks spread the religion as they traveled with traders, skirting deserts as blistering as 150°F. Worshipers built these shrines in hopes of such blessings as personal well-being, a safe and prosperous journey, advancement in the next life, or perhaps the birth of many healthy sons.

Scholars believe that local artists were commissioned by lay people to paint scenes depicting the teachings and previous lives of Siddhartha Gautama, the sixth-century B.C. Indian prince who came to be known as a Buddha—an enlightened being.

Grinding minerals such as malachite for green and iron oxide for red, the artists covered virtually every inch of wall and ceiling in colors that have remained vivid for centuries.

Little is known about the



people who created the caves, since the closest ancient cities have not been unearthed and studied. Probably they were of Turkic origin and—long before they adopted Buddhism—had already settled as far east as Dunhuang in Gansu Province.

Getting to the caves meant embarking on my own private pilgrimage. It took countless hours of negotiations with Chinese officials before I was allowed to choose ten caves to photograph. By the time we reached an agreement and I had surveyed all 363 caves at both sites, I had only four days left before my visa expired.

Leaving the horse on the road below, my assistants and I divided the cart's load between us and began to climb the narrow path leading more than 550 feet up the cliff face to the Kumtura caves. Hardy members of the region's largest ethnic group, my Uygur companions were no doubt used to making such treks, but each step filled me with worry that the fragile rock beneath my feet would crumble and send me and my equipment tumbling over the side.

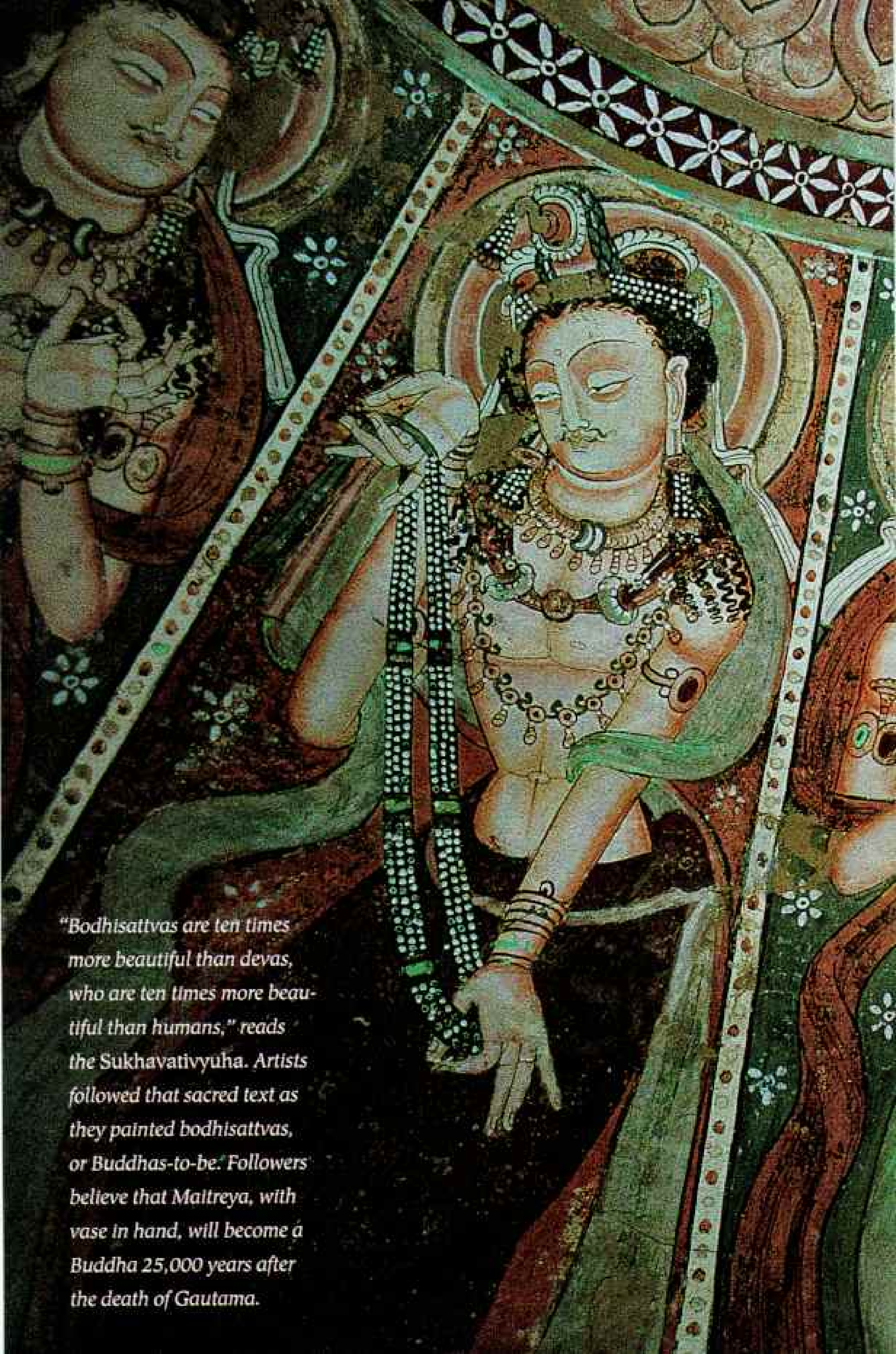
Fortunately we arrived without injury and began to work a morning-to-midnight

pace that would push the limits of our energy. To pierce the thick darkness that filled one cave, I gave all of my assistants mirrors and stationed them in a zigzag that started at the entrance. Bouncing the stream of sunlight from one mirror to the next, they snaked the reflection up to a dome in the ceiling (right). Perched on my ladder, I found myself standing in the same place as the master painter whose brush created these magnificent images. For a moment, trembling, I reached back through the centuries, and I will be forever moved by it.

REZA photographed "Xinjiang" and "The Silk Road's Lost World" for last month's issue.

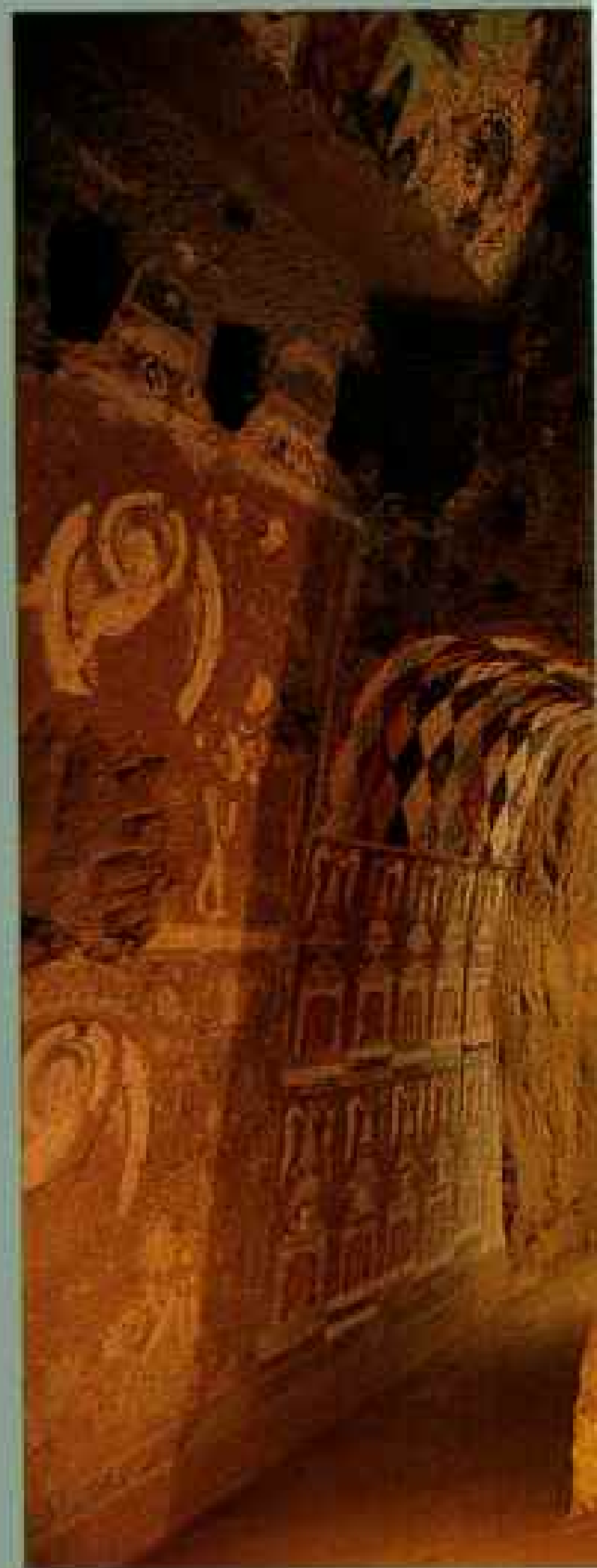
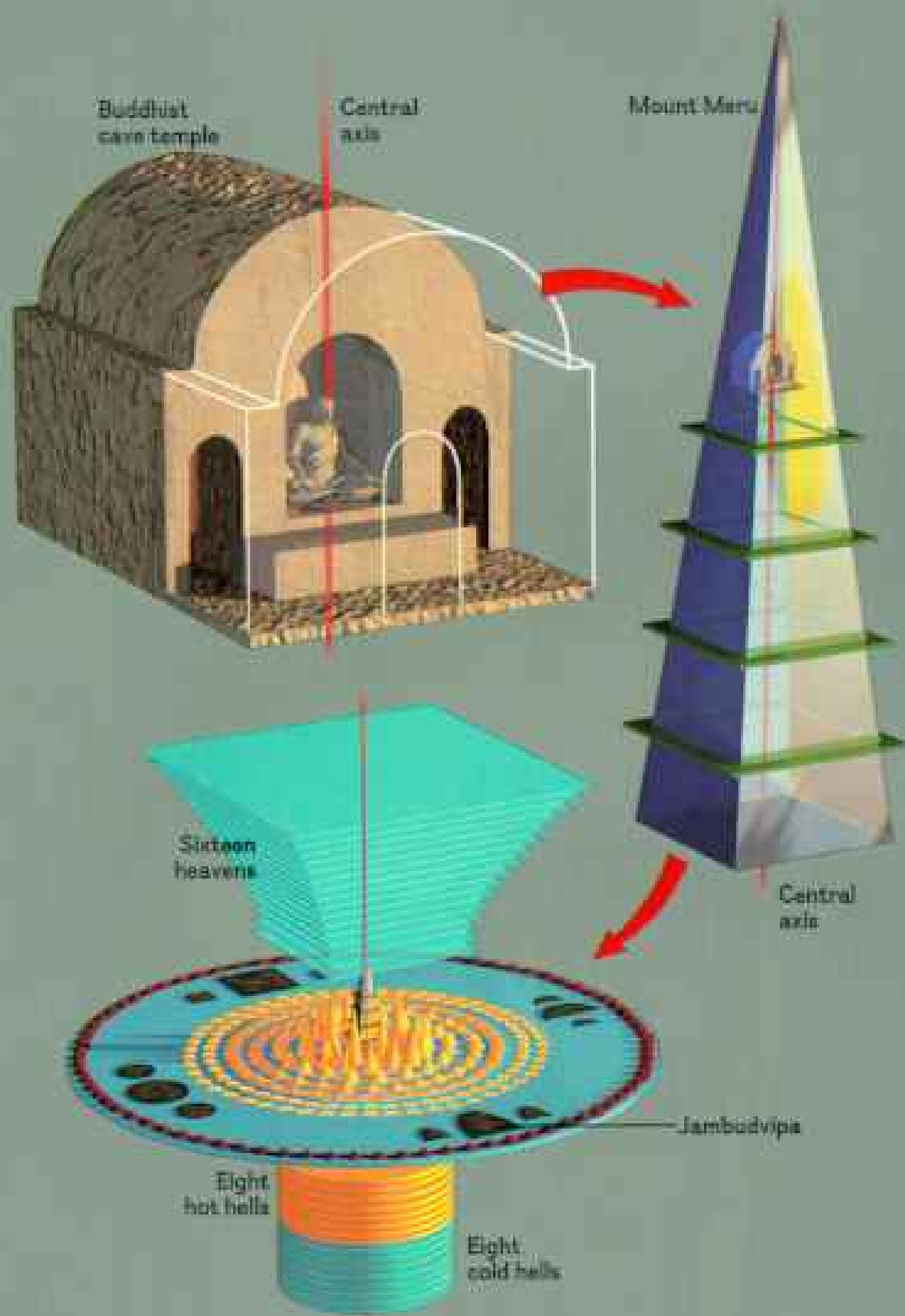






"Bodhisattvas are ten times more beautiful than devas, who are ten times more beautiful than humans," reads the Sukhavativyuha. Artists followed that sacred text as they painted bodhisattvas, or Buddhas-to-be. Followers believe that Maitreya, with vase in hand, will become a Buddha 25,000 years after the death of Gautama.





TO UNDERSTAND the significance of the paintings, I had to grasp the complex cosmology of Mahayana Buddhism, which flourished in Xinjiang when the caves were excavated.

In this cosmology (diagram above), an imaginary central axis runs through a Buddha as he sits in a cave within mythological Mount Meru, whose four sides are gold, lapis, silver, and crystal. There are an infinite number of these world systems, each with its own Buddha and Mount Meru.

Highly evolved spiritual beings live on the mountain's

four terraces. A progression of 16 heavens starts at the pinnacle of Meru, while at its base are mountains of gold and the continents, including Jambudvipa, the everyday human realm.

Below that are the eight hot hells and eight cold hells; their residents have a chance to escape in their next incarnation if they have advanced toward enlightenment. No one is irredeemable. Once a being achieves enlightenment, there is no need to be reborn.

Bodhisattvas postpone their own advancement and continue the cycle of reincarnation in order to help others in their

quests for perfection. Anyone can aspire to be a bodhisattva or a Buddha, Mahayanists believe.

One seeker is painted in a timeworn mural in Kizil cave 171, where a monkey offers food to an emaciated ascetic (right) who has renounced all worldly comforts to live a life of meditation, begging, and self-denial.

The outline of the Buddha remains where a statue of him once sat in the same Kizil cave (above right). Seeking merit and advancement, Buddhists walked clockwise three times around the icon, through one doorway and out the other, symbolically circling Mount Meru.





Serene in paradise, Maitreya teaches the dharma, or Buddhist law, to other bodhisattvas. Before painting, artists plastered the walls with straw and mud, making simple work for thieves who can cut around an image and lift it off like a tile. The incisions of a would-be robber surround one bodhisattva, second from left, in Kizil cave 17.







Floating among blue mountains, enthroned Buddhas were victims of desecrating vandals. Perhaps thieves were after valuable pigments, like lapis lazuli. Either lapis or azurite was used to render an enigmatic figure making an equally mysterious offering (above). In my breakneck tour of Xinjiang's caves, I discovered that many paintings have suffered such damage or have been removed and sold to clandestine collectors. We are fortunate that so many survive with at least their serenity intact. □



Celebrated by poets, stalked by Presidents, admired by multitudes—few fish ignite such ardor as trout. Some deem California's golden trout (above) the loveliest of all.

A Passion



PETER ESSICK WITH JOSEPH S. STANCAMPANELLO, NGA STAFF

Others are less opinionated. "To me," says one angler, "the most beautiful trout is the one on the end of my fishing line."

for Trout



*Loops of fly line fill the spring air during a casting clinic at the Al Caucci Flyfishing School in Pennsylvania. The rhythmic craft can be maddening for beginners. "If you have never picked up a fly rod before," warned Norman Maclean, minister's son and author of *A River Runs Through It*, "you will*



soon find it factually and theologically true that man by nature is a damn mess." The 1992 film version of Maclean's novella lured droves of new converts to the sport, spiking equipment sales, swelling enrollment in fishing courses—and making solitude scarce on many trout streams.

By CATHY NEWMAN
NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by PETER ESSICK

Paintings by JACK UNRUH

I was 36 when I fell in love with trout. Not the helpless crush of first love. Nor the steady affection of last love. This was midlife love. Compelling. Dangerous. I'll never forget that first rise to the fly. How the rod, then my hand trembled at the tug on the line. There I stood, waist-deep in a Pennsylvania stream, fighting a fish as beautiful as a rainbow. My heart leaped higher than the trout.

Which might explain why seven years later, in the black gulf of an Oregon night, I am encased in a diving suit in 42-degree water as a trout census taker.

I'm at a spring-fed tributary of the McKenzie River. The creek, a trickle of water that slips down a slope of the Cascades, is a nursery for cutthroat and bull trout.

Jim Capurso, a fisheries biologist with the United States Forest Service, hands me a pair of neoprene gloves. "The first 30 seconds are the worst," he says. "Then you'll be fine."

The frigid water stings the part of my face unprotected by mask or hood. The flare of my underwater flashlight dissects the dark, spotlighting, in a pool, a three-inch-long cutthroat trout. The cutthroat ignores me. Its mouth opens and closes in soundless conversation; its eyes are frozen wide in perpetual surprise.

As I cling to a boulder, a pulse of current pushes the cutthroat into my flashlight. My icy angst vanishes. In its place, wonder at meeting a fish on its own terms.

I have bonded with a trout.

How to make sense of a passion for a fish? I asked Joe McGurrin, resource director of Trout Unlimited, a conservation group with 85,000 members.

We were talking trout, a sleek, cold-water fish that has been around for about a hundred million years and is, as its family name Salmonidae implies, first cousin to the salmon.

Trout are more than passion, Joe and I agreed. They are religion. Magic. At certain phases of the moon, even madness. For love of trout, men (and women) do the inexplicable.

PETER ESSICK, a frequent contributor to NATIONAL GEOGRAPHIC, has become a fly-fishing convert. JACK UNRUH's paintings last appeared in "Alone Across the Arctic Crown" (April 1993).

A mechanical engineer I met kept eight 50-gallon tanks of aquatic insects in his living room. He's curious about the cycles of a trout's main food source. A general in the 1960s had rainbow trout stocked in a spring on a Florida Air Force base where trout, because of the climate, cannot thrive. Then there was my own folly: a longing, until the price (\$500 a yard) was mentioned, for a stream of my own.

Perhaps, Joe suggested, trout enchant us because they echo the harmony of the spheres. "Of all the major sport fish, trout need the coldest, cleanest, clearest water, the most pristine habitat," he explained. "When you have trouble in the environment, trout are the first to go. But when trout are where they ought to be, all is right with the world."

Of course. To stand with a rod in the cold pull of current while water dances over rock is to feel connected with every molecule in nature. "Rivers and the Inhabitants of the watry Element were made for wise men to contemplate, and fools to pass by," wrote Izaak Walton in *The Compleat Angler*.

Rivers are mirrors. We pursue trout and find an elusive something in ourselves.

IN THE BASEMENT of his house in Beltsville, Maryland, Frank Thompson, owner of an air-conditioning and heating company, emptied the 27 pockets of his forest green fishing vest.

He pulled out ten metal boxes, each about the size of a paperback novel. In them we counted 1,037 flies. He dug out half a dozen spools of spiderweb-fine nylon called tippet, to which the fly is tied; two pairs of tiny scissors, a measuring tape, a handheld scale, a stream thermometer; sprays, pastes, and powders to sprinkle on flies to make them float; pastes and powders to sprinkle on lines to make them



"To have great fishing with good friends" – that's the creed of the Houghton Club, England's most exclusive fishing fraternity and owner of 14 miles of the trout-rich River Test. The club's two dozen members include the Honorable Anthony Samuel, left, here getting an assist from retired riverkeeper Mick Lunn. To gain admission, prospective members must be both well-heeled and well-liked. "It's important that they fit in," says Lunn. "In the choice of membership, the blackball still exists."

Rounding out an evening with coffee and quiet conversation, guests at the Arundell Arms in Lifton, England, savor the genteel comforts of a British institution: the sporting hotel. No rustic fish camp, the Arundell Arms provides what the civilized trout requires — fine cuisine, comfortable accommodations, and 20 miles of private streams — and underscores the contrast between trout fishing in Britain and the U.S. “The greatest difference is in who owns the fishing,” says proprietor Anne Voss-Bark. While most Americans fish for free in public waters, British anglers pay riverine landowners for fishing rights. A second difference: Many U.S. anglers release the trout they catch, while most Brits catch their fish and eat them too. At the Arundell Arms, fishermen place their catch on a silver tray in the hall, “for everyone to admire,” says Voss-Bark. Instructions to the chef are inserted, cigarlike, into each trout’s mouth.



sink, and boxes of tiny BB shot to make them sink deeper; and more. Much more.

The vest, now 7.6 pounds lighter, looked deflated.

“Do you need all that?” I asked.

“Of course not, but it’s there if I do.”

He walked over to a rack that held 18 bamboo rods. He once owned 70 but sold most of them. “You get carried away,” he said.

One by one, he pulled them out for me to admire. They were lovely, each a golden wand, capable of magic. The one I selected trembled, eager to do my bidding. Sensing danger, I handed it back.

Three months later I bought a cane rod of my own, spending hundreds of dollars for the exquisitely crafted object. The truth is, I desperately needed it.

This involvement with trout is an old

affliction. Reportedly, the Roman politician Pliny the Younger built his villa on a pier so he could lounge in bed and cast to the trout in Lake Como. Today in the United States nine million anglers fish for trout. Half are fly fishermen, those who fish with hand-tied flies fashioned of fur and feathers, designed to imitate the insects trout eat. Last year they spent 227 million dollars on the sport.

“You have your \$500 reel,” explained an executive in Montana, “your \$800 rod, \$5,000 raft, and the \$30,000 Suburban to pull it. Just to have the best chance at that fish.”

We were watching two cutthroat trout hover in his \$6,000 indoor trout stream—a five-foot-long acrylic box in his living room. It was an expensive toy—a glorified aquarium, really, and the executive explained how the sight of trout gliding back and forth soothed



him after a hard day at the office. "It beats television," he said, rising out of his chair to pop a grasshopper into the tank. A trout shot to the surface and inhaled it.

IN WINTER I dream of trout. Brook trout with orange fins and lemon yellow bellies. Rainbow trout: all crimson and emerald. The golden trout, brilliant as a newly minted coin. There are about 30 species in the trout family, a lifetime of pursuit.

In winter trout hug the bottom of ice-clad streams. Their metabolism slows in synchrony with the still, white world. They may lunge for a minnow or snow fly, but mainly they wait for spring—like me.

Winter melts. The stream stirs, and so do I. I go to a river I know—a broad coil of green water called the Delaware, which forms part

of the border between New York and Pennsylvania. The river tumbles over rock, rushing past slopes clad in laurel and hickory.

Caddis flies emerge from mummy cases in which they snuggled as larvae; they rise from the surface like brown mist. Mayflies float on the current, their wings upright on water like tiny sails. They lift off in silver clouds, mate, and fall back. The air is soft. The water boils with trout.

Which wisp of feather and fur will conjure the trout? Sweeping my hand through the water, I scoop up a fly the size of a rice grain. Its body is apple green, its wings like a tiny crumpled pair of silk stockings.

From my vest I choose its dead ringer, a fly known as a Blue-winged Olive.

Behind that next boulder languishes the trout of my winter night's dream, sheltered

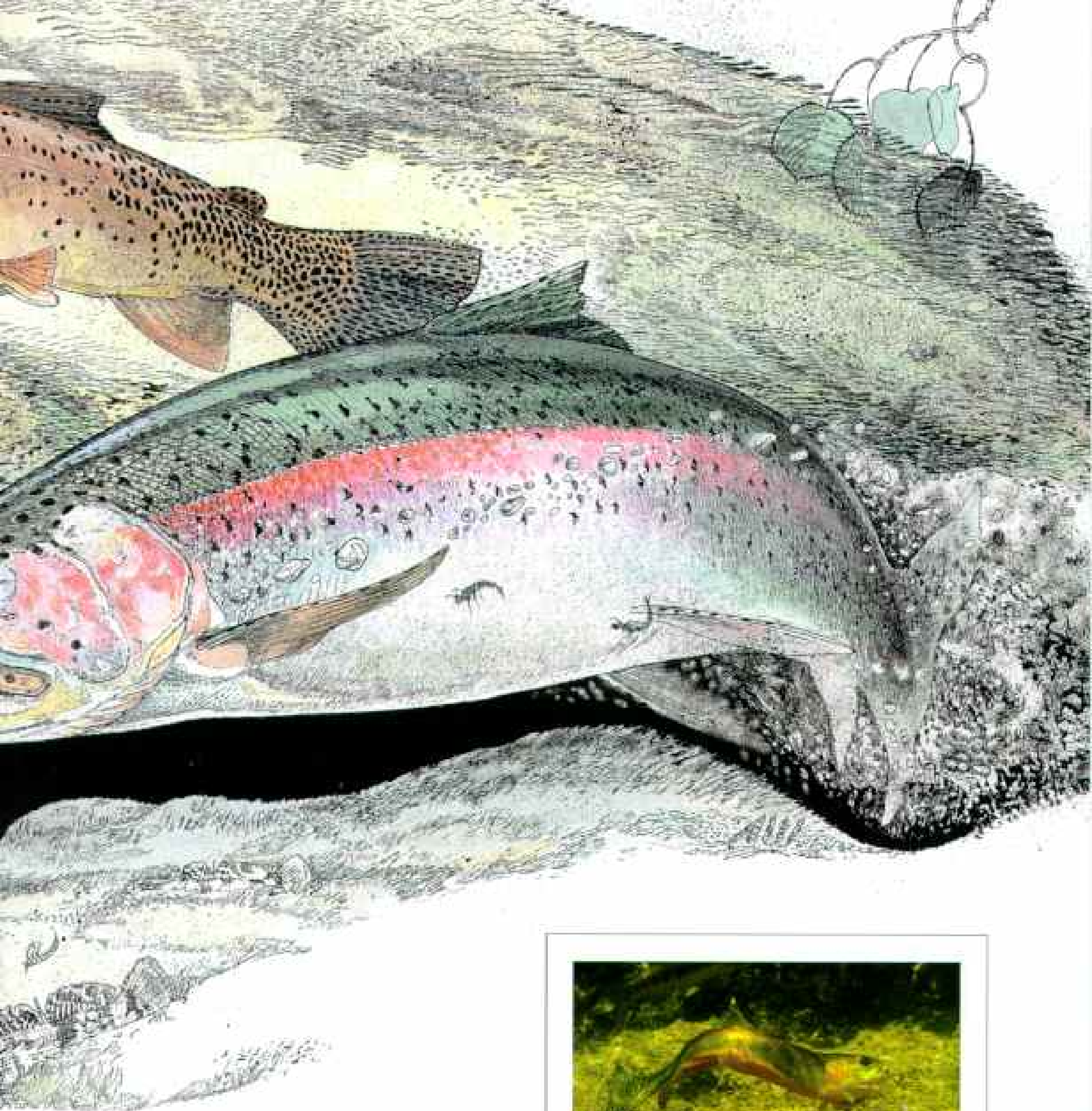


A Trout Family Portrait

Renowned for its wariness, the trout has been defined as "a fish known mainly by hearsay." Of the 30-odd species in the trout family, the most storied include (clockwise from top) the cutthroat, rainbow, brook, golden, and brown. Though no single stream harbors all five, this painting reflects actual habitat preferences and feeding habits. Rainbows and cutthroats, for instance, prefer life in water's fast lane, whereas browns favor pools shaded by vegetation. Brook trout often nose the bottom for prey, while goldens go wherever there's food.

