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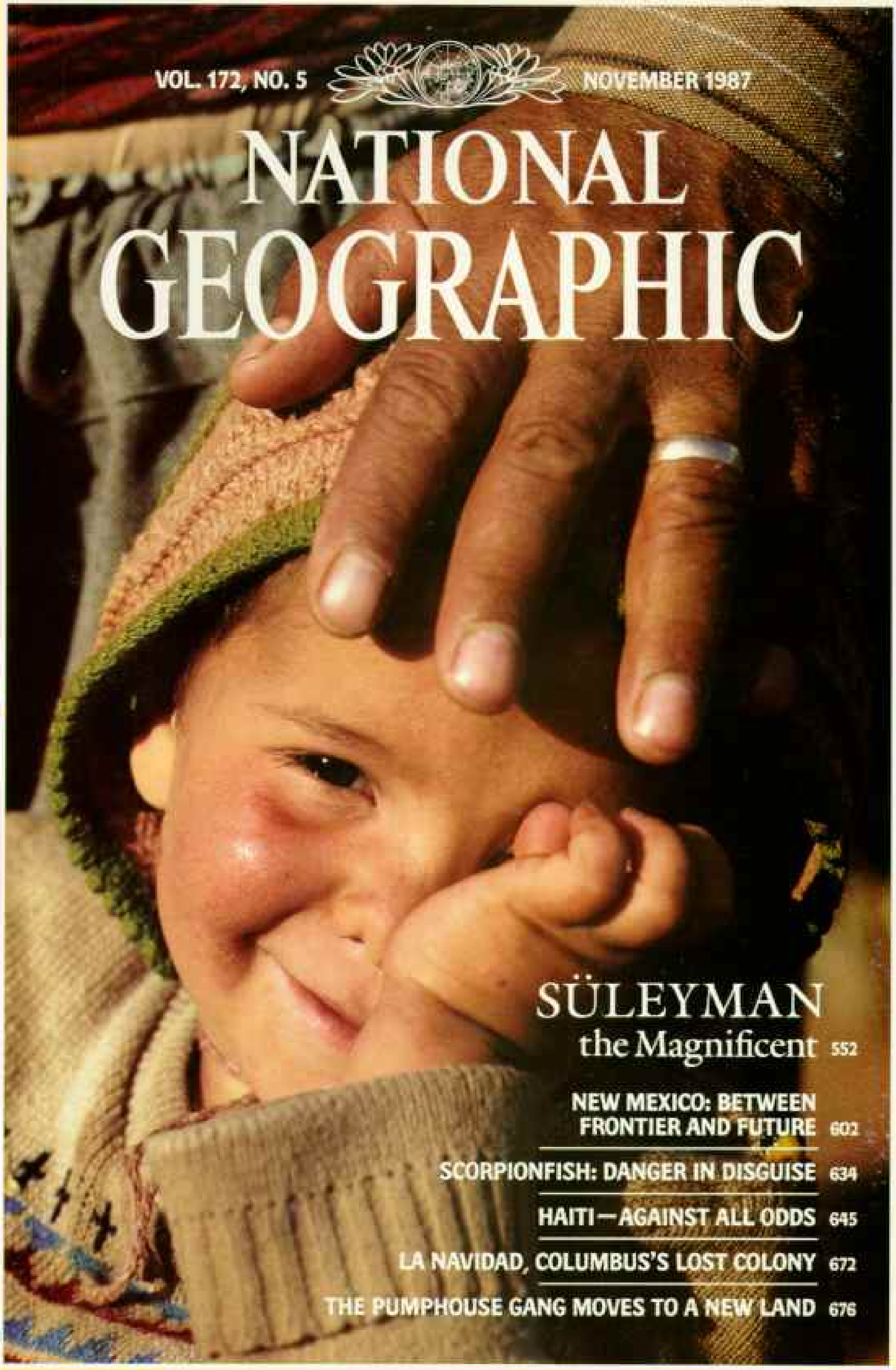

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NATIONAL GEOGRAPHIC

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Süleyman the Magnificent 552

Merle Severy and James L. Stanfield chronicle the great Turkish sultan who raised the Ottoman Empire to its zenith in the 16th century, pitting East and West in a holy war of terrorism, hostages, and intrigue that echoes in today's headlines.

New Mexico: Between Frontier and Future 602

High technology has come to this land of three cultures and infinite sky, and New Mexico will never be the same state again. Bart McDowell and photographer Danny Lehman investigate the changes that growth brings.

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The most horrific and beauteous of venomous fishes—whose spines can be deadly—are caught on film by David Doubilet in the Gulf of Aqaba.

Haiti—Against All Odds 645

Amid continuing political turmoil, the Western Hemisphere's poorest nation struggles simply to survive. Charles E. Cobb, Jr., and photographer James P. Blair report.

Columbus's Lost Colony 672

On Haiti's north shore, archaeologist Kathleen A. Deagan and her colleagues believe they have found the first Spanish settlement in America, La Navidad. Photographs by Bill Ballenberg.

West Indies Map

A double-sided supplement explores islands crucial to the "Making of America."

The Pumphouse Gang Moves to a Strange New Land 676

Anthropologist Shirley C. Strum discusses her continuing study of a fascinating troop of Kenya baboons after its move to a new habitat.

COVER: *Child of a nomadic family, Süleyman Önal carries a name legendary in Turkey, homeland of the great Ottoman ruler, Süleyman the Magnificent. Photograph by James L. Stanfield.*

GEOGRAPHICALLY, politically, culturally, and climatically, the ridgeline of the Himalayas forms one of the world's great divides. Here South Asian peoples of Hindu and Muslim faith crowd up against Tibetans and Han Chinese of Buddhist and Confucian belief. Rainfall ranges from monsoon downpours of 200 inches a year south of the ridge to a desert-sparse ten inches on the Tibetan Plateau.

In September the two dramatically different governments that face each other across this awesome ridge—Nepal one of the few religious monarchies on earth, China an atheistic Communist state—announced in Denver plans to develop an international nature sanctuary rivaling the Serengeti game preserve of Africa.

Nepal is significantly expanding its existing Sagarmatha National Park to 1,200 square miles, while China is creating a Qomolangma Nature

Preserve in Tibet with as many as 5,000. In the area lives a unique menagerie of rare mammals, including the snow leopard, lesser panda, and Asiatic black bear. As for flora, one valley alone supports 26 varieties of wild rhododendron.

The two preserves will remain politically separate, but their endangered fauna and flora, honoring no borders, will have a chance for survival, legally protected from human encroachment and outright poaching. For those of us involved, through association with the Woodlands Mountain Institute of West Virginia, in the planning for both preserves, the farsighted actions by Nepal and the People's Republic of China prove that these two nations—despite serious economic and population problems—are sensitive to the need to safeguard this unique natural environment. The new preserves are really a heritage in trust for all mankind.

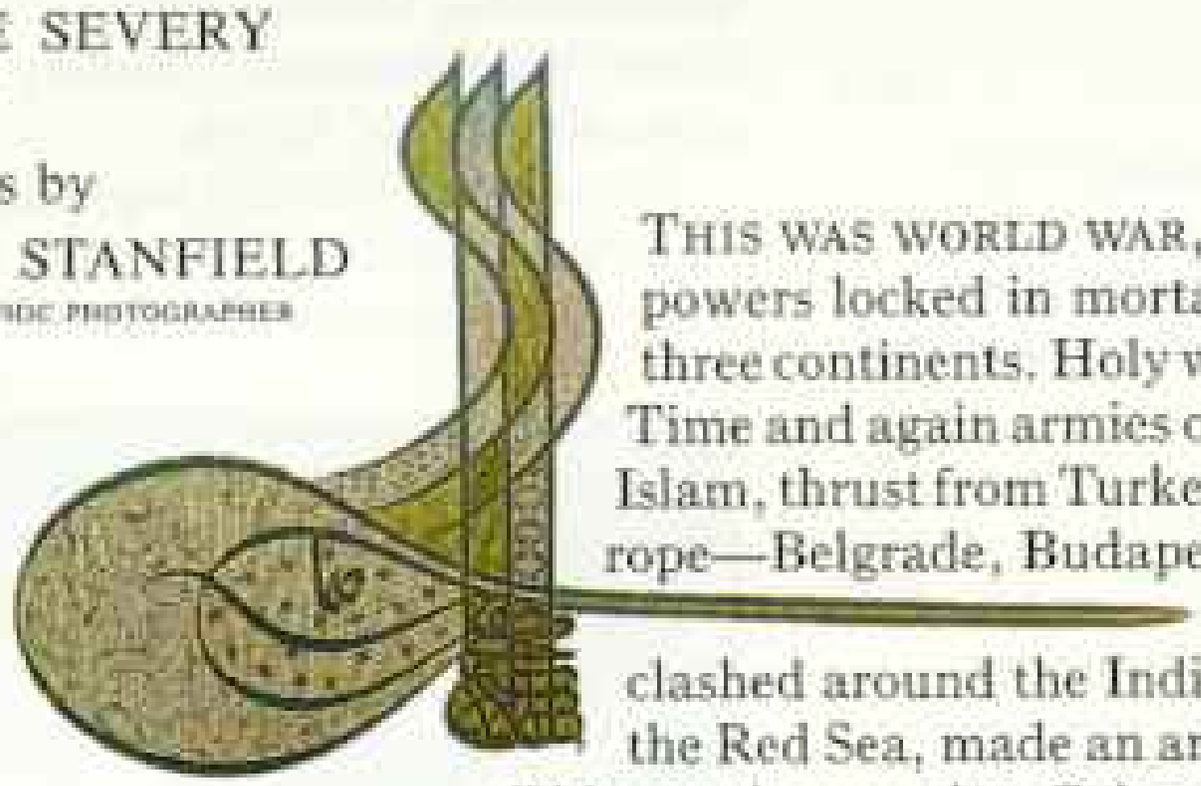
Wilbur E. Garrett

EDITOR

The World of SÜLEYMAN the Magnificent

By MERLE SEVERY
ASSISTANT EDITOR

Photographs by
JAMES L. STANFIELD
NATIONAL GEOGRAPHIC PHOTOGRAPHER



Sultan of sultans, conqueror on three continents, Süleyman I shook the world of the 16th century as he raised the Ottoman Empire to the height of its glory. Known to Europeans as the Magnificent and to his subjects as the Lawgiver, he was both a brilliant military strategist and an acclaimed legislator. His imposing monogram, or tuğra, *above, endorsed the many edicts issued during his 46-year reign.*

UNKNOWN ARTIST, LATE 16TH CENTURY;
MAGYAR NEMZETI MÚZEUM, BUDAPEST (OPPOSITE)

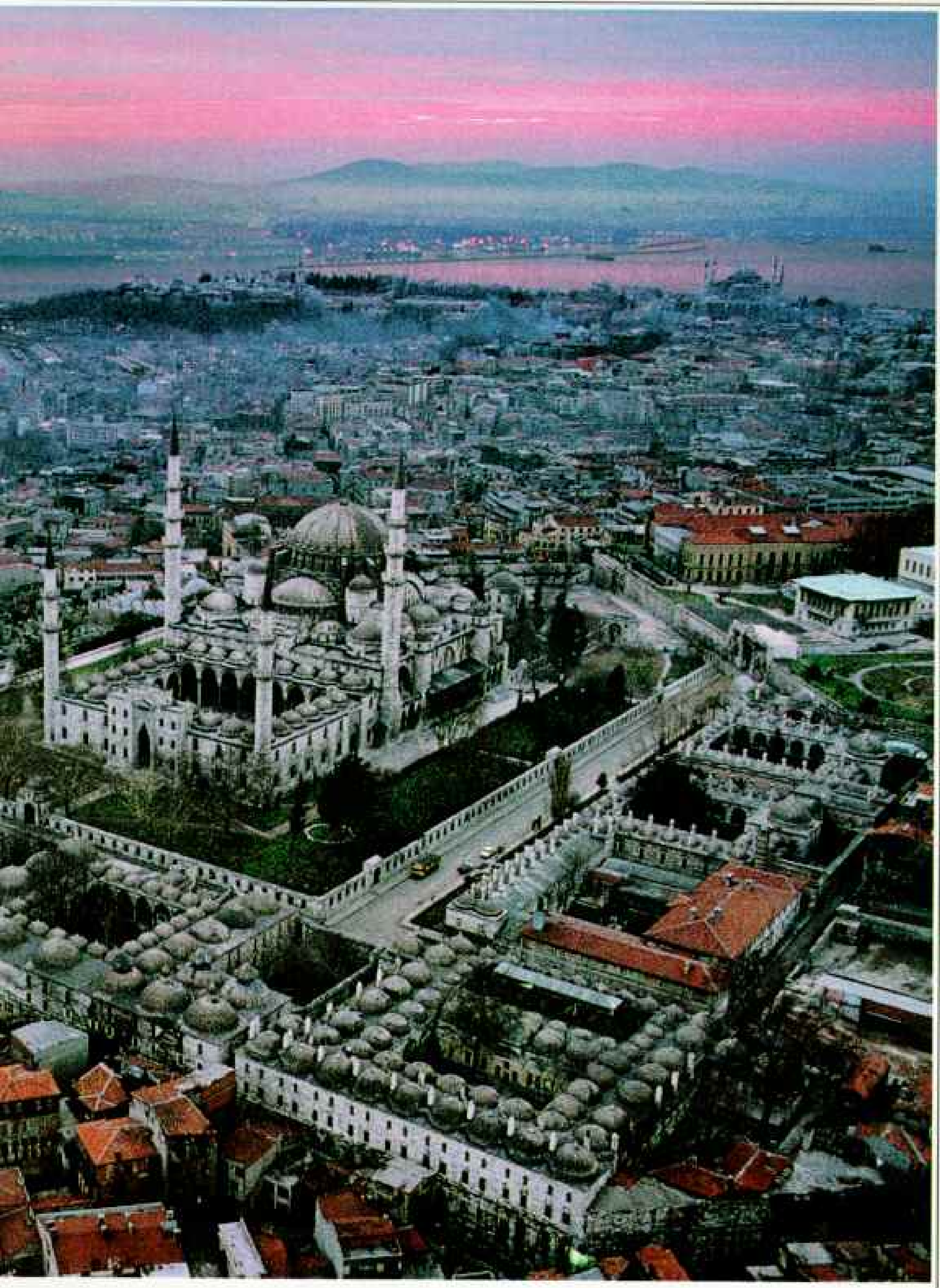
THIS WAS WORLD WAR, East against West, two superpowers locked in mortal conflict on lands and seas of three continents. Holy war fought with the fury of faith. Time and again armies of the Ottoman sultan, Sword of Islam, thrust from Turkey into the heart of Christian Europe—Belgrade, Budapest, to the very gates of Vienna. Christian and Muslim forces clashed around the Indian Ocean, in the Persian Gulf, the Red Sea, made an arena of the Mediterranean.

This was the age when Columbus sought westward for the Indies, da Gama found them eastward around Africa, and Magellan linked West and East by circumnavigating the globe. The age of gunpowder that saw Ottomans cast cannon more terrifyingly destructive than any before, turning turreted castles into picturesque anachronisms; when a peasant with a musket could knock a proudly plumed knight off his high horse.

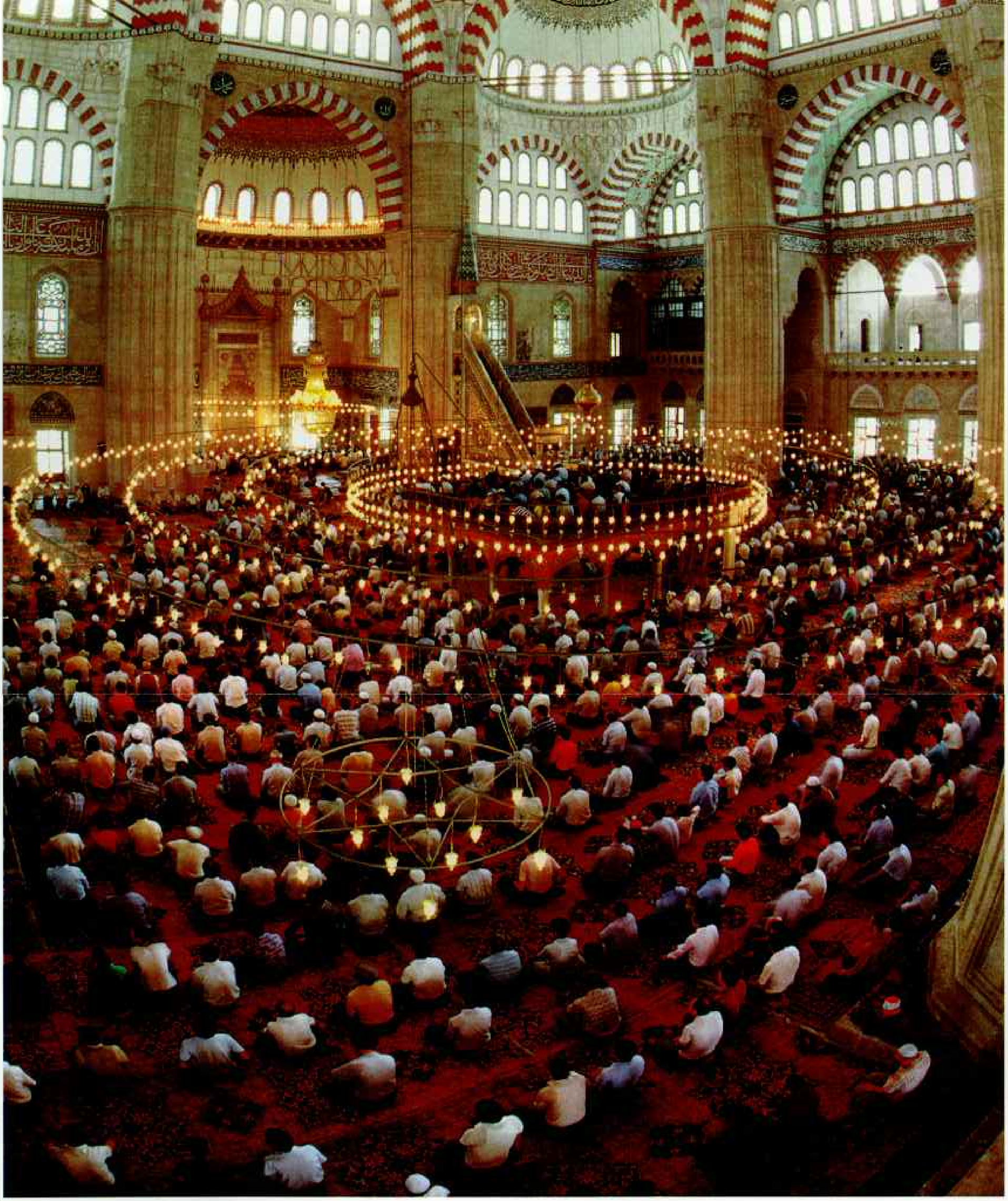
Stars studded this 16th-century playbill: Charles V, Habsburg monarch of imperial Spain, Holy Roman Emperor, and lifelong crusader against Islam. His Machiavellian archrival, Francis I, Most Christian King of France, who would sell his soul to Satan or Turk for possession of Milan, the jugular of Italy. Martin Luther, Saxon reformer who unintentionally shattered the unity of the church Charles was pledged to protect. Henry VIII of England, mercurial ally and enemy of all three—the pope's Defender of the Faith who broke with Rome so he could divorce Charles's aunt. Ivan the Terrible, launching the march of Muscovy that continues to this day.

At center of this world stage one stood taller than all the rest: Süleyman, Commander of the Faithful, Shadow of God on Earth, Protector of the Holy Cities of Mecca, Medina, and Jerusalem, Lord of the Lords of the World, East and West. . . . Revered by his people as Kanuni, the Lawgiver, feared and admired by the West as the Magnificent, Süleyman brought the Ottoman Empire to the pinnacle of its power, ruling from the city "most apt to command the world"—Istanbul, the famed Constantinople founded by *(Continued on page 562)*

MONUMENT TO A MIGHTY RULER, Istanbul's many-domed Süleymaniye complex looks over the Golden Horn, Bosporus, and Sea of Marmara to Asia. Built in the 1550s by court architect Sinan, the mosque was surrounded by colleges, a hospital,



a soup kitchen, baths, and the tombs of Süleyman and his wife, Roxelana. Istanbul —then known as Constantinople—became the seat of Ottoman power in 1453, when Süleyman's great-grandfather Mehmed II seized the Byzantine capital.



SOARING TOWARD THE HEAVENS, the vast Selimiye Mosque in Edirne, Turkey, represents the pinnacle of Sinan's achievement. Light flooding through curtain walls illuminates geometric designs, arabesques, and phrases from the Koran. The mosque was built by Sinan in the 1570s for Selim II, Süleyman's son and successor. Born in a Christian village in Anatolia, Sinan rose through the devşirme system, whereby Ottomans brought promising Christian youths to the court in Istanbul. They were educated, converted to Islam, and trained as Janissaries—elite infantry—or as administrators.

Battleground of a holy war

OCCUPYING A STRATEGIC POSITION at the junction of three continents, the Ottoman Empire under Süleyman became a major world power. Süleyman personally accompanied his army on 13 campaigns, expanding his territory from Buda in central Europe to Basra in Asia. He created a powerful navy that secured coastlines along the Persian Gulf, Red Sea, and eastern Mediterranean and brought most of the North African coast under Ottoman control.

THE BROAD SWEEP of the Ottoman Empire at the time of Süleyman's death in 1566 (shown in gold) included peoples of many religious and ethnic backgrounds, taxed and administered by a central bureaucracy. At the empire's periphery were numerous vassal states, granted varying degrees of control over their internal affairs in return for tribute paid to the sultan. This wealth enabled Süleyman to amass expensive heavy artillery and to support a dependable infantry equipped with firearms, giving the Ottomans a military advantage over their disunited foes.

X Battle

Scale varies in this perspective view.

NGS CARTOGRAPHIC DIVISION
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ATLANTIC OCEAN
KINGDOM OF ENGLAND
KINGDOM OF FRANCE
KINGDOM OF PORTUGAL
KINGDOM OF SPAIN
HOLY ROMAN EMPIRE
POLAND AND GRAND DUCHY OF LITHUANIA
EUROPE
RUSSIA
Moscow
Paris
Worms
Regensburg
Riegersburg 1486, 1529, 1532
Vienna, 1529
Güns, 1532
Buda, 1526, 1541
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Mohács, 1526
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Mostar
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Tunis 1534, 1535, 1575
Otranto, 1480
Reggio 1543
Corfu 1537
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KINGDOM OF SICILY
Malta 1565
Lepanto 1571
Jerba 1560
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AFRICA
MEDITERRANEAN SEA
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BLACK SEA
CASPIAN SEA
RUMELIA
Sofia
Marica
Nicopolis, 1390
Varna, 1444
Edirne
Gallipoli
Istanbul (Constantinople)
Iskudar
Bursa
Kütahya
Manisa
Konya
Kizil
ANATOLIA
Amasya
Trebizond
Caldıran 1514
Tabriz 1514, 1534, 1548
Qazvin
Bodrum
OTTOMAN EMPIRE
Aleppo 1516
IRAN (PERSIA)
TURKESTAN
ASIA
MOGUL EMPIRE
INDIA
Indus
Beirut
Damascus
Baghdad 1534
Alexandria
Jerusalem
Cairo, 1517
Suez
Tigris
Euphrates
Basra, 1534, 1546
Hormuz 1552
Strait of Hormuz
PERSIAN GULF
ARABIA
Bahrain 1559
Musandam Peninsula
Muscat 1552
Masira
Diu 1509, 1538, 1546
Chaul 1509
Goa
Malabar Coast
ARABIAN SEA
Nile
RED SEA
Medina
Jiddah, 1517
Mecca
Suakin
Massawa
Sana 1546
Mocha
Aden 1538, 1551
INDIAN OCEAN

Calendar of conflict

1453 Mehmed II, Süleyman's great-grandfather, conquers Constantinople from the Byzantines, makes it the Ottoman capital (Istanbul).

1454 First dated work from Gutenberg's printing press warns of Turkish peril.

1494 Birth of Süleyman; his French ally, Francis I; and his knightly foe at Malta, La Valette. French start Italian wars. Columbus on second voyage to New World.

1498 Vasco da Gama reaches India around Africa, outflanks Islam, threatens its spice trade and holy cities.

1514 Selim the Grim, Süleyman's father, defeats perennial enemy, Safavid Iran.

1516-17 Selim conquers Syria and Egypt. Portuguese bombard Jiddah, Mecca's port on Red Sea.

1520 Süleyman becomes sultan. Charles V is installed as Holy Roman Emperor in Germany 22 days later.

1521 Süleyman seizes Belgrade. Emperor Charles outlaws Luther at Worms.

1522 Süleyman conquers Rhodes. Magellan's *Victoria* first to circle the globe.

1523 Ibrahim made grand vizier.

1525 Charles V defeats Francis I at Pavia; the imprisoned king appeals to Süleyman, prelude to a later alliance.

1526 Süleyman triumphs at Mohács; Hungary's King Louis II dies. Buda burned.

1527 Charles V's troops sack Rome, confine French-allied Pope Clement VII.

1529 Siege of Vienna, high-water mark of Ottoman surge to Europe's heart, fails. Barbarossa, with Süleyman's guns, ousts Spanish from Algiers.

1530 Pope crowns Charles emperor and king of Italy. Süleyman is furious; only one emperor reigns—himself.

1532 Süleyman subdues Güns, ravages Austria.

1533-35 Barbarossa made grand admiral, conquers Tunis, provoking a crusade by Charles V. As Charles sacks Tunis, Barbarossa raids Balearics, enslaving 6,000.

1534-36 Süleyman invades Iran, winters in Baghdad, annexes Iraq, executes Ibrahim. Henry VIII's break with Rome boosts Protestants.

1537 Turks besiege Corfu.

1538 Süleyman campaigns in Moldavia. Barbarossa wins at Préveza. The Egypt fleet captures Aden, besieges Diu.

1541 Süleyman annexes Hungary. Charles V defeated at Algiers. Roxelana and harem move to Topkapi.

1543 Further conquests in Hungary. Ottoman fleet raids Italy, helps French take Nice, winters in Toulon.

1545 Council of Trent starts Counter-Reformation.

1546 Ottomans complete conquest of Yemen.

1548-49 Süleyman wars in Iran, winters in Syria.

1551 Turks take Tripoli.

1552 Ottoman fleet attacks Hormuz and Muscat. Ivan the Terrible begins Muscovy's march to the Caspian.

1553 On campaign to Iran, Süleyman executes his son Mustafa.

1554 Turkey's tulip introduced to western Europe.

1555 Peace of Amasya with Iran; Peace of Augsburg. First coffee shops in Istanbul.

1556 Charles V abdicates.

1558 Death of Roxelana and Charles V.

1559 Peace of Cateau-Cambrésis ends decades of Valois-Habsburg wars; Spain controls Italy.

1560 Ottoman navy defeats Spanish at Jerba.

1561 Süleyman has his son Bayazid executed in Iran.

1565 Siege of Malta.

1566 On 13th campaign, up the Danube, Süleyman dies on eve of victory at Szigetvár.

1571 Battle of Lepanto.

1588 England's Elizabeth I, ally of the Ottomans, defeats Spain's "Invincible Armada."

PAINTING BY ROBERT F. CRAFT

(Continued from page 552)

Constantine the Great 12 centuries before at the crossroads of Europe and Asia.

"I know of no State which is happier than this one," reported the Venetian ambassador in 1525; "it is furnished with all God's gifts. It controls war and peace with all; it is rich in gold, in people, in ships, and in obedience; no State can be compared with it. May God long preserve the most just of all Emperors."

Süleyman was granted a remarkably long reign of 46 years, and 72 years of life, filled with triumphs—also darkened with tragedy. Duty drove him to execute his dearest friend. His greatest act of chivalry repaid him four decades later with his bitterest defeat. Bewitched, some claim, by the slave woman who enslaved him, he ordered his finest son and most promising successor strangled in his presence with a bowstring.

For months I traveled the length and breadth of the empire Süleyman ruled and where his armies and navies fought—from the Danube and Ukraine to the Nile, from the gates of the Atlantic to the monsoon shores of India.

I often felt his presence. Topkapı Palace curators let me touch silken caftans Süleyman wore and hold in my hands a book of his poetry in his own calligraphy. Scholars in the Süleymaniye Library read to me from manuscript chronicles of his campaigns.

Professor Aptullah Kuran gave shoe leather and soul to elucidate masterpieces of Süleyman's court architect, Sinan. In his half century of architectural creation he built more mosques, baths, bridges, clinics, colleges, caravansaries, covered markets, and aqueducts than any other architect in history. Istanbul's crowning glory, dominating the skyline of a city spiked with a thousand prayers in stone, is his fulfillment of Süleyman's dream—the mighty Süleymaniye Mosque. Around it and in it the living are served. In a garden tomb behind, the sultan lies at rest.

As I flew over the Strait of Hormuz in an Omani Air Force helicopter, clambered the ramparts of Diu in India's Gujarat, explored Yemen's sleepy port of Mocha—which woke the world to its favorite beverage, coffee—and got arrested for photographing the 16th-century harbor at Algiers, I felt a shock of recognition. Terrorism, ransoms, contraband arms to enemies, funding subversives, duping allies, fear of encirclement, martyrdom—Süleyman's world had these too.

"It is a pleasure to be martyred for Islam. Death is always to be treasured when met for the Almighty." Holy-war dogma of Süleyman's day? Could be. But this is Ayatollah Khomeini of

FRIENDS BECAME FOES at the drop of a hat in 16th-century Europe, as feuding monarchs sought to protect and expand their domains and avoid annexation by the Ottomans. Chief among Süleyman's rivals was Charles V (below), Habsburg King of Spain, Holy Roman Emperor, and a fierce crusader against Islam, who also struggled against

CHARLES V, HOLY ROMAN EMPEROR (1500-1558

the Protestant Reformation engendered by Martin Luther. Francis I of France allied himself with the Ottomans against Charles. England's Henry VIII seesawed between Charles and Francis, as did Pope Clement VII. Ivan the Terrible pushed to the Caspian in the 1550s, starting a long Muscovite expansion against the Ottomans. Jean Parisot de La Valette and his Knights of Malta stood firm against Süleyman in 1565.

Iran today. His words find Christian counterparts in Süleyman's mortal foes—the celibate, fiercely dedicated Knights of St. John, who welcomed "the crown of martyrs" with its "prize of Eternal Life." "He who dies in the cause, dies a happy death."

Süleyman even had his Iranian hostage crisis—his own son. He fought to keep Persian Gulf sea-lanes open. Then it was for Asia's spices, silks, and gems. Now it is for oil, not much use in his age, when biscuits, hard biscuits by the ton, fueled galleys powered by oarsmen straining under the crack of the lash.

IVAN IV, "THE TERRIBLE," TSAR OF RUSSIA 1547–1584

WE PICK UP Süleyman's ancestors on history's radarscope in the tenth century, deep in the heart of Eurasia. The dust devil dancing on the distant steppes of Turkestan grows to a cyclone as it swirls through Iran and Iraq and bursts on Byzantine Anatolia in the late 11th century. On the way it gathers up the Islamic faith, Persian culture, and zeal of the *ghazi*—frontier champion of the *jihad*, or holy war, against unbelievers.

Not until the late 13th century can we distinguish the tribe of Osmanli, or Ottoman, Turks. These followers of Osman, their first sultan, on Islam's cutting edge, wrested northwestern Anatolia from the Byzantines and set their first capital at Bursa. They crossed over the Dardanelles into Europe near Gallipoli in 1352 and soon spread through the Balkans from their new capital of Edirne—ancient Adrianople—in Thrace, key to historical routes across Macedonia to the Adriatic, and up the Maritsa Valley to the Danube.

MARTIN LUTHER, 1483–1546

CLEMENT VII, POPE 1523–1534

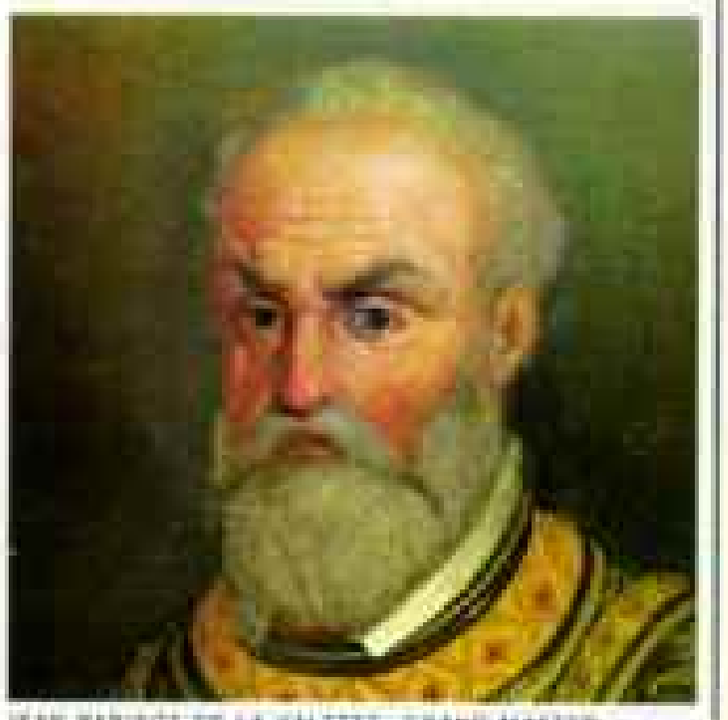
FRANCIS I, KING OF FRANCE 1515–1547

HENRY VIII, KING OF ENGLAND 1509–1547

Alarmed popes preached many crusades. Europe's quarreling princes mounted but two. Knights of Charles V's ancestral Burgundy joined the chivalry of many lands—only to be wiped out by the Ottomans at Nicopolis on the Danube in 1396 and at Varna on the Black Sea in 1444. The fall of Constantinople in 1453 shook Europe. Eleven hundred years of Byzantine history came to an end.* Islam's dream had been fulfilled.

Mehmed the Conqueror, Süleyman's great-grandfather, in one of history's most ambitious urban renewals, rebuilt and repopulated the city to create the Ottoman imperial capital. The scion of Turkestan nomads sat on the throne of the Caesars, priding himself as heir to all lands Roman emperors once ruled. Chroniclers hailed him as the new Alexander.

*Merle Severy described "The Byzantine Empire: Rome of the East," in the December 1983 NATIONAL GEOGRAPHIC.



JEAN PARISOT DE LA VALETTE, GRAND MASTER, KNIGHTS OF MALTA 1557–1568

FACING PAGE: BY TITIAN, AT THE PRADO, MADRID, FROM SCALA/ART RESOURCE, NEW YORK. CLOCKWISE FROM TOP: BY VASNETSOV, FROM THE BETTMANN ARCHIVE, NEW YORK; BY FRA SEBASTIANO DEL PIOMBO, FROM SCALA; BY HANS HOLBEIN THE YOUNGER, FROM SCALA; BY UNKNOWN ARTIST, FROM MUSEUM OF THE ORDER OF ST. JOHN, LONDON; ASCRIBED TO JEAN CLOUET, FROM FLAMMARION, PARIS; BY LUCAS CRANACH THE ELDER, FROM SCALA

WHIRLING IN ECSTASY, dervishes of the Mevlevi Order in Istanbul perform a ritual dance each December to commemorate the death in 1273 of their founder, Celaleddin Rumi. Pivoting on one foot as they circle the room—right hand facing

heaven, left hand facing earth—the dancers symbolize spinning planets revolving about God. A mystic poet, Celaleddin was admired by sultans for his humanitarian teachings; Süleyman restored his shrine in Konya, Turkey.

The unquenchable thirst of the ghazi for holy war was intensified now by a clear imperial purpose: the dream of a single world united under the green banner of Islam. So the juggernaut of conquest rolled on. Serbia, Bosnia, Greece, Albania, Moldavia, Wallachia, Transylvania, the Crimea, Dalmatia, Croatia felt its hammerblows. From St. Mark's campanile Venetians could see raiders' fires. Only Mehmed's death in 1481 kept him from pressing the conquest of Italy and resuming the siege of Rhodes, last crusader stronghold in the East.

With morbid fascination observers watched the deadly race for the throne. A sultan's death would be kept secret until a successor could make it from the provinces to the sacred "throne region." But couriers could be waylaid, the grand vizier could counter his dead master's choice, the troops could upset and bang on their soup caldrons in mutiny if the new leader was not generous in gold. By custom, codified into law by Mehmed himself, whoever got acclaimed first was ruler, and all his brothers must die—strangled by a silken bowstring, since it was sacrilege to shed royal blood. Better that a few die than imperil the realm with wars of succession. Mehmed had begun his reign by executing his infant brother.

In this age, piety, cupidity, and cruelty could animate the same heart without its missing a beat. Muslims and Christians alike subjected captured towns to slaughter, pillage, rape, the taking of women and boys as slaves. One reason the Ottomans pressed into Christian Europe rather than eastward was that koranic law frowned on Muslims warring on one another.

The great exception was Iran, stronghold of the Shiite heresy and dagger at the orthodox Turk's back. When the sultan attacked Europe, Iran struck his rear. Sunni Ottomans abhorred Iranian heretics as even unholier than Christians.

"I AM THE SULTAN OF LOVE," declared Süleyman, who wrote poetry in Persian and Ottoman Turkish under the pseudonym Muhibbi (meaning "beloved friend"). Expertly transcribed by a court calligrapher, his verses often were decorated with gold flecks sprinkled on wet ink. An enthusiastic patron of the arts, Süleyman was proud of his own penmanship. A collection of his poetry is preserved at Topkapi Palace, home of Ottoman sultans for almost 400 years and a museum since 1924.

SÜLEYMAN WAS SEVEN YEARS OLD when Shah Ismail brought to power the Safavid dynasty of Iran that was to plague him most of his life. Iran, disunited for centuries, now wielded its new state religion, expanding against its Islamic neighbors. Süleyman's father, Selim, grew impatient with the inadequate response of his father, Bayazid II, and deposed him.

"He was excessively cruel," observes Charles V's chronicler, Gómara, of the sultan history calls Selim the Grim; "he slew his father and two brothers, and many nephews and sixty-two other relatives." As well as seven grand viziers in his eight-year reign, which he baptized with the blood of 40,000 Turkish Shiite partisans of Shah Ismail.

Now Selim the Grim smote Iran. In 1514 he destroyed Shah Ismail's army at Çaldıran, then sacked the capital of Tabriz.

"But among his booty and captives he did not neglect to bring back Tabriz works of art and artists, which had a great effect on Ottoman court art," Dr. Esin Atil told me. She created the resplendent exhibition, "The Age of Sultan Süleyman the Magnificent," touring the United States this year.

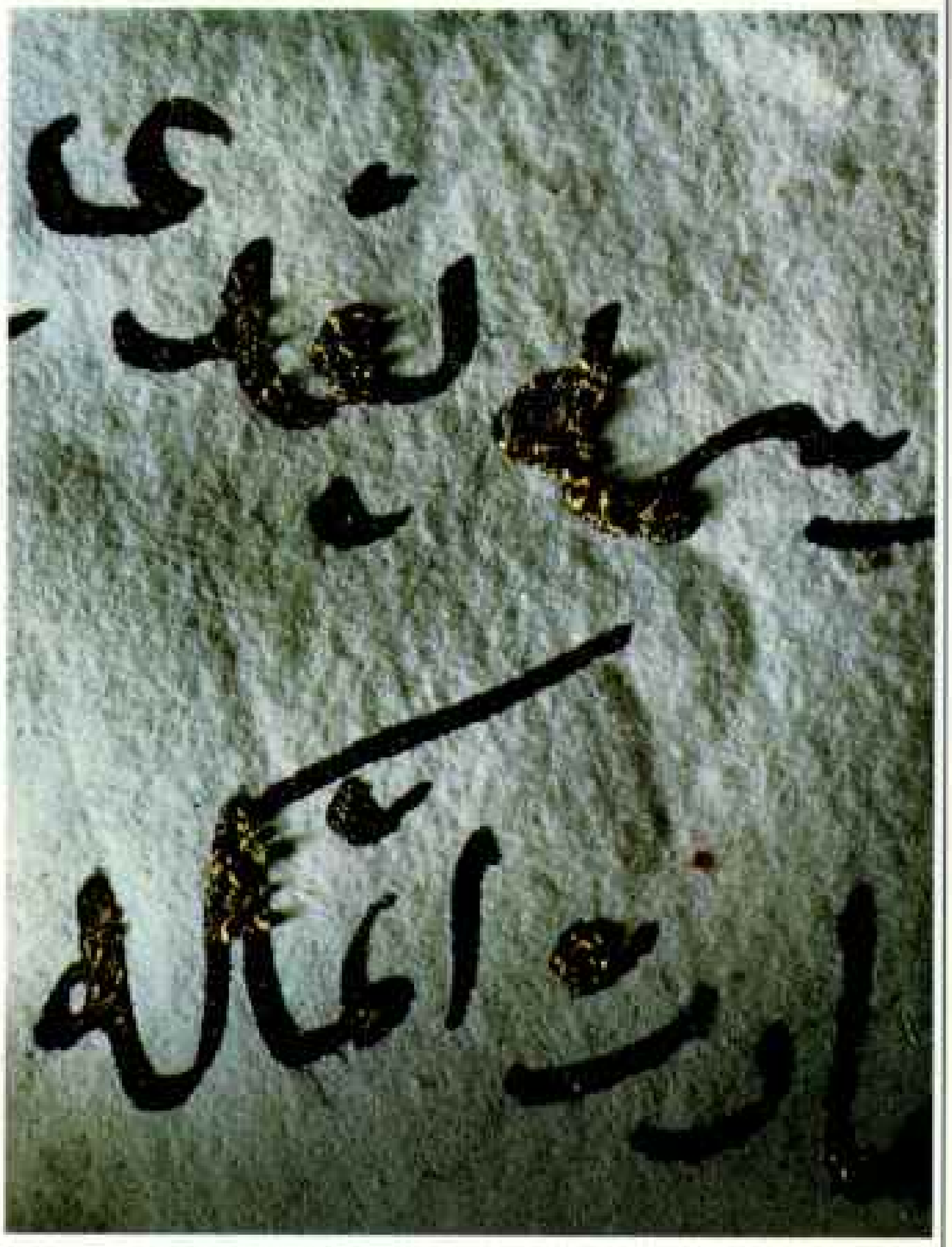
Next Selim turned south against the Mamluks, who contested borderlands with the Ottomans. In battles near Aleppo

and Cairo he ended the Mamluk Empire and slew its sultan.

"Selim's conquest of Syria and Egypt doubled the empire in size," Professor Abdul Aziz Nawar told me at Ain-Shams University in Cairo. "It now spread in a crescent around the eastern Mediterranean, linking with the Barbary Coast westward and the Red Sea shores southward."

"Taking over the caliphate gave the Ottomans great prestige. It made them spiritual as well as temporal leaders of Islam," a colleague added. "But they also shouldered the 'Islamic burden'—to defend against two evils, heretics and infidels."

Egypt brought many advantages. It became the granary of the Ottoman Empire—as it had been for Rome. A major source of revenue, and a base for campaigns in eastern seas.



Life with father had its rough moments, even in Trebizond, celebrated caravan city on the Black Sea that Selim governed as a prince when Süleyman was born in 1494. Here the boy trained as a goldsmith under a gruff Greek named Constantine. Custom called for a prince of the house of Osman to be skilled in a craft as well as in government and war.

Selim took the boy in his teens across the Black Sea to the Crimea. Amid the faded splendors of Bakhchisaray's palace I glimpsed the exotic life of the Crimean Tatar khans. Süleyman's mother, Hafsa, may have been a princess here, sent to Istanbul as tribute when the khan became an Ottoman vassal, and there catching Selim's eye. She would be a strong influence on Süleyman, for Selim left to struggle for the throne. Probably it was in the Crimea that Hafsa bought for Süleyman two Circassian slave girls they would take to Manisa, in a fertile river valley near the Aegean, where he was assigned as governor when Selim seized the throne in 1512.

