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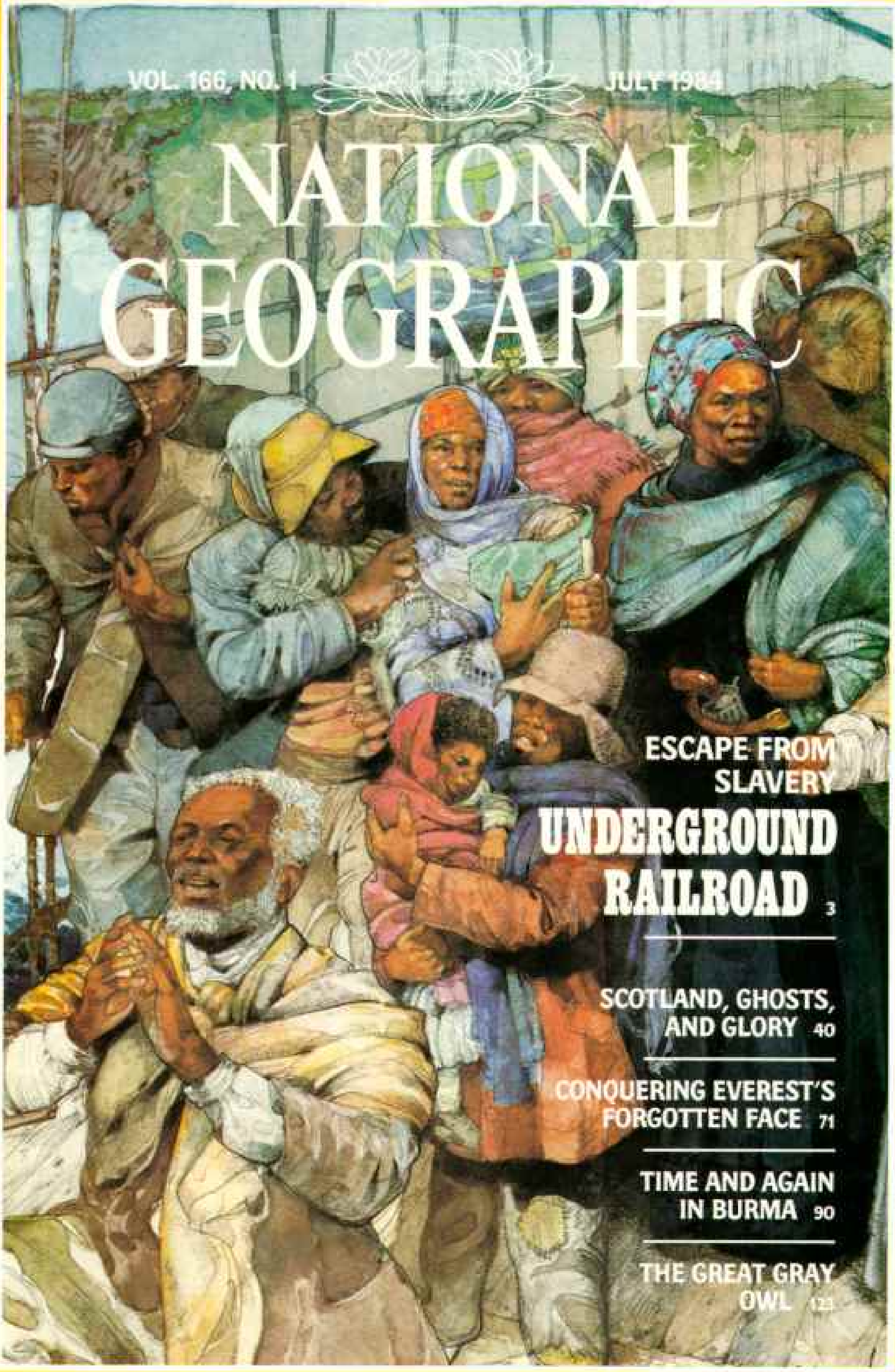
NATIONAL GEOGRAPHIC



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

ENCHANTED by a picture of five bronze statues found in 1967 at an archaeological site in Burma, senior staff writer Bryan Hodgson made it a point to look up the originals when he arrived in Rangoon for the article that appears in this issue.

But four of the five had been stolen a month after their discovery. "I felt cheated," Hodgson told me. "I really wanted to see them."

A Burmese archaeologist asked his assistance in locating the treasures, which date from the sixth or seventh century. They are products of the Pyu, early Burma inhabitants who occupied the Irrawaddy River Valley. After a determined search, Bryan learned that the statues, valued at $250,000, were in the hands of a New York art dealer. When Bryan explained how much they meant to the Burmese, the dealer personally took them back to Rangoon. The diminutive figures radiate a sense of grace and informal gaiety unusual in Southeast Asian art.

ANCIENT PYU FIGURINES PHOTOGRAPHED BY JAMES L. STANFIELD, '84

Not everything related to his coverage went as smoothly. When Hodgson and photographer Jim Stanfield were denied extended visas to enter Burma as journalists, they managed their coverage on half a dozen trips with tourist visas. Having done the same on two stories I've covered in Burma, on Pagan in 1971 and Inle Lake in 1974, I could sympathize.

But, as in my case, once they arrived they found the Burmese people as gracious and hospitable as any on earth. Despite seeing the country in glimpses, they gained revealing insights into this reclusive nation.

When he finally returned to the U. S., Hodgson brought with him a telling memento. He had provided a Mandalay craftsman with a photograph of the bronze statues and commissioned him to duplicate them. The reproductions, surprisingly true, show the enduring skill of Burmese artisans.

Wilbur E. Garrett

EDITOR

NATIONAL GEOGRAPHIC

July 1984

COVER: *Harriet Tubman conducts escaped slaves into Canada via the Underground Railroad. Painting by Jerry Pinkney.*

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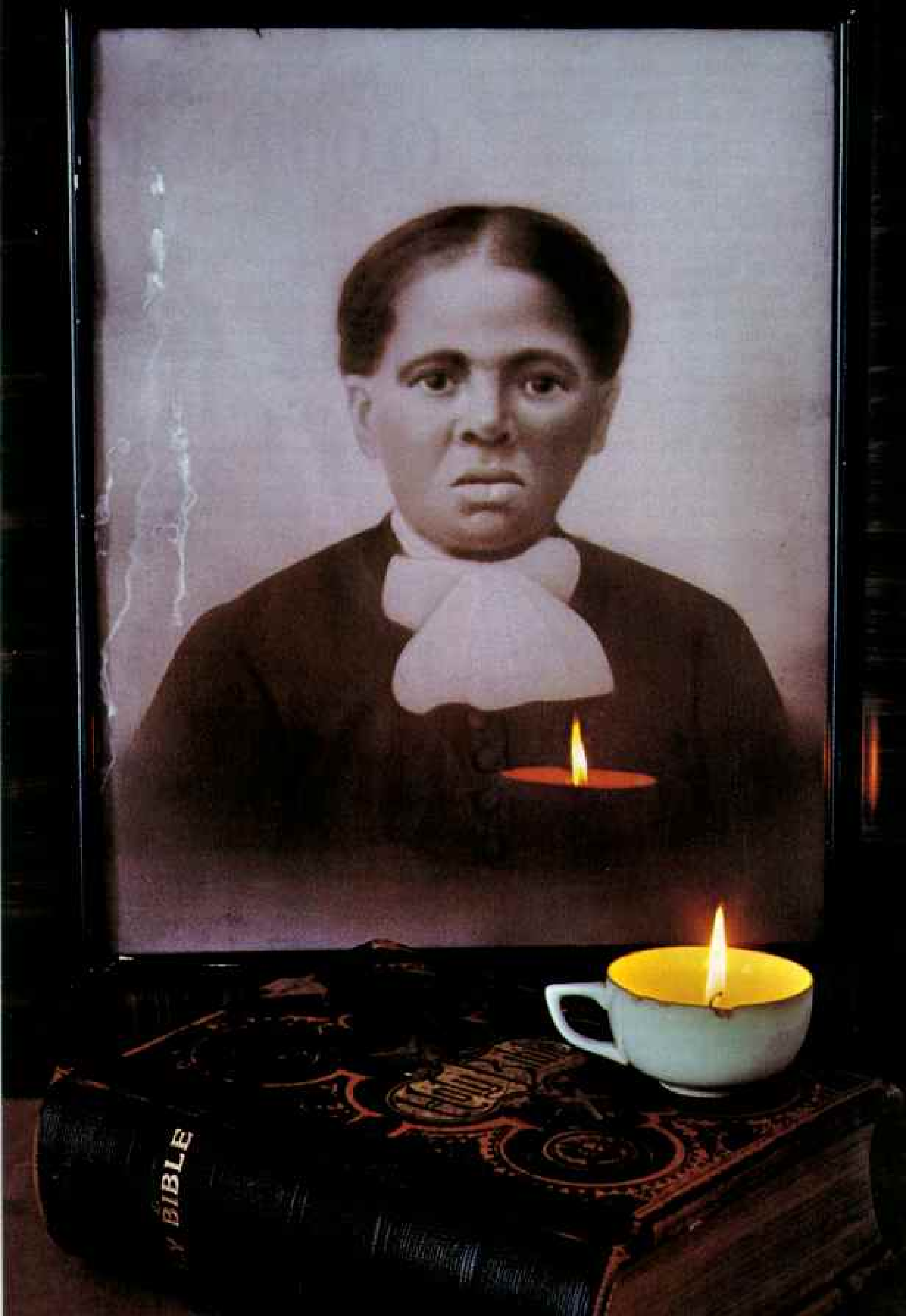

BIBLE

ESCAPE FROM SLAVERY

THE UNDERGROUND RAILROAD

By CHARLES L. BLOCKSON

Photographs by LOUIE PSIHOYOS

THOUGH FORTY YEARS have passed, I remember as if it were yesterday the moment when the Underground Railroad in all its abiding mystery and hope and terror took possession of my imagination. It was a Sunday afternoon during World War II; I was a boy of ten, sitting on a box in the backyard of our home in Norristown, Pennsylvania, listening to my grandfather tell stories about our family.

"My father—your great-grandfather, James Blockson—was a slave over in Delaware," Grandfather said, "but as a teenager he ran away underground and escaped to Canada." Grandfather knew little more than these bare details about his father's flight to freedom, for James Blockson, like tens of thousands of other black slaves who fled north along its invisible rails and hid in its clandestine stations in the years before the Civil War, kept the secrets of the Underground Railroad locked in his heart until he died.

So did his cousin Jacob Blockson, who escaped to St. Catharines, Ontario, in 1858, two years after my great-grandfather's journey to the promised land, as runaway slaves sometimes called Canada. But Jacob told William Still, a famous black agent of the Underground Railroad in Philadelphia, the reasons for his escape: "My master was about to be sold out this Fall, and I made up my mind that I did not want to be sold like a horse. . . . I resolved to die sooner than I would be taken back."

Years after that backyard conversation with Grandfather, I read Jacob's words in Still's classic book, *The Underground Rail Road*, and saw the name of my great-grandfather written there too—and thus authenticated my family's passage upon the Underground Railroad. In Still's book I found accounts of the heroism of the fugitive slaves and that of the men and women, black and white, North and South, who helped them flee from bondage at the risk of their own lives, fortunes, and personal liberty. For the Underground Railroad was no actual railroad of steel and steam. It was a network of paths through the woods and fields, river crossings, boats and ships, trains and wagons, all haunted by the specter of recapture. Its stations were the houses *(Continued on page 9)*

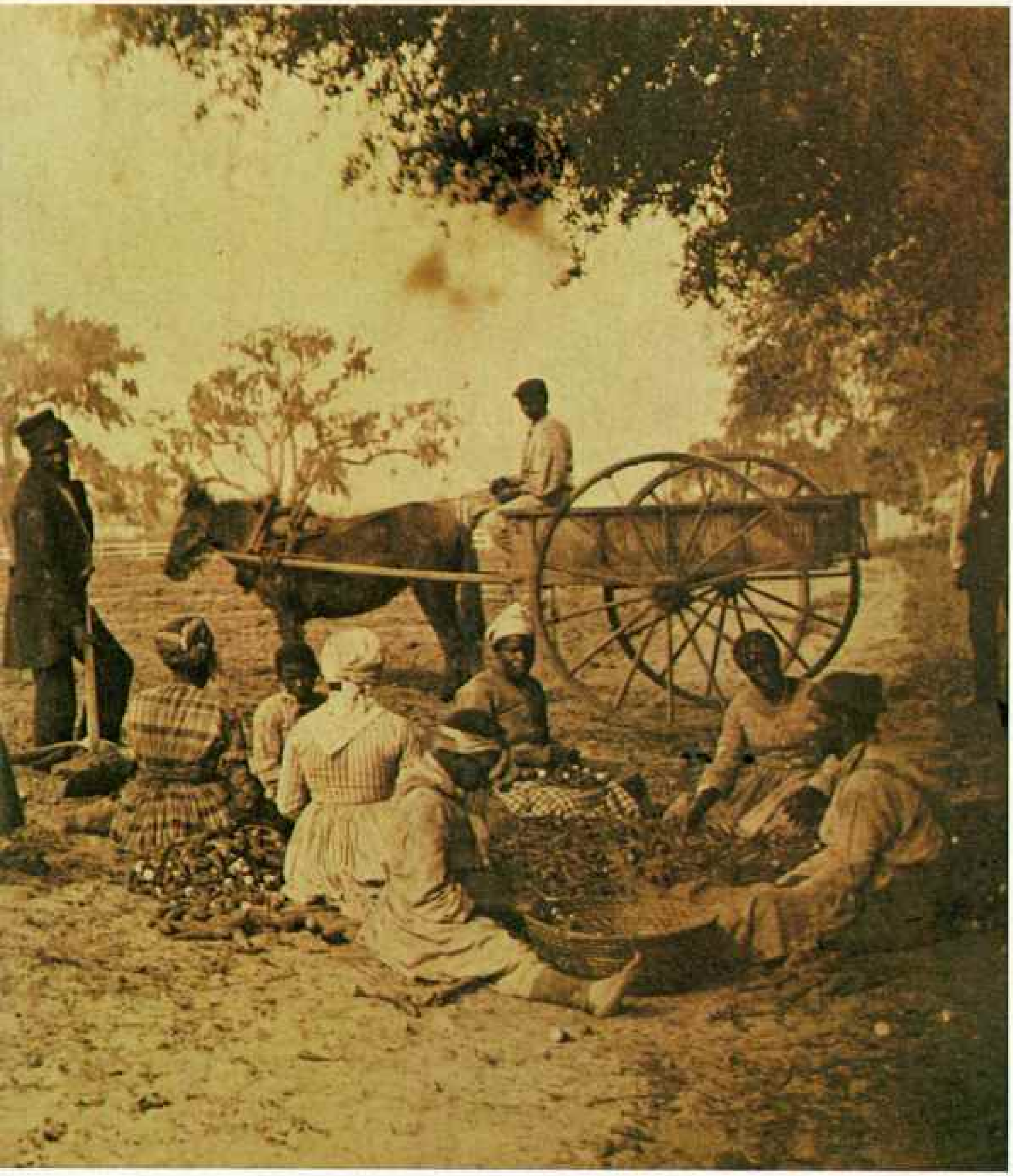
Moses to her people, *Harriet Tubman was born a slave in Maryland and as a young woman fled north to freedom in 1849. There she joined and inspired the Underground Railroad, a vast informal network of activists—black and white—who aided escaping slaves in the decades before the Civil War. At least 15 times Tubman returned south to conduct perhaps 300 fugitives, including her own family. Traveling the backcountry at night, she signaled people with a song. Though she could not read, she knew her Bible and felt no fear because, she told fellow conductor Thomas Garrett, she "ventured only where God sent."*

PHOTOGRAPHED AT HARRIET TUBMAN HOUSE, AUBURN, NEW YORK

FIELD HANDS PLANT SWEET POTATOES

"***For what purpose*** *does the master hold the servant?" asked a Southerner in the Farmer's Journal in 1853, answering frankly, "Is it not that by his labor he, the master, may accumulate wealth?" Profits did accumulate, even before the Mayflower landed; in 1619 Africans arrived as indentured servants at Jamestown. Gradually ship captains developed thriving businesses transporting Africans as slaves. In the South slavery took deepest root as gangs of the unpaid laborers turned vast tracts of cheap land into productive plantations of indigo, rice, cotton, and sugar destined for foreign markets. Though most southern whites were small farmers working for themselves, the plantation system soon dominated southern politics and traditions.*

Slavery, known as the "peculiar institution," required unconditional



AT CASSINA POINT PLANTATION, EDISTO ISLAND, SOUTH CAROLINA, DURING UNION OCCUPATION IN APRIL 1862; H. P. MOORE, COURTESY SCHOMBURG CENTER, N.Y. PUBLIC LIBRARY

submission; as one planter wrote, "We teach them they are slaves . . . that to the white face belongs control, and to the black obedience." As planters became increasingly concerned with perpetuating and spreading the system, more Northerners began to oppose the presence of chattels in a land of liberty. With convoluted reasoning the South rebutted: "The person of the slave is not property . . . but the right to his labor is property, and may be transferred like any other property."

As in every civilization where slavery has existed, the enslaved—who numbered four million on the eve of the Civil War—found ways to rebel: with inefficiency, petty theft, and flight. Dissembling became a key to day-to-day survival, as in this bit of wisdom from slavery times: "Got one mind for the white folk to see, nother for what I know is me."

- Fugitive slaves settled in many Canadian communities, and British authorities refused to comply with U. S. requests for their surrender.

- Importing slaves from abroad was a federal crime after 1808, but smuggling continued until the Civil War.

- After Nat Turner's short-lived insurrection resulted in the death of more than 50 Virginia whites in 1831, the South tightened slave codes and restricted manumission.

- Some slaves stowed away on ships to the Bahamas, where the British had abolished slavery in 1833.

- The Kansas-Nebraska Act of 1854 modified the Missouri Compromise, leaving the question of slavery open to territorial legislatures.

- In 1857 the U. S. Supreme Court ruled in the Dred Scott case that a slave was not a citizen, nor was he freed by virtue of temporary residence in a Free State.

FLIGHT TO FREEDOM

SELF-EMANCIPATION *carried fugitive slaves on their perilous journeys to the closest free territory. For some of them, the P for Pennsylvania on a marker* (**opposite**) *at the Mason-Dixon Line signified success. As Americans moved west, the question of slavery dogged every step, and compromises in Congress postponed the day of reckoning. Under the Missouri Compromise of 1820, Missouri entered the Union as a slave state, Maine and lands north of 36°30' acquired through the Louisiana Purchase as free territory. In 1850 California entered free in exchange for the southern-backed Fugitive Slave Law, which forced citizens to assist slave catchers, antagonizing Northerners and spurring their support of the Underground Railroad.*

BRITISH NORTH AMERICA

CANADA

Quebec

Montreal

St. Lawrence River

Lake Huron

Lake Ontario

Niagara River

Toronto

St. Catharines

Buffalo

Auburn

Rochester

Albany

NEW YORK

MAINE

Augusta

Brunswick

Concord

Manchester

Boston

New Bedford

NEW BRUNSWICK

NOVA SCOTIA

MICHIGAN

Battle Creek

Detroit

Windsor

Chatham

Lake Erie

Cleveland

Erie

Ashtabula

Oberlin

Hudson

PENNSYLVANIA

Pittsburgh

Columbia

Gettysburg

Norristown

Phoenixville

Trenton

Philadelphia

Wilmington

Baltimore

Seaford

Cambridge

Buckstown

Wheeling

Harpers Ferry

Washington D.C.

MD.

OHIO

Newport

Columbus

Indianapolis

Cincinnati

Ripley

Ohio

VIRGINIA

Richmond

Frankfort

Louisville

KENTUCKY

Appomattox

Dismal Swamp

ATLANTIC OCEAN

APPALACHIAN MOUNTAINS

New Garden

Raleigh

New Bern

NORTH CAROLINA

TENNESSEE

Wilmington

Columbia

SOUTH CAROLINA

Charleston

Atlanta

Milledgeville

Macon

GEORGIA

Savannah

ALABAMA

Montgomery

Fort George Island

Pensacola

Tallahassee

St. Augustine

MEXICO

Tampa

FLORIDA

Everglades

Cape Florida

BAHAMAS

Andros Island

Cuba

UNITED STATES, 1860

SLAVE STATE (Percentage of slaves in total population)

- More than 50 percent
- 30 to 50 percent
- Less than 30 percent
- No slaves

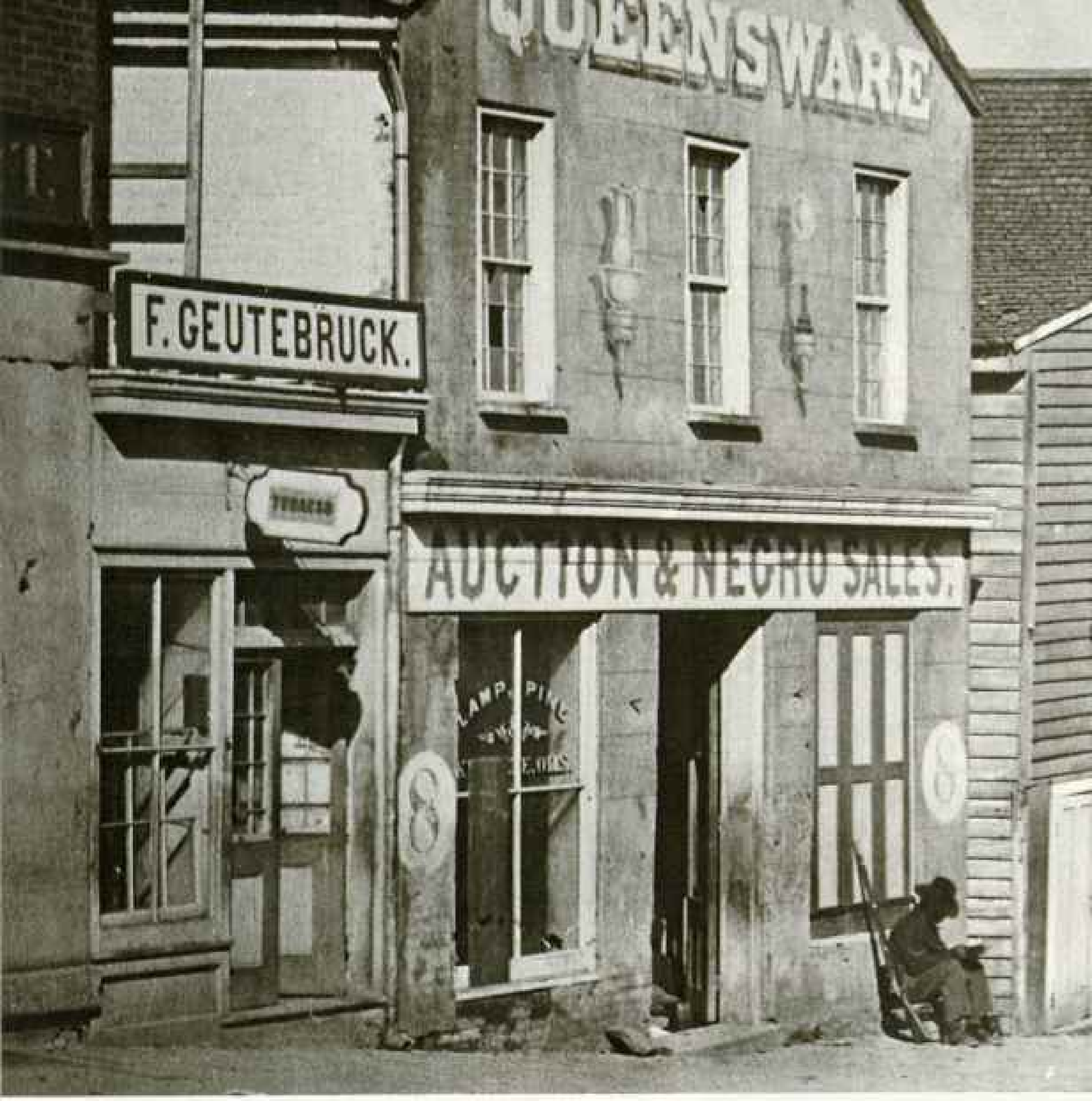
FREE STATE

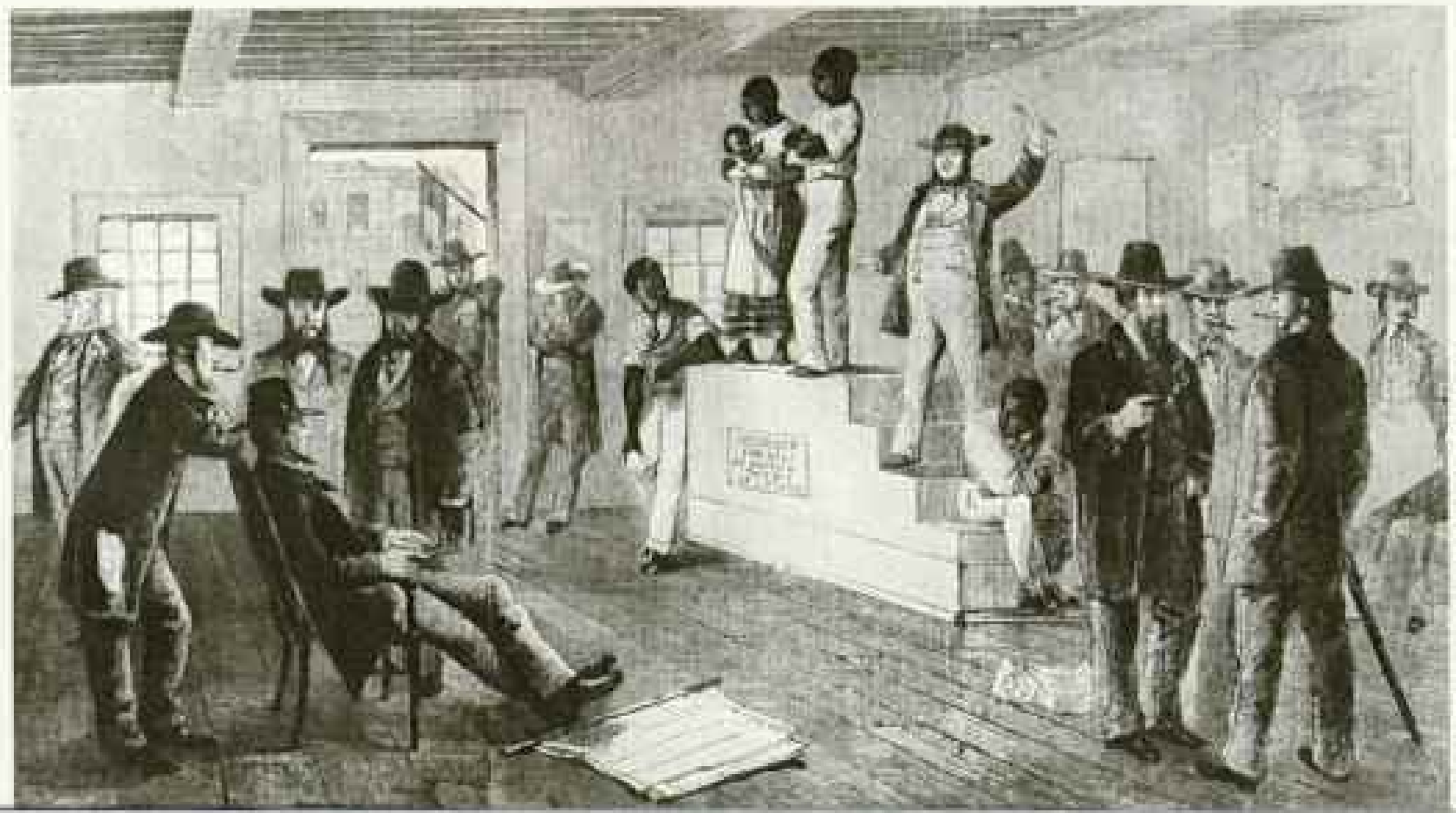
TERRITORY (Slavery permitted)

Arrows show major avenues of escape. Widths indicate relative numbers.