Cutthroat Trout (*Oncorhynchus clarki*)

Encountered by explorers Lewis and Clark, the cutthroat provided food for westbound trappers, miners, and railroaders. Ranching, mining, and logging have erased much of its original habitat, reducing it to a fraction of its former range.



PETER ESSICK WITH JOSEPH E. STANGMPFANO

Rainbow Trout
(*Oncorhynchus mykiss*)

Iridescent stripes along the flanks of this North American native led to its evocative name. The trout most commonly bred in hatcheries, it has been stocked world-wide and is a favorite for the dinner table.

Brook Trout
(*Salvelinus fontinalis*)

A trout by name and reputation only, the brookie is in fact a char. Also called speckled trout, brookies are dappled by light spots on a dark background, while true trout wear dark on light.

Golden Trout
(*Oncorhynchus aguabonita*)

Native only to the southern Sierra Nevada in California, the golden trout has been lauded as "one of the most beautiful fish that swims." Spawning in clean, cold water (inset), female goldens excavate shallow pits, or redds, in which to deposit their eggs.

Brown Trout
(*Salmo trutta*)

An epicure of aquatic insects, the European brown trout inspired the sport of fly-fishing. British imperialists carried its eggs from outpost to outpost, introducing trout, tea, and cricket wherever they went.

from the brisk current that propels food past his mouth. Observe his rhythm as he dines. Advance. Snap. Retreat.

With breathless hope I lift my rod and flick the fly upstream. It drifts wide. The next cast—short. The third. . . .

A gray snout breaks the surface. The fly vanishes. A swirl of water in its place. I pause. One heartbeat. Two heartbeats. I raise the rod tip. The line stretches and lifts, touched to life by a flash of gold that darts away from me.

I reel him in. No, I coax him in. One does not rush a trout. It is a delicate dance. I reel in line. Wait. Watch. Reel in again.

Tired, and within reach, he is slipped into the net. Gently, I reach for my trophy. Now I hold him: a foot-long wild brown trout, bright, and so alive—ruby- and black-speckled flanks, a belly of burnished bronze, amber fins. We regard each other eye to eye. Unhooking his lip, I set him free. At first he hardly stirs; fins weakly fan the water. Then, a sudden retreat. He vanishes into dark green water—and memory.

Not all trout are as lucky. Though catch-and-release is gaining acceptance, many trout that take the hook wind up in the creel.

With a finite number of streams, it's small wonder there are fewer trout for more fishermen. The increasing demand for trout raises the question of how to beef up the supply.

BY THE TIME we reached Newville, the number of cars following the hatchery truck had risen to six.

"Here they are. Come and get them," Erwin Wisner hooted, glancing in his rearview mirror.

The white rhino of a truck I'm in is an aquarium on wheels. Exactly 1,110 rainbows and browns slosh around in back—enough to stock three and a half miles of Big Spring Creek, a ribbon of stream that unfurls through the rolling farmland of central Pennsylvania.

An hour earlier those trout had been lolling in narrow, concrete raceways in the hatchery where they were raised from eggs.

Why grow trout when nature performs that function so expertly? Too many fishermen, too few fish, hatchery folks explain. So, states grow trout to help fill the demand.

West Virginia, for example, has 200,000 anglers, but only 600 miles of wild-trout-producing streams. "If all we could depend on were wild-trout streams, there wouldn't even

be room for all those anglers to stand," says Don Phares, assistant chief of cold-water management. So West Virginia stocks 1.2 million trout a year in lakes or streams that can't support a wild population. Perhaps the stream is barren because of silting, which suffocates fish eggs. Or water temperatures are within trout comfort range (45° to 66°F) during much of the year but intolerable in summer.

States operate hatcheries for put-and-take fishing. Fish are dumped in; fishermen haul them out. The "product," as farmed trout are called, is often the rainbow, a feedlot type of fish that tolerates crowding and gains weight faster than other species. A hatchery can turn out a half-pound rainbow in a year.

At the end of the line is a ride in a truck, like the one I'm in on a May morning. Stocking won't begin till 9 a.m., so Erwin pulls into a parking lot to wait. I hop out to ask the guy in the gray Chevy why he's tailing us.

"I'm entitled to a few fish," says Rodney Naugle, a retired electronics specialist for a military base. "If you wait till the end of the day, there's nothing left."

Nine o'clock. Stocking time. The truck lumbers down to the stream at Keck's Mill; we heave buckets of trout into the water.

"If we were throwing out silver dollars, you wouldn't have this many people," Erwin observes, nodding at the shoulder-to-shoulder line of fishermen on the bank.

Back in the truck, moving on. In the rearview mirror the count has risen to 12.

We stop at the bridge at Laughlin Mill. Six anglers stand with rods ready, each like a batter waiting while the pitcher winds up. Trout are tossed in; the fishermen start casting.

Why not just hand out fish? I ask Erwin.

"We've been asked that before."

We throw in the last several hundred trout at Ginter's Mill and head back to the hatchery. I glance in the rearview mirror.

The road is empty.

Are trout a commodity or a resource?

"Both," says Tom Greene of Pennsylvania's Bureau of Fisheries. "Wild trout are a resource; hatchery trout, a commodity."

Pennsylvania stocks about 5.2 million trout a year. California churns out 7.8 million; Colorado, 4.8 million. It's big business. California—which even stocks trout in Los Angeles County—spends ten million dollars of its inland fisheries budget on hatcheries.

"Fishing license fees support state fish and

game budgets," says Jack Williams, a senior ecologist with the Bureau of Land Management. "It's the let's-produce-zillions-of-trout-and-keep-people-happy philosophy."

"Does it really?" he asks, then answers his own question. "It doesn't teach the ethic people need. A stream isn't a holding tank for fish, a place to live between hatchery truck and hook. A stream is valuable habitat. If you don't have good water for trout, you won't have good water for people."

In Annapolis, I visit Bob Bachman, director of Maryland's Fish, Heritage and Wildlife Administration. "I followed the hatchery truck myself as a boy. It's how we all start out," he says. Maryland's hatchery program, he adds, generates \$1.77 for every dollar spent. "Do it right, and hatchery trout provide the money to restore wild trout."

That's no solace to hatchery-trout critics like Ray White, a fisheries biologist from Edmonds, Washington.

"Cookie-cutter trout," he snorts. "They're overfed blimps, disease prone, with frayed fins from rubbing against concrete raceways."

Introduce hatchery trout in a wild population, White says, and "they're like freshmen in a class of seniors. They get in the way and don't know how to act. They contaminate the genetics, compete for food and space, and eat smaller wild trout."

We were driving around a Seattle suburb to look at a stream White helped restore, when the subject of hatcheries came up. Better fish management might help, I suggested.

He nearly drove off the road.

"Fish management! Fish don't need management. *People* need management."

IN SPRING the longing for trout leads me to England, where angling can be as formal as high tea. On certain streams one even dresses for trout. "It shows respect for the fish," explained the manager of a tony London tackle shop. He pointed to a rack of tweed

Snippets of feather and fur metamorphose into a mayfly in the deft hands of fly tier Poul Jorgensen. The exacting craft demands dexterity, an eye for detail, and knowledge of streamside entomology. Sound difficult?

"Anyone who can tie their shoelaces can learn to tie flies," says Jorgensen, whose masterpieces fetch up to \$500 each — and hook more collectors than trout.



jackets and, for the really well-heeled angler, a \$295 pair of leather-lined rubber boots.

Only blue-blooded trout, I am convinced, swim in the River Test. From its source at the Hampshire village of Ashe, the fledgling stream wanders from Laverstoke to Whitchurch, Chilbolton to Stockbridge, and on past the lush lawns of Broadlands, the late Lord Mountbatten's estate at Romsey, before losing itself in the sea at Southampton. It is a chalk stream, spring fed, clear as gin ("and twice as expensive" it is said). To fish it is the dream of anyone who has held a fly rod.

At a state prison in Colorado (below) the law of supply and demand keeps inmates busy rearing trout to stock local lakes and streams. Colorado leads the U.S. in per capita trout production, annually churning out 4.8 million "stockers" for 750,000 license-buying anglers. Proponents say the practice improves fishing and helps fund conservation programs; critics charge that farmed trout erode the genetic integrity of wild strains and create anemic fisheries that require regular infusions of stocked trout. A better approach, they argue, is restoring the wild-spawning, self-sustaining populations. One example: In Washington State, biologists brave bone-chilling water to discover how imperiled bull trout are faring in the North Fork Lewis River (right). Though declining across most of their range, bull trout in the North Fork are making a comeback, owing to restrictions on fishing and protection of stream habitat.



A dream it usually remains. To fish the Test, one must know someone who has fishing rights on the river or belong to a club that does.

The pinnacle of privilege is the 24-member Houghton Club in Stockbridge, owner of 14 glorious miles of the Test.

Turn the brass knob, ease open the green wooden door marked PRIVATE, and perhaps a member will pour you a glass of port from the dimpled crystal decanter on the sideboard. Note the leatherbound book on the club room table. It is the fishing diary, and you will turn its pages to find the names of Gen. Dwight D. Eisenhower and Prince Charles, among other notables, who have fished as guests.

"I see a flush of lords has been here," says Mick Lunn, inspecting the previous day's entries. A compact Hampshireman with a round face that crinkles into laughter, he is the

third-generation Lunn to be the club river-keeper. Though retired, he still consults.

"We deplore fishing the water," he says. He means blindly casting in hopes that a trout lurks within reach. "You must stalk your fish. If you don't see one, you don't fish."

No wading. No stomping the watercress. Dry fly only. Upstream, please.

I ask the Honorable Anthony Samuel, a member of 37 years, what would happen if someone had the gall to drop a wet fly—one that sinks instead of floats—in the Houghton Club's holy water?

A look of alarm appears in his eyes. "It just isn't done," he says.

I'm invited to fish with him. More precisely, since I'm not a member, I'm invited to watch.

The scene is irresistible. The river shimmers. The water—utterly clear. Watercress



and wild celery wave in the current. Samuel, in tattersall shirt and black knit tie, is aiming a small brown fly at a feeding trout.

"A painting come to life," I scribble in my notepad, as a mayfly alights on my finger.

Not quite picture perfect, however. My hand itches for a rod. Absentmindedly, I make casting motions with my pencil.

Samuel glances back. "So sorry you can't have a go," he says. And continues casting.

"IN AMERICA it is very different," Conrad Voss-Bark explained. We sat in his cottage within casting distance of the Lyd, a river of wild brown trout that rises on the uplands of Dartmoor. Voss-Bark, former fishing correspondent for the *Times* of London, meant I shouldn't be offended.

"Here, fishing rights can be bought and sold

like commodities. You might say rather wickedly that Americans have a socialist system of fishing; with the Brits, it's capitalist." And, even in purist Britain, the capitalistic law of supply and demand produces stocking.

At Dever Springs, a 20-minute drive from the rarefied realm of Houghton, I met trout's P. T. Barnum. Nigel Jackson has just the thing for the bloke not born to money. A place to fish for anyone with the price of a day ticket. A fishing hole filled with sumo-wrestler-size trout in the double digits. The British records for "cultivated" brown and rainbow trout—28.06 and 36.9 pounds, respectively—were forklifted out of Jackson's two lakes.

"I don't care who comes here. If he's got 45 quid [\$70 U.S.], he can fish," Jackson told me. "We sell 9,000 tickets a year, and we're booked through December. The days of purist



Trashing a Trout Stream

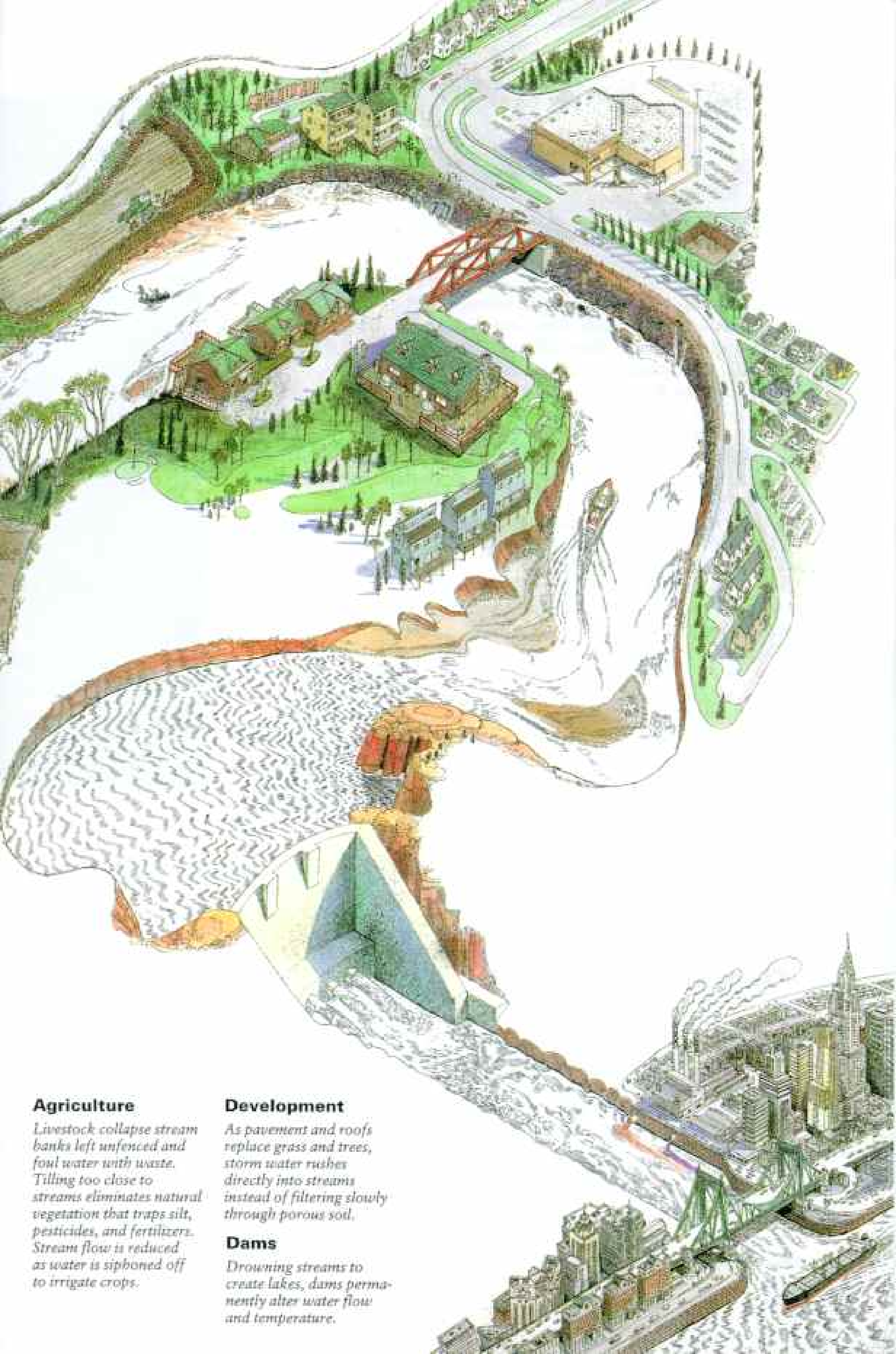
Touchstones of wildness, trout are barometers of stream health. Where they thrive, the water runs clean, cold, and oxygen rich. Impinge on its purity, and they—and the stream life that sustains them—will be the first to register ill effects. The imaginary stream snaking across these pages runs a gantlet of human abuses that have rendered many real-life streams unfit for trout. “Most of the trout’s woes stem from our misuse of land,” asserts Pete Rafle of Trout Unlimited, a conservation group. “To save a trout stream, you have to protect its watershed.”

Mining

Like open sores, old mines ooze acid and heavy metals lethal to trout. Cyanide used to extract gold enters streams when settling ponds leak.

Logging

Treeless banks bleed silt that suffocates trout eggs and insect larvae. Loss of shade warms water.



Agriculture

Livestock collapse stream banks left unfenced and foul water with waste. Tilling too close to streams eliminates natural vegetation that traps silt, pesticides, and fertilizers. Stream flow is reduced as water is siphoned off to irrigate crops.

Development

As pavement and roofs replace grass and trees, storm water rushes directly into streams instead of filtering slowly through porous soil.

Dams

Drowning streams to create lakes, dams permanently alter water flow and temperature.

fishing are over." At Dever Springs instead of tie and tweeds, dress runs to T-shirt and jeans. And in the case of Gary Wilson, a roofing contractor from Tilbury, tattooed arms.

Wilson hoists a four-pound brown, caught on a two-inch-long tuft of white rabbit fur called a Bunny Streamer. "I fish here seven or eight times a year," he tells me. "Afterwards my friends and I go to the pub. We have a bloody good laugh."

In truth, rivers, which really never belong to anyone, have the last laugh. The water from Dever Springs, where Gary Wilson, longshoreman's son, caught his four-pound trout, empties into the River Dever. Which in turn drains into the selfsame Test, where 24 gentlemen of the Houghton Club retire for port at the end of the day.

BECAUSE THE BRITISH so doted on fly-fishing, they internationalized trout. Trout eggs, kept cool and wet, survive for months, making it possible to transport them by sea. Trout, Northern Hemisphere natives, went to places where no trout swam before.

As the empire expanded beyond the sunset, so did trout: to Tasmania in 1864, India in 1889, South Africa in 1890. The hunger was insatiable. Not just for more trout. But also for different trout. European brown trout went to America in 1883. American rainbow trout came to Britain in the 1880s. Could there ever be too much of a good thing?

Absolutely. The law of unintended consequences immediately took over and has held sway ever since. So when rainbow trout from a nearby fish farm infiltrated the stretch of water under his care, riverkeeper Ron Holloway acted instantly. He called in the troops.

"Bloody American fish," he fumed, pacing the bank. Nothing personal, he hastened to add. "Rainbows are fine in their place. But this is a wild-brown-trout river."

Holloway is steward of a two-mile stretch of the Itchen, sister chalk stream to the Test. Because his native brown trout are territorial, he worried they would waste energy defending their turf and food from the alien rainbows.

As we watched, a commando team of three men in black neoprene from the National Rivers Authority, the British monitor of river health, waded through the river with an electroshocker. Fish floated to the surface, momentarily stunned. Rainbows would be

Trout fishing's not just for tweedy types in Boiling Springs, Pennsylvania, where anglers throng a local lake on opening day of trout season. Across the U.S., trouters divide into many camps, from dry-fly casters who use flies that float to pragmatic bait anglers who hew to an all-American tradition—whatever works. "I fish with anything," declares a Wyoming trouter who doesn't cotton to dry flies. "As my grandma once said, 'Flies should be killed with a fly swatter, not used to catch fish.'"



yanked out and trucked back to the fish farm. Wild browns go back in.

In the United States, brook trout, eastern natives, crowd out cutthroats in the West. Rainbows, West Coast natives, crowd out brook trout in the East. In Great Smoky Mountains National Park poor logging practices and rainbow trout have pushed brook trout—the only native salmonids in the Southeast—out of 70 percent of their original range.

"People perceive a vacant niche in the biosystem and rush to fill it," says Steve Moore, a fisheries biologist at park headquarters in Gatlinburg, Tennessee. "We forget there are no vacant niches in nature."

Will the biological bouillabaisse, brought to a boil by the geographic mixing of the different species of trout, ever be sorted out? "No," says Don Proebstel of Colorado State



University. "We only hope to maintain representative populations."

Already, the yellowfin and Alvord Basin cutthroats, western natives, have vanished. At least seven other natives are in trouble.

All is not lost. The greenback cutthroat has been nurtured back from the edge of extinction. Recovery efforts focus on bull, Gila, and Apache trout, Paiute and Lahontan cutthroats, and the Little Kern golden trout.

RIVERS ARE ROUND, naturalist Aldo Leopold said. He meant the seamlessness of life, how energy flows from sun to plants to insect to trout in a continuum broken only by man.

Such connectedness goes easily awry. Consider what post-Civil War Reconstruction did to brook trout in the Southeast. Investors

felled huge forests. Stream banks disintegrated. Streambeds silted. Trout eggs smothered. With no trees to shade streams, water temperatures soared. Trout died.

Fortunately, nature works at forgiveness.

The 130-mile-long Big Blackfoot River starts with a slide down the west slope of the Continental Divide in Montana. It slows into meanders through flats, then quickens and hugs the east flank of the Garnet Range before yielding to the Clark Fork near Missoula.

For all its loveliness, there are ugly scars. Twenty miles above the mountain hamlet of Lincoln, where the Blackfoot begins, I stepped over a creek that bled yellow acid—drainage from played out Mike Horse mine.

It is an old, festering wound. In 1975 heavy rains blew out the earthen dam that held tailings from the mine. Waste tumbled into the



Hip deep in people, Buffalo Ford on the Yellowstone River is short on escapist pleasures—but long on fishing action. “On a good day at the start of the season it’s not uncommon for an accomplished angler to catch 75 or even 100 cutthroat trout,” says Lynn Kaeding of the U.S. Fish and Wildlife



Service: Yellowstone National Park's catch-and-release policy prevents the river from being depleted and grants individual trout more lives than a cat: One study estimates that each fish is hooked and turned loose, on average, ten times during the park's peak trout-fishing season.

Catching its breath after battling a fisherman, a rainbow trout is returned to Montana's Bighorn River. "Most anglers here release their fish with no regrets," says a local guide. For them, author Izaak Walton's long-ago words have come true: "Angling will prove to be so pleasant, that it will prove to be like Vertue, a reward to it self."

streams that fed the Blackfoot. Cadmium, lead, and zinc—mining by-products—leached, killing all juvenile trout and nearly everything else in four miles of river.

Eighteen years later, toxics had spread 46 miles downstream, degraded the river, and reduced numbers of native trout. It wasn't just the mining. It was stream banks stripped bare and trampled by cattle, mountains clear-cut by logging, overfishing. The river was hurting. Thanks to friends like the Big Blackfoot Chapter of Trout Unlimited, it is healing.

"We're focusing on tributaries first," said Don Peters of Montana's Department of Fish, Wildlife, and Parks.

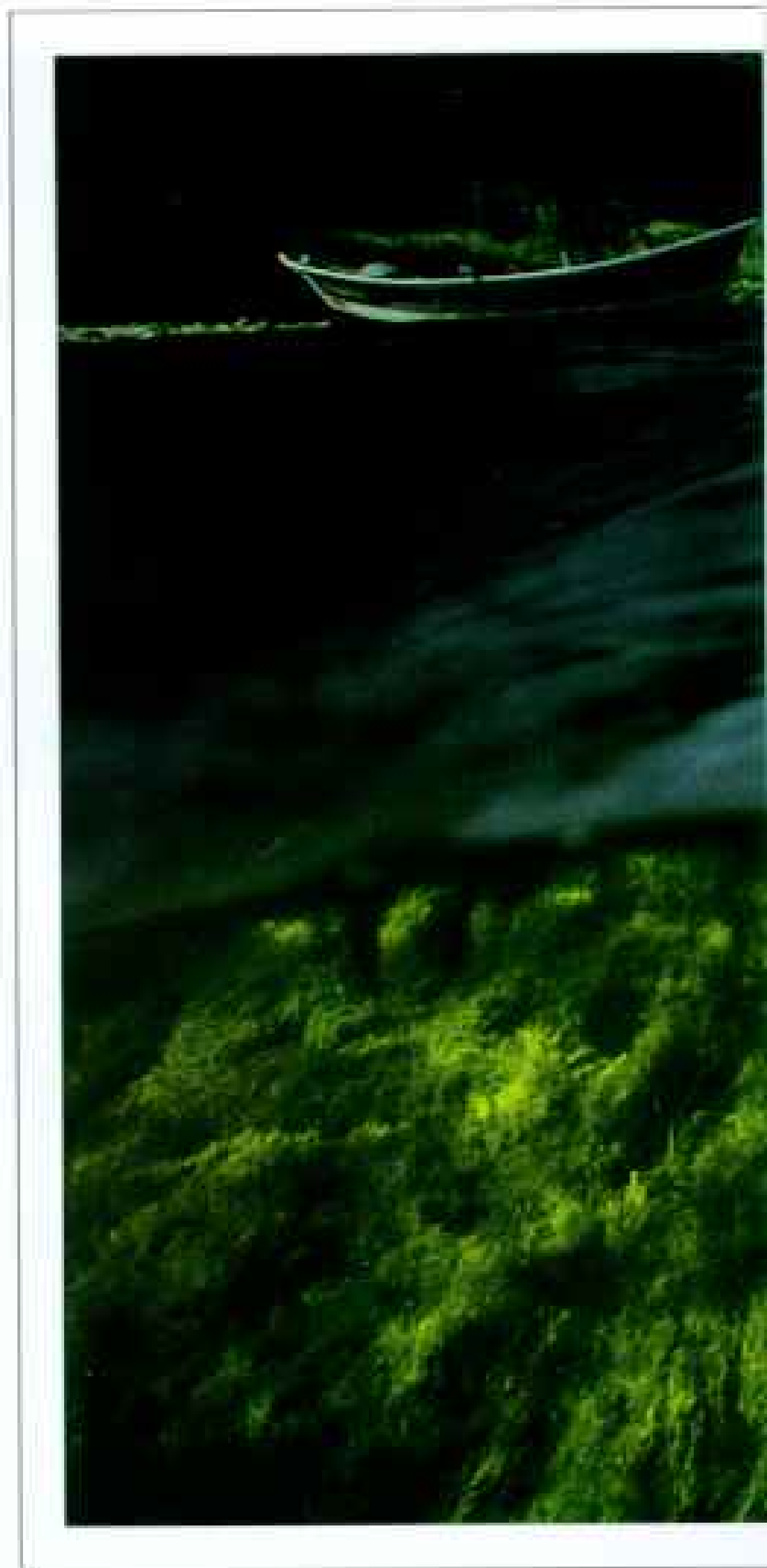
He and I were looking at one, a two-mile-long spring creek on Jon Krutar's 500-acre ranch outside Ovando. Tributaries like this, Don said, are how you keep a river going. "They're the key to reproduction."