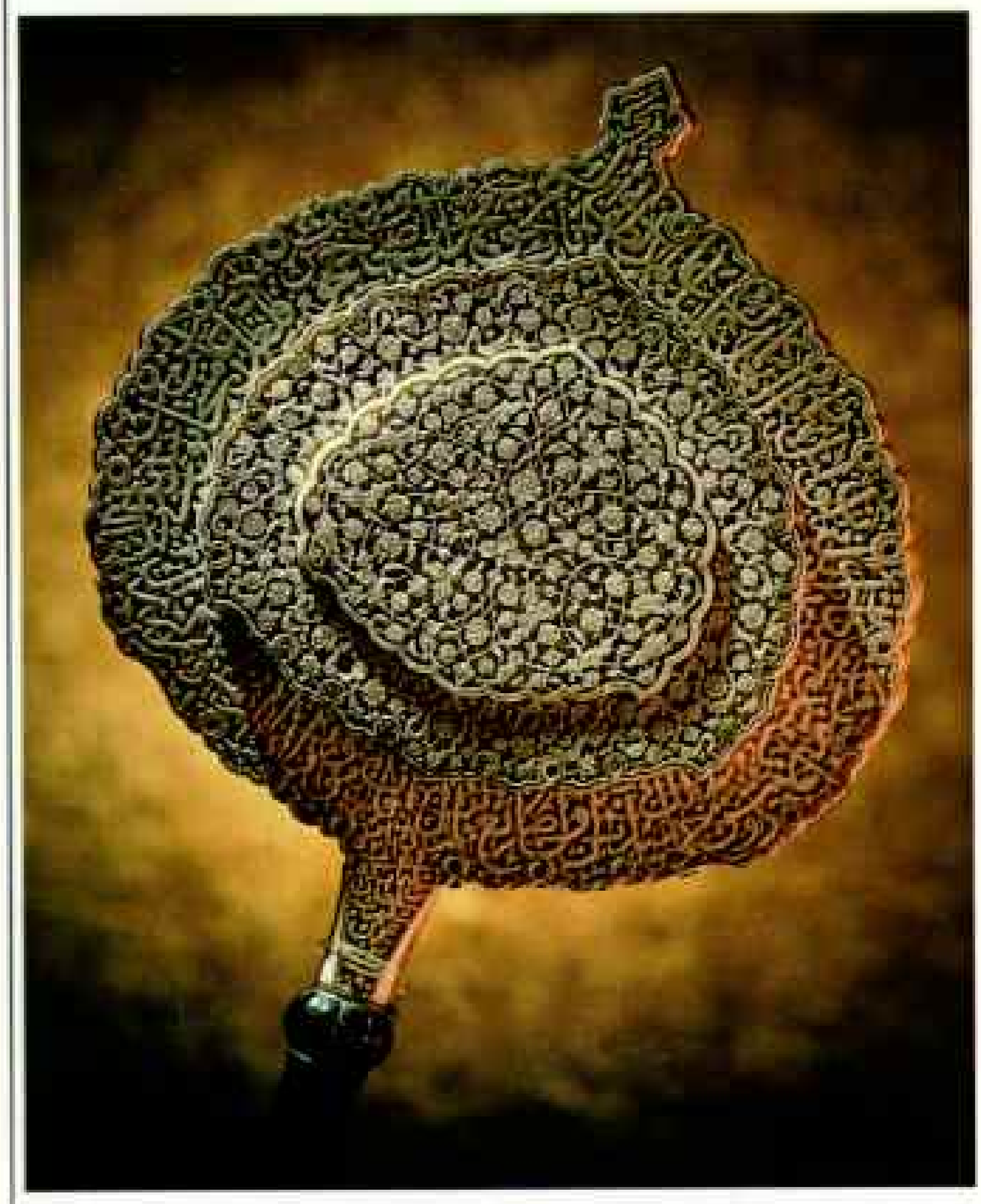
Manisa is a pleasant place, tucked against brown hills with tree-covered ruins of ancient Magnesia still clinging to them. Here his favorite, Gülbahar—rose of spring—duly presented him with a son, Mustafa.

Meantime he oversaw his province, and was overseen at his studies by his tutor—for an Osman prince should be well read in history, the Koran, precepts of good governance, science, astrology, and especially poetry. He worked hard at writing it, to master the ornate Persian style and vocabulary. Studies went swifter now because of Ibrahim, a page at his miniature court.

Hard to imagine two backgrounds so diverse, or two young men so compatible. Swept into slavery by Turkish raiders, this fisher boy from western Greece, educated in a wealthy Manisa home, passed into Süleyman's service as a convert to Islam, fluent in languages, intelligent, charming. Sultan's son and fisherman's son became boon companions. They wrestled, practiced swordsmanship, archery, horsemanship, shared meals, listened as Ibrahim played the viol, discussed books they read.

At Manisa, in late September of 1520, a courier brought news that Selim was dead. Three days of hard riding brought Süleyman to Üsküdar on the Bosporus. Men bent to the oars, slicing out into the swift cold current. Combined waters of the Danube, Dniester, Dnieper, and Don, collected from lands Süleyman would rule and flowing through his Black Sea, squeezed past here into the Sea of Marmara, then channeled by Gallipoli and Troy on the Dardanelles into the Aegean; there they mingled with the Mediterranean, which Süleyman would make an Ottoman lake.

IVORY BLOSSOMS, intricately carved, adorn a mirror with a fluted ebony handle made for Süleyman in the 1540s by an artist named Gani. Around the border an inscription of three Turkish couplets implores the Creator to keep the beholder's beautiful face perpetually radiant.



As the royal barge passed Seraglio Point into the placid waters of the Golden Horn, Süleyman looked with fresh eyes at the city that would become his capital. He took in the fortress on the point with its cannon "of unexampled size and monstrous bore," and looming beyond, the dome of Hagia Sophia, Justinian's church of the Holy Wisdom, now converted to Muslim worship. To its right spread public-service buildings around the mosque honoring his grandfather, Bayazid II, and in the distance, Mehmed's mosque.

Süleyman's eyes swept the hillsides; weathered wooden houses sheltered kin of Christian, Muslim, and Jewish families his great-grandfather had resettled from every corner of his domains. Spanish Jews and Moors expelled by Ferdinand and Isabella soon joined Turks, Greeks, and Armenians making wares for the shops and stalls crowding the dim maze of Mehmed's covered bazaar. The sultans let Christians and Jews discreetly practice their religion, customs, and laws for a tax not paid by Muslims.

Ottomans saw the world as divided into the Realm of War, the ghazi's eternal frontier against his unholy enemies, and the Realm of Peace, where races and religions coexisted under the sultan's just sway. Thriving by this concept, the cosmopolitan crossroads of continents grew so large that no other European capital overtook it until the eve of the 19th century.

AT THE HEAD of the Golden Horn, amid tall cypresses, stands a simple mosque. It is one of Islam's holiest sites—the shrine of Eyüp, standard-bearer of the Prophet, slain in Islam's first siege of Constantinople in the 670s. Lines of faithful pray at his tomb.

Here, on September 30, eight days after Selim's death, Süleyman girded on the sword of Osman. Now he was sultan, his name read in Friday prayers throughout the empire and stamped on its coins. He held absolute power, with right of instant death over any subject. But as he first rode forth from his palace, people gathered at the gate raised voices in ritual chant: "Be not proud, my sultan. God is greater than you!"

His first official acts: ordering a tomb, mosque, and school built in honor of his father; freeing 1,500 Egyptian and Iranian captives; compensating merchants for goods Selim had confiscated; and exemplary punishment for high-placed malefactors. These won him popular approval for piety, magnanimity, and justice.

"It seemed to all men," one observer commented, "that a gentle lamb had succeeded a fierce lion."

Soon the lamb proved a lion in disguise. A pasha's revolt in Syria was put down savagely. Then Süleyman set out to achieve in the West what his father had in the East. In his first two campaigns he succeeded where Mehmed the Conqueror had failed.

In spring of 1521, as Luther withstood Charles V at the Imperial Diet of Worms and ignited the Reformation,* Süleyman began his first campaign against Europe. Belgrade, kingpin of Balkan defenses, commanding the junction of the Danube and the Sava, fell after weeks of bombardment and 20 massed attacks.

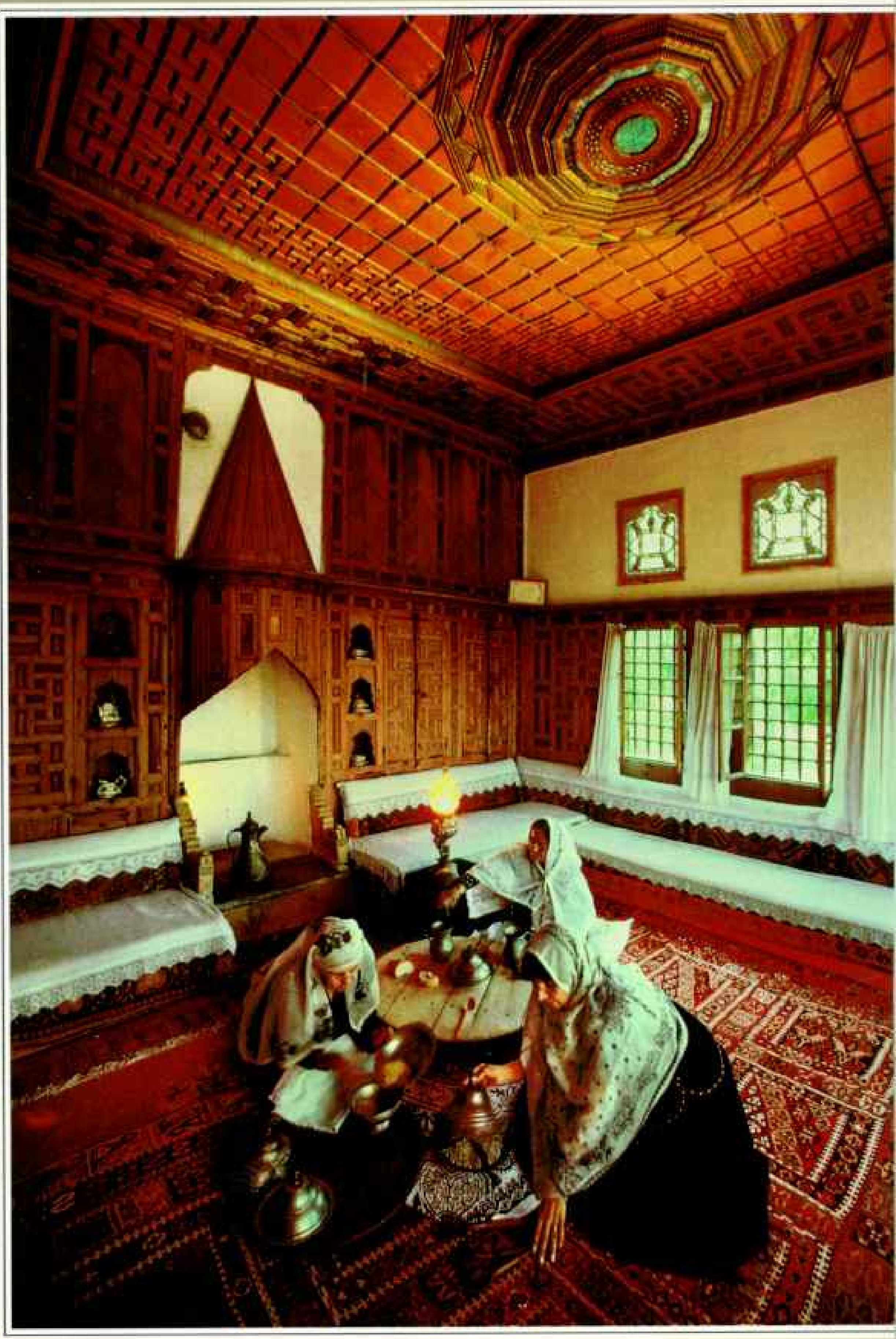
The next summer he besieged Rhodes off the southwestern corner of Asia Minor, bastion of the Knights of St. John. It stood between his capital and Egypt, its fleets intercepting grain moving northward and pilgrims bound for Mecca. Now 300 ships bearing 10,000 engineers and artillerymen sailed from the Golden Horn to prepare positions around the mighty port city for the 100,000 men that Süleyman was leading overland. Ferried to the island, they began the siege on July 29.

Summer passed into winter as the knights, mercenary men-at-arms, and brigades of townsmen defended against besiegers

SOLID GOLD and encrusted with emeralds, rubies, and other gems, this 4.5-pound canteen was carried into battle to quench the sultan's thirst. Its shape evokes a nomad's skin water bottle.

BOTH IN TOPKAPI PALACE MUSEUM, ISTANBUL

*The author related the rise of Protestantism in "The World of Luther," in the October 1983 NATIONAL GEOGRAPHIC.



outnumbering them perhaps 20 to one. Turks dug trenches closer and closer; cannon moved up to batter the walls. Mines blew up bastions; waves of attackers stormed breaches and filled the moats with their bodies, 15,000 men dying in one attack. After 145 days the desperate defense ended.

Having brought into submission the strongest fortified city in Christendom, Süleyman offered generous terms. Knights and mercenaries could leave freely within 12 days; citizens could depart at any time within three years. He won the admiration of all Europe for his chivalrous treatment of a gallant foe. Little did he realize the price he would pay for letting the knights go.

WHAT SORT OF MAN was Süleyman? Posterity shares the curiosity of his contemporaries, who observed with awe and apprehension as success crowned campaign after campaign.

We watch him ride forth in procession to mosque on Fridays, robed in white "like a minaret of light." We see him toss gold coins to performers as he presides over the festival in the Hippodrome when his sons are circumcised or reviews a pageant of 500 trade guilds, each in distinctive dress.

When not on campaign or hunting holiday, Süleyman dwelt in Topkapı Palace. Unlike Louis XIV's Versailles, early Ottoman palaces were on a human scale. Monumental edifices were raised to God. Mehmed the Conqueror laid out Topkapı in three main courtyards separated by gates. A sultan sojourned in private pavilions and kiosks; his viziers, judges, and department heads conducted the empire's business in the domed council chamber rimmed by a low, broad portico—perhaps echoing a nomad's tent. The *divan* met four days a week, viziers sitting on a cushioned platform (hence "divan" for a couch). The sultan could listen unnoticed at a latticed window.

Training ground for elite troops, school for officials, studio for artists, stable for horses, magnet for petitioners, Topkapı was a hive, a city within a city. Ten cavernous kitchens fed the 3,000 residents—and on days of the divan, as many as 8,000 persons. A typical recipe: "Take 500 lambs. . . ."

An ambassador's reception is designed to manifest Ottoman grandeur and power. Traitors' heads greet him from the Imperial Gate. At the double-turreted Middle Gate, beyond a semi-public courtyard, all but the sultan must dismount. Passing the executioner's chambers, the envoy enters a gleaming portico.

The grand vizier meets him and, on special occasions, leads him past 2,000 bowing officials and heaps of silver coins being paid to rank upon rank of tall-plumed Janissaries. While great kettles of rice and lamb are placed before the troops, he is regaled with "an hundred dishes or there about, most boiled and roasted." Asking about his mission, the grand vizier suggests subjects to omit lest they arouse the sultan's wrath.

Now to the sacred inner precincts. Visitors spoke of the silence—the "silence of death itself." The ambassador is robed in gold cloth while his royal presents are inspected. "Oriental monarchs are not to be approached without gifts." At the door of the throne room two officials grasp him firmly by the arms; at no

"SHE HAS ANTELOPE EYES," wrote Süleyman in a lyrical poem evocative of Roxelana, the slave girl from his harem whom he married after his accession. Known as Hürrem, or "laughing one," she ruthlessly fought to ensure the succession of her son Selim, later dubbed "the Sot."

Following a fire at the old palace in 1541, she persuaded Süleyman to move the harem to Topkapı, formerly the sultan's private domain. There Roxelana lived in palatial comfort, surrounded by a retinue of servants. Echoes of the grand life-style are reflected in the ornate interior of an aristocratic home (facing page) in Safranbolu in northern Anatolia.

(TOPKAPI PALACE MUSEUM

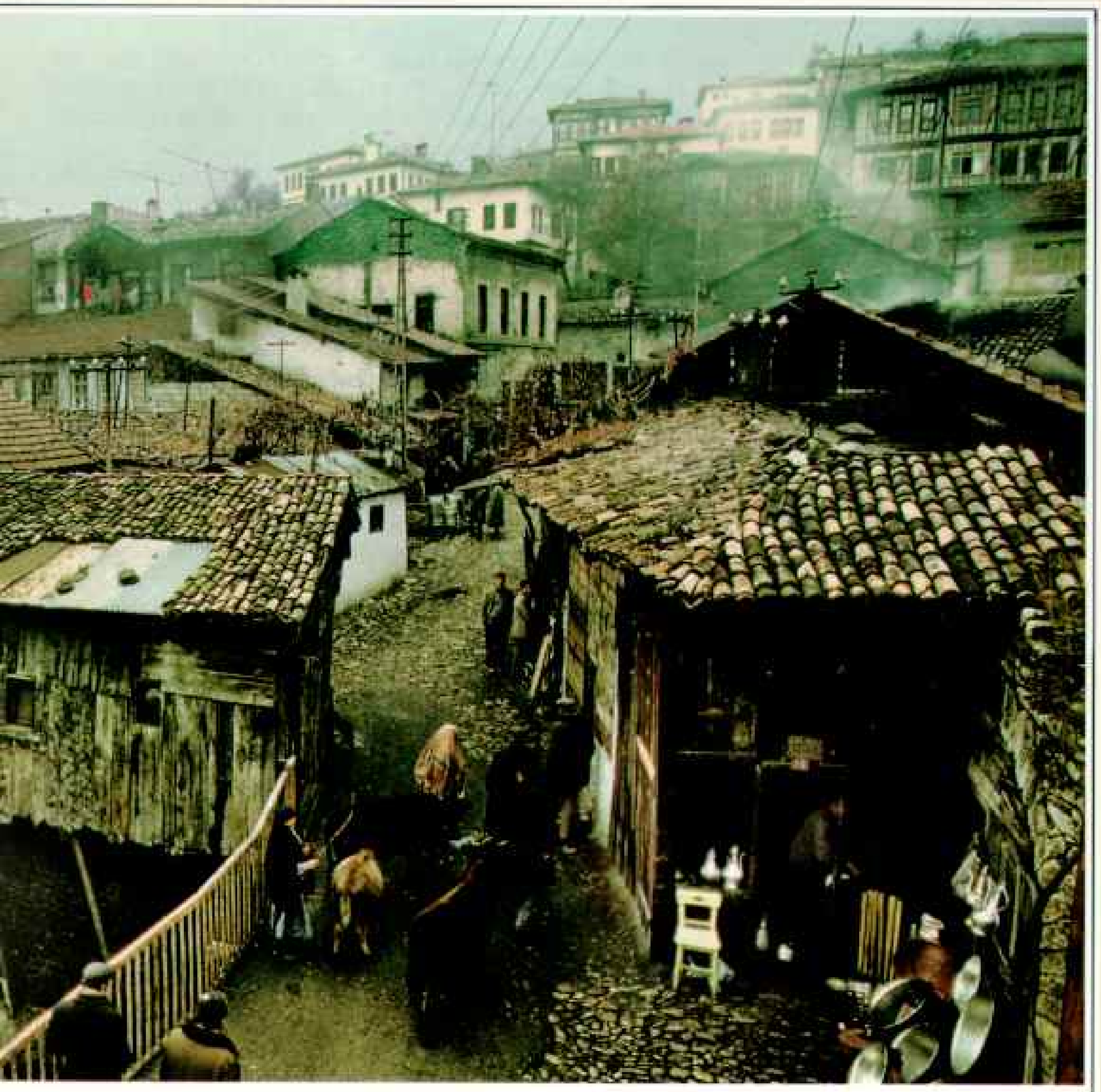
MIRROR OF THE PAST, the village of Safranbolu suggests the flavor of Ottoman life in 1509, when Süleyman, at 15, was assigned by his father to be governor of the nearby province of Bolu. Like her ancestors nearly five centuries ago, a woman delivers an armful of chickens to the Saturday-morning market.

time do they let go. They lead him across the room, push him down to kiss the sultan's foot, then raise him to deliver his message. The sultan, rigid in the heavy silk brocade of his ceremonial caftan, stiffened with gold and silver threads, listens impassively on his jewel-studded throne.

Süleyman might venture a comment or indicate with a nod that the audience is over. The ambassador is led out of the room, never allowed to turn his back on the sultan. Response will come later, often agonizingly later, through the grand vizier.

The envoy can scan Süleyman's features, more intently as years pass, for signs of failing health and vigor. So we are told how he looked, how he acted. But nothing on his thoughts. On Süleyman the man.

The campaign diaries? In the third person, they are devoid of emotion. From his first campaign: "On July 7 came news of the capture of Šabac; a hundred heads of the soldiers of the garrison, who had been unable like the rest to escape by the river, were



brought to the sultan's camp. July 8 these heads are placed on pikes along his route." From his third: "The Emperor, seated on a golden throne, receives the homage of the viziers and the beys; massacre of 2,000 prisoners; the rain falls in torrents."

Rarely, a glimpse of humanity. At Rhodes, face-to-face with the knights' grand master, he consoles him for his loss, praises his gallant defense, then confides to Ibrahim: "It is not without regret that I force this brave man from his home in his old age."

His letters to other monarchs are arrogant: "I, the Sultan of Sultans, the Sovereign of Sovereigns, dispenser of crowns to the monarchs on the face of the earth. . . ." This is the head of Islam responding to the Most Christian King of France, held prisoner by the Holy Roman Emperor. Süleyman acknowledges Francis's plea for "aid for your deliverance . . . at the foot of my throne, refuge of the world."

Charles's bête noire, Martin Luther, interests Süleyman. How old is he? Forty-eight? "I wish he were even younger; he

would find me a gracious protector." When told of this, the earthy theologian takes another draft of Wittenberg beer and guffaws: "May God protect me from such a gracious protector!"

LACONIC in diaries, grandiloquent in letters, shadowy in his sacred palace. "How can we get to know the true Süleyman?" I asked Dr. Bernard Lewis, a professor emeritus at Princeton.

"You can't. No one gets near a traditional Near Eastern monarch, the private man. They have a wall of privacy we can't penetrate."

Aptly named for the biblical Solomon, Süleyman showed wisdom as a lawgiver—not in the sense of an innovator, but as a regulator and restorer of balance.

He was pious, consulting theologians on crucial decisions. Fair, returning an overpayment in Egypt's taxes, lest collectors overdo. Just, letting no corruption or injustice go unpunished.

But—he sometimes acted before he had all the facts. And he could be swayed.

He ruled everything and everybody but was on a daily expense allowance—given two purses, one of gold, the other silver. What he didn't distribute by day's end, he shared among his pages. Skilled in the arts himself, he was a generous patron.

Above all, he was a conqueror—the ghazi sultan who assured success by leading his army in person. As he wrote Francis I: "Night and day our horse is saddled and our saber is girt."

But though almost constantly at war, the Ottoman Empire brought its diverse peoples the benefits of peace. The Pax Ottomanica saw population expand, road and caravansary networks extend, trade burgeon, crafts flourish. Social services made this the welfare state of its age. Precise records gave Balkan peasants a new security in their landholdings.

Europe's fascinated leaders sought the secrets of such success. "Do you mean a shepherd boy can become grand vizier?" gasped the Venetian senate, patricians all, as their ambassador described a society wherein everyone was proud to call himself the sultan's slave. A society of slaves in which the slaves were masters? The highest officials low born? Islam's power wielded by men baptized and raised as Christians? Unbelievable!

But true. Süleyman's eight grand viziers were all humble-born Christians brought to Turkey as slaves. The same went for most top civil administrators and the Janissaries. But the *ulema*, guardians of the *sharia*, or sacred law, the judges, and the teachers were sons of Turkish fathers, reared on the Koran.

The Ottoman Empire was a war machine geared to expansion, feeding on lands and peoples it conquered: new villages to tax, new manpower, new land grants to support cavalrymen to control the region and campaign with the sultan. One-fifth of all booty and captives became royal property. This fed recruits to the bureaucracy and the elite infantry, the Janissaries.

So did the *devşirme*, or child tribute. Every several years, the Ottomans would go into, say, a Serbian village and take its strongest, brightest youths. Beloved sons, lost forever. In Turkey they would undergo a strenuous seven-year apprenticeship:

hard physical labor to build strong bodies, instruction in Islam and the Turkish language. Those who excelled in sports and martial arts were selected as cadets for the Janissary corps—"men of the sword." Stripped of family ties, they had no conflicts of interest, and loyalty only to the sultan. They fought with a convert's fanaticism.

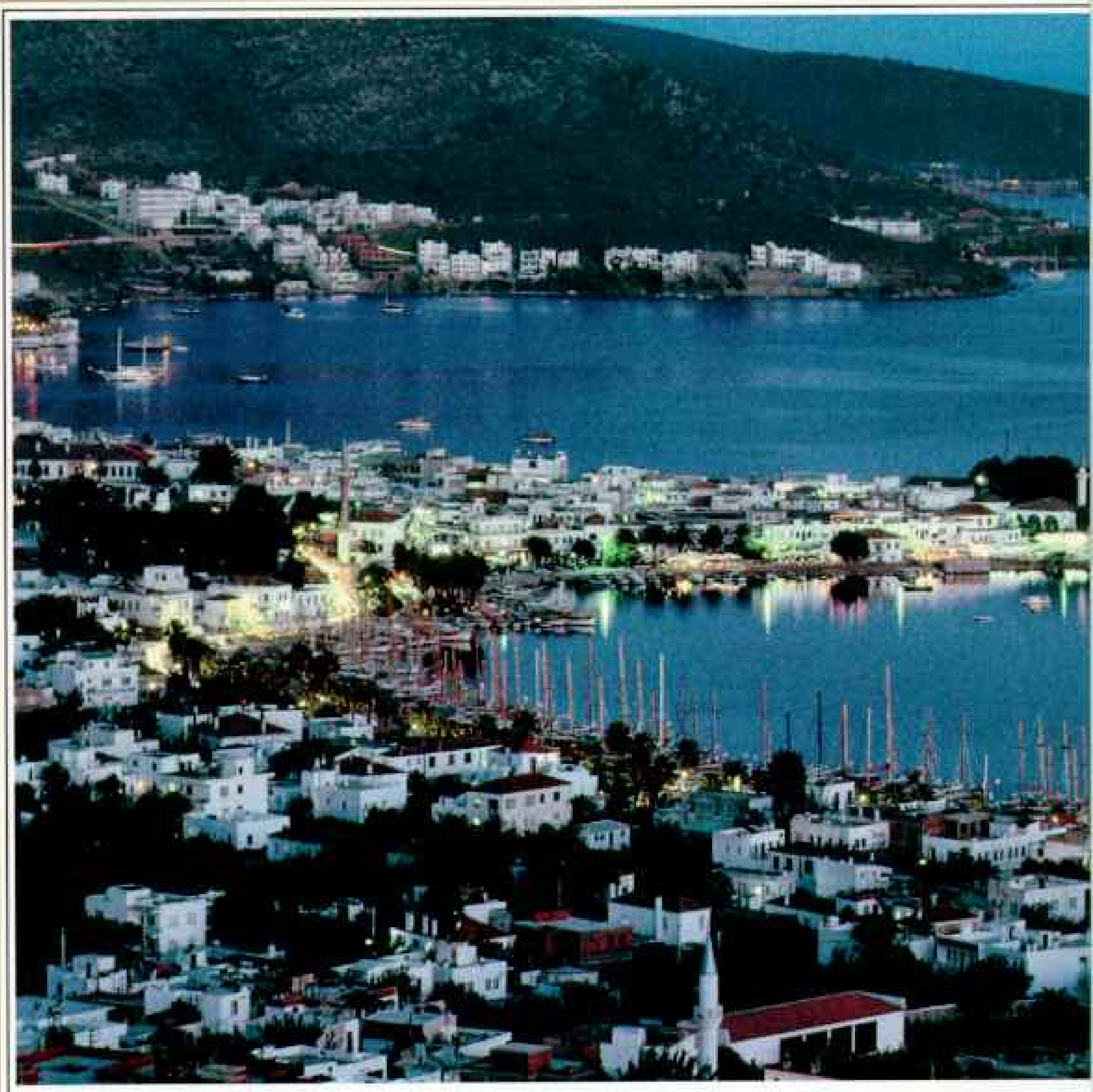
Those adept at book learning, mathematics, and calligraphy were picked as "men of the pen" to train in the palace school and serve as royal pages. From them future administrators were chosen—a system, in contrast to Christian Europe's, based entirely on merit rather than birth.

Süleyman fell increasingly under the spell of two slaves he raised to power: Ibrahim, whom he promoted swiftly to grand vizier; and Hürrem, "laughing one"—a captive Russian known to the West as Roxelana, who became his wife. After a fire in the old palace in 1541, she moved with the harem to Topkapı, the center of power. Mehmed the Conqueror had believed in the separation of sex and state.

"We have 1.3 million visitors a year," Sabahattin Türkoğlu, director of the Topkapı Palace Museum, told me. "They want to see the Treasury, of course." Four rooms dazzle with a riot of jade, pearls, rubies, emeralds, diamonds that turns prosaic objects into masterpieces. And in each room stands a throne, outgleaming the others. "Even more, they want to see the harem."

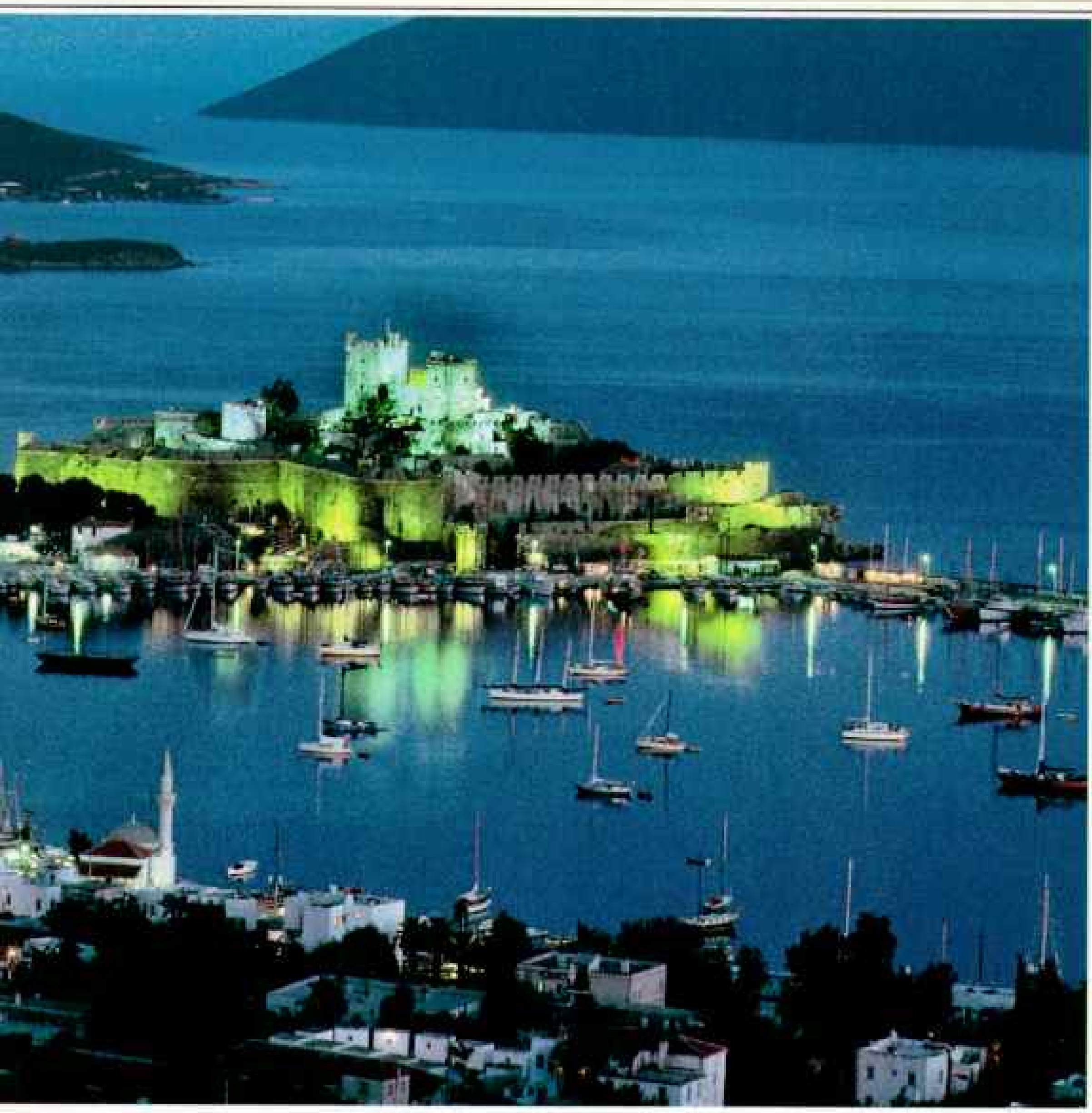
The harem. It might have cost your life to have a peek. The most beautiful of women secluded under the ever watchful eye of white and black eunuchs—usually Christians from the

GHOSTLY RELICS of the holy war between East and West, Islam and Christianity, lifelike suits of Austrian armor strike military poses at the Arsenal in Graz. Süleyman's troops, retreating from their abortive siege of Vienna in 1529, vented their frustration in a spree of pillage and rape that devastated the Austrian countryside. The Arsenal in later years continued dispensing weapons as Turkish raids persisted.



Caucasus or animists from the Sudan, since koranic law forbids emasculating Muslims. In such a closed domain stories mushroomed: of concubines who had displeased their master and were sewn into weighted sacks and dropped into the sea off Seraglio Point. One sultan, in an insane rage, is said to have rid himself of his entire harem. A diver retrieving an anchor came upon an eerie underwater forest of sacks swaying in the current.

MOHÁCS is a melancholy place. It lies beside the Danube, meandering south through tall grasslands of the Hungarian plain before curving east toward the Black Sea. Here surrealistic statues recall the death of a young king and his nobles—and the Hungarian nation for 150 years—one August day in 1526, when romantic chivalry was ground into the mud by a modern war machine.



"Born too soon, married too soon, king too soon, and dead too soon," Louis II survived premature birth to become Hungary's king when not yet ten. At 15 he wedded a sister of Emperor Charles and Archduke Ferdinand of Austria. Louis's frivolous court fostered the vainglorious feuding of extravagant, rapacious knights who treated their serfs like swine and slaughtered them savagely when they rose in protest. No wonder the serfs welcomed the Ottomans as deliverers. Such was the divided Hungary whose teenage king was fool enough to insult an envoy of Süleyman the Magnificent.

The sultan needs little pretext to war on Hungary. Raids have inflamed the border. The Janissaries are restless: no major campaign in the three years since Rhodes. Religious leaders approve this holy war. Auguries bode well.

On April 23, 1526, Süleyman sets forth from Istanbul. Cavalry from the Balkans, heavy artillery shipped up the Danube,

THORNS IN HIS SIDE, the valiant Knights of St. John, occupying the castle of Bodrum (above) on Turkey's Aegean coast, interfered with Süleyman's control of crucial trade routes and lines of communication. In 1522 he routed them from their stronghold on nearby Rhodes, but his chivalry in allowing them to leave unharmed backfired on him 43 years later.

will swell his army to 80,000 men. Thousands of camels and wagons carry supplies for his troops, powder and shot for his 300 cannon. Engineers will bridge rivers, build siege engines for taking Danube fortresses en route, sappers mining the walls.

In front fan out the *akincis*, light cavalry and scouts, bowmen mostly. They and the leopard-skin-cloaked *delils*, with huge winged hats, are paid only in booty and captives. When unleashed in enemy territory, they devour the land like locusts, smoke of burning villages marking their trail of terror.

The regular cavalry are *sipahis*, called from nonhereditary holdings assigned them by the sultan for military service. Clad in chain mail, they fight with bows, spears, swords, maces.

In the center march the Janissaries, infantry armed with harquebus or musket and sword. Blue or red cloaks, fierce mustachios, towering headgear set them apart.

Süleyman stands out, in white turban and bejeweled robe, riding a black horse caparisoned in gold, surrounded by pages and household cavalry, the sultan's standard of seven horsetails borne aloft. Ibrahim makes almost as brave a show.

Most striking is the *mehter*—the military band of booming kettledrums, clashing cymbals, brass, and piercingly nasal shawms sounding like a swarm of angry oboes. "When they pass all playing at the same time, the noise of them presses men's brains out of their mouths," reports one survivor. This Ottoman innovation, the marching military band, strikes terror when it signals an assault or parades into a breach as a city falls.

Observers are impressed by the discipline on the march. No harassing the sultan's peasants, trampling crops, stealing sheep.

Süleyman is amazed that no Hungarian army contests his crossing of the Drava. But the Hungarians have chosen the plain of Mohács to give their cavalry full rein. Süleyman's army reaches it in 128 days—930 miles, seven and a half miles a day average, rain or shine. The rains make Mohács a soggy sponge.

Louis's undisciplined courtiers take 38 days to move 105 miles south from Buda. Other units straggle in. John Zápolya, a Hungarian magnate, is reported on his way with 20,000 men. But Louis's nobles, wildly overconfident, squabbling over who

SULEYMAN THE VICTORIOUS, astride a black steed in this painting (below), led his troops to triumph in the 1526 Battle of Mohács, when Hungary's knights and king were massacred in two hours. At the Mohács memorial a modern wooden sculpture (opposite) depicts the sultan with severed heads of the enemy.

TOPKAPI PALACE MUSEUM

should command, feel no need to wait. In gleaming armor and plumed helmets and mounted on spirited steeds, they are sure their bravery will carry the day, even outnumbered three to one.

About three o'clock on the afternoon of August 29, the Ottomans emerge from a wood, the men of Anatolia on the right, of Rumelia (the Balkans) on the left, the akıncıs forward on the flanks. Süleyman commands the center, to the rear.

The Hungarian cavalry charges across the sodden ground. The divisions of Anatolia and Rumelia draw apart, feigning a break. The Hungarians throw their entire force into the gap.

Thirty knights, who have vowed to slay the sultan or die, break through. An arrow glances off Süleyman's armor. Three knights reach him, wounding him, before he cuts them down.

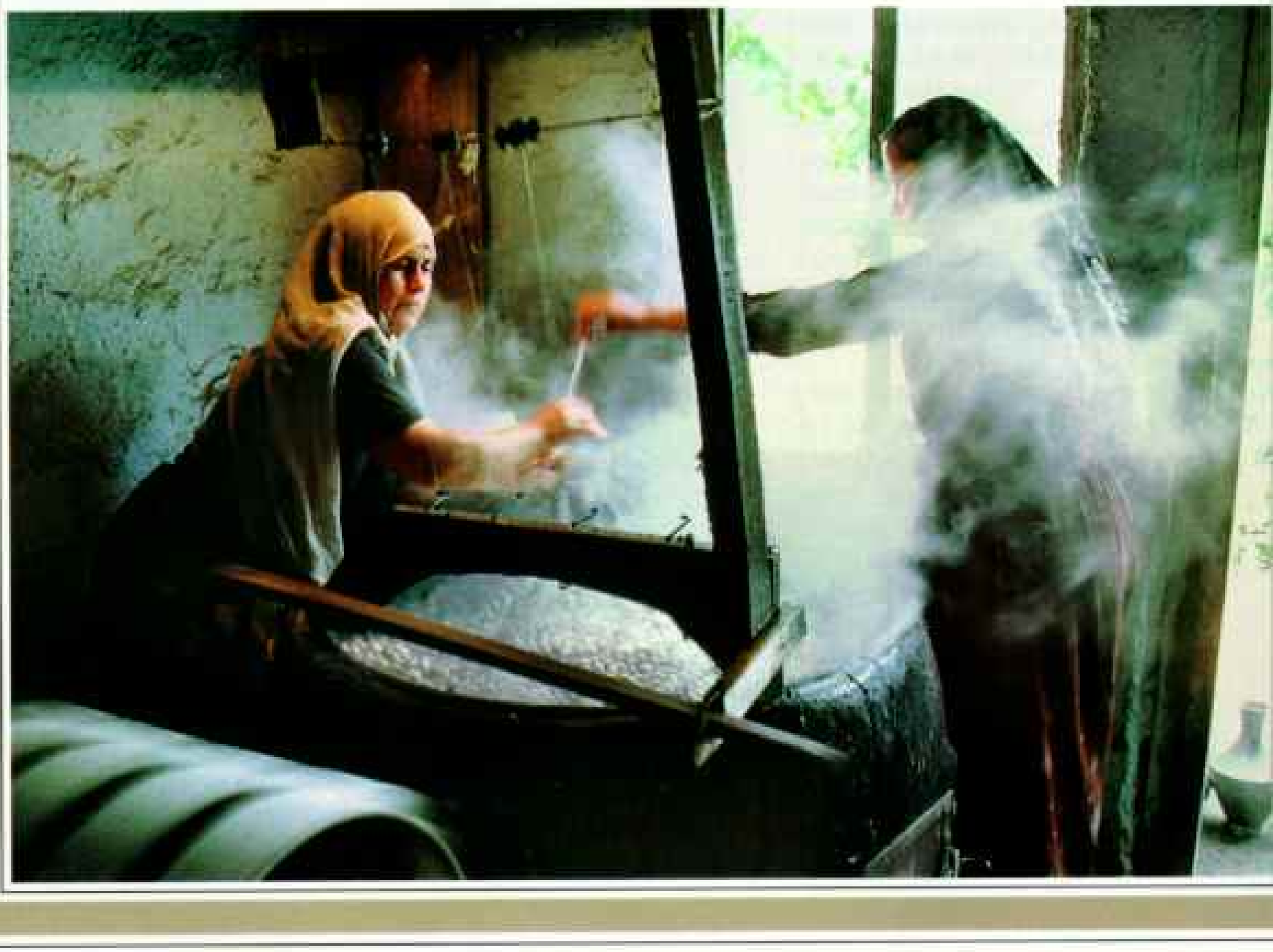
Then the Janissaries, massed around him, open fire, one line volleying while the next reloads. And when the main body of Hungarians reaches the back center, the Ottoman cannon, lined up and chained together, open at point-blank range, blasting great holes in the Hungarian ranks.

The Anatolian and Rumelian divisions close like a steel trap on the milling Hungarians. Rout turns into slaughter. Those who break free are run down by the akıncıs, or stumble into marshes, armor bearing them down. In two hours all is over.

Next morning King Louis's body is found. As he fled, his horse slipped on a slope. Thrown, he rolled into a stream. Held down by his golden armor, he drowned, face in the mud.

"May God be merciful to him," Süleyman says, "and punish those who misled his inexperience. I came indeed in arms against him; but it was not my wish that he should be thus cut

A CALDRON OF COCOONS in the city of Bursa in western Turkey—declared the Ottoman Empire's first capital in 1326—is tended by silk makers, following a tradition that began in Byzantine times. By the 16th century Bursa, whose tiled mosques and mausoleums lie at the foot of snow-crowned Mount Olympus near the Sea of Marmara, had become an international center of the East-West silk trade.



off while he had scarcely tasted the sweets of life and royalty."

Mohács struck the fear of God in Europe. With Hungary gone, Austria would be next, then Germany. Earlier Luther, whose Reformation was able to take root because of the empire's distraction by the Turks, had declared that "to fight against the Turks is to resist the Lord, who visits our sins with such rods." Now he preached holy war, urging every prince to back the emperor in the defense of Christendom.

FROM THE 450-FOOT SPIRE of St. Stephen's Cathedral, I looked out on Vienna. Today traffic on the Ringstrasse besieges the inner city, and rooftops replace the white sea of Turkish tents that spread outside the city wall in 1529.

I looked down the Kärntnerstrasse, the promenade of fashionable shops crossed by enticing streets of restaurants, *Keller, Weinstuben,* and cafés. Here Viennese relax over coffee and croissants, which recall in shape and color the captured golden Turkish crescent that long topped St. Stephen's spire as a trophy of victory.

"The Turks focused on the Kärntnertor—the Carinthian Gate—at the end of this street," a curator of the city historical museum pointed out. "They opened a breach and mounted several assaults but never could break into the city. It happened there on the Ring where the Opera stands today." He grinned. "With tickets so scarce, it's still a hard place to get into."

Süleyman's main enemy was the weather. Constant rains cost him 141 days to get to Vienna, heavy guns abandoned in the mud, his army underequipped, dispirited. In less than three weeks the Turks withdrew—in heavy snow. Harassed by cavalry and the bite of approaching winter, men fell in their tracks, camels perished by the hundreds. But Vienna's perils were not over.

Süleyman again approached the city three years later, with an even mightier army. The incredibly heroic defense of the nearby Hungarian-Austrian border fortress of Köszeg (Güns) delayed him most of August. Again it was late in the season. But Süleyman had set out "against the king of Spain," and he sought to draw Charles from Regensburg, Bavaria, some 250 miles west.

Charles was no more eager than his brother Ferdinand "to stake his all . . . for his private gratification," the imperial ambassador Ogier de Busbecq informs us. "What he must expect from such a contest is clear to him from . . . the disasters at Nicopolis and Varna, and the plains of Mohács still white with the bones of slaughtered Christians." So Charles comes to Vienna only when Süleyman, out of time, is homeward bound.

The sultan, "used to making an end of mighty kingdoms in a single campaign," vented his rage on eastern Austria. Akıncıs spread like wildfire, pillaging, slaying.