Mason-Dixon Line

SCALE VARIES IN THIS PERSPECTIVE


QUEENSWARE
F. GEUTEBRUCK.
AUCTION & NEGRO SALES.



COURTESY SCHOMBURG CENTER, N.Y. PUBLIC LIBRARY (ABOVE); THE BETTMANN ARCHIVE

Most terrifying fate *for a slave was to be sold away from family and friends. Yet slaves signified riches to their owner, useful for obtaining credit or paying off bonds. Dealers stood by in every southern town to pay cash, often operating, as in Atlanta* ***(above)****, out of recognized businesses, advertising openly that they had "slaves of all classes constantly on hand . . . paying the highest market prices." The subjects, often brought in chains, were washed and groomed for display like prize horses, as in this Virginia scene* ***(left)****. The prospect of the auction block frequently triggered flight.*

and the churches of men and women—agents of the railroad—who refused to believe that human slavery and human decency could exist together in the same land.

The scholar Edwin Wolf II captured the essence of my ancestors' experience when he wrote that *The Underground Rail Road* is filled "with tales of crated escapees, murdered agents, soft knocks on side doors, and a network as clandestine and complicated as anything dreamed up by James Bond."

As a historian attempting to research the Underground Railroad, I have found, with a mixture of admiration and chagrin, that this atmosphere of secrecy endures. So much is uncertain. Even the origin of the term "Underground Railroad" is obscure. No one knows how many fled from bondage along its invisible tracks: As many as 100,000 between 1830 and 1860? As few as 30,000? Probably no one will ever know. What we do know is a mere fragment of the whole, but it is enough. Ordeals may have gone unrecorded and names may have been forgotten, but such records as have survived in the memories of men like my grandfather and in the memoirs of those who risked all for freedom and brotherhood make it clear that the flight to freedom on the Underground Railroad was an epic of American heroism.

THE FLIGHT TO FREEDOM actually began long before the Underground Railroad was known by that name. George Washington wrote in 1786 about fugitive slaves in Philadelphia "which a Society of Quakers in the city (formed for such purposes) have attempted to liberate." Washington, a slaveholder himself, was probably referring to the Pennsylvania Abolition Society, which included among its members at various times such non-Quakers as Benjamin Franklin, Thomas Paine, Dr. Benjamin Rush, and the Marquis de Lafayette.

Ottawa Indians led by Chief Kinjeino were among the earliest friends of fugitives in western Ohio. Portuguese fishermen are said to have conspired with members of the Shinnecock tribe to transport fugitive slaves from the north shore of Long Island into ports of freedom in Massachusetts, Connecticut, and Rhode Island. The Seminoles harbored escaped slaves and

fought a continuing war with the United States to preserve their refuge in Florida.

Most heroic of all were the slaves and free blacks who offered their churches and their homes to help the enslaved—and above all, the passengers themselves.

There were ingenious escapes. Henry "Box" Brown, a "model slave" from Richmond, had himself nailed in a box with a bladder of water and a few biscuits and shipped to the Philadelphia Vigilance Committee. Though he traveled upside down part of the way, he arrived safely. But the white Virginian who helped him, Samuel A. Smith, was sentenced to prison for a subsequent attempt to freight slaves to freedom.

In 1848 a slave from Macon, Georgia, named William Craft dressed his young wife, Ellen, who was possessed of a light complexion, in the top hat and well-cut suit of a planter. They contrived a bandage for a "toothache" and a sling for a "broken arm" to conceal her beardlessness and her inability to write. Masquerading as master and slave, the two traveled northward with Ellen sleeping in first-class accommodations in southern cities along the way, until they reached Philadelphia and relative safety.

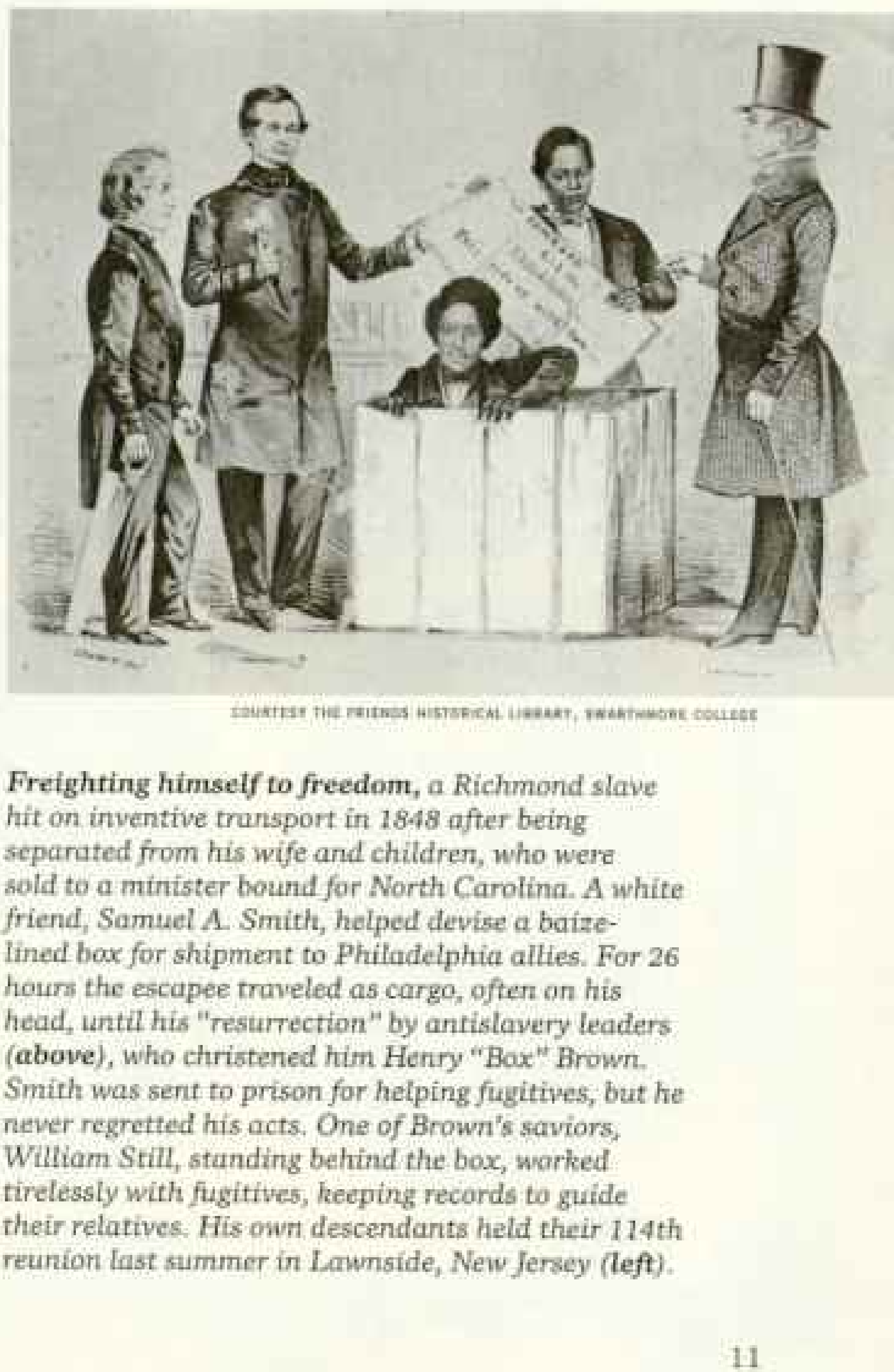
The vast Dismal Swamp on the Virginia-North Carolina border was a refuge for many slaves and a magnet for slave hunters who disabled their human quarry with bird shot, so as not to damage such valuable flesh with heavier ammunition. A runaway slave belonging to Augustus Holly of Bertie County, North Carolina, when finally

recaptured in the swamp, was found to be wearing "a coat that was impervious to shot, it being thickly wadded with turkey feathers."

Most simply walked to freedom. "Guided by the north star alone," wrote the great rescuer William Still, "penniless, braving the perils of land and sea, eluding the keen scent of the blood-hound as well as the more dangerous pursuit of the savage slave-hunter. . . . [enduring] indescribable suffering from hunger and other privations . . . making their way to freedom."

Slaveholders, of course, looked upon the Underground Railroad as organized theft. Under the Constitution of the United States, it was. Slavery was lawful and slaves were property. Their bondage was upheld as a matter of economic necessity for the agricultural South. Buying and selling at slave auctions was a sort of human stock market and a major source of income for many. Not only the South benefited. Entrepreneurs in the industrial North were eager to purchase cheap, slave-produced raw materials.

IF THE UNDERGROUND Railroad had a charter apart from the longing for freedom and the urgings of conscience, it was the Fugitive Slave Law of 1850, which greatly strengthened an earlier law dating from 1793 and gave slaveholders the right to organize a posse at any point in the United States to aid in recapturing runaway slaves. Courts and police everywhere in the United States were obligated to assist them.



COURTESY THE FRIENDS HISTORICAL LIBRARY, SWARTHMORE COLLEGE

Freighting himself to freedom, *a Richmond slave hit on inventive transport in 1848 after being separated from his wife and children, who were sold to a minister bound for North Carolina. A white friend, Samuel A. Smith, helped devise a baize-lined box for shipment to Philadelphia allies. For 26 hours the escapee traveled as cargo, often on his head, until his "resurrection" by antislavery leaders* ***(above)****, who christened him Henry "Box" Brown. Smith was sent to prison for helping fugitives, but he never regretted his acts. One of Brown's saviors, William Still, standing behind the box, worked tirelessly with fugitives, keeping records to guide their relatives. His own descendants held their 114th reunion last summer in Lawnside, New Jersey* ***(left)****.*

JERMAIN LOGUEN

LUCRETIA MOTT

FREDERICK DOUGLASS

ALLAN PINKERTON

JOSIAH HENSON

THOMAS GARRETT

WILLIAM L. GARRISON

SUSAN B. ANTHONY

JONATHAN WALKER

UNDERGROUND RAILROAD

THOUSANDS OF PEOPLE *sought to aid slaves. The varied lot included former slaves, freeborn blacks, white reformers, and clergy. Some whites championed gradual emancipation, others a return to Africa or freedom without citizenship; few approved social integration.*

JERMAIN LOGUEN (ca 1813–1872) *"No day dawns for the slave, nor is it looked for. It is all night—night forever," said this fugitive, son of his Tennessee master and a slave woman. Underground agent and ordained minister, he helped 1,500 escapees and started black schools in New York State.*

LUCRETIA COFFIN MOTT (1793–1880) *A well-educated Quaker wife and mother, she preached eloquently for abolition, women's rights, and temperance. She stood with William Garrison for immediate emancipation.*

FREDERICK DOUGLASS (ca 1817–1895) *A fugitive slave, Douglass became a skilled abolitionist speaker, praised for "wit, argument, sarcasm and pathos." He urged blacks to pursue vocational education and the vote; his print shop in Rochester, New York, was a depot on the underground.*

JOHN GREENLEAF WHITTIER (1807–1892) *Remembered for bucolic verse, the Quaker poet gave powerful voice to the abolition movement. He early joined the Republican Party, founded partly to halt the spread of slavery.*

ALLAN PINKERTON (1819–1884) *Before founding a detective agency, this Scottish immigrant managed an underground depot at his cooper's shop near Chicago.*

JOSIAH HENSON (1789–1883) *So trustworthy a slave that his owner made him an overseer, Henson, while transporting slaves to Kentucky, resisted others' efforts to free them all. Harriet Beecher Stowe attributed a similar episode to Uncle Tom in her novel. Henson eventually escaped to Canada, led others to safety, and traveled as abolitionist and businessman.*

THOMAS GARRETT (1789–1871) *"Among the manliest of men, and the gentlest of spirits," wrote William Lloyd Garrison about the Wilmington businessman who aided more than 2,700 slaves to freedom.*

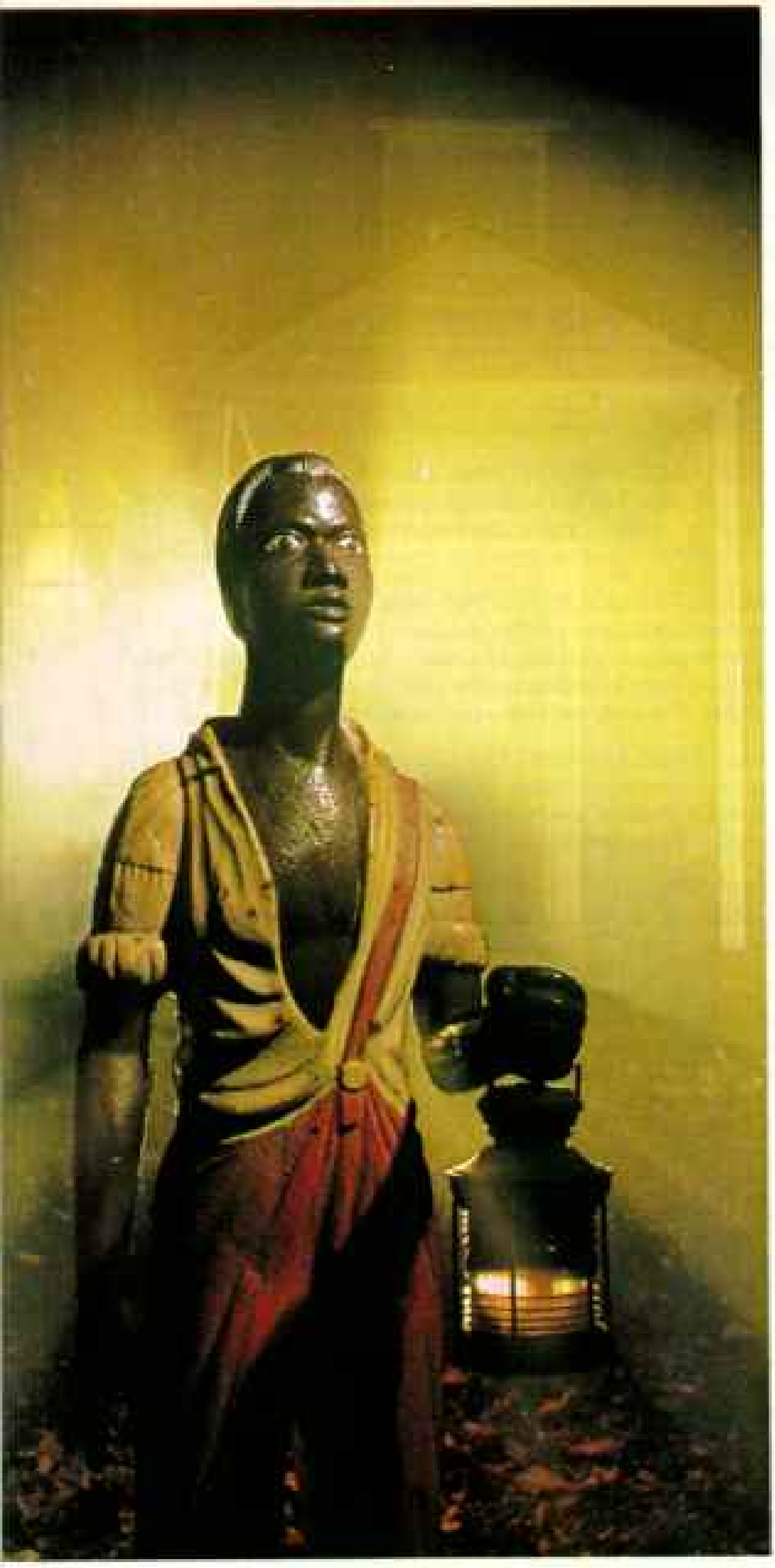
MARY ANN SHADD (1823–1893) *Daughter of a black agent in the Wilmington underground, the Quaker-educated teacher moved to Canada, where as a writer and editor she preached permanent emigration from the States.*

WILLIAM LLOYD GARRISON (1805–1879) *One of the earliest, most vitriolic abolitionists, he devoted full time to the cause, speaking against slavery and the Constitution that permitted it. By 1841 he was calling upon the North to secede.*

SUSAN B. ANTHONY (1820–1906) *Raised to be self-supporting by a Quaker father, the teacher spoke out for temperance, women's rights, and abolition, despite vehement prejudice against women in public affairs. Later she led the fight for women's suffrage.*

JONATHAN WALKER (1799–1878) *Imprisoned for helping seven slaves sail from Florida bound for the Bahamas, he was branded on the hand with S S for "Slave Stealer." After release he became a "conspicuous witness against slave power" for the abolitionists.*

WILLIAM STILL (1821–1902) *Indefatigable worker in the Philadelphia underground, Still kept rare day-to-day records, which were published in 1872. A successful coal merchant, he continued to campaign against discrimination.*



The faithful groomsman, *once used as a hitching post and today considered a derogatory ornament by many blacks, sometimes served the Underground Railroad. According to oral tradition, if no slave hunters were about, the sympathetic agent lighted a lantern or tied a bright cloth to signal welcome. Without this sign fugitives hid elsewhere until the coast was clear or moved on to the next depot.*

As a result, slave hunters plied their trade under the protection of governmental authority in all the free states bordering on slave states and even far into New England. Fugitives were plucked from churches in Ohio, from ships in Boston harbor, from the bosoms of free wives and husbands whom they had married in the North. The runaways were not safe anywhere in the nation. Those who aided them faced criminal penalties of six months in jail and a $1,000 fine in addition to a civil liability to the owner of $1,000 for each fugitive.

Some who helped the runaways were important figures in American history: Thaddeus Stevens, Frederick Douglass, Allan Pinkerton, Henry David Thoreau, Harriet Beecher Stowe, William Lloyd Garrison. One among them is a colossus: John Brown.

Captain Brown, the Old Man, Osawatomie Brown, Brown of Kansas—called by whatever name, he was known to all. Among abolitionists, some of whom supported him with money, Brown was revered as a righteous warrior and martyr. Others, including the government, regarded him as a murderous insurgent.

Believing that slavery must be eliminated by force, Brown organized guerrillas to preserve Kansas from slavery, and at Pottawotamie, Kansas, on May 24, 1856, they killed five men in revenge for an earlier attack by proslavery forces at Lawrence. With a score of followers on October 16-18, 1859, he seized the government arsenal at Harpers Ferry, Virginia, in the hope of igniting a general uprising of slaves, but he was taken prisoner, convicted of treason, and hanged.

Like his stationmaster father before him, Brown supported the Underground Railroad body and soul. In December 1858 he and his guerrilla fighters undertook one of the boldest adventures in the history of the Underground Railroad. With 11 slaves, including men, women, and children, the group set out in wagons on a journey of a thousand miles from Missouri to Windsor, Ontario, in the dead of winter. In Chicago they met the celebrated detective and Underground Railroad agent Allan Pinkerton. Pinkerton helped the group on to Detroit, where they boarded a ferry to Canada.

Nestled in the woods on Hines Hill Road in Hudson, Ohio, is a house where John

Brown once lived. Only the red chimney is visible from the road, and still existing somewhere under the barn floor is said to be a secret compartment where runaways hid.

Not far from there I came upon a surprising symbol of the Underground Railroad—an iron manikin of a young black groomsman, hand outstretched, which had been designed as an ornamental hitching post. Just such a lawn statue was used on the property of Federal Judge Benjamin Piatt, whose wife was an agent of the Underground Railroad, as a signal to fugitives and conductors. If the manikin held a flag, runaways were welcomed; if the flag was missing, the judge was at home and fugitives must pass on.

INVISIBLE though it may have been, the railroad had many subsidiary routes and innumerable sidings and spurs. The great trunk routes led north from the slave states. The one my great-grandfather probably followed when he escaped from Seaford, Delaware, ran through Wilmington and Philadelphia to New York City and the Canadian border. Farther west, fugitives passed through Lancaster County and on up through central Pennsylvania to the Finger Lakes and Lake Ontario.

Eliza Harris, immortalized as a fictional character in Harriet Beecher Stowe's *Uncle Tom's Cabin*, is modeled on a real woman who crossed the ice of the Ohio River. Faced with the threat of being separated from her only child, Eliza planned to make her flight to freedom beyond the river. But when she reached its banks she discovered that the ice had broken up and was drifting in large cakes and floes. In desperation as her pursuers closed in, Eliza darted into the river, holding her child in her arms. Springing from one floe to another, she lost her shoes in the icy waters but struggled on with bleeding feet to the opposite shore and the safety of the Ohio underground.

Ohio was a broad field of escape; the rights-of-way to freedom led to the Great Lakes and friendly ship captains en route to Canada, as did the routes through Indiana and Illinois, Wisconsin and Minnesota.

Before publishing *Uncle Tom's Cabin*, Stowe kept an underground station in Walnut Hills, near Cincinnati. Another celebrated Cincinnati agent was Levi Coffin, sometimes called the president of the Underground Railroad. A birthright Quaker, Coffin was first active in the system in New Garden, North Carolina, and Newport (now Fountain City), Indiana. He and his wife, Catherine, assisted more than 2,000 fugitive slaves from their Newport home, later known as the Grand Central Station of the railroad.

In Ashtabula on Lake Erie I encountered Tim Hubbard, descendant of Colonel William Hubbard, an ardent abolitionist whose large brick house was an important refuge for fugitives. "No fugitive slave was ever retaken from Ashtabula County," Tim told me, with pride and tolerable accuracy. Every year Tim Hubbard helps conduct an Underground Railroad pilgrimage, retracing the northern portion of the route from Wheeling, West Virginia, to Ashtabula Harbor, onetime anchorage of abolitionist sea captains bound for Canada.

OBERLIN, Ohio, has a unique tradition pertaining to blacks. John Brown's father was one of the trustees of Oberlin College, and the community was strongly abolitionist. In effect, the whole town was a station, and when, in 1858, a fugitive slave named John Price was seized on the outskirts of Oberlin, hundreds of her citizens followed him and his captors to nearby Wellington, stormed the hotel where he was confined, and freed him. Later they helped Price north toward Canada and safety.

The tradition lives on. In January 1980 David Hoard and eight other black Oberlin College students reconstructed the flight of escaping slaves from Kentucky to Oberlin. They covered about 420 miles on foot, crossing valleys and mountains, sleeping in barns, churches, and houses.

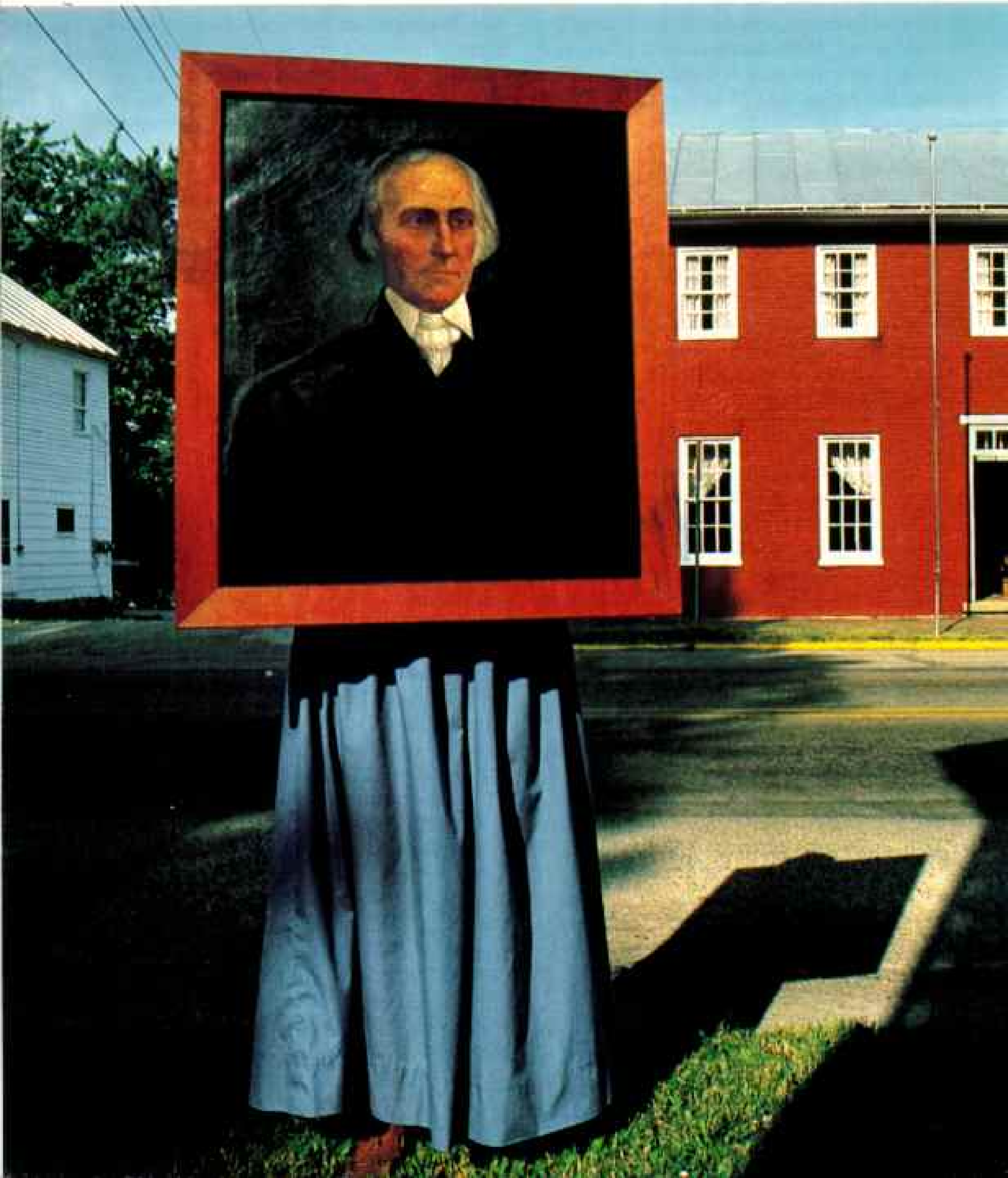
Crossing a starlit field in Kentucky, the students got a taste of the harsh realities faced by the fugitives. An officer of the law, seeing the group of black strangers marching out of the night, mistook their purpose and declared that he would have no demonstrations in his county. "You can't sleep here tonight," said the sheriff. "Get on across the [Ohio] river." But that, protested the young people, was a walk of 35 miles.