He showed me how banks had been stabilized by planting willows, how fencing kept cattle away from the banks, how strategically placed logs helped create riffles and pools—a combination of fast and slow water that trout love so well. In six years trout reproduction has increased 10 to 15 times there.

As I found joy in the clear, bright water that twisted through Jon Krutar's pasture, the owner drove up on his tractor. "I don't fish myself," he said. "I fish through my son Eric. When I see him cast, wearing my grandfather's hat, it connects four generations."

Connections. The lesson we learn from trout. The connection between a mayfly and the ring of a rising fish. The connection between drainage from a mine and no trout. The bond that forms when sharing a stretch of stream with someone we love. Father and son. Brother and sister. Friends.

On a languid July afternoon John Maclean and I sat in his family's cabin on Seeley Lake, 25 miles north of the Blackfoot's coiling path. Maclean is the son of Norman Maclean, author of *A River Runs Through It*.



The river that runs through it is the Blackfoot.

The book is a dark poem about rivers, trout, and fly-fishing, but more intimately about a troubled brother who lived at full throttle—drinking, gambling, brawling. About the family who loved him but couldn't save him from a tragic death—a brutal beating, his body left in a dark alley. The story, drawn from personal experience, haunted Norman Maclean and found its voice in the book, published when he was 73.

"In my family fly-fishing had a spiritual dimension," said John Maclean. "It held together a family that communicated in disastrous ways. Dad talks about going to the river because he could say things there he couldn't say anywhere else."



Do you remember the last time you went fishing with your father? I asked.

"Yes," John said, and I could see tears in his eyes.

We drove up a road that spirals high above the river. When we stopped, he pointed out how the Blackfoot runs straight for a while, erupts into riffles, and slams into the mountain; then, after clawing out a deep hole, turns away and, in time, repeats the cadence.

"The book is written to that rhythm," he said. Then he finished his answer to my question about his father.

"When we returned from our last fishing trip, my father sat down. He was tired.

"I asked if I could get something—anything—for him.

" 'A drink,' he said.

"I fixed it, but it didn't taste good to him, and I knew he was near the end. He was like an old fisherman who has a big one he knows he'll never land."

John was silent for a moment. "The thing about trout fishing," he finally said, "is that a lot takes place beneath the surface."

So we learn to read the water. We note the wake of a cruising fish and the ring that marks the soft kiss of a rise.

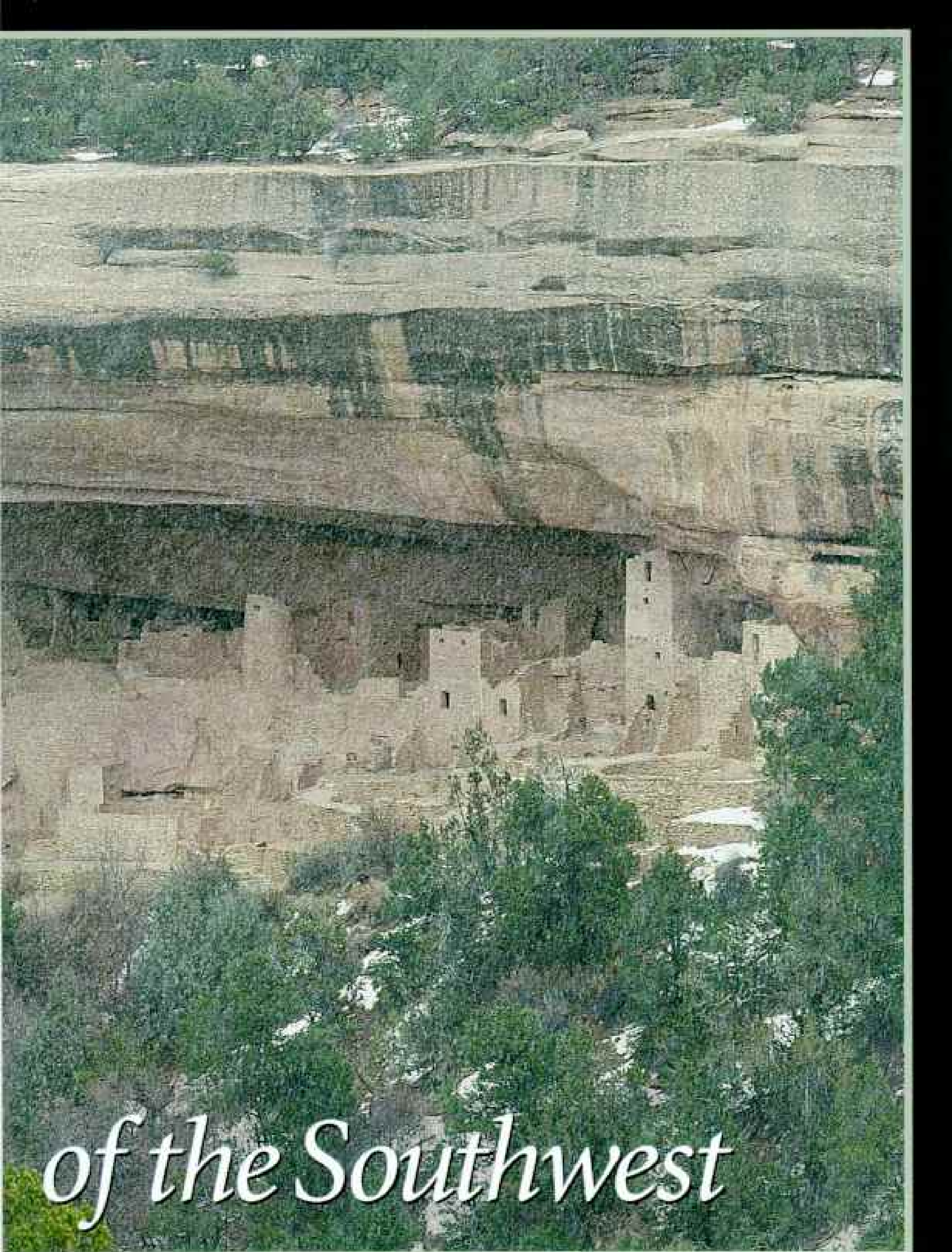
There are secret sorrows within us. While water swirls around us, we watch, we wait, we "study to be quiet," as Izaak Walton urged.

If our concentration is fierce enough, we find safe harbor, if only for an afternoon, in the holy water of a trout stream. □



The Old Ones

BY DAVID ROBERTS
PHOTOGRAPHS BY IRA BLOCK

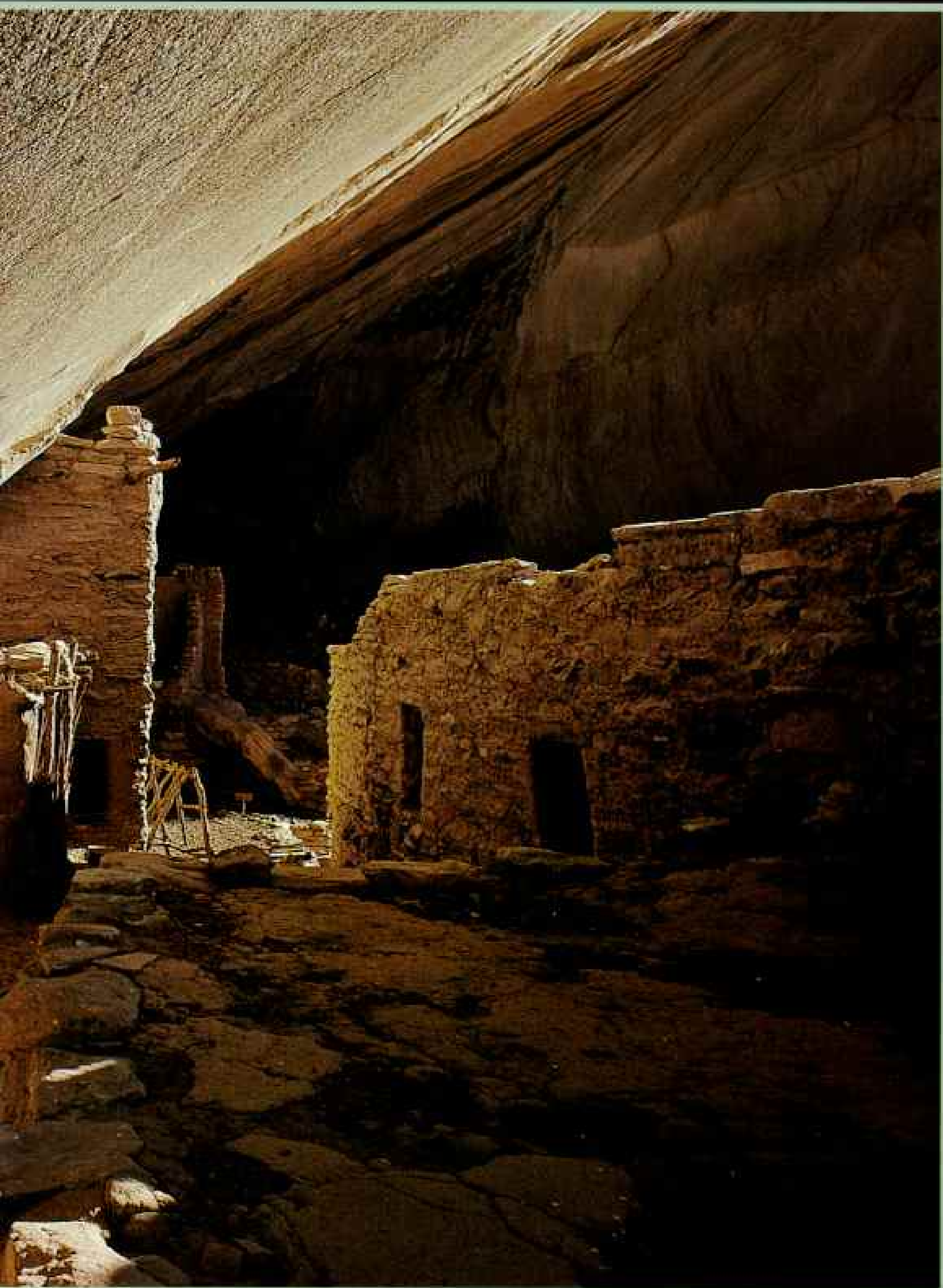


of the Southwest

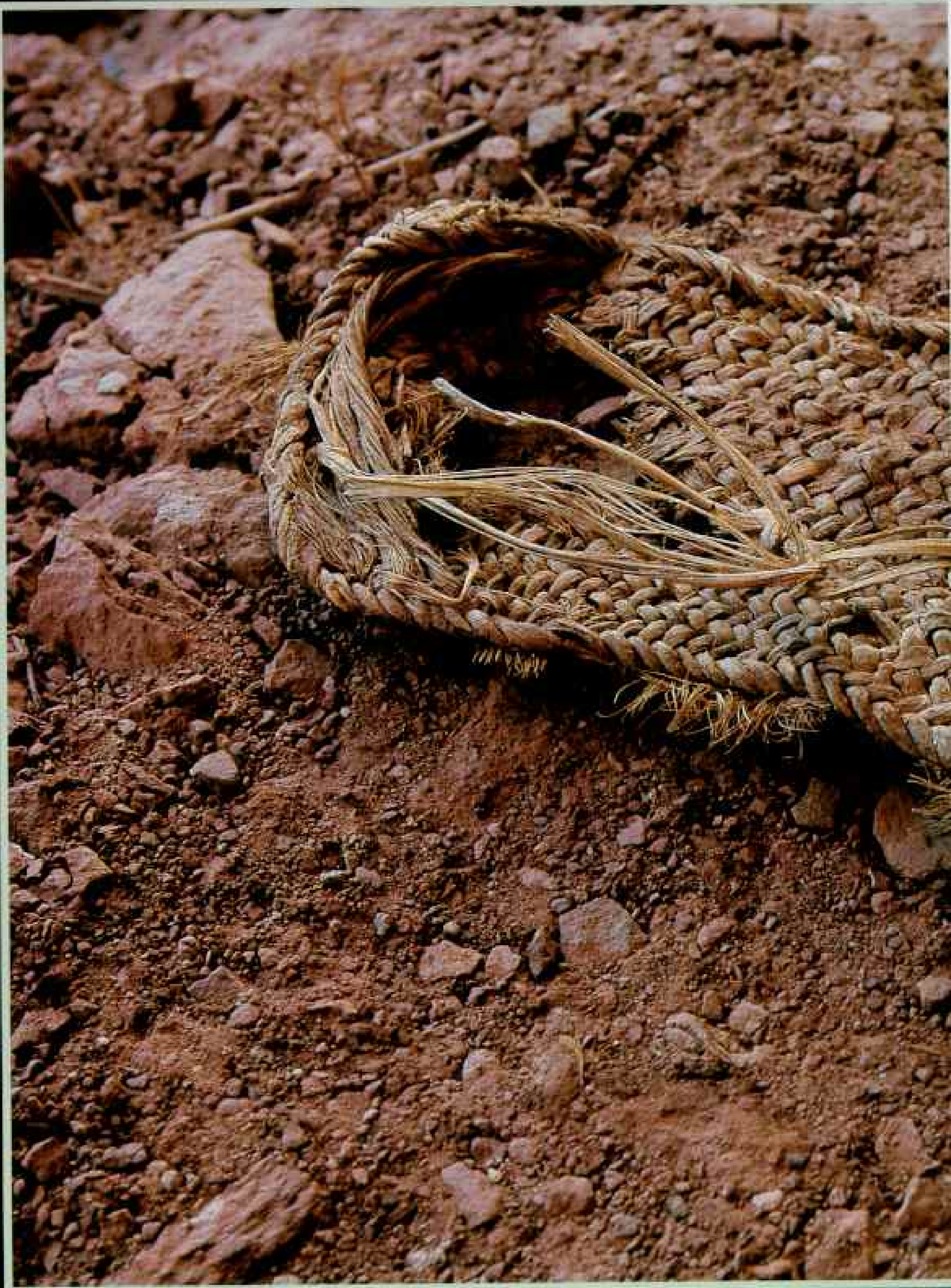
The sandstone keep of Cliff Palace has endured seven centuries of Mesa Verde winters. Thousands of such sites shelter clues to the Pueblo culture that once enlivened canyons and mesas across the Colorado Plateau.



*S*unbaked mud still clings to the stone walls of Keet Seel, Arizona,



abandoned in a sudden migration of the people known as the Anasazi.



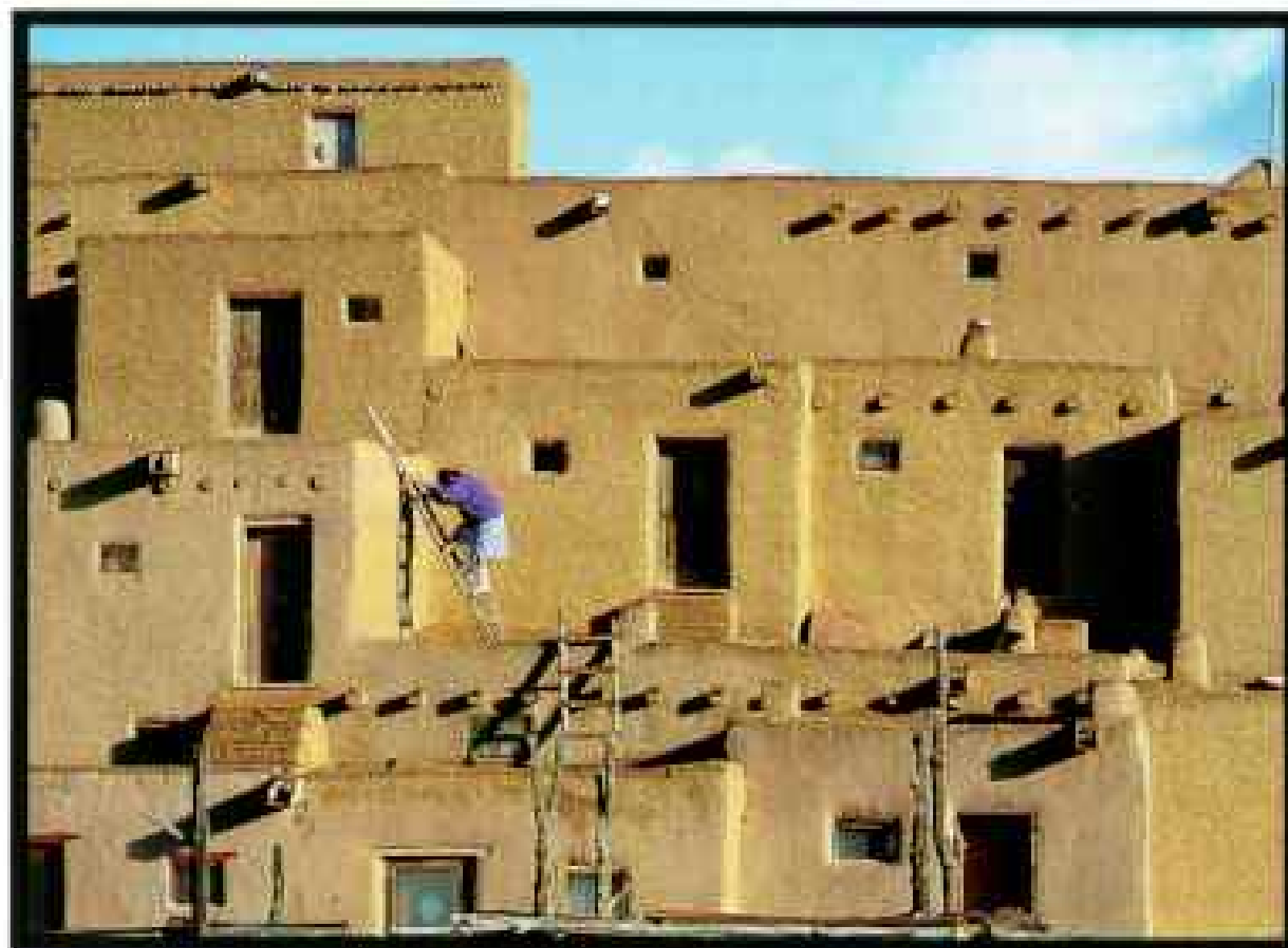
Footsteps have long since faded, yet a sandal last worn about 1200



remains where cloudless skies help preserve links to past lives.



Life's basics—food and shelter—tie modern pueblos to ancient ones. Santa Clara celebrates corn, a long-standing staple. Taos maintains adobe apartments reminiscent of the old dwellings. “We were and still are a communal society in architecture and thought,” notes Tessie Naranjo of Santa Clara.



IN AN ISOLATED CANYON in southeast Utah a little-known ruin rests beneath the edge of a 500-foot precipice, half-hidden under a small overhang. Sometime in the 13th century the Anasazi, ancestors of modern Pueblo Indians, built five rooms here out of sandstone slabs, mortaring them with mud in which you can still see the imprints of their fingers. Scores of potsherds decorated with jagged black designs lie scattered in the dirt. The floor of one room is littered with small corncobs, every one plucked clean.

By most measures, the ruin's location makes little sense. This dwelling had belonged to farmers, but they had built it far from their fields of corn, squash, and beans back north across the mesa top. Their water source was even farther away: Every day, to fill their jars, Anasazi women must have traced and retraced the difficult route down to the stream on the canyon floor.

The only attribute the site had going for it, it seemed, was its supreme defensiveness. The

house was invisible from the canyon rim 80 feet above. A single guard, stationed on the sloping descent from the rim, could prevent all access to the place. But what were these people afraid of?

For more than 2,000 years the Anasazi had lived seemingly without such fear, flourishing across an expanse of the desert Southwest the size of New England—from the Grand Canyon east to the headwaters of the Pecos River, from the junction of the Green and Colorado Rivers south to present-day Flagstaff (map, pages 96-7). We do not know what they called themselves, but they have become known to archaeologists as the Anasazi—an unfortunate name, because the word is Navajo rather than Pueblo; it means “ancient enemies.”

Many of the modern descendants of these ancients still live in houses of sandstone and mud. Some 50,000 in number, they belong to 20 tribes that inhabit the three Hopi mesas in northeastern Arizona, the Zuni pueblo in western New Mexico, and 18 pueblos along the Rio Grande and its tributaries from Taos to Isleta. Among Native Americans, the Pueblo peoples have been especially successful at retaining their ties to the past, maintaining their ancestral religion, and keeping their communities intact.

DAVID ROBERTS's most recent book is *In Search of the Old Ones: Exploring the Anasazi World of the Southwest*, just published by Simon & Schuster. IRA BLOCK photographed Arizona's San Xavier Mission for the December 1995 issue.

Long before the time of Christ, the Old Ones (as some Pueblos call their ancestors) had become skilled hunter-gatherers. They chased antelope, deer, and bighorn sheep with flint-bladed spears and darts flung from powerful atlatls. They collected piñon nuts, cactus fruit, and berries by the basketful. By A.D. 500 they had grown more sedentary, making pottery and planting crops. By the year 1200 the Anasazi numbered well into the tens of thousands; their villages, which had become elaborate grids of square rooms, often stacked several stories high, spread across their heartland.

But something happened in the 13th century that forced most of the Anasazi from mesa tops and valley bottoms into defensible villages and dizzy cliff dwellings such as the one I had explored. Then, just before 1300, the Anasazi suddenly abandoned half their ancestral domain—virtually all of the Colorado Plateau, every site northwest of a diagonal line drawn between Flagstaff, Arizona, and Pagosa Springs, Colorado, a distance of 300 miles.

Their leave-taking remains the crucial puzzle in the archaeology of the Southwest, despite more than a century of research. For decades scholars sought an environmental explanation: drought, deforestation, famine, or disease. Or they invoked attacks by hostile nomadic tribes. But in recent years some experts have turned to a cultural theory: By 1300 a new religion may have arisen to the southeast, so compelling that it helped draw tens of thousands of Anasazi from the homeland in which they had lived for millennia.

I HAVE FOUND my strongest linkages with the Old Ones by hiking into the backcountry and discovering for myself ruins like the one high on the precipice. In dozens of remote canyons, I have visited hundreds of unrestored sites, admiring the relics strewn in the dirt while taking care to leave them exactly as I found them.

One fall in my favorite Utah canyon I studied mystifying panels of rock art carved in the natural black patina called desert varnish. Massive, triangular-bodied figures, some with birds on their heads and others with crescent-shaped halos floating above them, stared balefully back at me.

I clambered up to granaries built out of bound, upright sticks covered with mud, where the ancients had cached their beans and

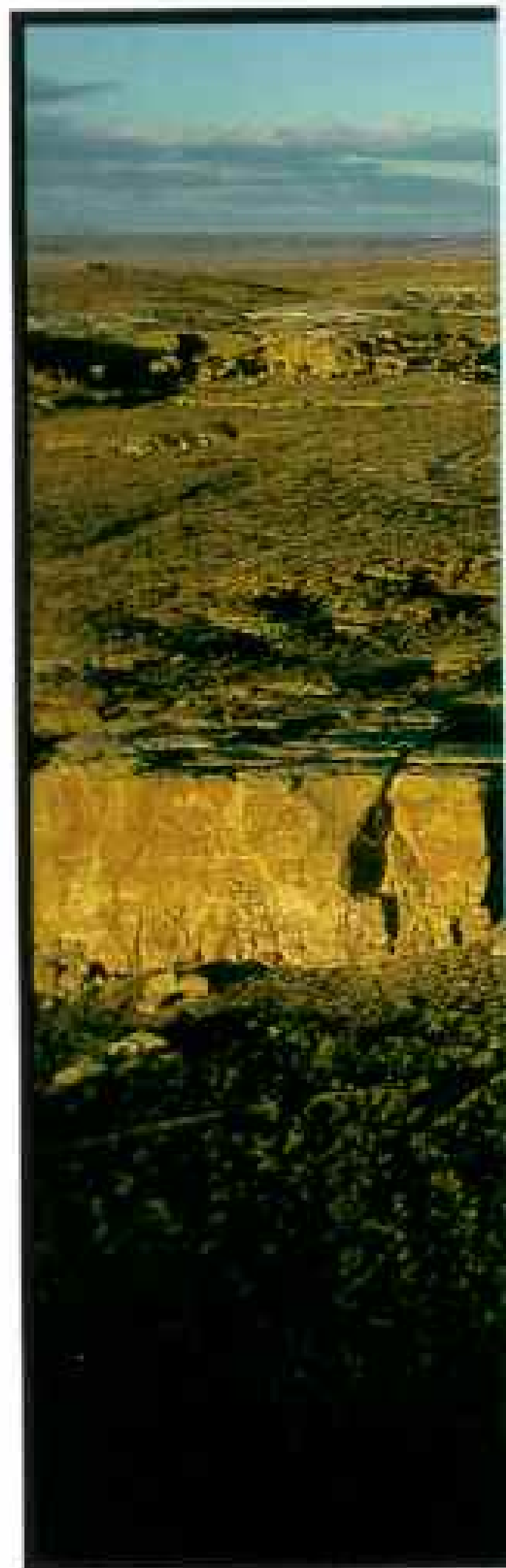
Signature of a culture at its height, Pueblo Bonito's giant D shape embraces three acres of Chaco Canyon, New Mexico. A master plan apparently guided construction for two centuries, beginning about A.D. 900.

Probably ceremonial, Pueblo Bonito may have been part of a regional center that included neighboring sites in the canyon. Roads converged on this area from dozens of outlying communities. Did pilgrims travel here for rituals? Were subjugated people compelled to come for terrifying displays of cannibalism? Experts debate the answers.

corn. I fingered hundreds of painted potsherds and pieces of worked flint. I scaled frightening prehistoric hand-and-toe trails that took me high above this sun-bleached land. Some of the ruins were simply beyond my reach, so instead I sat admiring those aeries for hours through my binoculars. I slept under cottonwood trees, on stream banks where the Anasazi had hunted deer and rabbits. I drank from the same streams that had watered the ancients so long ago.

Scores of interconnected rooms line the cliffs of the canyon. Many archaeologists believe that because the rooms are of equal size, the Anasazi were an egalitarian people. Until about 900 nearly all their settlements remained hamlets of fewer than a hundred people, each community autonomous.

But around that time, in a shallow canyon in northwestern New Mexico, a new way of life





began. Archaeologists call it the Chaco phenomenon. Anasazi villages joined together in a network stretching 250 miles from north to south. Scattered for nine miles along Chaco Canyon, nine great houses, rectangular blocks of hundreds of rooms looming as high as five stories and centered on big plazas, anchored the network. An estimated 150 villages throughout the Southwest were tied into the Chacoan system, mirroring the design of the great houses and sharing their culture.