This *gemütliche* land, sculptured so artfully by nature's hand, tended so lovingly by man's, seems to deny such violence. But the ranks of gleaming armor and weaponry in the Arsenal at Graz, 30,000 arms in all, bespeak the constant threat these borderlands lived under. Climbing to a storybook castle at

Riegersburg, I came upon a poignant circle of memorial stones engraved with a litany of the fallen from Charlemagne's day to ours. Turks raided here 1480, 1529, 1532.

Ferdinand, claiming Hungary through marriage and treaty, and Süleyman, alarmed at Habsburg power extending across Europe from the Atlantic to the Black Sea, kept the pot boiling. The sultan "overruns the plain of Hungary with 200,000 horsemen; he threatens Austria; he menaces the rest of Germany," Busbecq writes. "Like a thunderbolt he smites, shatters, and destroys whatever stands in his way. . . . Persia alone interposes in our favor; for the enemy, as he hastens to attack must keep an eye on this menace in his rear."

SPINNING AND WEAVING through the centuries, women of the nomadic Karakoyunlu and recently settled Bekdik Turkmen tribes practice their craft in Anatolia much as they did in Süleyman's time. In those days nomadic tribes provided much of the livestock used for transporting arms into war. They consistently threatened Ottoman authority, however, by refusing to be settled, taxed, or conscripted to fight. Despite his numerous military victories abroad, Süleyman was unable to quell these dissident factions in his own land.

"THIS IS A MILITARY INSTALLATION," glowered the officer.

"It sure is," I agreed. "This port called the tune in the Mediterranean. It was Süleyman the Magnificent's advance base in his naval war with Spain."

I had emerged from the walled maze of the Casbah that spills down the slopes to the old harbor of Algiers. The modern Algerian city swings to the right in a gleaming white curve around a vastly larger port protected by artificial breakwaters. Fishing boats snuggled in picturesque array in the 16th-century harbor that had sent out lean corsair galleys to scour the Mediterranean for fat prizes. I raised my camera. A young soldier arrested

me, took it and my passport, and led me to the duty officer. "Forbidden to photograph the port," the officer said sternly.

"Süleyman's admiral, Barbarossa, created this harbor," I explained. "Not much here when he first operated as a corsair along this Barbary Coast. Guns of a Spanish fort on a little island offshore commanded the old city—the Casbah.

"But in 1529, the same year that Süleyman besieged Vienna, Barbarossa destroyed that Spanish fort. Then he had 20,000 Christian captives build a great mole out to the island and make the harbor we see today. Look, I'll show you what he did." I spread a map on the table.

A second officer, who had been sitting quietly, came over. They grew less uneasy when they saw it wasn't a modern map.

"From Algiers, Barbarossa's galleys could raid Christian shipping and coasts. Spain and Italy but not France, because Süleyman and the French king, Francis I, had become allies against the emperor Charles V. The Ottoman fleet even wintered on the French Riviera in the 1540s."

"La Côte d'Azur!" exclaimed one officer.

"Barbarossa increased Algiers' population by rescuing from Spain thousands of Moriscos persecuted by the Inquisition," I continued. "They made fierce galley crews, eager to strike back at their Spanish oppressors. Adventurers flocked to Algiers. They grew rich from loot and ransom money from captives. European mothers frightened naughty children, saying Barbarossa would get them if they didn't behave.

"Algiers became such a thorn in the emperor's side that in 1541 he resolved to destroy it."

The officers exchanged glances.

"Fearing that Barbarossa's fleet might attack from the rear while he was besieging the city, Charles chose to sail after the normal sailing season, despite the advice of his admiral, Andrea Doria. How wrong! A monstrous storm blew up in late October when Charles landed. It wrecked more than two-thirds of his 200 transports and galleys, drowning thousands of men. One of the great shipwrecks of all time. It happened just down the coast east of here."

Both officers leaned over the map. Then the duty officer stared at me intently, as if seeking to read my fate written, by Islamic tradition, on my forehead.

Kismet was kind. He thrust back my passport, camera, indicated the door. Outside, the young soldier apologized meekly.

"*Rien du tout*—it's nothing. Only doing your duty," I said.

DRESSED TO KILL from head to toe—with beltloads of pistols, knives, and grenades—nomads gather in the western Anatolian village of Söğüt to commemorate the death of their warrior ancestor, Ertuğrul. Buried here in 1288,

Ertuğrul was the father of Osman I, who founded and lent his name to the Ottoman dynasty. A military parade, dancing, a symbolic wedding, and other events draw as many as 2,000 participants to the annual festivities.

NUNHO DA CUNHA and I faced off in a courtyard—he in bronze, I in awe of the fortress he had built in the 1530s on this island of Diu 10,000 sea miles from the court of his master, the King of Portugal. A deep stone-cut moat lay to landward; the Indian Ocean broke on the seawall where cannon thrust brazen muzzles. Dhows in the inlet separating the palm-shaded island from the low-lying Gujarat coast of western India palely harked back to the heyday of lateen-sail trade on the monsoon seas.

Men like da Cunha contested fiercely with Süleyman and his allies for control points and trade routes on the underbelly of Islam, which da Gama and his successors outflanked. Süleyman sent fleets to break the Portuguese stranglehold. Diu survived two horrendous sieges. In defense of Islam's holy cities and access to caravan routes from the Persian Gulf and Red Sea to Beirut and Alexandria, Süleyman was fighting on his fourth front: Europe, the Mediterranean, Iran, and now the Indian Ocean.

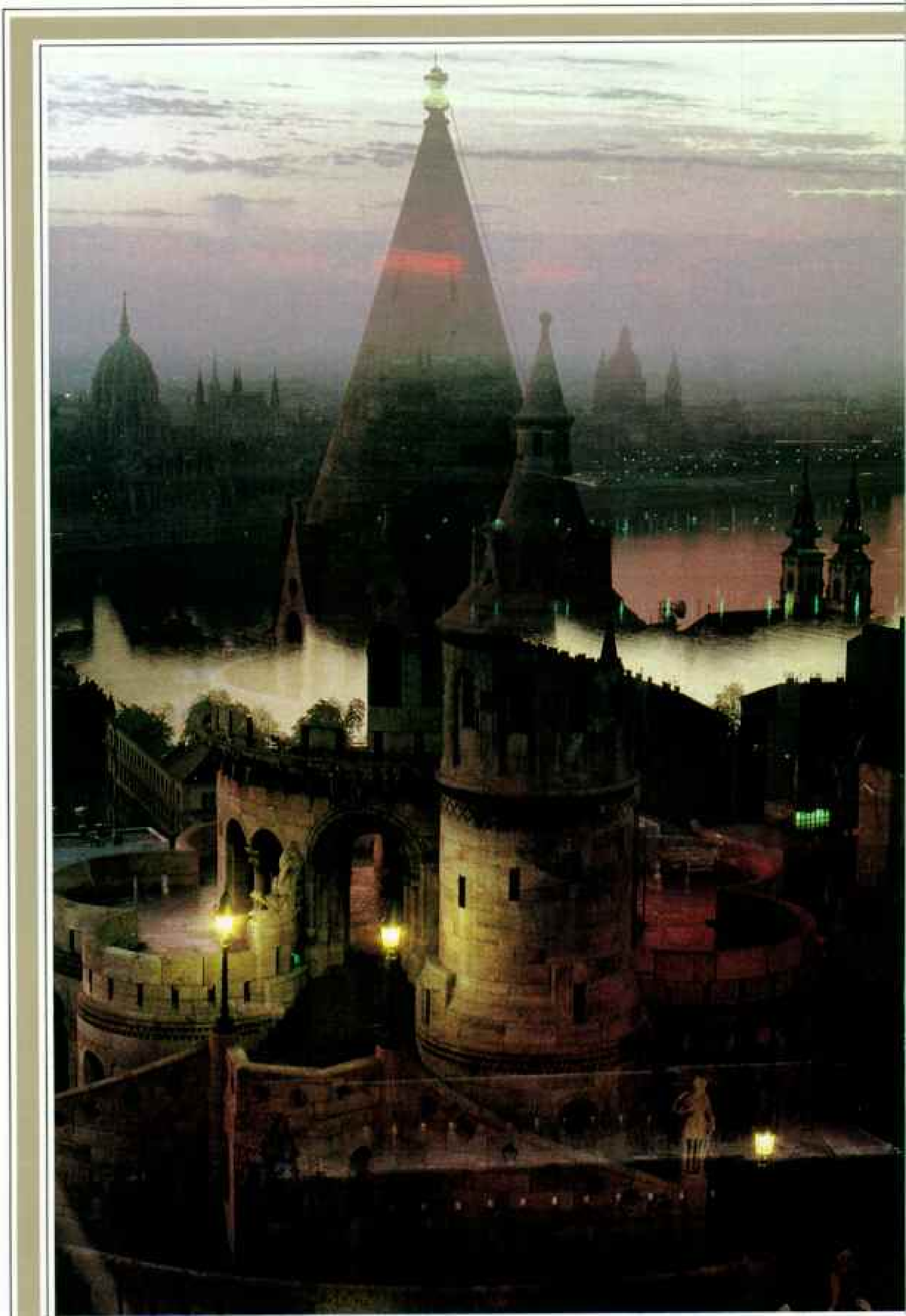
The strategy of the Portuguese: to control entrances and exits to the Indian Ocean and to route Arab shipping through their entrepôts at Malacca, gateway to the Spice Islands, China, and Japan; Hormuz, key to the Persian Gulf and the source of Arabian horses so much in demand by India's armies; and Goa, their capital on India's Malabar Coast, which licensed and taxed shipping. From here Portuguese ships carried spices directly around the Cape of Good Hope to Lisbon.

One gate the Portuguese could not shut: the Red Sea. They made raids into it, once all the way to Suez, and in 1517 alarmed Mecca by bombarding its port of Jiddah.

I had come to Jiddah by air over Arabian coastal waters. The green-and-white mosaic of shoals and islets is as lovely to the eye as it is perilous to the sailor, who must tack north against the prevailing wind six months, south against it the other six.

"This is an arena for galley warfare," naval historian John Guilmartin explained. "On the open sea, broadsides of the Portuguese caravel could blow an Ottoman galley out of the water. Amid Red Sea shoals the oared galley had the advantage; it could maneuver where a sailing ship couldn't. And with friendly territory at its back, it could be beached by the stern and train its long-range bow guns on a caravel unable to get close enough to strike back. At Jiddah, Ottoman galleys took shelter in an S-curved channel covered by batteries that would make a sailing ship's approach suicidal."

Süleyman assured his control of the Red Sea by the conquest



of Aden and Yemen. Arabia Felix, ancients called this southwestern corner of Arabia. "Happy Arabia," for the 7,000-foot central highlands whose cool green terraces offer blessed relief from the burning Empty Quarter sands inland and the steaming Red Sea lowlands. "Hospitable Arabia," I call it after being invited to dine, four stories up in Yemen's towered village of Jiblah, by Muhammed Kassim al Goshah, whom I had just met.

We knelt in a circle, dipping right hands into common caldrons and trays—father, son, and friends. One hung up his rifle on arriving from the village where he lives with his four wives. The master of the house served the meal. In the doorway women and children peeked and giggled at the only one not clad in a turban, vest, ankle-length skirt, and broad belt holding the wicked curved dagger without which a Yemeni male feels naked.

Later, from the flight deck of an Omani Air Force transport piloted by Saif Bin Sulaiman, I watched the radar brush in the glowing coastlines of Oman and Iran and the firefly blips of tankers waiting to load in the war-menaced Persian Gulf. Nearing the 28-mile-wide Strait of Hormuz, where Oman's Musandam Peninsula thrusts a giant finger of rock at the solar plexus of Iran—as strategic in Süleyman's day as in ours—I pondered the perils of keeping these sea-lanes open. Patrolling warships are sitting ducks; carrier aircraft call for in-flight refueling. Our ace in the hole: forward air-strike potential of Masira, a 40-mile-long island Oman has let the United States set up for crisis use.

"Any U. S. forces there now?" I had asked in Muscat.

"Only Omanis. But the installation is shaped to fit two feet."

SHAH TAHMASP OF IRAN could afford the luxury of a smile. Again Süleyman's envoys had returned. Messages had run the gamut: friendship, polite requests for return of the shah's guest unharmed, war threats. Now the envoys brought 500,000 gold coins, 40 Syrian and Arabian horses, unequaled for "fleetness of foot, with bejeweled saddles . . . blankets of brocade." This hostage was important indeed: Süleyman's son Bayazid.

The dark-featured shah, thick in lip and beard, looked about his sumptuous new audience hall at Qazvīn. Süleyman had burned his old one at Tabrīz, 250 miles northwest, occupied by Süleyman's armies three times.

Lost were Baghdad and Basra in the Tigris-Euphrates Valley of today's Iraq; gone the sweep of land from the Caucasus down the Persian Gulf to Bahrain. Finally the two empires, Sunni Ottoman and Shiite Safavid, patched up a truce in their struggle for spiritual leadership of Islam: the Peace of Amasya in 1555, the same year Catholic and Protestant took a breather in their religious wars in Germany with the Peace of Augsburg.

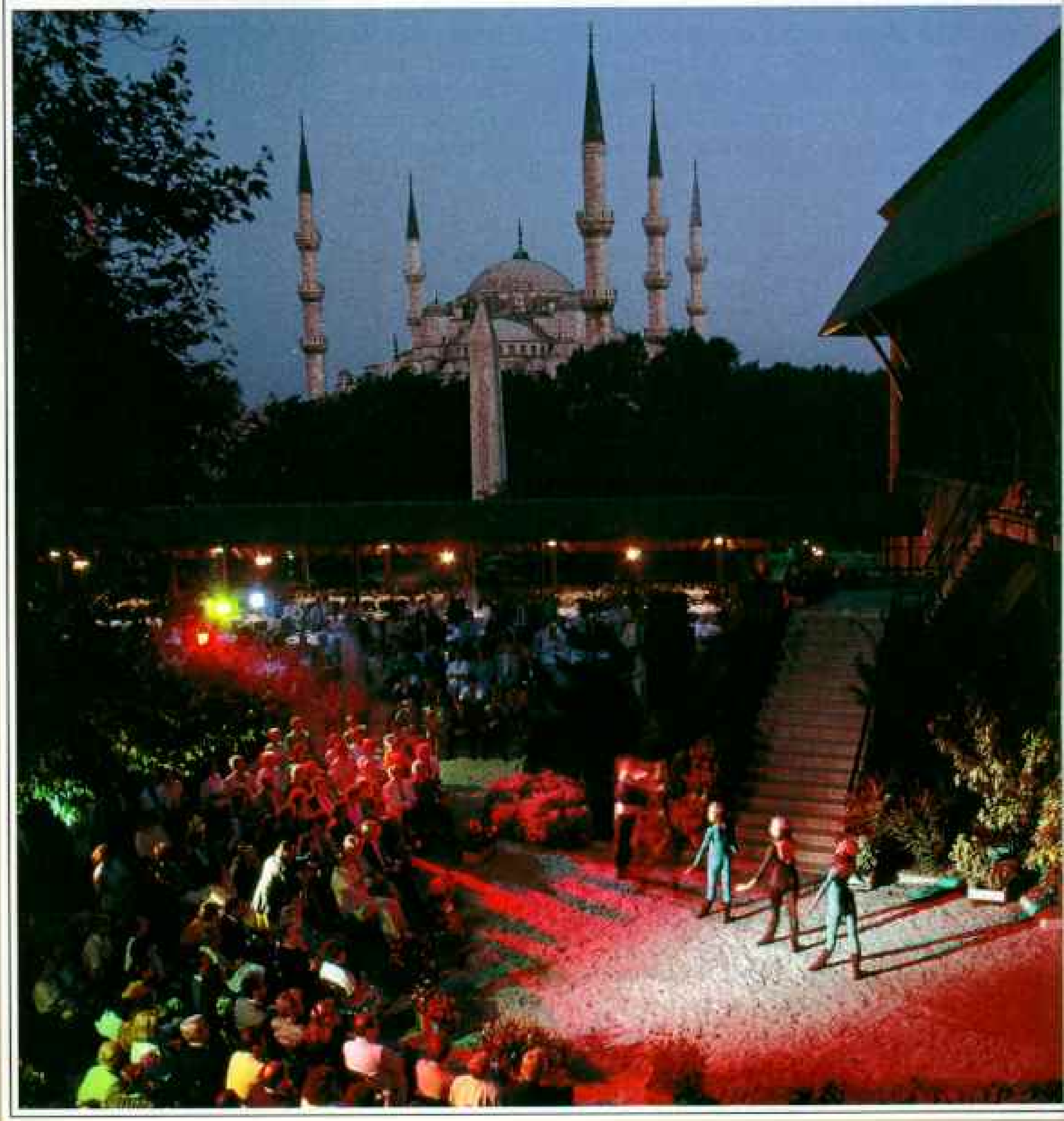
No. Tahmasp didn't relish more war, more provinces lost. So now in 1561 Prince Bayazid was turned over to the envoys. He didn't make it out of the gates of Qazvīn. Süleyman's executioner snuffed out his life. Bayazid had sought refuge with a perennial enemy. His father's justice brooked no exception.

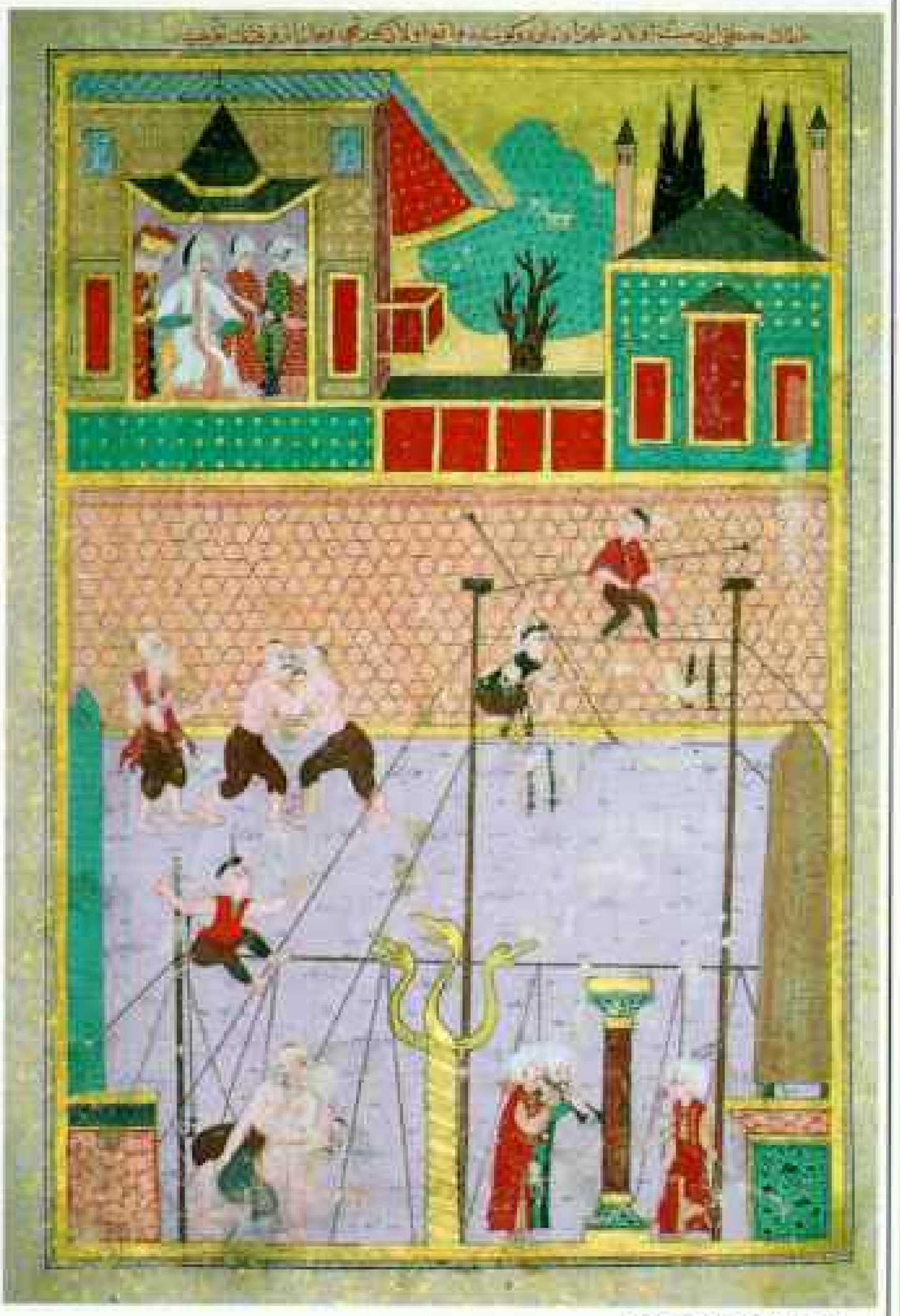
Ironically, Süleyman's three greatest personal tragedies all relate to Iran—and his Russian wife, Roxelana. To gain

BOTH BUDA AND PEST, the two halves of Hungary's modern capital, are reflected in a window overlooking the Danube. Razed in 1526 by Ottoman forces coming from Mohács, Buda, subsequently rebuilt, was struck again in 1529 by Turkish troops marching to Vienna. Ottoman arms and armor—such as this grand vizier's helmet (top)—were often ornately decorated. They included the best cavalry weapon of the day—the short, composite, recurved bow (above), whose 150-pound draw took long training to master.

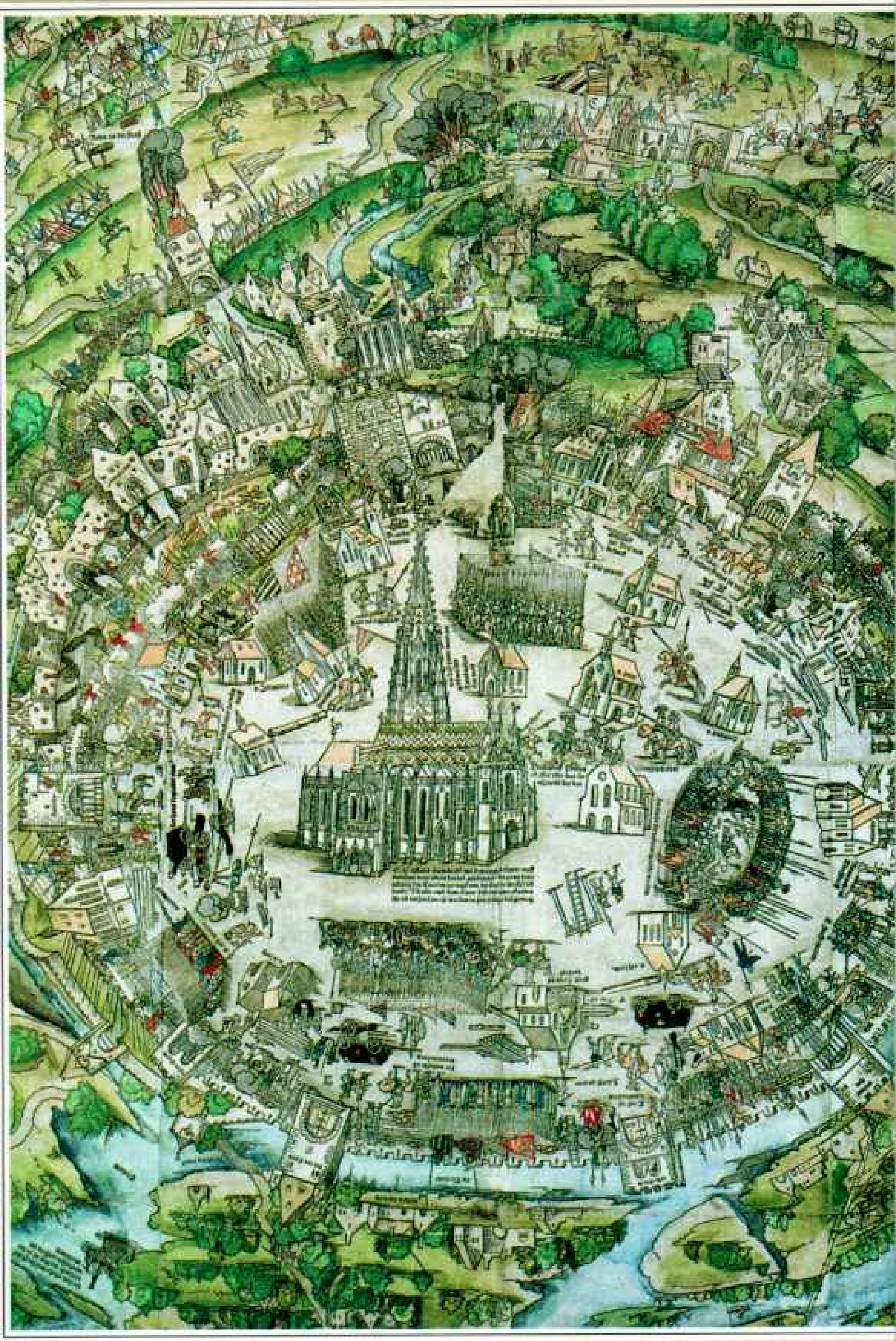
BOTH IN THE WAFFENSAMMLUNG DES KUNSTHISTORISCHEN MUSEUMS, VIENNA

THE SHOW GOES ON at the former palace of Ibrahim in Istanbul (below)—now the Turkish and Islamic Art Museum—with folk dancing, ballet, and fashion shows. The grandest private residence of Ottoman times, the palace gave Süleyman an excellent balcony view of festivities to celebrate the circumcision of three of his sons in 1530. Court-appointed artists recorded in meticulous detail the events of Süleyman's life: Thus we see him majestically enthroned (below right), enjoying the lavish spectacle, which lasted for weeks and featured acrobatics, juggling, fireworks, and the reenactment of battles and sieges in shadow play. This art form had been much admired in Egypt by Süleyman's father, Selim I. Performances by master puppeteers, such as these in Istanbul (right), continue to this day.





TOPKAPI PALACE MUSEUM



uncontested power over him, Roxelana had to get rid of Ibrahim, who alone shared the privacy of his meals, who was given a palace by the Hippodrome and Süleyman's sister in marriage, and who served brilliantly as grand vizier for 13 years.

Her insinuations finally bore fruit when Süleyman bestowed on Ibrahim the title *serasker sultan*, commander in chief, hitherto to the sultan's alone. Jealous reports came from the campaign in Iran that Ibrahim was acting as if he *were* sultan. Upon his return Ibrahim was invited to dine with Süleyman. Next morning he was found strangled.

Now she must get rid of Mustafa, Süleyman's firstborn son. Under the law of fratricide he threatened her own sons. First she maneuvered his mother, Gülbahar, her senior in the harem, away from court. She got her son-in-law, Rüstem Pasha, appointed grand vizier. From yet another Iranian campaign, Rüstem sent back word that Mustafa, a regional governor, was so popular that his troops were clamoring to have him lead them in place of the aging sultan (as Süleyman's own father Selim had overthrown *his* father).

Overtaking the army, Süleyman summoned Mustafa to explain. Mustafa trustingly went to his father's tent. The bowstring did its deadly work.

Next, two of Roxelana's sons fought civil wars. Defeated, Bayazid fled to Iran, where his father's executioner tracked him down. That left the least worthy of sons—Selim "the Sot." It is said that to get his favorite Cypriot wines he conquered Cyprus. This roused Christendom to defeat the Ottomans at Lepanto in history's last great galley battle. Indeed, many trace Ottoman decline, in the weak sultans and "Reign of Women" after Süleyman, to Roxelana. To this strong-willed woman in a male world who, prompted by the primal instinct to protect one's young, played a man's game with consummate skill for the highest stakes.

AT THE WALLS OF VIENNA, 1,000 miles from Istanbul, Ottoman troops led by Süleyman and his grand vizier, Ibrahim (below), met defeat in 1529, forced after less than three weeks to raise their siege. Delayed by rains that bogged down heavy artillery, they had only light guns to batter a city whose defenders were outnumbered but well prepared. Church bells pealed and a triumphant Te Deum rang out from St. Stephen's Cathedral, at center in this 16th-century map (facing page), as Süleyman's army retreated before the onslaught of winter.

BOTH IN THE HISTORISCHES MUSEUM DER STADT WIEN, VIENNA

"JEAN PARISOT DE LA VALETTE, hero of Malta in 1565—did you know that as a young man he fought against Süleyman in the 1522 siege of Rhodes and Süleyman let him go?" Dr. Elias Kollias's question echoed in the Grand Masters' Palace in Rhodes. La Valette's defense of Malta 43 years later marked Süleyman's most galling defeat.

At Rhodes I made a circuit of those incredible walls, inspected some of the 85,000 cannonballs, stone and iron, fired at the city,

A CRESCENT IN STONE, the humpbacked bridge at Mostar spans the Neretva River in Yugoslavia's Bosnia-Hercegovina Republic. The bridge was built in 1566 on Süleyman's orders to replace a nearby chain bridge

deemed unsafe by his subjects. Being part of the empire brought its benefits: In this area alone, the Ottomans constructed 42 bridges, 18 caravansaries, 264 inns and hostels, 10 covered markets.

walked the Street of the Knights, where the various *langues*—tongues or nations—had their own inns, and reviewed the knights' story. Founded in Jerusalem in the 11th century to care for Holy Land pilgrims, the Knights Hospitalers of St. John evolved from medics to military, first protective, then aggressive. At Rhodes their navy harried Ottoman shipping.

In the order's archives on Malta, Chevalier Joseph Galea showed me the charter sealed by Charles V in 1530 ending the knights' eight years of exile after Rhodes. It grants them Malta and Tripoli, on the adjacent coast of Libya, to hamper Ottoman fleet actions in the western Mediterranean. Annual payment: a falcon—hence the movie thriller *The Maltese Falcon*.

Tripoli fell to the Turks in 1551. But Malta still sent out fierce fleets to cut Ottoman sea routes. Expecting reprisal, La Valette, now grand master of the Knights of Malta at 71, readied the island's strategic harbor complex. Here the new Italian military technology had raised star-shaped bastions to stand pounding even by the great bronze basilisks cast in Istanbul foundries of copper from Islamic Anatolia and tin from Christian Cornwall.

The siege of Malta is holy war at its unholiest: poisoned wells, flaming hoops to burn men to death, summer sun that fells knights in massive armor with heat stroke.

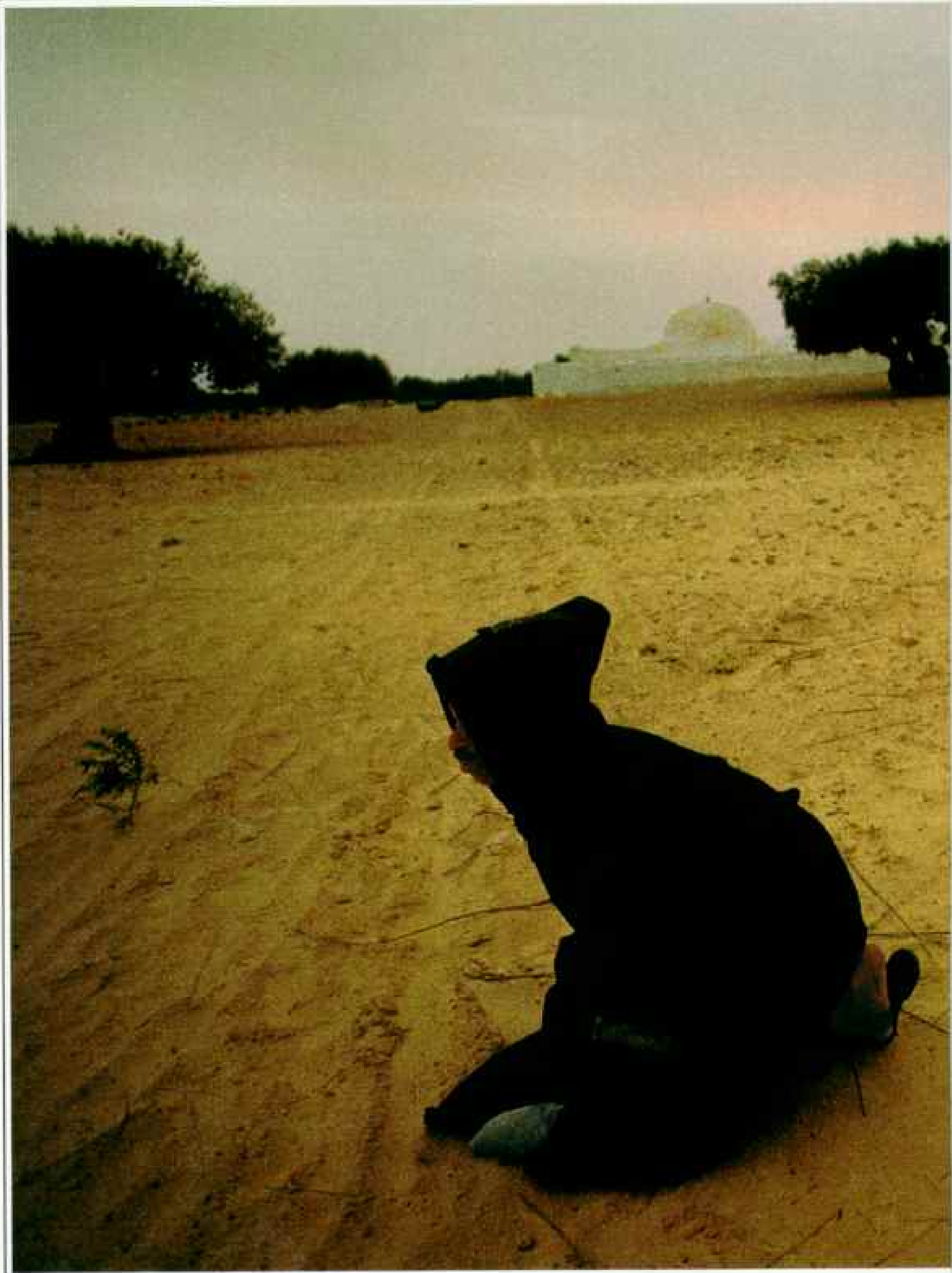
The Turks figure five days for Fort St. Elmo at the harbor mouth. It takes nearly a month to smash it to rubble. Its wounded defenders prop themselves in chairs to give one more stroke before they die. Enraged at the casualties, the Ottomans impale the knights' heads, nail the bodies to crosses, cast them into the harbor to float over to their compatriots. La Valette's reply: severed heads of Ottoman prisoners fired back from Christian cannon.

Now, late in the season, the Ottomans batter the other two forts. Men fight like moles in mines; swimmers with knives and stabbing swords perform a deadly underwater ballet over sharpened stakes in scenes straight out of a James Bond movie.

Besiegers die by the thousands in the heat, stench, dust of crumbling walls. False word of a relief force draws Ottomans back from broken ramparts they could have walked into over the bodies of the last 600 defenders. They return to find their siege works destroyed. Later 7,000 Spaniards arrive from

KING OF THE CORSAIRS who ruled the Mediterranean, the Barbary pirate known to Europeans as Barbarossa (below) became Süleyman's grand admiral, leading a fleet of galleys on attacks against the coasts of Italy, Spain, and North Africa. In 1543 he combined forces with Francis I to attack Nice (facing page), held by a vassal of the Holy Roman Emperor.

BOTH IN TOPKAPI PALACE MUSEUM



CAUGHT IN A SUDDEN STORM OF SAND, shepherd Ahmet Blibita Mundi takes shelter on Jerba, a low-lying, semidesert island off the Tunisian mainland. In the background a mosque—one of 213 on the island—bears witness to the

Islamic presence in North Africa. Jerba served as a stronghold for Barbarossa early in his career and much later as a base for his formidable successor, Dragut, who continued the naval war against the Spanish forces of Charles V.

Sicily. Not many, but enough. Charles V's storm-wrecked fleet at Algiers is not forgotten. One thousand miles from home base in Istanbul with winter approaching—the same combination that stopped Süleyman at Vienna—ends the siege of Malta. The Ottoman armies and navies have reached the end of their line.

SÜLEYMAN IS OLD, racked with infirmities—72 is a notable age for a monarch in his day. He is more puritanical, darker in moods; he has the palace's musical instruments smashed, dines off earthenware instead of silver. He rouges his face to counterfeit good health. Let no envoy report the empire is not strong at center.

But the defeat at Malta rankles. The Habsburg emperor adds insult by refusing to pay treaty tribute and raids Turkish-held Hungarian border towns. Roxelana's daughter Mihrimah insists it has been too long since the sultan rode out to holy war.

Süleyman, says Busbecq, had set himself three objectives: to finish his mosque, restore ancient aqueducts to supply water to Istanbul, and capture Vienna. He has achieved the first two. Now to wipe out the stain of Malta and the insult of Hungary in the ultimate blow of a ghazi sultan.

The world has changed since Süleyman's first Danube

A FEARSOME ARMADA of 150 Turkish vessels sailed past the glassy waters of Malta's Grand Harbour (below right) on May 18, 1565. Disembarking, the Turks prepared to fulfill Süleyman's order—to destroy once and for all the Knights of St. John, whom he had gallantly spared at Rhodes in 1522. After five months and staggering losses on both sides, the mighty siege—portrayed in a fresco by Matteo da Lecce (facing page)—ended in triumph for the knights. Their heroic deeds are commemorated on some 400 marble slabs on the floor of St. John's Co-Cathedral (below) in Malta's capital, Valletta.

PALACE OF THE GRAND MASTER OF ST. JOHN, VALLETTA

campaign 45 years before. Francis I and Henry VIII died in 1547, the year after Luther and Barbarossa. Valois-Habsburg wars ground on until 1559. But Charles V had already bowed out. Worn from warring with France, German Protestants, and the Ottomans, Charles shifted imperial burdens to his brother Ferdinand in Vienna, shed Spain's kingship on his unsmiling son Philip II, and retired to a modest palace beside the Spanish monastery of Yuste. Here the monarch who spoke Italian to women, French to men, and German to his horse, spoke to God in Spanish to prepare for the *buen morir*, which he met in 1558.

Caught in a vise between Russian expansion on the steppes and European domination of southern Asia, the Ottomans' Mediterranean would become an economic backwater. Western technology overtook their military might. (Time came when Viennese could relish a chorus of Janissaries in Mozart's *The Abduction from the Seraglio* and hear a Turkish march by Beethoven with titillation instead of terror.) With no new lands, taxes, or manpower, decline set in. Süleyman passed on an inflexible system that had no machinery for contraction.

Government turned from paragon to parody: sale of offices, corruption, tyranny. Conservatism squelched ideas; trade and industry stagnated. Neighbors gathered like vultures around the 19th century's "Sick Man of Europe." But when, in the twilight of an empire that would endure 600 years, a score of nations emerged from its cosmopolitan umbrella, they had preserved their languages, religions, cultures. Thus the Ottoman experience differed from that of "purified" Spain, where no muezzin's call or Arabic was heard.

HIS LAST CAMPAIGN, in 1566, found Süleyman, severely weakened, transported from Istanbul by carriage and barely able to ride into Szigetvár at the head of his army. While the Hungarian battle raged, the 72-year-old sultan lay dying in his tent, where he expired before learning of his final victory. His death was kept secret for three weeks until his son, Selim II, could be safely installed as his successor.

Today, on the facade of a Christian church built on the site of his death, plaques in Hungarian and Ottoman Turkish record: "The princely heart and inside parts of His Majesty, Sultan Süleyman Khan Ghazi, who moved to Eternal Heavens during the siege of Szigetvár . . . are buried here. . . . The Mercy of God shall be with Him."

TOPKAPI PALACE MUSEUM

BUT NOT QUITE YET. Marshaling a mighty army, Süleyman set out for the Danube on May 1, 1566. Going was slow, painfully slow. Süleyman could no longer sit a horse but rode in a carriage, engineers smoothing the roadbed ahead: 49 days to Belgrade, pouring rain, bridges out, roads flooded. Word came that a Hungarian count had slain one of Süleyman's governors and holed up in Szigetvár, near Mohács. In a fury Süleyman diverted his entire army to reduce the fortress.

Even with only 2,500 defenders, marsh-girt Szigetvár held up the Ottomans a month. Massed assaults reaped mounds of corpses. A huge mine shattered the main bastion. Finally, dressing in finery with a jeweled sword and thrusting a hundred gold coins in his purse so the soldier who looted his body would think well of him, the count sallied forth with his survivors.

"When 150 charge 100,000, the outcome is fairly certain," remarked Professor Gustav Bayerle, my learned guide to Hungarian battlefields—"even if they are Hungarians!"

But the spectator for whom this heroism was meant did not see it. Süleyman had died in the night in his tent.

The sultan is dead. But no word must leak out to demoralize the army. No word before Süleyman's son, Selim, 800 miles away in Kütahya, reaches the throne. Orders issue as usual from the tent; rewards for valor, letters to inform monarchs of the victory. The count's head is sent to his imperial master.

Finally the order to move out. Süleyman, his embalmed body sitting behind drawn curtains, begins the long journey homeward. Three weeks later, when word comes that Selim has acceded, Mehmed Sokollu announces Süleyman's death. Among the greatest of grand viziers, Sokollu will guide the empire for the next 13 years while Selim reigns.

The army is silent, stunned. So too the people of Istanbul, who follow in swelling procession to the Süleymaniye Mosque. Their leader all their lives, he raised their sacred empire to its golden age. Their descendants will look back on it with pride and nostalgia. They will never see his like again.

ACCORDING to custom, his heart would be buried where he died. So I searched near Szigetvár for the site. A road sign caught my eye: "Szulimán." A dying village, the young moved away, the old hanging on.

"Why this village name?" I asked a man in his garden.

"It was named for a sultan who came long ago," I was told.

"What did he do here?"

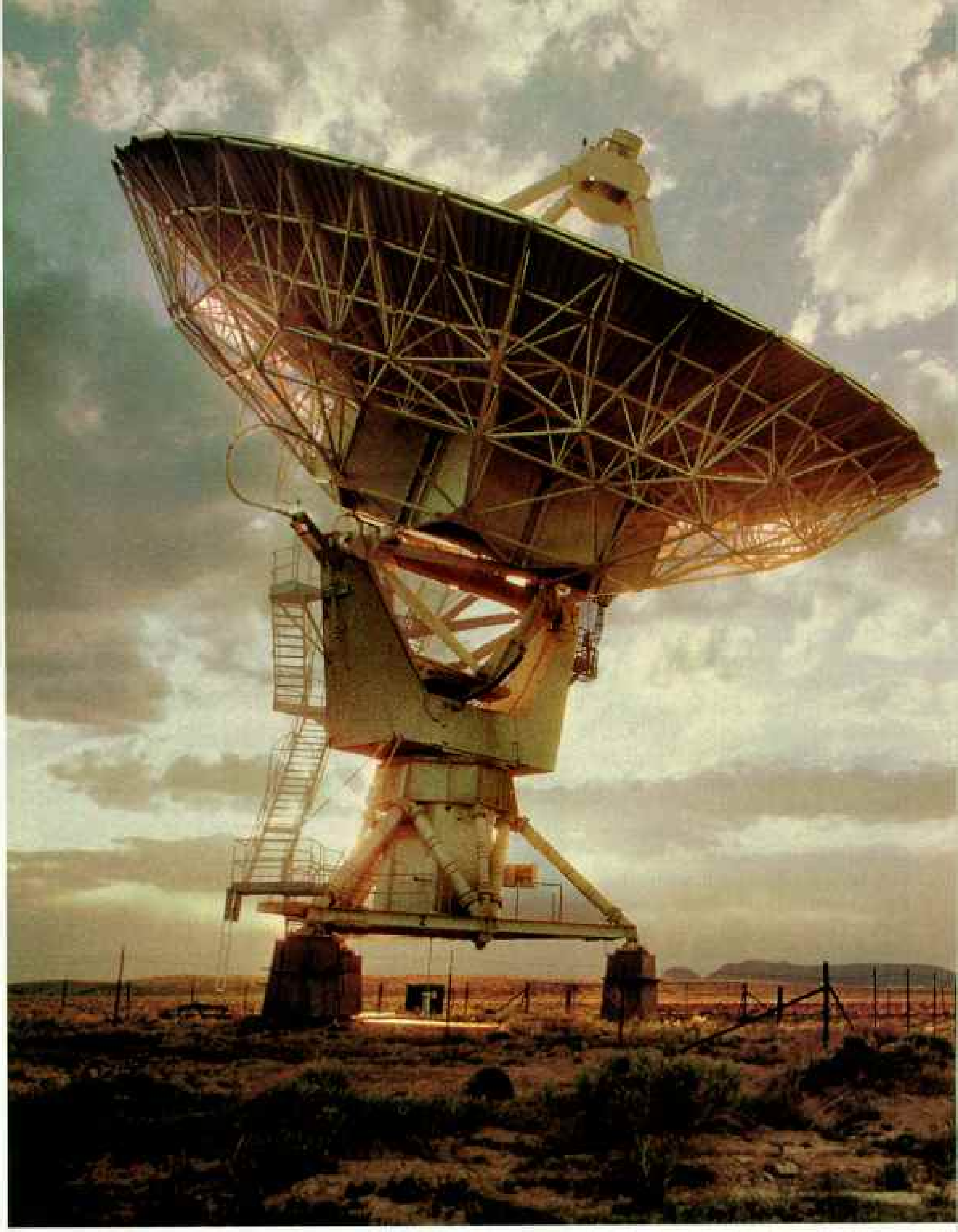
"I heard that he died here," a woman leaning on her hoe said, the lines of many years etching her face. "The old folks would know. But they are all dead now."