"Fine—keep moving," said the sheriff.

A bit farther on the students found a friendly family who let them sleep in their barn. "We sang spirituals of the Underground Railroad, but it was a frightening night," David told me. "Sometimes it's too cloudy to see the North Star."

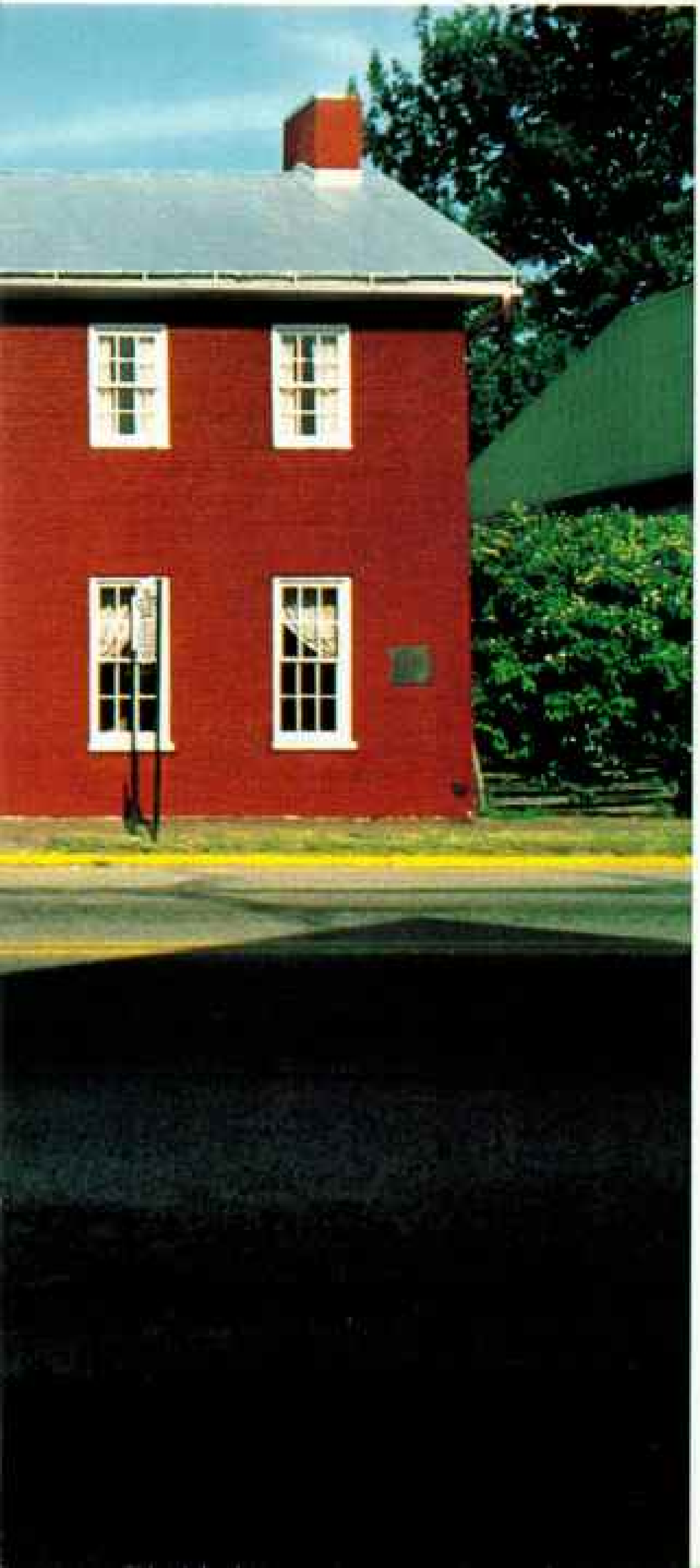
But there was safety across the Ohio and the Mason-Dixon Line. Thousands of fugitives passed to the North through the forests along the Appalachian range. Many from the Deep South hid on Mississippi River steamboats to northern ports. As Jefferson Davis observed: "Negroes do escape from Mississippi frequently, and the boats, constantly passing by our line of river frontier, furnish great facility to get into Ohio, and when they do escape it is with great difficulty that they are recovered."

Beyond Ohio one of the most important



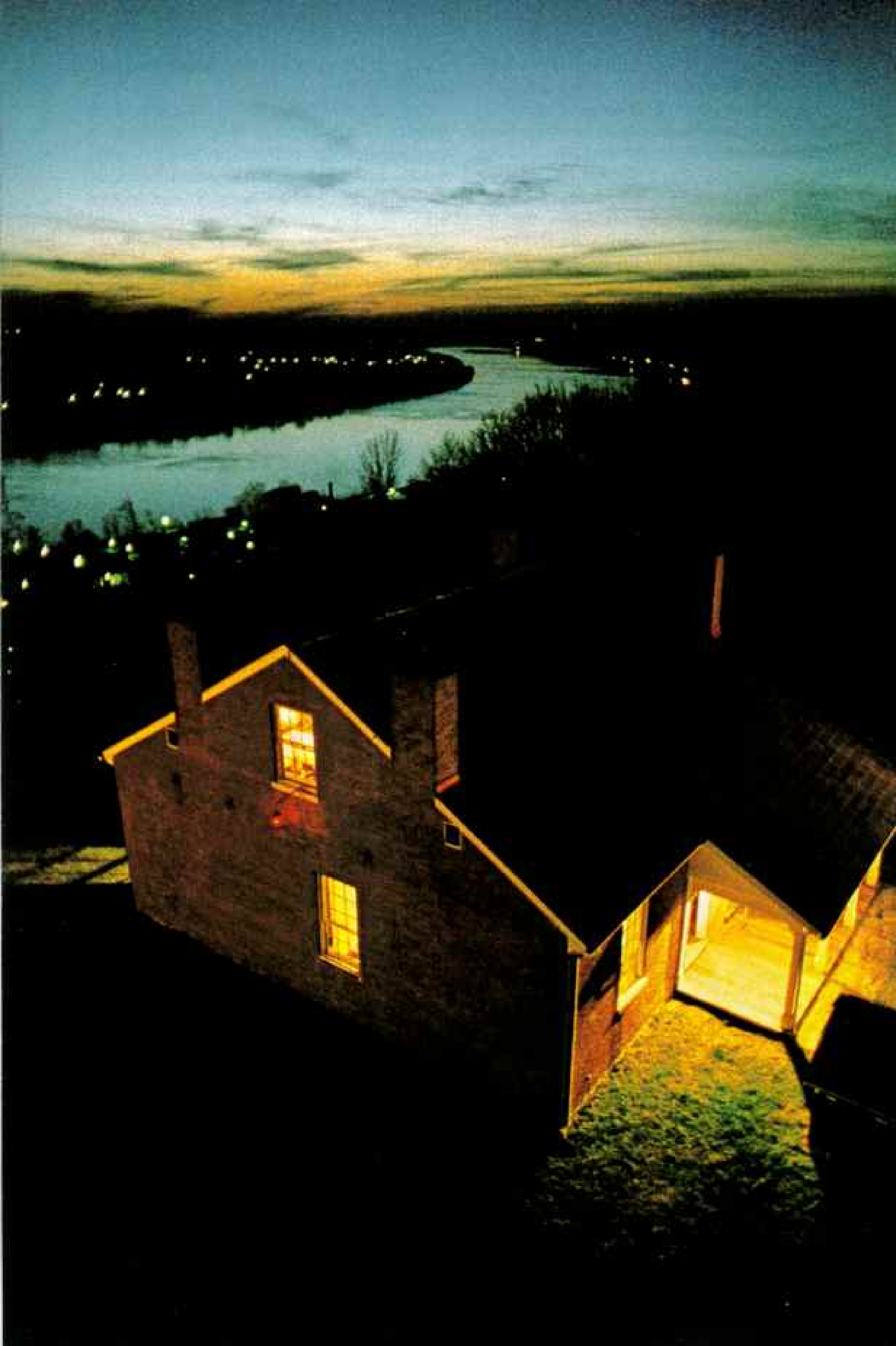
Underground Railroad sites may have been the Joseph Goodrich house at Milton, Wisconsin, where passengers escaped intruding slave catchers through a secret underground tunnel. Among the most ingenious of the Michigan agents were George De Baptiste and William Lambert, who created the Order of African-American Mysteries, with its system of secret signs. Such handshakes, passwords, and other signals were known and used by agents throughout the underground system.

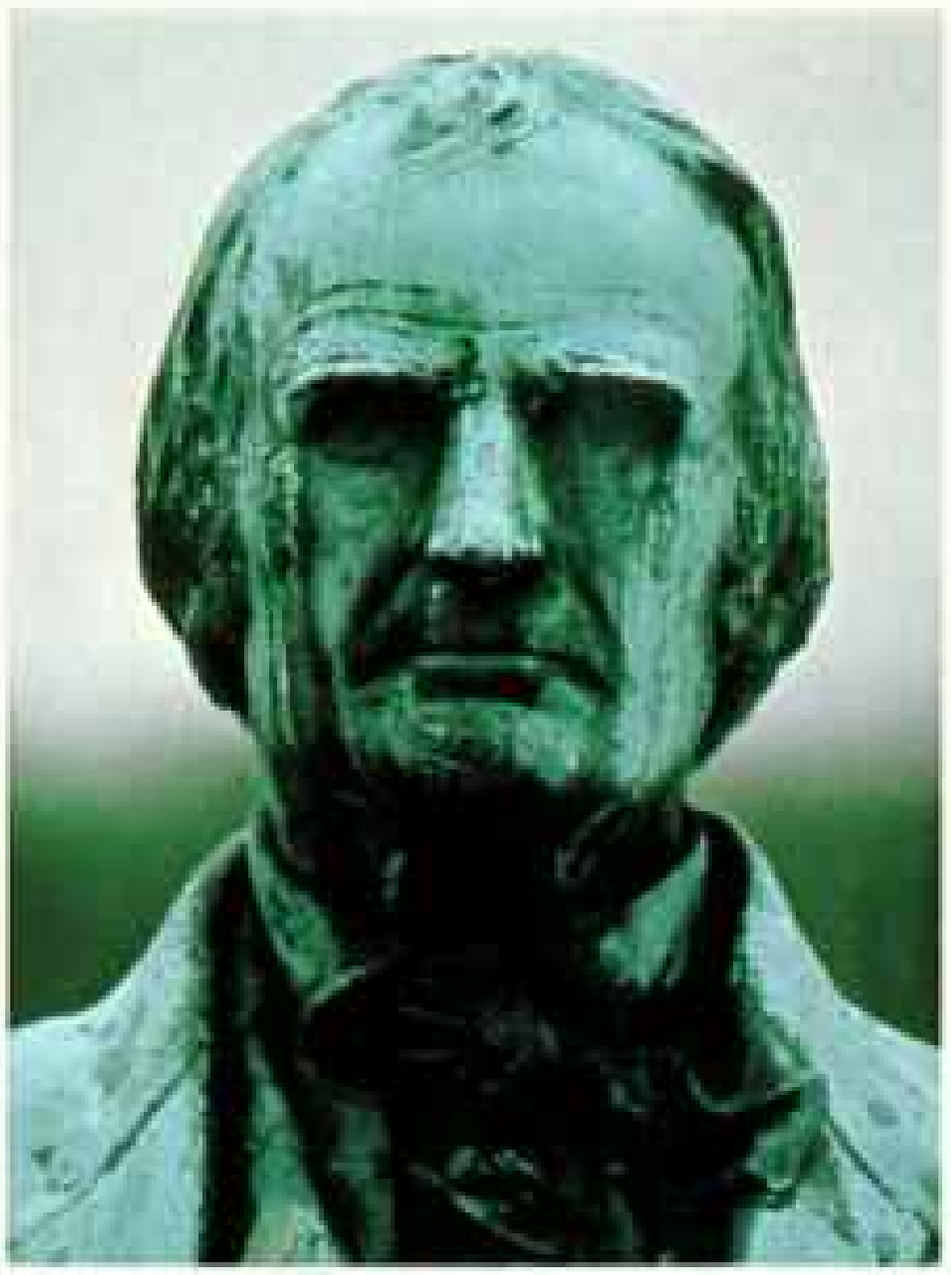
Sojourner Truth, an unlettered black woman born a slave in New York State, is memorialized by a statue at Battle Creek, where she died in 1883. Alone and in company with her friend Frederick Douglass and other leading abolitionists, always in the plainest of clothes, she wandered the land, speaking *(Continued on page 22)*



Man with a mission, *Levi Coffin, whose portrait is held by a costumed hostess before his Indiana home, saw men chained, whipped, and driven to market during his North Carolina youth and realized how he would feel if his father were abducted. He and his wife, Catherine, both strong Quakers, moved north and started a crossroads store at Newport (now Fountain City), Indiana, then a stop on the underground. Soon they were sleeping a dozen or more strangers and distributing clothes donated by friends.*

Among the 2,000 runaways assisted was William Bush, who reached Coffin's house wearing wooden shoes he had carved for himself. Settling in Newport, Bush became a conductor for other runaways while following the blacksmith's trade. He won the town's gratitude when during an epidemic he dared to bury the dead. His grave was marked recently by a descendant ***(above)****.*

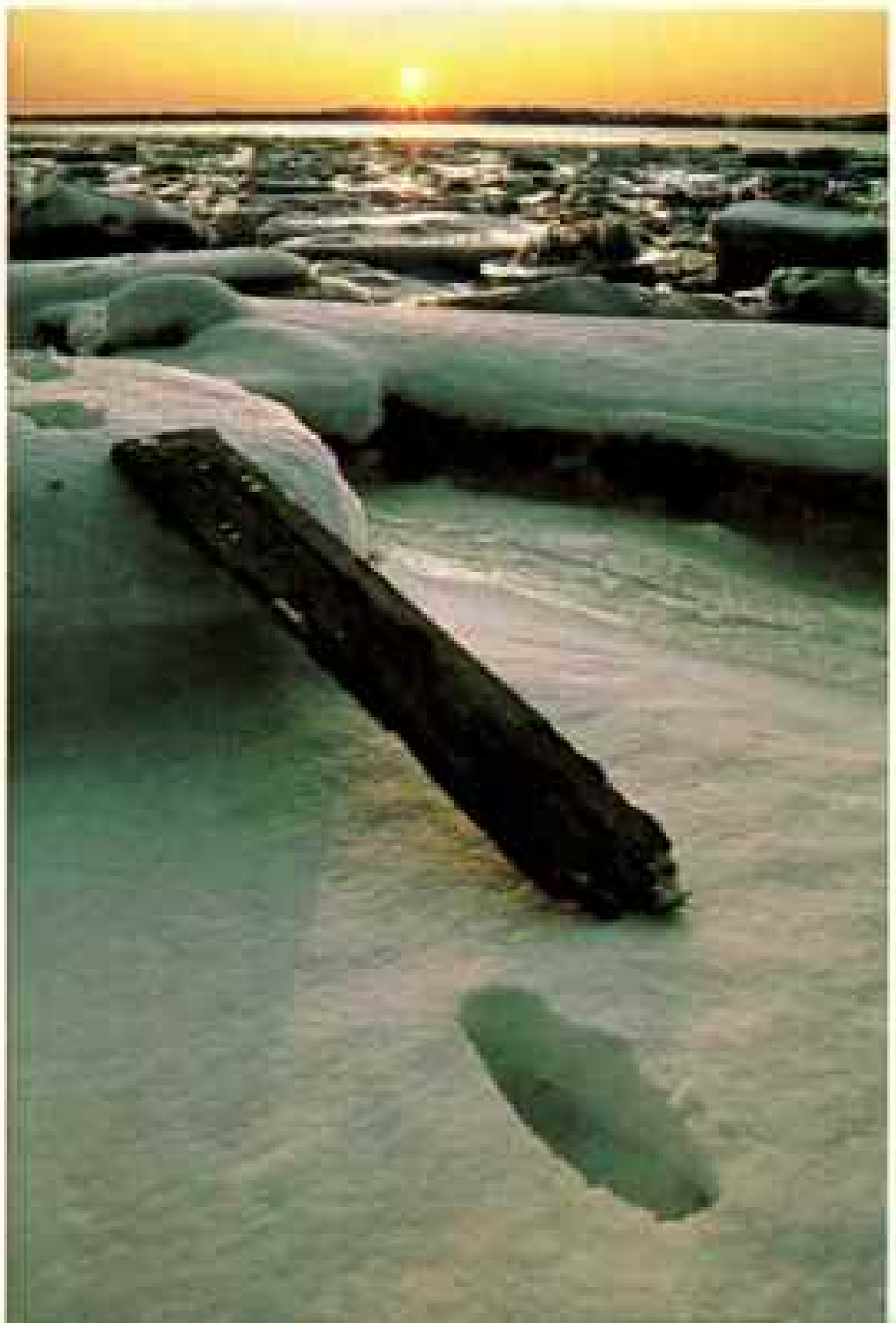


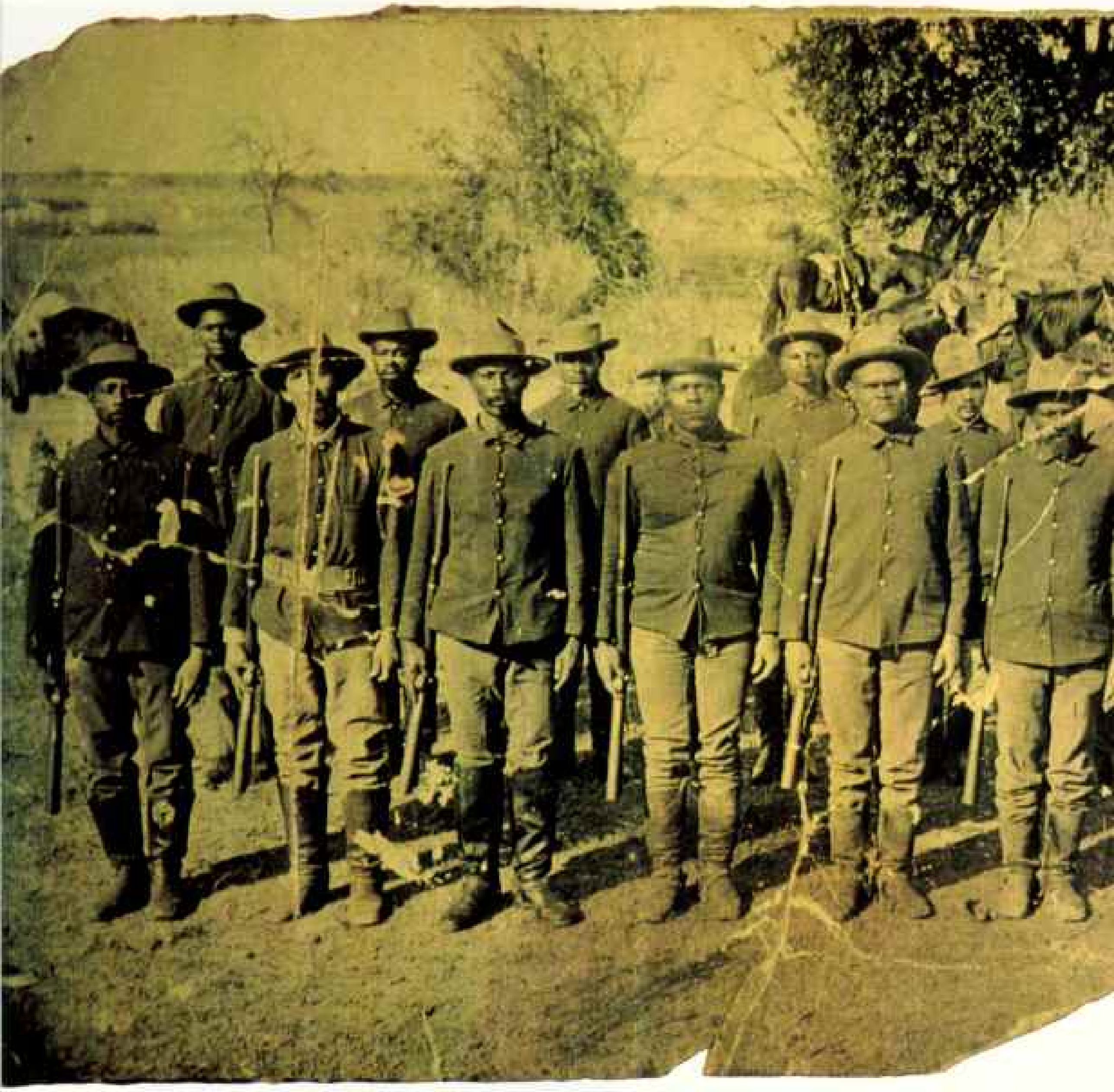


Welcoming beacon *from Liberty Hill* ***(left)*** *once drew fugitives from Kentucky across the Ohio River to the Ripley, Ohio, farm of the Reverend John Rankin* ***(above)****. Ofttimes escapees oriented by the North Star, seen above his house in a time exposure* ***(upper right)****.*

For 40 years the outspoken Presbyterian minister passed refugees north, his sons ready to defend them with guns. Slave owners offered rewards of as much as $2,500 for the "abduction or assassination" of Rankin and other conductors.

One winter eve a bondswoman carrying her child crossed over on the river's melting ice, a journey recalled by footsteps on the Kentucky shore ***(lower right)****; she found refuge with Rankin, Coffin, and others. Harriet Beecher Stowe drew on this and other episodes to create Eliza Harris in* Uncle Tom's Cabin. *Published in 1852 "to show that the evils of slavery were the inherent evils of a bad system," the novel influenced emotions leading to the Civil War.*

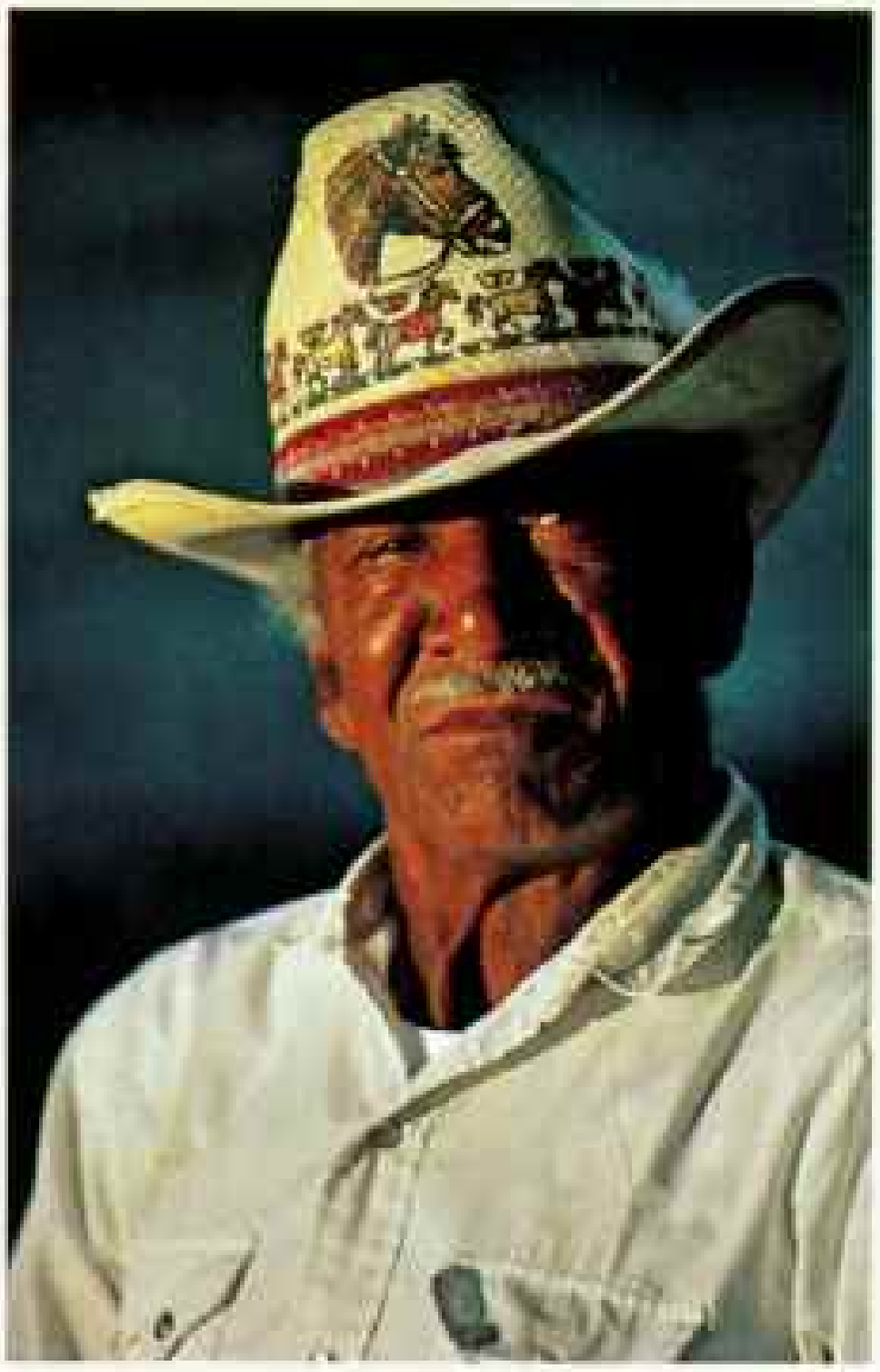




By long and tortuous trails, *fugitives who allied themselves with Florida Indians made their way to Oklahoma and Mexico, where today descendants are known as Seminole freedmen or black Seminoles. In Spanish Florida blacks had lived in their own villages, paying tribute to the chiefs and fighting beside them against American intruders. By speaking English and interpreting white ways, many became influential in tribal affairs. When the Seminoles were evicted to Indian Territory, some 500 blacks went along, among them the grandfathers of school principal Lance Cudjoe (***near right***) and farmer Dave Carolina (***upper right***), who recently discovered "a little oil." Each man represents his freedmen's band on the General Council of the Seminole Nation.*

*After finding that Indian Territory was not exempt from slave raiders, some black Seminoles moved to Mexico in 1849-50, including the forebears of Dan Factor (**far right**), who ranches near Nacimiento. Some of his family returned to the U. S.*

in the 1870s to scout with regiments of the U. S. Army. Protecting the Texas border from Comanche and Apache raiders, the Seminole Negro Indian Scouts **(above)** earned praise as "splendid fighters." Yet verbal promises of land grants and provisions for families were not honored.