The complexity of this network, many scholars believe, required the Anasazi to become a hierarchical society. Moreover, the discovery of several burials at Chaco teeming with precious grave goods, such as turquoise necklaces and jet pendants and amulets, suggests that the Chacoans had powerful rulers.

At the peak of its glory, at the end of the 11th century, Chaco commanded an extensive

trade in the exotic: macaw feathers from Mexico, seashells from the Gulf of California, turquoise from central New Mexico. The Mexican links indicate that Chaco was in contact with more advanced civilizations.

The most mysterious aspect of the Chaco phenomenon is a system of roads extending at least 200 miles and perhaps as far as southeastern Utah and southwestern Colorado. These roads often are 30 feet wide and stretch for miles in dead-straight lines, ignoring natural contours. They pose a great puzzle: Why should people who had no vehicles, no beasts of burden, need highways?

Some experts think the roads bore laborers who carried some 200,000 heavy roof beams of ponderosa pine, felled and trimmed with stone axes, from as far as 80 miles away to build the great houses. Others picture the roads as routes for ceremonial pilgrimages to Chaco.

Pueblos bloom in the desert

Pueblo life was not always peaceful. Especially during their last 50 years in this region, villages may have fought among themselves to survive.

With roots that reach back to hunting and gathering, the Anasazi became early farmers of the Southwest. They coaxed squash, beans, corn, and cotton from an inhospitable land. As their culture flourished, they cultivated contacts with Mexico and the Pacific and Gulf coasts (top right), elevated crafts to art (below), and built distinctive homes across the Four Corners region.

Yet these were restless people. They abandoned some sites after mere decades, perhaps having depleted scant resources. By the 1300s they had moved on entirely, many ending up around the Rio Grande. The reason remains a puzzle. Perhaps an exhausted environment pushed them out as the new kachina religion pulled from the southeast.



SCHOOL OF AMERICAN RESEARCH, SANTA FE, NEW MEXICO



MUSEUM OF NORTHERN ARIZONA, FLAGSTAFF

Launched with an atlatl, stone-tipped spears from the Basket Maker II period likely brought down deer, antelope, elk, and bighorn sheep.



AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK

ARCHAIC 1000 B.C. BASKET MAKER II A.D. 500 BASKET MAKER III 700

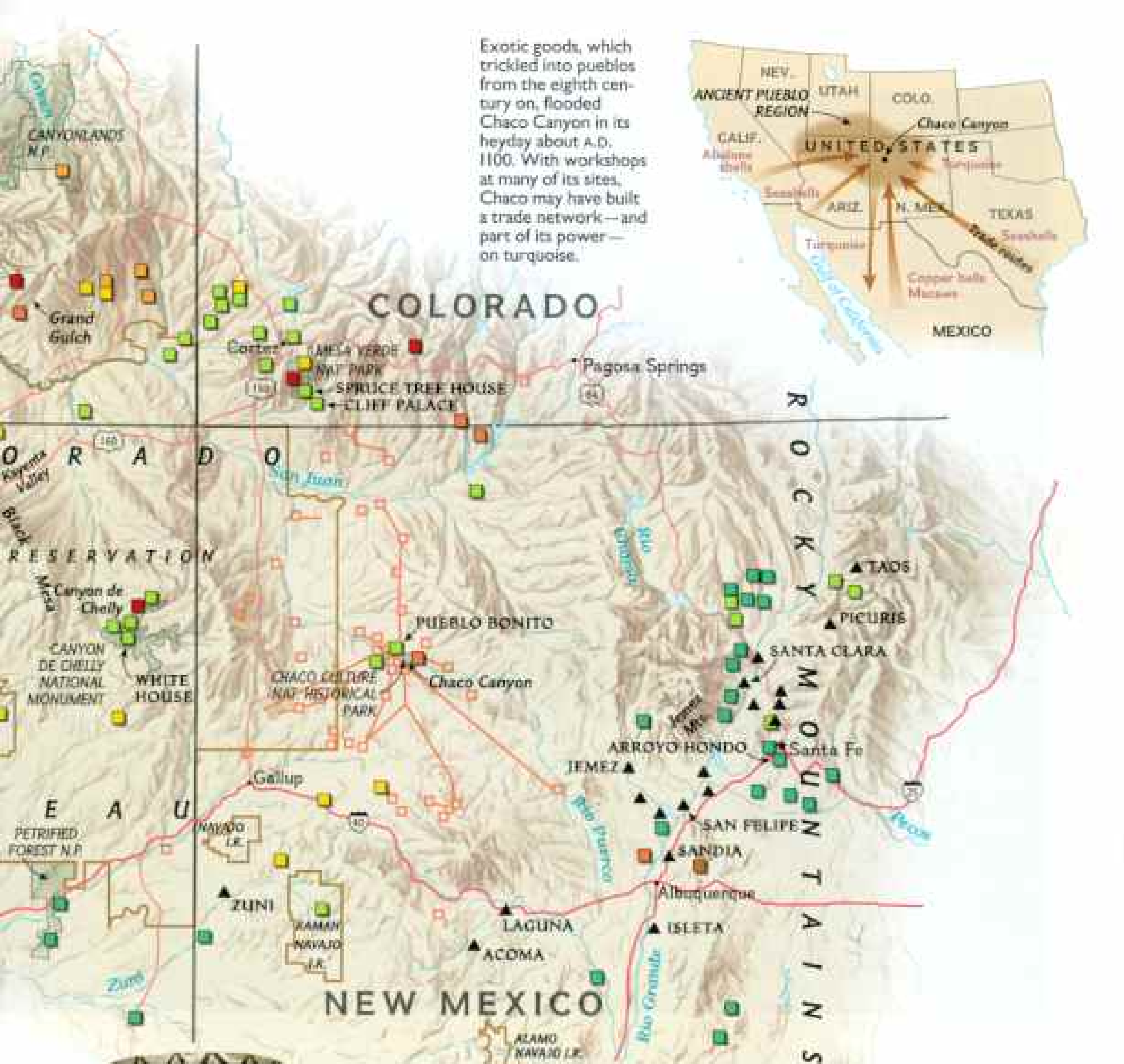
A twig figure may have had religious meaning for Archaic-period nomads who roamed here as early as 5500 B.C. Camping in brush shelters, they subsisted on seeds, nuts, berries, and small game.

Stones for grinding corn signal the start of farming in early Basket Maker times. Working with grasses, yucca fibers, twigs, and bark, women crafted hall-mark woven containers, some of them watertight.



MUSEUM OF NORTHERN ARIZONA

Fine weaving and decoration (above) testify to advancing skills and aesthetics in the Basket Maker III period. Settled in stone-lined pit houses with beam-and-pole roofs, villagers also began to make simple clay pots.



Exotic goods, which trickled into pueblos from the eighth century on, flooded Chaco Canyon in its heyday about A.D. 1100. With workshops at many of its sites, Chaco may have built a trade network—and part of its power—on turquoise.



A black-on-white cylinder jar (left) displays the simple geometric designs that characterize the Pueblo II period. The great sites of Chaco Canyon were now under construction along with the surrounding system of roads.



Just under three inches tall, a Pueblo IV pot stored beads of sacred shell and turquoise in a room that was probably ceremonial. A 24-year drought, beginning in 1276, may have helped drive the Anasazi away during this period.



PUEBLO I 900 **PUEBLO II** 1100 **PUEBLO III** 1300 **PUEBLO IV** 1800



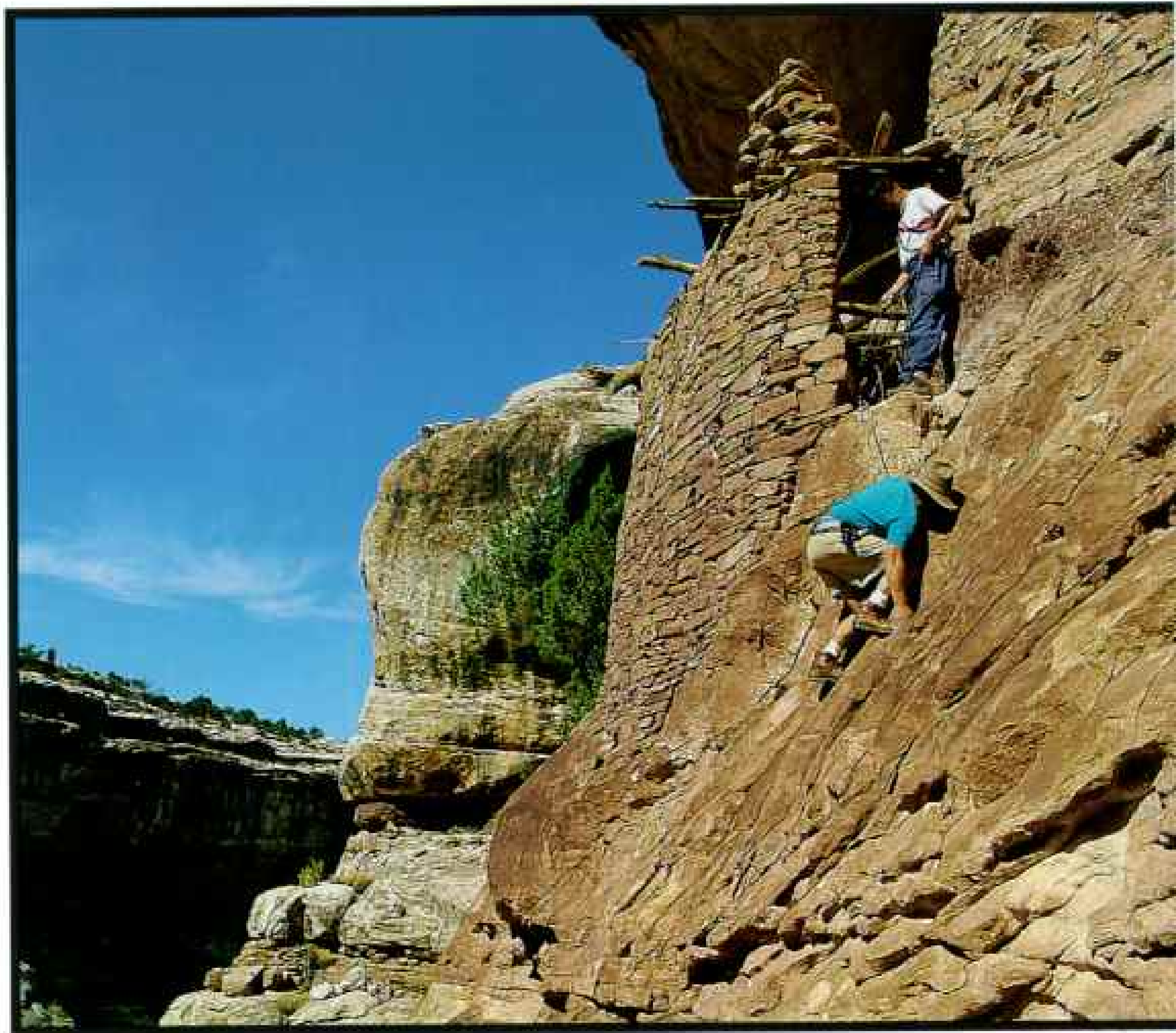
Varieties of pottery during the Pueblo I period include coiled-necked culinaryware (left). As people moved to multiroom masonry buildings, pit houses may have evolved into underground chambers today called kivas.



A golden age for the arts, Pueblo III produced this unusual double mug (left) at a time when many people began retreating to defensive sites like Cliff Palace.

MUSEUM OF NEW MEXICO

MESA VERDE NATIONAL PARK



One scholar, David Wilcox of the Museum of Northern Arizona, believes that small Chacoan armies traveled along the roads. "I see them marching up and down the roadways like something out of the movie *The Seven Samurai*," he says. "Perhaps the villages were beset by bandits, so they hired 'samurai' to protect them." Wilcox bases his argument on enigmatic towers and lookout posts that line the roadways, which he believes might have been used as staging areas and re-supply points.

Archaeologists have traditionally viewed Chaco as a peaceful civilization dominated by astronomer-priests, tradesmen, and governors. Evidence from recent years, however, may undercut this picture. The Chaco phenomenon may have been linked with violent rites aimed at intimidating reluctant pueblos on the Anasazi periphery. New discoveries—

of human bones scored with fine cut marks and of fractured bones—suggest that the Anasazi practiced ritual cannibalism. If true, this theory may force scholars to take a fresh look at the nature of the ancients.

THE FIRST RAYS OF DAWN crept along the dusty wash behind me. A breeze out of the south brought the scent of sagebrush. Chaco Canyon was so still that I heard a raven flap its wings seconds before its cry broke the silence. The morning was cool, but soon bleaching heat and haze would seize the canyon below.

I topped the 150-foot cliff that borders the wash on the north and turned to gaze down on the Anasazi edifice called Pueblo Bonito. Its builders had marshaled at least 700 rooms into a design shaped like a huge capital D. Centering the ruin was a spacious plaza bordered



Two grown men need all their strength and skill for a climb that was child's play before toeholds up this Utah cliff eroded. Master masons built the aerie at the top, blending their work with the rock. "I had walked right by the ruin twice before and missed it," says author David Roberts, who led the ascent. Meant to be seen, art decorates a nearby spring. It likely spoke volumes to a culture with no writing, but its message is lost to modern viewers.



by some 40 circular underground chambers, called kivas.

Pueblo Bonito was at the hub of Chaco, the axis from which the roadways emanated, and in many

respects it represents the most sophisticated architecture in the pre-Columbian United States. During many previous visits, wandering inside the ruin, I had stared in awe at some of the finest masonry crafted in the prehistoric Southwest: tabular slabs of sandstone, often thinner than my little finger, shaped and fitted so tight that I could not see the mortar that bound them together.

Now my thoughts were on the darker side of the Chacoan builders—on the picture of violent ritual that emerges from the controversial work of Christy G. Turner II, a physical anthropologist at Arizona State University, and a handful of colleagues. For more than two decades Turner has reexamined skeletons and bones exhumed from earlier digs, discovering consistent markings that he can account for only as the result of cannibalism.

Reaching among the cluttered shelves in his

university office, Turner brought out several boxes full of bones dug from a mesa in northwestern New Mexico in 1969, the skeletal remains of 11 victims dating from around 950. "This is a femur," he said, picking up a long, broken leg bone. "It's a tough bone, hard and dense—one of the least likely to break. No natural process is apt to produce this kind of fracture."

When I peered closer, I saw thin parallel grooves running across the bone, the kind of marks a flint knife would make. Turner handed me a diminutive skull. I sucked in my breath. The skull, which had been glued back together in the lab, had been violently fractured; even the tooth sockets were smashed. "This was a child between six and eight years old, probably a girl," Turner said, then showed me parallel grooves on the forehead. "You see cut marks here, probably from scalping. Also anvil abrasions." I looked closer, and saw tiny scrape marks.

"What are they?"

"You place a bone on a stone, an 'anvil,' then smash it with another stone to break it open," Turner replied. "The bone slides off the anvil, leaving these scrape marks."

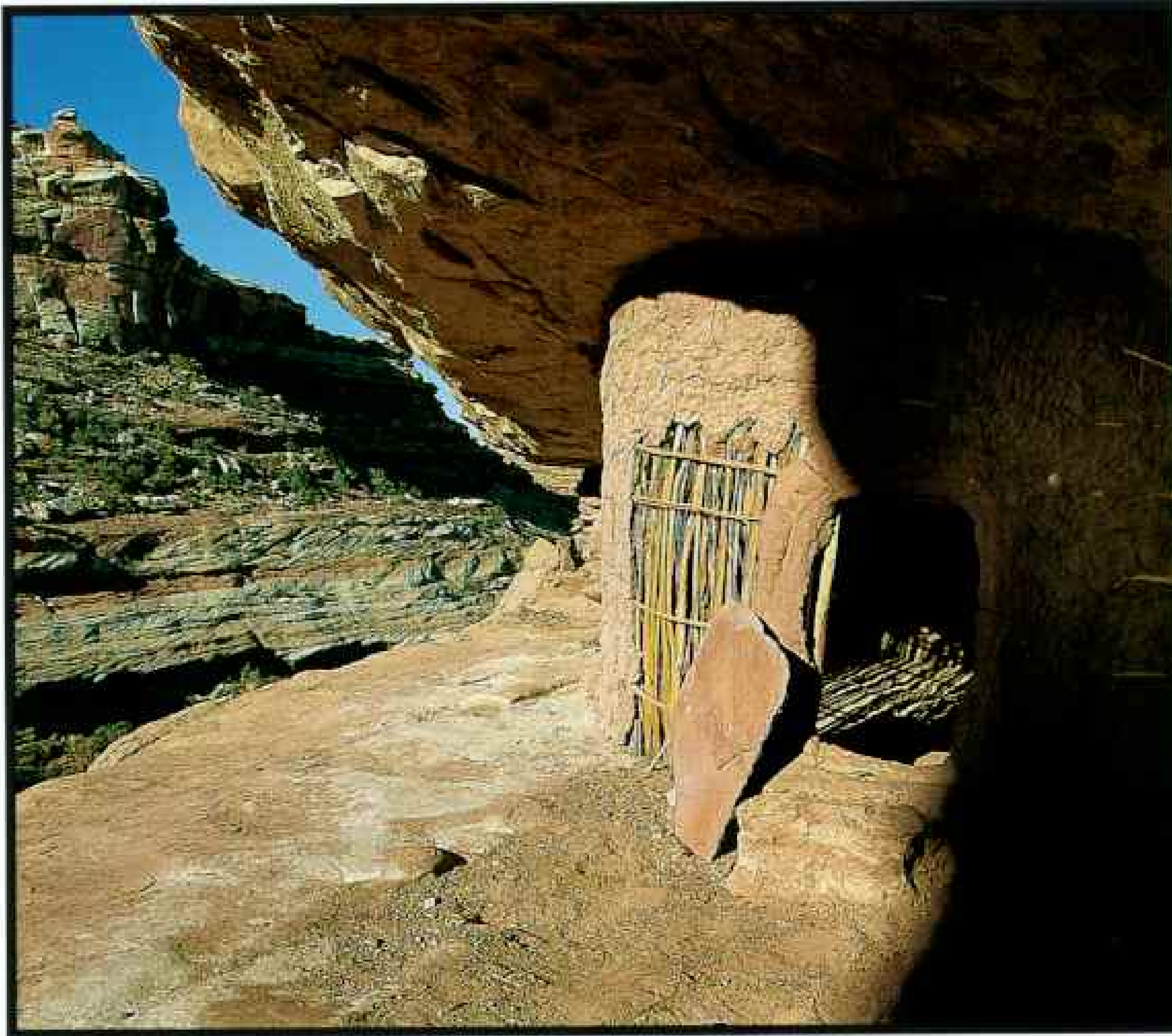
Turner went on to demonstrate other signs



*C*utting into a parched Utah mesa, Grand Gulch delivered water to



scores of small pueblos sprinkled along its 60 tortuous miles.



of cannibalism: burned bones, vertebrae pulverized perhaps to get at the marrow inside, bone ends polished by hours of stewing in ceramic pots.

"The clincher," added Turner, "is that the process is exactly the same as the Anasazi used to butcher and cook antelope and prairie dog, two of their staple foods. What other possible explanation could there be?"

This is a troubling hypothesis to modern Pueblo people, who cherish the image of their ancestors as peaceful agriculturalists, living in harmony with the land and one another. "Claims of cannibalism are deeply offensive to all Pueblo peoples," said Kurt Dongoske, an Anglo who serves as Hopi tribal archaeologist. "As far as I'm concerned, you can't prove cannibalism until you actually find human remains in prehistoric human excrement."

Some scholars argue that systematic

smashing, cutting, and burning of bones could indicate not cannibalism but the ritual execution and mutilation of witches, whose evil deeds were believed to have thrown the world out of harmony. In more recent times certain Pueblos have occasionally disposed of suspected witches in this way.

Yet in 25 years of work Turner has amassed some three dozen separate instances of what he believes is Anasazi cannibalism, comprising more than 300 victims.

Why would the Anasazi resort to cannibalism? One explanation is offered by Turner and David Wilcox, though few of their colleagues have endorsed it. At first the two assumed that famine drove the Anasazi to eating one another. One day two years ago, however, they plotted the cannibalism sites on a large map. "Suddenly, we had a kind of Eureka!" Turner recalled. "The sites were not randomly



distributed: Nearly every one lay next to a village in the Chacoan system. And the dates were right—between 900 and 1200. The cannibalism must be tied to the rise of Chaco.”

FOR ALL ITS POWER, the Chaco phenomenon lasted less than 300 years. By 1200 Chaco’s domination of the Anasazi world was finished, and most of the canyon was abandoned. Why Chaco fell remains a mystery.

With Chaco’s demise, the whole network collapsed. Each village lapsed back into autonomy—a pattern that holds in modern pueblos. Yet the Anasazi flourished for a century after the fall, building such masterly villages as Cliff Palace and Spruce Tree House at Mesa Verde, Colorado, and Keet Seel in Arizona.

Secret caches hold the stuff of daily living almost as the owners left it. A wattle-and-daub granary probably kept corn from weather and rodents; a pot held water for a small pueblo; a carved sheep’s horn worked as a shovel. The locations of these and countless other artifacts have not been publicized. “People find these places themselves,” explains wilderness guide Fred Blackburn, “so the experience means a lot more than reading from a guidebook. That usually results in better care of the ruin.”

Then, around 1250, some new crisis seized the Southwest, leading to the mass abandonment in the years just before 1300. For a century researchers have struggled to comprehend its causes. The old notion that marauding Utes, Paiutes, or Navajos drove the Anasazi into their defensive cliff dwellings, then forced them out of the Colorado Plateau, seems far-fetched. There is no evidence that those nomads arrived on the plateau before 1400.

But thanks to the recent work of a younger generation of archaeologists, warfare once more takes center stage in the Anasazi world after 1250—not battles against an alien tribe, but internecine warfare.

On a serene, cloudless October day in northeastern Arizona, I received a vivid demonstration of this conflict. My tutors were Jonathan Haas, of Chicago’s Field Museum of Natural

History, and his wife, Winifred Creamer, a professor at Northern Illinois University. They led me up a 900-foot flatiron, a great tilted slab of red sandstone, above the Kayenta Valley.

As we approached the base of the great rock, which anchors the ancient site nicknamed Happy Valley, Creamer pointed out potsherds strewn here and there, noting the graceful patterns of thin black lines on white that are characteristic of early 13th-century Anasazi potters. We started our ascent, scrambling up soft earth, then spidering flat-footed on the tilted stone. At one point the only way to continue was to traverse in shallow toeholds carved by the ancients. As we climbed higher, new scatterings of potsherds appeared on ledges underfoot, different in style from the ones we had found at the base: The black paint covered most of the surface, reducing the white slip to tiny squares.

"The sherds below were all made before 1250," Creamer explained. "These all date from after 1250. This proves the people moved to the top of Happy Valley around that date."

As we gained height, the barren valley stretching east of us unfolded: Buttes and pinnacles jutted against the horizon, vividly outlined by the afternoon sun. "The sites down below are not defensive," Creamer said. "We think that before 1250 the Anasazi here lived in a state of peace. Then something ominous happened. From climatic studies we know that after 1150 there were periodic droughts, and erosion cut into the arable land. It got harder and harder to live here, and it got really bad around 1250. The population had to compete for fewer resources. The people retreated into high, defensive villages like the one you're about to see."

Breathless and exhilarated, I reached the summit of the flatiron to discover a sandy clearing dotted with small junipers. All about me stood the crumbling walls of some 80 adjoining rooms. Thousands of potsherds along with flint and obsidian flakes, debris from the making of hundreds of arrowheads, lay scattered in the sand.

We lingered in the clearing for two hours,

Cowhand archaeologists, the Wetherill brothers explored and led expeditions to many ruins near their Colorado ranch. Benjamin Alfred Wetherill (below, at left) stumbled on Cliff Palace while hiking in the late 1880s. By that time walls had begun to crumble (right). Partly restored early in this century, the largest Anasazi cliff dwelling now gets 170,000 visitors a year.



poking through the ruins, marveling at the sheer precipices of the flatiron. As we sat on the highest rock in the orange glow of approaching sunset, Haas pointed out other butte-top sites in the distance, all inhabited after 1250.

"Archaeologists have prowled all over this country since the early 1900s, but for the most part nobody thought to look on these summits until we began to 13 years ago," Haas said, gesturing at the ruins before us. "This is an improbable place to build. Look how far you have to go to get water." I squinted at the creek bed, 900 feet below. "And where do you plant your corn? Far below, on the plain. There's simply no other reasonable explanation. Happy Valley was built for defense."

During the next two days Haas and



MESA VERDE NATIONAL PARK (LEFT); NATIONAL BOARD OF ANTIQUITIES, FINLAND (TOP)

Creamer guided me to a half dozen other defensive sites in the Kayenta area. Atop each butte they pointed out that each village was connected to others by lines of sight. These villages formed a coalition of mutual support, for line of sight was the Anasazi answer to attack by siege, a means of signaling allies for help. Everyone outside the coalition loomed as the enemy. On one hillside, not far from today's Highway 160, the ancients had carved a V-notch out of an intervening ridge to ensure a view between a pair of high villages.

On the last afternoon we drove ten miles west down the highway and came to the Klethla Valley. Those ten miles had been dotted with villages as late as 1250. After that date, apparently, not a soul lived there. In the broad basin of the valley my guides showed me

half a dozen more butte-top sites that made up another defensive network, also linked by line of sight. The two researchers believe that the Anasazi of Klethla and Kayenta were enemies.