My quest ended in a churchyard amid cornfields in the nearby countryside. A church without a village must mark some special spot. This could be the place called Turbék, from *türbe*, tomb in Turkish. I went through the gate, past a large crucifix, and on the church facade saw an Ottoman Turkish inscription. A crescent with the town name of Kütahya stood by the wall.

As I read that here was buried the heart of Sultan Süleyman, the setting sun threw the crucifix image on that wall and bathed the crescent in a warm glow. I recalled a Turkish poet wanting

Not the day of judgment
But the day of understanding

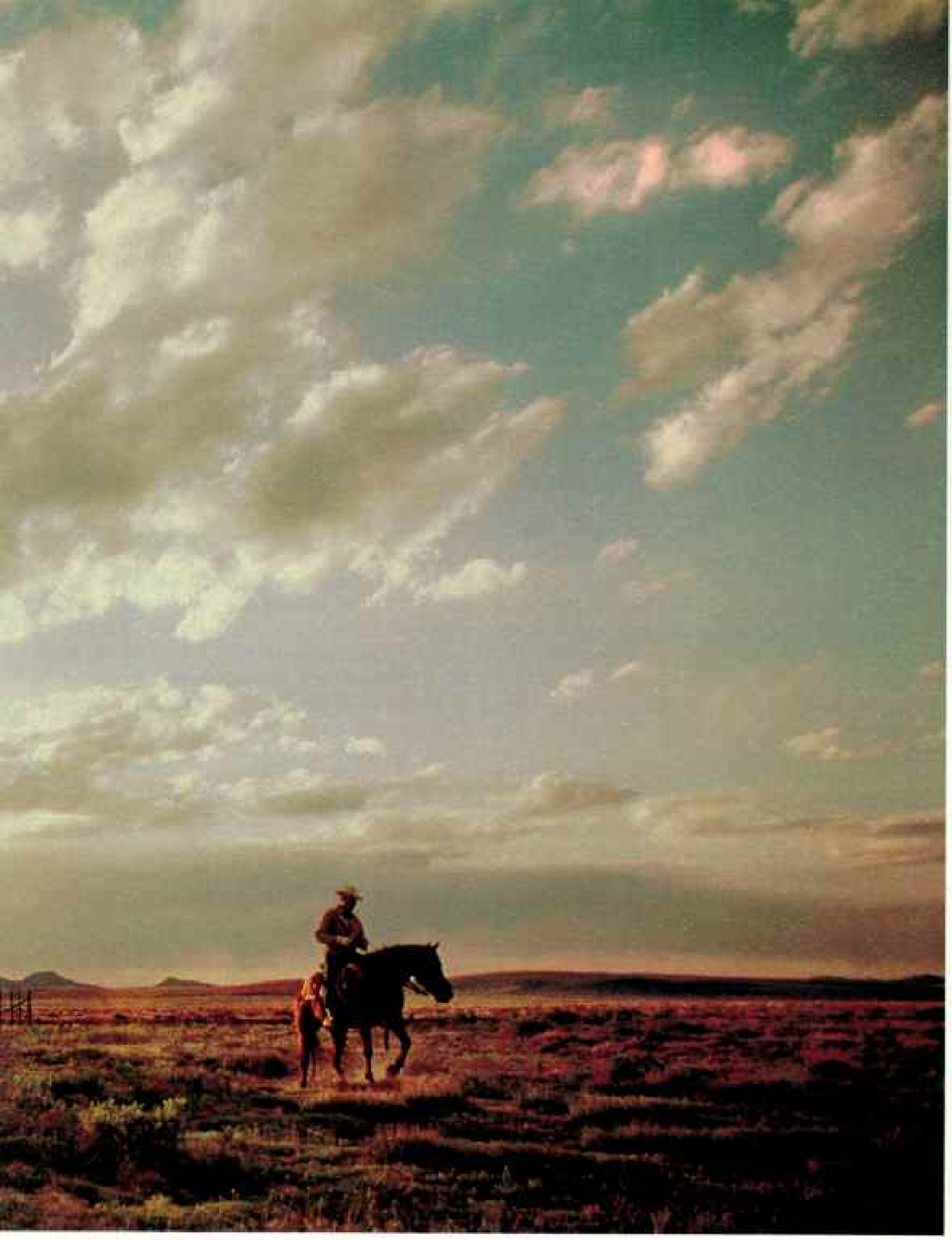
and hoped that somewhere the shades of the sultan and the emperor Charles, of tragic young king Louis and the redoubtable Jean Parisot de La Valette, had found peace. □



To hear the distant voice of the universe, the Very Large Array radio telescope

New Mexico Between

By BART McDOWELL SENIOR ASSISTANT EDITOR



requires the isolation of the Plains of San Agustin. So, says rancher Marvin Ake, does he.

Frontier and Future

Photographs by DANNY LEHMAN

ONCE UPON A TIME a Navajo Indian woman took her nine-year-old son to the bank of a stream. "We have no food," the mother explained in the Navajo language. "But you can follow this stream to the Indian school 50 miles away. There you will have free food and clothes and a place to stay."

So, without asking questions, the boy walked 50 miles to the school. It was more than two years before he saw his parents again and 13 years before he enrolled in the University of New Mexico. Fred Begay—for that was the young Navajo's name—completed his courses with distinction and became the first of his people to earn a doctorate in physics.

Today he works with 8,000 other scientific savants at Los Alamos National Laboratory. On holidays he returns to the hogans of his people. He can give an hour's lecture on laser fusion in the Navajo language without using a single foreign word. He studies the parallels between Navajo mysticism and modern science. "I would probably be a medicine man," he told me, "except for that 50-mile walk."

I thought of Fred Begay not long ago as I drove through the dry Navajo lands of northwestern New Mexico, past the existential buttes of Chaco Canyon with its thousand-year-old ruins of the Anasazi people, the "alien ancient ones." On the horizon I watched blue-black clouds spill a veil of rain upon hills that my map identified as the Continental Divide.

That's New Mexico for you: An ignorant Indian boy can walk 50 miles to the forefront of science, for the state straddles both watersheds and cultures. And it divides the terrain of time itself; on one side, the layered past—history and, beneath it, archaeology and geology—and on the other, an unshaped future, tomorrow's techniques, new weapons and cures, mankind's threat, promise, and choice.

I have lately been traversing New Mexico, seeing parts of it for the first time and updating old memories. On back roads my tires have stirred dust storms, skidded in mud, and strummed their way across cattle guards. For the New Mexico traveler, highway signs give fair warning: "Dangerous Crosswinds" . . . "Dip—Watch for Water" . . . "Runaway Truck Ramp" . . . and often, often, "Watch for Rocks." How could we not? In New Mexico—fifth largest of our states—geology makes a spectacle of itself. Landscapes have an eccentric beauty, and horizons stand as sharp as a cactus thorn.

But to me it's the human geography that shows the greatest contrast. "A unity of three cultures," notes conventional rhetoric, referring to the Hispanic, Anglo, and American Indian. And it seems so neat and tabular: a population 37 percent Hispanic, 8 percent Indian (or Native American, as some of them prefer), and (with only 2 percent black and Asian) the rest Anglo.

But simplicity falsifies. Ask a restless Navajo how he'd like the sedentary life of a Pueblo Indian: "Like being in jail." Or discuss the chili recipes of Mexican Americans from Las Cruces with Hispanic chefs in Chimayo: "Don't call *us* Mexican," they say carefully. "And don't call *that* chili." Or ask an Anglo rancher about his fellow ethnic in the Bureau of Land Management: "Saphead bureaucrat!" New Mexico cultures fracture and subdivide throughout the state's population of 1,480,000.

AND HERE I MUST CONFESS to prejudice: My grandpa John Gist ranched in New Mexico Territory. My mother still remembers the day 75 years ago in 1912 when the family celebrated statehood—"one day late because the newspaper came on the train." From my own boyhood I recall snowy Christmas holidays in the log ranch house near Magdalena, just west of the center of the state, and sweaty summer days crossing the desert near Columbus. But I'll try to balance affection with truth.

In the 1930s Grandpa ran sheep on a ranch called the Montosa, "mountainous" in corrupt Spanish, though much of it wasn't. The log headquarters buildings sat on the Plains of San Agustin, some 400 square miles of former lake bed surrounded by a skyline of conifer-clad peaks. There, as a youngster, I collected arrowheads and piñon nuts, and one summer even helped the hired hands put out "a genuine forest fire," as Grandpa described it—actually a lone pine that lightning had struck.

I recall the barbershop of the Aragon Hotel in Magdalena where Grandpa went for his 25-cent shaves. The barber kept a bathroom with a proper tub, and for 50 cents a cowboy could get hot water, soap, and a towel during his visit to town.

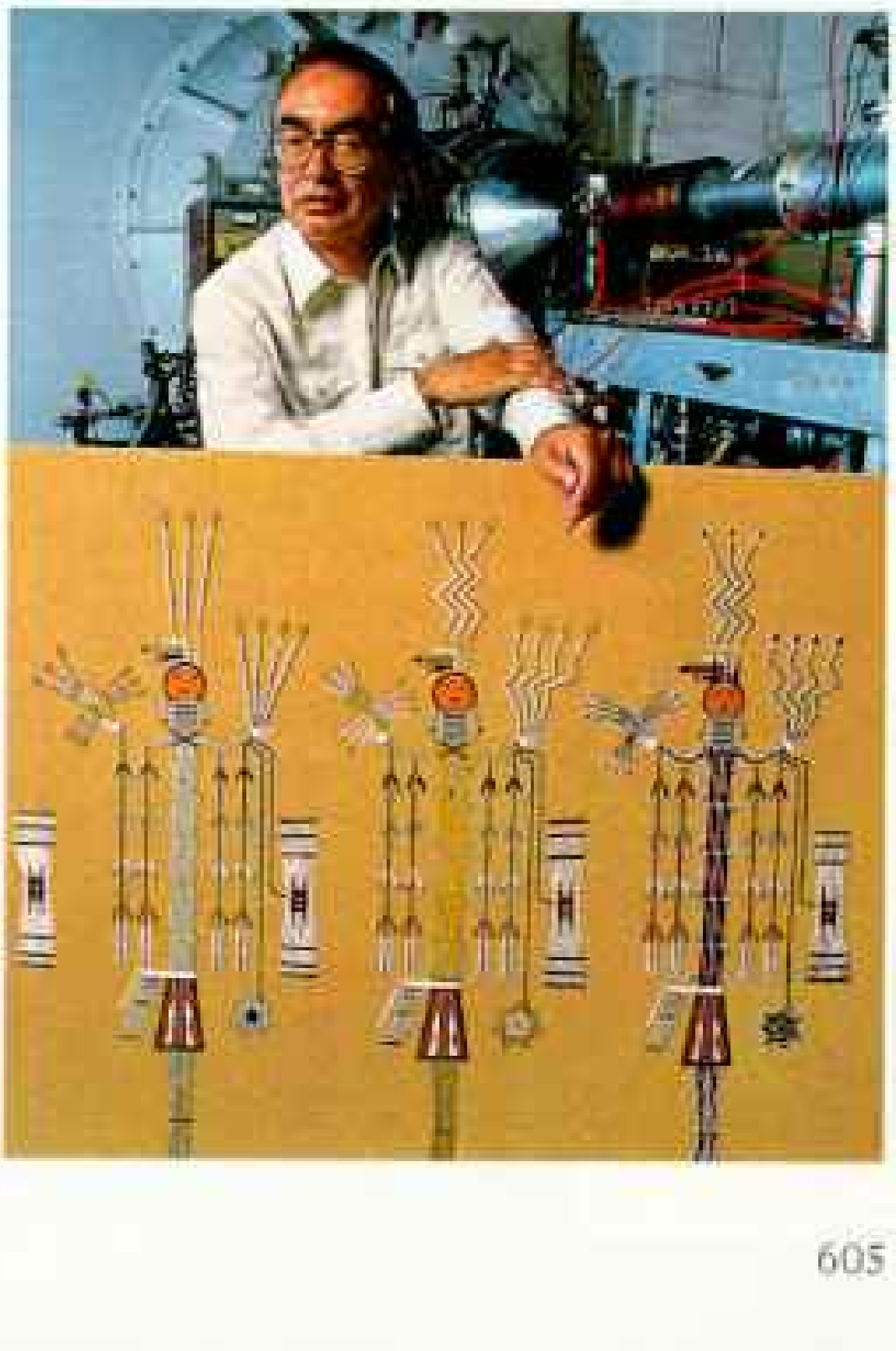
Magdalena was a hard-drinking town. First came the nearby silver, lead, and zinc mines with a payroll of hundreds. The railroad arrived to haul ore and stayed on to ship cattle and wool when mines shut down. Cowboys drove their herds from as far away as Arizona to load the steers onto cattle cars. After weeks on the trail the cowboys had wages to blow. Magdalena inherited the trail's end tradition of Dodge City.

"They got some real rank people in those days," says my friend Max Evans, ex-miner, ex-cowboy, and one of the best New Mexico writers. Max made a movie in Magdalena a few years ago and knows about local justice. Talk about jury tampering: "They'd say, 'If you convict my boy, I'll shoot your milk cows and layin' hens—and then go after your wife and kids.' Evidence? You could bring in a pile of hides *that* high with all the brands altered: *Not guilty.*"

Some of the guilty needed no threats, as old-timer Marvin Ake recalls. "Your grandpa had a *caporal*—a sheep boss—named Guy, a great thief but a friendly fellow. He stole a man's windmill right off the ranch. Only reason Guy stopped stealing was he got too old." Marvin Ake sighs. "Welfare puts thieves out of work these days."

More than 30 percent of Magdalena's 1,100 people now receive welfare or other government assistance, according to municipal judge Charles Galt. "We had no shootings in town last year," notes Judge Galt. "Except the police had to shoot one man three times before he'd quit shooting at them. But he had lived in town only a little while." *(Continued on page 610)*

Calling the spirit *of the eagle, medicine man Atcitty Begay kneels beside nuclear physicist Fred Begay near Ship Rock on the Navajo Reservation. Fred Begay speculates that a myth about warriors armed with weapons of light rays—some straight, others zigzag—depicted in a sand painting (bottom), suggests an ancient Navajo understanding of laser theory.*



UTAH

COLORADO

ARIZONA

NEW MEXICO

Four Corners
OIL
COAL
Shiprock
Aztec
Farmington
AZTEC RUINS NAT. MON.
SHIPROCK
COAL
San Juan GAS
CARSON NAT. FOR.
Navajo Indian Reservation
Jicarilla Apache Indian Reservation
COAL
Chama
Rio Chama
MOLYBDENUM
CARSON
PERLITE
NATIONAL
FOREST
Rio Grande
Taos
Truchas
Chimayo
Española
Los Alamos
Los Alamos Nat. Laboratory
CHACO CULTURE N.H.P.
SANTA FE NATIONAL FOREST
Pajarito
Los Alamos
CHANDELIER N.M.
Jemez
Santa Fe
Science and Technology Commission
N.M. Research and Development Institute
Mora
SANTA FE NAT. FOR.
Whitetail Peak
Raton
COAL
MAXWELL N.W.R.
Wagon Mound
FT. UNION NAT. MON.
Las Vegas
LAS VEGAS N.W.R.
PECOS NAT. MON.
Gallup
Ft. Wingate Army Depot
COAL
Navajo Ind. Res.
CIBOLA NAT. FOR.
URANIUM
Mount Taylor 3,445 m 11,301 ft
CIBOLA NAT. FOR.
Zuni Indian Reservation
EL MORRO NAT. MON.
Ramah Navajo Ind. Res.
Grants
Laguna
Acoma Ind. Res.
Laguna
Bernalillo
Rio Rancho
Sangre de Cristo 3,265 m 10,712 ft
Madrid
Albuquerque
Isleta Ind. Res.
Albuquerque Seismological Center
Air Force Space Technology Center
Air Force Weapons Laboratory
Center for High Technology Materials
Center for Non-Invasive Diagnosis
Lovelace Medical Foundation
N.M. Engineering Research Institute
N.M. Technet
Sandia National Laboratories
Technological Innovation Program
University of New Mexico
Rio Puerco
CIBOLA NATIONAL FOREST
SEVILLETA N.W.R.
SALINAS NAT. MON.
CIBOLA NAT. FOR.
Center for Explosive Technology Research
Langmuir Lab. for Atmospheric Research
N.M. Bureau of Mines and Mineral Resources
Petroleum Recovery Research Group
Terminal Effect Research and Analysis Group
Very Large Array
Very Long Baseline Array
Pecos
Ft. Sumner
Alamo Navajo Ind. Res.
Quemado
Magdalena
Socorro
CIBOLA NAT. FOR.
BOSQUE DEL APACHE N.W.R.
Plains of San Agustin
GILA
Eagle Peak 2,810 m 9,765 ft
NATIONAL
GILA CLIFF DWELLINGS NAT. MON.
FOREST
SILVER
Silver City
GOLD
Gila
COPPER
Continental Divide
Animas Peak 2,607 m 8,532 ft
CORONADO NAT. FOR.
Elephant Butte Reservoir
Jornada del Muerto
TRINITY SITE
White Sands Missile Range
Holloman Air Force Base
Alamogordo
WHITE SANDS NAT. MON.
SAN ANDRES N.W.R.
Hatch
Computer Research Laboratory
Physical Science Laboratory
Plant Genetic Engineering Laboratory
N.M. Solar Energy Institute
N.M. State University
Las Cruces
Deming
Columbus
Rio Grande
UNITED STATES
MEXICO
TEXAS
LINCOLN NAT. FOR.
Lincoln
San Patricio
Mescalero Apache Indian Reservation
LINCOLN NAT. FOR.
BITTER LAKE N.W.R.
Roswell
Artesia
Apache Point Observatory
Sacramento Peak Nat. Solar Observatory
USAF Electro-Optical Observation Site
White Sands Missile Range
White Sands Test Facility
(Johnson Space Center-NASA)
Ground Based Free Electron Laser Fac.
Guadalupe Mts.
Fort Bliss
Fort Bliss
LINCOLN NAT. FOR.
CARLSBAD CAVERNS NAT. PARK

- National forest system
- National park system
- National wildlife refuge
- Government reservation

New Mexico

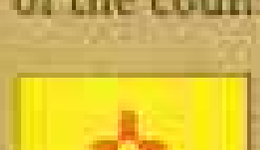
Dancing ground of the sun

A SWEEPING CANVAS of diverse landscapes and cultures, New Mexico embraces terrain from desert to alpine tundra. More than three-fourths of the state lies above 4,000 feet. "The distance sort of gets into your soul," writer Ernie Pyle observed, "and makes you feel that you too are big inside."

Indian, Hispanic, and Anglo cultures flavor the fifth largest state, ranked only 37th in population. Most people live along the Rio Grande Valley; a fourth live in Albuquerque.

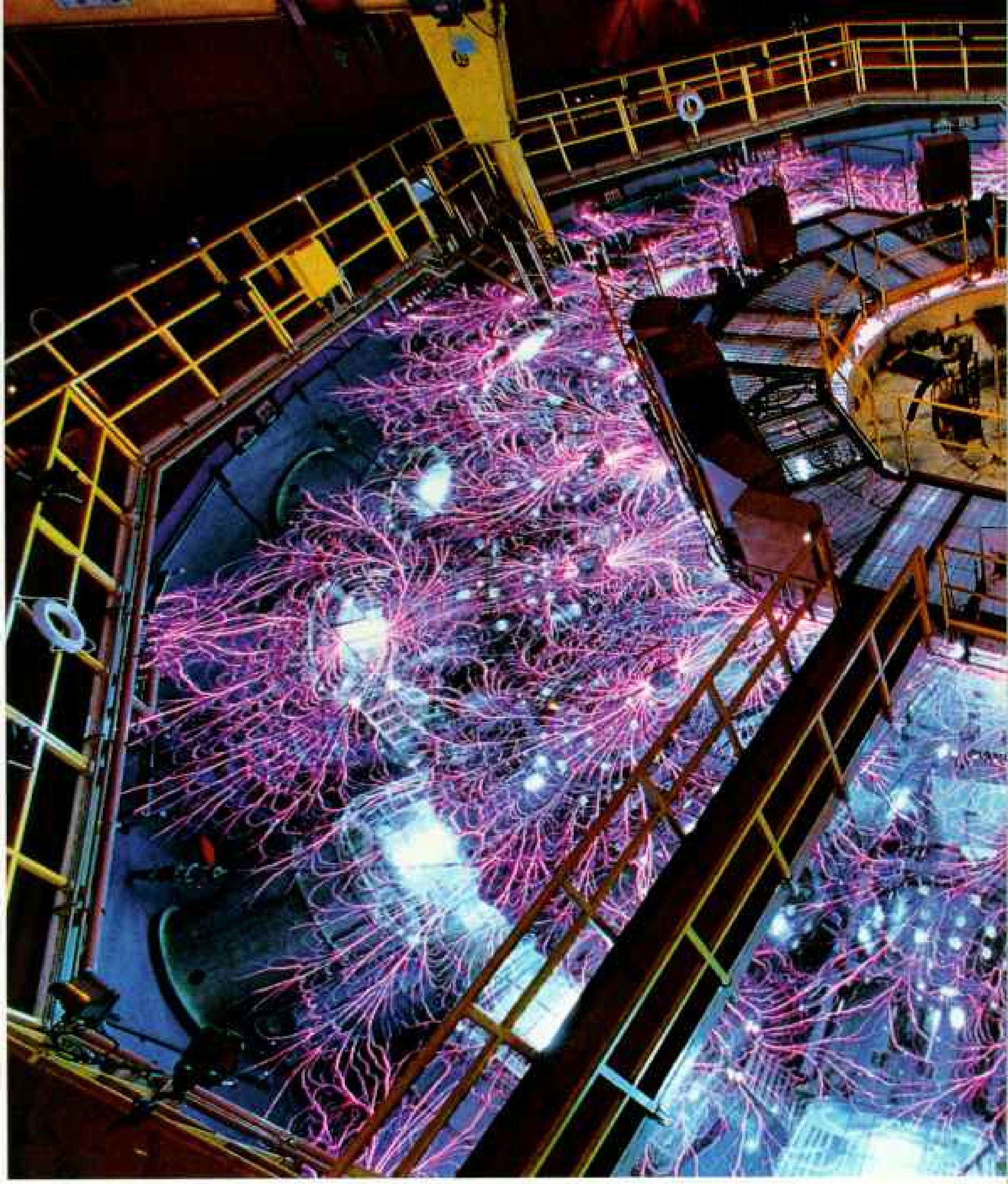
The Spanish explored this land in 1540 and named it for the city of Mexico in New Spain. Colonists followed in 1598 in the wake of Franciscan missionaries. The Pueblo Indians, named for their tiered mud-brick towns, evicted the Spanish in 1680; Spain soon regained rule. Part of newly independent Mexico in 1821—when Anglo traders first came out the Santa Fe Trail—the territory was ceded to the U. S. in 1848 after the Mexican War. Ranchers and miners prospered in the 1880s after the arrival of the railroad and the military suppression of Navajo and Apache tribes.

Granted statehood in 1912, New Mexico boomed after World War II, when the atom bomb was developed at Los Alamos. That isolated laboratory—today one of the state's largest employers—became the nucleus of the burgeoning Rio Grande research corridor, which gives New Mexico one of the country's highest percentages of Ph.D.'s.



AREA: 121,666 sq mi (315,113 sq km). **POPULATION:** 1,480,000. **MAJOR CITIES:** Albuquerque, 350,600; Santa Fe (capital), 52,000. **ECONOMY:** Government, trade, service, and manufacturing. **AGRICULTURE:** Livestock, alfalfa, chilies, cotton.

NGS CARTOGRAPHIC DIVISION CEDRIC N. NANCY SCHWEICKART RESEARCH JUDY M. THOMSON PRODUCTION BARBARA CARRUBBA MAP EDITOR JOHN T. BOOS PAINTING BY LLOYD K. TOWNSEND



The quest for nuclear fusion *as an energy source lights up Particle Beam Fusion Accelerator II at Albuquerque's Sandia National Laboratories. A web of electrical discharges merely hints at the power. Arranged like spokes in a 76-foot-wide tank of water, 36 accelerators pulse electricity toward the center to produce a beam of ions. At 30 billionths of a second, the 100-trillion-watt pulse is stronger than the world's total generating power. Tests will eventually use this energy to attempt to fuse hydrogen isotopes. Success may herald a cheap, safe energy source, though commercial use of fusion to produce electricity is decades away.*

At Los Alamos National Laboratory, physicist Guy Worth looks through seven layers of steel melted by a particle-beam accelerator. A prototype for space weaponry, the technology is crucial to the Strategic Defense Initiative.

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The judge's wife, Marilyn Galt, the local superintendent of schools, adds, "I don't remember a racially motivated fight at school last year." Not bad for an ethnic mix with 45 percent Navajo and the rest split between Hispanics and Anglos.

Of course, they often have other kinds of fights. People in Magdalena take football seriously.

And, indeed, a state policeman was protecting the peace when I accompanied Magdalena's maroon-and-white Steers westward to play the Golden Eagles of Quemado, population about 400. With such a shortage of people, some schools play football with six-man teams.

BUT IF the Plains of San Agustin sometimes seem lonely, solitude there is also a natural resource. Thanks to an absence of electrical interference—and to the high, wide, and handsome topography—the largest employer is known by the initials VLA.

The letters stand for Very Large Array, and large it is. The National Radio Astronomy Observatory has mounted 27 antennas here, some of them within sight of Grandpa's Montosa pastures. Each antenna weighs 235 tons and measures 82 feet across. (Marvin Ake calls them daisies—and then he spits.)

Arranged in a Y shape along a 23-mile stretch of real estate, the antennas work as a unit, like a single telescopic lens 23 miles across. This system reaches farther into space than any other telescope on earth. Soon special adapters will make VLA a hearing aid for NASA, so that in August 1989 the weak signal of Voyager II can be heard when it passes the planet Neptune—nearly three billion miles away.

But astronomers remain greedy for more and more information. The next telescope generation, funded by the National Science Foundation, is called the VLBA—the Very Long Baseline Array. Radio antennas will be located at points from Hawaii to the Virgin Islands—making a telescope 5,000 miles across.

"It will be just like reading a newspaper in San Francisco—from Washington, D. C." So says Peter Napier, project manager.

What news that imaginary paper will publish! The VLBA will directly determine the rate of continental drift, the speed of the earth's rotation and the wobble of its axis, even the effect of atmospheric wind on the rotating earth. Astronomers will be better able to probe the gaseous clouds where stars are being born, to measure distances to our neighboring galaxies, and even to help determine the size and age of the universe. The whole project will be coordinated by a digital computer system centered in Socorro, New Mexico, population 8,100.

The boom in science, however, hides hard times for the livestock business. The president of the New Mexico Cattle Growers' Association, Peter T. Mocho, says: "We've got rich ranchers, but it's taken them 60 years to get that way. For others, it's a struggle. We lost 400 members in recent years, mostly small ranchers who went out of business. Once we had 5,000 cattle ranches in the state. Now it's more like 3,000."

Why? Rising costs, an uncertain labor supply, market fluctuations. ("If cattle prices were as high as the grass this year, we'd be OK.") But a special problem here is

landownership. What with national forests, parks, Indian reservations, and such, 44 percent of New Mexico land is privately owned. That makes for checkerboard lands, as local folk call them.

"There's hardly a ranch in New Mexico that's entirely deeded land," says Peter Mocho. Ranchers must often lease acreage from both the state and federal governments. "State leases are for five years, but forest lands have all sorts of permits. We no longer have many one-man outfits—one person has to do the paperwork. Full time. The wild game belongs to the state. The public thinks they have recreational access. The rancher has to provide water, stock pens, everything. Ranching is capital intensive.

"Most stockmen's problems are government. Once I caught an old trapper on our ranch turning loose a bitch coyote. He just said, 'You don't expect me to work myself out of a job!' Well, that's bureaucracy. Four people used to manage these lands from an abandoned filling station, I think it was, in Albuquerque. It was that way until after World War II. Now it's exploded. No more services and a million acres less land to manage."

According to the Bureau of Land Management personnel office, out of a total of 706 employees throughout the state a hundred now work in Albuquerque, along with almost one-third of all New Mexicans.

This is "a city on the edge of greatness," insists Mayor Ken Schultz. "Just five years ago a mayor lost an election here because this was a dirty city. Now"—Mr. Schultz swivels his chair to see the plaque behind him—"we're America's cleanest city. That's from Keep America Beautiful.

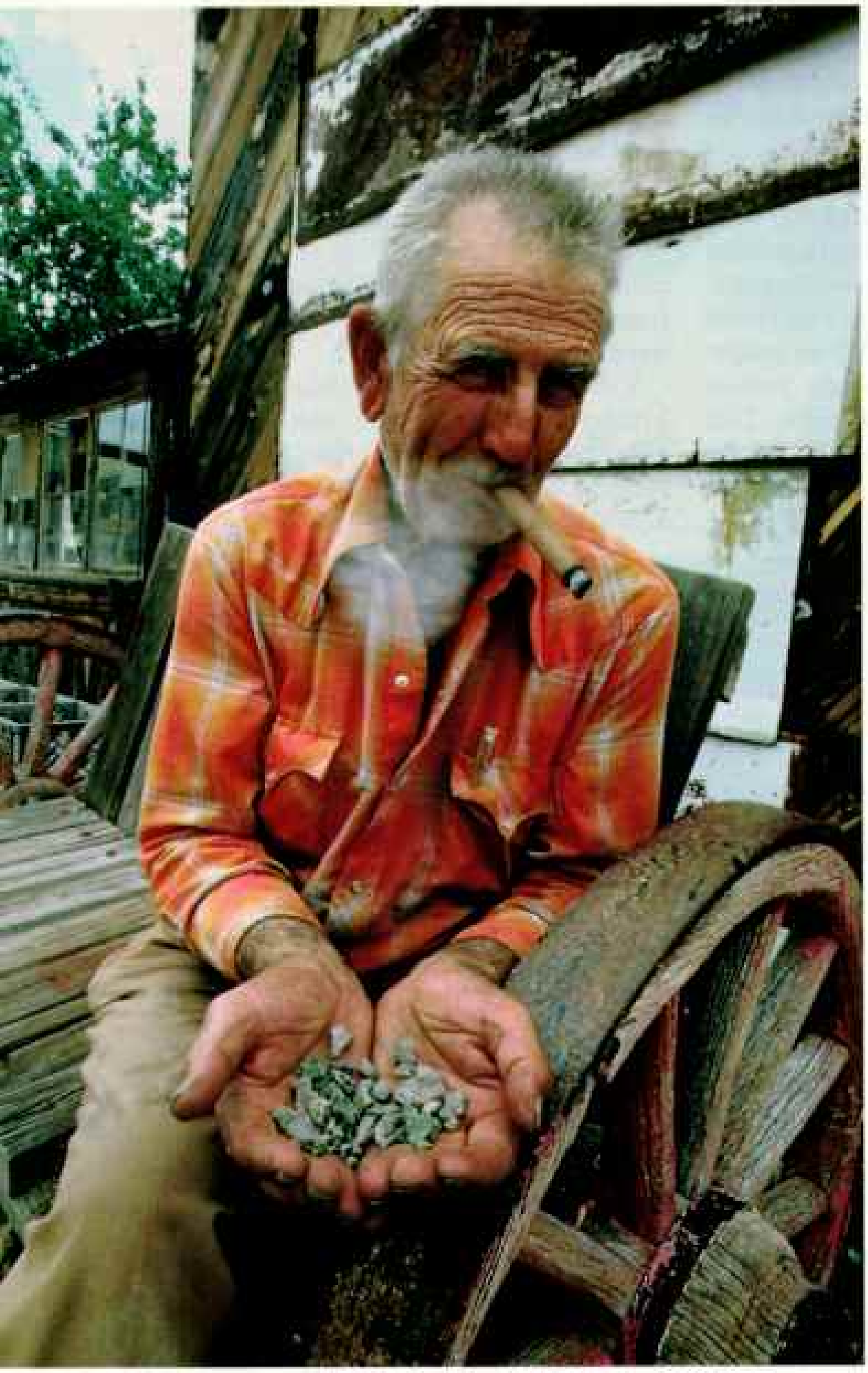
"Where else can you live 18 minutes from skiing or *see* 90 miles?" he asks. "We have huge underground water resources. We've never had a race riot."

The city grows at a youthful pace, scaling brushy foothills to the east, gentrifying older structures near the Rio Grande, spilling out onto the high, dry mesa of neighboring Sandoval County at Rio Rancho, fastest growing community in the state. Albuquerque's median age is 29.

"Young people like our outdoor life," notes Carol Bates, a real estate agent who handles the relocation of people moving to town. She works with companies before the moving vans arrive. "We have a lot of high-tech organizations—Honeywell, Signetics (they make semiconductors), Ethicon (that's Johnson & Johnson). Clean industries. And crime? Well, my house has never been burglarized, but we do have some bad neighborhoods."

And so, on a payday weekend, I joined Albuquerque police in the southeast for nightly rounds in a squad car. "The southeast has real variety," noted Sgt. Robert

***What if terrorists** took hostages in a nuclear lab and demanded plutonium or uranium? At the U. S. Department of Energy's Central Training Academy in Albuquerque, DOE security forces play out such scenarios (left). From Albuquerque DOE manages the development of nuclear weapons. Near Carlsbad DOE's Waste Isolation Pilot Plant plans disposal of contaminated materials in salt deposits 2,150 feet deep (right). Here technicians emplace a canister containing heaters that simulate temperatures given off by radioactive wastes. A five-year test program begins in 1988.*



Ground zero *of the nuclear age lies in the Jornada del Muerto desert (facing page), where the first atom bomb exploded before dawn on July 16, 1945. Miner Sam Jones of Bingham (above) grew up near the test site, code-named Trinity, now part of White Sands Missile Range. He holds Trinitite, desert soil fused into glass by the blast, which left a crater half a mile wide. "Lined with this glass, it looked like a lake," Sam recalls. "If I'd known they were going to fill it in, I'd have collected a lot more."*

Caswell. "Affluent, transients, everything."

"Yes," agreed another policeman, "I really don't like for my wife to shop at the supermarket at night."

As darkness settles, I ride with Officer Leonard Rodriguez. We check a minor theft, then watch parking lots fill in front of saloons on Central Avenue. The Caravan, a hangout for Anglo cowboys, advertises "Western dancing—ladies regular drinks 35 cents." Next door is the Extra Point, a bar favored by Hispanic cowboys and by Indians. "Usually no fights between the Anglo and Hispanic cowboys," observes Officer Rodriguez.

A man has roughed up his woman on Dallas Street—"that's the 'war zone', transients, a real ethnic mix." The man has gone, and she is sobbing, "I didn't know he had a knife until he cut my hair."

We drive on, and Officer Rodriguez ruminates, "Last weekend we had four homicides. One was a double murder—two Mexicans killed by two Hispanic brothers. They said they didn't like illegals."

Next is a family fight in a trailer park. The shirtless husband is drunk: "She's been using the back door on me. . . . Her boyfriend was about six two and 240."

Drunk drivers and a false alarm take some time. Now the manager of the Blue Spruce Lounge has called for help. We arrive with other police cars to find an Indian woman knifed and her bulky brother vowing vengeance.

Officer Clay Joyce remarks, "I haven't had dinner." Nor have we, and it's past midnight. We carefully select a restaurant where no cook has been arrested.

The best view of Albuquerque is from the

sky. And why not? With its mile-high elevation, Albuquerque is itself part sky—which helps explain Albuquerque's International Balloon Fiesta. It has grown from 14 entries 15 years ago to some 500 now—the world's largest assemblage of hot-air balloons. For nine days each October, balloonists from all across North America gather in darkest morning hours on a field that resembles a circus midway (pages 620-21).

Dawn peeks through gray lumps of cloud as I join the crew of record-setter Kris Anderson aboard his famous *Knight Hawk*. Kris readies the empty envelope, spread out wide on the ground. With a whoosh the burner begins heating air; the envelope billows, and moments later we are high above the city.

We watch the rising sun burn away cloud on Sandia Peak, at nearly eye level. Sandia means "watermelon" in Spanish, and a green rind of vegetation neatly rims the red cliff.

Albuquerque spreads below us, a linear city paralleling the tree-lined Rio Grande. Bright skyscrapers stand like boxes lassoed by freeways; Interstate 40 heads east and west, and I-25 north and south. X marks the economic center of the state. And on the western horizon looms Mount Taylor, a peak that Indians consider sacred.

A MEASURE OF MIRACLE remains with Mount Taylor, and next day I drove to the heights above Grants, where Chevron Resources runs the state's last full-scale uranium mine.

Thermal springs and an unusual depth make the Mount Taylor Mine an engineering challenge. To the *Wall Street Journal* it's "the deepest hot tub in New Mexico." It felt that way to me when I rode its cage down 3,200 feet. Mine manager Jack Burgess and I were suited with belts carrying batteries and self-rescuers—catalytic converters that can turn carbon monoxide into carbon dioxide. We needed rubber boots and yellow slickers, for a dark drizzle pours from holes in the ceiling. Hardly a refreshing shower—the water spilling on our heads had a temperature of 130°F.

"When we make this next turn, hang on to your hat," Jack warned—and just in time. A narrowing passage created a wind tunnel of forced air. Blowers, refrigeration, and pumps all keep the mine in operation. "We try to keep the temperature down to 85 degrees where the miners are working," said Jack. "Right here it's 98." And wet.

Working in this underworld weather of gales, floods, and darkness, miners extract 600 tons of uranium ore each 24-hour day.

"We have first-rate miners—100 of them," said Jack. "All experienced. We have a thousand applications on file. Hard-rock miners are like dinosaurs. In the West there used to be maybe 25,000 of us. Now we're about 2,000. An independent bunch."

Until the price for uranium improves, Chevron will make little profit here. Ores from Africa and Canada are more profitable. The state's whole extraction industry has felt the same pressures. Oil and gas still employ 8,900; coal and quarrying, 3,900. Overall, extractive employment is down some 40 percent in a decade.

There's an irony here: The quest for precious metals has long brought people to New

Mexico. Mount Taylor sits on the border of Cibola County, named for Coronado's elusive seven cities of gold.

According to my friend Fray Angelico Chavez, historian, poet, and longtime Franciscan friar, recorded New Mexico history begins with his birth. Strictly and literally speaking, Fray Angelico was born in 1910 in Wagon Mound, a prairie town on a branch of the Santa Fe Trail, "but I say that I myself was born when those first Spanish settlers were preparing to enter New Mexico, their land and mine."

The year was 1598, when Don Juan de Oñate, standing among old cottonwoods along the Rio Grande, solemnly claimed this land for King Philip II of Spain. The kingdom was called New Mexico—"named for the city of Mexico," notes Fray Angelico, "some 240 years before New Spain became a republic called Mexico."

Fray Angelico has studied his own "bloodlines back through the myriad-veined system of a dozen generations." Because the population is small—fewer than half a million Spanish-speaking people in the state today—old families are interrelated.

Communities were intensely isolated; overland mule trails to Mexico City took more than a year. Few outside influences penetrated the region, so customs and

Daughter of a weaver *and a medicine man, Pattie Sherman, at far right, weaves a rug in her parents' home on the Navajo Reservation. New Mexico holds a quarter of the vast reservation; most of the state's 70,500 Navajo live there. Pattie uses wool from the family's sheep. "I tried store wool once," she says, "but it tore apart." In the tradition of her generation, sculptor Lillie Brown (above) wears her wealth in turquoise and silver.*

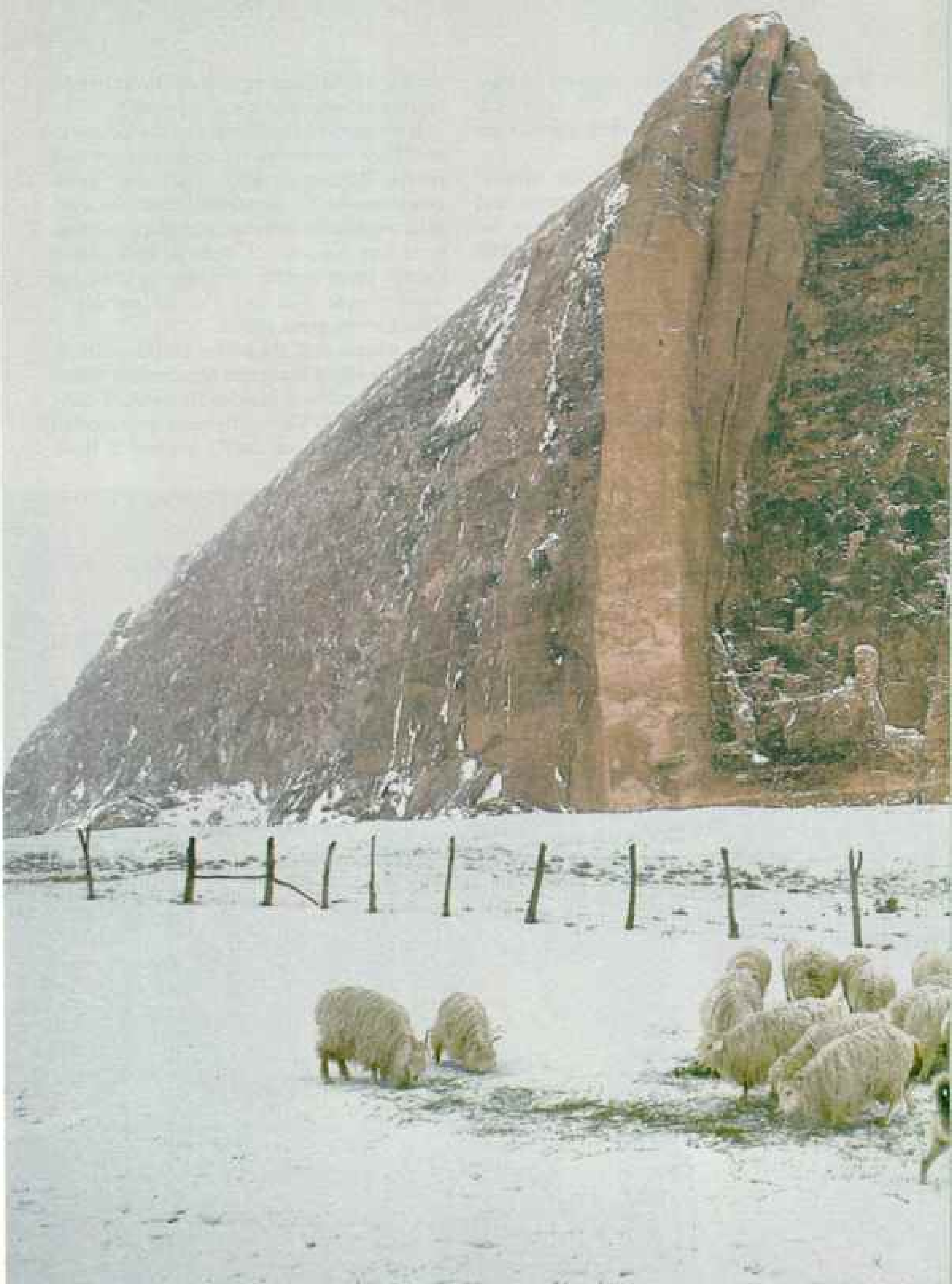
language were preserved without change until early in this century. "We were still speaking the 17th-century language of Cervantes," notes Fray Angelico.

Take the word *trucha*. It means "trout," and mountain streams have always had abundant trout. Since the ocean was far away, people in some villages came to call all fish truchas.

Outsiders are still not welcome in some of the mountain villages. At Chimayo, Jake Trujillo showed me his family's textile studio, a cheery bright place with the smell of wool and herbal dyes and the soft shuttling sounds of looms. Jake has been weaving—using traditional designs and techniques—since 1925. "My son Irvin is the seventh generation of weavers," he says proudly.

Irvin studied engineering at the University of New Mexico but returned home to help revive Hispanic crafts. Still, with some neighbors the Trujillo family feels a barrier. Jake worked for years as a property manager in Los Alamos. "I went to high school there," Irvin recalls. "So here in Chimayo some people still feel I'm an outsider." That's seven generations.