COURTESY THE MUSEUM OF THE BIG BEND, SUL ROSS STATE UNIVERSITY, ALPINE, TEXAS (UPPER LEFT)

with an orator's eloquence and a victim's rage against the institution of slavery.

Although most runaways reached the protection of the Free States and the underground on their own, abolitionists did daring work even in the heart of the South. Virginian John Fairfield conducted dozens across the Ohio. The son of a slaveholder in New Bern, North Carolina, secreted slaves aboard ships hauling lumber to Philadelphia. In Florida, the Seminole Indians welcomed slaves from Georgia and South Carolina as well as Florida who fled through swamps and wilderness into Seminole territory.

When the Seminoles were removed to Indian Territory starting in the early 1830s, 450 to 500 black members of the tribe, representing about 15 percent of its numbers, went with them. Ironically, some of these black Seminoles were formed into a special U. S. Army unit to fight the Comanches and Apaches. About 800 descendants of these fugitives, known as Seminole freedmen, now live in Seminole County, Oklahoma, as members of the tribe that harbored their ancestors.

THE GHOSTS of fugitives and their collaborators linger in all these places. To me, the most vivid of all figures connected with the Underground Railroad was Harriet Tubman, who lived on the Eastern Shore of Maryland, just across the Delmarva Peninsula from my great-grandfather. Born a slave into an environment that is still harsh today, Harriet was one of ten or so children. As a woman in her 20s, she set off one dark summer night in 1849 from Bucktown, Maryland, to follow the North Star. From there the railroad route passed through country filled with fearful dangers: armed patrols on horseback, bloodhounds, placards advertising rewards for the capture of runaways posted at every tavern and crossroads. At length Harriet crossed the Mason-Dixon Line into free territory in Pennsylvania, penniless and

"a stranger in a strange land," as she later remembered.

In Philadelphia she found employment and saved almost every penny she earned for the real work to come. Her own freedom was not enough for Harriet Tubman. Again and again she returned south through the nights, seeking passengers for her train, risking recapture and defying the wrath of slave hunters. The price on her head, by the time she conducted her final perilous journey as a liberator, reportedly reached $40,000. Among those Harriet brought north in her caravans were her parents, whom she conducted to Canada.

Dark of skin, medium in height, with a full broad face topped often by a colorful kerchief, Harriet developed extraordinary physical endurance and muscular strength as well as mental fortitude. John Brown so admired Harriet's character and prowess that he nicknamed her "General Tubman."

It was with Harriet Tubman, a famous heroine of the Underground Railroad, and my great-grandfather, one of its unknown passengers, linked in my mind that I began a pilgrimage of rediscovery along the old freedom rights-of-way.

As George Washington's letter suggests, the Quakers won an early and richly deserved reputation as friends to fugitive slaves. But the fellowship of the Underground Railroad was truly ecumenical, including Roman Catholics, Jews, and Protestants, as well as freethinkers, and if adherents of most other faiths were numbered among slaveholders, so (contrary to legend, alas!) were certain members of the Society of Friends.

Nevertheless, one cannot travel very far along the Underground Railroad without encountering a Quaker. In the graveyard of Longwood Meetinghouse, not far from my present home in Pennsylvania, sleep great conductors of the railroad: Darlington, Mendenhall, Taylor. All were members of this progressive Quaker meeting that concealed fugitive slaves and spirited them

The railroad went underground *literally in the Wisconsin wilderness on the property of staunch abolitionist and temperance man Joseph Goodrich. In 1844, five years after founding the village of Milton, he built an unusual hexagonal inn of poured concrete and hand-dug a tunnel from its basement to the root cellar of a log cabin 40 feet away (**left**). If any customers were slave catchers, the fugitives resting and eating in his basement could exit to the cabin and follow creek beds and lakes north to Canada. Today guide Cathy Ban (**right**) recounts stories about the famous black abolitionist Sojourner Truth, said to have lectured in Milton on the evils of slavery.*

A white conductor in nearby Beloit, Mrs. Jeremiah Porter, considered her work "secret service before the Lord." She and her minister husband were once awakened at midnight by a trembling father and hungry children knocking on their window. The Porters hid the family in the church belfry to await their transportation by boat to Canada. Such abolitionists took great pride that none of their passengers were ever recaptured.

$200 Reward.

Ranaway from the subscriber, last night, a mulatto man named FRANK MULLEN, about twenty-one years old, five feet ten or eleven inches high. He wears his hair long at the sides and top, close behind, and keeps it nicely combed; rather thick lips, mild countenance, polite when spoken to, and very genteel in his person. His clothing consists of a variety of summer and winter articles, among which are a blue cloth coat and blue casinet cutter, white pantaloons, blue cloth do., and a pair of new ribbed casinet do., a blue Boston wrapper, with velvet collar, several black hats, boots, shoes, &c. As he has absconded without any provocation, it is presumed he will make for Pennsylvania or Newyork. I will give one hundred dollars if taken in the State of Maryland, or the above reward if taken any where east of that State, and secured so that I get him again, and all reasonable expenses paid if brought home to the subscriber, living in the city of Washington.

THOS. C. SCOTT.

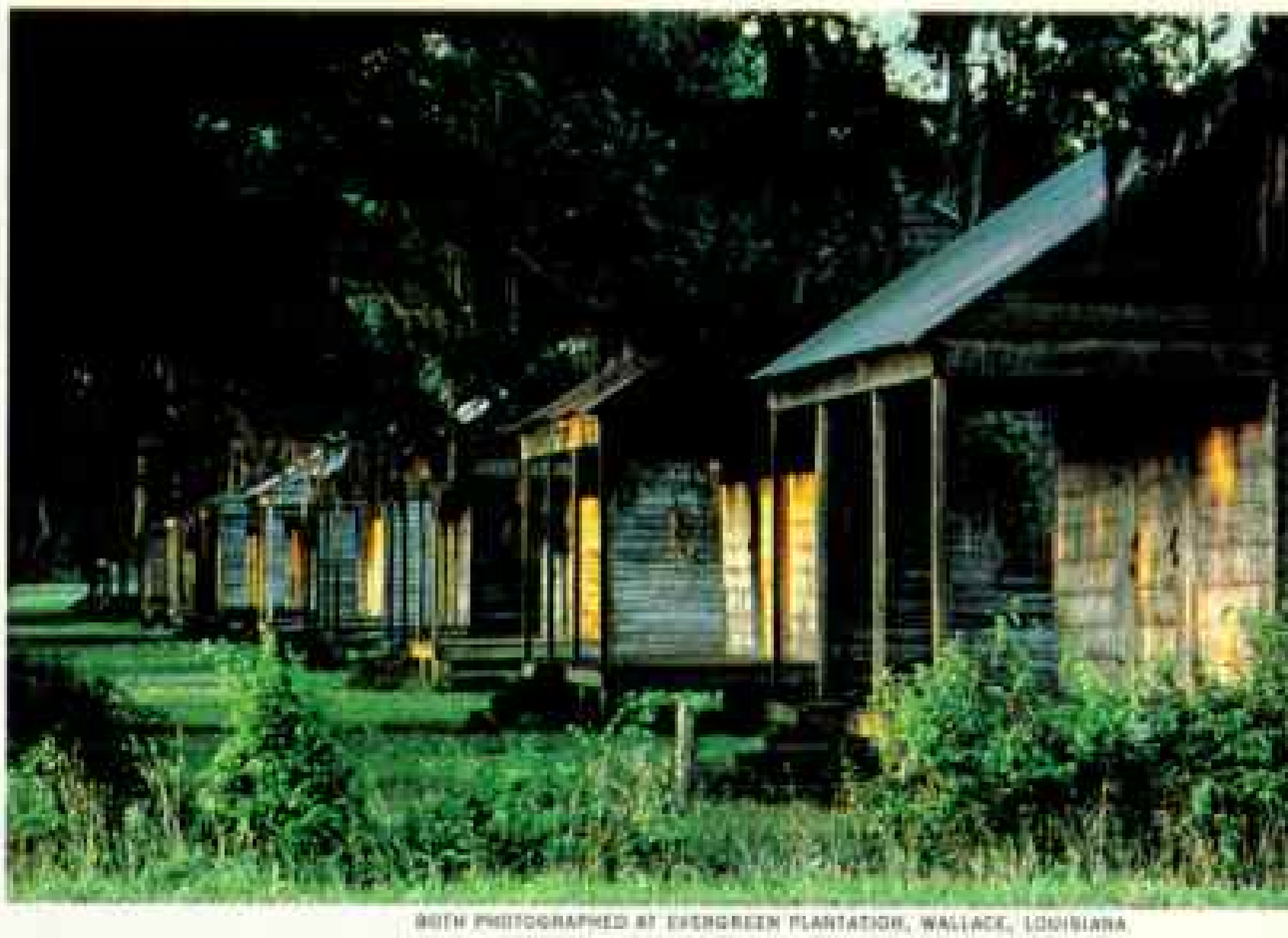
October 21, 1835.

*Unlocking the shackles of slavery meant breaking the law—organized theft, as Southerners called it—yet abolitionists did so eagerly. Quaker businessman Thomas Garrett (**left**) of Wilmington, Delaware, worked openly for 40 years, sheltering fugitives and pleading their cause. In 1848, after he helped a freedman carry his enslaved family from Delaware to Philadelphia, a court assessed damages at $5,400. After declaring that he had always been fearful of losing what little he possessed, he added, "but now that you have relieved me, I will go home and put another story on my house, so that I can accommodate more of God's poor."*

*The Reverend Alexander Dobbin apparently did just that about 1810 at his Gettysburg, Pennsylvania, home, now a restaurant. Sliding shelves (**right**) in the wall of an addition conceal a crawl space large enough to hide several adults.*

*Abolitionists developed new stratagems as slave catching increased in response to reward posters such as this (**above**) in the nation's capital.*

WRIST SHACKLES FROM AUTHOR'S COLLECTION



*Romantic charm of plantation life was lost on the slaves who made it possible. They built this ten-room Greek Revival mansion with matching privy on a 2,500-acre Louisiana sugarcane plantation. For their own housing they had to construct—at a proper distance—two-family cypress cabins (**right**). The double stairway looks toward the Mississippi River, where steamboats sometimes served as escape vessels.*

BOTH PHOTOGRAPHED AT EVERGREEN PLANTATION, WALLACE, LOUISIANA

away from the meetinghouse under the very eyes of proslavery spies and informers who knew of their activity but could not prove or prevent it.

At Longwood Harriet Tubman, too, found sympathizers to welcome her into their homes in moments of danger.

BALTIMORE was a pivotal junction point on the railroad. A city with both an antislavery society and a slave auction block, it was divided in its allegiances. Here many a fugitive found friendship and aid. The eloquent Frederick Douglass labored as a slave at Fells Point, but met a friendly sailor who provided false papers and so obtained his freedom. He wrote a powerful autobiography and became one of the greatest of the black antislavery orators as well as U. S. minister to Haiti. In his lifetime and beyond, the connection of the term "statesman" to his name seemed a natural thing.

Douglass also served as a U. S. marshal for the District of Columbia, where, well into his manhood, manacled slaves had marched under the windows of the White House to the auction block at Decatur House on Lafayette Square, across Pennsylvania Avenue. Solomon Northup, a free black kidnapped and on his way to slavery in New Orleans, recalled that "the voices of patriotic representatives boasting of freedom and equality, and the rattling of the poor slave's chains, almost commingled."

In Cambridge, Maryland, not far from Harriet Tubman's birthplace on the Edward Brodas plantation in Dorchester County, I encountered her kinswoman Addie Travers. Together we explored the crooked creeks of the Eastern Shore, where Harriet's route took her along the Choptank River and its many inlets.

This was perilous country, home ground of the slave hunter Patty Cannon and her merciless gang. A tall, striking woman whose salty language was her trademark, Mrs. Cannon ran her underground railroad in reverse. A letter to Philadelphia Mayor Joseph Watson in 1826 suggests that her gang was abducting blacks as far north as his city.

Sometimes she employed renegade blacks to entice fugitives into their homes as false station stops on the Underground Railroad. There the trusting runaways were entrapped by Patty's gang, who often tortured and murdered free blacks as well as escaped slaves and sold the survivors.

Finally captured and indicted for the murder of four fugitives—two of them children—Patty Cannon poisoned herself on May 11, 1829, in her prison cell at Georgetown, Delaware, cheating a public eager to witness her trial and execution.

According to family tradition, my

great-great-grandfather Spencer Blockson occasionally saw Patty while living in slavery in Sussex County near the Nanticoke River where she operated. My great-aunt Minerva Blockson, born only nine years after Appomattox, was terrified as a child growing up on the Delmarva Peninsula by tales of this villainess. "We children would hide behind chairs while the big folks told how evil old Patty Cannon would catch us and sell us to slavers down south," she told me in a voice hoarse with age. And in Aunt Minerva's bright face the old terror rekindled, though she was then 102 years of age.

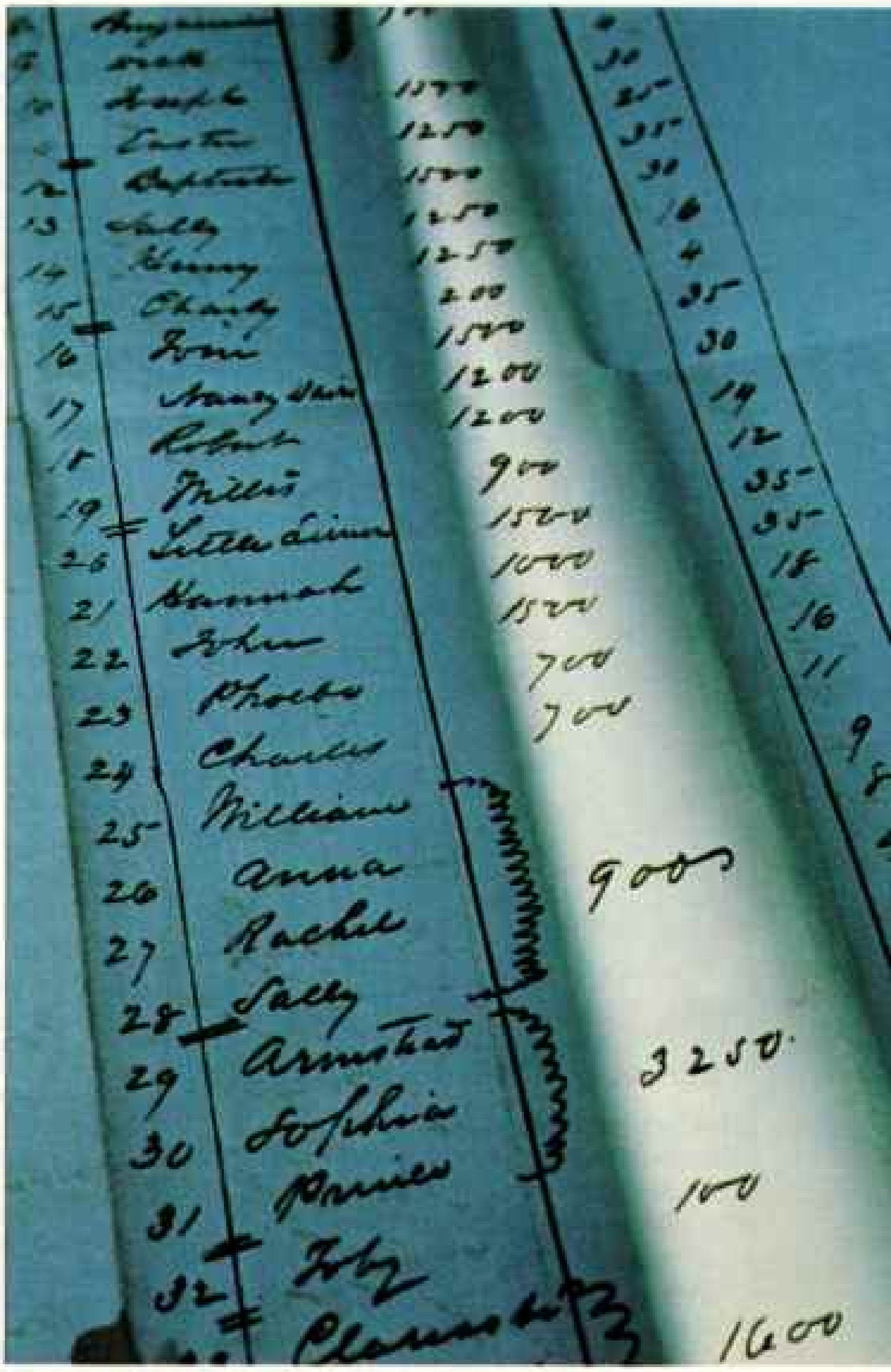
THROUGH PERIL and wilderness, Harriet Tubman was a natural navigator. She did not keep a journal, but she described her various routes of escape to her biographer Sarah Bradford and others. Usually she followed the route from Cambridge along the Choptank toward Camden, Delaware. Harriet always carried a pistol to ward off pursuers. She didn't hesitate to raise it when slaves refused to travel on, crying, "You go or die." She carried tincture of opium to quiet crying babies and frightened and wounded fugitives.

At 227 Shipley Street in Wilmington,

Delaware, stood the home of Quaker Thomas Garrett, Harriet Tubman's great collaborator and keeper of perhaps the most important Underground Railroad station on this right-of-way. It was Garrett who forwarded Harriet and her passengers on to William Still in Philadelphia; he is said to have aided about 2,700 fugitive slaves with assistance from Wilmington's free black community. In the early days of the Civil War these blacks protected Garrett's home, and he had need of their vigilance, for his activities earned him the hatred of many who wished to preserve the institution of slavery.

Friend Garrett was not deterred by physical threats or financial penalties. Ordered to pay $5,400 in damages for helping a family of fugitives to escape, Garrett defiantly told the court: "I had assisted over 1,400 in 25 years on their way to the North, and I now consider the penalty imposed might be as a license for the remainder of my life . . . if any of you know of any slave who *needs* assistance, send him to me."

Runaway slaves entering Philadelphia—as many as 9,000 of them before 1860—were forwarded to points along the Reading and Pennsylvania Railroads and put on trains to



Anonymous Africans, *imported by trader Zephaniah Kingsley, slept in tabby-walled, palmetto-roofed cabins* ***(left)*** *of his Ft. George Island, Florida, plantation. After training in field and shop, they were sold at 50 percent above the market rate.*

Only a number on a copper tag ***(above)*** *identified the slave hired out for a year in Charleston, South Carolina; without tags or papers, blacks were jailed as runaways.*

A slave inventory of 1849 ***(right)*** *from Natchez, Mississippi, lists first name, value, and age. Unbeknownst to owners, most slaves had family surnames.*

New York State and New England. As a great port and rail center, Philadelphia was a natural junction on the Underground Railroad. It was also an abolitionist center and had a large community of free blacks.

YET EVEN on the Underground Railroad, bigotry existed. William Wells Brown, a former slave and a celebrated orator, said of Philadelphia in 1854: "Colorphobia is more rampant there than in the proslavery . . . city of New York."

***Rare batch** of brown cotton, found at Melrose Plantation, near Natchitoches, Louisiana, grew from seeds imported from China to enable slaves to grow a separate crop for themselves. But in the fields brown crossed with white, and the experiment was abruptly ended.*

Fugitives were sometimes banned from entering conductors' homes; some conductors were known to shackle fugitives for "control," and these fetters can still be seen in one former Pennsylvania underground station. Spies of both races abounded, ready to sell out escaped slaves.

A steadfast friend to the Underground Railroad in Philadelphia, Lucretia Mott, Quaker minister and leader in both the antislavery and women's rights movements, was threatened by an angry crowd in my hometown of Norristown in 1842 when she offended against politics and convention by leaving an antislavery meeting at the First Baptist Church arm in arm with Frederick Douglass. When the meeting reconvened that evening, the crowd outside stoned the church before being dispersed by antislavery sympathizers and members of the black community.

But Philadelphia's Mother Bethel African Methodist Episcopal Church hid hundreds of fugitive slaves. Although the original building has been replaced, the existing church stands on the oldest piece of ground continuously owned by blacks in the United States.

In nearby Plymouth Meeting, George Corson and others received the passengers forwarded north by Elijah Pennypacker of Phoenixville, another major terminal on the eastern railroad. Pennypacker and his Valley Forge neighbor Lewis Peart directed slaves on a route leading along property that once belonged to John James Audubon.

My friend Richard Mayhew tells of his Shinnecock Indian ancestors' conspiring with Portuguese fishermen to transport fugitive slaves from Long Island into New England ports. The Mayhews are connected with the family of the great conductor William Still, and at a reunion of the Still family in Lawnside, New Jersey, I found myself surrounded by members of this remarkable clan.

Its progenitors, Levin and Charity Still, were born as slaves, but they were able to buy Levin's freedom and he moved to Indian Mills, New Jersey, about 1810. Charity succeeded in escaping with two of their children and the Stills eventually raised a family of 18. One son, James, the "black doctor of the pines," treated patients both black and

white with herbal remedies and became an ardent worker on the Underground Railroad from his Mount Holly home. Two of his sons were physicians. James's brother Peter, left behind in slavery, was the subject of *The Kidnapped and the Ransomed*, a dramatic account by Kate Pickard of Peter's 40 years as a slave. He finally bought his own way to freedom, assisted by two benevolent Jewish brothers, Joseph and Isaac Friedman of Tuscumbia, Alabama.

Most famous of all the Stills, of course, was William, the legendary Philadelphia dispatcher and historian who forwarded hundreds—including Jacob Blockson—along the route to freedom. This is a family with a great will to be together. "The original Still's Day was celebrated in 1870," Clarence Still told me. "We have doctors, teachers, scientists, and military heroes. We have been able to accomplish so much because of our family's strength and stability."

AT COLUMBIA, Pennsylvania, along the Susquehanna River, spies and informers watched the bridges. A few miles from here, at Christiana, in September 1851, the first blood was shed in resistance to the Fugitive Slave Law of the previous year when a Maryland planter, Edward Gorsuch, with his son and a deputy U. S. marshal, tried to serve warrants for the return of some fugitives. Threats were exchanged at the home of a William Parker, who sheltered the runaways, while Parker's wife sounded a horn over and over again to summon help. A force of local free blacks, accompanied by a Quaker sympathizer named Castner Hanway, arrived. In the ensuing melee, afterward known as the Christiana Riot, the runaways escaped.

But shots were fired and Gorsuch was killed. Parker, charged with treason, became the object of a celebrated manhunt but escaped to Canada with the aid of the anti-slavery underground.

More than thirty Christiana blacks were arrested and jailed in Philadelphia. Friend Hanway, charged not with violation of the Fugitive Slave Law but with "wickedly and traitorously [intending] to levy war against the United States," went on trial in a federal courtroom in Independence Hall.

Lancaster's Thaddeus Stevens, member of the U. S. House of Representatives, the Old Commoner, the Great Leveler, led the defense. Stevens's hatred of slavery was matched by his genius for courtroom drama. When the blacks were led into the courtroom, each wore a red-white-and-blue scarf around his neck in a demonstration of support for Hanway. Lucretia Mott sat nearby in her plain Quaker dress, serenely knitting.

When even the federal judge, otherwise no friend to abolitionists, was forced to say that the charges against Hanway were

One of the last *to arrive by slave ship, Cudjo Lewis landed in Mobile in 1859 aboard the* Clothilde, *having been captured and sold by Africans in Dahomey. After the Civil War he and his shipmates founded Plateau, Alabama, where he lived into his 90s.*

Taking up arms *to free slaves seemed the only solution to single-minded abolitionists like John Brown* **(left)**, *whose portrait was painted by black craftsman-artist David Bustill Bowser, with whom he sometimes stayed in Philadelphia.*

Son of an underground stationmaster, Brown brooded about the evils of bondage, becoming increasingly obsessed with the idea that God had chosen him to liberate slaves by force. With his sons he fought proslavery settlers in Kansas, conducted a group of fugitives from Missouri to Detroit, and finally plotted a raid on the U. S. arsenal at Harpers Ferry **(above)**. *He expected to set*

COURTESY THE HISTORICAL SOCIETY OF PENNSYLVANIA (BELOW LEFT); PHOTOGRAPHED AT THE CHICAGO LIBRARY (BELOW)

off an uprising of slaves, but they didn't answer his call. Instead, federal troops led by Col. Robert E. Lee subdued the insurrection, and Brown and his followers were hanged in December 1859, having helped set the nation on the road to the Civil War.

*Only four years later, at the height of the war, blacks were again urged to take up arms, this time as a patriotic duty. Black abolitionists in Philadelphia sponsored this recruitment poster (**right**) to raise Union forces that eventually counted more than 8,000 blacks. Despite valiant service, the black regiments were not permitted to march in the city's welcome-home parade at war's end.*

absurd, a "not guilty" verdict was returned within 20 minutes. The Christiana Riot ranked with John Brown's raid on Harpers Ferry in the power of its symbolism to the antislavery movement before the Civil War.

During the Civil War, Confederate cavalry raiders led by Maj. Jubal A. Early sacked an ironworks owned by Stevens. Early remarked that he was sorry he had not found Stevens there: "I would hang him on the spot and divide his bones and send them to several states as curiosities."

The day after the raid Gen. Robert E. Lee issued a reproof. "We cannot take vengeance . . . without . . . offending against Him to whom vengeance belongeth," wrote the Confederate commander.

FROM CENTRAL PENNSYLVANIA one branch of the Underground Railroad passed through New York State to the Canadian border. In Rochester, Frederick Douglass published his newspaper *The North Star* and made friends with Susan B. Anthony and the abolitionist Elizabeth Cady Stanton. Miss Anthony's brother Merritt fought beside John Brown in a bloody skirmish with proslavery forces at Osawatomie, Kansas. Brother and sister had early imbibed the abolitionist spirit from their Quaker family.