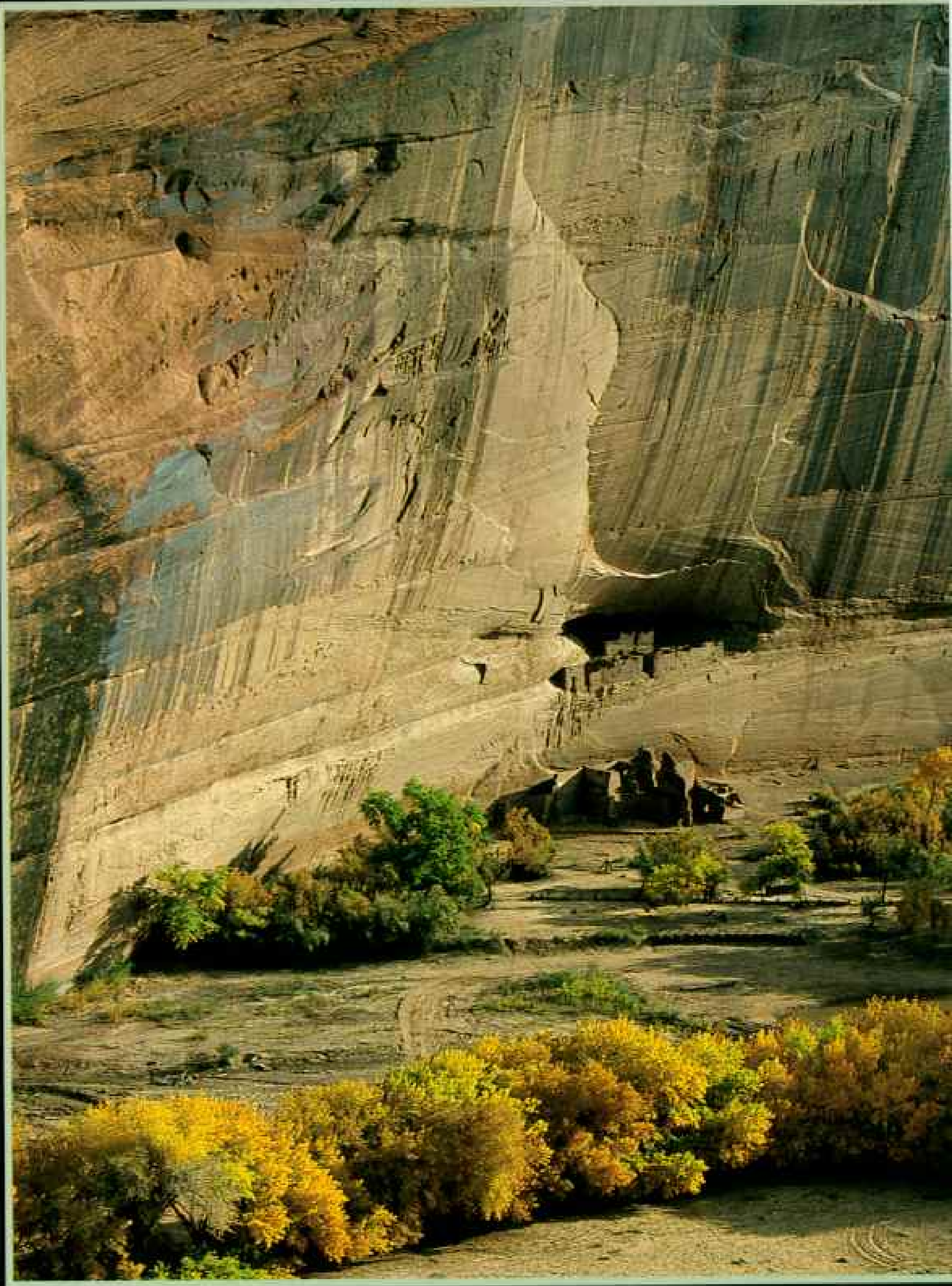
Throughout the Anasazi domain, researchers are finding new evidence, cropping up right around 1250, that buttresses Haas and Creamer's work: environmental stress, Anasazi retreats to cliffs and butte tops, defensive structures such as walls and watchtowers, and scores of skeletons showing trauma at time of death.

But the era of paranoia and violence didn't last long. Before 50 years had passed, the Anasazi forever abandoned the Colorado Plateau to begin a better life elsewhere.

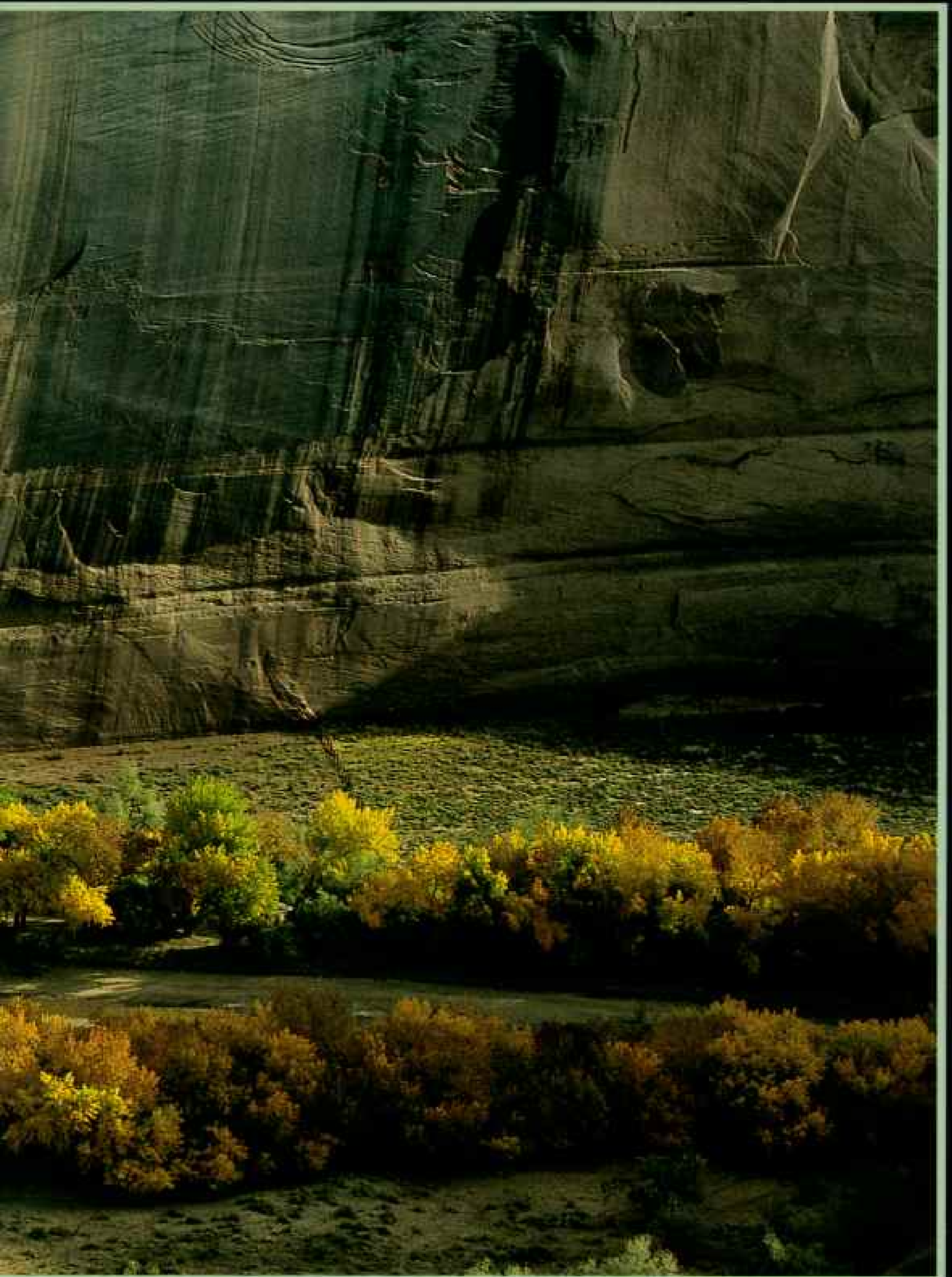
“FOR MOST OF THIS CENTURY, archaeologists saw this abandonment only in terms of a ‘push.’ But we’re starting to see that it takes a ‘pull’ as well,” says Bill Lipe, an Anasazi scholar from Washington State University. “Something immensely attractive must have been going on to the south and east, and up on the Colorado Plateau the Anasazi got wind of it. More and more, I’m coming to believe that the pull was a new religion. When they moved, they dramatically changed patterns of ceremonial architecture and site layout that had lasted for centuries.”

Archaeologists debate whether the Pueblos' kachina religion developed early enough to be Lipe's “pull factor.” But there is general agreement that in the 1300s this new religion flourished throughout the Pueblo world. Today's Pueblos believe that hundreds of ancestral spirits, called kachinas, act as intercessors to the gods for rain, good crops, health, and happiness. In the kivas and plazas of pueblos, men dance kachina dances, in which they act out the roles of kachinas to ensure the pueblo's success. Their masks, which are made of wood, hair, feathers, and animal hide, are elaborately decorated to symbolize the history and meaning of the various kachinas.

Images of masks similar to the ones used by



Stacked up against the massive face of Arizona's Canyon de Chelly,



the split-level White House seems small, yet its 80 rooms housed an entire community.

The creative fire of a trench kiln blazes forth for the first time since the old Pueblo potters departed from Mesa Verde. Artist Clint Swink, at far right, experimented for six years to recover lost techniques that produced pieces similar to this seed jar (below), unearthed near Cortez. "Primitive pottery is hard work," he concludes. Yet his labors have kindled a new appreciation for those who left behind the beauty of their art and architecture.



modern kachina dancers appear in Anasazi rock art, pottery designs, and kiva murals dating back to about 1300. The earliest of these were discovered well to the south and east of the Colorado Plateau, which is why some archaeologists believe that the same religion that anchors the society of today's Pueblos might have pulled the Anasazi from their homeland.

"The kachina phenomenon, by integrating kinship groups, allowed a kind of socialism to flourish—huge villages inhabited by equals cooperating to build a communal life," says Bruce Bradley, a researcher at Crow Canyon Archaeological Center in Cortez, Colorado. "It's worked in the pueblos for 700 years. In the 14th century the Anasazi found an answer to how to live together."

The primacy of community endures in modern pueblos, where the group is considered more important than individuals. When someone is ill or in trouble, the whole village is expected to come to his aid.

Another link between today's Pueblos and their Anasazi ancestors comes from their oral traditions. For hundreds of years most Pueblos have honored their forebears by telling the story of their migration from the

Colorado Plateau. The Jemez, a tribe that lives 40 miles north of Albuquerque, believe their ancestors' wanderings ended at Kwanstiyukwa, a site on the edge of a thousand-foot-high mesa overlooking today's pueblo.

One autumn morning William Whatley, the Jemez tribal archaeologist, drove me to Kwanstiyukwa, "place of the pine bird."

The site of Kwanstiyukwa seemed blissful, with lordly views south all the way to Albuquerque, east to the summits of the Jemez Mountains, which were dusted with new snow. Wind tossed the tall ponderosas around us, carrying the scent of pine sap. Cones thudded softly to the ground, and tangles of brown needles drifted like sand dunes.

We strode across a grassy clearing, whose surface swooped and undulated as we crossed the buried walls of some 2,500 rooms. "The gist of the Jemez migration story is that the people came from the Four Corners area on the Colorado Plateau," Whatley said. "They pushed hundreds of miles south and east. This





was the first place they stopped to build. The pottery goes back to about 1300.”

From the summit of a high mound I could make out the grid of rooms sprawling about me, a crosshatched pattern of faint ridges scoring the ground. I could also discern the flat depressions of seven big plazas, a reservoir, and a large kiva. The ruin’s height—21 feet at maximum—suggests that some of the blocks of rooms had towered five stories.

All told, Kwanstiyukwa covers an area of 160,000 square feet, almost the size of three football fields. Not even at the height of Chaco’s glory had the Anasazi built a village so large. Yet towns of more than a thousand rooms, centered on big plazas and kivas, became the norm in the 1300s. Archaeologists believe that the florescence of Pueblo religion dictated this town plan, as elaborate ceremonies became the focus of community life.

ON MY LAST AFTERNOON in Utah the wind came up in gusts, and the west grew dark with storm clouds. Just before dusk I crouched inside a soot-blackened kiva. Half of the roof was intact, and I craned my neck to look at it from beneath. Tiny square knots of yucca fiber still bound the cross sticks of the ceiling in place. Faint etched designs, like chessboard grids, decorated the plaster on the kiva’s inner walls. For more than seven centuries the most delicate whims of the builders’ art had hung, frozen and perfect, in the timeless air.

Then a gust of wind swirled through the kiva. I squinted as a burst of fine particles streamed across my face. I blinked and looked up. The motes were wisps of shredded juniper bark, used to chink the roof. The work of the ancients was turning back into dust before me. □

Understanding



▲ THE FIRST EXPEDITION

A legacy of discovery began in 1890, when 27 donors contributed funds to help finance the Society's first expedition, to Alaska's Mount St. Elias. Headed by Israel C. Russell (above), the team measured glaciers, gathered samples, and made sketches for the Society's magazine.

► WHALE WATCH

Saluting with flukes, an endangered right whale (opposite) slips beneath the surface off Argentina's Peninsula Valdés. Society grantee Roger Payne, at far right, of the Whale Conservation Institute is studying the social behavior and effects of pollution on the mammals.

IN THE MIDDAY HEAT of a tropical sun, archaeologists and government officials gathered last August with ranchers and townsfolk to witness the dedication of a new museum at San Lorenzo Tenochtitlán in Veracruz, Mexico. The Tenochtitlán Community Museum houses an astonishing trove of 3,000-year-old sculptures of the enigmatic Olmec, creators of one of America's earliest civilizations. For archaeologist Ann Cyphers, who unearthed most of the sculptures at nearby sites with the help of funds from the National Geographic Society, the occasion fulfilled a dream of seeing such a facility become reality for the proud local populace.

Ann Cyphers' contributions to our knowledge of ancient America epitomize two goals of the National Geographic Society's Committee for Research and Exploration—exemplary scholarship and the communication of research findings to the public.

In 106 years more than 5,500 researchers and explorers have taken to the field to pursue everything from archaeology to zoology and to convey the adventure that comes from exploring the unknown. Those who followed the first, Israel C. Russell, form ranks of high achievement: Robert E. Peary, polar explorer; Louis Leakey, discoverer of human forebears; George Bass, explorer of ancient shipwrecks; Matthew Stirling, 1930s pioneer in Olmec studies; and many others.

For each investigator seen on the following pages, hundreds of others now labor around the globe—excavating the remains of ancient civilizations, assessing environmental degradation, exploring the heavens and the seafloor. Such studies embody the National Geographic's mission, elegantly expressed by Society President Alexander Graham Bell at the turn of the century: to better understand "the world and all that is in it."



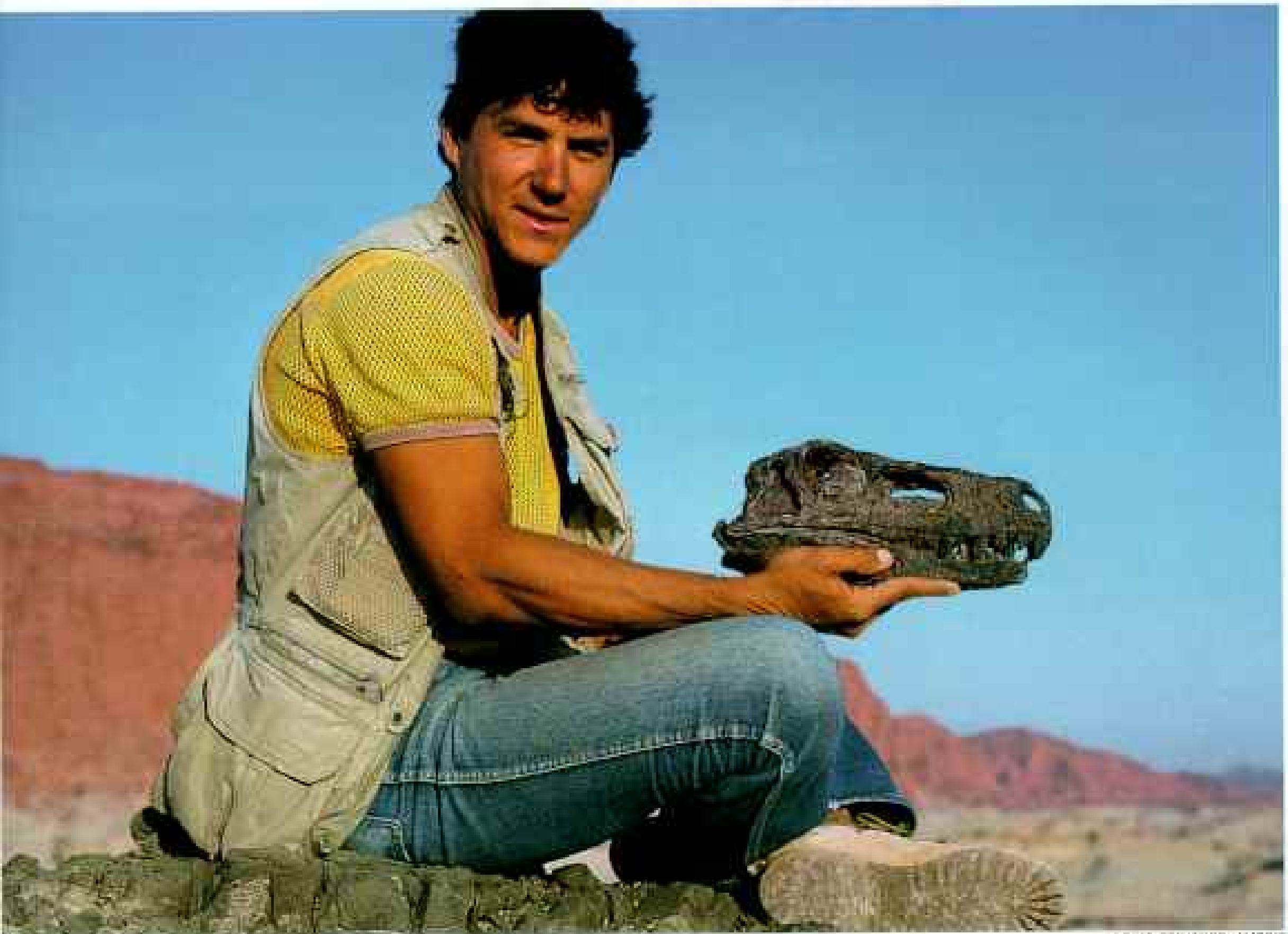
for Research and Exploration

Our World



FLIP HIGLIN, MINDEN PICTURES

Time travelers



LOUIE PEINOVIC, MATHIEU

▲ DESERT DISCOVERY

Herrerasaurus, one of the oldest known dinosaurs, was found in Argentina's Ischigualasto desert by Paul Sereno in 1988. Society grants have helped the University of Chicago paleontologist study and describe fossils of the second oldest bird, in China, and two previously unknown dinosaurs, in Morocco.

"Society funds are important not only for my work but for the entire field," he says.



GEORGE E. STUART, WGS

◀ OLMECS' LOST WORLD

Virtually unknown before the 1930s, Mexico's Olmec civilization was unearthed largely through excavations sponsored by the Society. Ann Cyphers (left), a research grantee from Mexico's National Autonomous University, discovered this 3,000-year-old Olmec head in May 1994.

Society studies of New World ruins range from U.S. cliff dwellings to the Inca city of Machu Picchu.



KENNETH GARRETT

▲ MAYA UNDERGROUND

A subterranean gallery in Copán, Honduras, shelters the Rosalila facade, an example of Early Classic Maya architectural decoration. Society grants have enabled experts like Ricardo Agurcia Fasquelle, co-director of the Copán Acropolis Project, to excavate, preserve, and interpret such delicate stucco creations.

Other grantees have explored secrets of Maya writing and trade.



LOUIE PRINOVOL, MATRIS

◀ EYES PEELED FOR DINOSAURS

Scouting fossil sites, Michael Novacek of the American Museum of Natural History scans the Gobi desert in Mongolia. His team's discoveries there include fossil dinosaur embryos and numerous mammals from the dinosaur era.

"The Geographic supports some of the risky work necessary to make great discoveries," says Novacek. "There aren't many places to go for that."

It's a wild, wild world



LARRY J. TEMPLE, HWI

▲ CURIOSITY SAVES THE CATS

Down for the count, a tranquilized mountain lion is measured and collared along the North Fork of Montana's Flathead River. Biologists Jamie Jonkel, Tom Parker, Toni Ruth, and Randy Siemens work for the Hornocker Wildlife Institute in Idaho, headed by Maurice G. Hornocker. The institute's work with carnivores has been supported by Society grants since 1973.



CHRISTIAN LYDERSEN

◀ A FRIENDSHIP IS SEALED

Comforting bearded seal pups is just part of the work being done in Norway by biologist Kit Kovacs. The University of Waterloo (Ontario) researcher fitted mother-pup pairs with satellite-linked depth recorders to monitor the animals' underwater movements. Says Kovacs, "The Society's support was absolutely essential in launching our research program."

▼ WINGS OF HOPE

Little birds with a big problem, the chucaos of southern Chile are losing their habitat. Kathryn Sieving of the University of Florida has a two-year Society grant to study the preservation of patches of forest by the area's small-scale farmers. "The farmers may be the best—and last—hope of maintaining viable populations," she says.



► HANGING HIGH IN BORNEO

Going up: Fig seedlings planted at various levels of the Borneo rain forest canopy are inspected by Tim Laman. The Harvard University biologist is studying figs as a dietary mainstay for animals during periods when other food is scarce. Laman's wife, Cheryl Knott, a Harvard anthropologist, is also a Society grantee, studying orangutan reproduction in Borneo.



SPYER MURELLO/CAPOE LEFT; MARK W. MOFFETT, MINDEN PICTURES

Penetrating looks in all directions

► DRY ANCIENT PORT IN A STORMY WIND

In the trenches of archaeology, University of Delaware grantee Steven Sidebotham braves a wind-buffed ladder to photograph an excavation at the Greco-Roman seaport of Berenike. The third-century B.C. city on Egypt's Red Sea coast, a center for commerce between the Mediterranean world and the Far East, had not been scientifically studied until this Society-sponsored project.

▼ DARK DAYS OF DISCOVERY

Few people have witnessed more solar eclipses than astronomer Jay Pasachoff of Williams College's Hopkins Observatory,



checking instruments during a 1991 Hawaii expedition. Beginning with Alexander Graham Bell's coverage of a 1900 eclipse, the Society has sponsored space studies ranging from the analysis of tiny asteroids to all-sky surveys.



RODGER N. HESSEMEYER, CORBIS (ABOVE LEFT); WILLIAM L. ALLEN, NGS



WILLEMINA WENDRICH (TOP); SYLVIA DUKAN SHARNOFF

◀ SMALL WORLDS IN BIG WORLDS

Up close and personal with lichens, Stephen Sharnoff and his wife, Sylvia, are photographers with the North American Lichen Project. The study will create the first color guide to 800 species in the U.S. and Canada. From fungi to the canopy of the universe, Committee for Research and Exploration grants continue a century-old mandate "for the increase and diffusion of geographic knowledge." □

The Aran Islands ANCIENT HEARTS Modern Minds

BY LISA MOORE LAROE

PHOTOGRAPHS BY SUSIE POST

Irish mist mutes the sharp edge of thistle and stone on Inishmore, one of Ireland's three Aran Islands. Still tied by tradition to field and sea, islanders face a turbulent future. "It's change or die," says one. Change means embracing the hordes of visitors who come for beauty and solitude—and threaten to erode both.





GO ON, GO ON, GO ON. . . .” Colman Conneely chanted a familiar refrain to cajole his brown mare into a faster trot. Seated in an old wooden pony trap, we jounced along the bumpy roads of Inishmore, largest of the three Aran Islands off Ireland’s west coast. “Oh, it was a hard life here, love,” said Conneely, his bushy copper brows animating a face that’s seen too much weather during 70 years. “There was never any work here, love. There was no lights, no sewerage, no water, nothing. We’d dip the bucket into the well and take it home for tea and washing. And all we had was paraffin lamps hanging up on the wall, and candles standing by in case we ran out of fuel.”

Like many islanders, Conneely left Inishmore as a young man to work as a miner in England.

After retiring five years ago, he returned to a land transformed. Electricity, air service, widespread telephone hookups, and a thriving tourism trade have arrived just since 1970, altering the islands more in the past 25 years than in all the centuries before.

“In my time there was no tourists at all,” said Conneely, who pads his small pension by carting visitors around in his trap. “No buses, no bicycles, no restaurants. Now it’s building up all the time. We’ve never had it so good. Tourists liven the place up, and we make a few pounds. Without them the island would be forgotten.”

The Aran Islands are not easy to forget. Like three skipping stones, they jump across the entrance of Galway Bay just six miles from County Clare. Though born of the same geologic parent—Clare’s bleak limestone terrain—each island (*inis* in Gaelic) has a unique character and strikes its own balance between traditional and modern ways.

Visitors have always been drawn by the islands’ wealth of antiquities—massive stone enclosures from the Iron Age and 11th-century

monastic ruins. More recently they have come for a taste of tradition. Here Irish Gaelic is still the language of choice, and an ancient romance lingers in sea-stained piles of fishing net, in puffs of fog that drift past like ghosts, in the smell of coal smoke and hand-scythed hay.

But the changes extolled by Colman Conneely have threatened the islands’ subtle beauty. On Inishmore, the “big island,” traditional stone-and-thatch cottages are nearly gone, replaced by plaster-and-slate houses with satellite dishes that beam in soaps and sitcoms. Utility lines mar the seascapes. Restaurants and craft shops fan out from the pier in Kiltonan. And in August passenger ferries drop more than 2,000 tourists a day on Inishmore—an island of fewer than 850 year-round residents.

I had first visited the islands seven years earlier with my father, whose parents were born in Ireland. We landed at the village of Kiltonan on Inishmore and stepped off the lurching ferry into a cold, damp May evening. The lanes were quiet, the sky painfully dark. The next day I biked along the one main road, past miles of unmortared stone walls that snaked down toward the sea, cutting patterns of gray lace against the sky.