In a book that she edited on this culture, anthropologist Margaret Mead noted that to be a northern New Mexico Hispanic "is to be of a village." The settlement represented "the basic cultural fact"; beyond it there



An orphaned lamb finds care *in the arms of Melvin Touchine, who was raised with a Navajo regard for sheep. "He's probably asking the lamb if it's cold," says Melvin's mother, Dolly Pine, who also grew up herding beneath the sandstone*

monoliths east of Gallup. "The lamb's mother died giving birth, so Melvin brought it in each night. He was the mother, he fed it milk." Sheep and cattle, though declining, account for more than half the state's agricultural income.

Deep Spanish roots *are nurtured and celebrated during the Fiesta de Santa Fe, held annually since 1712. A candlelight procession after Mass (right) concludes the city's biggest festival, commemorating the Spanish reconquest of the capital in 1692.*

Mexican Americans dominate Hispanic culture in southern New Mexico. The fiery heart of the state's cuisine, chili peppers harvested in Hatch (left) help make the state the nation's top chili producer.

was then "no keen awareness of special national or cultural identity."

"Some villages are very peaceable," notes one historian and geographer who has worked in the state, "and some aren't. In the town of Mora people have yelled at me: 'Get out of town, White Eyes!' " (In 1847 U. S. Army cannon razed Mora, so the village grew back tough.)

In another old Hispanic village, colleague Danny Lehman photographed local groups with lowriders, the souped-up, sawed-off automobiles. "They started drinking straight gin at 5 a.m.," Danny told me. "You wouldn't believe how much they drank all day. But funny thing—if their mothers were around, out of respect, they wouldn't touch a bottle to their lips. They'd go behind the house to drink. . . . An outsider could sure get into trouble in one of their bars."

And there are other ways to get into trouble. "See that car with smashed headlights?" an attendant asked me in a lonely gas station in the north. "Kids trashed it—because it's got Texas plates." Resentments date from Texan invasions of the last century. But with New Mexico plates on my own rental car, I got a helping hand oftener than the hostile finger, even in rundown, weedy settlements. Or in towns too dry for weeds.

On highways all over the state I was often stopped at roadblocks by lawmen looking for undocumented workers. Only once did a farm worker admit to me he was illegal—and then only after a long chat when he was sure I wasn't official. I asked him what he thought of Hispanics from northern New Mexico. "They speak like country people at home," he told me in Spanish. "Some of them are rich. Own land and cars. Some . . . feel they are better than people like us."

Today New Mexicans have local Spanish-language radio and television programs as well as some from other places, so things change fast. And in my favorite Hispanic town in the northern mountains, changes come even faster.

I refer to Truchas, which sits like a saddle on a steep hill. The view from Truchas is wide, green, and vertical. A single winding road links the town with other lofty

settlements in the Sangre de Cristo Mountains. And not only the roadway links Truchas to the past. Once Comanche war parties used this route to raid Spanish colonists. But in 1754 an energetic Spanish governor founded Truchas so its plaza would have "only one entrance for carts so that the inhabitants may defend themselves against . . . their savage enemies."

The frontline settlers survived repeated Indian attacks, often using only bows and arrows against better armed Comanche. Today the town has weathered another kind of invasion. Actor-director Robert Redford chose it as his location to film John Nichols's book *The Milagro Beanfield War*.

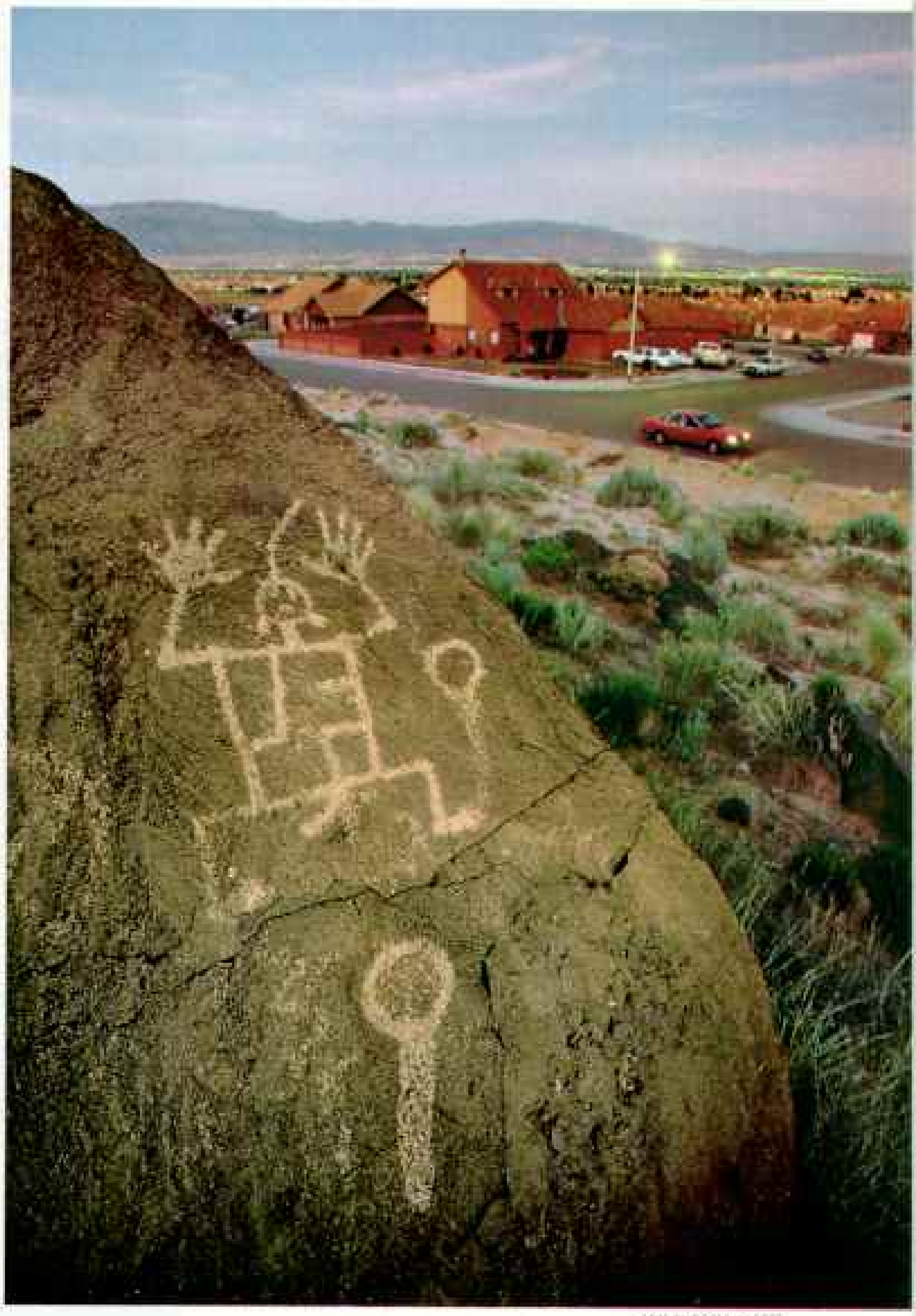
Redford was lunching on soup and a salad in his trailer when I talked with him. He squinted out the window toward his movie-set town plaza and at snow-peaked mountains serrating the horizon. "The light is special here. You get these incredible skies. And combustible weather patterns.

"Then there's the blood that's been spilled here, the violence that's part of the heritage. Imagine three cultures clashing, dying, and fighting with one another for over 300 years. I think the ghosts, the bloodspill, the spirits do stay around to some degree. . . ."

Bloodspill, of course, brought New Mexico under the Republic of Mexico for 25 years, and then in the 1840s under the Stars and Stripes. Railroads replaced the Santa Fe Trail, and trainloads of English-speaking settlers arrived bringing different laws and religions. What of the Spanish who have been living there for 300 years? Fray Angelico reminds us: "They wish to be identified correctly as longtime Americans by birth and nationality."

OF THE 50 U. S. STATE CAPITALS, the most Hispanic—and the oldest—is the terra-cotta town of Santa Fe, population 52,000, resort, retirement haven, and art colony. I remember it, albeit dimly, as a village in the 1930s; in its plaza my grandfather bargained with an old Indian for a Navajo rug that now decorates my house.

Bargaining continues in the same plaza as it has for four centuries. And inside the



ANN PURCELL (LEFT)

The world's largest gathering *of hot-air balloons soars above Albuquerque during the annual International Balloon Fiesta in October. The state's most populous city was christened in 1706 for the viceroy of New Spain. Encroaching on the past, new houses near Albuquerque's West Mesa escarpment (above) border one of the largest concentrations of rock art in North America. Like this horned figure, many of the more than 15,000 petroglyphs are thought to be religious and ceremonial images carved on volcanic basalt by Pueblo Indians who farmed here between 1300 and 1600.*

colonial Palace of the Governors, museum visitors take a vivid backward look. Santa Fe is a delicious destination.*

"I come for the opera," says a clergyman.

"It's like Europe, but we can drive," remarks the owner of a mobile home.

Whatever the lure, some 22.6 million travelers come to New Mexico annually and leave 2.2 billion dollars behind—and most come to colorful, traditional Santa Fe.

One of the city's traditions is spiritual. I attended the centennial celebration of St. Francis Cathedral, seat of the Roman Catholic archbishop of Santa Fe. The ceremony lasted for hours with hymns in English, Spanish, and Latin, as well as Indian sign language. Aptly, Archbishop Robert F. Sanchez is the first Hispanic to hold the Santa Fe see, and he has made an effort to include all ethnic groups in "this land of faith—this holy land," as he calls his home state. He has encouraged Indians to anoint the altar with corn pollen and to fan incense smoke with the eagle feathers they hold holy. He has recognized the local Penitentes, an age-old brotherhood once accused of ritual excesses, and has brought them toward mainstream Catholicism.

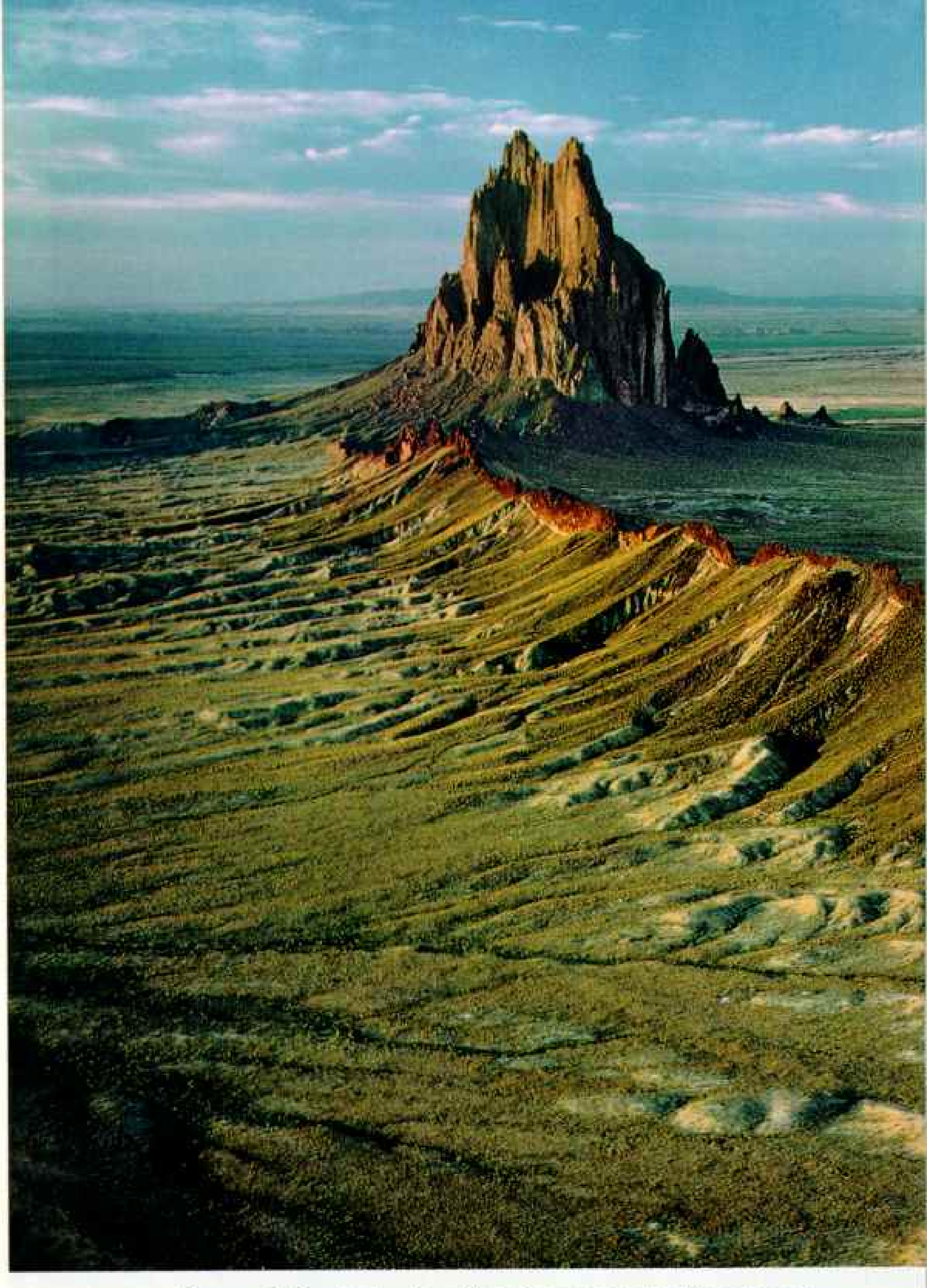
THE SYNTHESIS of ethnic groups may be easier in church than in the workaday world. At the Indian pueblo of Taos north of Santa Fe, I talked with Peggy Sandy—widow of Percy Sandy, a Zuni by birth. They met at an Indian school in Santa Fe, married, and first tried living on the Zuni Reservation, "but it was too hot, so we moved here." Still, no Zuni could buy a house in Taos Pueblo. With her husband now dead, Peggy would be permitted to buy a house among her own people on the outskirts of the settlement, "but who would pay for it?" She looks around her two-room apartment. By day it's a gift shop with showcases of curios. A skylight and whitewashed plaster walls keep it bright and attractive. By night, when tourists are required to leave Taos Pueblo, Peggy takes coverlets off the sofa to make it a bed.

Taos Pueblo is perhaps the most touristic of the old Indian settlements. Visitors pay an admission fee and can wander around designated areas. A central courtyard is surrounded by the flat-roofed, layered buildings that made the word "pueblo" an architectural term. On the surface Taos Pueblo seems to have changed little in its seven centuries.

Peggy Sandy knows better: "Things are

*See "Goal at the End of the Trail: Santa Fe," by William S. Ellis, in the March 1982 GEOGRAPHIC.

***"The only place in America** where true color exists," artist Marsden Hartley wrote of New Mexico in 1918. The play of light and landscape around San Patricio today inspires the paintings of Henriette Wyeth Hurd and Michael Hurd (right), widow and son of artist Peter Hurd. "It gets in one's blood," says photographer Eliot Porter (top), who has called Santa Fe home since 1946.*



"Our grandfathers had no idea of living in any other place," *Navajo leader Barboncito told the U. S. government in 1868, when the tribe chose to retain this arid land for their reservation over greener pastures offered in Oklahoma. The 1,500-foot-*

high pinnacle known as Ship Rock, or Tsé Bit'a'í—"rock with wings"—is regarded as one of their most sacred sites. Infused with myth, the volcanic core was thrust up 30 million years ago, when magma pierced the surrounding earth with basaltic rays.

different. You can't slap your children any more; they'll slap you back." I heard similar complaints in other pueblos. "The kids watch television too much," one Isleta grandmother said. "They talk English to each other, not Tiwa." (Pueblo Indians speak variants of three language groups.)

One Pueblo father complained about prosperity: "With money come bad habits. Older kids get whiskey. Some even drugs. We're too close to cities."

IT HAS NEVER been easy to be an Indian, and the terrain of northwestern New Mexico shows some of the reasons. The Colorado Plateau has been called the oldest and the youngest land in the lower 48 states. Oldest in weathered landforms that resemble caves turned inside out . . . youngest economically for its lack of development.

West of Farmington, under the ragged Ship Rock peak on the Navajo Reservation, the land often seems eroded from overgrazing, soil impoverished like the people on it.

Near Gallup on a rocky hilltop stands Ellis Tanner's Indian trading post, a general store with 90 percent Navajo employees.

Typical is Mrs. Katherine Yazzie James, the soft-spoken wife of Ray James, a roadman, as the Navajo call some of their religious leaders. Ray works as a custodian at the Gallup High School, so the Jameses commute seven miles from their rural home "under the mountain," where they tend 18 sheep and mohair goats, some chickens, and a cornfield. "We don't have running water or regular electricity," says Katherine. "We use kerosene lamps, but we have a generator for TV."

Indian living standards vary as widely as their lands. The Mescalero Apache, for

Art and the art of having fun *go hand in hand in Santa Fe. The nation's second oldest city supports some 150 galleries and a vibrant art community. At the Rio Grande Gallery, R. C. Gorman (left) puts his famous signature on posters—and on fan Stephanie Potters (below).*

The dress is gala, the food gourmet, and the atmosphere anything but stuffy as tailgaters (bottom) celebrate opening night at the renowned Santa Fe Opera. Supported by patrons from across the country, the opera last year brought 36 million dollars into the state during its brief summer season.

ALL BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JODI COBB

Rowdy end of the trail *a hundred years ago, Magdalena still caters to ranch hands like Manuel Franco (facing page). The serene Rio Chama Valley (below) captured artist Georgia O'Keeffe, who painted here for more than 50 years. "If you ever go to New Mexico," she said, "it will itch you for the rest of your life."*

instance, enjoy forested mountains—and own a lavish resort hotel. But on the brushy mesas south of Gallup at the town of Zuni, simple houses of cinder block and plastered adobe have a solid, if Third World, look. There's cottonwood shade at Twin Buttes High School; stocky Alex Seowtewa, a Zuni historian, teaches there. "We Zuni have survived by dealing with nature," he says.

Alex is himself a survivor. An orphan at five, he was raised by his grandfather, a high priest who knew no English. From the old patriarch, Alex learned about the pre-Columbian theocracy of his people, how "to go hand in hand with the world," how "to make offerings of cornmeal or pollen or honey or even turquoise for using the land—a payoff to Mother Earth." He learned about the stars "like warriors to protect us overnight until Father Sun takes over." Thus protected, the Zuni have survived on the state's westernmost border, the largest of the 19 Pueblo nations in New Mexico.

"We have a population of nearly 10,000," notes Alex. "But we still know one another. We share. If a farmer is unlucky with his crop, others share with him. We also share laughter. We tease. It makes you feel good."

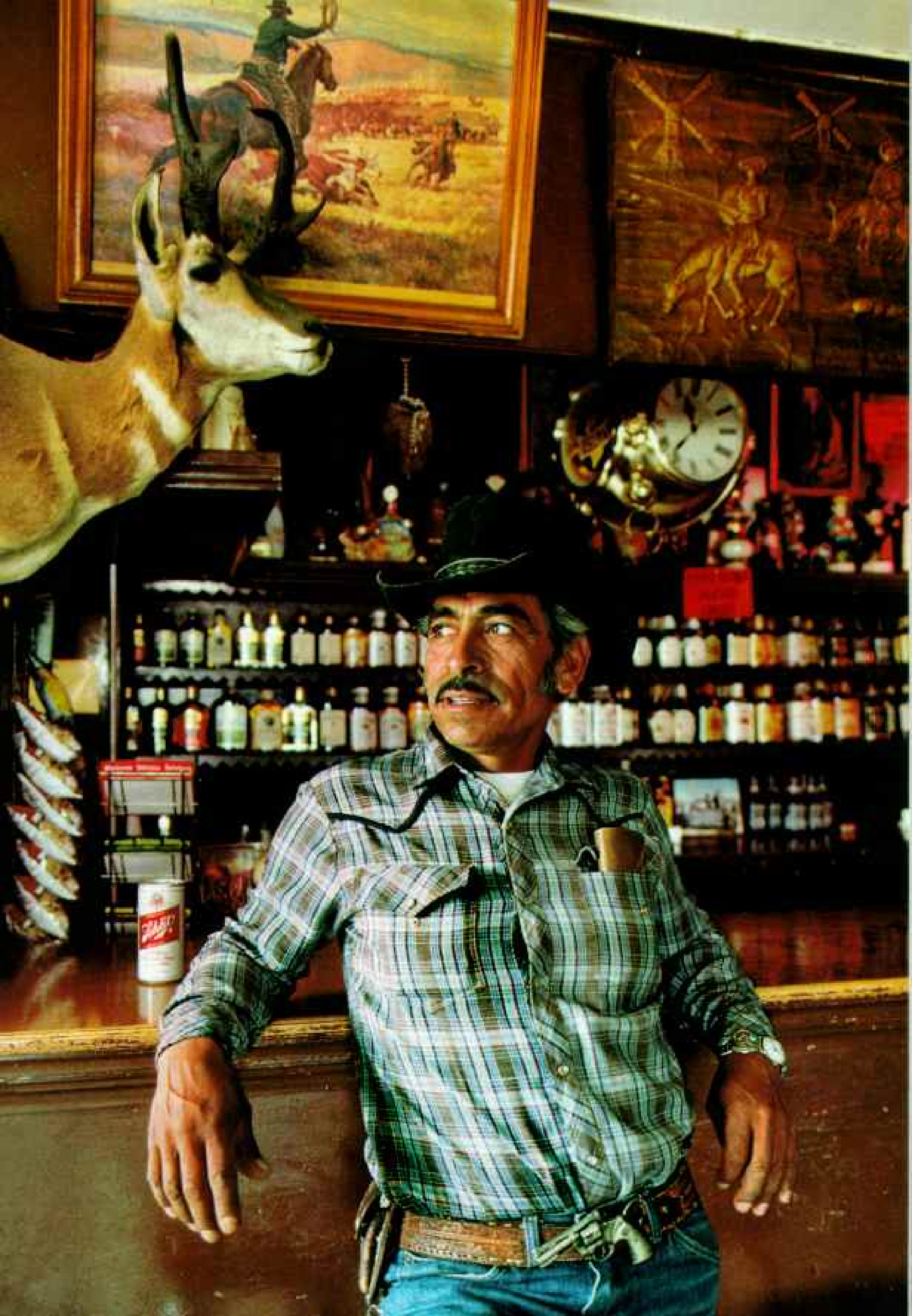
Alex's grandfather died when the lad was only 14, "but my relatives wiped off my tears." He won a scholarship for art school, served in the U. S. Army, and then took to strong drink. "We get caught between two worlds," he explains. "I stumbled for three or four years, but I quit drinking. That was 30 years ago. Now I help others through a program on alcoholism and drugs."

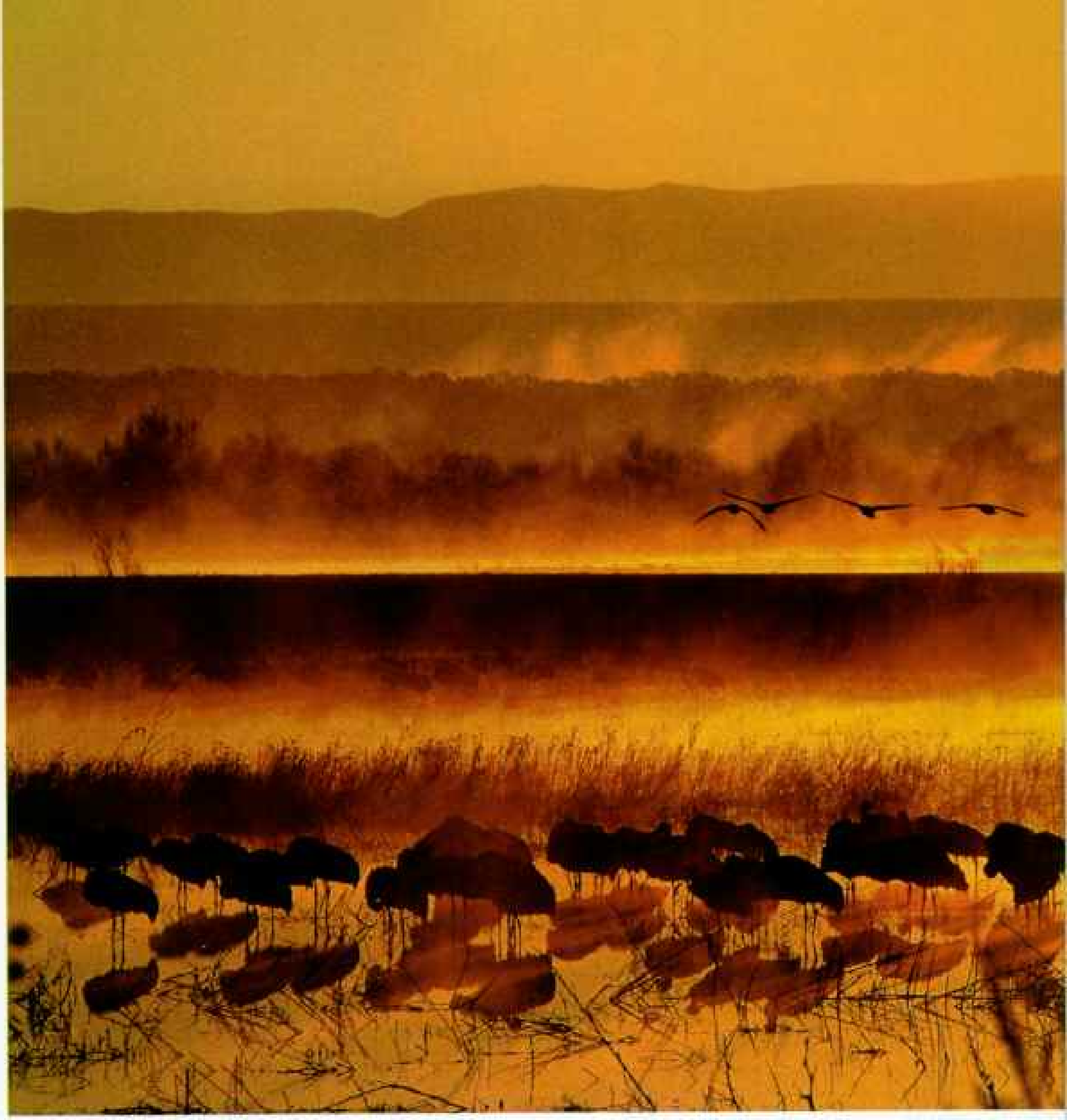
In the 1960s the Zuni began restoring their mission church, Our Lady of Guadalupe, first built about 1660. "The roof had fallen in," Alex recalls. "But our old people could remember what it was like. They said, 'One thing is missing—the paintings on the wall.'"

In 1970, encouraged by the parish priest, Alex climbed a scaffold and began a work that continues to this day: painting large murals of traditional Zuni ritual dancers, or kachinas. The church is as magical as its painted dancers. Famous people drive dusty miles to see Alex's paintings: Jacqueline Onassis, Harry Belafonte, the list is impressive. But more impressive is Alex himself.

"Once on my birthday," he recalls, "I was sitting up on my scaffold and looking out that window. We Zuni believe our beloved ones, when they are dead, return as clouds—in summer rain, in winter snow.

"I saw this beautiful purplish cloud with white-silver trimming. And I said to myself, 'Hey, maybe you're my mother, and you visit me on my birthday.'





"I had tears in my eyes, and I climbed down and knelt on the hard floor and asked the Man Upstairs to give her a place of peace. . . . Spirits are always with us to help us make right choices."

TIME AND AGAIN as a traveler criss-crosses New Mexico, he crosses the Rio Grande like a musical theme. The great river splits the state vertically, providing cliffy gorges and white-water rapids in the north, slowing down voluptuously behind a dam for Elephant Butte Reservoir, trickling into straight ditches to irrigate gardens at Hatch.

This route of conquistadores and cattle herds has more recently given name and fame to the Rio Grande research corridor. It starts at the scenic spot where the research effort began during World War II, Los Alamos. It was near there that J. Robert Oppenheimer, who led the quest for an atom bomb, once had a summer home. And no wonder. At a 7,300-foot elevation this old volcanic landscape is part of one of the world's great vistas, the Jemez Mountains on one side, the Sangre de Cristo range on the other—all of it fragrant with pine.

The Los Alamos National Laboratory is managed for the U. S. government by the

***Silhouettes of success**, sandhill cranes huddle at dawn in Bosque del Apache National Wildlife Refuge. More than 12,000 winter here along the Rio Grande; there were fewer than 20 when the refuge opened in 1939. Last winter 13 endangered whooping cranes also foraged here, along with 60,000 geese and ducks.*

University of California, and the lab's 8,000 employees solve problems for the Departments of Energy, Defense, and Health and Human Services, NASA, the Environmental Protection Agency—name it. Work ranges from nuclear fusion and fission to the disposal of nuclear wastes, free-electron lasers, even studies of the solar wind. Most efforts are defense-related; two-thirds of the nuclear weapons in the U. S. arsenal today represent Los Alamos designs.

Designs—but not the engineering. The people of Los Alamos realized in the late 1940s that for testing some of their hardware, their Z-division needed more space—and an airfield. The division was moved to Albuquerque, where it became the Sandia National Laboratories.

In 1949 President Harry Truman asked the head of AT&T to provide the management for Sandia. So today AT&T Technologies Incorporated still operates Sandia as a public service for the Department of Energy, without any kind of fee or profit. As at Bell Laboratories, Sandia scientists do their basic research, but stress application.

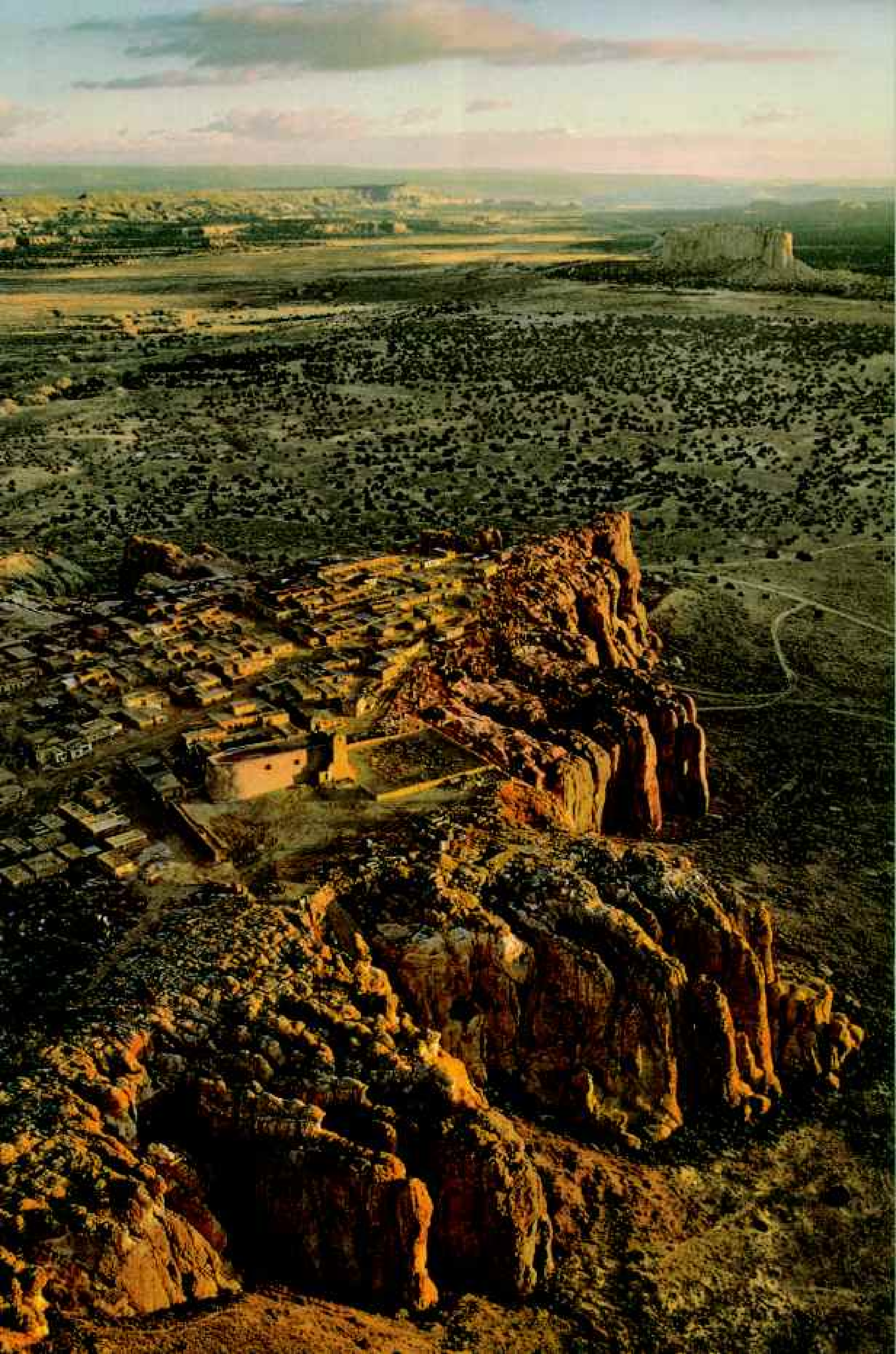
Behind the barbed wire at Sandia's 40-square-mile Coyote Canyon Test Complex, men work all kinds of secret gadgets. Rockets fire into layers of ice. Containers for transporting atomic waste are burned, bashed, and get smashed in train wrecks on a 10,000-foot rocket test track. At the Large-scale Melt Facility scientists learn ways to prevent or combat another Chernobyl.

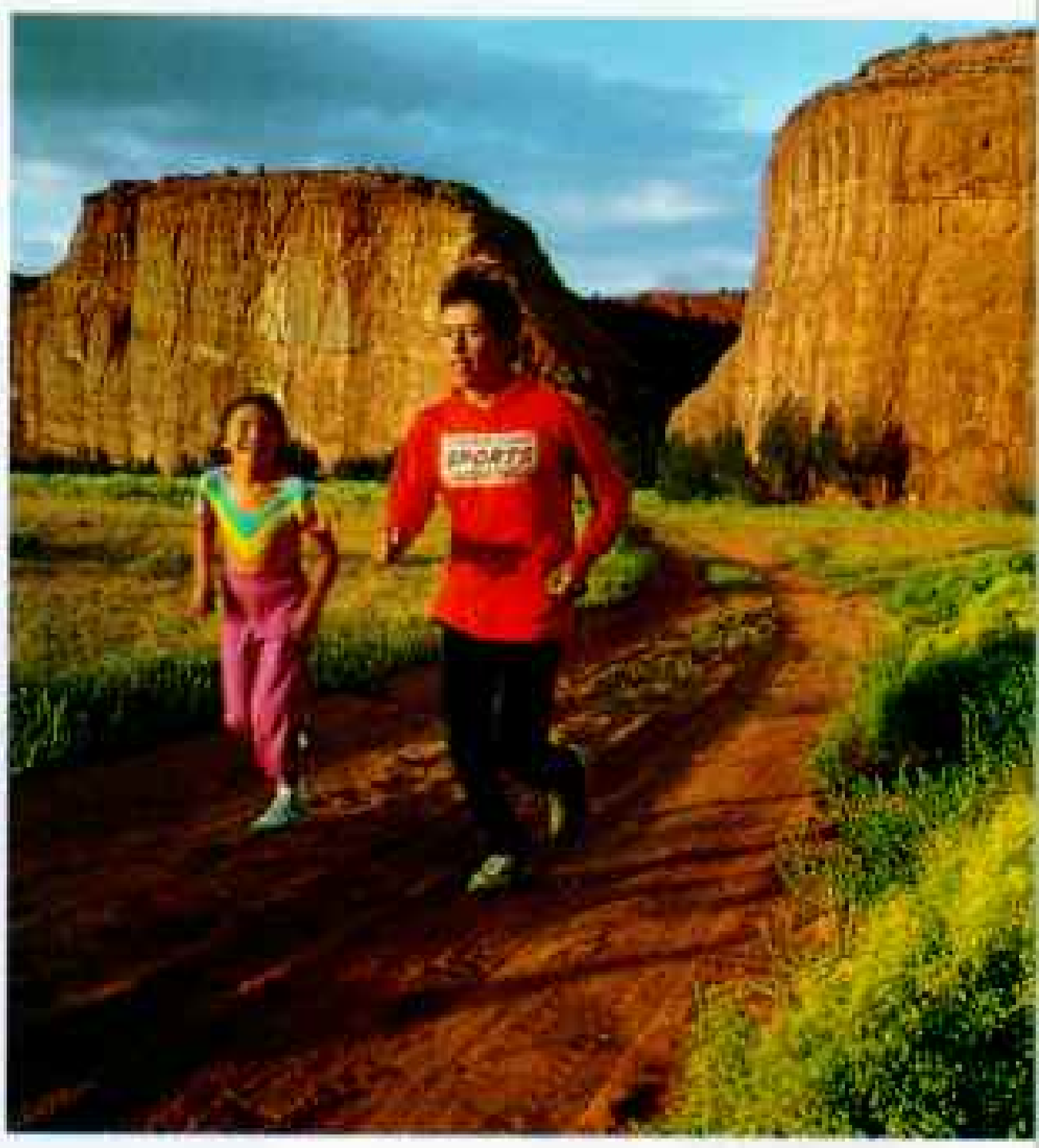
At Los Alamos research seems a tad less extroverted. "We neither compete nor duplicate," says Siegfried S. Hecker, director of the Los Alamos National Laboratory. "Take the fusion programs—each lab tries a different approach."

The success of both outfits lies with their people, a brilliant bunch of individuals, some 15,000 skilled folk in all. To recruit newcomers, both labs rely on their own scientists and engineers to attract talent. The climate also helps. So do pure curiosity and old-fashioned patriotism.

"They say if you stay here long enough to wear out a pair of shoes, you'll stay." So says Sandia's Randall C. Maydew, a man who has worn out many shoes here as one of the world's authorities on aerodynamics.

J. Pace VanDevender's interest began at age eight. He heads the pulsed-power programs at Sandia; his new technology delivers electrical energy equivalent to a stick of dynamite—but a thousand times faster than a dynamite detonation. Pulses at Sandia can produce electron or ion beams,





*"**Sky City,"** Acoma Pueblo has occupied its 300-foot-high mesa since the 12th century. Most of the Acoma now live in surrounding towns, gathering here for festivals. About 33,000 Indians live in New Mexico's 19 pueblos. In the tradition of Pueblo message runners, record-setting mountain runner Al Waquie of Jemez Pueblo trains with Raylene Fragua (right). "My grandfather and father showed me the old trails," he says. "I run to encourage the young to find them."*

X rays, or gamma rays in pursuit of controlled thermonuclear fusion or the weaponry for the Strategic Defense Initiative.

"I watched a lightning storm in Mississippi from a window in my grandfather's farmhouse," VanDevender says. He has been interested in thunderbolts ever since.

At Los Alamos there's Ed Flynn, once a nuclear physicist but now a neurophysicist. His specialty changed with tragedy—when his wife fell into a coma that lasted 18 months until her death.

Dr. Flynn watched the helplessness of doctors, and "after a year you want to hit someone," he says.

Instead, he began to study the human brain himself, tracing the stimuli, mapping their movement. His speciality is called magnetoencephalography—he measures the magnetic fields from the brain. The stimulus of sight, for example, moves through neurons to the back of the brain, its destination located precisely by these studies for the first time. Dr. Flynn's research is already being applied medically in treatments for epilepsy—and for coma caused by brain damage.

Since he retired as president of Sandia Laboratories, George C. Dacey spends much of his time promoting local opportunities. "We have something unique—a large technical nucleus on which to build some industries right now," he says.

"Then we have other areas of technology not yet ready but important for development in the future. For example," he continues, "plant genetics for arid environments—cash crops for the desert. (After all, three-fourths of the world's land is dry, like New Mexico.) Another area is computer technology—particularly for artificial vision and artificial intelligence, and noninvasive diagnostics for medicines."

SO WHAT IS NEW in old New Mexico? And what of the values held dear—the land's faith, hope, and charity?

Well, rocky, rainless mountains can be chary of charity. But we have the archbishop's word on this land of faith. And hope comes with abundance.

"We're all optimists in the livestock business," laughs rancher Peter Mocho.

"Mining has always gone in cycles," says mine manager Jack Burgess. "I worry about not having enough miners in 20 years."

"We switched from cotton and alfalfa and grains," notes Roswell farmer Harold Hobson. "Went into chili peppers, squash, tomatoes, watermelons. It's labor intensive, but our family is *committed* to farming."

Science may offer the most hope of all. New Mexico's governor is Garrey Carruthers, himself a Ph.D. and former professor of agricultural economics. "I'd say that per capita we are the leader in terms of scientific capability of any state in the Union. The Rio Grande Research Corridor may be the secret to the New Mexico economy in the next 20 years."

As in the past, New Mexico's hopeful future may be to shape the future for us all. □

Scorpionfish:

Text and
photographs by
DAVID DOUBILET

THIS IS A CREATURE of fantasy, I think, as a baroque vision floats above me. Fluttering its striped and polka-dot fins, this fish stands out, even in the bizarre coral reef realm of the Gulf of Aqaba off Israel's southern tip.

Its finery has inspired many names—lionfish, zebrafish, firefish. Many marine biologists now call it turkeyfish, alluding to its feather-like pectoral fins. I like to imagine that it was designed by a court artist catering to the whimsy of Ludwig II, the mad king of Bavaria.

With all its frills the slow-moving turkeyfish—here close to life-size—should be a sitting duck for predators. It is, in fact, a well-protected hunter with dorsal, anal, and pelvic spines loaded with venom.

Poisonous spines are a distinguishing defense mechanism of most species in the family aptly called Scorpaenidae. The scorpionfish family counts more than 300 members around the world. The Gulf of Aqaba, an arm of the Red Sea, is home to more than a dozen species—ranging from these extravagant beauties to the nightmarish stonefish, the most venomous fish in the world.

PTERois MILES. FORMERLY P. VOLITANS, A NAME NOW RESERVED FOR THE PACIFIC OCEAN VARIETY

Danger in Disguise

SHIMMERING SUNLIGHT in the late afternoon transforms the reef into a hall of mirrors. Here I witnessed what seemed to be cooperative hunting—rare among fishes, and never before documented in turkeyfish. A school of small fish hung like a chandelier beneath the surface. Five turkeyfish circled, herding the school into a tighter mass. Two turkeyfish drifted closer, lunged, and a few silvery fish disappeared. Then the hunters became herders again, while the others took their turn.

WHERE THE SANDS of Sinai spill into the Gulf of Aqaba, patrolling turkeyfish sweep the bottom with their pectoral fins to stir up small crustaceans. These turkeyfish and other scorpionfish take advantage of the old abandoned fish trap in the background, lurking there to capture young fish drawn to the algae-covered shelter.

When I lay on the sandy bottom to photograph the spectacle, half a dozen turkeyfish approached me one by one. Soon I was surrounded. I gripped my camera tighter as fins brushed the back of my hand. Though turkeyfish venom is not lethal to humans, the intensely painful sting can bring on nausea, paralysis, and convulsions. When threatened, the fish arches its head down to point dorsal fins at the aggressor. But I made no move to alarm them, and, like bored guests at a dull party, they soon drifted off.

I swam about 160 feet away and began to photograph an anemone and the tiny shrimp that live around its base and tentacles. Suddenly I was surrounded again by the fish-trap gang. They looked at me and then suddenly discovered my subjects. In a flurry of pectoral fins and snapping jaws, my shrimp vanished. I felt strangely like a waiter.

Scorpionfish: Danger in Disguise

I STARED at the rocky bottom, and the bottom stared back. Like a chunk of coral with eyes, it was *Inimicus filamentosus* (bottom), sometimes called the devil scorpionfish. With a shock I realized that the neighboring green rock was another species, *Scorpaenopsis diabolus*. Well camouflaged, both fish are sitters, waiting motionless on the bottom for small crustaceans and fish to feed on.

I had searched for an *Inimicus* for weeks with Israeli marine naturalist David Fridman before finding this one in the shallows off Elat. Its short, slender "legs"—pectoral-fin rays covered with hard cuticle—allow the fish to walk along the bottom. Swimming, it unfurls hidden beauty (top left). Like signal flags, the gold-and-black fins and tail may warn would-be predators: I am venomous. The markings, found on both sexes, also help the fish recognize its own species for mating. Fertilization in these species occurs externally.

The shortfin lionfish, *Dendrochirus brachypterus* (top right), grows a fleshy fringe on its spines and body, helping it blend with coral outcrops.