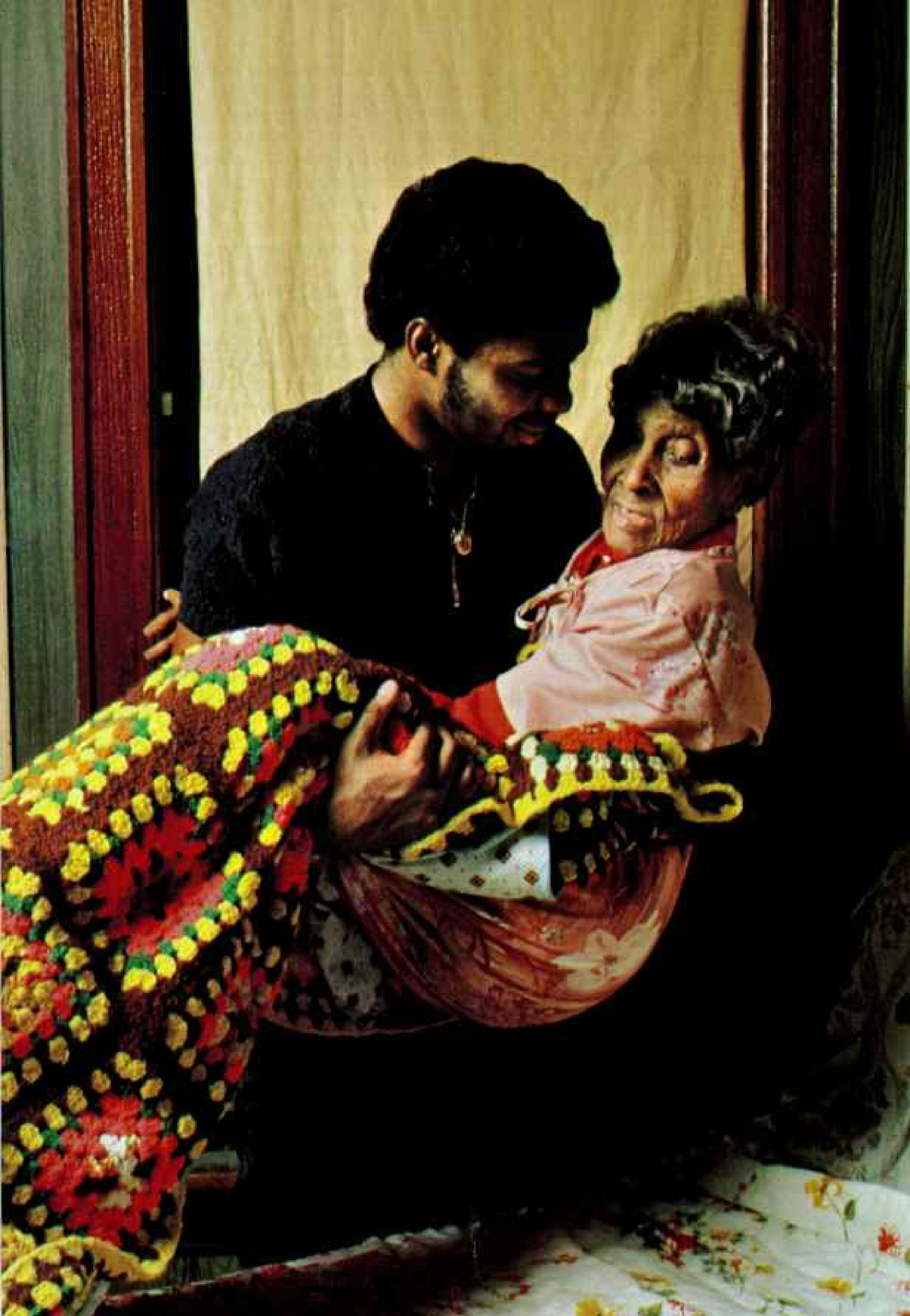
In Buffalo, Professor Monroe Fordham of Buffalo State College, standing on the banks of Lake Erie, described the bitter local winter, and I pictured the lake then, frozen enough for fugitives to walk across to Canada and freedom. In other seasons, many got rides from ferryboat captains who were sympathetic toward the underground.

Had my great-grandfather struggled across the ice in a winter gale? Had he found a sympathetic ferryman to take him over this symbolic Jordan? It was just as possible that he had passed over by another route altogether—New England. If he passed through New Hampshire, he may have been regarded as something of a curiosity. As I ate lunch in Manchester, an elderly gentleman fixed me with a friendly wrinkled smile and said: "We don't see many colored people in our state." I explained that I was conducting a study of the Underground Railroad throughout New England. "I thought all that abolition business took place in Massachusetts," he replied.

A good deal of it did. In Concord, Massachusetts, on the night of my arrival, I heard the tolling of the town's bell. Here, on October 30, 1859, Thoreau had rung the great bell as John Brown was tried for treason. The Thoreau house was a hiding place for slaves traveling on the Underground Railroad.

In Boston, gaunt, fiery William Lloyd Garrison published his inflammatory newspaper, *The Liberator*. In the cause of

*"**John Brown's body** lies a-mouldering in the grave. . . . His soul is marching on," sang Union soldiers to a tune that became the "Battle Hymn of the Republic." Brown's grave lies near his Lake Placid, New York, farmhouse (**left**). Another New York home, near Auburn, was bought by Harriet Tubman for herself and her parents. Although she served Union troops as scout, spy, and nurse, she was denied a pension for her work. She labored here for the destitute until her death in 1913. Manager of the restored site, the Reverend G. H. Carter welcomes an annual pilgrimage in May.*



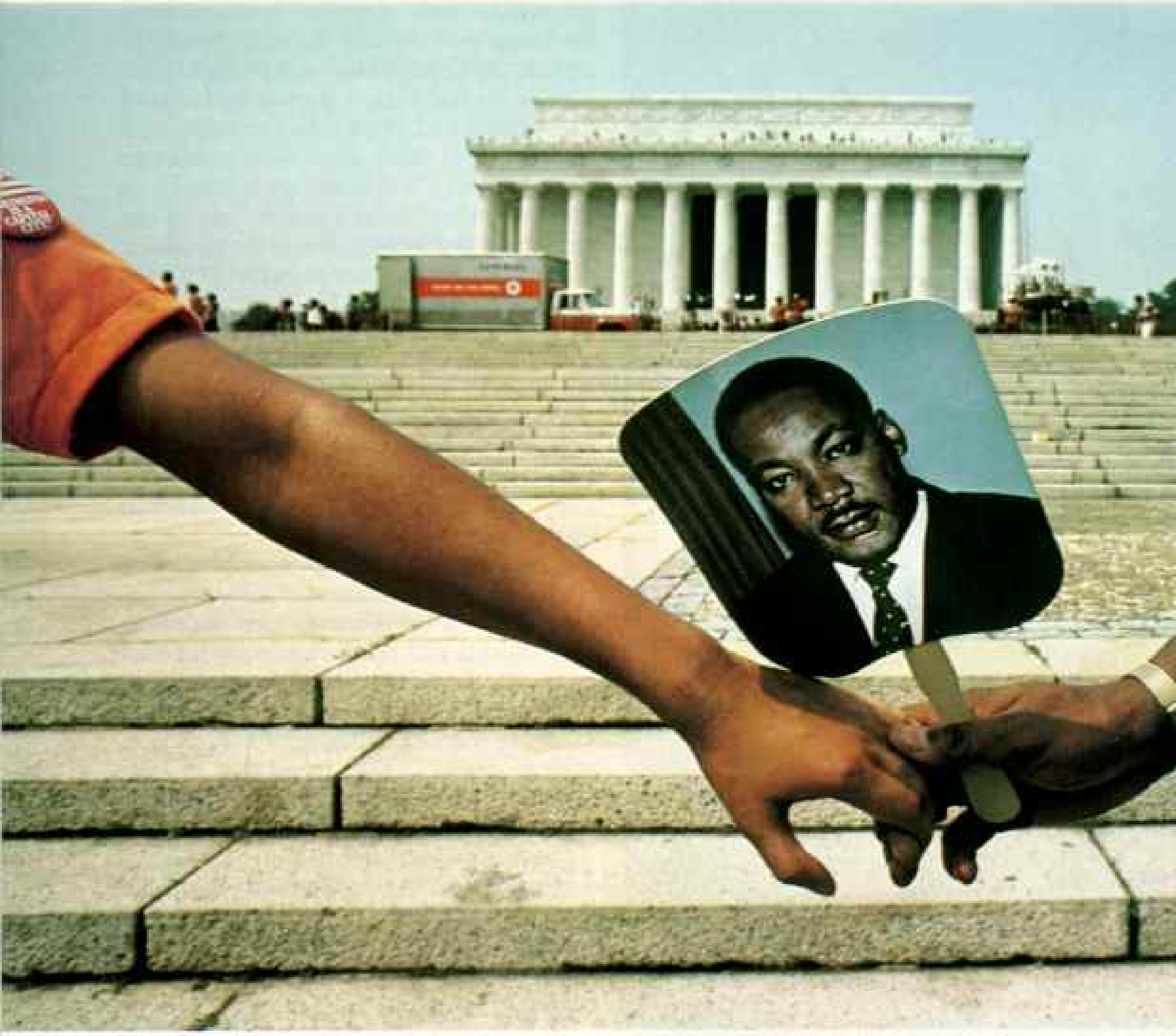
immediate and complete emancipation, Garrison was willing to cast away the church, the Constitution, and the Union. He paid for his convictions in a way that defined his enemies and helped the cause. In 1835 Garrison was confronted by a proslavery mob shouting, "Kill him! Lynch him! Hang the abolitionist!" Seized and tied up, he was finally rescued by delegates of the mayor.

In 1838 a slave about 20 years old named Frederick Augustus Washington Bailey escaped from his owner in Maryland and was forwarded to the noted black conductor Nathan Johnson in New Bedford. Johnson suggested that the fugitive slave change his name to Frederick Douglass. In later life Douglass, a proponent of moderation, would oppose Garrison's extremist tactics.

New Bedford, an important port, welcomed many runaways, and the sea had its own story of the Underground Railroad; many agents and conductors were sea captains. My favorite underground sea story concerns a Massachusetts shipwright named Jonathan Walker, who went to Florida to salvage a wreck. One torrid day in 1844 seven slaves left Pensacola with Walker in his open boat, bound for a Bahamian island. As their craft approached Cape Florida, it was overtaken by another vessel. The fugitives were delivered to their owners, and Walker, sent back to Pensacola in chains, was placed in a pillory and pelted with rotten eggs.

By order of a federal court Walker's right hand was branded with the letters S S for "Slave Stealer." Eventually his fines were paid by abolitionist friends and he returned to New England, where he attracted large audiences on the antislavery lecture circuit as "the man with the branded hand."

From slavery to freedom, *Mary Duckworth's family records trace her from birth in Taylorsville, Mississippi, in 1861 through decades of Jim Crow segregation. Devoted to religion and family, she raised 12 children and counted more than 300 descendants, including great-great-grandson Michael David Thompson, who helped care for her until she died in Chicago last year.*



MY PILGRIMAGE took me, finally, across the Canadian border to St. Catharines, an Ontario city that Harriet Tubman once called home. Here too James Blockson and his cousin Jacob had briefly lived. Nearby, the trembling suspension bridge over the Niagara River had been the passage between slavery and freedom.

William Lloyd Garrison reported that there were 25,000 fugitives in Canada in 1852. No fewer than 3,000 had arrived there within three months after the Fugitive Slave Law of 1850 was passed. The Reverend William Mitchell, a black Underground Railroad conductor and historian, estimated that at the end of the decade at least 1,200 refugees were reaching Canada every year.

Josiah Henson, on whom the character of Uncle Tom is partly based, settled in Dawn, not far from St. Catharines, after escaping from slavery in 1830. In 1841 Henson and a group of abolitionists purchased 200 acres and established a vocational school for fugitive slaves known as the British-American Institute. Henson made numerous trips on the Underground Railroad, leading fugitives to Canada. It is a supreme irony that the name of this activist's fictional counterpart should have become synonymous with servility in the usage of a later generation.

In nearby Chatham, before John Brown marched to his apotheosis along a forest route long used by fugitive slaves, he had

No longer underground, *the movement to break "the manacles of segregation and the chains of discrimination" came to Washington, D. C., in August 1963, when the Reverend Martin Luther King, Jr., marched to urge Congress to end legal discrimination. Twenty years later demonstrators gather here at the Lincoln Memorial to commemorate the King march and voice the continuing fight for equal justice.*

plotted the new government he dreamed would follow his attack on the Harpers Ferry arsenal.

Walking through this hushed Canadian town, I remembered that other quiet town—Harpers Ferry. In both places John Brown's tumultuous spirit seemed to reside. I found myself humming "The Battle Hymn of the Republic," of which the tune, of course, is "John Brown's Body."

A little time before, while visiting Harriet Tubman's home in Auburn, New York, I had attended her old church and with a group of friends sang the coded spirituals of the Underground Railroad: "Steal Away to Jesus" and "Wade in the Water, Children," songs doubtless sung by Harriet Tubman during her journeys through that vanished South where men would have taken her life because she had taken her freedom.

These coded songs had double meanings: "Follow the Drinking Gourd," for example, was a metaphoric allusion to the Big Dipper and North Star. And, as Frederick Douglass once said, "A keen observer might have detected [Canada] in our repeated singing of:

'O Canaan, sweet Canaan,
I am bound for the land of Canaan.'"

We also sang the soulful "Amazing Grace," whose origins amaze with their power, for the hymn was written by a former English slave trader, John Newton, after he was seized by the Lord and exchanged his slave ship for the ministry.

The spirituals, filled with secrets that perhaps could only be told in song, have not lost their power to join one heart to many others and to explain mysteries. Standing beneath the tall evergreen that guards the grave of Harriet Tubman, I felt close to this woman who was called the Moses of our people, and to the ancestors, those of blood and those of spirit, black and white, who had trod these rights-of-way to freedom and kept the stations of the Underground Railroad and kept the faith in the oneness of mankind.

We held hands in a circle. Gladys Bryant, 77-year-old great-great-grandniece of Harriet Tubman, told us that "Harriet would be proud of the gathering assembled here today. She would have supported the causes that brought us together."

Saying good-bye, we tightened our hands one upon the other and sang "Swing Low, Sweet Chariot," the song, beloved by Harriet and by each of us, that Harriet's friends sang on March 10, 1913, the evening that she died. □

Scotland, Ghosts, and Glory

By ROWE FINDLEY
ASSISTANT EDITOR

Photographs by PETER CARMICHAEL

NOW THE PIPES HURL song against song, where lately they took harmonious turns. "My Love, She's But a Lassie Yet" and "Comin' Thro' the Rye" are overcome by "A Hundred Pipers" a-skirling "Scotland the Brave." First the sound rides down from battlemented heights above the River Ness; now it sweeps in on the other ear from across the blue river itself, bridged golden by a July sun still planing easily above northwestern hills—tune and countertune, lilt and drone, peace and war. I feel the tug of rival parades, competing for favor of a capricious wind.

And that is the story of Scotland itself, ever competing waves of hopeful humanity struggling across a leonine landscape where mountains and glacier-gouged lochs now frustrate confrontations but again funnel unknowing armies on collision courses, as if they march within the closing palm of fate.

Despite the wind's ethereal phrasing, the bagpipes I hear are real—at first a solitary piper striding before the turreted court chambers of Inverness, "capital of the Highlands," then a drum-cadenced pipe band in a stadium beyond the hurrying river.

The stadium bandsmen, I soon learn, are the Inverness and District pipers, Roddie MacLeod, pipe major. They give martial pulse to a kilted show of balladeers keening lost love in the glens, of bonny lassies springing through a Highland fling with the grace of a gamboling doe. The performers, all amateurs, take the stage on summer nights for visitors, who on this particular evening come from 17 countries and as far away as New Zealand. Amateur or no, all these Gaelic rhythms stir some deep ancestral memory, as did a peat barrow full of other sights and sounds and smells of Scotland.

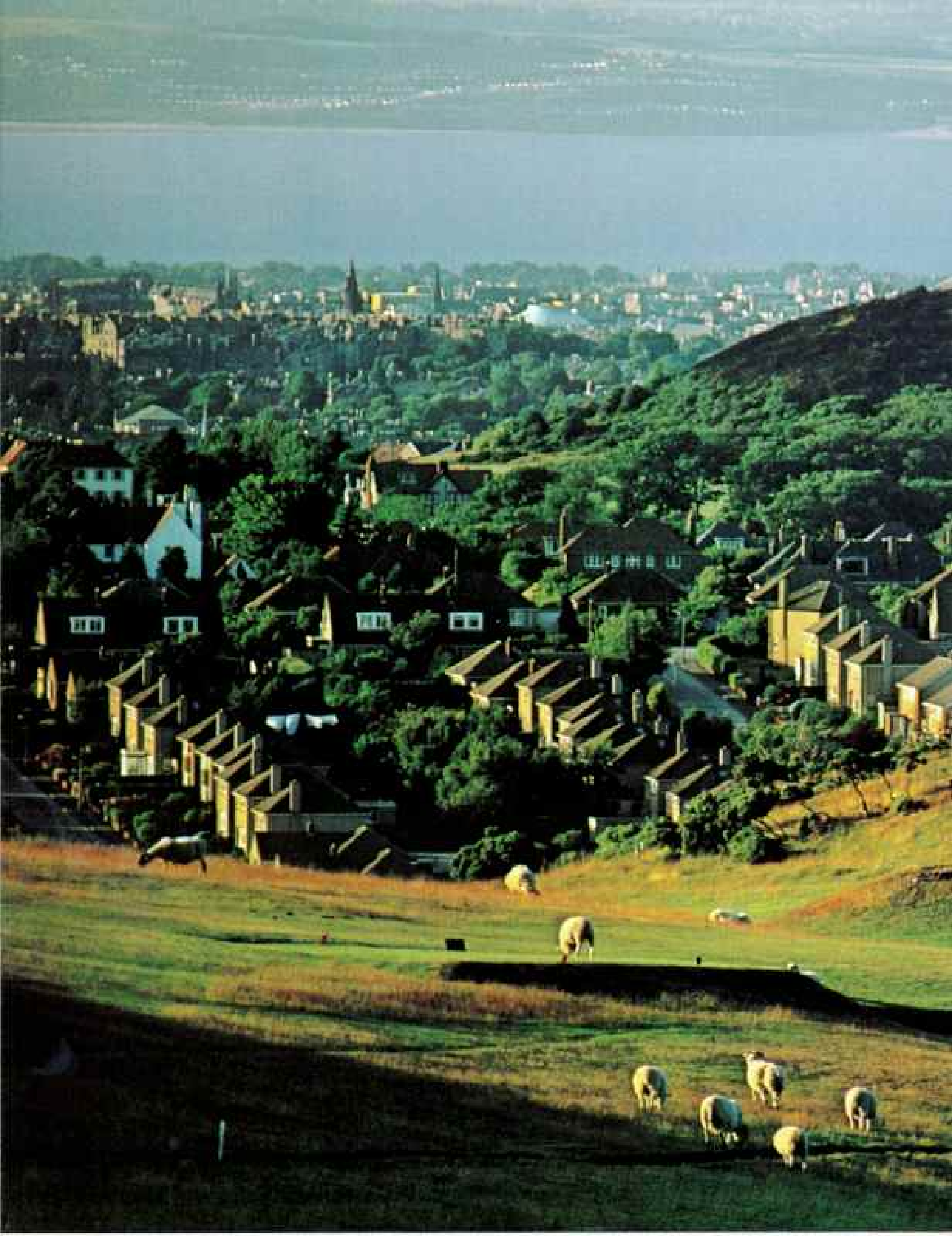
There was the old year's death by Loch Lomond, while full moon and snow showers alternately ruled the sky, and the old Inverbeg Inn overflowed with the reels and glad-sad songs of a ceilidh (KAY-lee) to mark Hogmanay—the New Year's coming.

There was the Robbie Burns supper, traditional birthday salute to Scotland's poet-hero, in Halfway House near Ayr, with the steaming haggis borne by a chef in white, preceded by a piper, and the Immortal Memory delivered by the Reverend James Currie of puckish wit and Friar Tuck cheer.

There were marveling tours of Victorian blocks in Glasgow, of Edinburgh's Royal Mile; there were crescent-bay villages in the Hebrides, resolute golfers racing wind and failing light at St. Andrews, rock-rooted lighthouses in the Shetlands, fetes to the battles and resident bandits of the Borders.

There was bell heather to purple Deeside

Heather carpets the path *of hunters returning from a stag shoot in Scotland's stark, lonely Highlands—emptiest quarter in crowded Britain. Cherishing the traditional while pioneering the new, Scots remain very much their own people, as the author learns in a homecoming to his ancestral land of tartan and tweed.*



From the broad Firth of Forth, *Edinburgh rises to the Pentland Hills, where sheep tend the turf of a golf course—perhaps the country's most successful export after Scotch whisky. Crowning point of Scotland's capital, historic*

Edinburgh Castle is haunted by centuries of royal intrigues. Its most famous resident, Mary, Queen of Scots, was such an avid golfer that she reportedly took to the links while still mourning her murdered husband, Darnley, in 1567.

hills, the yellow of wild iris from Islay to Skye, roadsides and hillsides of daisies and buttercups and red clover and bluebells.

There were breakfasts of porridge and sausages and kippers, scones and strawberry jam with tea, dinners of salmon and venison stews and pastries adrift in cream.

At Bannockburn I found a mailed and mounted Robert the Bruce in bronze still holding the field from which he routed Edward II's heavier force seven centuries earlier. At Culloden long mass graves attested Highland passion's failure to match Hanoverian steel. In the National War Memorial atop Edinburgh Castle, I looked for my surname in regimental books of the fallen and repeatedly found it coupled to given names of my sons—David, Stephen, John.

There were unspoken prayers under the sky-vaulted roofs of ruined St. Andrews and Elgin Cathedrals, once among Britain's largest, and in lovingly preserved St. Magnus in the Orkneys, for 800 years holy to Scot and Norseman. And there were three days escaped from time on an isle called Iona, where a restored abbey and cloister celebrate St. Columba's coming from Ireland in the sixth century with the light of Celtic Christianity. Iona pulsed a confidence that surely God is in this place.

As you have guessed, Scotland for me was not just another story but a dream realized. The nation counts five million people, but beyond its shores there is a greater Scotland sevenfold larger that claims Scottish descent, including 19 million in the United States alone, and of which I am one.

I KNEW that a welcome like coming home awaited me in Kilbirnie, a place I had never been. There Bert and Anna Cullen, longtime friends through family ties, had promised a hearthside seat and my fill of Scottish pancakes.

Roses and a lawn like a carpet gave inviting individuality to the Cullens' look-alike public housing. Inside, on a Saturday night, there was good talk with my hosts and their longtime friends Jackie and Isa Burns and Iain and Nancy MacCourt. Jackie is a foreman of joiners, and Iain is a fire-and-rescue station officer. Bert and Jackie saw army service, and Iain was once an engineer on those stubby Baltic traders that braved Cape Wrath's evil storms to shuttle goods between Dublin and Oslo, Glasgow and Helsinki.

We talked of hulks back to Viking times that "X" coastal waters, and of the derelict mines and plants ashore that hold ghosts of a Scotland that was. Of Bert, third-generation steelman, leaving a failing giant of Scottish industry to assemble Volvo trucks. Of Anna's leaving her fishnet-making job to care for the elderly, an index of Scotland's rising longevity and increasing social services. Of North Sea oil softening the recession, of new microchip firms starting up, of Bert and Anna's son John going out to Australia to make a new life, of a double christening for grandchildren of Iain and Nancy. We talked sadly of so many things changing, lifted a glass to those that do not—such as friendship—and shared a song or two, ending with "The Stair o' Rabbie Buhns—The Star of Robbie Burns." It was a good beginning.

I was warned before leaving home: "You'll see more kilts and tartans and hear more maudlin toasts at the St. Andrew's Society ball in Washington, D. C., than you'll find in a year in Scotland." Look only in memory, I was told, for the Scotland of Columba and of the Bruce, of Tam O'Shanter and William Wallace, that sent Dr. David Livingstone to Africa and Clydebank's ocean queens to reign over global maritime transport. Expect a country pitching and yawing in the crosscurrents of North Sea oil and worldwide recession, homogenized by video games and American sitcoms, by designer jeans and blaring rock, its population declining, its human values under fire.

Well, I am happy to report some cheer on the economic front, that cultural homogenization still has far to go, that spirits are vigorous and traditions ascendant. And all the Scotlands you *(Continued on page 49)*

Pilgrims of the plaid, *transplanted Scots from around the world visit the land of their forebears in record numbers. In Edinburgh, Thomas A. Robertson gets fitted for a kilt to wear at his clan's gatherings back in California, home to a million of the 19 million Scottish descendants in the United States.*

With oil and intellect, *Scots strive to pull out of a long recession. Though revenues from the great North Sea oil fields go directly to the British treasury, Scotland reaps a lion's share of the jobs. While unemployment still plagues Glasgow to the west, the eastern city of Aberdeen is thriving. Here Europe's busiest civilian heliport shuttles crews (**top**) to and from the offshore platforms.*

*Europe's largest oil terminal, in close proximity to the richest fields, Sullom Voe (**facing page**) handles more than half of Britain's production. It was carved from a desolate peat bog in the Shetland Islands, which became Scottish after James III married a Danish princess 500 years ago.*

*With Britain's highest percentage of university graduates, Scotland is well suited for the challenge of extracting oil from the hostile North Sea. To improve offshore oil-rig design, Dr. Ian Grant, of Heriot-Watt University in Edinburgh, uses a laser (**left, bottom**) to measure the effects of simulated wind turbulence on a model. In the northern town of Wick, David Humphries (**middle**) examines a camera he helped design for Osprey Electronics, Ltd. Combining television and still photography, the camera has greatly eased underwater inspections. Oil applications aside, Scotland is fast becoming a world center of electronics manufacture and research.*

Above 3,000 feet
1,200-3,000 feet
600-1,200 feet
0-600 feet

New town
Airport
Major port
Castle
Battle
Ruin

Sanday
Orkney Islands
Skara Brae
Maeshowe
St. Magnus Cathedral
Stromness
Kirkwall

A fault cutting through the heart of the Highlands, the 60-mile-long glen is navigable through its length by lochs and canal.

Cape Wrath

Circle of megaliths rivals Stonehenge in prehistoric achievement.

Dunnet Head
John o' Groats House
Strathy
Wick

Home to the world's most elusive monster, or shrine to the power of imagination, the loch is the Highlands' biggest tourist attraction.

Callanish Standing Stones
Isle of Lewis
The Minch
Tarbert
Harris
Ullapool
Durness

Final defeat in 1746 of Charles Edward Stuart—Bonnie Prince Charlie—who attempted to restore the Stuarts to the throne. London banned the kilt and broke the power of the Highland chiefs.