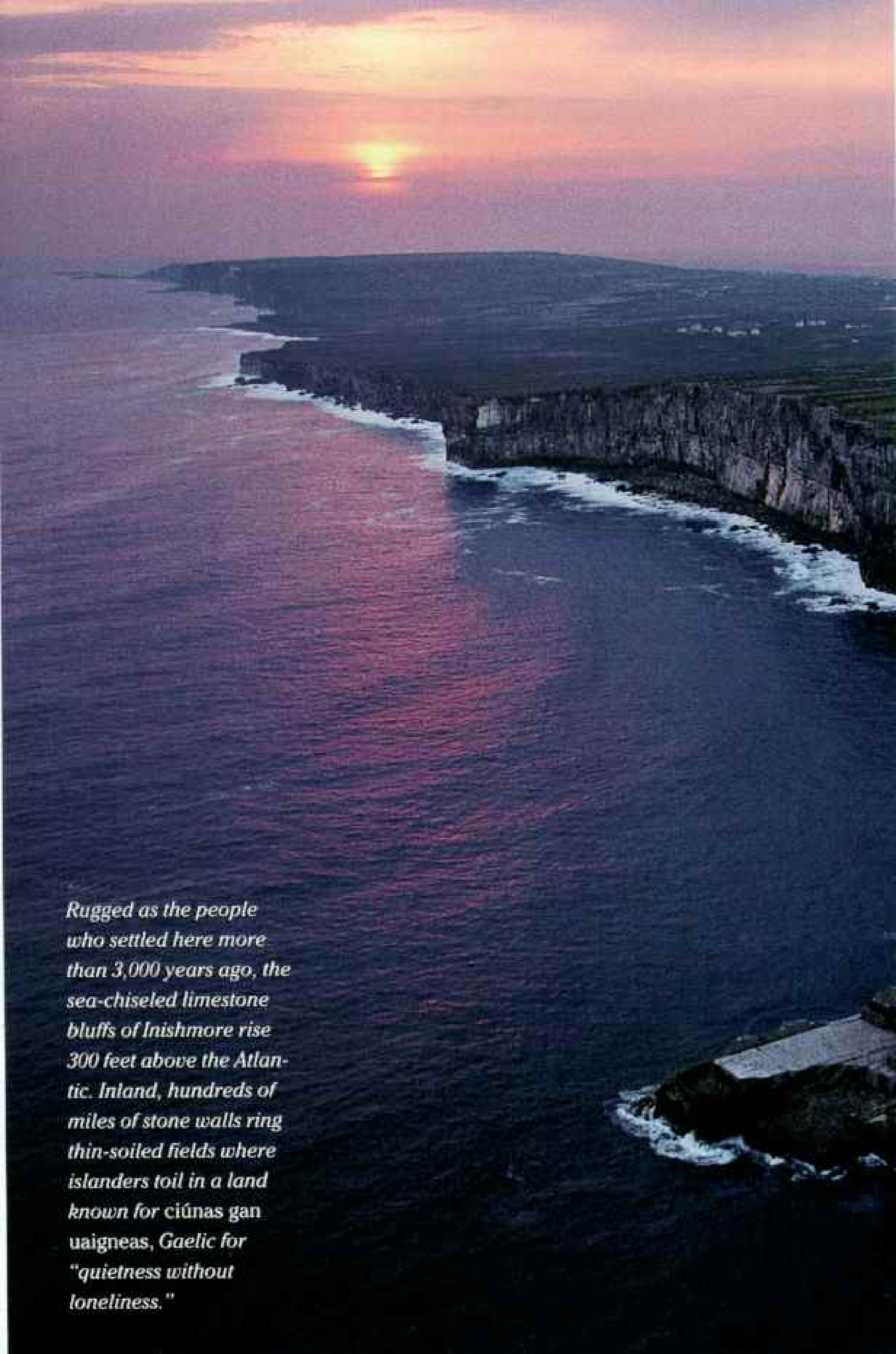
When I arrived in Inishmore last year on a blistering June morning, the contrast to my earlier visit was startling. Cargo ships, fishing trawlers, and ferries vied for space at the pier. As tourists debarked with bikes and backpacks, minibus drivers leaned out their windows brandishing maps and hawking tours. Most visitors now are day-trippers, who strain limited water, sewage, and trash systems and leave relatively little cash in their wake. The chief beneficiaries of the boom are the fiercely competitive ferry companies, which are all owned by mainlanders—a cause of resentment among many islanders.

Some natives say the tourist influx is corrupting Inishmore’s heritage of insular self-reliance, turning neighbor against neighbor as



Face aflame with the setting sun—and her Irish roots—13-year-old Mairín Ni Fhlatharta reflects on her Inisheer home. “It’s beautiful,” she says. “I know everyone, everybody is friends, and we have all we need.” Needs are relative. Electricity arrived only in the 1970s, and these barren isles still must import food and fuel from the mainland.





Rugged as the people who settled here more than 3,000 years ago, the sea-chiseled limestone bluffs of Inishmore rise 300 feet above the Atlantic. Inland, hundreds of miles of stone walls ring thin-soiled fields where islanders toil in a land known for ciúnas gan uaigneas, Gaelic for "quietness without loneliness."





a handful of locals profit from the visiting hordes. "They don't want to see one of their own getting too far ahead," whispered one man. A local priest blamed tourism for lower turnouts at church, saying, "People are down driving minibuses or serving breakfast. They don't keep Sunday." Another fellow despaired about the Wild West approach to tourism on the island, which allows virtually unregulated development. "Aran is a beautiful woman, and some people here are pimps," he said. "They say, 'You can have her any way you want her, just give us money.'"

But far more islanders I spoke with viewed tourism as the salvation of a place whose traditional livelihood of fishing suffers from dwindling ocean stocks and vigorous competition from other nations in the European Union.

"You'll hear a lot of people say the island has been destroyed by tourism. Well, it's either

that or emigration," says local musician and entrepreneur P. J. O'Flaherty. Seeking higher education and a skilled trade, he left at age 15. He returned in 1981 to start a family and open a restaurant, the island's second. Now 40, O'Flaherty has two restaurants, three children, and big plans. "If we want to survive, we have to embrace the present," he says. "Private enterprise has given people back their dignity and created opportunity. At least my kids won't be indoctrinated with the idea that they have to go away."

Chaotic as the tourist bustle on Inishmore can be, it's still easily escaped. Five minutes beyond the pier, visitors disperse to explore ruins, beaches, and the 14 small villages sprinkled across the island's nine-mile length. Locals remain free to savor the traditions that still define the land.

"After five o'clock people slow down and walk along the cliffs exactly the same as it always was," says Michael Gill, a teacher and Inishmore native. To help preserve the island's character, Michael has formed a group to monitor local development. "We try to mind the heritage that was passed down to us and to pass it away without its being damaged," he says.

Michael has passed a love of Inishmore to his three children that rivets them to the land. After a lunch of tea and smoked mackerel I walked with his wife, Olwen, and their young daughter, Noinín, to a place they call the moon, an expanse of flat rock and boulders where Michael once played as a boy. Noinín, her freckled face beaming with pleasure, nestled into a deep depression chiseled into the rock by eons of rain — a spot she calls the wishing chair. Later she propped her feet on a small flat stone, asked Olwen for a push, and went "rock skating," leaving graceful scrapes on her limestone rink. It's terrain the Gills never tire of.

Sometimes an attachment to land is not enough to prevent islanders from leaving for better jobs and more excitement elsewhere. Michael and Mary Hennon raised 15 children on the raw western end of Inishmore in the days before electricity. Most of the children left, heading to New York, San Francisco, London, and Dublin. I sat with Mary outside the cottage where the couple have lived for 50 years and asked about the past. She gazed at the ocean, her soft eyes tinged with fear, remembering when Michael, a former fisherman, faced the sea. "I'd see the huge waves out there. It was a very worrying time."



Dropped at Kilronan on Inishmore (above), some 200,000 tourists a year disperse to seek the legendary romance of Aran. Most rent a bike for the day then depart, seeing only a commercial caricature.

Those who linger get a truer taste of the traditional Irish language and culture that thrive here. In an Inisheer pub, Brian Ó Maoilleoin of Belfast delivers a soulful sean-nós, or "old style" song, accompanied only by a respectful silence. "We celebrate even the saddest song," he says.



But it was also joyful. Before television and tourists whetted children's desires for the latest gadgets, "it was easier to raise a family," Mary said. "There was a crowd of kids in every house, and it was like a party. They'd make their own fun."

The Hernon clan hasn't lost its knack. The couple's 13 surviving children, along with 24 of 26 grandchildren, had returned to Inishmore to celebrate their parents' 50th wedding anniversary. Following an afternoon Mass, the family packed a local restaurant. After dinner, tables were moved for dancing and voices rose with song, laughter, and the catch-up tales of scattered lives. As I left the party well past midnight, the restaurant's windows glowed with the steam of an exuberant crowd.

Though a passion for music enlivens pubs and homes throughout Ireland, the Aran Islands cling to the most traditional forms. Starting in grade school, islanders learn the stomps and twirls of figure dancing, which they showcase at gatherings called *céilithe* (KAY-lee-huh). Young mainlanders consider *céilithe* "uncool," but on the islands the dances draw large crowds of all ages.

To ensure a good turnout, *céilithe* on Inishmore start only after the pubs close at midnight. At *Ti Joe Mac*—one of six pubs on the island—a raucous crowd fueled itself before trickling over to the community hall, a wood-floored room lined with orange plastic chairs. At first just two women waltzed uninhibitedly to the music of drums, flute, banjo, and accordion.



Farming much as their forebears did, two brothers on Inishmaan prepare to unload hand-scythed hay into a shed. Few cars or visitors ply the lanes of this most isolated Aran isle, which must export its most valued resource—its youth—to boarding school at age 12.

'It's up to you, lads. There's only one way off this island, and we've got that covered.' Usually they'll settle down."

Inishmore's peace is a powerful lure for refugees from a restless world. Siobhán McGuinness, 38, moved here ten years ago, weary of her factory job in Dundalk, Ireland. "I wanted to simplify my life," says McGuinness, who was drawn to the island after she first saw it on a holiday. "There's a sense of godliness about it that really kept pulling at me."

McGuinness has found simplicity in spades. We sat by the coal stove in her three-room thatched cottage. Russet hens scratched in the yard outside the wooden door, open for air and light. McGuinness has no phone and only a "dry loo"—a bucket out in her stone shed. Sitting in a worn rocking chair, she expertly knitted an Aran sweater, using wool she had spun from a neighbor's sheep. Knitting is now her chosen profession, supplemented by a few odd jobs. "It's the creativity and the earthiness of it that appeals," she says.

Such serenity comes at a price. McGuinness recalled the past winter—months of endless rain, cold, gales, and waves of flu. "It was damn hell," she says. "But the other side of it is you really experience nature, in its mildness and in its raging storms."

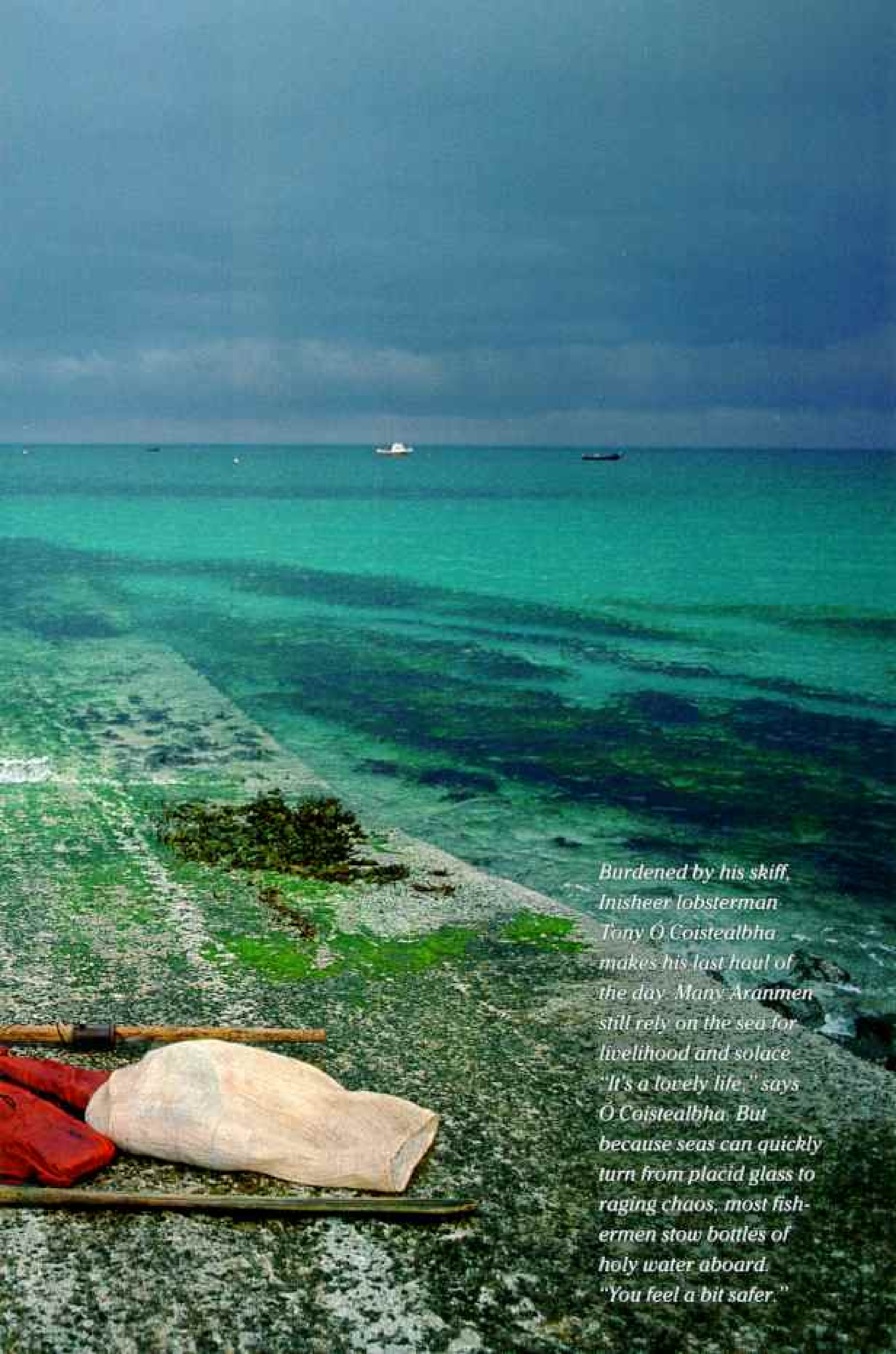
By 1:30 the place was packed, a chaos of sweating bodies whirling so fast to the reels and jigs that they blurred into the blue cloud of cigarette smoke that hung in the air.

Biking home at 2 a. m., I passed kids walking unaccompanied and unafraid. Their sense of security is well-founded, as islanders all seem to know and watch out for one another. "From a crime point of view it's not that busy," said Sean McCole, one of only three police based on Inishmore (there are none on the other two islands). McCole is more likely to soothe disgruntled neighbors, judge a local pageant, or lend his muscle to a friendly tug-of-war than to fight crime. The biggest problem is pub brawls at closing time. McCole and his partner look over the crowd, memorizing faces: "We say,

THE BRUTAL ISOLATION that Inishmore knows in winter is readily apparent year-round on Inishmaan, the "middle island." Long bypassed by outsiders, Inishmaan is the shy sibling of the Aran trio. The few visitors who stop here know what they'll find: long walks on bony cliffs and empty beaches, the company of gulls, and the slow acceptance of a people too honest for superficial smiles.

Drained by years of emigration, the island today has fewer than 200 residents, down from a high of 503 in 1851. Most left for education, work, and to escape from monotony. Those who stayed cast wary glances at passersby. There is one pub, one knitwear factory, a few modest bed-and-breakfasts. The former cottage of the island's only claim to fame—author





Burdened by his skiff, Inisheer lobsterman Tony Ó Coistealbha makes his last haul of the day. Many Aranmen still rely on the sea for livelihood and solace. "It's a lovely life," says Ó Coistealbha. But because seas can quickly turn from placid glass to raging chaos, most fishermen stow bottles of holy water aboard. "You feel a bit safer."

John Millington Synge, who published a romantic portrait of Inishmaan in 1907—sits piled with junk, its thatched roof sprouting a wig of weeds.

Synge's description of life here as "perhaps the most primitive that is left in Europe" still felt true as I roamed the quiet lanes. Though each home likely had a television and a telephone, such modern trappings were overshadowed by more timeless images: A young man rumbled by in a donkey cart. An elderly woman in a bright scarf and blue wellies filled buckets at a roadside spring and struggled to carry them home. Boys scavenged periwinkles from rocks along the shore. Farmers with scythes sliced through waving fields of rye. And each morning pairs of stoic fishermen in yellow oilskins hauled their long black canoes, or currachs, down to a fickle sea.

Though modern currachs now have a small outboard and are covered with fiberglass instead of tarred canvas, the boats are otherwise much the same as those used here for centuries. I learned how perfectly the upturned bow meets the swells as I gripped the spruce gunwales of a currach manned by lobstermen Sean O'Donnell and Michael Conneely (a common surname on the islands). Theirs was a practiced choreography. Sean steered toward a buoy. Michael hooked the line and pulled it in with ungloved hands, eyes intent, anticipating the catch. Two pots emerged. Each man cleared one quickly, ripping the claws off crabs ("They grow back," said Sean) and throwing only the claws and whole lobsters into a box. They rebaited the pots with stinking hunks of pollack, tipped them back into the water, and moved on to the next buoy.

After three hours and 42 pots they had caught only nine lobsters, a dismal toll. I asked Sean how he keeps from being discouraged. He smiled, and his answer echoed the same fatalistic acceptance I heard from many islanders weaned on the unpredictability of weather and the sea. "Oh well, you have to put up with it. That's the way it is."

Sean and Michael left me at the pier, which was topped by a groaning construction crane. Both here and on Inisheer, the "east island," newly extended piers were nearing completion. The harbors around them had already been dredged and deepened, improvements that allow regular ferry service, as boats can now dock regardless of tide in all but the worst weather.

Consoled by a friend's card, Máire Mulkerrin of Inishmaan grieves for her husband, who died last May, five months shy of their 40th anniversary. "It's lonely at times," she says. To ease the pain, she relies on routine—taking in boarders, tending the cow, knitting, praying.

Faith sustains many islanders, who have seen their numbers dwindle to fewer than 1,400. At the Corpus Christi Mass on Inishmore, Treasa Seoighe (below, with palms pressed) voices the optimism of youth: "I'm going to stay. I love Aran."



This is an obvious convenience for isolated Inishmaan. Yet islanders expressed a mixture of fear and hope that the new pier might also lure more visitors.

Pól Ó Foighil, manager of the local cooperative, which oversees development, was one of the cautiously hopeful. "Of the three islands, Inishmaan is in the most danger of collapse," he said. "We're at a critical stage. Only 21 children are enrolled in the school. We'll have to have economic input for survival, and we're determined to build it around cultural tourism." To attract more visitors, the cooperative plans to expand the island's water supply, build a small hotel, and help spruce up Synge's decrepit cottage. Most important, the co-op is hoping to run its own ferry service with Inisheer and limit the numbers that come. "We don't want to see the island destroyed by too many visitors," says Ó Foighil.





Wandering Inishmaan's ragged cliffs, I couldn't imagine the island inundated with people. I stood alone watching gulls circle overhead as waves crashed below, sculpting new curves into weary rock. Eventually I met a young couple from Seattle sitting on a lichen-splotched ledge at the island's western end. "This is as untainted a place as I've ever seen," said the woman.

IN CONTRAST to the stark quiet of Inishmaan and the action of Inishmore, Inisheer exudes a calm sincerity. On this smallest Aran island a castle ruin dominates the highest hill, overlooking a white beach where campers lounge and kayaks slice the sea. Two tiny thatched huts mounted on flatbeds towed by

tractors form the tour-bus fleet for the 30,000 visitors who come here each year. A pack of mangy gray donkeys roams unfettered, sheep graze in a patchwork of fields, and farmers willingly chat with strangers.

One evening John Kevin Conneely, age 76, invited me along to milk his cow. His leathery hands took a sure aim toward the bucket. "If it were any fresher, it would be grass," he said of the milk that lightens his tea and makes his butter. Between morning and evening milkings he picks a few spuds, plucks caterpillars from his cabbage leaves, hauls some hay, or mends a gate—"just a bit o' fun" he calls the chores that fill farmers' lives on this island.

Afterward, as we sat on a stone wall in the late summer sun, John Kevin looked out across



the fields to the sea and sky. "I'd be able to tell you who owns every field great and small as far as your eye can see," he said. His own land sweeps down to an inland lake. Beyond it sits the rusting wreck of the *Plassy*, a cargo ship that ran aground in 1960. John Kevin walks that ocean shore in springtime, gathering the seaweed that will fertilize his potato plots.

As he headed home, I asked about his uncanny talent to predict rain—a skill I had witnessed several times. "We've lived on the sky all our lives," he says, "listening to the wind and rain."

Subsistence farming and a sense of rain, though still so much a part of island life, are hardly enough to live on these days. Inisheer has no industry, previous efforts at a knitwear

Inisheer islanders prepare to bury one of their own. Like the 11th-century ruin of St. Cavan's church, which must be constantly dug out of drifting sand, Aran islanders will endure. "We have a survival instinct," says one. "The spirit of what was is still here."

factory, salmon farm, and daffodil farm having failed. Beyond its beauty, the island's chief draw is its culture, largely defined as language—the Gaelic tongue that is still spoken in churches, schools, shops, and pubs, where its rhythms drift slow and sweet.

Despite the eroding influence of English, Irish Gaelic thrives on the Aran Islands, giving them status as pockets of cultural purity. Fired by a resurgence of national pride, growing numbers of students attend summer classes on Inisheer to learn Irish, nourish their roots—and fatten local coffers.

The abandoned factory where Irish is taught to adults lies beyond a tangle of stone walls and fields of knee-high grass. I reached it just as students were filing in. Seeing I was lost in their fluid babble, the students, who ranged in age from 17 to 92, explained in English why they had come to study Gaelic.

"It's important to see that this is not a language that's dead," said one. "Unless you know where you come from, you can't move forward with confidence," said another. Later, at a pub for a farewell party after their last class, the room fell silent as the eldest student stood and recited in Gaelic a poem about the dark days under English rule. His effort was met with applause and a chorus of "*sláinte*," a traditional toast.

Seeing these students, I understood how the islanders could protect their culture from the outsiders it attracts. Immovable and fluid as the rock and sea around them, they are solid traditionalists tied to what's best of the past but flexible enough to embrace change and carve a future that suits them.

On one of my final hops between the islands I stood in the bucking cabin of a small boat and shared this thought with its owner, Paddy Mullen, a fisherman from Inishmore. Curious about an outsider's impressions, he grinned tolerantly as I expounded on the islands' complex struggle to balance old ways and new. Then he made it simple. "We just adapt," said Mullen. "If they invented a plane that could fish, hell, we'd use the plane." □

FLASHBACK



NATIONAL PARK SERVICE

■ FROM THE GEOGRAPHIC ARCHIVES

The First Fast Food?

Hooking and cooking, fishermen in Wyoming pulled a trout from the chilly waters of Yellowstone Lake, then plunged it to poach in Fishing Cone, a hot spring in the lake. Though many early tourists were photographed—often in chef's garb—at this volcanic feature, the anglers risked being simmered themselves. During 1919, the year this photo was taken, the geyser occasionally erupted to heights of 40 feet. Today fishing is still allowed in Yellowstone Lake; standing on the hot spring is not.

This photograph was published in "Our Heritage of the Fresh Waters" (August 1923).

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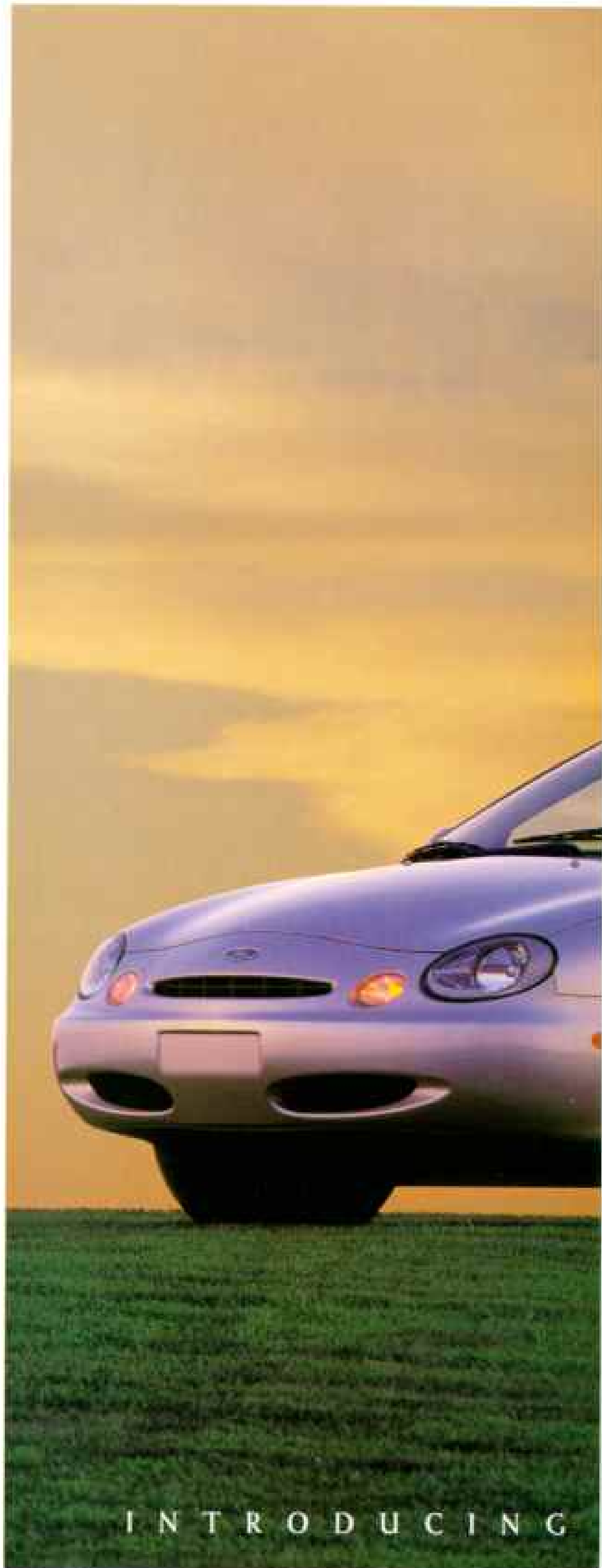
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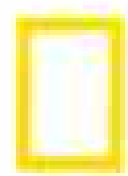
Make a plan.

"We always had a five-year plan. I think life is like an ocean, and the waves go up and down and no wave stays up forever."