David Doubilet has recorded freshwater and marine life from Loch Ness to Japan, the Galápagos, and Australia in 21 GEOGRAPHIC articles. David, his wife, Anne—also a diver—and daughter, Emily, live in New York City.

MASQUERADING as a trio of rocks, gargoyle-like stonefish (left) are the most feared of the scorpionfish. Rarely seen swimming (below), *Synanceia verrucosa* lies in the shallows where unwary waders can step on it or pick it up. Its spines contain a powerful venom. The sting is so excruciating that people have begged for death, and some have gotten their wish.

The pressure of a victim's foot or hand on a dorsal spine pushes back a fleshy sheath containing venom glands, squeezing venom up two grooves on the needle-sharp spine (top). In a sense, the victim shoots himself. Even the sting of a dead stonefish can be disabling. An antivenin developed in Australia is effective against two of the world's four species of *Synanceia*.

The skin of a stonefish itself is poisonous; glands in the wartlike tubercles secrete toxins. The skin is also host for tiny worms, crustaceans, and algae. Periodically the stonefish sheds this encrustation and reveals pink and red hues.

The appearance and poison seem to do the job; stonefish have been found in only one predator, the sea snake.

Other scorpionfish are at risk even among relatives, I learned when I knelt down to photograph a stonefish. My flipper stirred up a smaller scorpionfish that flew through the water and—in its last mistake—landed on the stonefish's head. With lightning speed the stonefish opened its mouth and gulped down its cousin. Then it paused and extended its jaws in a great yawn. I prefer to think of it as the ultimate marine belch. □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IN KOREA

HAITI

Against All Odds

By CHARLES E. COBB, JR.

Photographs by JAMES P. BLAIR

BOTH NATIONAL GEOGRAPHIC STAFF

SUSPICION SWIRLED amid jubilation in Port-au-Prince on March 29 as the polls closed and votes for a new constitution were about to be counted. "*Veye yo*—watch them," voices shouted in the Champs de Mars when officials began moving to an outdoor stage with ballot boxes containing the day's vote. Other voices broke out in song: "We have to watch out in the mountains / in the plains / we don't want them to steal / in the new elections."

Earlier in the day, near the small village of Petite Rivière de Nippes, I had watched peasant farmers tentatively approach a small church parish house, not quite believing that they could vote.

On a cardboard bed a three-year-old child sleeps in the netherworld of a Port-au-Prince slum. Outside the metal-and-cardboard shack, the Western Hemisphere's most impoverished country struggles for redemption from generations of plunder and tyranny.

"I'm in my 60s," Clero Brisma said. He was voting for the first time since 1964, when the ballots allowed one choice: yes, Francois Duvalier, president for life. To vote no meant possible arrest for defacing a ballot. Clero Brisma smiled when I asked about voting now. "I am glad to vote today," he said simply.

"We don't want them to steal . . . ," Haitians had sung in March. But on June 22—defying the promises of the new constitution—Haiti's three-man National Governing Council (CNG) decreed that it, rather than an independent electoral council, would control pending presidential elections. "Whether the decree is unconstitutional or not does not concern us," Information Minister Jacques Lorthé told a news conference.

To Haitians that meant the army planned to rig the vote—to steal—and they exploded. In Haiti's *(Continued on page 650)*

Passions flared last summer as thousands of angry Haitians took to the streets, demanding the resignation of Lt. Gen. Henri Namphy (below) and his interim military government. Triggered by government attempts to seize control of upcoming elections, the insurrections marked Haiti's worst political crisis since Jean-

Claude Duvalier was deposed in February 1986, ending 29 years of corrupt and brutal rule by the Duvalier family. Riots began in Port-au-Prince on June 29, with demonstrators frequently confronting army troops (far left). Though the junta backed down on the election issue, opposition leaders like Father Jean-Bertrand Aristide (top left)—who claims "Duvalierism is still wrapped around the people's throat"—continued to rally resistance. Strikes, marches, and riots resulted in more than 30 deaths—many in the Port-au-Prince slum of Cité Soleil, where neighbors grieve for a victim (left) apparently shot at random by troops. Photographer Carole Devillers and other journalists were also fired at while covering the street battles.

ALL BY CAROLE DEVILLERS

Naked and vulnerable, the ravaged landscape along Haiti's northeastern corner stands in stark contrast to the dense forests of its neighbor, the Dominican Republic. Hungry peasants have stripped the land of its soil-stabilizing tree cover to plant quick-growing foodstuffs. Once one of the world's most productive agricultural regions, Haiti today relies on imports for much of its food.

The thick forest that once blanketed the nation was disappearing by the end of the 19th century. By 1954 less than 9 percent remained. Today there are only six tracts larger than 20 square miles (below), and all patches of woodland with 60 percent or more tree canopy cover only 500 square miles—less than 5 percent of the land area. If the trend continues, Haiti's forest remnants will vanish by the middle of the next century.

Signs for optimism are few. In recent years peasants have felled remaining trees for charcoal, the country's primary fuel. What's worse, nearly a quarter of the country's exposed soil is undergoing rapid erosion. Lost tree cover causes Haiti's rivers to flow in torrents, decreasing their effectiveness for irrigation.

Creole language *"Raché manyok bay tè-a blanche*—uproot your manioc and clear the land completely"—became the rallying cry of protest.

A coalition of groups—labor, religious, and political—known as the 57 Organizations, spearheaded countrywide demonstrations. Port-au-Prince and other cities and towns were paralyzed by a general strike. Burning tires and buses blocked streets and roads. Businesses were shuttered.

The CNG called out troops, who opened fire on crowds of protestors. In two weeks more than 20 persons were killed and more than a hundred wounded by gunfire. Journalists, both Haitian and foreign, were frequently shot at by soldiers. Two youths apparently looting a store were dragged away by soldiers and beaten with rifle butts and clubs. Haiti's Roman Catholic bishops protested "the blind use of murderous automatic weapons. . . ."

Ten days later the CNG backed down and rescinded its decision. By then, however, the 57 Organizations were demanding that the government resign. "The Haitian people have lost their trust in the CNG," said Victor Benoit of the Congress of Democratic Movements, one of the main groups within the protesting coalition.

The CNG, composed of Lt. Gen. Henri Namphy, another general, and a civilian, was formed the same day that Haitians ousted a dictatorship. *Dechoukaj*, or uprooting, Haitians call the February 7, 1986, toppling of the Duvalier regime. For 29 years the Duvalier family—first François "Papa Doc" Duvalier and then his son, Jean-Claude "Baby Doc" Duvalier—ruled with devastating brutality and venality.

Most people believed General Namphy's statement that he looked forward to nothing more than becoming citizen Namphy when a new government was elected. But even before this summer's protests, Haitians often complained that too many former Duvalierists remained in government. "We don't want to put out *all* the old ones who worked for Duvalier," a student leader told me, "but they must change."

Expectations of course were high and hardly likely to be met under the most perfect of circumstances. Most Haitians saw little change, thus fueling impatience and disillusionment. Some officials, pressing for faster reform or for prosecution of Duvalierists, were replaced.

Though under the gun again, Haitians, perhaps because they have so recently freed themselves from dictatorship, do not seem inclined to surrender easily to another.

"Without democracy you are not going to keep this country quiet," Marc Bazin, a presidential candidate, told me. "People want to understand what's going on," Willie Lamour said. "It's like an awakening."

SIXTY MILES east of Cuba, Haiti shares the island of Hispaniola with the Dominican Republic. Crammed on the semi-arid western third of the island, Haiti's 6.3 million people are the poorest in this hemisphere. Per capita income is a mere $380 a year. Resources are scarce; coffee is the main export, but it is controlled by a small number of export houses that buy from *spéculateurs* to whom peasant growers must sell. Factories produce shoes, soap, flour, cement, and oils for domestic consumption. And in recent years foreign-owned (mainly U. S.) factories and assembly plants have been producing garments, toys, electronic goods, and baseballs. Half the population is unemployed. As my friend and informant Bob Vrigneau puts it: "Right now Haiti is crying. Haiti is sick. Haiti is almost dead."

Haitians want to believe that "better is coming," as one man told me. A literacy drive uses the phrase Goute Sel, which means "a taste of salt" in Creole. And in the Creole tradition it is a taste of salt that awakens zombies—people stupefied by voodoo black magic. Now, despite the violence, perhaps—just perhaps—goute sel for Haiti.

"The Haitian people want to prove that they can change the Haitian story," Luciano Pharaon told me in Gonaïves, a town 90 miles north of Port-au-Prince. Small and intense, he stared at me from behind wire-rimmed eyeglasses. Luciano was once a Roman Catholic lay brother but left when told to choose between the church and politics. Now he and his wife run a small grocery store. Next door he has organized a woodworking cooperative and school. "I didn't want to be political," he explained. "I wanted to educate."

Defiance is in his blood. His grandfather was a Caco, a guerrilla, who fought the U. S. occupation that lasted from 1915 to 1934. His father was jailed by François Duvalier, he by Jean-Claude. "If a Haitian does not believe Haiti can change, then that person is not supposed to believe in anything."

Says Pierre Bayard, editor and publisher of the *Haiti Times* newspaper: "It's our last chance to move to democracy. After 29 years of dictatorship, it's a long way. You have to make it step by step, and it's not easy to find a good way."

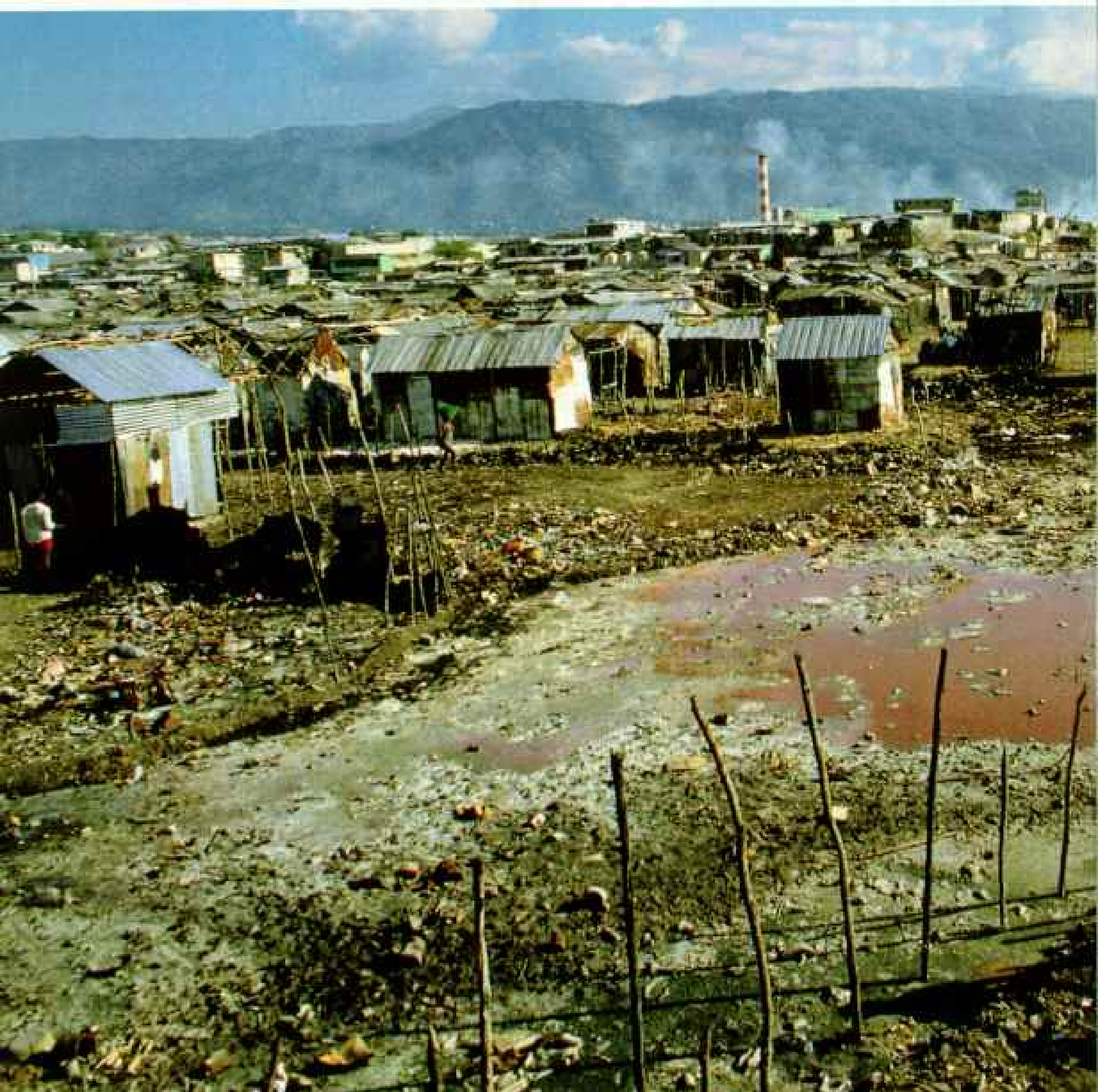
Finding that way is made even more difficult because Haiti is not just poor but has also been plundered. Hundreds of millions of dollars were stolen by the Duvaliers and their associates. Last year a World Bank study found that nearly a fifth of government expenditures were untraceable. The National Governing Council says it can document 120 million dollars in stolen funds. Estimates of the money stolen range as high as 800 million dollars. This in a nation with annual revenues of only 230 million dollars.

Plunder is too mild a word. Haiti has been raped and cast away to wither in the Caribbean sun. I found myself constantly staggered by its plight. Life expectancy is 54 years. Potable water is available to only 23 percent of the population. Four-fifths of all Haitians are illiterate.

HAITI

AREA: 10,714 sq mi (27,750 sq km). **POPULATION:** 6,300,000. **CITIES:** Port-au-Prince (capital), 1,200,000; Cap-Haitien, 65,000. **LANGUAGES:** French, Creole. **ECONOMY:** coffee, sugar, rice, cocoa; light manufacturing. Per capita income: $380. **LITERACY:** 20%.

Discovered by Christopher Columbus, Hispaniola was Spain's first colony in the Western Hemisphere. By 1697, when Spain ceded the western third of the island to the French, virtually all the original inhabitants, Arawak-speaking Indians, had been killed by disease, overwork, or slaughter. With the labor of 700,000 West African slaves, the French made their colony of St. Domingue the most prosperous in the New World.



Statistics, however, do not begin to convey the dimensions of human wretchedness. Thousands live on the streets of Port-au-Prince, bathing and washing in sewage-filled gutters. Haiti is plagued by infectious diseases. Measles, diarrhea, and tetanus are child killers here. Two hundred fifty of every thousand children die before reaching the age of five.

A TRAGIC LAND, HAITI; one that has always seemed to promise something better, but has then been betrayed. "The most beautiful in the world . . . almost like . . . Castile," Christopher Columbus wrote.

Under French rule that began in 1697, African slave labor helped generate fabulous wealth, putting into the European lexicon: "wealthy as a Creole." In 1791 the slaves revolted and, led by a remarkable set of black generals, in 1803 defeated a force of 28,000 veteran troops sent by Napoleon Bonaparte. This despite the betrayal of Toussaint L'Ouverture, preeminent general in the war of independence, who had been kidnapped and sent to France, where he died in prison.

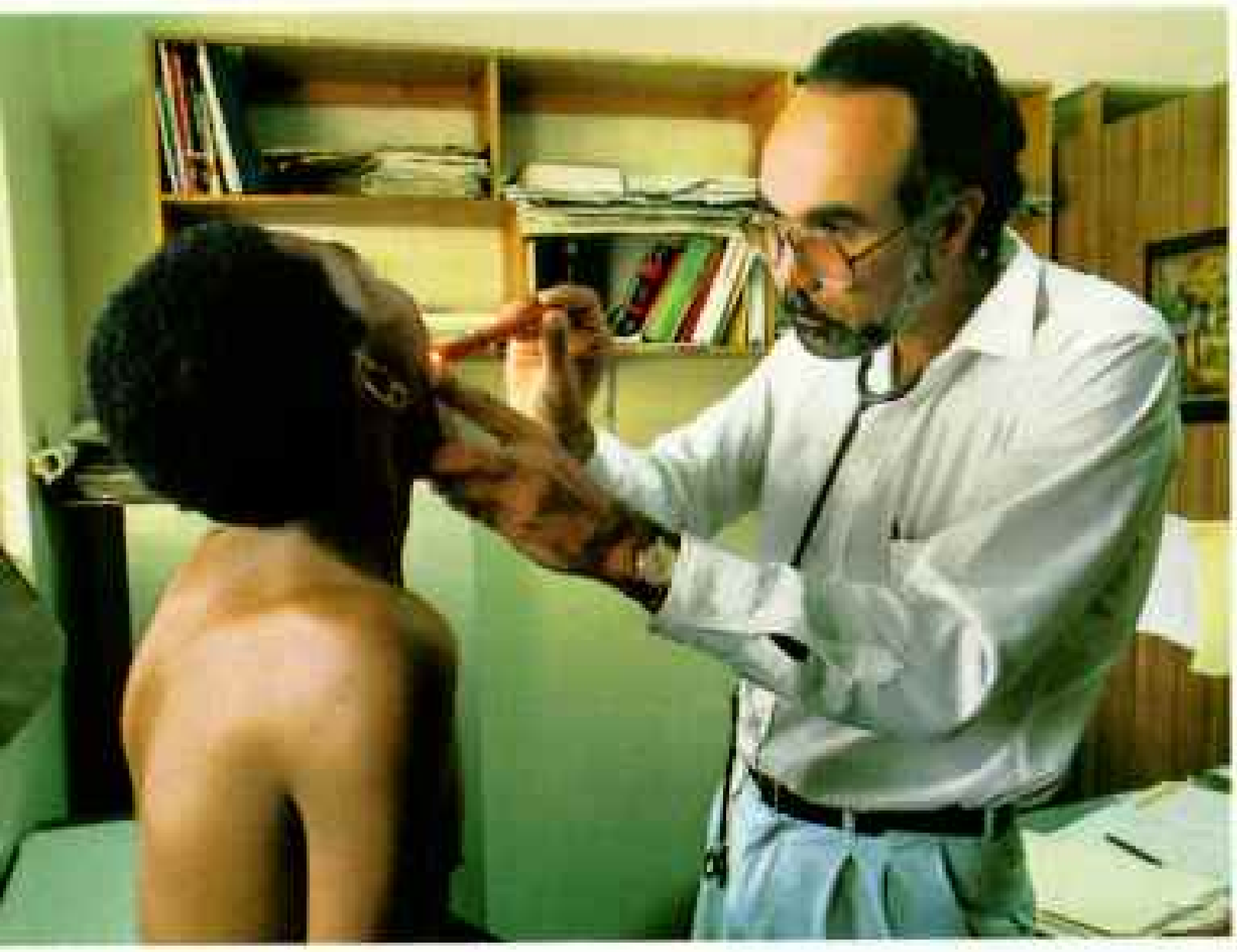
On January 1, 1804, Haiti gained independence. It became the world's first black republic, and the second—the United States being the first—republic in this hemisphere. For a time it split into two separate regimes, north and south. The republic reunified, but from 1843 to 1915, 22 dictators shattered

Enclave of privilege and despair, Haiti's capital stands so apart from the quiet poverty of rural Haiti that it is often called the "republic of Port-au-Prince." For years the source of that distinction was the National Palace (top), seat of Duvalier power, on the Champs de Mars. A statue of patriot Toussaint L'Ouverture, a leader of the 1791-1803 war for independence, overlooks the square.

The economic disruptions that followed Jean-Claude Duvalier's ouster in 1986 worsened an already deteriorating situation. In the wake of a highly publicized AIDS epidemic, the nation's vitally needed tourist industry has collapsed, and unemployment is near 50 percent. Though opportunities in Port-au-Prince are more limited than ever, refugees from the countryside continue to pour in, crowding slums like Cité Soleil. Poorest part of one of the hemisphere's poorest slums, the "city of cartons" (left) floats on a swamp of human and animal waste, whose nauseating sewage ponds contribute to the nation's epidemic of sanitation-related diseases.

Neck and neck with the United States in the incidence rate of AIDS, Haiti reports about five cases per 100,000 people. Dr. Jean William Pape examines a patient at the national research institute in Port-au-Prince.

At a clinic of the Albert Schweitzer Hospital in central Haiti, a mother awaits treatment for her child under a poster advertising a remedy for dehydration, a major cause of child mortality.



political and social order. Then the United States occupied the country.

In a sense, Haiti never became a nation.

At the village of Milot I hired a horse and guide and made my way up the mountain trail to the Citadel of Henri Christophe, Haiti's first president and later king, both tyrant and visionary. His Citadel is the largest mountaintop fortress in the New World. Even from the ground it overwhelms with its prow dominating the northern sky (page 666). Walls 18 feet thick rise 130 feet from the fort's base.

Christophe feared reconquest by Napoleon; the Citadel symbolized his determination to keep Haiti free. From its ramparts, lined with 180 cannon and piles of rusty, unused cannonballs, I gazed across Haiti to the bay where Columbus lost *Santa María* and perhaps established his first New World settlement, La Navidad (page 672). To the north lies the 17th-century town of Cap-Haïtien. And just outside Cap-Haïtien: Vertières, where the Haitian Army won its last decisive battle against French troops.

When Christophe strode this fortress, the mountains he viewed were green, forested. Today there are few trees. As one farmer told me, "We grow stones."

Eighty percent of Haiti's population is rural, trying to scratch out a living from the land and losing ground; a population that has doubled since 1950 and that may well double again over the next three decades.

I was stunned by Haiti's mountains. On many, erosion has ripped off most of the topsoil, leaving bare rock. Where peasants could farm, they chipped away on hard sun-baked land with machetes and hoes, not even able to completely turn over the soil.

There are few stoves and hardly any electricity in this landscape, so trees are cut for fuel as well as to clear land for farming. Of this Haiti, says Dr. Guy Theodore, who operates a small hospital in a tiny, remote town called Pignon, "There are two Haitis. If the people who know Port-au-Prince would know this Haiti, we would not have some of these problems you see here."

IN APRIL I BUMPED ALONG on a road twisting through bare-skinned mountains in Haiti's central plateau. The sun played games of light and shadow. I had finished a string of political conversations in the capital and was pleased to be escaping those as well as the honking, bullying traffic of the city. Making my way through the mountains, I breathed a gentler, quieter Haiti with sounds of scuttering goats, falling mangoes, and children playing in the footpaths that lead to scattered settlements.

At one level, this is Haiti at its most delightful. Call out in Creole *"Kouman ou ye?*—How are you?"—and the smiles are quick. Women riding donkeys or walking with burdens on their heads, maintaining an easy grace, even elegance. Men working the fields, chopping rhythmically to song.

But this Haiti is no postcard to send home.

SOINS ESSENTIELS
SUR L'HYGIENE &
L'ASSAINISSEMENT
DU MILIEU
ORAL

Far from the political tempests in Haitian cities, the southern peninsula town of Pestel goes about its daily commerce much as it has for generations. Like Haiti's cities, many of the country's small market towns are built along the nation's 850 miles of seacoast. Unlike the cities, Pestel and other villages are most

easily accessible by dugout canoes and small sailing craft. Here, during Saturday market, farmers sell mangoes, sweet potatoes, and other produce grown in the relatively wet south. On the wharf, bags of charcoal, produced from scrub trees in the surrounding hills, await transport by boat to Port-au-Prince.

A child catches my eye, points to his stomach. He is hungry. Other children, though bright-eyed, are frail and soft-boned; the reddish tinge to their hair is a sign of malnutrition that is all too common here.

Neither the land nor Port-au-Prince provides very much. Just outside the town of Hinche, 45-year-old Illion Belzi told me he tries to provide for his family from a parched two-acre plot, growing manioc, millet, maize, and sweet potatoes.

They have little with which to work the land, a man named Providence Pierre explained. "We would like plows that can be pulled by oxen." But that seems impossibly expensive. Pierre sighs, "Those who have will have, those who never have will never have." There is a weariness in these men that stops short of despair. They are involved in a newly formed congress of peasants. Said one: "To stay stagnant is not what we mean to do."

Less than a dot on most maps, Lambi Island, off the north coast of Haiti's southern peninsula, jams 200 souls onto a narrow spit of sand (facing page), an extraordinary density even for people-packed Haiti. Subsisting on small fish, islanders (above) haul their water five miles by boat from the mainland.

EVERYWHERE, limited choice reduces life to survival. Consider trees. "I want to show you my mountain," Bob Vrigneau said as we drove through the village of Petite Rivière de Nippes. Leaving the car in the village, we began hiking up a mountain to his family homestead. Bob was excited; it had been months since he had visited the place.

The more than one-hour walk beneath a blazing sun exhausted me. But for most of these mountain people, even longer hikes several times a day are routine. As we neared Bob's home, his face dropped in dismay. "They're all gone. They chopped them all." Two years ago Bob had planted scores of tree saplings, and now none remained.

In the distance I heard the thumping of machetes felling other trees, clearing land. A neighbor shrugged when we asked why: "Where else would we grow food?"

In 1920 about 60 percent of Haiti had lush forest; today less than 5 percent. With U. S. assistance millions of trees are planted yearly; only half survive the first year. Just 20 percent of the trees cut are replaced by reforestation.

Twenty-one of Haiti's 30 watersheds have been effectively deforested. The rest are disappearing. "Haiti is not a Sahel," said Gerald Zarr, director of the local U. S. Agency for International Development office. "There is malnutrition but not famine. But if the population continues to increase and agricultural production remains stagnant, it is possible in our time."

It is clear that huge infusions of assistance are needed in every sector. Haiti is a major U. S. aid recipient. More than a hundred million dollars has been earmarked for Haiti this year. I wondered if Haitians thought it was helping. Haitians I met kept bringing up the subject of pigs.

In 1978 an African swine fever epidemic broke out. Two-thirds of Haiti's 1.2 million pigs died; soldiers shot many. In rural Haiti

that's like blowing up the bank. Pigs represent money to pay school fees, to pay for funerals, to meet unforeseen emergencies. Haitians never quite believed the epidemic was bad enough to warrant slaughtering their pigs. So when the Duvalier government and the U. S. government agreed to replace them with American Hampshire, Yorkshire, and Duroc pigs, many Haitians saw conspiracy.

Haitian or Creole pigs were hardy, and fed largely on garbage. The new pigs were pink and initially only distributed to cooperatives that could afford expensive imported pig food and sties with concrete floors. Furthermore, to many Haitians the new pigs did not taste as good as the old familiar black pig that used to run around in the yard.

Critics say American pigs lead to dependency on the U. S. "They killed our pigs, now they want to sell us their pigs," said Bazelais Jean-Baptiste, a worker with the Catholic group CARITAS. "Why? They know we'll have to work in their factories. It is a way for them to hold us by the stomach."

Not all Haitians agree. In Depuis village near the southern town of Miragoâne, Avelon Theodore showed me his 19 Iowa pigs, saying happily, "They're better; more piglets, more meat." They reach 250 pounds in nine months, and he sells a pig that size for $250. The Creole pig takes almost two years to grow and is worth only $90.

For his first pig Theodore paid a nearby wealthy businessman $100—a great deal of money. However, thousands of pigs were

"Miami rice" and pink pigs spell political indigestion. To protect the Haitian rice market, centered in the Artibonite Valley (left), cheaper U. S. imports are officially prohibited. Still, contraband shipments in bags stamped "Miami, Fla." are unloaded in daylight at Petit Godve (below). Following an outbreak of African swine fever in 1978, Haiti's native pigs died or were killed at U. S. urging and are being replaced by higher yield U. S. animals. Near Jacmel, Willie Lamour (bottom) instructs farmers—many of whom have protested the taste and expense of the new pigs—on feeding methods.

Bygone glory of Haiti's lush mahogany and tropical oak forests can only be imagined in the denuded mountains north of Port-au-Prince. The ruins of a coffee plantation hark back to the 1780s, when 40,000 Frenchmen ruled 700,000 African slaves. Some 28,000 mulattoes, though technically free, enjoyed only limited rights.

given to poor Haitians. The new pigs seem to be the future, but only time will tell.

Another sharp debate centers on contraband. As I traveled through Haiti, I was amazed to see in roadside markets an abundance of foreign goods, mostly U. S.: toothpaste, radios, clothing, canned goods, sugar, rice. They are contraband—smuggled goods. Some, notably rice and sugar, threaten Haitian industry.

IN THE TOWN OF PETIT GOÂVE I walked onto the dock accompanied by Mona Arcelin, a Haitian journalist. Workmen were unloading hundred-pound bags of "Miami rice."

"Why have you come here to shut us down?" a worker suddenly shouted. "We need this work. Don't try and stop this rice, or we will burn everything up." Then, looking at Mona: "She looks like Michelle [Duvalier]. Go back to Port-au-Prince!" With that, he hurled a bag of rice at Mona.

Except that we were strangers, it is not clear why we were the targets of this worker's wrath. Although such contraband is officially illegal, it is not smuggled in the dead of night. Here the sun shone brightly. Police and one soldier were in the area. Around the corner a political rally was in progress. Some participants wandered over to buy some rice before going home.

Because no duty is paid, Miami rice can undersell Haitian rice by more than half. Haitian rice growers do not like it. Last December a mini-war broke out on the highway between the port of Gonaïves and the rice-growing Artibonite Valley. Peasants barricaded the road and spilled contraband rice across it. In retaliation gangs from Gonaïves attacked the peasants' homes.

There is no clear right or wrong. Smuggling of basic goods has lowered prices, and the roadside *pepes*, piles of used clothing that can be bought for almost nothing, are a real benefit in this poor country. But smuggling threatens local production and jobs.

In April HASCO—the Haitian American Sugar Company—announced it was closing down, costing 3,500 employees their jobs. Sugar smuggled from Miami and the Dominican Republic sold for 24 cents a pound, compared with 27 cents for Haitian sugar. "We have no money to continue operations," said Georges D. Rigaud, a company spokesman. "The state can't compete."

It must be said that Haitian industries are not used to competing. Mostly in the hands of well-to-do elites, they were protected by

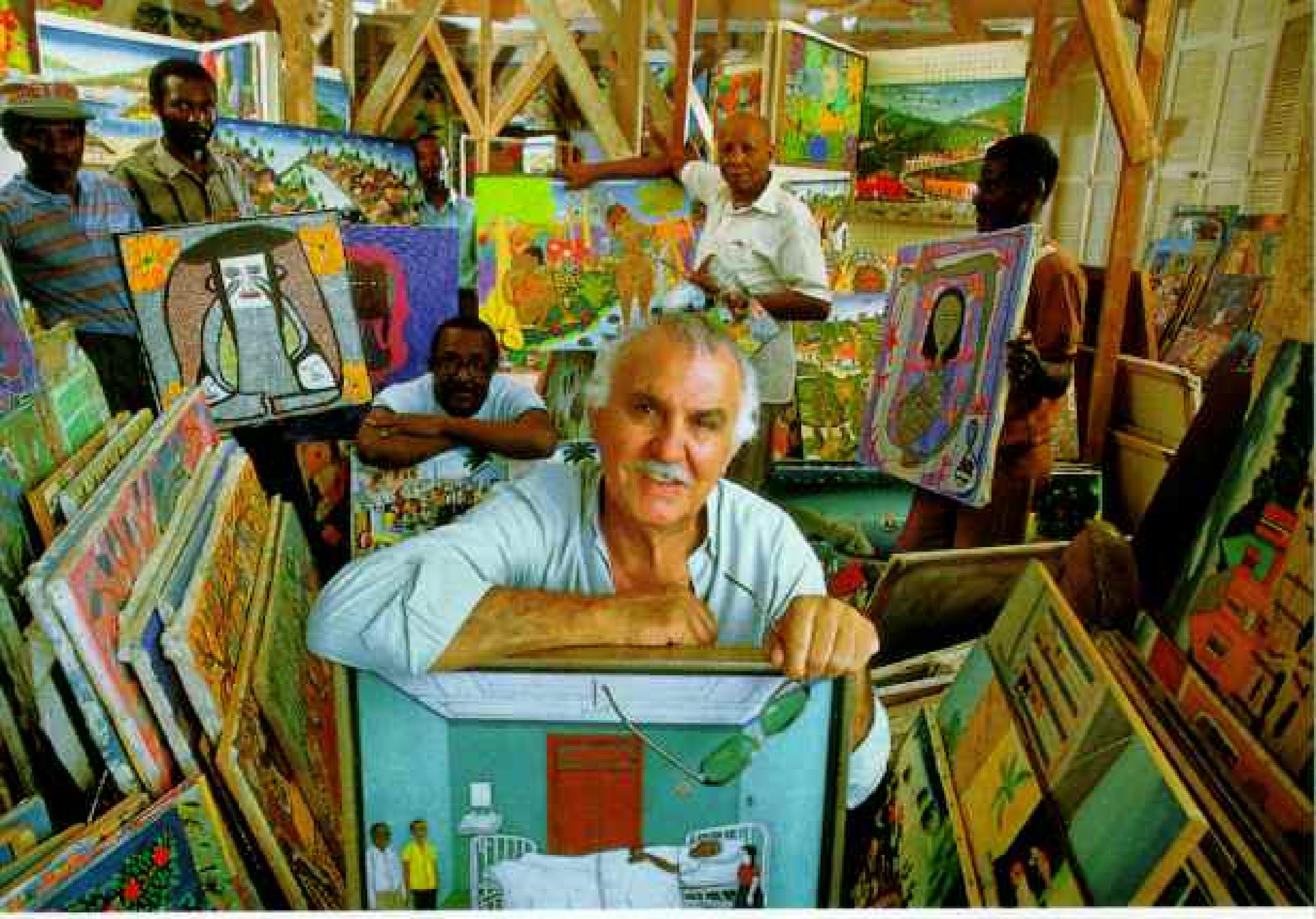
previous governments. Skimming of profits in government firms was the rule.

Haiti's provisional government is trying to break up monopolies and slim the bureaucracies that feed at the government trough with them. But little has changed.

This has led to criticism, particularly from the Roman Catholic Church. "Can it be said that there has been a change of system in Haiti?" it asked last February. "Is the present economic system helping to take the country forward or setting it back?"

The church is a powerful voice in Haiti. There were many factors in Haiti's February 7 revolution, and Pope John Paul II's visit in 1983 was one of them. He galvanized dissent when he stated, "Things must change here." In 1985 thousands of young people marched from church to church with banners that read "peace, participation, justice, democracy."

In Haiti the church's flag is displayed, its papal colors of yellow and white flying alongside the nation's new blue-and-red flag. Throughout the country murals celebrate the dechoukaj, or uprooting of Duvalierism, with portraits of Christ as liberator breaking the chains of the people. A common slogan on many walls is *"Merci léglis*—Thank you, church."



A number of factors combined to politicize Haiti's Catholic Church. During much of Haiti's history the church was identified with Haiti's Francophile elite. In the 1940s it came under assault by a black cultural movement emphasizing African values. Under François Duvalier the hierarchy, mostly foreign, was replaced with Haitians.

Ironically, in seeking to reduce the power of the church, Duvalier strengthened it. As Haiti's economic situation worsened, parish priests became increasingly involved in development projects, cooperative enterprises, and relief efforts.

Particularly important are the *ti-légliz*, or "little churches," some 3,500 informal Christian communities where twice a week small numbers gather not just to pray but also to discuss community problems. Related conceptually to the "liberation theology" common in Latin America, these churches look to earth more than to heaven. Jesus is a brother in social change.

In a hot and crowded living room lit by a 40-watt bulb, about 30 people were wrestling with their hopes for Haiti when I arrived. A man stood up. The army still has too much power in the new constitution, he said. Someone else said the National Governing Council is still loaded with Duvalierists: "Only the head has been chopped off." A woman said her baby is sick, but there is no money for care. Problems aren't really solved here, but even being able to ask questions openly is a giant step in Haiti.

One of the most important questioning voices is Radio Soleil. The Creole language church radio station maintained a drumfire of criticism against the Duvalier regime and was frequently shut down by police.

I talked with one of the young managers of the station. Using a new Creole word for consciousness-raising, he explained that the station's main task is to "conscientize the people; not to let them be bought. We have freedom of speech now; we can demand things, protest. But do they take our concerns seriously? If you're going to fall into a hole, the duty of the church is to give orientation so you don't fall in."

One important change under way in Haiti's church is the beginning of a reconciliation with voodoo. Although 80 percent of Haitians are officially Roman Catholic, voodoo has always been Haiti's most important religious tradition. Derived from the

Impresario for Haitian artists, Issa El Saieh and five protégés display their paintings in his Port-au-Prince gallery. Though exports keep many painters working, the vanished tourist trade has deprived young artists of a market. Performing with the St. Trinity Philharmonic Orchestra, 24-year-old violist David César displays a talent ripe for a concert career, though he plans to become a priest.

African rites brought to Haiti by slaves, the voodoo spirits known as *loas* have always offered spiritual and social redemption. In a land where life is often cruel, wrote the late Haitian folklorist Dr. Jean Price-Mars, voodoo offers consolation: "Neither injustice nor suffering are essential . . . nothing is really despairing because God is good."

Church Masses now are sung in Creole, often accompanied by voodoo drums. Before Communion in one church I visited, the chalice was raised north, south, east, and west in the tradition of a voodoo offering.

Haitians have never seen much contradiction between Christianity and voodoo. African religion was forced underground during slavery, and African spirits merged with Christian and Indian spirits. Voodoo altars are frequently decorated with portraits of Christian saints. The Virgin Mary is used to represent Erzulie, spirit of love; the loa Damballah Ouedo by St. Patrick. Papa Legba is voodoo's St. Peter. Wrote Haitian poet Frank Fouche: "We love the violin / as much as the drum / We love the church / but we adore voodoo."

ONE BY ONE spirits were being summoned as I entered the village of Souvenance, east of Gonaïves. Each was invoked by rhythmic drumming and dancing believers, who twisted their way from tree to tree—places of worship.

Haiti's voodoo spirits made frequent and dramatic appearances, suddenly possessing—"mounting"—a participant, who with a shout would then spin out staggering and trembling, sometimes laughing, sometimes crying in communion and communication.

It was not so strange. I saw that people were thanking their gods, praising their gods, asking of their gods. It was church.

Before going to Souvenance, I had spoken with Herard Simon, a voodoo priest, or *houngan*, in Gonaïves. "I hope you don't think voodoo is to kill people, to eat them like Hollywood says," he told me laughing. "Voodoo is life; it tells Haitians how to live."

Simon scratched at the gray stubble on his face as we talked in a grove of banana trees on his farm. His heavily lidded eyes were half closed. Nearby, women winding up a literacy class were quietly singing. Our talk quickly turned to living in Haiti today, and what the future might bring.

"What's being done now is not really Haitian. The leaders do not work as Haitians but as foreigners," Simon said. The agricultural bank charges high interest, he complained. "Too high for poor farmers." And will voodoo offer answers to these problems? "We keep the traditions," he replied, explaining that voodoo spirits act in the world of man. Referring to the houngan's role as herb doctor and counselor, he added: "If we did not have folk medicine, do you believe all the people in Haiti would have the treatment they need? No."

During the ceremonies at Souvenance I talked to a young woman named Rachel Beauvoir. Her father is a well-known voodoo priest. She confirmed my observation about voodoo in the church and added that the trend is broader. "The middle class is accepting voodoo more and more. In Haiti we are blocked, and our best possibility is to work with the people. Without that link

Haiti will collapse. That means work with voodoo. Their spirits give them more than any government ever has, give them the strength to survive and hope for a better life. It is strength that Haiti needs."

WHEN I RETURNED to Port-au-Prince in early August, the streets in the heart of the capital were sullen, tense . . . and barricaded. CNG restrictions on public demonstrations had put much of the downtown off-limits for protests. Organizers could be held criminally responsible for any damages. This clampdown along with fear of further violence brought a halt to the demonstrations.

Everywhere there was a sense of betrayal. "They lie me, they lie the whole country," a friend remarked, asking me not to use his name. "We don't know where the country is going yet."

The 57 Organizations continued to call for General Namphy and the CNG to step down, but few thought they would. Public opinion seemed divided between those who believed that the general sought to seize the country and those who believed he was holding off other army leaders. For all its heavy-handedness in repressing protests, the Army had not taken over . . . yet. Newspapers and radio maintained constant criticism; political parties continued to exist. "The army is powerful," Interior Ministry official Eddy Colas told me, "but it has not used the force it could."

Without doubt, though, fear had grown, and with its growth came the unraveling of social order. In the town of Jérémie former exile Bernard Sansaricq reportedly led three carloads of armed men on an attack against a police station, handed out arms to peasants, then fled into the countryside. In Léogâne centrist politician Louis Eugène Athis prepared to speak at a church. A crowd accused him of being a Communist and hacked him to death. Near Jean-Rabel clashes between peasants seeking land reform and those opposed resulted in at least a hundred deaths. Many think the officially disbanded but still much feared *Tontons Macoutes* are behind some of the violence.

Symbol of defiance against Napoleon's designs on the early republic, the Citadel (facing page) dominates a mountain range within sight of the northern coast. Built at great cost in lives by Haiti's first king, Henri Christophe, the colossal fortress is being restored as a UNESCO world heritage site. Remnant of colonial rule, the Basilica of Notre Dame in Port-au-Prince is also being restored, under the direction of Haitian architect Albert Mangonès (below).

Under the constitution an elected president is to be sworn in on February 7, 1988. But many Haitians wonder if elections are possible and if they will be free and fair.

They are certainly possible, Ernst Mirville, president of the electoral council, told me. The council had finished most of the planning of election mechanics when I spoke with him, but the CNG would have to ratify them. "But even if the election is February 6," he said, "it is OK; the government is on."

Whether presidential elections are held or not, politicians alarm Haitians. The fear is rooted in history. Haiti has had 41 heads of state. Only six completed full terms. Nine declared themselves chiefs of state for life, and 23 were overthrown. Understandably,

Two faces of faith, one Western, the other African, give Haitians the strength to survive bad times and worse. In Port-au-Prince, Good Friday celebrants hoist a cross to the final station, high above the city. Though 80 percent are Roman Catholics, Haitians remain deeply committed to voodoo, whose spirits, or loas, have merged in the popular mind with Christian saints. At a voodoo ceremony near Gonaives a believer lies exhausted after being possessed by a loa, in this case as punishment for some transgression.

to most Haitians elected office is synonymous with a license to steal and kill.

There are dozens of presidential contenders. Many of them have spent years in exile abroad, and so Haitian attitudes toward them are often cool and ambivalent. "These candidates have no real base, no real links with the people," businessman Robert Duval told me.

Candidates I met were all quite aware of the skepticism. And their responses were similar. Says one major presidential candidate, Leslie Manigat: "To be a Haitian has meaning for us too, although we have been away for years. We have a sense of duty to our fatherland. We have to do something."

AND THEN there is Port-au-Prince, the capital, where one of these men will govern if elected. Sneeringly called the "republic of Port-au-Prince" by Haitians resentful of the power and privilege found here, it contains indeed a Haiti distant from the land of the majority. Still, the paradoxes that have plagued the country for nearly two centuries are most sharply drawn here.

Its mountain suburbs contain palatial homes overlooking the grim poverty in the plains below, where most of the city is spread. On crowded twisting streets most of the city's more than one million inhabitants engage in subsistence commerce. The princes and princesses of the suburbs squeeze their Mercedes Benzes and BMWs through the congested streets, windows rolled up against the fumes of charcoal cooking fires and the putrid smell of the harbor.

As you come down from the suburbs into the city, the population becomes blacker and poorer. Travel this social geography and you will reach Cité Soleil, a slum of some 200,000 people, perhaps the poorest part of the poorest city in this hemisphere. And the poorest part of the Cité Soleil is Cité Carton—city of cartons.

Built on landfill, houses are of cardboard. There is no sewage system, no water. Women trudge for water daily, paying a few pennies for five gallons. Flies, not flowers, decorate yards. It is easy to sink up to the ankles in human and animal waste when it rains and the ground turns to jelly.

In her cardboard shack papered with

advertisements from magazines, I met 34-year-old Lucy Solon, mother of 12 children, six of whom have already died. She left her home near the Dominican Republic border after having a baby at 18. "Life there was too difficult," she told me. In the city she collects used plastic wrapping from nearby factories, which she washes and cuts into small sheets and then sells to street vendors for five cents each.

In the strange mixture of heartache and hope I found to be typical, she told me: "If people here don't get dead, they can hope to get better." Will it get better for you? I asked. "It's not easy," she replied. "If you're in here, you're in here."

The people of Cité Soleil are as ignored as those in the countryside. They *are* the countryside, driven to the city by exhausted lands, lack of services, and dreams of something better.