Dornoch
Moray Firth
Fraserburgh
Elgin
Peterhead
Dunvegan
Island of Skye
Loch Carron
Kyle of Lochalsh
Inverness
Culloden
Dufftown
H I G H L A N D S
Loch Ness
Glen Mor
Sea of the Hebrides
Ben Macdui
Aberdeen
Armadale
Mallaig
Braemar
Balmoral
Glenfinnan
Dee
Ben Nevis
Glencoe Mamore
Mountains
Grampian
Montrose
Tobermory
Island of Mull
Lochaline
Glamis
Forfar
Arbroath
Oban
Perth
Dundee
Firth of Tay
Iona
Firth of Lorn
Inveraray
Tarbet
Lochgilphead
Ben Lomond
Stirling
Luss
Loch Lomond
Glenrothes
St. Andrews
Home of Scotland's oldest university, founded in 1411, and the world's premier golf club.
Bannockburn
Helensburgh
Dunfermline
Firth of Forth
Greenock
Clydebank
Edinburgh
Renfrew
Glasgow
Livingston
Motherwell
Hamilton
Islay
Kilbirnie
Dunlop
East Kilbride
Coldstream
Galashiels
Berwick upon Tweed
Firth of Clyde
Irvine
Kilmarnock
Troon
Island of Arran
Abbotsford Mansion
Selkirk
Hawick
Ayr
Burns's Cottage
Campbeltown
Moffat
Cheviot Hills
IRELAND
North Channel
Ballantrae
Dumfries
Border Area
NORTHERN IRELAND
Stranraer
Solway Firth
HADRIAN'S WALL
Carlisle
Belfast
ENGLAND

Scotland

CALEDONIA, the Romans called the land of unconquerable Picts and erected Hadrian's Wall to keep them at bay. Then, from Ireland in the sixth century came the Scots. In 843, when Kenneth MacAlpin became King of Scots and Picts, the crucible of a sovereign nation was formed that would endure 864 years, embracing Britons, Norse, and Angles as well.

Though sporadic warfare with England marked most of that history, Scotland's independence was ultimately strangled, largely by the twined bloodlines connecting the neighboring royal houses. In 1603 Scotland's James VI became James I of England, succeeding Elizabeth I. In 1707 the parliaments of England and Scotland united.

AREA: 30,414 sq mi (78,772 sq km). **POPULATION:** 5,150,000. **MAJOR CITIES:** Glasgow, 761,000; Edinburgh (capital), 445,000. **CLIMATE:** Temperate. **ECONOMY:** Industry, oil, electronics, whisky, textiles, fishing, livestock.

ever knew are still there in the Scottish genius for reliving its past and regaling its present—from the annual marshaling by the Duke of Atholl of his 100-man private army to the flourish of the Edinburgh Festival with its music, drama, vigorous fringe festival, stirring military tattoo.

About that recession, the jobless rate is a discouraging 15 percent and, I was told, some mine and mill towns are economic-disaster pockets with half the men idled. Worse, economic doldrums already had sapped Scotland's historic brawn—steel-making, coal mining, locomotives, ships.

George Younger, Secretary of State for Scotland in Prime Minister Margaret Thatcher's cabinet, lives with the economic problem. Even so, his easy laugh put me at ease, an asset in politics. His post combines a legislative role in the House of Commons with diverse executive duties at the apex of the Scottish governmental pyramid.

"Scotland led the first industrial revolution," he told me in his Edinburgh office at New St. Andrew's House. "Now it is in a second industrial revolution, away from the heavy industries into diversification. We have the third largest concentration of electronic plants, after California and Japan."

The industrial corridor across Scotland's waist, once a belt of mining and smelting, is becoming a "Silicon Glen" of microchip firms, many parented by Japanese and U. S. companies—Honeywell, Nippon, NCR Corporation, Timex.

"These major readjustments cannot be accomplished in a year or even in ten," Mr. Younger said. "But by the turn of the century, while we yet have North Sea oil to ease the transition, I see a Scotland prospering in its second industrial coming of age."

At Edinburgh's namesake university, one of Britain's venerable in its 401st year, Professor Donald Michie rides the chip's cutting edge by building computers that think.

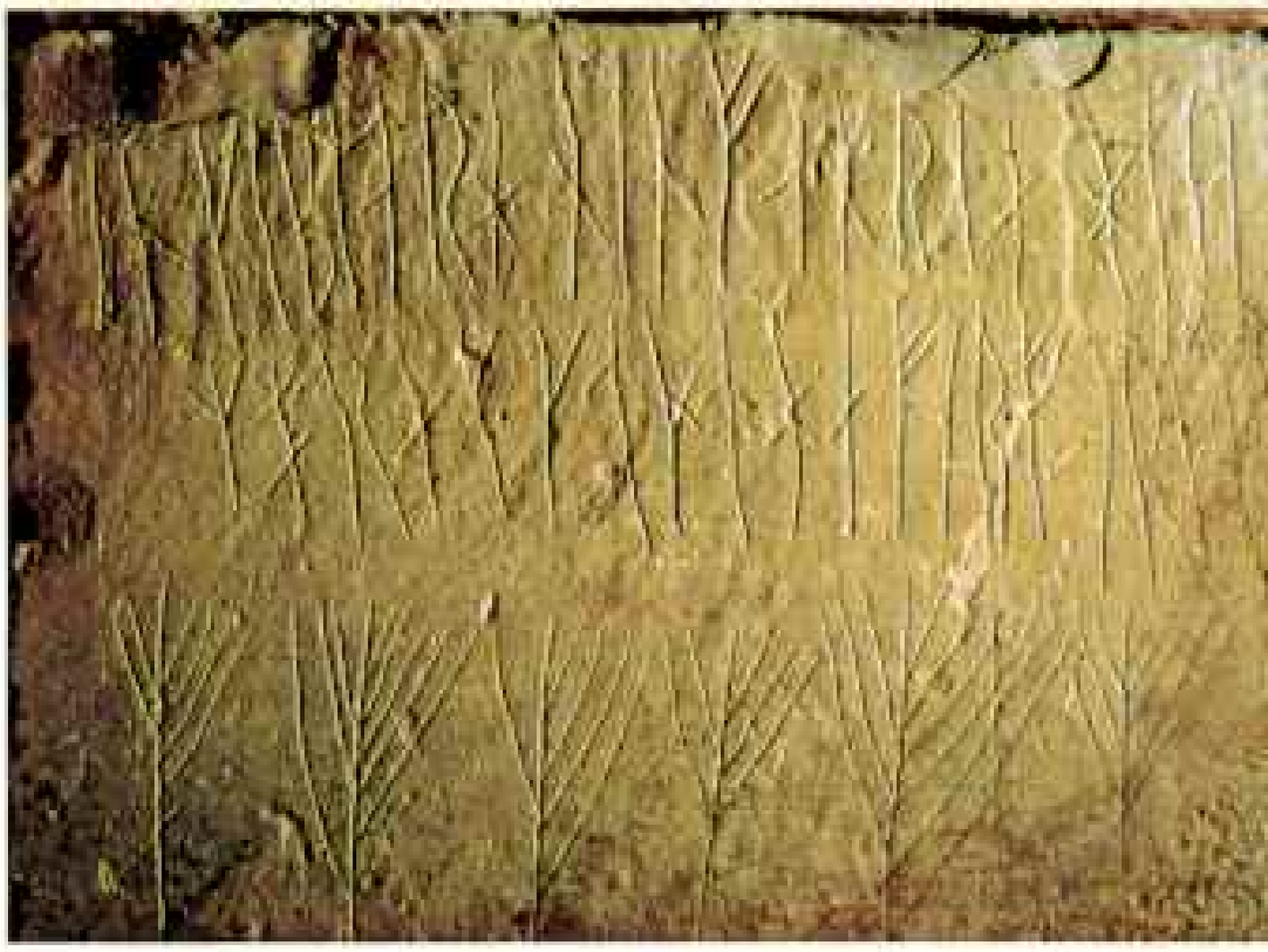
But can they really think?

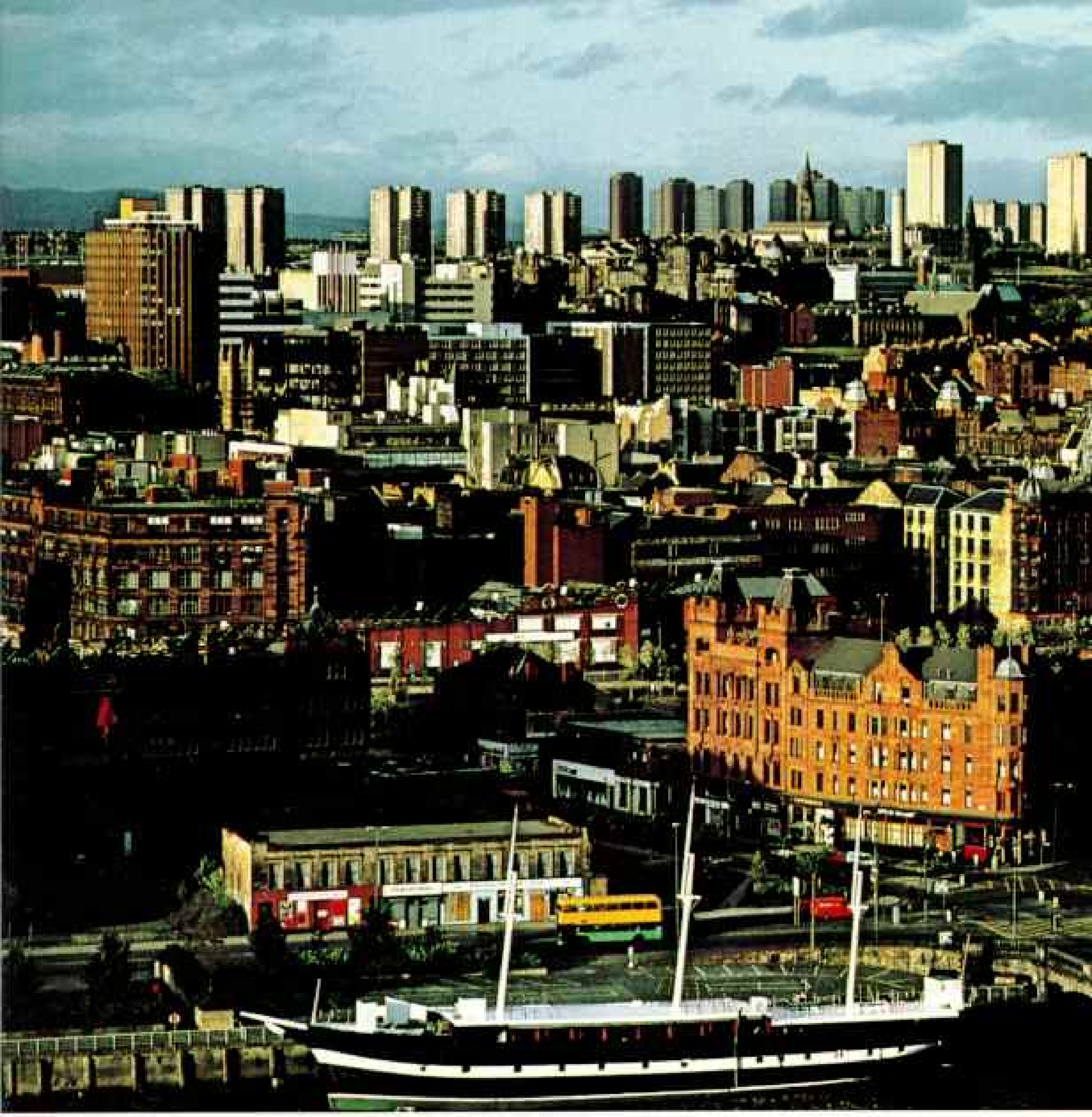
"A hand-held electronic calculator is much cleverer than I am at arithmetic problems, but it can't direct brain surgery or bake a cake," Professor Michie explains. "But our computing systems give sensible explanations of what they are doing, on demand. This is their distinguishing aspect—the faculty that was missing at Three-Mile Island."

In the far and ancient isles *of northern Scotland, testaments abound to the early ages of man. On the windswept Orkney Islands, the excavations at Skara Brae* (**above**) *have yielded a wealth of information on Neolithic life. Linked by covered passages, several dwellings of unmortared flagstone were buried by some sudden catastrophe, thus accounting for their remarkable state of preservation. Fisher folk who also raised cattle and sheep, the mysterious inhabitants built peat-burning hearths and impressive stone furniture, without benefit of metal tools.*

Nearby, in the chambered tomb of Maeshowe, 12th-century Norsemen left graffiti as fascinating as the Stone Age monument itself. According to runic inscriptions such as this one (**right**), *the tomb was plundered more than once by Norse treasure seekers.*

The ruins of the abbey at Arbroath on the mainland are the setting for the reenactment of one of Scotland's most historic moments (**left**). *Here in 1320 Robert the Bruce—hero of Scotland's greatest victory over the English, at the Battle of Bannockburn —presided over the signing of the Declaration of Arbroath, which states: "For so long as a hundred of us are left alive, we will yield in no least way to English dominion."*





Packaging such electronic brains into robots is also a Michie specialty, leading to the inevitable question of creating a self-programming Frankenstein monster.

"The machine can never be greater than its programmer," Professor Michie assured me. "I am happy to have a robot take over doing my laundry, but I have no concern about its taking over my life. That is the province of science fiction writers."

Science fiction takes on reality in the gray Tayside city of Dundee, where labs of the Ferranti company refine the laser's magic wand. "Laser power is relative to length of the tubes," general manager Arthur C. Bastable told me. "Our multifold technique doubles back the tubes so that a laser as long as a bus can be reduced to 3.5 meters."

Another Dundee harnesser of the laser is John Cruickshank, a self-winding inventor in the tradition of Alexander Graham Bell, whom he greatly admires: "Brilliant minds have been Scotland's best export to the world—and often its greatest loss."

However, Scotland will not lose John Cruickshank. He passed up attractive offers by the CPI Corporation of St. Louis to head up its research. Instead, the United

Mother of ships, *Glasgow's River Clyde, foreground, hummed with shipyards when Britannia ruled the waves. Only remnants of the industry survive in the ailing industrial giant, now framed by high-rise flats.*

States firm formed a British branch, and John guides that from a modest office in the ghostly vastness of a former jute mill. The jute industry, which once made Dundee rich, has gone the way of empire, and as an incentive to new firms the Scottish Development Agency offers bargain quarters in the silent mills.

With 89 patents, John has great hopes for his CICLOPS—the Cruickshank Information Collection Laser Optical Profiling System: "It uses a laser beam to copy any three-dimensional profile." Without the trouble of taking measurements, it can produce exact busts of people, make scale models, and—to the benefit of amputees—precisely copy stumps of limbs for better fit of artificial ones. "Its ability to reproduce any object, no matter how complex, makes it endlessly useful in industry."

COMPUTERIZATION is a Jekyll-and-Hyde dilemma that haunts industry. At James Keiller & Son, Ltd., in Dundee, the line that turns out that famous marmalade once needed 200 pairs of hands; now it zips along with a tenth of that—good for profits but not for unemployment.

Even *uisge beatha*—water of life, otherwise known as Scotch and from which we get the word whisky—has been affected by the economic pinch. A tumbling demand—part world recession, part changing tastes—has closed many distilleries and set others to cutting costs, which usually means jobs.

Scotch malt whisky is distilled from barley. Whisky makers soak the grain and spread it on a smooth floor to malt, or germinate. Then they dry it, grind it, mash it, and add yeast. They distill the resulting brew two times to attain high proof and minimum impurities, then age it for eight, twelve, even thirty years in oaken casks to tint it amber and mellow its fierce bite. It is a long process admitting of few shortcuts, but one of increasing recourse recently is buying the barley already malted.

"The quality is in no way diminished," Mike Don of William Grant & Sons' famed Glenfiddich distillery at Dufftown assured me. I reviewed the ranks of giant fermenting vats and gleaming copper stills, savored a wee dram, and validated the statement.

"Water is a key to Glenfiddich," Mike, an engineer who had worked in electronics, explained to me. "A river or loch will not serve, because they vary greatly in quality between dry times and flood. The water for Glenfiddich comes from a spring-fed burn, high in the hills, called Robbie Dubh."

Another industry stunned by recession, Scottish textiles in a decade lost 30,000 jobs and scores of plants. Yet homespun enterprises thrive, especially in the Shetlands, Orkneys, and Hebrides, and plants in the Border country textile belt bet on computerized modernization to protect the profit in a shrinking export market.

On flower-laned Sanday, an out island of the Orkneys with gleaming empty beaches and a lonely lighthouse, postmistress Barbara Sinclair heads a knitting co-op that ships homemade sweaters, caps, and mittens all over the world. "These nine cases are going to Japan," she said. I admired the bright colors and imaginative patterns, and let my fingers linger in the thick soft wool.

"We work in our homes part-time, 130 of us, creating our own designs," Barbara said. "We learned as children; it was part of our growing up. Now it is in great demand."

In Hawick and Selkirk and other Border towns, a hundred textile mills still spin woolen knits and worsteds by the millions. The industry was important enough a century ago to start a school at Galashiels for aspiring weavers and dyers. Today the Scottish College of Textiles instructs 505 students in subjects ranging from handloom weaving to textile design by computer.

Among the projects of an on-campus research center is a computerized matching test for the tiniest wisp of fabric that can clinch criminal investigations. "It analyzes the fragment in digital values, and if another fragment reduces to those same digits, you have a match that is as good as a fingerprint," said research chief Vaughan Walker as a computer spat a digital torrent.

SINCE North Sea oil fields piped the first petroleum ashore in 1975, a cumulative economic dollop of 30 billion pounds sterling has helped Scotland counter recession. Geography made Aberdeen the beachhead for the oil wealth, and just in time. "This place was becoming a graveyard when the oil was found," said Pat Lynch, whose Irish grandfather started a fishing fleet here after World War I (Royal Navy service made him unwelcome back home). Once, the mile of great sheds filled and emptied three times with a single day's catch, and you could cross the jammed harbor from deck to deck on the moored ships without wetting your feet. Now Pat's North Star fleet makes more by servicing North Sea oil operations than by fishing.

Elbowing my way through Union Street's flood tide of shoppers, I found it hard to credit that there was even a 7.5 percent jobless rate in Aberdeen, as I had been told. Cleaning had blasted the soot of decades from handsome gray-granite facades, including the turreted City Chambers. In suburbs and beyond, high rises cast shadows over fields and quaint cottages, and Holiday Inns and sprawling offices for big oil sprouted where sheep had lately grazed. One new hotel chain was called Skean Dhu—Black Dagger—causing me to inquire about the Scottish entrepreneur who chose such a fine Gaelic name. But he's an American, I was told, born in Harlan County, Kentucky.

At British Petroleum's new glass-and-masonry complex near the airport, the office of J. R. Seed, manager of the recently opened Magnus field, looks down on a modest building housing banks of silicon-brained monitors. They keep vigil on the siphoning of crude oil and natural gas from scattered wells beneath the seafloor.

"The Magnus field is not the biggest in the North Sea, but it lies in the deepest water, more than 600 feet, and its platform is the most expensive at 1.3 billion pounds," said J. R., standing to his six-foot-two height to point to a map. "Being farthest north, it is in some of the most exposed waters in the world, subject to 100-knot winds and 100-foot waves."

The oil is piped ashore at Sullom Voe in the Shetlands, Europe's biggest terminal and the biggest man-made complex in the British Isles. In a protected deepwater channel, four jetties accommodate tankers as large as the 300,000-ton supersize, pumping oil aboard at 30,000 tons an hour.

"Before the oil is safe to ship, we must remove its gases, such as butane and propane, which are marketable," Peter Johnson of BP told me as we toured the 1,000-acre facility in a Range Rover.

He praised the terminal's layout within a shallow bowl: "It vanishes from view as soon as you drive over the first hill."

I soon wound across high moors empty of humans. But as wraithlike mists captured

and then gave back the sun, I felt other eyes upon me, for I was under the spell of Scotland's "little people." These trows, or trolls, or elves, or Finlay's people as they are called on the Outer Hebridean Isle of Lewis, live merrily below ground, in rooms carpeted and richly hung, ample tables set with china and silver. Was I seeing their modest entrances, or merely rabbit holes?

The wee folk have always been here and thus feel a certain condescension toward humans, who arrived only recently in the slow-turning clock of the trows. "A person taken into their company for what seems like just a few hours may be surprised to learn he has been away for days or weeks or even years," James R. Nicolson told me. A geologist-turned-fisherman-turned-journalist and historian, James Nicolson knows about trows and just about everything else in the Shetlands from a lifetime of living there.

Trows are creatures of whimsy, he explained, and therefore a worry to humans. "They might 'witch' a cottage for untidiness, which they hate, or steal a newborn infant, leaving a sickly one in its place.

"But trows are mostly cheerful and lovers of good music, and many Shetland fiddle tunes are said to have been learned by listening at a trowie doorway."

Such is Scotland below the surface. Above ground, resembling the rearing lion that guards its coat of arms, it is mostly mountains. Cleaving the Highlands northeast to southwest as by the stroke of a clansman's claymore, Glen Mor—Great Glen—is one of our planet's distinctive landmarks, easily visible from space. Geologists say the glen defines a fault along which slippage occurred. The land on the northwest side once was part of the American plate, with rocks that match Newfoundland strata.

FAR ROLLING HILLS and rivered valleys form Scotland's southeast front on England, and only the nation's narrow waist, between the Firths of Forth, Clyde, and Tay, offers a considerable expanse friendly to the plow. It was also a prize of invaders, including Romans who came and saw that they could not hold what they conquered from resilient Celtic guerrillas—and withdrew southward to a wall they named for Emperor Hadrian.

In the sixth century from Ireland came Gaelic people called Scots, including Columba. Calling Christ the "sun incarnate," he converted sun-worshiping Picts and rebuked the Loch Ness monster for trying to snack on one of his band—history's first citing of that reclusive creature.

The Scots started a genealogy of kings—notably one Kenneth MacAlpin, a Macbeth, some Malcolms and Davids—and endured

A pride of Protestants *turns out in Glasgow for the annual Orange Walk. Though independent of Northern Ireland's fraternal lodge, Scotland's 80,000 Orangemen encourage Irish participation. Only 110 miles from Belfast, Glasgow has a large population of Scots-Irish—a bloodline born of generations of Irish immigrants.*

four centuries of Norse visitations. Scandinavia's withdrawal left Scots the continuing task of keeping out the English, which cued Robert the Bruce to center stage.

"Robert was six generations removed from a Bruce who landed with William the Conqueror," Andrew Bruce, the Earl of Elgin, a descendant of Robert, told me. We talked in high-windowed Broomhall, his country seat, by the wide Firth of Forth. "But through his mother, Robert also bore the blood of Scotland's Celtic kings."

Robert was only 16 in 1290 when the throne fell vacant with at least a dozen aspirants, and his royal bloodline inevitably swept him into the protracted struggle. For years he survived by intrigue and furtive living amid cruel deaths. At last he hid, despairing, in a sea-cliff cave and watched a spider's repeated failures to spin a web, and its persistence until finally the strands held. The patient spider's triumph broke Robert's black mood and moved him to try again.

I had sought out the King's Caves on Arran's southwest coast. A "Scotch mist" filled my shoes like bathtubs as I squished along a lonely shore of rocks and turf starred by wee daisies, escorted by sandpipers racing the surf of that rugged isle. In a cave of kingly dimensions, under a Gothic-arched ceiling, I saw not one spiderweb but two, classic concentric circles held by diverging strands, the builders-proprietors in hopeful vigil for lunch. Surely this was Robert's cave.

"Actually no one knows which cave it was," Lord Elgin said. "The tale is legend, like Washington and the cherry tree. The point is that Robert did not give up."

Robert's pivotal test came in 1314 when Edward II of England, coveting Scotland's crown, pressed in with an army estimated at 20,000. Robert waited for him with half those numbers. They met on June 23-24 near marshy Bannockburn, just south of Stirling, historic key to Scotland.

When Edward's heavy cavalry—the tanks of their day with armor for horse and rider—came rumbling in to crush the phalanxed Scottish infantry, they found an unbreakable human hedgehog of deadly spearpoints. On the second day of fighting, an English pullback became a rout.

A prized memento of Robert's rule reposes at Broomhall—a ceremonial sword carried before him on state occasions.

"It weighs seven pounds—about the same as an Enfield rifle," Lord Elgin said, having

A generation on hold, *youths in Glasgow's East End, where unemployment runs as high as 60 percent, mark time on a tenement wall, waiting for opportunity to knock. Without technical skills for today's jobs, alarming numbers of Glasgow teenagers are graduating from the classroom to the public dole, venting their frustrations in drugs and crime. For many, emigration may be the only answer, as their city undergoes a painful transition from a smokestack to a diversified economy. Built to replace teeming Victorian slums, abandoned high rises (**above**) in the Gorbals district stand as testaments to hasty planning, poor construction, and vandalism.*

"Warm-reekin' rich," a haggis is carved by David McMahon at a Robert Burns supper near Edinburgh. Piped in on a "groaning trencher," then toasted and washed down with Scotch whisky, the "Great chieftain o' the puddin'-race" highlights hundreds of suppers celebrating the January 25, 1759, birth date of Scotland's most beloved poet. Concocted of sheep offal—chopped and mixed with oatmeal and onions and traditionally encased in a sheep stomach—the dish never fails to inspire oratorical heights. Of the man who eats it, said Burns in "To A Haggis"—"The trembling earth resounds his tread!"

retrieved the sword from a vault for my admiration. Half a dozen armorers had pounded the steel thin and bent it back on itself again and again to give its four feet of cutting edges the strength of many laminations—like the tempering of Scottish character.

Though London yielded national recognition to Scotland, the next centuries seldom saw a bloodless year in the Border lands facing England. Repeated sweeps by kingly armies left lawless wakes in which raid and counterraid became a way of life for powerful families on both sides of the line—the Kerrs, Scotts, Grahams, Milburns, Elliots.

The Armstrongs, fiercest of the reivers, or raiders, did not always have such a name, according to R. J. Armstrong, a candy salesman I met in Shetland: "The original name was Fairbairn, the story goes. Once, the king was unhorsed, and a Fairbairn picked him up and sat him on his own mount, armor, chain mail, weapons, and all, an impressive weight. 'Henceforth your name will be Armstrong,' the king declared."

And so it became, still celebrated on the family coat of arms by clenched fist and flexed biceps, for the first man to carry the royal mail.

A modern-day Elliot named Walter in the medieval Border town of Selkirk put it in context for me:

"Raiding cannot be judged by modern morality. One wife would bake her husband a pie with a beautiful crust but only his spurs for a filling, a hint that the larder was low and he must be riding to replenish it."

In wartime or peace the reivers rode. Sometimes a merchant or farmer or a whole town paid protection money not to be raided. "That is where we get the term 'blackmail,'" said Walter. "The rent was called 'mail,' and the payment to raiders to keep them from your door was the blackmail."