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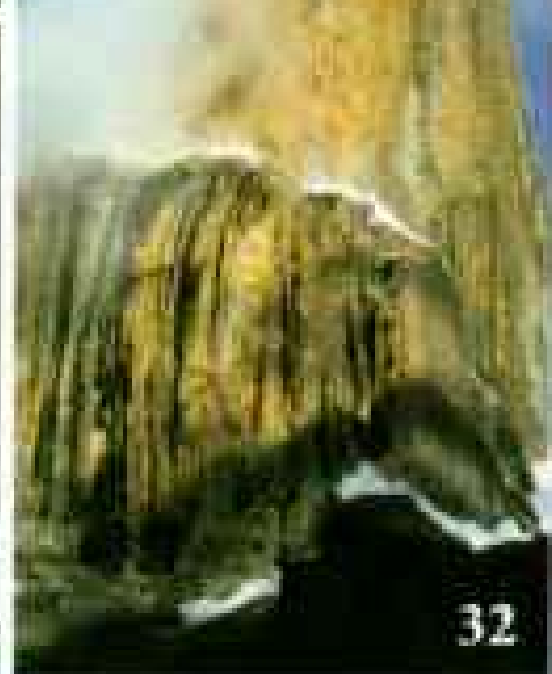
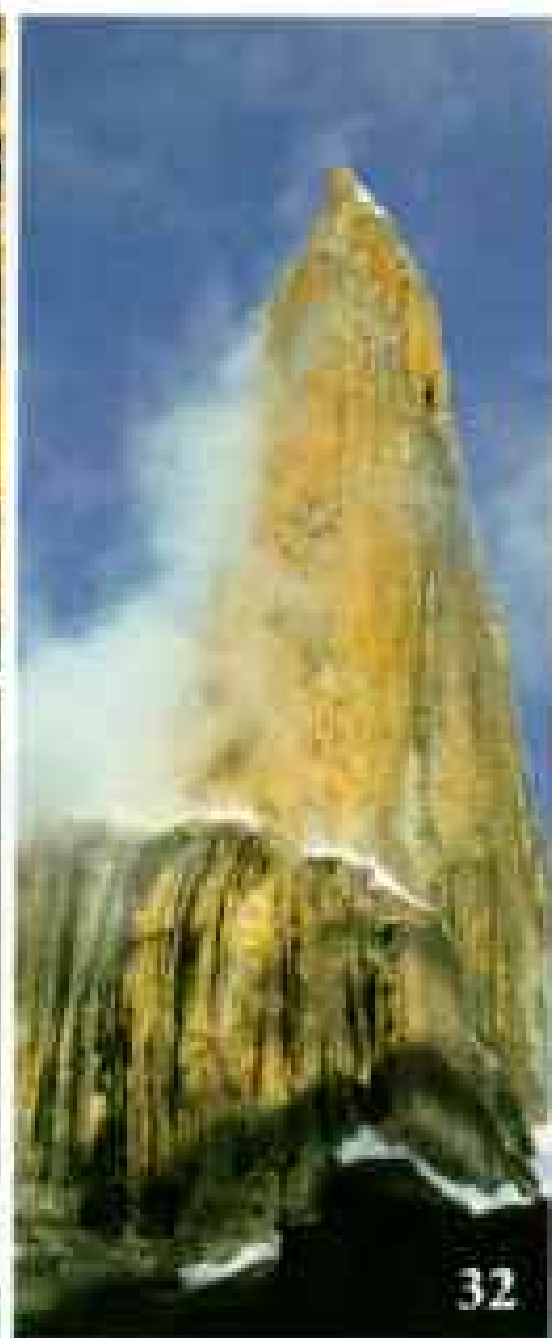
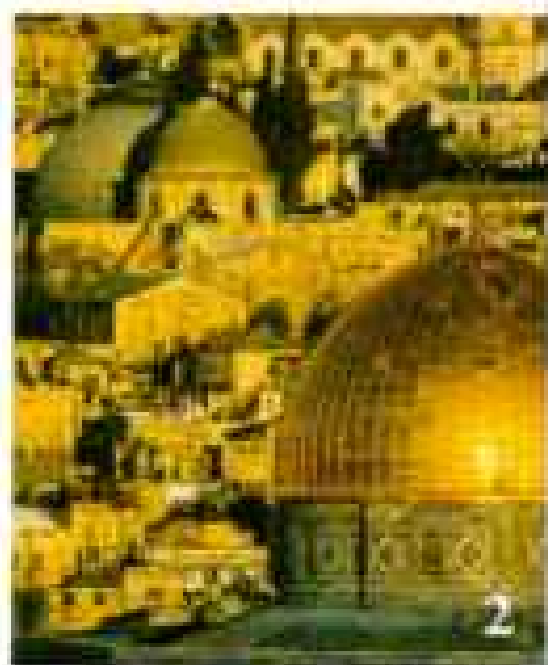
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NATIONAL GEOGRAPHIC

APRIL 1996



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The Cover

Free climbing at 17,800 feet, Bobby Model nears the summit of Trango Tower in northern Pakistan.
Photograph by Bill Hatcher

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Behind the Scenes



CURT FRELSON

Just in Case

WHAT DOES A Swedish designer of art furniture do with 444 bright yellow GEOGRAPHICS? He creates bright yellow bookcases. "I had stopped smoking and needed something to take its place," says artist Mats Theselius of Göteborg. "So I started reading NATIONAL GEOGRAPHIC. I began collecting old issues, and soon I had 37 years' worth!" Mats thinks of his cabinet as "an unusually large binder." This painted beech model will hold 25 years of the magazine.

87 Years: A Geographic Record?

STILL TURNING PAGES at the age of 95, Elsie Gordon of Red Cloud, Nebraska, has received the GEOGRAPHIC since her father first signed her up in 1909. "When I sit down with the magazine, I take a nice, long journey," she says. She still reads every issue, though now with help from a magnifying glass. Elsie might not have the longest continuous Society membership; she let it lapse for four months once while traveling with her husband in Alaska. "But I renewed it as soon as I got home," she says. Her grandson just renewed her membership again—for another two years.



MICHAEL FORSBERG

■ FAMILIAR TERRAIN

The GEOGRAPHIC index shows a lot of "land" covered in our titles over the years. Among others:

"A Land of Drought and Desert" (California), May 1911

"A Land of Giants and Pygmies" (Africa), April 1912

"The Land of Lambskins" (Central Asia), July 1919

"The Land of Sawdust and Spangles" (circuses), October 1931

"Land of a Million Smiles" (Ozarks), May 1943

"A Land of Lakes and Volcanoes" (Nicaragua), August 1944





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passenger room and better resale value than Taurus, Lumina or

Camry.† Intrepid starts at \$18,995*.

Intrepid ES shown, \$23,010*.



With cab-forward design and V-10s

Stratus ES features: • cab-forward architecture • rigid ladder frame construction • available 24-valve, 2.5L V-6 • available electronic 4-speed automatic transmission • speed sensitive steering • ABS braking • aluminum wheels • touring tires • power windows and locks • power heated mirrors • fog lamps • air conditioning • driver and front passenger airbags • speed sensitive wipers • AM/FM stereo cassette player • automatic speed control • available AutoStick® System transmission and more.

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ES shown, \$16,795*.





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and child safety seats and bushings



Ram features: • the most powerful overall line of pickup engines on the planet: a 3.9L V-6, a 5.2L and a 5.9L V-8, an 8.0L V-10, and a 5.9L Cummins diesel • best-in-class interior room (both standard and Club Cab) and best-in-class maximum towing capacity • higher resale value than Ford, Chevy or GMC† • ergonomically designed interior • available 40/20/40 seating with center armrest/business console • subdividable bed and more. Ram pickup starts at \$14,366. Ram 4x2 Regular Cab shown, \$19,292.



and cupholders and Magnum engines and AutoStick transmissions.



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Avenger ES features:

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(Note: Due to advance sales to current Viper owners, only a limited number of 1996 GTS Coupes were still available at time of printing. GTS-R is for racing only and some features mentioned above are not available.)



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**Neon Sport Coupe acceleration test reported in Jan. '95 Car and Driver. †We calculated resale using avg. trade-in values ('93 and '94 models of Intrepid, Taurus, Lumina and Camry; '91-'94 compact pickup models; '94 full-size pickup models) vs. MSRPs, published in '95 Jan.-Sept. N.A.D.A. Official Used Car Guide® monthly editions. Prices correct at time of printing.

Always wear your seat belt.

BEHIND THE SCENES



BOTH: PRIIT VESILIND

You Can Go Home Again

"I ALWAYS THOUGHT my past was irretrievable," says senior writer Prit Vesilind, who was a baby when his family fled the Soviet invasion of Estonia in 1944. The Vesilind home in Tallinn, completed by Prit's grandfather in 1926, was seized by the communists and turned into seven apartments. Prit found the building deteriorated by neglect when he made his first visit there as an adult for his article "Return to Estonia" in the April 1980 issue.

The return of democracy to his homeland returned something else: the house and 14 acres, repatriated to the Vesilind family. Tenant Leonora Lukanenok (above left) peers from a room that was once Prit's nursery. Prit (above right) and his brother plan to restore the building. On a recent trip they scouted local contractors—and winced at costs. Says Prit, "The house will be a tribute to our grandfather. It wouldn't be worth it otherwise."



BRUCE BRADLEY

Teaming Up

MEMBERS ASK: DO GEOGRAPHIC photographers and writers travel together? The definitive answer is: sometimes.

Text and photography needs

often conflict. But for the article on ancient Pueblo peoples in this issue, shooter Ira Block (above, at right) and writer David Roberts llama-packed into remote Utah together. "Each of us had his job to do," says Ira. "I was glad David was there. He's an

expert climber, and we had steep cliffs to negotiate."

David compliments Ira for "reaching me how light works in the canyons" but had one complaint. "I was the trip's cook, but Ira still brought pocketfuls of energy bars. I think he thought he might get lost in the wilderness."

—MAGGIE ZACKOWITZ

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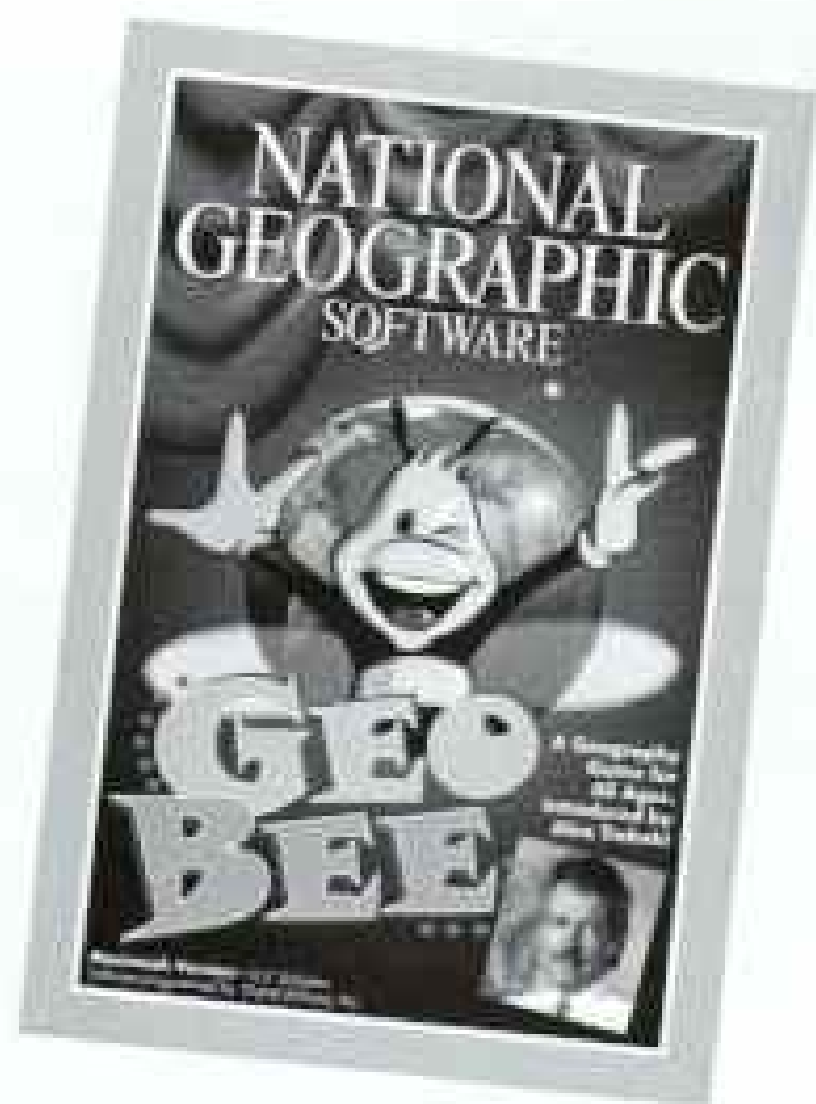
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Forum

Teotihuacan

How amazing Teotihuacan is and how impressive the work of investigators (December 1995). If one of the archaeologists could go back in time 475 years, what a magnificent job he or she would do on restoration, conservation, interpretation, and revelation of all Teotihuacan society, culture, and treasures. The Spanish authorities had this opportunity in their time and they wasted it, destroying rather than preserving. No excavation is going to bring back that part of our history.

FRANCISCO BLANCAS MENDIVIL
San Diego, California

The fourth paragraph states that Teotihuacan was the greatest metropolis in the Americas before the Aztec Empire. It should read "before colonial Mexico City" since the twin Aztec cities of Tenochtitlan and Tlatelolco would have been nothing but a large barrio hidden in the immensity of Teotihuacan.

WILLIAM VAN SWEARINGEN
Provo, Utah

The Aztec metropolis was half the size of Teotihuacan but as large or larger in population.

The Street of the Dead was the longest urban axis in civilization, exceeded only in the 20th century by the axes of Brasilia and the elongated Champs-Élysées. The space perception of buildings that appear and disappear as one walks through patios and up staircases along the causeway is a unique and extraordinary Mesoamerican concept in the story of urbanism.

ALEJANDRO JOSÉ MANGINO TAZZER
*Universidad Autónoma Metropolitana-
Acapotzalco
Mexico City, Mexico*

Manta

I had heard of the giant manta-ray but had seen nothing quite like this article to illustrate its size compared with a human, which I can now fully appreciate. The haunting form and size of these creatures was perfectly portrayed. The breathtaking photographs by David Doubilet were a visual feast.

JAMES A. TREADWELL
Oxford, England

Farming Revolution

The photographs in "A Farming Revolution: Sustainable Agriculture" were beautiful. The real farming revolution, however, is the one that has been going on for the past 50 years—by the blood, sweat, and tears of hardworking American farmers practicing high-yield "conventional" agriculture.

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They still have the challenge of doubling or tripling production in the next 40 years to satisfy the food and fiber needs of a growing world population.

N.S. (BILL) MANSOUR
Corvallis, Oregon

The article was very inspiring for us at the Foundation for Sustainable Development of Venezuela. We are trying to achieve sustainable agriculture, social and economic development of rural communities, and environmental conservation. We must break the cycle of poverty and environmental degradation. The only reasonable instrument we possess is sustainable agriculture and development.

PATRICIA GUTIÉRREZ
General Manager
Fundación Desarrollo Sustentable de Venezuela
Caracas, Venezuela

The article started out to be a piece on sustainable agriculture but quickly became an article about organic farming—two different subjects.

I am 64 years old and have paid my dues on a hoe handle and milking cows by hand. Portraying farmers as raping the land and using “oceans” of herbicides is a disservice to your readers. Those oceans of herbicides in some cases are less than an ounce per acre—hardly an ocean. No mention was made of no-till farming, where all residue is left on top and the next crop is planted into that residue, leaving to earthworms the job of breaking down residue into nutrients the new crop can use.

LUTHER E. WEISMAN
Ottwell, Indiana

It's a telling sign when the flooding of chemicals onto land is considered conventional and the organic alternative is unconventional. It should have never started, as Rachel Carson tried to point out 30 years ago. The trend is reversing. I am sure she would be happy.

ALEX SULAIMANI
Alexandria, Virginia

My husband and I have been practicing sustainable organic techniques in our gardening for many years. Our boys work hard along with us because they cannot stand the flavor of store bought. In bitter cold January, opening a jar of flavorful vegetable soup canned in August is like releasing a bit of summer into the house. It sustains us nutritionally and spiritually at a time when we wonder if we will ever see spring again.

CINDY L. BURNES
Eland, Wisconsin

Sustainable farming is great for people who want to feed the chosen few who can afford high prices. The farmers in this article feed the embassies of D.C., the rich artichoke eaters of the world, and backpackers who can afford two dollars for a single serving of split pea soup. Give me a break!

FRANK ZAKRAJSEK
Monticello, Indiana

Given the immeasurable benefits that sustainable agriculture can bring to the quality of what we eat and the health of soils, lakes, and rivers, why does

it lag far behind? Universal acceptance, I believe, must be mandated by government, which should increase research funding and assist farmers to make this transition.

GINO LALLI
Ile Bizard, Quebec

As a farmer whose family has been involved in large-scale agriculture from its roots, it seems to me that a marriage of old technology (crop rotation, plant and animal residue management, and cover crops) to the new technology (the careful use of pesticides, commercial fertilizers, and biotechnology) is the only chance we have to feed the world's increasing population. Here in the High Plains of eastern Colorado this marriage has increased production and the health of our soils.

DAVID L. ANDERSON
Pierce, Colorado

Orion

As an amateur astronomer whose favorite constellation is Orion, I would like to thank James Reston, Jr., for his excellent article. Having seen M42, the Orion nebula, I can attest to how exciting it is to view what amounts to a celestial womb and nursery. The article helped expand my knowledge of what is beyond a doubt the heaven's most magnificent constellation.

JUNE E. COOLEY
San Jose, California

We would also mention the place of Orion in Maya cosmology. Maya astronomers considered Orion's triangle as the sacred place of creation and nebula M42 as the heart of the universe. See *Maya Cosmos*, by David Freidel, Linda Schele, and Joy Parker.

TERESA CARMONA AND ARTURO GÓMEZ
Tulum, Mexico

The Maya believed three stars in the Orion constellation—Alnitak, Saiph, and Rigel (page 93)—were arranged by the gods as a triangular hearth, enclosing the smoke of the fire of creation—the nebula.

Jane Goodall

I just finished your feature and realized how much your magazine has enriched my life. Wondering what strange new worlds actually look like has led me to travel to different countries whenever I could afford to do so. The love of seeing new cultures caused me to join the Peace Corps in 1993. And where do you guess I served? In Tanzania. I even had the pleasure of visiting Gombe Stream.

JOHN MCGILVRAY
Palmer, Arkansas

The map seems to indicate that there are no chimpanzees between western Ghana and eastern Nigeria. However, during short-term work in northern Togo in 1987, I clearly saw a group of five or six chimpanzees, probably a whole family, in the northeastern part of Keran National Park or just outside it.

HUBERT DUVEUSART
Pointe Claire, Quebec

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That's good news. The last data published by the International Union for the Conservation of Nature says that chimpanzees have been considered extinct in Togo since 1978. But many experts agree that their current distribution in individual countries is poorly known and new surveys are needed.

Through articles and documentaries on Goodall that I've seen in the past ten years, I've come to take on some of the beliefs and projects she fights for, from subscriptions or donations to environmental organizations, to letter-writing protests, to becoming vegetarian, to buying only recycled and biodegradable products. Your article was a further inspiration. The message I got was whether as an individual, or as part of an activist group, we can all make a difference. And we must think globally and start taking responsibility for our actions.

V. A. CURRAH
Picton, Ontario

Geographica

"Fighting to Save Pearl Harbor's Last 'Veteran'" speaks of the tugboat *Hoga* as the sole surviving Pearl Harbor vessel afloat in the U.S. Another ship shares this distinction, the 327-foot Coast Guard cutter *Taney*, currently docked in the Inner Harbor in Baltimore as a tourist attraction. The *Taney* was docked at Pier 6 in Honolulu Harbor (eight miles away) when the battle started. It was also the last active ship at that battle to be decommissioned (December 7, 1986).

ALBERTO OCASIO
Bridgeton, New Jersey

Earth Almanac

In the item "Why the Birds Really Went Berserk," Alfred Hitchcock may have been intrigued by a 1961 incident in Santa Cruz County, but his movie was based on a story by Daphne du Maurier, titled "The Birds." He changed the setting from an English seaside community, but the movie followed her story closely with one exception. In du Maurier's story the birds won.

HELEN OLIVER
Lakeport, California

Forum

A letter in the December Forum on bowhead whales perpetuates the idea that the Eskimo subsistence hunt employs traditional harpoons. Instead, a darting gun, developed by Yankee whalers in the 19th century, is used. Its harpoon places an explosive to quickly dispatch the whale, while attaching a float and line.

BURTON REXFORD
Alaska Eskimo Whaling Commission
Barrow, Alaska

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

Forum

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BRIEF SUMMARY

(For full Prescribing Information, see package insert.)

INDICATIONS AND USAGE: CLARITIN Tablets are indicated for the relief of nasal and non-nasal symptoms of seasonal allergic rhinitis and for the management of idiopathic chronic urticaria.

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

PRECAUTIONS: General: Patients with liver impairment or renal insufficiency (GFR < 30 mL/min) should be given a lower initial dose (10 mg every other day) because they have reduced clearance of CLARITIN Tablets.

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

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

	Loratadine	Descarboethoxyloratadine
Erythromycin (500 mg Q8h)	+ 40%	+46%
Cimetidine (300 mg QID)	+103%	+ 6%
Ketoconazole (200 mg Q12h)	+307%	+73%

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

Carcinogenesis, Mutagenesis, and Impairment of Fertility: In an 18-month oncogenicity study in mice and a 2-year study in rats, loratadine was administered in the diet at doses up to 40 mg/kg (mice) and 25 mg/kg (rats). In the carcinogenicity studies, pharmacokinetic assessments were carried out to determine animal exposure to the drug. AUC data demonstrated that the exposure of mice given 40 mg/kg of loratadine was 3.6 (loratadine) and 18 (active metabolite) times higher than a human given 10 mg/day. Exposure of rats given 25 mg/kg of loratadine was 28 (loratadine) and 67 (active metabolite) times higher than a human given 10 mg/day. Male mice given 40 mg/kg had a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) than concurrent controls. In rats, a significantly higher incidence of hepatocellular tumors (combined adenomas and carcinomas) was observed in males given 10 mg/kg and males and females given 25 mg/kg. The clinical significance of these findings during long-term use of CLARITIN Tablets is not known.

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

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

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

Pregnancy Category B: There was no evidence of animal teratogenicity in studies performed in rats and rabbits at oral doses up to 96 mg/kg (75 times and 150 times, respectively, the recommended daily human dose on a mg/m² basis). There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, CLARITIN Tablets should be used during pregnancy only if clearly needed.

Nursing Mothers: Loratadine and its metabolite, descarboethoxyloratadine, pass easily into breast milk and achieve concentrations that are equivalent to plasma levels with an AUC_{0-24h}/AUC_{0-24h} ratio of 1.17 and 0.85 for the parent and active metabolite, respectively. Following a single oral dose of 40 mg, a small amount of loratadine and metabolite was excreted into the breast milk (approximately 0.03% of 40 mg over

48 hours). A decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother. Caution should be exercised when CLARITIN Tablets are administered to a nursing woman.

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

ADVERSE REACTIONS: Approximately 90,000 patients received CLARITIN Tablets 10 mg once daily in controlled and uncontrolled studies. Placebo-controlled clinical trials at the recommended dose of 10 mg once a day varied from 2 weeks' to 6 months' duration. The rate of premature withdrawal from these trials was approximately 2% in both the treated and placebo groups.

REPORTED ADVERSE EVENTS WITH AN INCIDENCE OF MORE THAN 2% IN PLACEBO-CONTROLLED ALLERGIC RHINITIS CLINICAL TRIALS

	PERCENT OF PATIENTS REPORTING			
	LORATADINE 10 mg QD n = 1926	PLACEBO n = 2545	CLEMASTINE 1 mg BID n = 536	TERFENADINE 60 mg BID n = 684
Headache	12	11	8	8
Somnolence	8	6	22	9
Fatigue	4	3	10	2
Dry Mouth	3	2	4	3

Adverse events reported in placebo-controlled idiopathic chronic urticaria trials were similar to those reported in allergic rhinitis studies.

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

In addition to those adverse events reported above, the following adverse events have been reported in 2% or fewer patients.

Autonomic Nervous System: Altered lacrimation, altered salivation, flushing, hypoesthesia, impotence, increased sweating, thirst.

Body As A Whole: Angioneurotic edema, asthenia, back pain, blurred vision, chest pain, conjunctivitis, earache, eye pain, fever, leg cramps, malaise, rigors, tinnitus, upper respiratory infection, weight gain.

Cardiovascular System: Hypertension, hypotension, palpitations, syncope, tachycardia.

Central and Peripheral Nervous System: Blepharospasm, dizziness, dysphonia, hyperkinesia, migraine, paresthesia, tremor, vertigo.

Gastrointestinal System: Abdominal distress, altered taste, anorexia, constipation, diarrhea, dyspepsia, flatulence, gastritis, increased appetite, nausea, stomatitis, toothache, vomiting.

Musculoskeletal System: Arthralgia, myalgia.

Psychiatric: Agitation, amnesia, anxiety, confusion, decreased libido, depression, impaired concentration, insomnia, nervousness, paranoia.

Reproductive System: Breast pain, dysmenorrhea, menorrhagia, vaginitis.

Respiratory System: Bronchitis, bronchospasm, coughing, dyspnea, epistaxis, hemoptysis, laryngitis, nasal congestion, nasal dryness, pharyngitis, sinusitis, sneezing.

Skin and Appendages: Dermatitis, dry hair, dry skin, photosensitivity reaction, pruritus, purpura, rash, urticaria.

Urinary System: Altered micturition, urinary discoloration.

In addition, the following spontaneous adverse events have been reported rarely during the marketing of loratadine: abnormal hepatic function, including jaundice, hepatitis, and hepatic necrosis; alopecia; anaphylaxis; breast enlargement; erythema multiforme; peripheral edema; seizures; and supraventricular tachyarrhythmias.

OVERDOSAGE: Somnolence, tachycardia, and headache have been reported with overdoses greater than 10 mg (40 to 180 mg). In the event of overdosage, general symptomatic and supportive measures should be instituted promptly and maintained for as long as necessary.

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

Oral LD₅₀ values for loratadine were greater than 5000 mg/kg in rats and mice. Doses as high as 10 times the recommended clinical doses showed no effects in rats, mice, and monkeys.



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Fading Voices



From top, left to right:
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Gray Wolf, Whooping
Crane, Douc Langur, Ring
Tailed Lemur, Orangutan,
Indian Tiger, Wyoming
Toad, and the threatened
Florida Scrub Jay

Gray Wolf: Whooping Crane, Wyoming Toad, and Florida Scrub Jay: Photos: Joel Sartore

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Geographica



Memorial to a Warrior for the Environment

THE WORDS WERE FIRM, their meaning clear: "The environment is man's first right. Without a safe environment, man cannot exist to claim other rights, be they political, social, or economic."

The message came from Nigerian writer Ken Saro-Wiwa (above) upon winning a 1995 Goldman Environmental Prize for leading protests against environmental woes in his native Ogoniland. His words had been smuggled out of prison, where Saro-Wiwa faced charges by the military regime of inciting the murder of four Ogoni elders.



SARO-WIWA: BARR LEIGH LEWIS; FLARING (ABOVE): TIM LANGDON; OIL ON GROUND: GREENPEACE

Last November, after 18 months in jail and a trial that Amnesty International called "politically motivated" and "an attempt to silence him," he and eight others were hanged.