To my surprise, little anger was in evidence. In fact, small kindnesses accompanied me. Children followed me as I moved from house to house, carrying a chair to make certain I would have a place to sit. They took pride in saying hello, good morning, how are you? in English. The phrases became a chant that followed me everywhere. I met Christy Jackson, who leads the community-improvement association in Cité Carton. Can things here be improved? I asked. "Only God knows," he replied. "After God a good government could help."

The other sections of Cité Soleil are not significantly better. Yet it was in this slum that I saw most clearly what determination to make a difference can mean.

DR. REGINALD BOULOS, a Haitian of Arab descent, offers high-quality medical services through the Medical Social Complex of Cité Soleil. Aided by 12 Catholic Daughters of Charity, the center stresses preventive care.

Begun by his father, Dr. Carlo Boulos, who opened a small clinic, the operation has expanded to three clinics and one curative hospital. Every family in Cité Soleil is registered by "collaborators," who have the duty of bringing the families for checkups once every three months, "sick or not," said Dr. Boulos. If more intensive care is needed, individuals are referred to the hospital. The

Hope her only resource, Port-au-Prince slum mother Marie David despairs for her infant daughter, whose distended belly and reddish hair are signs of severe malnutrition. She and millions of Haitians ask: Will change truly come to Haiti? Will it come in time?

checkups cost nothing. Prescriptions at the center's own pharmacy cost about 40 cents. "People feel that anything totally free is no good," Dr. Boulos told me.

The results have been dramatic. In 1978 infant mortality in Cité Soleil claimed 236 lives per thousand. This year the rate is down to 84 per thousand. It is slow, difficult work. When the center opened a maternity facility, only 20 percent of the women came. Investigation revealed that women were refusing to drink milk. In Haitian tradition nothing white should be eaten after delivery of a baby.

"I like the challenge," Dr. Boulos told me. "I don't think I could do anything in the United States as interesting."

Unfortunately, few Haitian doctors return to Haiti to practice. "They don't want to come back to where they were before," says Dr. Guy Theodore, one of those who did. "They are even more afraid of the economics than the political situation."

Yet those who do return find it unexpectedly rewarding. Says Dr. Féquière Joseph, back in Haiti after 15 years in Spain: "At first I felt shocked. Now I'm challenged."

After seven weeks of travel in Haiti I cannot tell whether all Haiti feels challenged, but I have been influenced enough by Haitians to resist despair.

Despite the turmoil, many share the belief of Marc Bazin, the presidential candidate: "It's a new country, even for General Namphy. Even if he wants to reverse the course, there is nothing he can do. Nothing. It would take three Duvaliers, not just one."

Yet other observers worry that Haiti may have again entered into the beginning of another long cycle of social and political instability. Must there be tragedy again in this country that has known little else? Dr. Joseph gave me a long thoughtful look just before I left him to his work in Cité Soleil: "'Why?' you ask. 'Why, why, why?' The answer is for Haitians to ask why." □

LA NAVIDAD, 1492

Searching for Columbus's Lost Colony

By KATHLEEN A. DEAGAN

Photographs by BILL BALLENBERG

JUST BEFORE MIDNIGHT on Christmas Eve, 1492, a sleepy helmsman gave the tiller of Christopher Columbus's flagship, *Santa María*, to the ship's boy. After two nights of entertaining and trading with local Taino Arawak Indians, the crew was exhausted. The hapless lad promptly ran the ship onto a coral reef off the north coast of Haiti, near the present-day town of Bord de Mer de Limonade. Attempts to free the vessel failed, the planking opened, and the Admiral abandoned her for *Niña*.

To salvage what he could, Columbus appealed for help to Guacanagari, the Indian *cacique*, or chief, whose village was about four miles from the wreck. The Indians helped unload supplies (right), dismantle the ship's timbers and boards, and carry them by canoe to the village, where Guacanagari gave Columbus two of his biggest and best houses. Thus the tiny settlement—named for the infant child of Christmas, La Navidad—was established on December 26, 1492.

Thirty-nine crewmen, including a carpenter, a caulker, a physician, a gunner, a tailor, and a cooper, were given the doubtful privilege of manning this first Spanish settlement in the New World. They were left with instructions to trade with the Indians for as much gold as possible until Columbus could return.

Before he left, Columbus also told the men to build a fort and moat to impress the Indians. It is not difficult, however, to imagine them, surrounded by an abundance of fresh food and friendly Indian women, making their own decisions about the need for such defenses. We can only speculate upon what happened next. When Columbus returned 11 months later, he found the settlement burned and all his men dead.

Columbus moved on to more hospitable locations, and the site was forgotten for nearly 500 years. Now, after three seasons of excavations and the discovery of key European artifacts, our team from the Florida State Museum believes we have found it again.

PAINTING BY RICHARD SCHLECHT

Dashes outline the ring of raised earth; solid line indicates the central mound and main excavation area.

THE SEARCH for the vanished colony is centered on the remains of a large Indian town near En Bas Saline. The site (above) is now concealed beneath 21 small gardens, each surrounded by a dense, prickly hedge. In Columbus's time a channel, today dry, connected the village to the sea.

A broken ring of earth and shells, roughly three feet high and 1,100 in diameter, surrounds the townsite, the largest known in northern Haiti. Inside this ring—which could have been formed by the accumulation of trash tossed behind the Indians' houses—is a flat, open space that may have been a plaza. The fortified complex reportedly built by Columbus's men was probably in the center of the plaza.

Residents of En Bas Saline serve as our field crew, helping me (right) and other researchers trowel out squares and sift soil for artifacts. The project has been supported by the Organization of American States, the National Endowment for the Humanities, the National Science Foundation, and the Haitian government.

OUR MOST EXCITING excavations so far have been on a raised mound in the central plaza—a strong candidate for the location of both the cacique's house and the fort of La Navidad. Here we found cinders of cristobalite, a product of burned clay that forms only in intense fires. The cinders could have come from the walls of the cacique's house when it burned to the ground.

We found evidence that Columbus's men may have lived in the same area: sherds of European pottery from the same period and bones of European animals. These were discovered in a large pit, seven feet deep and more than three feet in diameter, dug to the present water table. The pit had been filled in with charcoal, shells, bones, and artifacts.

The hole might have been a well, theorizes Dr. William Hodges, the amateur archaeologist who discovered the townsite in 1977. Since wells are unknown in Caribbean Indian culture, he suggests it may have been the well of La Navidad, filled in by the Indians after the colony's demise.

Radiocarbon and thermoluminescence studies made on charcoal extracted from the hole gave us an adjusted overall date of A.D. 1440, plus or minus 35 years. This was earlier than we had hoped for, but our zooarchaeologists, under the direction of Dr. Elizabeth Wing at the Florida State Museum, made a major discovery that helped refine the date.

Deep in the hole they uncovered the jaw of a rat *(Rattus rattus)* and the tooth of a pig *(Sus scrofa)*, seen here next to the jaw of a modern pig (center). Both were European animals unknown in the New World before Columbus. There was no doubt that the hole had been filled in after 1492! And not long afterward, given the absence of other European artifacts.

Our suspicion that the pig may have arrived on *Santa María* (and our only half-joking comment that the rat may have been one of the first to leave a sinking ship in the New World) has been reinforced by the work of Dr. Jonathon Ericson at the University of California at Irvine. Through sophisticated analyses of strontium isotopes in the pig's tooth, he has determined that the pig probably grew up in the vicinity of Seville in Spain, not far from the port of Palos, from which Columbus set sail.

In the layers of soil surrounding the possible well, we have so far recovered ten European artifacts, including fragments of pottery (above, at left and top) and a shard of glass (above, at right). They were so tiny and dirt encrusted that we didn't recognize them until we were back in the Florida State Museum laboratory.

Thus far we have established that the site is in the right place and of the right time. But much work remains to be done. Nearly seven tons of shells, artifacts, soil, and food bones have come from the site, giving us fascinating glimpses of Indian culture at the time of European contact. The Taino Arawak became extinct after the arrival of Columbus, victims of social disruption and European disease. We think it is fitting that Columbus's quincentenary should be cause for bringing their lost culture to light. □

Taking up residence in a new Kenya homeland, a troop of olive baboons—the in the wild. Their social order remains intact: Families are headed by females

The "Gang" Moves to a

Article and photographs by SHIRLEY C. STRUM

Pumphouse Gang—becomes the first nonhuman primate group to be translocated like Theodora, here with her black infant, its playmate, and a male friend, Pinocchio.

Strange New Land

THROUGH UNFAMILIAR BARS, familiar faces peeked, some with puzzled and haunted expressions. Closest to me huddled Thea and baby Thistle, with oldest daughter Theodora and *her* infant, Teleki. These were descendants of Peggy, deceased matriarch of the Pumphouse Gang, the baboon troop I had been studying for more than a dozen years here on the upland savanna of Kekopey Ranch in central Kenya.

My eyes met those of David, a male I had known from birth, now with an adult male's impressive mantle of shoulder hair. Down the line I glimpsed other members of the troop, all arrayed in three rows of cages protected from the sun and rain by a floppy canvas canopy.

I guessed what was on their minds—they hated being caged. I hated it even more. If only there was some way to let them know that freedom lay only a few days ahead.

A RESEARCH PROJECT SUPPORTED IN PART BY YOUR SOCIETY

Pumphouse, named for the monkeys' habit of frequenting a water pumping station on the ranch, was being forced to move. Recent years had brought humans and baboons into confrontation here in the Rift Valley. Rangeland had been converted into farmers' fields. The crops of the struggling smallholders and the garbage pits of a nearby army camp tempted—and corrupted—the drought-stricken animals. So trucks would haul Pumphouse and two other troops 150 miles north to a new home in a less disturbed environment.

At the site we were abandoning, I had made good progress in studying olive baboons *(Papio anubis)*. Of course the Pumphouse Gang, my primary subjects among the troops on Kekopey, wasn't a gang at all but a well-organized group of 57 nimble, smart primates.

Their old home *was Kekopey Ranch (map) until portions were converted to cropland, and the intelligent, hungry monkeys became raiders. The author arranged for the translocation of three troops, totaling 130 animals, to cattle ranches in more arid, sparsely inhabited country. The animals were trapped and moved by truck. More cautious by nature, females and young were released first (far right) to acclimate for several days before males were freed.*

Wildlife and lands of East Africa come under pressure as population grows and more area is needed for crops.

Exploring, *the omnivorous baboons foraged cautiously (left) on their first days at their new home; within months they were ranging as far as the rocky outcrop, about eight miles distant. The arid scrub country offers many new plants, as well as familiar species like acacia trees, which supply edible flowers, seeds, pods, and gum.*

Author Shirley Strum placed radio collars on several sedated baboons to help track the troop if it spooked and fled a great distance after release.

BOB CAMPBELL (ABOVE AND RIGHT)

The females had revealed their behavior more readily than had the males. Very early I learned that Pumphouse females like Peggy, Thea, and Theodora were the core of the troop. The females and their descendants, arranged in a hierarchy of families, gave the troop its stable structure. It wasn't the powerfully muscled males but the families themselves that most often protected and policed their members. Against danger from outside or within, kin rushed to defend their own.

The male baboons baffled me. They weren't superfluous, but neither were they the strength of the group as earlier studies had suggested. Males displayed little aggressiveness and didn't conform to the expected male-dominance hierarchy. It took me a decade to understand male behavior in baboon society.

UPROOTING THE BABOONS, I knew, would be risky, a daring experiment. Never before had a group of nonhuman primates been transported from one natural habitat to another. What I would learn could determine if translocation was a realistic procedure for endangered primates living in vulnerable areas.

The move would also test my ideas about the baboons' use of social finesse rather than aggression in solving the problems of daily life. If aggression was ever to come to the fore, it should be during the trauma of transfer or afterward in the sere environment of their new home.

For the translocation, undertaken in September 1984 with support from the National Geographic Society, we would capture one troop at a time. Each troop would be moved to the Laikipia Plateau, a six-hour truck trip over rough roads. Pumphouse and daughter troop Malaika would go to Chololo Ranch, Cripple troop to Colcheccio Ranch.

To trap 130 baboons, we needed the help of the capture team of the Institute of Primate Research in Nairobi. We used baited cages with drop doors. Only one big male, Arnold—the artful dodger—escaped. Lifting the heavy door of his trap, he evaded all efforts to recapture him.

After capturing them, we sedated all the baboons and gave each a complete physical examination. In Cripple troop not a single tooth cavity was found. But many of the adult males in all three troops showed severe mouth problems—recent and healed abscesses, infections, and broken and badly worn teeth. The baboons were notably free of parasites, reconfirming that social grooming is effective in their control.

Over my years with the Pumphouse Gang I had been determined not to interfere with

Delicate wildflower *provides a new treat for an adult male. After observing local baboons and experimenting, the troop learned to eat the leaves too.*

Making a "threat face," Ron, a local male from the new site (opposite), exposes his fearsome canines and closes his eyes to flash white lids. Such attention-getting gestures are an opening gambit in his efforts to transfer into this troop. Yet aggressive displays seldom accomplish what conciliatory gestures do: acceptance by a female like the one below him and consequently by her troop. The transfer of males between groups is common to many primates.

Shirley C. Strum, Associate Professor of Anthropology at the University of California, San Diego, is director of the Uaso Ngiro Baboon Project, Kenya. Dr. Strum wrote "Life With the 'Pumphouse Gang,'" NATIONAL GEOGRAPHIC, May 1975, and is the author of *Almost Human*, a book about her baboon studies, published this fall by Random House.

natural behavior and had restrained myself from touching a baboon. Now, while the animals were sedated, I allowed myself a new freedom—touching, tweaking noses, stroking, hand holding, and playing with toes and fingers.

OUR FINAL CONVOY, the one bearing Pumphouse, at last drove into view of the rocks, grasslands, and local landmarks at Chololo. Here as at Colcheccio the baboons entered a strange, wilder environment with a hotter, drier climate and an unfamiliar array of plants and animals.

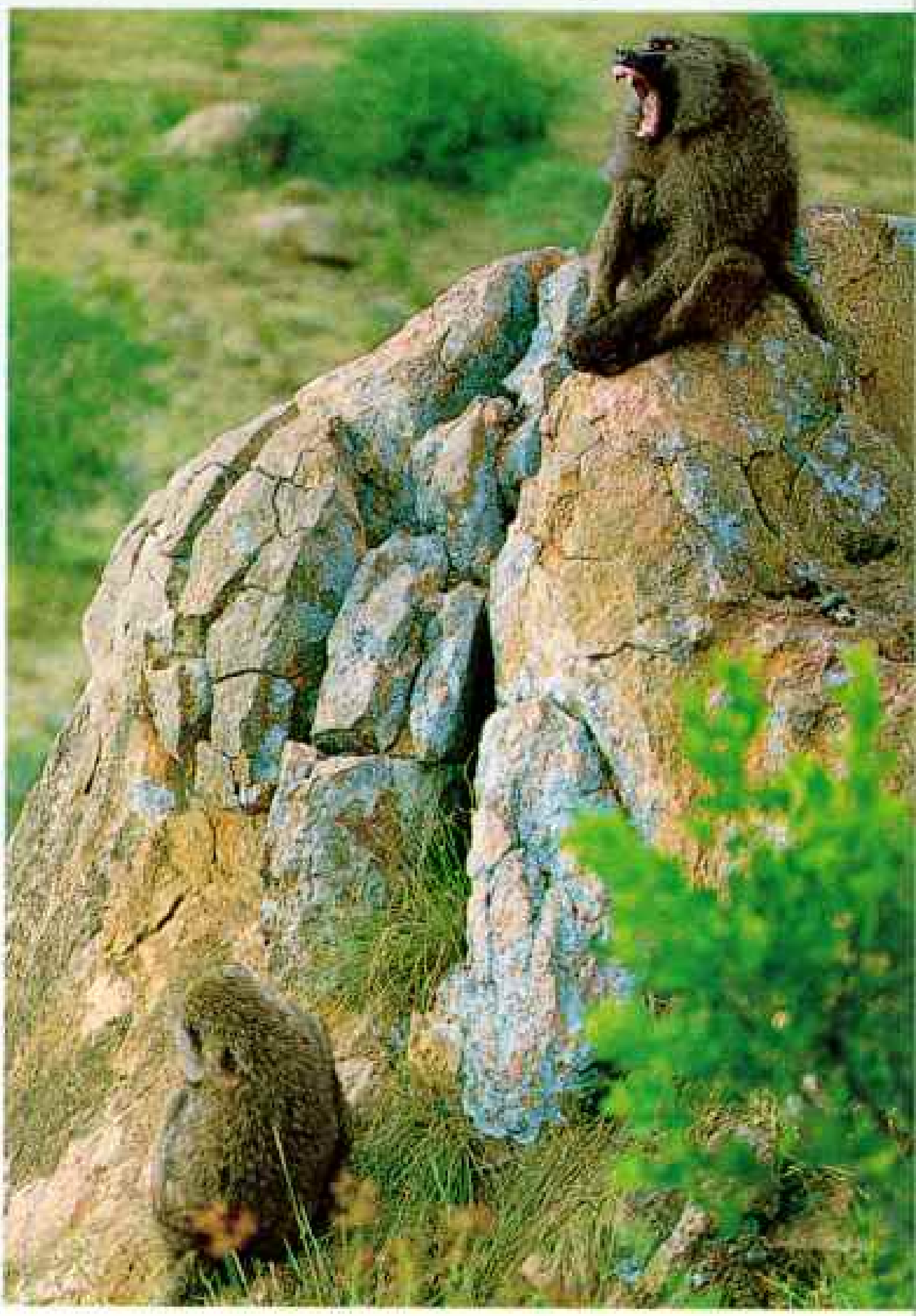
With each of the troops, release was the riskiest part of the operation. We had to persuade the baboons to remain in certain areas and not venture where they were not welcome. Josiah Musau, my deputy director, and I had carefully considered the problem. Would our plan work? "Maybe we should give them lots of beer," I joked, "so they can't go very far!"

I decided to keep the males caged for a few days after the females and youngsters were released. Without the more adventurous males, we reasoned, the rest of the troop wouldn't stray very far. Providing food in one central area would help the females gain familiarity with that place. Once the males were let loose, the more conservative females would act as a check on the males' tendency to explore farther afield.

It worked! I don't know which touched me more, the mournful *wahoo* of the captives as their friends and relatives scattered from the release site or the reassuring embraces and grunts of excitement of the reunited troop when we uncaged the males.

Both at Chololo and Colcheccio, I was concerned about friction between "our" troops and the local baboons. As it turned out, the residents proved to be curious and only rarely hostile. Within a few weeks local males began transferring into the relocated troops. This reestablished, early on, the normal baboon pattern of male movement between groups.

Their new environment tested the baboons' resourcefulness. Josiah, along with research assistant Mary O'Bryan, had already surveyed the area, giving us an idea of what foods were available. The baboons immediately ate familiar plants and selected new food by resemblance to these. They experimented with the unfamiliar—new acacia species, buried mushrooms, spindly leaves and dried berries of *Lycium* bushes,



The "Gang" Moves to a Strange New Land

Stooping to sip, *an adult drinks from a rain pool, while a female friend grooms her for parasites. The infant needs only mother's milk for the first few months. During a drought the baboons learned to pull up sanseviera and other dry-climate plants to draw moisture from the stems and roots. During pregnancy the color of a female's rump turns from gray to pink to scarlet, and back again after birth.*

and the soft fleshy roots of sanseviera.

The baboons quickly returned to the pattern of social life they had known before. The day began at the sleeping sites, now kopjes (rocky outcrops) rather than the fault scarp cliffs of Kekopey. First light found the Pumphouse Gang in its normal resting clusters of families and friends. Early morning was a time for socializing. Mothers groomed children, siblings groomed each other or played, females from other families came to

greet young babies, friends relaxed in mutual companionship. Youngsters romped together, finding the nooks and ledges of the rocks well suited to their games of chase, hide-and-seek, and daredevil—how far out on a thin ledge could you push someone before he had to jump.

Sexually receptive females and their male partners tended to keep to one side, relaxing in the sun, grooming, and resting. When competing males were also interested in the females, the scene might not be so tranquil.

The bulk of the day was taken up with finding food, especially during the hard times of the dry season. The group always stopped for a midday rest (and drink, if there was water around).

At Chololo, water was available in ponds behind ranch dams. At first the monkeys were wary about filing to the man-made drinking holes. But soon, when I broke through the thicket around a reservoir, I was likely to be greeted by a row of shiny pink or gray bottoms as the baboons, who don't like to get wet, stood shoulder to shoulder at the edge, drinking deeply.

Afternoon was like the morning in reverse. As the animals filled their bellies, they headed back toward the sleeping sites. This was the time to relax and be sociable once more. Daylight began to fade: Individuals coalesced again into tight subgroups that would sleep together that night.

AS TIME PASSED, we all—baboons and observers—relaxed. For me it was sheer pleasure to see the monkeys adjusting so well to their new life. Then, after the short rains of that first year, a severe drought parched the countryside. The baboons explored new areas for food, following the lead of the local troops and the indigenous males that had joined them. They discovered plant species adapted to aridity that remained edible in times of drought, and learned how to go without water, finding extra moisture in special plants. They conserved energy, resting during the long hot midday, bunched together in large clusters taking advantage of what little shade there was.

Now, three years later, Pumphouse behaves, in most ways, like a native troop. But differences remain, differences perhaps critical in the next drought. This is where local males who join Pumphouse could be important. They know how to survive tough times. But will the translocated troops use these males' special knowledge? I knew from Kekopey that a male's sphere of authority, his influence, is limited.

Male behavior had perplexed me from the start. I had expected them to be aggressive. Why else were they endowed with huge dagger-like canine teeth, powerful muscles,

TIMOTHY RANSOM

For the powerful males, *social maneuvers are a learned skill. When Strider entered the Pumphouse Gang, he reacted calmly to curious juveniles (left). With greetings and grooming, he won many female and infant friends during a five-year sojourn.*

Feistier newcomer Jessel (right, at right) feigns an attack on a resident male in an aggressive display that rarely leads to physical contact.

Resident Hudson (below, center) proves a skillful strategist when attacked by Ron. Hudson starts to grab his friend Dawn and her infant to hold them as a willing shield. Ron backs off.

Evoking trust or terror, *the enormous males can elicit many responses. Berlioz enjoys a trusting snuggle with five-month-old Sammy (above) since the infant's mother is a friend. In unusual rough handling, Lou repeatedly grabbed Teleki, an infant he had not befriended. Teleki's screams brought help, but Lou's odd conduct lasted two weeks, raising new questions about baboon behavior.*

and bodies built for physical domination?

Males were supposed to use aggression in competition and defense—competition over choice foods and receptive females, defense against predators and threats from other baboons. I had also expected their aggression to lead to a status order, as other researchers claimed. Not so.

What I observed was paradoxical. Instead of claiming a prized female after a tiff, the winner often lost her to a sly abduction by another male. Even which male won a confrontation could change in the same day.

As puzzling as the restraints on male dominance and aggression was the intensity of baboon friendships. Friends—like family—slept together and traveled, fed, rested, and groomed as a close-knit group. Males in particular spent vast amounts of time building and maintaining friendships. Over the long pull each male could claim at least one female and a few infants as friends. Females also had female friends, and youngsters became close companions with some of their playmates. Males, however, never formed really cordial ties with one another.

MY FIRST CLUE to understanding male behavior had come from the constant transfer of males in and out of Pumphouse from the other Kekopey troops. A male immigrant might stay from one to five years before

moving on; a few stayed longer. Females, by contrast, spent their entire lives in the troop of their birth.

Long observation taught me the factor that best predicted male baboon behavior: Not age, not size, not aggressiveness, but the length of time he had been with the troop. I classified the adult immigrants as newcomers (from arrival to one and a half years), short-term residents (during the next year and a half), and long-term residents (with the troop more than three years).

Newcomers were aggressive; long-term residents conciliatory and unaggressive. In between stood the short-term residents, who displayed less belligerence than the newcomers and less diplomacy than their veteran troop mates. The new arrivals harassed the resident males, often attacking innocent bystanders in frustration or rage. Such actions brought the rest of the group, including long-term residents, hurrying to the defense.

Male newcomers also were generally the most dominant while long-term residents were the most subordinate, the most easily cowed. Yet in winning the receptive females and special foods, the subordinate, unaggressive veterans got more than their fair share, the newcomers next to nothing.

Socially inept and often aggressive, newcomers made a poor job of initiating friendships. Antonio was typical. Approaching Zelda, who was already frightened of him, Antonio's reassurance grunts and lip smacks were unconvincing. When Zelda tried to avoid him, Antonio vented his frustration by attacking her—not the best way to win Zelda's trust. A skillful resident such as Gargantua would be slow and patient, repeating—as long as necessary—his indications of friendly intentions. Such experienced veterans were the focus of social networks, surrounded by friends of all ages.

Every Pumphouse male, if he stayed long enough, went through the three stages of social progress. Yet this transformation raised a nagging question: Why should aggressive males prove the least successful while unaggressive ones won what was valued?

Answers began to come in my observations of sexual behavior. A female baboon becomes sexually receptive during a short period in the middle of her 40-day menstrual cycle, around the time of ovulation. Baboons form consort pairs then; these pairs can last from several hours to a few days.

MALES FOUGHT over receptive females in only a quarter of the mating situations. Yet no matter how a male gained possession of a consort, the female seemed ultimately to control the mating. Sometimes this was active, as when Zelda zigzagged through a thicket losing a male she didn't like and picking up one she did. At other times a female avoided an unwelcome male, forcing him to give up and leaving the field open to others.

Certainly, in consort relationships, male success depended more on friendship with particular females than on aggression. Friendly females stayed close, welcomed advances, were loyal to their consorts.

Guile instead of brute force played a role. I observed long-term resident Strider sit on the sidelines watching newcomer Dr. Bob, who was in consort with Frieda. Strider acted uninterested but was just biding his time as Dr. Bob grew more and more irritated by a group of pugnacious male hangers-on. Dr. Bob finally exploded. When the dust of combat settled, Dr. Bob had fought off the challengers. But Strider, sneaking in,

had claimed Frieda, mated with her, and walked her away, assuming an air of secure possession.

Reliance on diplomacy, friendships, and cunning held true, too, in nonmating confrontations. While observing a pair of antagonistic males, I was quite amazed the first time I saw one duck out, grab a nearby baby or a compliant female, and return to the fracas clutching the living shield to his belly. The effect was remarkable: The aggressor backed off.

David and Reuben staged a classic encounter of this kind. Reuben, a feisty newcomer, had had little success in forcing David, a long-term resident, to notice him or subordinate himself by showing fear and avoidance.

From simple harassment Reuben stepped up the challenge with serious aggression—eyelid flashes and yawns baring impressive canines. David's composure snapped, but instead of responding aggressively, he surveyed the troop and made a beeline for Thea, a good friend. As Reuben dashed toward them, still flashing eyelids and gleaming canines, David clutched Thea around the middle and turned, presenting her as a shield.

Each time Reuben tried to press his attack, David adjusted his stance so that Thea always faced Reuben. Thea kept calm in David's skillful embrace. At last Reuben gave up and walked off with a final half-hearted threat.

More often, a male grabbed an infant instead of a female as a ploy against his antagonist. How and why did these techniques work? They succeeded only if the infant or female was willing. A screaming baby or a distressed female just created more difficulties for the defending male.

Which individuals cooperated in this game? The answer was clear: Friends! A congenial infant or female could work as insurance against defeat and injury, because the troop routinely defended its infants and females.

One aspect still baffled me. Why should a friend, female or infant, be so willing to cooperate with a male? I came to understand that each friendship rested on an unstated contract of social reciprocity. Females and infants benefited from the physical protection that a male friend provided. Beyond that, just sitting close to a male averted bullying and assured availability of some special foods, better resting places, and other baboon desirables.

These social trade-offs were complicated. Debts might be repaid hours, or even months, later. And what was offered in exchange could be very different from what was originally given.

The social strategies by which one male countered or circumvented the aggression of another rounded out the picture of male

Understanding the males, *like Norman, presented a challenge to the author during 15 years of nearly continuous observation of the Pumphouse Gang. The key to male success is social finesse, not brute force.*

A tight-knit family *focuses on the oldest female like Zelda, far right. Such matriarchs and their female relatives and young form the stable core of the troop. They develop close bonds with accommodating males who provide protection. In estrus, a female is more likely to consort with male friends than with outsiders.*

The success of the translocation of the author's subject troops suggests the feasibility of this technique for saving endangered primate species in the future.

behavior. The social maneuvering of males depended on intimate knowledge of the entire troop, on friendships, on adroit behavior.

With both sexes aggression was far less pervasive than I had expected. There was no point in powering your way past an opponent, especially one with family or friends—even the whole troop—as allies. Baboons learned that social politics, not force, is the way to get things.

AFTER MANY YEARS of observing baboons, I see them as intelligent manipulators of their social world, weighing alternatives and making decisions. Even without language as we know it, I believe they have symbols and images that allow them to think first and act later. Humans, of course, have taken these traits to new heights, but I no longer believe them uniquely human abilities.

Some have claimed that a "killer ape" lurks within each of us, a relic of our evolutionary past that preordains us to violence. But could not the human experiment have begun with the legacy of smart primates—baboons like the Pumphouse Gang—who long before mankind evolved already relied on intelligence and social concessions more than aggression?

When human politicians, no matter their elegant oratory or persuasive arguments, kiss babies and "press the flesh," they are behaving, it seems to me, like good baboons, saying in shorthand fashion, "I'll do something for you if you'll do something for me." There may be one important difference: In matters of diplomacy I find baboons more predictable than politicians! □

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A vote of confidence for geography

MARK THE DATES on your calendar: November 15-21, 1987, has been designated Geography Awareness Week by the United States Congress.

This recognition is a real boost to those of us who are working to improve the study of geography in our schools. It shows that our message is being taken seriously in high places.

"We cannot expect to be a world leader if our populace doesn't have an understanding of other lands and cultures," said Senator Bill Bradley of New Jersey, key sponsor of the resolution.

A variety of activities have been planned to kick off the week. In New Jersey, finalists will compete in a statewide geography bee for eighth-grade students. Public officials and ambassadors from abroad will visit classrooms in Minneapolis, Dallas, and other cities to talk about their states and native lands.

For teachers all across the country the week will be an opportunity to explore an often misunderstood subject.

"Geography is more than memorizing place-names," explains Fred Willman, a junior-high-school teacher from Naperville, Illinois. "It's a little bit of everything. It's the glue that holds together our perception of the world."

Fred was one of 65 teachers who attended this year's Summer Geography Institute at Society headquarters. His comments were among many I heard one morning when I invited participants to speak out about geography teaching.

SENATOR BILL BRADLEY OF NEW JERSEY, SEATED, VISITS WITH TEACHERS FROM THE GARDEN STATE AT THE SOCIETY'S SUMMER GEOGRAPHY INSTITUTE. FROM LEFT, KATHERINE TARJORIAN, JANET PORTERFIELD, MARK BOCKENHAUER (NGS STAFF), HILBREY ZELLEY. PHOTOGRAPH BY DENIS FINLEY

Here is a sampling of what they told me:

"We need more support from the public at large. If people don't see geography as the connecting force behind the way things happen, it will never be important enough to be stressed in the schools."—Dwight Zirschky, Newberg, Oregon.

"Parents should put pressure on state legislatures to require teachers to be better trained in geography."—Joan Longmire, Elgin, Illinois.

"We need to help our students see how varied the world and its peoples are . . . and begin to understand why. Geography is perfect for this."—Rita Duarte, San Jose, Calif.

"Why not ask regional universities to set up a resource room, where teachers can check out books, activity plans, geography units, films, games. Such materials are too expensive for most classrooms."—Allyson Steffen, Murray, Kentucky.

"How about a geography achievement award—like the Presidential Physical Fitness Award—with inflatable globes as prizes? Kids would go bonkers over that."—Fred Walk, Normal, Illinois.

You already know how I feel about promoting geography. Now you've heard from some teachers as well. Why not see what you can do to get the ball rolling?

Gilbert M. Grosvenor

PRESIDENT, NATIONAL GEOGRAPHIC SOCIETY

Good News For People Who Eat.

If your taste buds are not altogether excited about a future of organic fiber flakes, the beef industry would like a few words with you. Even a few from the U.S.D.A. Because the lowdown on beef is probably less than you think—lower in calories, leaner on fat, lighter on cholesterol than you would ever imagine. It's even faster to fix than your mother knows. So read on. And hang on to your forks.

THE LOWDOWN ON CHOLESTEROL

True fact: beef has only 76 milligrams of cholesterol in a 3-ounce serving. That's only average. Wonderfully average.

GOOD NEWS FOR PEOPLE WHO COOK

No sauces, no fussing, no fros-fros. Beef doesn't need much help in the kitchen. To cut time, just cut big things in pieces. With stir-fries, sautés, kabobs and marinades, there's never a dull moment. Or a wasted one.

THIS IS YOUR LIFE

A 6-oz. broiled beef is under 300 calories. But for that fraction of a total day's calories, you get: • 46% of the adult man's RDA for protein • 59% of the adult woman's RDA for protein • 15% of the adult woman's RDA for iron • 40% of the adult RDA for zinc • 76% of the adult RDA for vitamin B-12

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Over half the fat in beef is actually mono- or poly-unsaturated. That's why 3 ounces of tenderloin have only 3.1 grams of saturated fat out of 7.9 grams total. May your body and your taste buds make peace.

TERIYAKI BEEF STIR-FRY

Preparation: 15 min.
Cooking time: 10 min.
Cut 1 lb. top round steak in thin strips. Marinate in 3 Tbs. teriyaki sauce, 1 Tbs. oil and 2 tsp. cornstarch 30 min. Stir-fry 3 bell peppers (¼" cubes) and 6 green onions (2" pieces) in 1 Tbs. oil 3 min.; remove. Stir-fry beef (½ at a time) 2-3 min. Return all ingredients. Cook until hot. 4 servings.
Calories: 267 per serving. 102 from beef.

Figures are for 3-ounce servings, cooked and trimmed.

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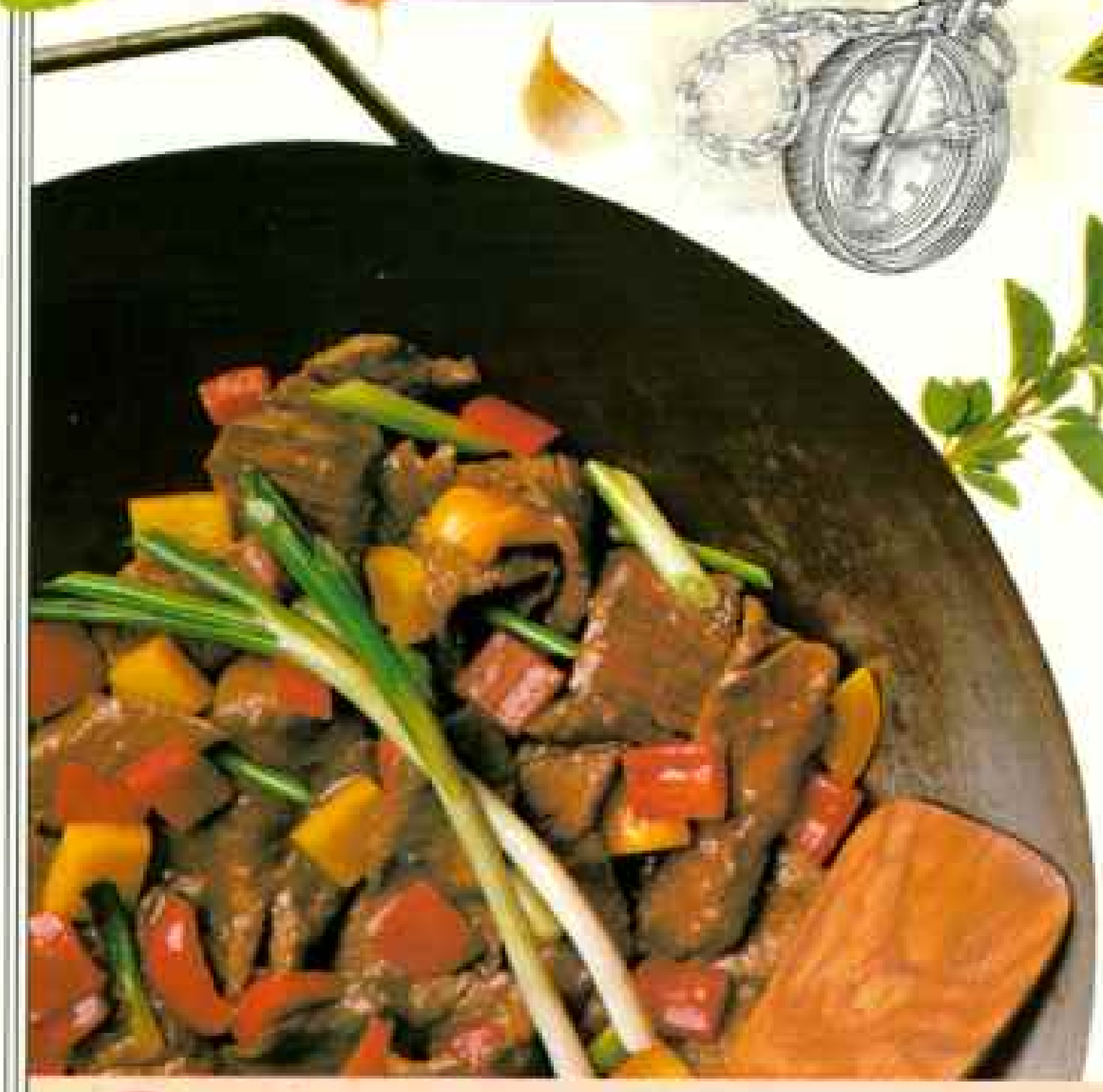

ROUND TIP
*6.4 grams total fat**
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162 calories

TOP LOIN
*7.6 grams total fat**
(3.0 grams sat. fat)
172 calories

TOP ROUND
*5.3 grams total fat**
(1.8 grams sat. fat)
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EYE OF ROUND
*5.5 grams total fat**
(2.1 grams sat. fat)
155 calories

TENDERLOIN
*7.9 grams total fat**
(3.1 grams sat. fat)
179 calories

SIRLOIN
*7.4 grams total fat**
(3.0 grams sat. fat)
177 calories

Members Forum

Great Lakes

Your July article on the Great Lakes was most impressive; however, the treatment of the lake-levels problem is flawed. Had available control measures been implemented when levels first became destructive, levels could now be at least 31 inches lower. Many decisions made by the International Joint Commission, either to act or not to act, have favored higher levels. The justification has been the increased income that shipping and hydropower receive from above-normal levels. Although destruction of environment has cost billions of dollars, extra corporate income exceeds it by billions, according to the IJC interpretation of cost/benefit.

DUDLEY TABER
Pentwater, Michigan

Thank you, Charles Cobb, for transforming this native Detroiter from a habitual NATIONAL GEOGRAPHIC skimmer to an in-depth reader.

EVELYN S. VAUGHN
Uniondale, New York

The northern region is a sublime mix of crystal waters, white sand beaches, forested shorelines, and endless recreational opportunities. Let's show America what is being lost and what there is yet to save, not just old rusting factories.

PAUL M. DUCKER
Vancouver, Washington

There was no discussion of the nuclear industry, its inherent wastes and by-products. I reside on the north shore of Lake Ontario between Toronto and Port Hope; within this 60-mile stretch are situated on the shore two nuclear generating stations, a low-level radioactive waste dump, and a manufacturer of uranium. In the early days of uranium refining, by-products were dumped into unlined holes at Port Granby. Unknown chemicals and radioactive waste are leaking into Lake Ontario, and the site is eroding. In 1976 the Canadian government declared that the site was inappropriate and must be removed. Also, spent fuel rods sit in pools of water at the generating stations. One major accident and the water of millions of Canadians and Americans will be contaminated.

HELEN MACDONALD
Newtonville, Ontario

The pollution problem grew worse after the St. Lawrence Seaway opened to oceangoing shipping. These vessels dump tons of pollutants every day.

LE ROY C. ADLER
Milwaukee, Wisconsin

Your excellent, timely coverage gives valuable help and credence to those working to clean up our water and air. You perhaps give more credit to our legislators and enforcement agencies than is due. Although my county is "phosphate free," for instance, most stores are either oblivious of the law or blatantly ignore it.

JANETTE STAVANA
Tallmadge, Ohio

Soybeans

After several years of research and writing on soybeans, I was gratified to read your July article. The miracle bean has indeed transformed agricultural systems, industries, and diets around the world. It has kept uncountable numbers of people alive and improved their diet. It has transformed our corn belt into a corn-soybean belt.

THOMAS RUMNEY
State University College
Plattsburgh, New York

Fred Hapgood made the Chinese preparation of *doufu* (bean curd) sound like the extrusion of plastics, while the lovely photo essay by Chris Johns left out the Chinese mastery of cooking doufu. After five weeks in China and Japan, I was impressed by the Chinese skill in creating vegetarian dishes based on doufu that have the look, texture, and flavor of meat. As for elegant display—pity you didn't send Johns to Beijing's Diaoyutai Guest House or Hangzhou's Lingyin Temple, both noted for mock-meat cooking.

WILLIAM CROSS
Upper Montclair, New Jersey

I laughed when an allergist informed me that my only food allergy was the soybean. "I never eat those," I said. Then I found out what you illustrate—they are a hidden ingredient in nearly everything. (You left out peanut butter.) I wish there was a non-soybean food list for those of us who break out in itchy sores from too much soybean in the diet. Thanks to your interesting article, I know what my enemy looks like.

MARY A. BUCHER
Columbus, Ohio

Remarkable as the story of soybeans is, there is a new bean on the horizon—the sweet white lupin. It is more digestible, less gassy, has better flavor, and provides more protein, calcium, and dietary fiber than the soybean, with no cholesterol. And it needs no processing. The kernel can be ground to make flour, cereal, baby and pet foods, and

How nuclear energy can help defuse the next oil crisis

Nuclear-generated electricity, still the fastest-growing major energy source in America, may be our best defense against another oil crisis.

More and more energy experts are asking the same question: How long before another oil shock torpedoes our economy and threatens our national security?

Oil turmoil

Signs of the next energy crisis:

- U.S. oil imports soared last year, costing the country $27 billion. This year, America's foreign-oil bill is expected to grow even bigger.
- Many oil analysts are saying that in three years or less, as much as 50% of all the oil used in the U.S. will have to be imported. That's a higher percentage than we have ever imported before, even during the oil crises of the 1970s.
- A whopping two-thirds of the world's oil lies under the sands of OPEC nations.

The need for nuclear

Nuclear electricity is a *domestically produced alternative to foreign oil.* Not just at the power plant, where nuclear energy is used instead of oil to generate electricity, but wherever Americans choose electricity (instead of oil) to heat their homes or run their factories.

The 1987 special report on U.S. energy security, ordered by the President and prepared by the U.S. Department of Energy, states that without electricity from nuclear energy, the United States "would be using more oil, paying more for each barrel of it, and feeling much less secure about its energy outlook."

The more we use our own nuclear electricity, the less we'll have to rely on energy from unstable regions of the world.

Nuclear energy for a secure future

With over a hundred operating plants in the U.S., nuclear energy is now our second leading source of electricity. But in spite of all that we have accomplished, the threat of foreign oil dependence remains. Difficult choices still need to be made, but one fact is clear: the more we develop our own energy sources, the more we can control our own destiny.

For a free booklet on energy independence, write to the U.S. Council for Energy Awareness, P.O. Box 1537 (FQ14), Ridgely, MD 21681. Please allow 4-6 weeks for delivery.

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pasta. Look for a second legume renaissance, as this Cinderella crop comes into its own.

NANCY ELLIOTT
Ottertail, Minnesota

Cover Picture

What a delightfully sensuous cover (July 1987). NATIONAL GEOGRAPHIC moves from the realm of science and geography to visual art.

DOUGLAS F. BREWER
Seattle, Washington

To me, [the tofu-nibbling geisha] was gross and inconsistent with past cover choices.

BARBARA WILLIAMS
Boulder, Colorado

Kathmandu

I disagree with the opening sentence (July 1987) that "Tolerance is the spiritual glue that has long held together the people of Nepal's Kathmandu Valley." The Reverend Nicanor Tamang [an Indian Christian] was sentenced to six years imprisonment in 1982 for proselytizing Nepalese nationals. In Nepalese law no person is entitled to convert a person from one religion to another.

C. STAMMERS
Bath, England

Queen Charlotte Islands

As a former resident of Masset, I was happy to see the Queen Charlottes in the July issue. I was elated when one week later South Moresby gained

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official national park status. If only the article had been published 13 years ago. One small correction: The population of the islands is more than double the 2,500 figure given.

TOM DEMARCO
Sackville, New Brunswick

I am writing to express my disappointment with your publishing a story that seemed to be more about an issue than a people or place.