Rival families feuded for generations, and the strong often got stronger and richer and nobly titled. But the independent Scot seems always ready to challenge the mighty.

"The Duke of Buccleuch was driving in his carriage when he spied an old tramp lying beside the road," Walter continued. "Getting no sign of respect, the duke stopped and asked what he was doing there. Without rising, the old man said, 'And who might you be to be asking?'

"'The Duke of Buccleuch; I own this land.'

"'You own this land, do you; and how did you get this?'

"'My forefathers fought for it.'

"The old man got up, took off his coat, and said, 'Step down from there and we'll fight for it again!'"

IN THE WILD HIGHLANDS to the north, raiding continued into the 18th century. The clans survived by communal ventures, including cattle raids.

The Highlander's way of life paralleled the North American Indian's. "He needed the same skills to survive," author and climber W. H. Murray observed, "stealth and a sure aim in the hunt, a strong arm in battle, endurance for long hungry marches to surprise an enemy or steal a herd."

Over tea in his cottage at Lochgoilhead, Bill Murray talked about Scotland's famous outlaw, the subject of Bill's latest book, *Rob Roy MacGregor, His Life and Times*.

Rob was a dauntless foe and, like Jesse James, got credit for far more than his own deeds. He too had the affection of commonfolk, who saw his cause as their own. But unlike Jesse, Rob outlived the charges against him and died in bed at age 63, his parting wish fulfilled by the lament of his piper, "I Shall Return No More."

Integrity was central to the code of the Highlander; no written contract was needed when he gave his word. The code governed all conduct, including hospitality.

"That is why the massacre at Glencoe stirred a sense of outrage," said Tom Weir, mountaineer, historian, and guide to scenic Scotland through many television travelogues. Tom guided me one July morning down Glencoe for an appreciation of its famous mountains and its infamous massacre. In 1692 Alasdair MacIain MacDonald, his wife, and 36 of his clan were slain by soldiers of King William, to whom Chief MacIain had been slow to swear loyalty. To their discredit the executioners had accepted hospitality from those they were sent to kill.

Ghosts of that time still haunt the glen. Tom tells how he and friend Rob Anderson took shelter for the night in a sheep barn while climbing above Glencoe in winter. "Rob shook me awake and said, 'That face, that face at the door—it's like clay, and his clothes are covered with blood!'

"'There's no face at the door, Rob,' I said. 'You've had a dream. Now go back to sleep.'

"Soon he was shaking me again, insisting he saw a man with bloody clothes, prying at the door. Next morning we described to our shepherd host the face Rob had seen. 'Sure, that would be old MacIain himself,' he said. 'This is the anniversary of the massacre.'"

King William and successors, including the Hanoverian Georges, tilted with Stuart ghosts and pretenders until a final bloodletting called Culloden in 1746. Led by Bonnie Prince Charlie, that most gallant pretender of all, insurgent clansmen charged through sleet to hurl themselves against twice their numbers—and met bitter defeat.

To bar Highlanders from ever again fielding an enemy army, shaken London broke the clans by banning rallies, arms, tartans, and pipes. But chiefs were left as lairds of clan lands at a time when sheep offered greater return than cotters' poor scratchings. Many lairds broke generations-old leases, even evicting blood kin—the controversial, passion-wrapped "clearances."

While some of the dispossessed crossed wide seas to new lives, others went down to Glasgow or Aberdeen or Edinburgh, which, flourishing with commerce, outgrew its medieval confines. As the New Town rose, an intellectual golden age gave Scotland and the world Adam Smith's *Wealth of Nations*, John and William Hunter's insights into anatomy, and Robert Adam's neoclassic architecture.

AMID SUCH BRILLIANCE, Robert Burns won fame by simple eloquence. In lyric English or the broad Scots of Ayr, he celebrated Wallace's iron at Stirling Bridge and Tam O'Shanter's flight from witches across Brig o' Doon.

Burns was dead at 37, his short years filled with hard toil on the land, collecting and adapting 300 Scottish songs, with poetizing, lusty conviviality, and romantic extravagances. The sheer force of his simple lines made him not merely national poet but also a premier figure in Scotland's history, and he gave the world a tender song to toll the years: "We'll tak a cup o' kindness yet For auld lang syne."

Human catapult *at the Highland Games in Braemar prepares to toss the caber, a 132-pound log that must turn end over end before it lands. At an Orkney*

*fair, a youngster shows her Shetland pony (**above**). Gentle Shetlands owe their stunted stature in part to the harsh environment of their native islands.*

To his birth cottage at Alloway I went as to a shrine, part of an annual convergence of 100,000. On our 33rd wedding anniversary I read to my Virginia from Robbie's uneven script: "As fair art thou, my bonnie lass, So deep in luve am I, And I will luve thee still, my dear, Till a' the seas gang dry."

Two literary giants, Sir Walter Scott and Robert Louis Stevenson, were trained for the bar, a calling with a tether to Edinburgh; Scotland's separate legal system concentrates judicial business, including all major civil cases, in Parliament House there. For a briefing I went to the book-lined chambers of a man whose working clothes were black jacket and pinstripe trousers.

Charles Kemp Davidson was dean of the Faculty of Advocates of Scotland, an ombudsman of his peers, a post without counterpart in the American system. He has since become a judge of the Court of Session.

"A condition of the union with England preserved Scotland's legal code and structure," he explained, guiding me through the great hall where lawmakers once met. "It is based on the Roman system, rather than the English.

"For one thing, no one can be held more than 110 days awaiting trial, reducing anxiety and expense, and freeing courts of backlogs that in other countries have stretched into years. For another, English law until recently attached the stigma of murder to suicide, adding to the tragedy."

The skein of tradition *binds 80-year-old Laura Malcolmson and great-grandniece Romaine Kemp, who spins while Laura cards raw Shetland wool—the golden fleece of the islands' world-famous seamless sweaters. The art of hand knitting still engages hundreds of Shetlanders, despite the islands' disruptive oil boom.*

A RELIQUARY AIR haunts Glasgow, whose crane-forested miles of Clyde-side yards were synonymous for a century with the best and biggest ships that steel and brawn and brains could launch. Glasgow seeks new work and a new sense of identity. Visually the new Glasgow melds Victorian elegance with the concrete ribboning of expressways, the cubical thrustings of office towers, high-rise flats, homogenized hotels.

For a sharper focus on all this, I called on Arnold Kemp, vigorous 18th editor of the venerable Glasgow *Herald*, in its third century of continuous publication, which makes it one of the oldest English-language newspapers. It began life with a scoop that pained British readers: the signing of the Treaty of Paris that transformed the American Colonies into a separate nation.

"The identity problem, not just of Glasgow but of Scotland," Kemp told me, "is how to remain a Scot, proud of heritage and history, without becoming an obsessive nationalist. I think that explains Scottish politics since World War II."

Voters in the 1970s gave 11 of Scotland's 71 seats in Commons to Nationalists and backed a referendum for devolution (more autonomy, including a limited legislature). But the global economic storm unleashed by 1973's oil embargo ultimately pushed nationalism and devolution into a backwater: "Recession causes cultural inertia; a lot of people just want to stay in their bunkers."

Glasgow sentiment ran high for the peace movement, I found, with petitions for a nuclear freeze filling a huge wire basket in the City Chambers. Near the British nuclear submarine base at Faslane, north of Helensburgh, I visited a camp of resident protesters. Clergymen in Iona and St. Andrews independently described the superpowers as caught up "in a terrible madness" that could at any moment deny the world its future.

A lesser madness, chronic in the view of the unafflicted, is a game called golf, which also has religious connotations. Scotland claims its origin. Appropriately, my chief mentor on the sport was also an adviser on the faith. Dr. George Docherty's eloquence had won my attention when he was pastor of New York Avenue Presbyterian Church in Washington, D. C. Having retired to St. Andrews in his native Scotland, near the Old Course, he honored me with lunch at the Royal and Ancient Golf Club, of which he is a member.

Founded in 1754, this paramount shrine of golfers and arbiter of golfing occupies a gray-stone eminence that overlooks the first tee and 18th green of the Old Course. A troublesome undulation before that green is known as the Valley of Sin. One bunker is called Hell, because a ball landing there will never get out. An English bishop whose ball landed there turned to his venerable Scottish caddy for advice. The caddy advised placing the ball out and taking the penalty stroke. But the bishop instead asked for his sand iron and with one neat stroke chipped the ball out onto the fairway. He then turned in triumph to ask his caddy: "And what do you think of that?"

"Well, sir," the caddy replied, "I think you should go to your lawyer and have him draw a codicil to your will and specify that when you die, that sand iron be buried with you—because where you're goin', you'll be needin' it."

That much of Scotland is a natural golf course waiting to be played argues for the game's Scottish origins—and against a heresy that it was imported from Holland, where it was played with a clubbed stick called a *kolf*. Ancient dunes carpeted with centuries-old turf, broken by erosion here and there into sand traps, or bunkers, give deceptive pitch and roll to courses at St. Andrews, at Troon, and at other seaside meccas. Elsewhere in the world the task of golf-course architects is to re-create a bit of Scottish landscape, complete to water traps in place of burn or loch.

GOLF HAS BECOME a universal game, but an unexportable sport is that of Nessie-watching. Since that first recorded sighting in St. Columba's time, people have scanned Loch Ness for its celebrated monster. Though unequivocal proof remains elusive, many sightings and a few controversial photographs agree on an aquatic dragon, huge and undulatory, with a talent for appearing when light is bad and cameras out of focus.

Uncongenial sunshine attended my Nessie patrols, camera ready, and thus I missed

Counting sheep *keeps the economy awake in the northern Highlands, where lambs are rounded up for auction. Once a large population of crofters scratched a living from the meager rockbound Highland soil. Bonnie Prince Charlie's*

ill-fated uprising in 1745-46 led to suppression of the clans and eventually to the notorious "clearances" of tenant farmers to make room for sheep. The population drain of two centuries has only recently been checked.

a sighting shared by five persons only a week earlier, when it had been quite cloudy.

Scottish weather puts suspense in any outdoor venture, mist, rain, sleet, snow at times platooning through at the double-quick. Wind rides like a demon spurred by the "deil" himself, lashing the world for being there. Trees on exposed heights lean permanently to the northeast. Moisture-heavy southwest winds torture many trees, rendering them grotesque weathervanes even in a calm.

During a January fortnight around Loch Lomond and Glasgow, I never saw dry ground nor slept without a banshee serenade under the eaves. An even windier spell escorted me eastward to Edinburgh amid reports of lorries flipped, markets unroofed, trawlers driven onto rocks. Five climbers perished; it would be July before Ben Nevis's retreating snows yielded the bodies of two, youths on holiday from Belfast.

In an Edinburgh bus queue, whipped by arctic windchill, a little old woman saw my misery and offered her version of comfort: "You have to be born here to live here."

Of all roads in Scotland, the one that calls me most winds along Loch Lomond's bonnie banks. Credit a poignant song for that, traditionally the words of a young Jacobite

The real beef *in Scotland's livestock output, cattle bring three times the income of sheep. Six native breeds, including hardy Highland cattle* ***(left)****, undergo the scrutiny of officials, like these* ***(above)****, at the annual Royal Highland Show near Edinburgh. Short on productive arable land, Scotland earns 70 percent of its farm income from livestock and their products.*

The pristine waters of Scotland's fjordlike sea lochs have spawned stock raising of a different kind—salmon farms. After three or four years of nurturing, from eggs to adults, fat Atlantic salmon are harvested ***(below)*** *on Loch Carron in the western Highlands.*

soldier to his sweetheart as he awaited hanging in England: "Oh, ye'll tak' the high road and I'll tak' the low road, and I'll be in Scotland afore ye. . . ."

Now the loch, a scenic jewel set in history, faces a different death. Holiday throngs from the nearby Edinburgh-Glasgow population belt are in danger of loving it to death, overwhelming roads, inns, caravan parks, toilets, and rubbish bins. Another visual blight: logging of the encircling high slopes.

Hannah Stirling, longtime leader of Friends of Loch Lomond, used to look eastward across the loch from her home at Tarbet to a view as wild and free as when Rob Roy MacGregor was its master. But now a road, built with government subsidy, has been bulldozed from skyline to lochside to serve a shepherd's cottage, compelling the gaze to its zigzag rawness. "It is an affront to the eye," said Hannah, "and it illustrates the need to protect Loch Lomond."

SUNDAY MORNING usually finds the Reverend James Currie in the pulpit of rural Dunlop parish church, but on other days he is on the move. I followed him one January day from the East-Park Home for Infirm Children in Glasgow to a Kilmarnock gathering of blind or deaf old folks to a muscular dystrophy benefit near Ayr, a schedule that wore me out but on which he thrived. He is also emcee for the Scottish Fiddle Orchestra, whose glad reels set audiences dancing in the aisles at annual sellouts in four Scottish cities and London.

"I used to have one of the largest parishes in Glasgow—some 3,000 souls—but I had a heart attack, and the doctors told me to slow down," he said. He shaved with a cordless razor as he drove. Last year, between early January and mid-March, he delivered the principal address—called the Immortal Memory—at 47 Burns suppers over Scotland and as far as Lagos, Nigeria. Doesn't he ever become bored with the subject?

"I never tire of talking about Burns's tenderness for life and about his universal humanity—'a man's a man for a' that. . . .'"

At the Kilmarnock gathering elderly celebrants at a Burns supper sang and danced to music of a blind pianist and accordionist. For one sightless and deaf woman, an aide tactually signaled the name of the tune and gave her the cadence by wrist pressures. And the dark and silent world of the old one filled with the music and light of remembered youth, and she danced once more.

From lively scenes I turned at last to one where only memories lived. Through all my Scotland wanderings some mental compass ever pulled toward an obscure site I'd heard about by River Dee under the Grampians' rough folded heights. There in a brambled grove a pile of stones stands as high as a man's breastbone—the Cairn of Remembrance of Clan Farquharson (FAR-ka-son).

From earliest times the clan rallied for war by the rushing Dee, each man bringing a stone to the rally site and taking it away upon disbanding. The stones not reclaimed became a memorial to the clan's fallen.

Intently scanning route A93's skimpy margins for a historical marker, I saw instead signs forbidding stopping for security reasons. The road here afforded a distant view of Balmoral, royal summer residence and, incidentally, former site of a Clan Farquharson castle. "If you'll be parking your car at the turnout and walkin' a quarter mile, you'll see a wee hole in the fence and a path past some ruined cottages and across a pasture," offered a helpful innkeeper.

And so, through a herd of indifferent cattle and across a field yellow-green with mustard, in sight of Balmoral's distant clock tower, I came to the solitary cairn.

In one of those recurring wars with England a Farquharson named Finlay fell bearing the standard. Descendants who emigrated to the Lowlands became Findlays, spelled variously—my family name.

By the whispering river, as sheltering firs dripped the wetness of a fine mist, I mused on the cold glistening stones and the warm hands that had carried them there. □

"A cup o' kindness" *with old friends adds warmth to a pub in Edinburgh. The Victorian decor harks back to a time when the Scots took a lead in colonizing and managing the British Empire—a time anticipated by Burns: "We've wander'd mony a weary foot sin' auld lang syne."*

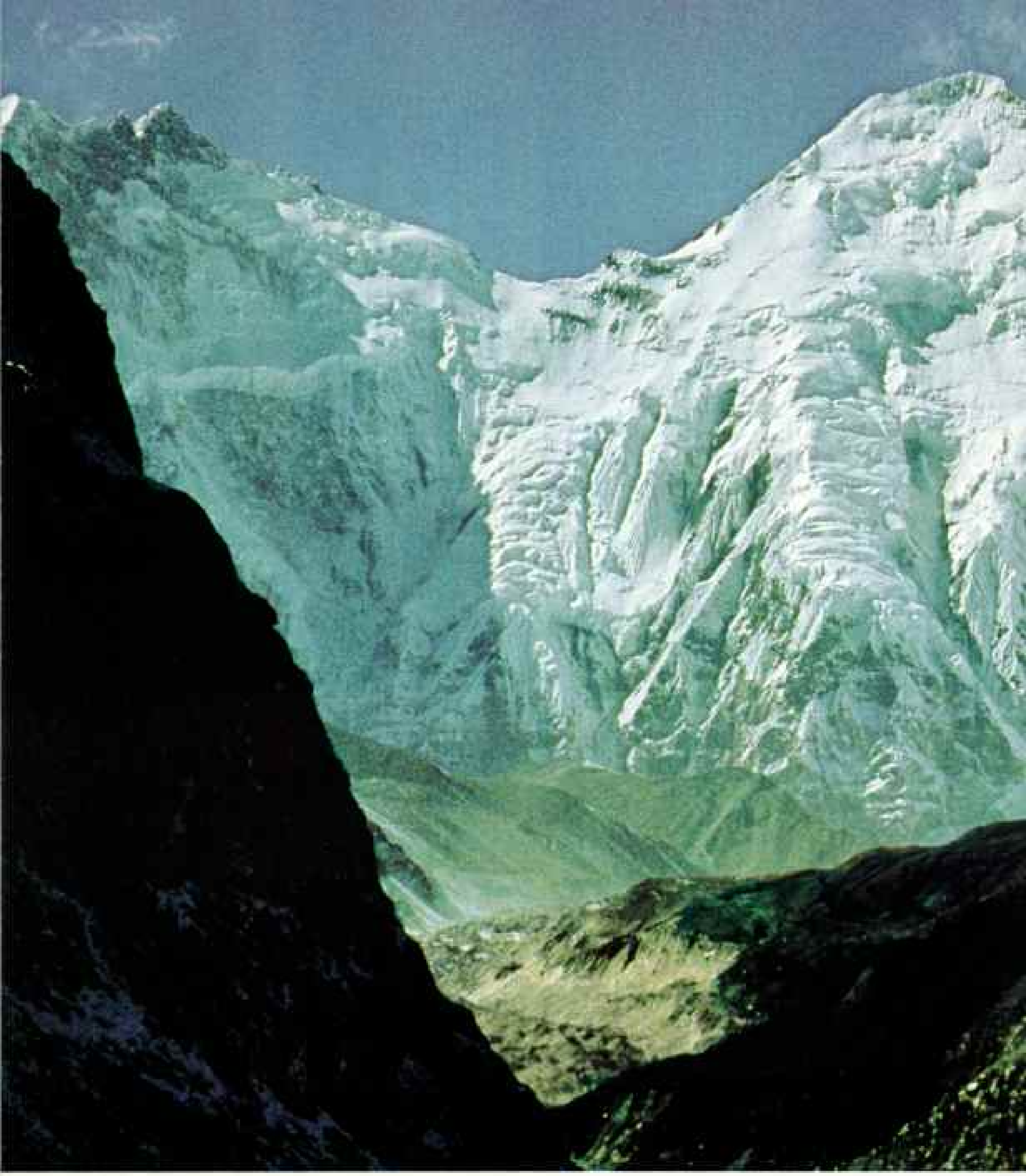
The Forgotten Face of Everest

By ANDREW HARVARD

Photographs by
Expedition Members

Through an ice-sheathed corridor dubbed the Bowling Alley, my teammate David Coombs ascends the East Face of Mount Everest, a sheer wall once regarded as unscalable by mountain climbers. Following its discovery in 1921 by British alpinist George Mallory, the East Face remained unclimbed for half a century while mountaineers found more accessible routes up the world's highest peak. In the fall of 1980, I was asked by an American mountaineering group to reconnoiter the East Face and report whether it could be climbed. My answer after a careful look: dangerous, but possible. The following pages document two dramatic stories—the reconnaissance of Everest's legendary East Face and its ultimate conquest by American climbers.

GEORGE LOWE



NOTHING PREPARED ME for that first unforgettable view. As I rounded a slope overlooking Tibet's great Kangshung Glacier, I suddenly faced an immense mass of ice and rock thrusting toward the vault of the sky. For many moments I stood motionless at the majesty of the scene—the virtually unknown East Face of Mount Everest.

As I watched, an avalanche silently began from somewhere on the mountain's height about a dozen miles away. Gathering size and speed as it descended the face, the slide spilled down and over the great buttresses of rock, exploding in a cloud of atomized ice on the surface of the Kangshung Glacier, two miles below the mountain's summit. A long minute later the delayed rumble of the

ANDREW HARVARD

avalanche reached me in the stillness.

It was not a good omen. I had journeyed to this remote area of Tibet to survey the East Face, also called the Kangshung Face, to determine whether it could be climbed with modern techniques and equipment. Since 1947 politics had closed the northern approach through Tibet. Now the way had been reopened to mountaineers.

My companions on the overland journey from Lhasa, the Tibetan capital, were a veteran Chinese mountain climber, who acted as my escort, and an interpreter from Beijing named Tsao, who was to become a good friend.

Traveling southwest from Lhasa by jeep, we had come on the third day to the village of Kharta, where the road ends. During those

Khumbu Glacier

Nuptse
7,879 m
24,850 ft

Nuptse Glacier

British Expedition 1953
(Hillary and Tenzing)

American Expedition 1963

British Expedition 1975

West Ridge

Western Cwm Glacier

Lhotse
8,501 m
27,890 ft

South Col
7,986 m
26,201 ft

Mount Everest
8,848 m
29,028 ft

Changtse
7,553 m
24,780 ft

Northeast Ridge

North Col
8,990 m
22,939 ft

Camp 3

Camp 2

Camp I

East Face
(Kangshung Face)

Helmet camp

Lowe Buttress

Pinnacle camp

Bowling Alley

Rock Haven camp

Advanced base camp

Lhotse Glacier

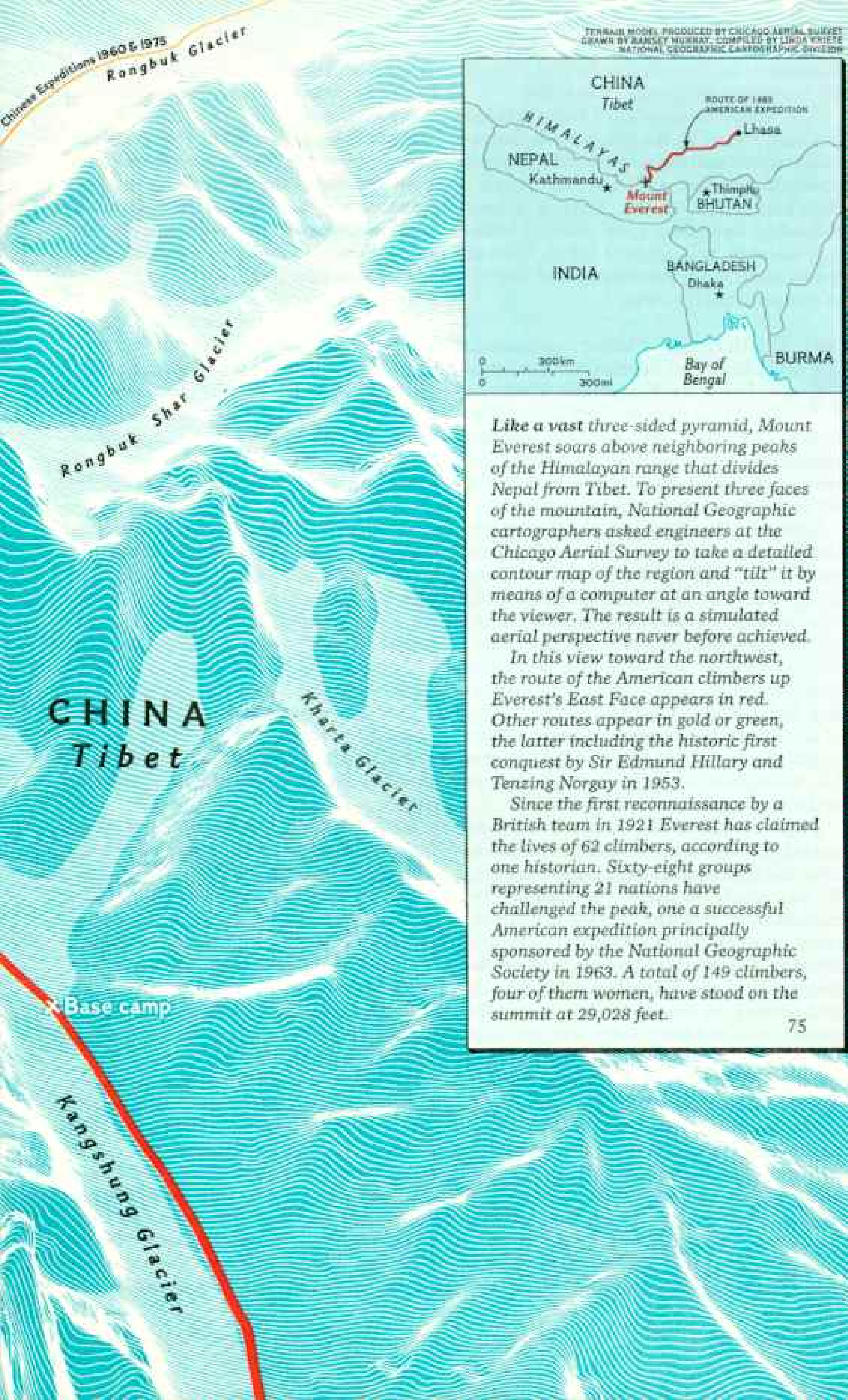
NEPAL

Barun Glacier

NORTH

Makalu
8,463 m
27,766 ft

Chomo Lonzo
7,790 m
25,558 ft



TERRAIN MODEL PRODUCED BY CHICAGO AERIAL SURVEY
DRAWN BY BARCLEY MURRAY. COMPILED BY LINDA KNIETE
NATIONAL GEOGRAPHIC CARTOGRAPHIC DIVISION

***Like a vast** three-sided pyramid, Mount Everest soars above neighboring peaks of the Himalayan range that divides Nepal from Tibet. To present three faces of the mountain, National Geographic cartographers asked engineers at the Chicago Aerial Survey to take a detailed contour map of the region and "tilt" it by means of a computer at an angle toward the viewer. The result is a simulated aerial perspective never before achieved.*

In this view toward the northwest, the route of the American climbers up Everest's East Face appears in red. Other routes appear in gold or green, the latter including the historic first conquest by Sir Edmund Hillary and Tenzing Norgay in 1953.

Since the first reconnaissance by a British team in 1921 Everest has claimed the lives of 62 climbers, according to one historian. Sixty-eight groups representing 21 nations have challenged the peak, one a successful American expedition principally sponsored by the National Geographic Society in 1963. A total of 149 climbers, four of them women, have stood on the summit at 29,028 feet.

three days I was both fascinated and sobered by encounters with rural Tibetan life.

There is a sadness in Tibet today that has not been erased by the new schools, hospitals, tractors, and roads furnished by Tibet's powerful neighbor and ruler, the People's Republic of China. For Tibet is a land shaped by more than 2,000 years of building, learning, and spiritual belief, much of it now shattered by the violence and tragedy of conquest and civil war.