The Goldman Environmental Foundation, which established the annual prizes for grassroots environmentalists (GEOGRAPHIC, May 1990), has created a Ken Saro-Wiwa Memorial Fund "to protect environmental advocates in danger around the world." It

launched the fund, administered by Human Rights Watch, with a \$200,000 contribution.

Royal Dutch/Shell discovered oil in the Niger River Delta in 1958. The 500,000 Ogoni have seen little revenue—most flows to Nigeria's central government—but much environmental damage. Flaring gas (top) created sooty smoke; oil seeping from leaky pipelines permeated the ground (above), seen here in 1993. Protests organized by Saro-Wiwa sought a share of the revenue and a cleanup. Shell pulled out of Ogoniland in 1993 because of attacks on its workers. It now admits its Nigerian environmental record has been imperfect and vows to improve.



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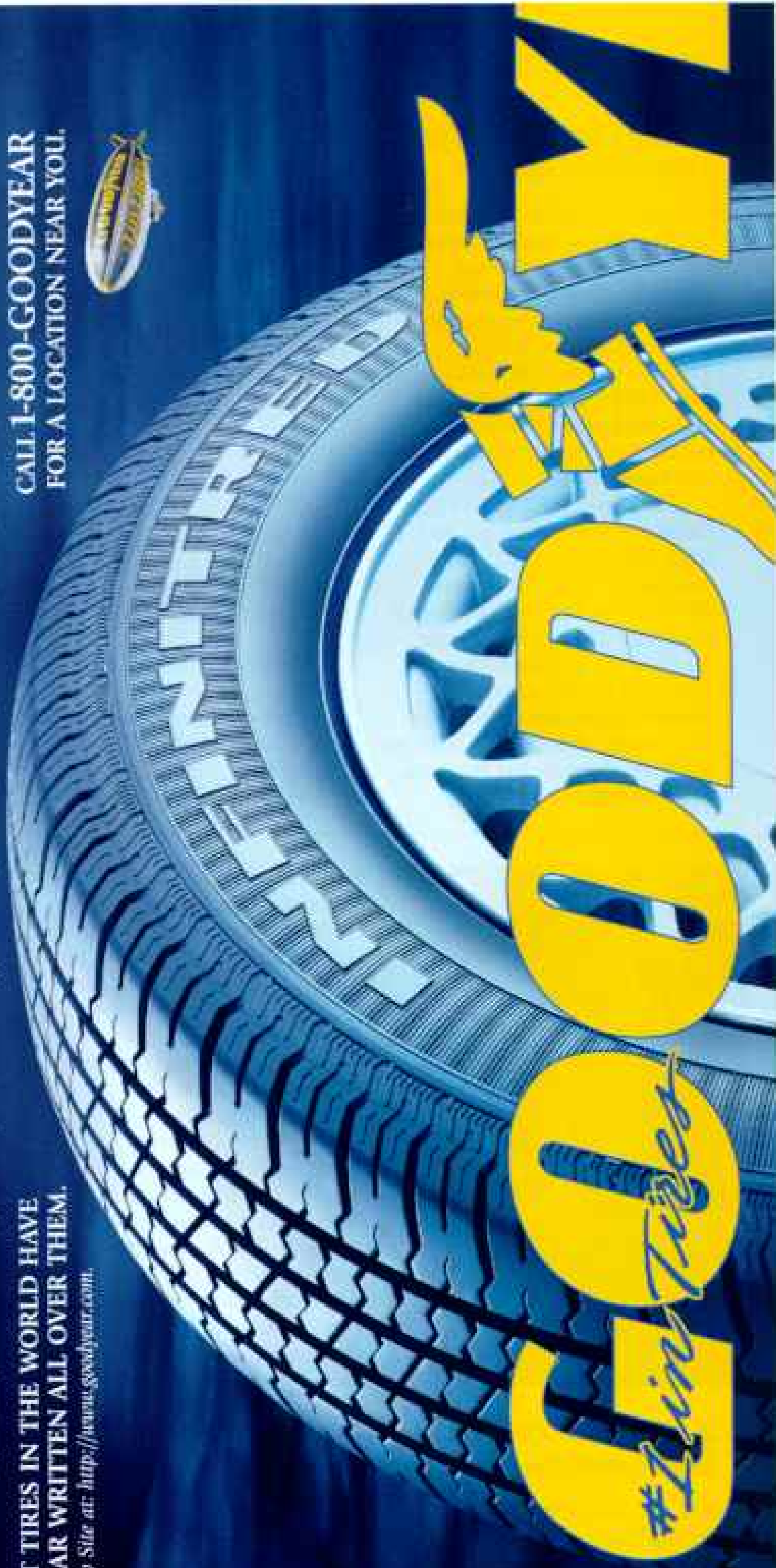
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Havens in Bangladesh From Killer Storms

"FLOODS, CYCLONES, and tornadoes are our constant companion," says Prime Minister Khaleda Zia of Bangladesh. In the wake of the catastrophic 1991 cyclone that killed 139,000 people (*GEOGRAPHIC*, June 1993), Zia's government embarked on a drive to protect residents of the Bay of Bengal coast and offshore islands.

Aided by international organizations, private agencies, and other nations, Bangladesh—marking its 25th anniversary this year—is building brick-and-concrete shelters like this one near the city of Cox's Bazar. They will double as schools, community centers, adult literacy centers, and clinics. They also will provide space for livestock, vital to residents unwilling



STEVE HAZURRY

to abandon their animals. "The main thing is to make shelters acceptable to the community," says an official of a British consulting firm.

A total of 1,275 shelters,

many with space for up to 1,750 people, were open by the end of 1994. That year, deaths from a cyclone numbered fewer than 200, largely because many potential victims took shelter.



DUBI TAL, ALBATROSS

2,000-Year-Old Galilee Boat Emerges Anew

FOR TWO MILLENNIA the homely fishing boat lay submerged in the Sea of Galilee. But in 1986, as a drought lowered water to record lows, two Israeli men spotted a plank from the first Galilee boat ever found dating from the time of Jesus. After an 11-day excavation the boat was

drowned in a preservative to keep its waterlogged timbers from disintegrating.

Conservationist Orna Cohen of the Israel Antiquities Authority (IAA) removed the preservative last summer. Visitors can now see the boat at the Yigal Allon Centre near the town of Migdal.

"It is about 27 feet long, used a seine net, and would have had four rowers and a helmsman," says Shelley Wachsmann of the Institute of Nautical Archaeology at Texas A&M, who led the excavation for IAA. "At least seven kinds of wood were used, including scraps from older boats. Either wood was scarce or the owner was extremely poor."

Mating Nurse Sharks to Get a Little Peace

THESE FISH have a hard enough time mating, even without boaters milling around their shallow breeding grounds off the Florida Keys. Less than 10 percent of

nurse sharks' attempts to mate end in success.

Now the National Park Service will help. It has acted on a proposal by Jeffrey Carrier of Albion College, Michigan, co-author of a May 1995 *GEOGRAPHIC* article. Carrier urged



NICK CALOYIANNIS

that buoys be set to declare a 400-by-100-yard area, where the sharks return annually, off-limits to boaters during the May-to-August mating season. Richard G. Ring, superintendent of Everglades and Dry Tortugas National Park, which includes the breeding grounds, agreed with Carrier that human activity could interfere with mating.

—BORIS WEINTRAUB



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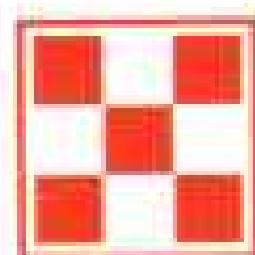
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WILLIAM THOMPSON

■ EXPLORER, APRIL 7, 9 P.M. ET

Growing Up With Africa's Elephants

IMITATING an elephant's rumbling call, wildlife biologist Joyce Poole attracts the attention of her namesake (above). The elephant, now in her 50s and matriarch of her family, was named in 1976 by Poole's friend and colleague Cynthia Moss, head of the Amboseli Elephant Project, an ongoing study of elephant society.

At Amboseli, in the shadow of Kilimanjaro, Moss shared her vast knowledge of elephants with Poole, including how to identify individuals by their distinctive ear markings. EXPLORER's "Coming of Age With Elephants," filmed by Poole's brother, Robert, chronicles her life among these largest of land animals.

She was seven when she asked

her father what would happen if a bull elephant charged. "He'd squash the car down to the size of a pea pod," came the reply. Clearly intrigued, Poole grew up to study bull elephants and, at the age of 23, proved that male African elephants, like their Asian kin, experience individual periods of heightened sexuality and aggression known as musth. Until Poole gave scientific grounding to generations of tales about rogue elephants, the cause of such aggressive behavior had eluded researchers.

Surviving some terrifying encounters with bulls in musth, Poole went on to study elephant vocalizations. To date she has documented more than 30 different calls, each associated with a specific behavior.

In 1990, after 14 years at Amboseli, Poole joined the Kenya Wildlife Service, invited by then director Richard Leakey to run

the national elephant program.

Kenya's exploding human population, which has nearly tripled in the past 25 years, has meant dramatic loss of elephant habitat. For Poole the conflict between the needs of elephants (each of which devours 300 to 500 pounds of food daily) and people has led to agonizing decisions about priorities.

Even as Poole writes the story of her life in Amboseli, "Coming of Age" comes full circle when she brings her infant daughter home to meet the elephants.

■ PROGRAM GUIDE

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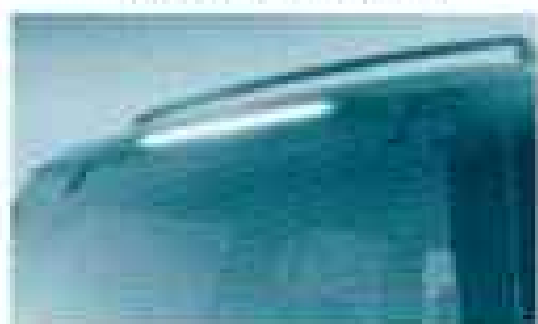
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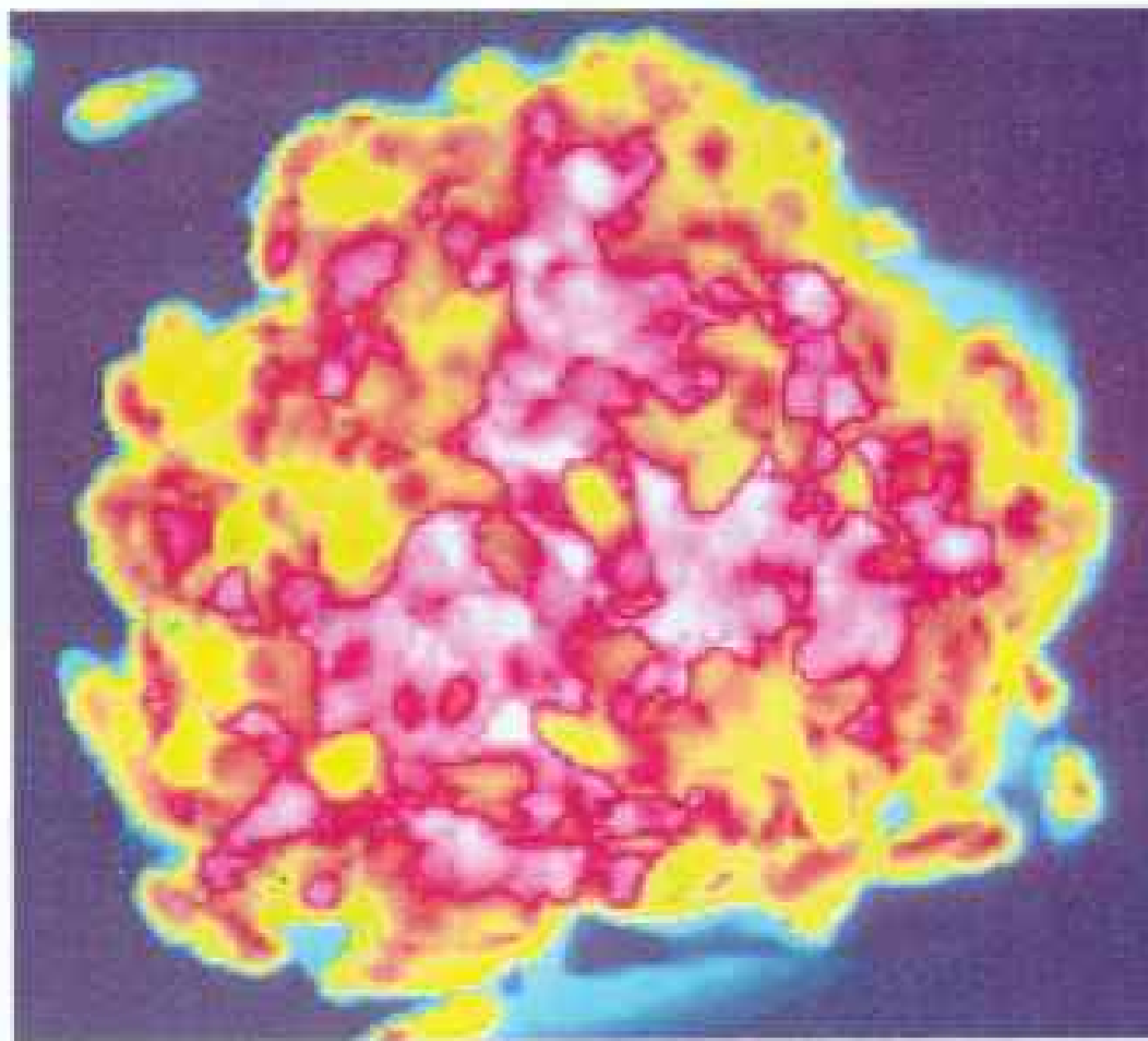


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THE WORLD'S JUST TOO BIG TO BE LEFT UNEXPLORED.

Earth Almanac



MASATO ONO & NATURE (BOTH)

If Attacked, Japanese Bees Shake and Bake

A FEROCIOUS GIANT HORNET is the bane of Japan's bees. Introduced European bees are defenseless against the monsters; 30 hornets invading a hive can wipe out 30,000 bees in three hours. But Japan's native bees employ a devastating counterattack—as one hornet corpse attests (top). How? They cook it, according to Masato Ono and his colleagues at Tamagawa University.

When one hornet finds a bee colony, it leaves a special scent, a pheromone to attract other hornets. But the bees also recognize the pheromone and summon defenders to the hive mouth. When a hornet approaches, about 500 bees engulf it and, with their rapidly vibrating bodies, create a hot seething ball of death. White areas in this thermogram show bees reaching a temperature of 118°F, lethal to the hornet but not to the bees.

Return of the Falcon

FEWER THAN 50 PAIRS of peregrine falcons were found in the U.S. in 1975. The use of DDT, which was destroying their eggs, had recently been restricted. During the recovery that followed, nearly 5,000 captive-raised peregrines were released into the wild by the Peregrine Fund, now based in Idaho.

Now the birds may soon fly off the endangered species list. Of some 1,300 pairs in the U.S., several have found aeries on tall buildings, with plenty of pigeon and gull prey nearby. Among the most famed is Baltimore's Beauregard, here with chicks hatched last May on a ledge of the USF&G Corporation headquarters building. Since 1984 Beauregard has sired 39 offspring here. "Our new baseball park, Camden Yards, is a magnet for pigeons," says ornithologist John Barber. "At dusk, if fans look up, they might see peregrines hunting pigeons right over the stadium."



ROBERT S. HAMILTON, BALTIMORE, MD

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Lord Howe Woodhen (*Tricholimnae sylvestris*) Size: Length, 36 cm Weight: Approx. 500 g Habitat: Forests on Lord Howe Island, Australia Surviving number Estimated at 250 Photographed by Rod Morris

WILDLIFE AS CANON SEES IT

A shaft of sunlight breaking through the clouds lures a Lord Howe woodhen into a clearing for a brief moment of sunning. Often shrouded in mist, the island's two mountain summits comprise a miniature rainforest where trees are cloaked in ferns, mosses and orchids, and where barely 30 of the flightless rails once held on in what was their last refuge. But thanks to a captive breeding

program and the eradication of predators, the woodhens have recovered. Today, they can be spotted throughout the island, quietly scratching for worms in the leaf litter with their long drooping bills. As a global corporation committed to social and environmental concerns, we join in worldwide efforts to promote greater awareness of endangered species for the benefit of future generations.

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

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Wanted: Volunteers With a Nose for Trouble

WHEN AN ILL WIND BLOWS in San Francisco, city officials enlist volunteers with discerning nostrils and strong stomachs to sniff out the source. They identify foul discharges in the city's aging, 900-mile-long sewer system and report the location. Then a work crew fixes the problem, often clearing out an odor-trapping catch basin.

"The citizens become our watchdogs," explains Sam Murray of the Department of Public Works, at far right, instructing volunteers in a pungent part of San Francisco. "We also teach them how to teach others, so we don't have to have an army of inspectors working all the time."

The Odor Project uses an Odor-mobile, a customized



JAMES A. SUGAR

recreational vehicle, to carry the gas whiffers to complaint sites phoned in to the Odor Hotline. The vehicle is also a training center equipped with a video lab. At stops citizens learn about

the care and feeding of their city's sewers.

Says Murray: "They learn not to throw paint or ammonia or oil into the sewer. They learn to treat it right."



ROXANA VILLA

Signaling Alarm, Plants Use Chemical Warfare

ROOTED TO THE SPOT and possessing neither nerves nor muscles, plants nevertheless exhibit dramatic behavior. Like animals, they communicate and defend themselves.

When some leaves are nibbled by a foraging insect, they produce chemicals that either give the bug indigestion or make it feel falsely sated. An injured leaf also releases jasmonic acid, which signals the plant's other leaves to muscle up their chemical defenses before the bad guys arrive. Corn and bean plants even summon mercenaries: When some species of caterpillars munch the leaves, the plants emit chemicals that attract parasitic wasps. The wasps lay eggs in the caterpillars, and the developing larvae eat their hosts. The plant is happy.

—JOHN L. ELIOT

A Light Fantastic?

CASTING A GLOW similar to sunlight, a new long-lasting lightbulb is being tested in commercial buildings.

Filled with argon gas and sulfur, the sulfur lamp was created by Fusion Lighting, Inc., and is now backed by the Department of Energy. It produces light four times as bright as ordinary bulbs while using a third of the energy.

The lamp has no filaments to burn out. Instead, each bulb has its own microwave generator, which bombards the argon and sulfur to create light; the generators last 20 months.



MARK THORSON

"We've found some new ways
Their names are Elena, Andrew,



General Motors Corporation © 2004

Lori Wingerter, a GM Environmental Engineer, is chairperson of the Global Rivers Environmental Education Network (GREEN), a non-profit program that helps local schools teach children how to improve the quality of their rivers. There's a lot to learn: biology, geography, history, math and

*to help improve the environment.
Miesha, and Brian."*



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On Assignment

■ TRANGO ASCENT

Not Quite at the End of His Rope

DON'T SHOW this magazine to BILL HATCHER's mom. "She knows I climb rocks, and she knows I take pictures," says the freelance photographer (right), hanging in the air at 18,800 feet to shoot the Trango Tower ascent in Pakistan. "But she would prefer to think I do this all with trick photography."

The only trick on Trango was staying alive. "Rockslides just poured off that mountain; you got used to the sound of stones pelting your helmet. Once a 30-pound chunk of ice came tumbling down and bounced off my leg!"

After traveling the world as an Army brat, Bill took photojournalism classes while getting a history degree from the University of Wyoming. He now lives in Flagstaff, Arizona.



BOBBY MODEL

■ ARAN ISLANDS

Having the Stomach for the Job

"I HAD FORGOTTEN to take my seasickness pills," remembers freelance photographer SUSIE POST (below). Shooting salmon fishing off Ireland's Aran Islands landed her a boatload of misery.


"The worse I felt, the less I cared about focus, or whether my cameras were drenched, or whether I would ever eat again. All I wanted was to sit still, look straight ahead at the land, and hold on tight. I sat there for five hours!" But she got her pictures.

Susie started in photography almost by chance. Pursuing a business degree from the University of

North Carolina at Chapel Hill, she took photography "because I was looking for small classes." The course changed her life. "I learned that photography was something that could drive my heart."



ALEX HARRISON

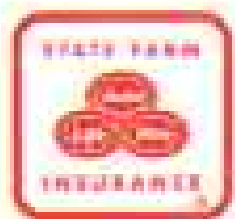


MS. BEBELAAR IS FAMOUS FOR
GIVING HER STUDENTS
ASSIGNMENTS THAT TAKE
A YEAR TO FINISH.

Judy Beelaar gives the high school students in her creative writing class a rather unusual assignment: It's one that involves art, poetry and prose, as well as research, marketing and sales. And it's an assignment that takes exactly 12 months of work to finish, because Judy gives her students at San Francisco's International Studies Academy, a charter school, the responsibility of designing, producing and marketing their own calendar.

Drawing upon the diversity of their cultural backgrounds, Judy's students use the calendar to explore issues like cultural heroes, human rights and the environment. And each page is devoted to an expression of their views through art and the written word. By selling the calendar, Judy's students end up learning a bit about business as well. But more importantly, they learn about the power of the written word and the strength that lies in their own ideas and convictions.

For her achievements, State Farm is proud to present Judy with our Good Neighbor Award, and to donate \$5,000 to the educational institution of her choice.



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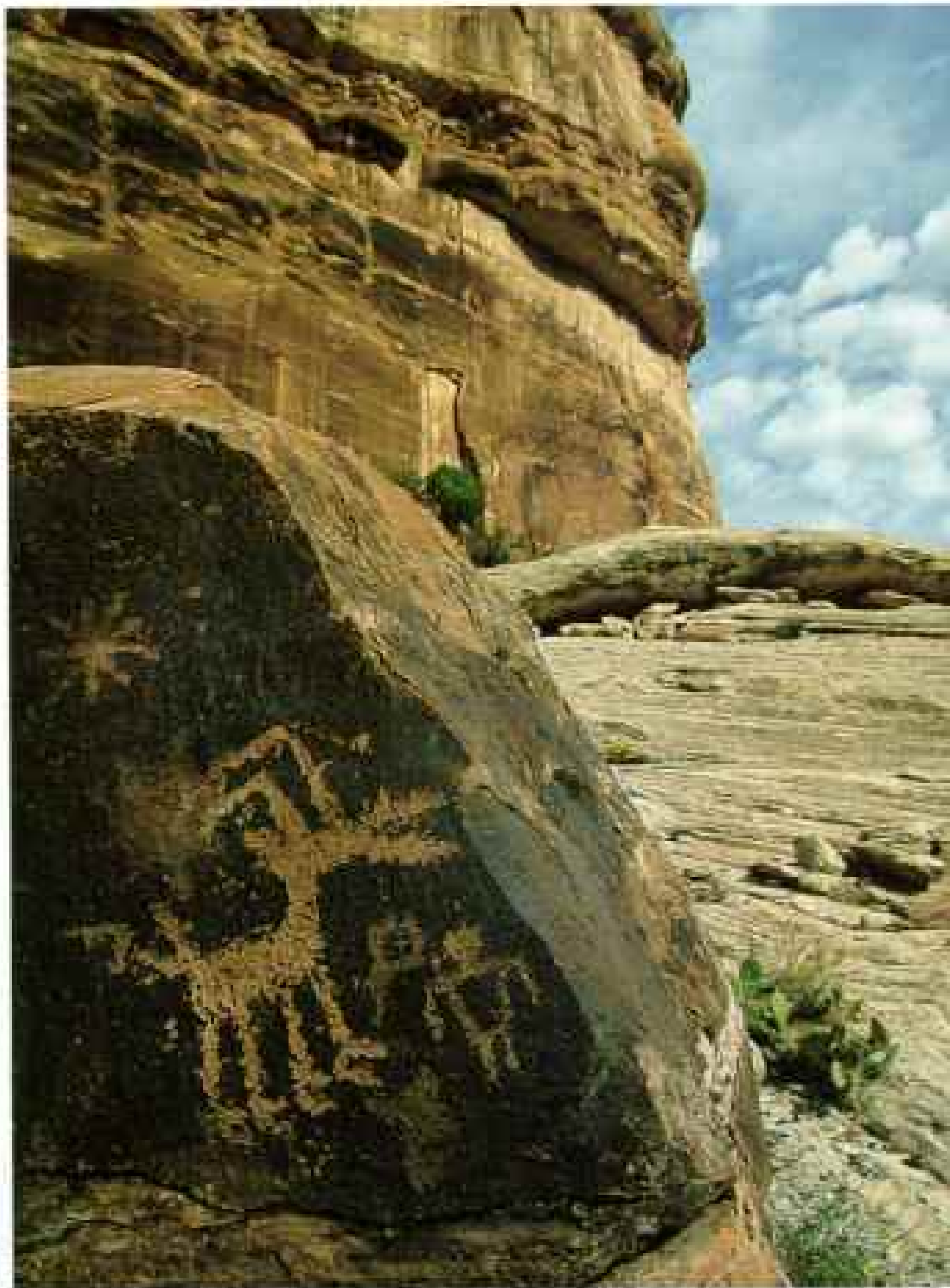


Pueblo People

■ From bones, artwork, and other remains, archaeologists make educated guesses about the habits and beliefs of the ancient Pueblo people. If archaeologists a thousand years from now were to uncover items

from our time, what would be good clues as to how we live today? A high-top sneaker? A computer keyboard? A piano key? A soda can? A Barbie doll? A Frisbee? What would you *like* them to find?

■ A model of a pueblo can be made using only a few materials. Adobe buildings can be constructed from small blocks of plastic foam glued together, then plastered with a thick paste of soap flakes and water. Sand or sawdust pressed into the wet paste will make the model



SCHOOL OF AMERICAN RESEARCH, SANTA FE, NFM HERBIB (TOP LEFT); ISA BLOCK

resemble adobe. Toothpicks stuck into the walls, then trimmed, will look like roof beams. The photographs in the article can serve as guides to building shapes.

■ The map on pages 96-7 shows that Pueblo settlements have clustered in different areas over time. Why do you think these areas were chosen?

To learn more about his ancestors, T. J. Loretto (above) of Jemez Pueblo, New Mexico, studies archaeological techniques at Castle Rock in Colorado. In remote Grand Gulch, Utah, a Pueblo artist's bighorn sheep (left) has weathered sun and wind for more than a thousand years. Shells from a distant sea (top left) were swapped in trade — then left undisturbed for centuries in a tiny clay pot in New Mexico's Arroyo Hondo Pueblo.

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