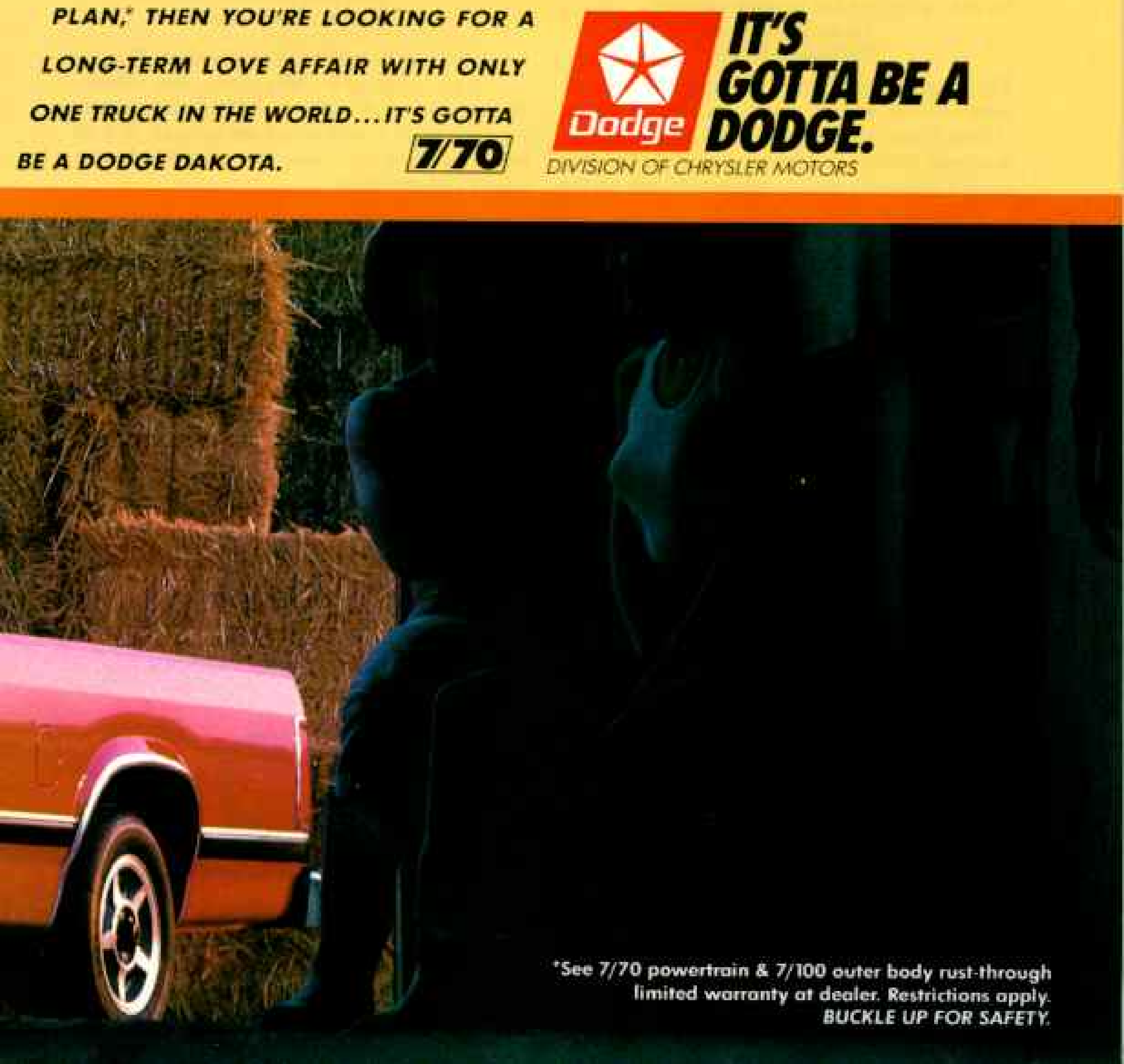
MICHAEL HENRIKSSON
North Vancouver, B.C.

Unfortunately, British Columbia asked a high price for the loss of land, and the federal government promised 106 million dollars Canadian plus a possible seven-million-dollar annual ferry subsidy. Some fear that other provinces may also ask for large compensation for future parks, making it more difficult for the Canadian government to complete the national park system.

ANDREW LOWRY
Newmarket, Ontario

Bangladesh Dam

As a coastal-resource manager, I was disappointed by your one-sided coverage of the damming of the Feni River (July 1987). Estuaries like the Feni are among the world's most productive areas. Over three-quarters of all food fish and shellfish spend part of their life in estuaries. Cutting one



off from the sea is like cutting off your hand at the wrist. Bangladeshis may have rice now but may not have any fish to eat with it.

JOHN HOULAHAN
Arlington, Virginia

Timber Rattler

I was thrilled to see the article on timber rattlers (July 1987). Hardly anything is written about snakes, as they repel a lot of people. In future articles how about the bushmaster and the fer-de-lance? I know this is asking a lot, but I'm 85 years old, so I can't wait too long!

ALICE PENNOCK
Kezar Falls, Maine

Among today's heroes are scientists like William Brown who devote much of their lives to the study of a small part of the natural world, always keeping in mind the big picture. He seeks out what most people consciously avoid, so that we may replace fear with wonder. My four-year-old daughter keeps turning to Dr. Brown's article; he is a role model for her inquisitive spirit.

GLEN D. PHELAN
Palatine, Illinois

The benefits of a healthy rattlesnake population were entirely lost on me, a resident of north-central Texas, where rattlesnakes are neither endangered nor novel. The day I received the July issue, I received a serious rattlesnake bite on the calf of my leg. I was not warned, and the snake was not provoked.

SHELLY S. STEWART
Walnut Springs, Texas

Members Forum

I cannot let the July Members Forum have the last word on my state. The North Dakota article in March was good, but to focus on a wheezing, sickly agricultural economy cast an inaccurate picture. The economy is trapped in a predictable cycle we have no control over. We have the lowest per capita violent crime rate in the nation, an unusually high church attendance, and an unemployment rate urban and diversified states can only dream of.

MIKE MARTIN
Enderlin, North Dakota

Please know that we produce 80 percent of the durum wheat in America. If a fence were built around the state, it would close every pizza parlor from here to Rome.

DON and MARTHA ERICKSON
Minot, North Dakota

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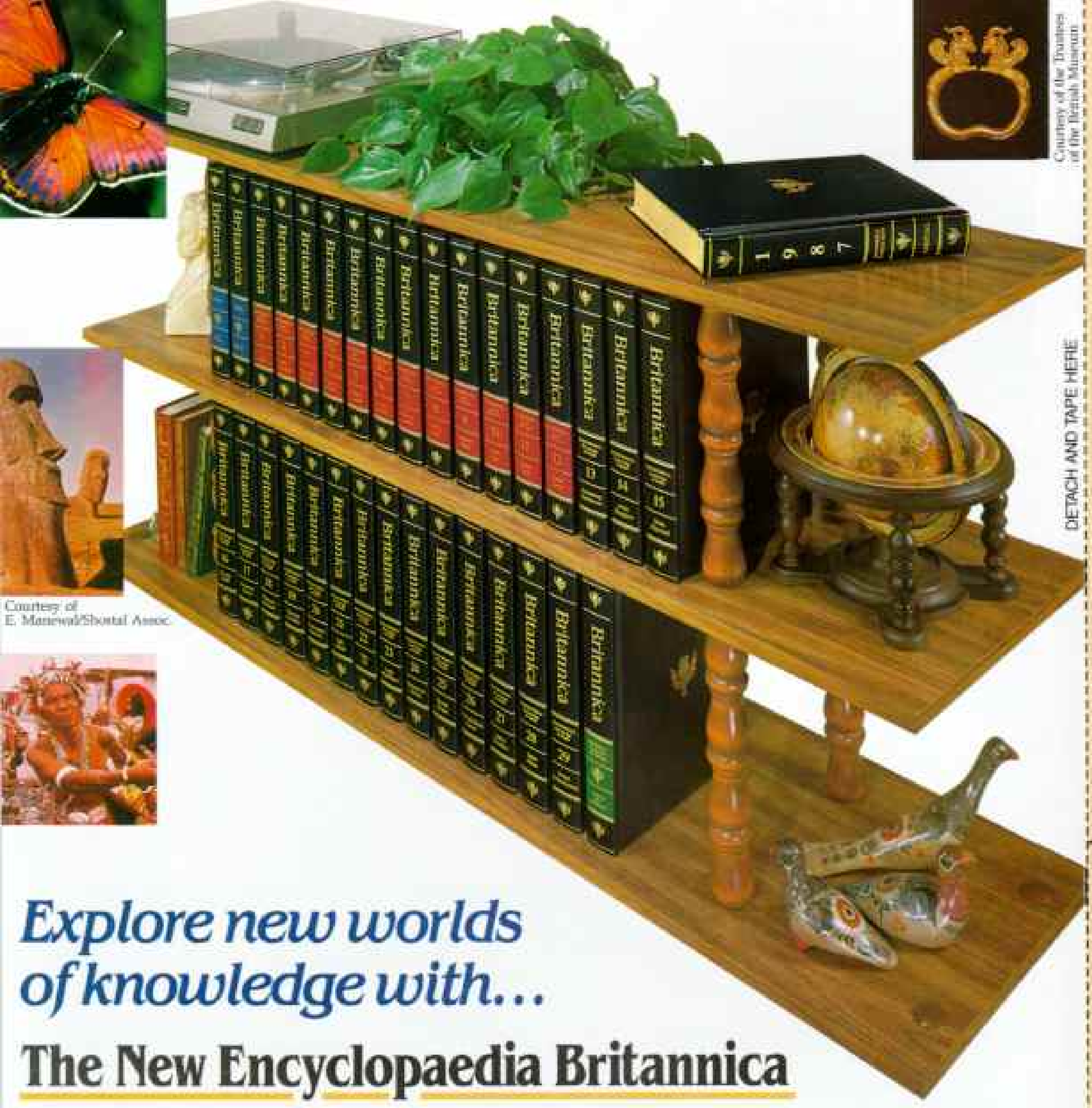

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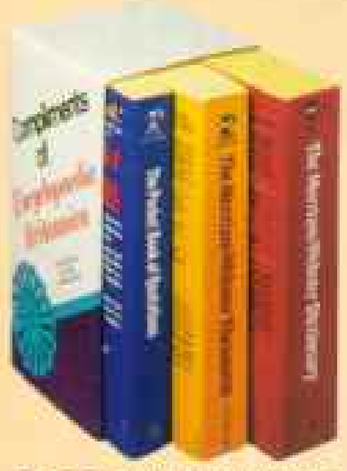

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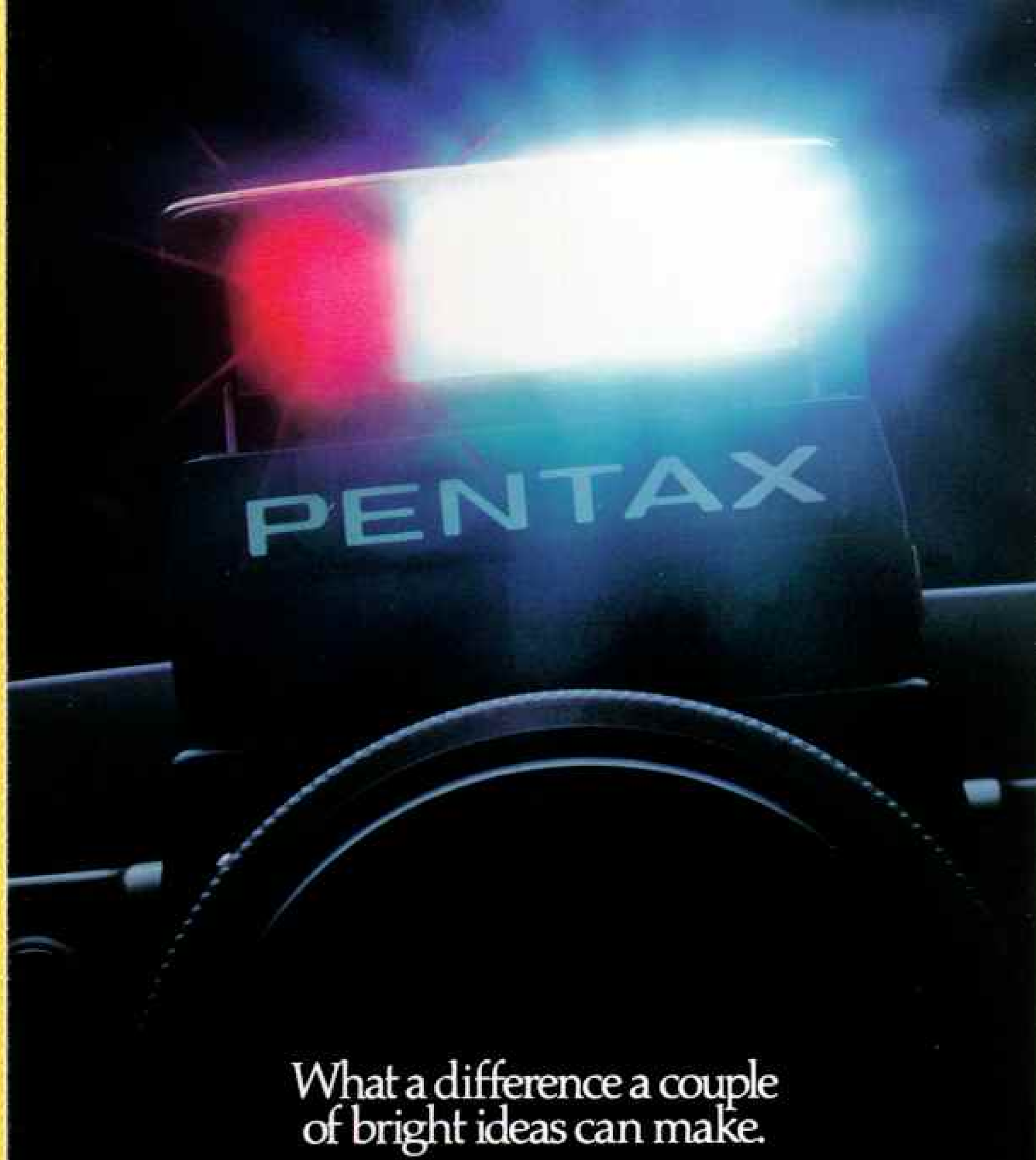

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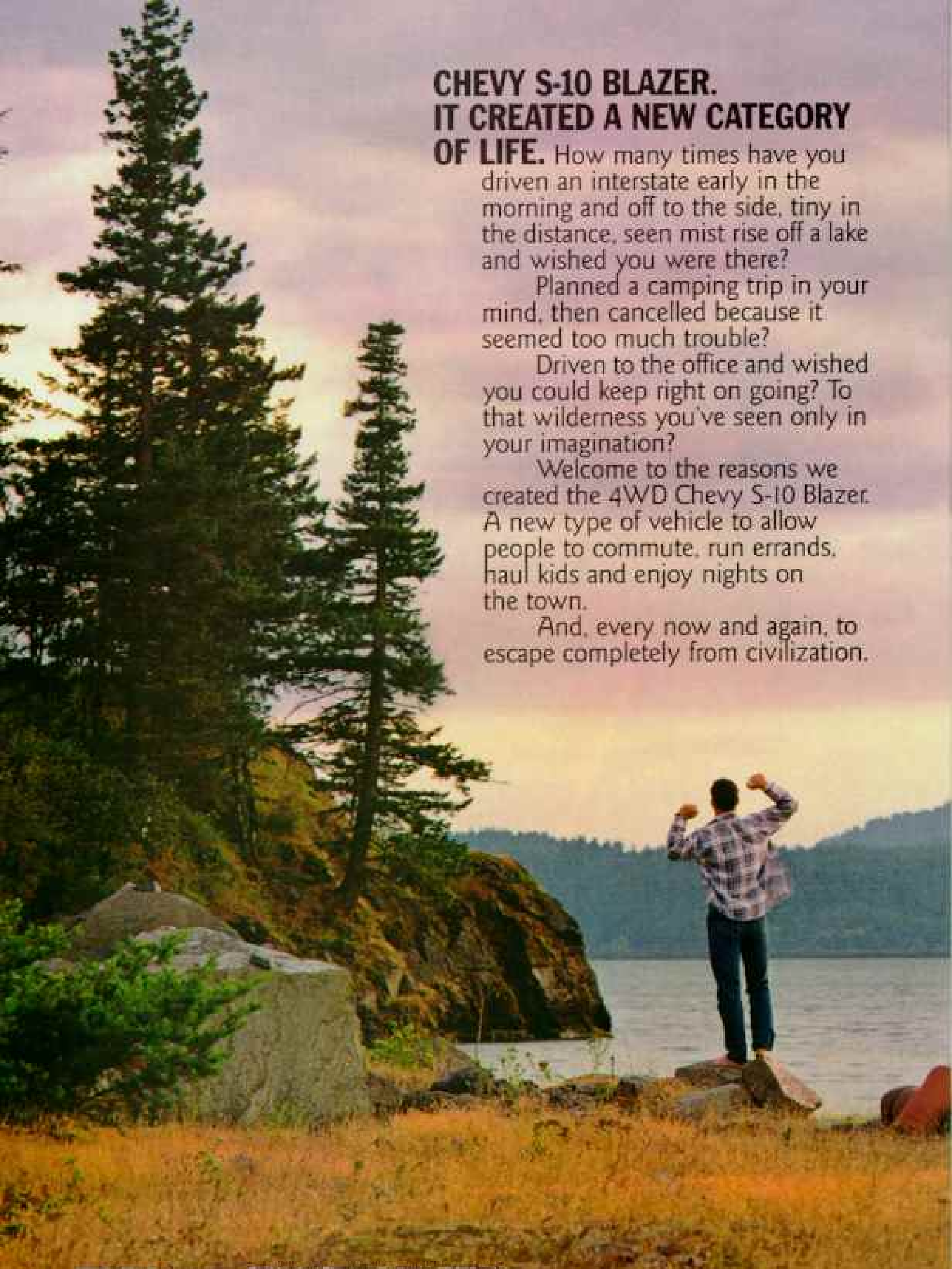

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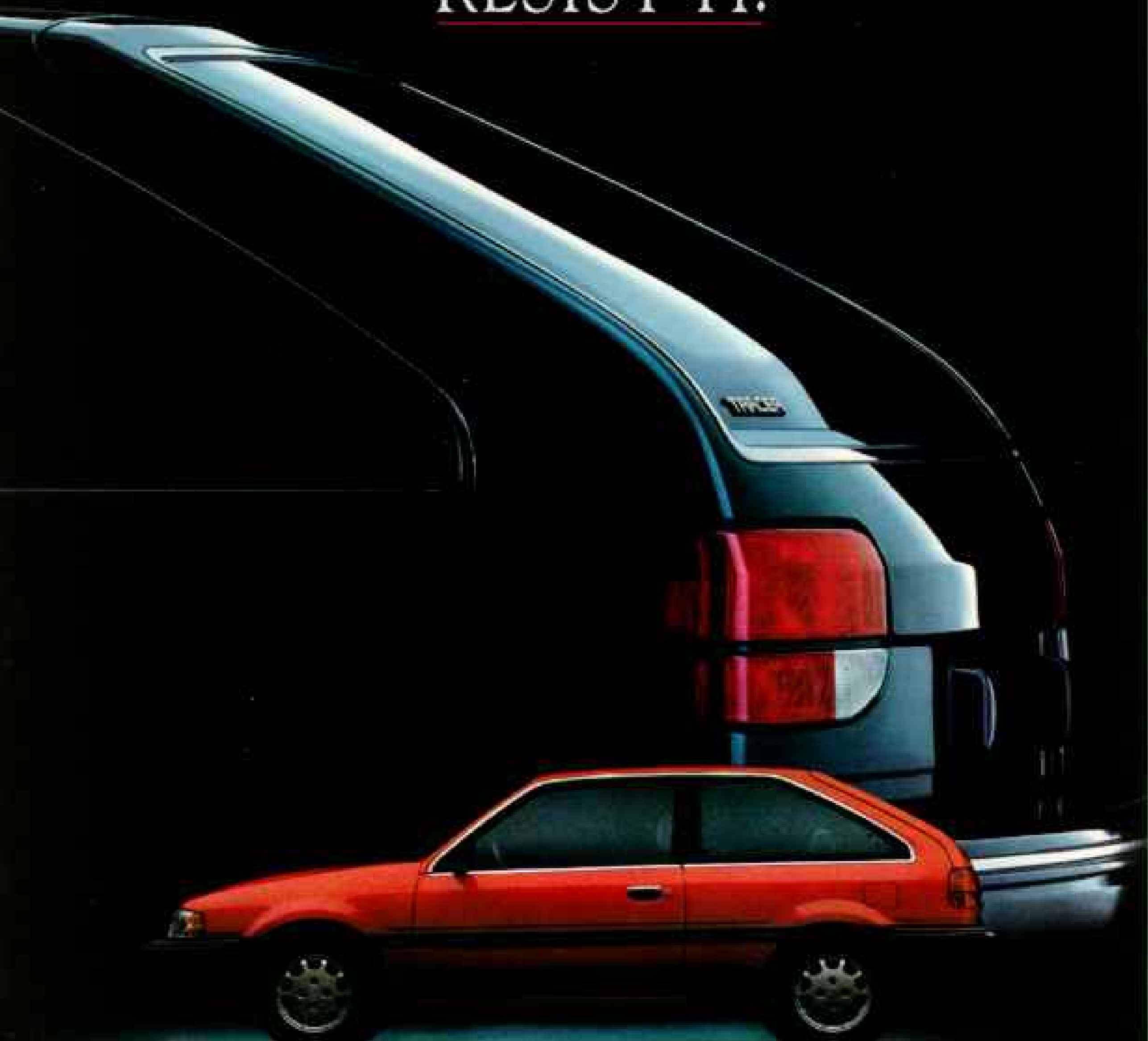

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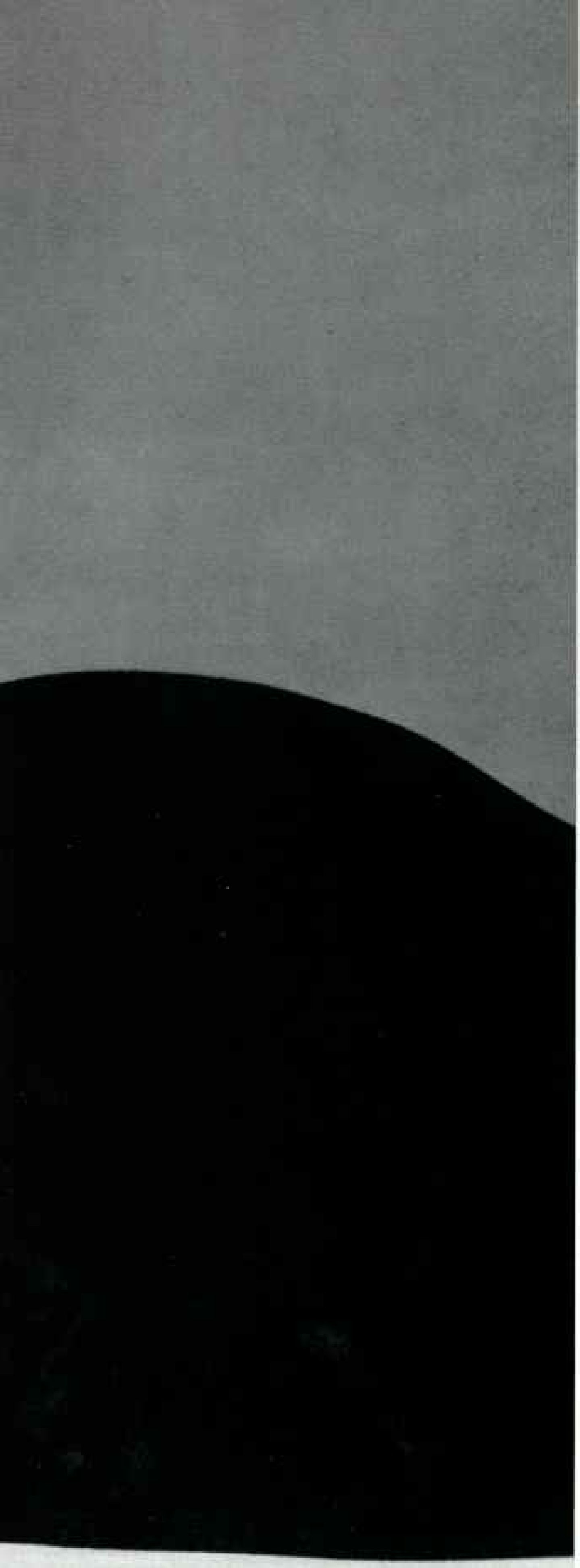

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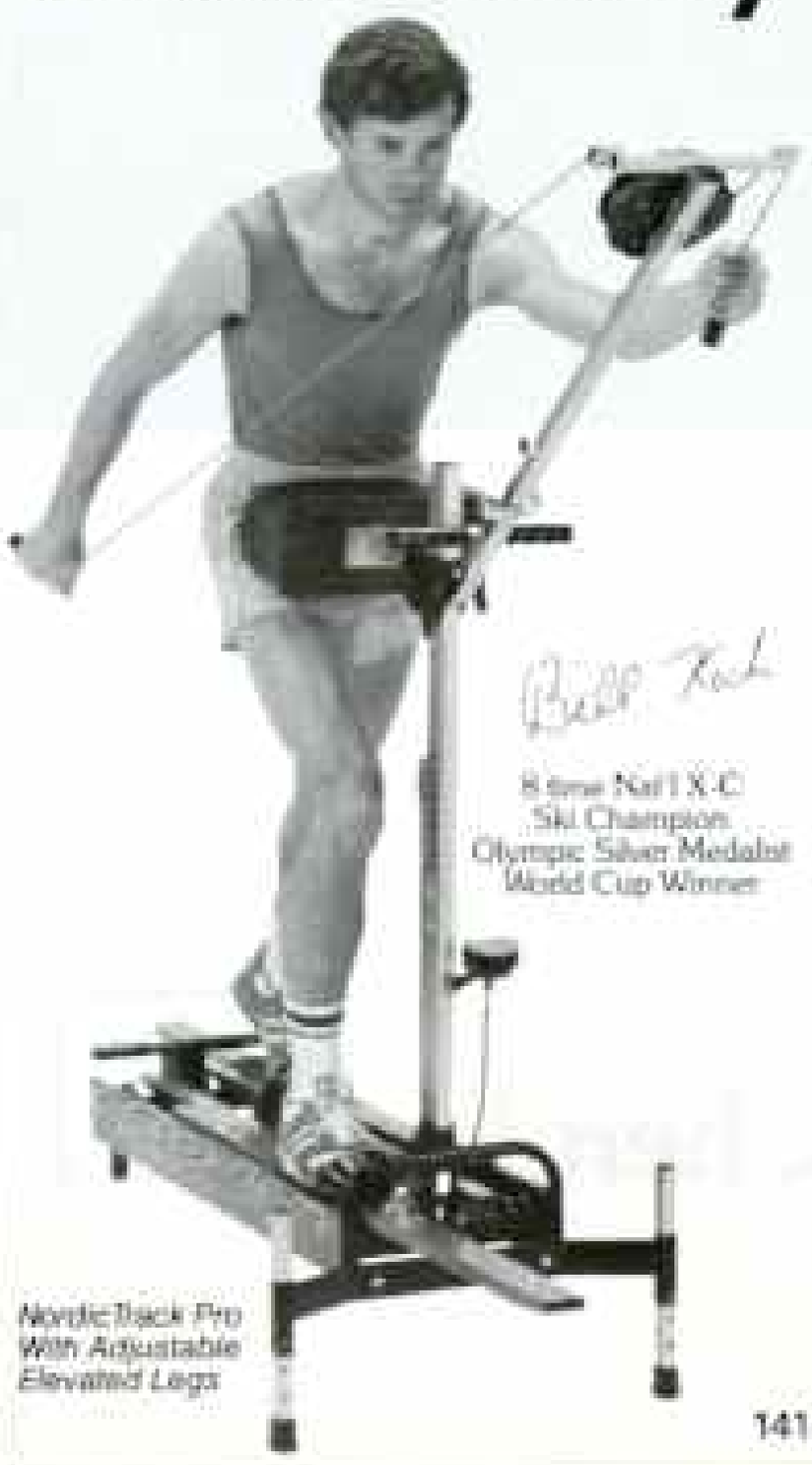

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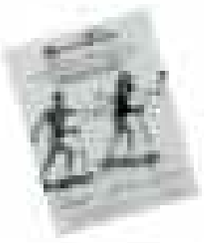

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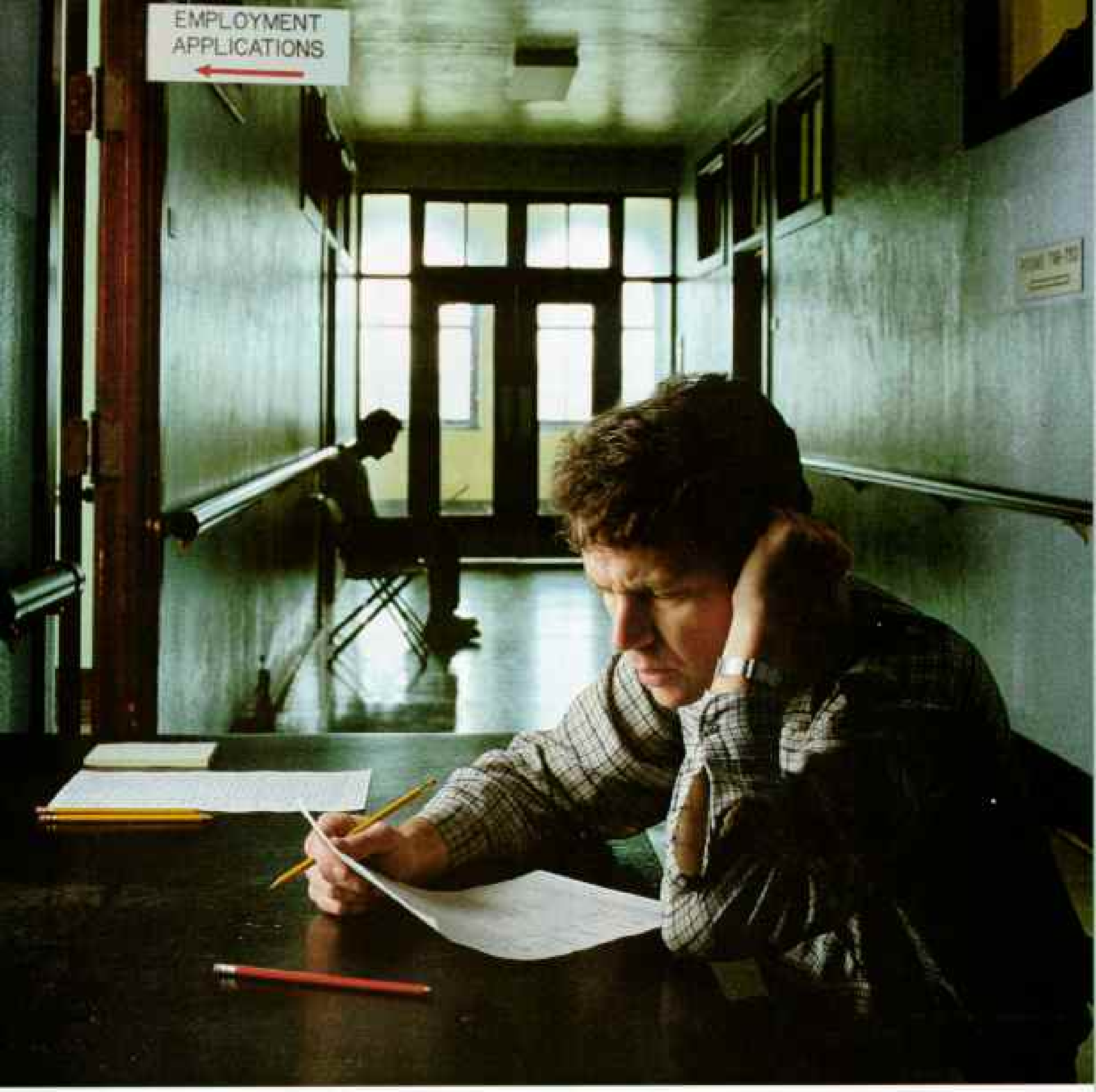

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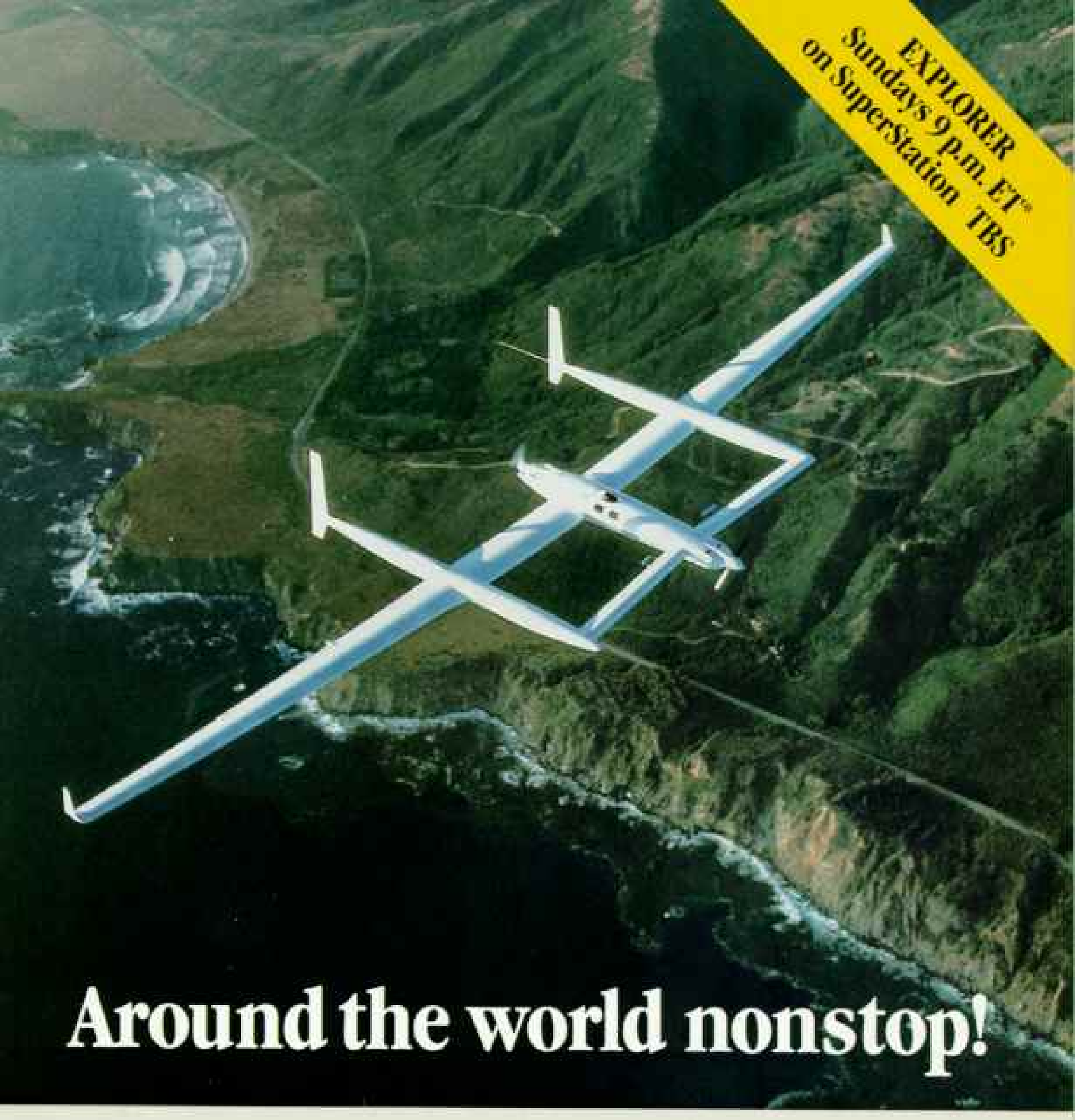

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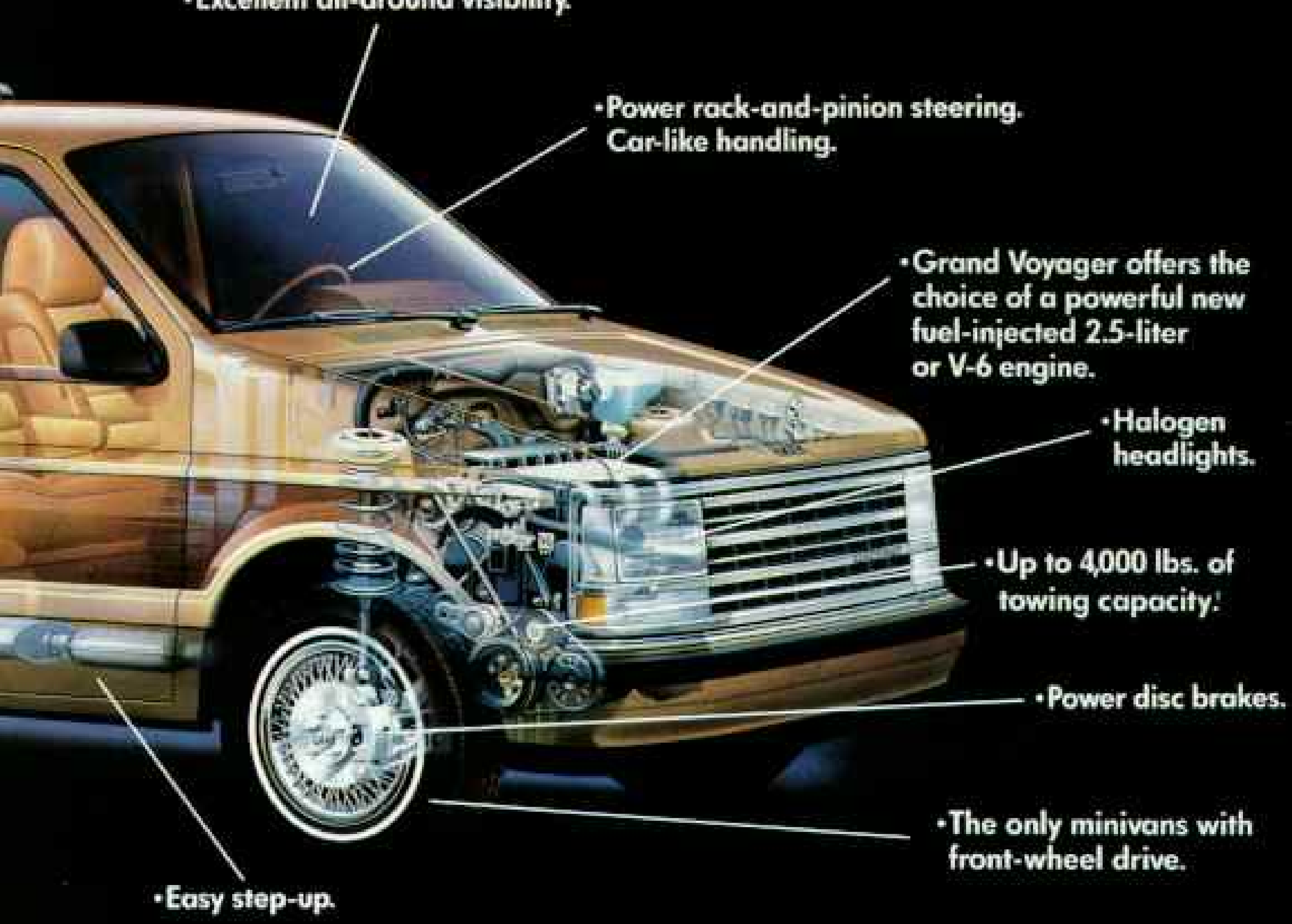

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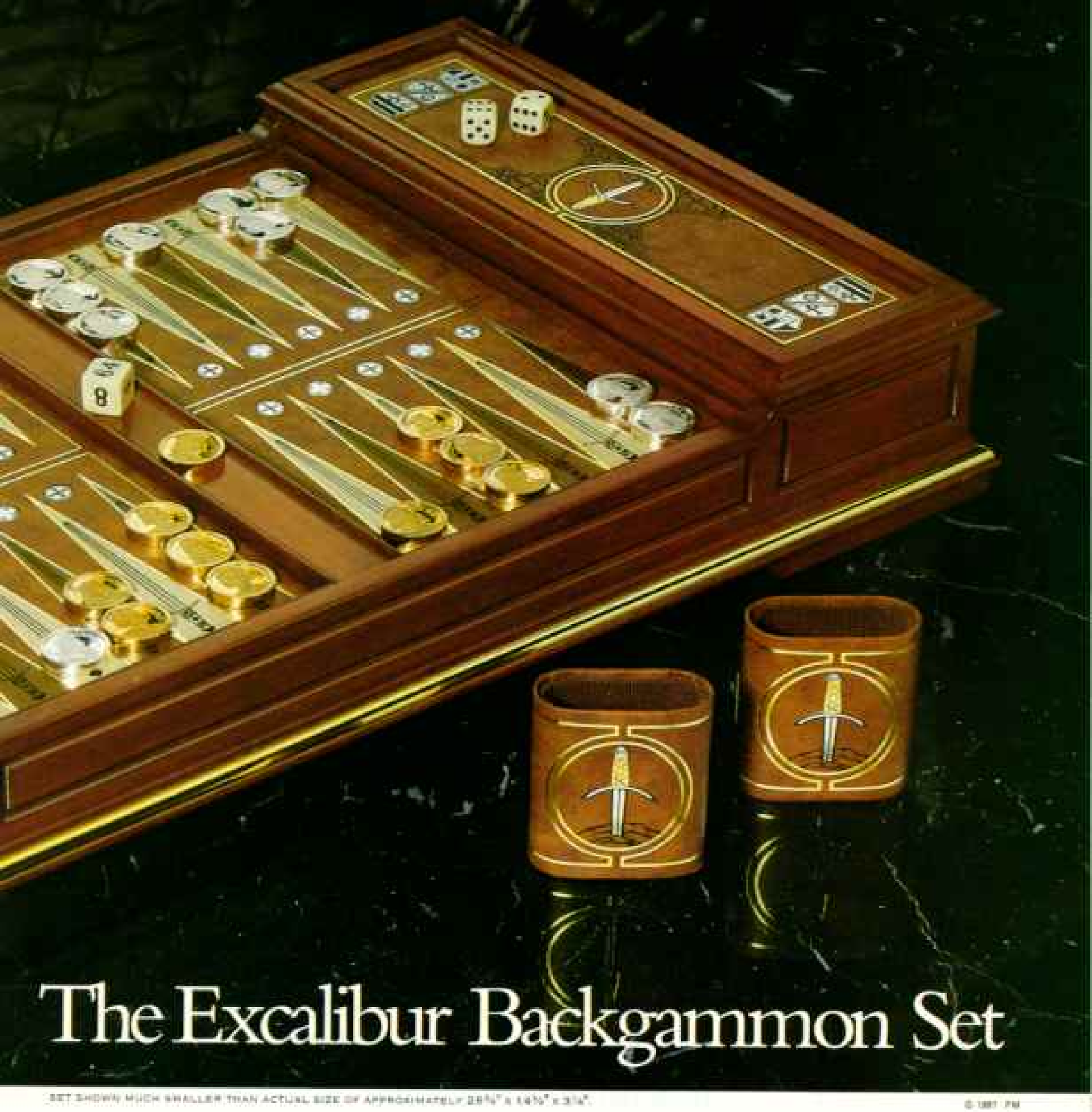

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On Assignment

"NO PICTURES!" came the warning at gunpoint last July from Haitian soldiers to free-lance photojournalist ***Carole Devillers*** (above). She had just photographed them arresting civilians during anti-government demonstrations that marked Haiti's most serious upheaval since Jean-Claude Duvalier was deposed in 1986. While covering weeks of turmoil, Carole was shot at, held at gunpoint, and had film confiscated. Nevertheless she intends to live permanently in Haiti, her home for the past five years. "I love the people—their kindness and their resiliency. And it is a beautiful country to photograph."

Born in France, Carole—who has three GEOGRAPHIC articles among her credits—plans to make documentation of Haiti her life's work. To help her new land, she has set up a nonprofit foundation, PATCH—Photography in Aid To Children of Haiti.

At times Carole served as guide-interpreter for staff photographer ***James P. Blair*** (below), here recording a fish-seller's meager offering on crowded Lambi Island. He was shaken by conditions: "In my 25-year career I've never seen such poverty as I found in Haiti; these people, who are so gentle and hospitable, now have to suffer the pain of political crisis."

RENÉ LEDRAND, AGENCE FRANCE-PRESSE (TOP); KENT J. KOBERSTEEN, NGS STAFF

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