AT KHARTA my Chinese companions and I hired two Tibetan yak herders to guide us to the Kangshung Glacier, a trek of four days through altitudes as high as 17,000 feet. We loaded our gear and supplies on two yaks, but since those animals might not find food above 16,000 feet, we added another yak to carry fodder.

The route from Kharta to the Kangshung Glacier is both ancient and scenic. Running south from Kharta, it reaches the Kama River Valley, where for centuries yak herds have grazed the lush pastureland. On his 1921 reconnaissance of the East Face, George Mallory had followed the same route, though he had started from Darjeeling, India, rather than Lhasa. I had no map of his travels, but I knew the names of two major passes, the Shao La and the Langma La, mentioned in the journals of Mallory and his colleagues on the expedition.

Climbing above the Kama Valley, we passed through dense forests of rhododendron and emerged into high alpine meadow. It was nearly October, the weather remained clear, and we could see two distant snow-crowned peaks, Chomo Lonzo and Makalu. On the third day we reached the lower end of the Kangshung Glacier. By midmorning we rounded a slope above the glacier, and suddenly there was the East Face of Everest in all its vast and timeless splendor. Soon afterward my four companions refused to go another step.

They gave no reason, but I sensed a certain unease, perhaps from the increasing altitude or the unfamiliarity of the surroundings. They could not understand why I needed to get closer to the mountain. Could I not see all I needed to from here?

I explained that I could not, that I had to examine the sheer face of the mountain at close range, to look for a route to the summit. Even the veteran Chinese mountain climber shook his head.

Secretly I was delighted. Few people today are given the chance to explore an unknown corner of the earth alone, to search for a new way from here to there. Here was the Kangshung Glacier, there was the summit of Everest: Was there a possible route between the two?

I recalled the words in Mallory's journal when he surveyed the East Face from a point probably very close to where I stood now. "It required but little further gazing," he had written, "to be convinced . . . that, in short, other men, less wise, might attempt this way if they would, but, emphatically, it was not for us."

Mallory had continued his survey of Everest and, ironically, finally chose an approach via a northeast ridge on which he and a companion perished three years later.

But I had not come this far to accept another's opinion. I had to see for myself if the East Face was truly unclimbable. Hurriedly I packed a small tent and food for five days, bade my companions good-bye, and set off for the mountain before they could object.

Two days later I stood near the foot of the East Face, with a clear view of the massive rock wall whose base lies at a higher elevation than the top of Mont Blanc, Europe's highest peak.

Here, I thought, was the last great wall of Everest, which no one had seriously considered since Mallory's day. The history of Everest is a succession of such barriers blocking each step toward conquest of the mountain. Whether in the form of a wall, relentless winds and weather, avalanches and icefalls, or simply the dangerously thin atmosphere at high altitude, each barrier has divided the known from the unknown, and each in its time has fallen.

Before me stood an actual wall of rock, on a side of Everest untouched until all others had been challenged and conquered. The wall was as steep, as high, as dark, and as silent as I had always known it would be.

Alone in the stillness I felt a growing kinship with those British explorers in 1921, dressed in their tweeds and nailed boots. They, too, had been driven by wanderlust, by a will to seek the ends of the earth, and by

an urge to find the dimensions of their endurance.

As I studied the mountain, I tried to put aside my initial horror at the avalanches that swept its face. For two days I watched sunlight creep across the rock headwall. The sun's progress slowly revealed, in a changing line of light and shadow, the cracks, ledges, and fissures that might give us a route up that sheer, forbidding face.

Perhaps more important, as I watched the sun traverse the slopes higher up, a subtle but definite ridge line began to appear, threading its way through the frozen maelstrom of avalanche slopes from the summit ridge down to the top of the rock wall, a vertical distance of 6,300 feet. The ridge line, I saw, was partially sheltered by topography from the great sweep of avalanches that lent such terror to the mountain.

At dusk on the second day I had completed my study. By then I knew: There was a route. It would be difficult and dangerous, but not impossible, not suicidal. Certainly it was the last great approach to the summit of Everest, a challenge worthy of those in the past who had attempted and ultimately ascended the mountain's other sides.

As sunlight began to fade, I turned and started back down toward the glacier, convinced of one other thing: Americans would see the East Face of Everest again.

The rest is history. In 1981 an American climbing team led by Richard Blum of San Francisco scaled the rock wall but failed to reach the summit. Seven members returned last autumn with a second American team, led by Jim Morrissey, whose story appears on the following pages. This group conquered the East Face and reached the top.

As a member of both expeditions I had the satisfaction of sharing a historic challenge that resulted in final victory. Mallory, I think, would have approved. * * *

Casualty of violence, *the great Tibetan monastery at Xegar, photographed* ***(right)*** *by a British group on a 1922 reconnaissance of Mount Everest, appears as a magnificent cliffside sanctuary guarded by a walled fortress on the slopes above. Xegar, whose name means "shining crystal" in Tibetan, then housed more than 400 monks and served as a center of Buddhist teaching and influence.*

The lower photograph, taken by author Andrew Harvard in 1980, shows the devastation of both fortress and monastery, with nothing remaining of Xegar but the small village at the base of the mountain. Although local residents were reluctant to discuss Xegar's fate, other sources have indicated that the monastery was destroyed by Chinese Communist forces during the Tibetan rebellion of 1959 or by the Red Guard and Tibetan insurgents during the Cultural Revolution a decade later.

ROYAL GEOGRAPHICAL SOCIETY (TOP); ANDREW HARVARD

THE FORGOTTEN FACE OF EVEREST

Conquest of the Summit

By JAMES D. MORRISSEY

THE MIRACLE is that all of us survived—13 climbers against a 3,500-foot rampart of rock so sheer and treacherous that in many places even ice and snow barely clung to it. Yet we scaled the wall twice: first in 1981, before having to abandon the climb, and again in 1983, when six climbers went all the way to the summit (**pages 88-89**).

In this view (**right**) *the great rampart—which we named Lowe Buttress after one of our climbers, George Lowe—soars from its base at 17,800 feet to an icy pinnacle at 21,300 feet. Beyond the Buttress and invisible here, the summit of Everest rises another 7,700 feet, across treacherous ridges and snowfields beset by avalanches. But it is the Buttress that gives the East Face of Everest its awesome character. In more than a quarter century of mountaineering, I have found no challenge to equal it for modern climbing techniques.*

Meeting that challenge, teammate Jay Cassell (**left**) *scales an ice face near the top of the Buttress. Blinding spindrift of snow cascading from slopes higher up combines with fog to reduce visibility —and often safety—to the narrowest of margins. Rockfall is a greater threat, requiring safety helmets at all times. Despite the hazards, Jay carries a 30-pound pack of supplies and equipment—the normal burden on the Buttress ascent—needed to establish our staging camp above the Buttress. The job required 28 days. By contrast, the climb from that camp to the summit took only ten days.*

DAVID CHESSMOND (LEFT); CARLOS BOHLER

LABYRINTH *of line (**left**) festoons the heights of the Buttress during an attempt to rig a cargo tramway up the face of the rock wall. After arranging 4,000 feet of rope in a fishbone pattern on the snow so that it would pay out easily, we connected it to a small rocket used for launching lines between ships at sea. Then we aimed the rocket outward and fired. This attempt failed to clear all the ledges. Another try from lower down succeeded, and we rigged a winch designed by our nonclimbing engineer, John Boyle, powered by a five-horsepower engine capable of lifting 80-pound loads nearly 1,000 feet up the Buttress face. From a point higher up, a smaller winch, powered only by a counterweight of snow packed in a canvas bag, lifted the loads—more than half a ton in all—another 700 feet. The two winch systems saved us valuable time and effort.*

*Kim Momb (**above right**) steadies an incoming load at the upper end of the powered winch. George Lowe (**right**), one of our strongest climbers, strikes a nonchalant pose with nothing beneath him but air. Oxygen tanks, which we used only during the final 3,000-foot assault on the summit, hang suspended beside him. Teamwork, however, rather than oxygen or mechanical aids, provided the margin of success on Everest.*

DAVID CHESSMOND (FACING PAGE); LOUIS REICHARDT (ABOVE); CHRIS KOPCZYNSKI (BELOW)

ON THE KNIFE EDGE OF OBLIVION, *a climber treads warily along a two-foot-wide ridge soaring above the great Kangshung Glacier. A single misstep and failure of his safety line could plunge him down either side in an unbroken 1,500-foot fall. Since this ridge separated the big winch from the small one, we spent days portaging 30-pound packs of supplies across it.*

CARL TOBIN

JAY GRISELL (FACING PAGE); GEORGE LOWE

TETHERED *in space, David Cheesmond* ***(left)*** *scales an overhang near the top of the wall. On our descent of the Buttress in 1981 we left our climbing ropes and pitons in place on the rock wall. Two years later we used the same ropes as a backup system for climbing. At points such as this one negotiated by Dave, Kim Momb climbed first, using the old ropes to rig new ones.*

Each team member made unique contributions: Medical student Geoffrey Tabin, for example, checked our eyes for hemorrhaging that can occur at high altitudes. Carl Tobin excelled at ice climbing, while Chris Kopczynski brought with him the experience of one who had stood on Everest's summit before.

Our final camp on the Buttress occupied a narrow ledge beneath an overhang ***(right)****, with barely enough room for a two-man tent and a second tent for supplies. We dubbed the camp Pinsetter, since it adjoined the corridor we had earlier christened the Bowling Alley. At this point, on September 25, we were three and a half weeks and 2,000 feet into the climb, with 9,200 feet more to go to the summit. Climbing conditions were soon to change when we left the vertical rock wall for higher slopes of ice and snow. There rockfall was no longer a threat; the danger was avalanche.*

OBLIVIOUS OF MAJESTY *around them, weary climbers at 24,000 feet trudge the steep slopes above the Buttress. On this ascent, for the first time in history, all members of a team succeeded in reaching that altitude. Yet we still had two more camps to build and supply.*

—CHRIS KOPCZYNSKI

ALL BY LOUIS REICHARDT

TRIUMPH at the top is signaled by Carlos Buhler **(right)** *with upraised ice ax. The date is October 8, 1983, five and a half weeks after we had pushed off from the bottom of the Buttress. Carlos reached the 29,028-foot peak together with teammates Kim Momb and Louis Reichardt. Their final approach, shown in the two views at left, joined the route taken by Everest's first conquerors, Sir Edmund Hillary and Tenzing Norgay.*

On October 9 three more of us reached the summit: George Lowe, Daniel Reid, and Jay Cassell. Except for a severe storm that struck on October 10, the list might have included more names, one of them my own. But the risks were too great. In fact, our sense of victory was overshadowed by the deaths of two Japanese climbers and a Sherpa companion who had approached the summit from the Nepalese side almost at the same time as we. All three fell soon after they began their descent. The Sherpa took his fatal plunge past Louis Reichardt, an image Louis will never forget.

The accomplishments of our team speak for themselves. We have broadened man's knowledge of the world's highest peak through a new route that only a few believed possible. □

Time and Again in BURMA

By BRYAN HODGSON

Photographs by
JAMES L. STANFIELD

BOTH NATIONAL GEOGRAPHIC STAFF

SHE WAS YOUNG and very pretty, and her eyes glinted with Oriental mischief as she came gracefully toward me on a crowded Rangoon street.

"Welcome to Burma. Happy New Year!" she said, and emptied a pail of water in my face.

I was not bemused.

It was the time of Water Festival in the largest, most reclusive country of mainland Southeast Asia. For three days some 38 million citizens had been preparing for the Buddhist New Year by merrily hurling water at each other to wash away the misdeeds of the old.

I'd had my share of absolution by fire hose, bucket, and water balloon in every village and town along the 365-mile drive from Mandalay. It was a man-made monsoon, refreshing in the 100°F heat that had parched the land for weeks.

Soon enough the real monsoon would come, bringing months of downpour and floods and the urgent business of plowing and planting millions of acres of rice. But this year's rich harvest was safely in. Driving south, I'd seen scores of pagodas agleam with new patches of tissue-thin gold leaf, pressed there by farmers who had gratefully shared their bounty with the Lord Buddha.

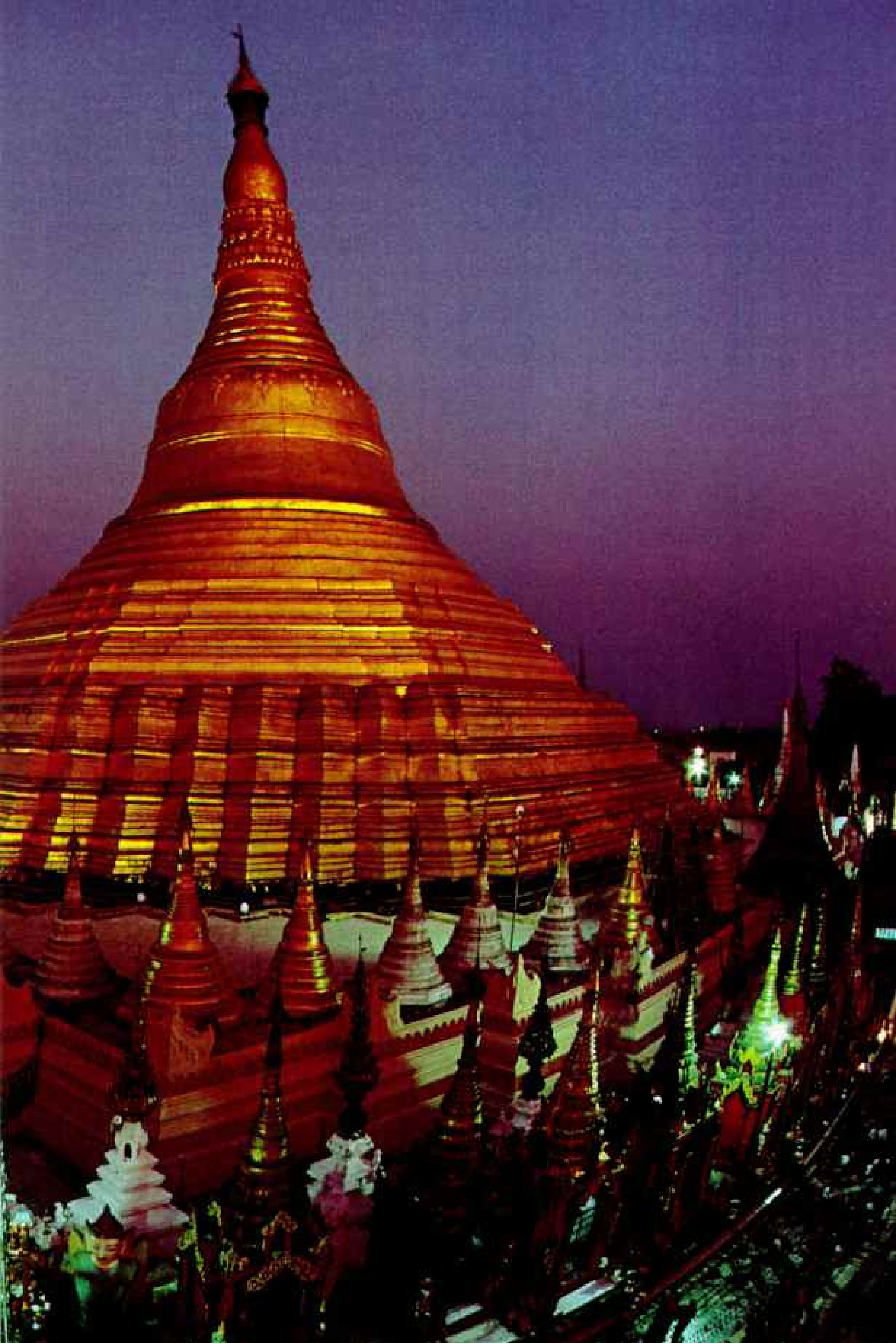
Now Burma was on holiday, and it seemed a cheerful place to be.

I turned toward the Shwe Dagon Pagoda, whose 326-foot stupa glittered above Rangoon like a second sun,

Good cheer by the bucketful *drenches passersby in Mandalay to help welcome the Buddhist New Year, part of a free-for-all dousing to wash away misdeeds. Though reclusive Burma has recently nudged open a creaky door, much of the country remains closed to the world.*

NATIONAL GEOGRAPHIC EDITOR WILBUR E. GARRETT

RISING LIKE "A SUDDEN HOPE *in the dark night of the soul,*" *as W. Somerset Maugham wrote, Shwe Dagon Pagoda soars 326 feet amid a ring of smaller shrines. Begun 2,500 years ago to enshrine eight hairs of Buddha's head, as legend has it, the pagoda is sheathed in 90 million dollars' worth of gold and capped by a seinbu—bud of diamonds—set with 4,350 diamonds and other precious stones.*



radiant with some 90 million dollars' worth of solid gold plate. Barefoot, I climbed long flights of steps past sellers of food and flowers and sacred things, and joined gentle throngs of worshipers. Their ancestors had been coming in faith to this site for perhaps 2,500 years, sharing Buddhist belief that the present is ephemeral, useful mainly for earning merit for a future life.

That made me a stranger. As a journalist I used the present as my stock-in-trade. I wondered what demerits I was earning by pretending to be a tourist.

This was my sixth visit to Burma. With photographer Jim Stanfield I'd been commuting every other week into Burma from Thailand, pausing long enough in Bangkok to get a new seven-day tourist visa. Journalists are not welcome in the Golden Land, and our many applications for credentials had simply been ignored.

By now, though, officials at Mingaladon Airport were greeting us by name. We'd passed out copies of earlier NATIONAL GEOGRAPHIC articles on Burma and made no secret of our intention to add another to the list. "I like your magazine," one officer told us. "You show things we Burmese are proud of. Why are so many journalists interested only in our problems?"

It was a delicate point. Burma has been shielding its problems from outsiders since 1962, when military leaders toppled the shaky parliamentary government of Prime Minister U Nu. They had closed the borders, imprisoned more than 8,000 intellectuals and government executives, and expelled the "capitalist mercenaries" who provided foreign aid. Their leader, General Ne Win, had imposed a rigid system called the Burmese Way to Socialism. Alone, Burma would create a self-sufficient state free of both capitalist and Communist taint.

It didn't work. Within a decade the economy all but collapsed. Rice exports dwindled from 1.7 million tons a year to less than 170,000 tons, nearly wiping out foreign earnings. Industrial development lagged. Citizens turned to private enterprise in the form of a flourishing international black market that traded priceless artworks, rare rubies and jade, and valuable teak for desperately needed medicines, cloth, cooking pots, even soap. In 1975, while farmers hoarded rice and citizens in Rangoon rioted against food shortages, Burma's leaders turned to the outside world for aid. Cracks appeared in the wall of isolation. Jim and I entered through the one opened for cash-bearing tourists. It was very much like a gateway to a strange and timeless past.

WE HAD ARRIVED on the eve of the annual Resistance Day parade, commemorating the time in 1945 when Burmese troops turned against their Japanese allies to join the British and American reconquest of the country.

Burma won independence from Britain in 1948, but Rangoon wore an eerie atmosphere of World War II as we drove downtown amid fleets of 1940-style military trucks and a collector's dream of tottering old American and British cars. Between them, other fleets of tiny new Japanese pickup trucks signaled an invasion more constructive than the one that devastated the country in 1942. Also, decades of neglect reinforced the impression of a city still emerging from catastrophe. Among moldering buildings and tumbled pavement only the British colonial administrative buildings gleamed with refurbished Victorian brick, seeming faintly surprised to be wearing the Burmese flag instead of the Union Jack.

The Resistance Day parade began at dawn with a mass of flags and a thumping brass band. Then, with sunrise sharpening their fixed bayonets, came company after company of businesslike soldiers, marching silently in jungle boots. Their military expressions melted rapidly as pretty girls darted out to garland them with flowers, and family groups raised personal cheers as they recognized relatives in the ranks.

This was the Pyithu Tatmadaw, the

Snug and sound, *a young child swings in the folds of his father's longyi, a tube of fabric traditionally worn by Burmese men and women. Children start their 11 years of schooling at age five. Attendance in primary school is compulsory; last year 4.5 million were enrolled.*

Army of the People, and clearly it was among friends.

When the soldiers had passed, the spectators dispersed, few of them paying heed to a squadron of air-conditioned limousines in which generals were bringing up the rear.

An old man told me why.

"The soldiers are our children. We come to show our love," he said. "But the only general we ever loved is dead."

He was an old soldier, and he offered to escort me to the nearby tomb of General Aung San, the architect of Burma's independence, who was assassinated with six of his most trusted aides in 1947 before he could take office as the first prime minister.

"Aung San was a great man. He led us against the British when we thought the Japanese were our friends. He had the courage to admit his mistake. I fought beside him against the Japanese. After the war he won the trust of our frontier peoples, who had never really been a part of Burma. But they agreed to join him in the new government. When Aung San died, they never trusted anyone else. We have been at war among ourselves ever since."

The young soldiers I'd seen were veterans of those civil wars. They had suffered heavy casualties in months of campaigning against

The balance of trade *rests lightly on the head of a woman (**left**) carrying limes to market in Rangoon, Burma's capital. Thanaka, a powdered bark, decorates her cheeks. Vintage cars clog Sule Pagoda Road in the city center (**below left**). Founded in 1755, this city of 2.5 million people owes its grid layout to British occupancy. Telltale signs advertise an eclectic variety of goods and services available at a Mandalay shop (**below**).*

"traitorous elements." That was shorthand for at least three different conflicts. In the south, Karen tribespeople had declared an independent republic in mountain zones along the Thailand border. Farther north, feudal warlords of the Shan State battled to protect the largest opium-growing region in Southeast Asia. In the Shan and Kachin States the 12,000-man army of the Burma Communist Party controlled some 6,000 square miles of Burmese territory bordering China's Yunnan Province (map, page 100).

Well armed with modern American and Chinese weapons, the rebels had wrested about a third of the country from control of the government. Only the central plain south and east of Mandalay was open to foreign visitors.

Jim and I learned that we could fly by aging propjet to Pagan, Mandalay, and Inle Lake, or take a 14-hour rail trip on the euphemistically named Mandalay Express.

Stringent gasoline rationing prevented long road trips, a Tourist Burma clerk

The ebb and flow of humanity *crowds sampans and steamers launched from Nantira Jetty on the Rangoon River. A canal links the Rangoon*

explained, and reminded us that our seven-day tourist visas required us to spend the first and last day of each visit in Rangoon.

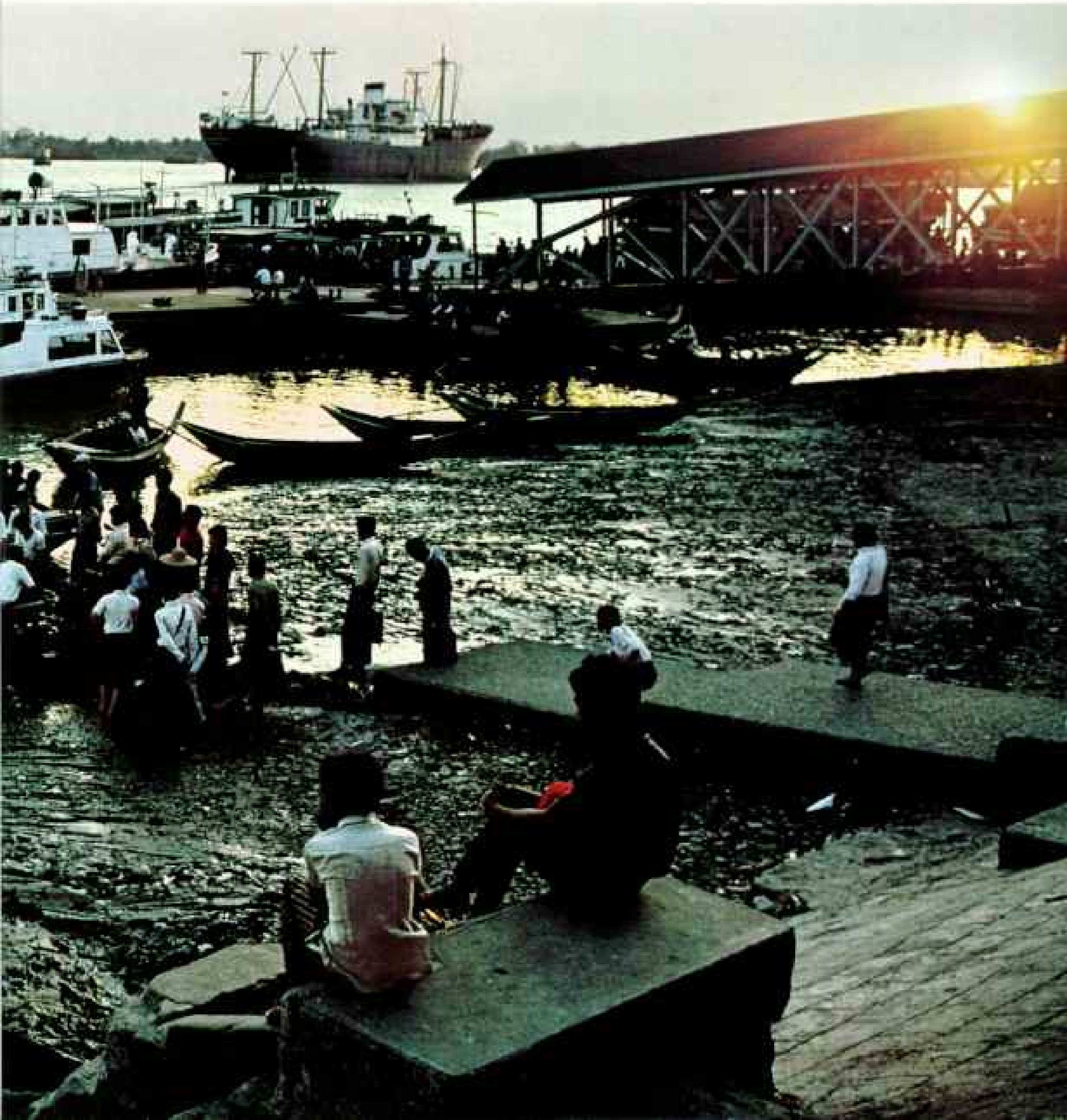
For legitimate tourists Burma was a bargain, costing little more than $50 a day for transportation, hotels, and food. For would-be journalists the tourist trail didn't look encouraging.

But gradually we found ourselves caught up in a conspiracy of hospitality. I met scholars who talked proudly of Burma's wonders, and elder statesmen who candidly discussed its woes. Drivers appeared who knew how to find black-market gasoline. We even found energetic young officials who gave us introductions to their counterparts in other villages and towns.

Thus encouraged, we were ready to begin our marathon commute.

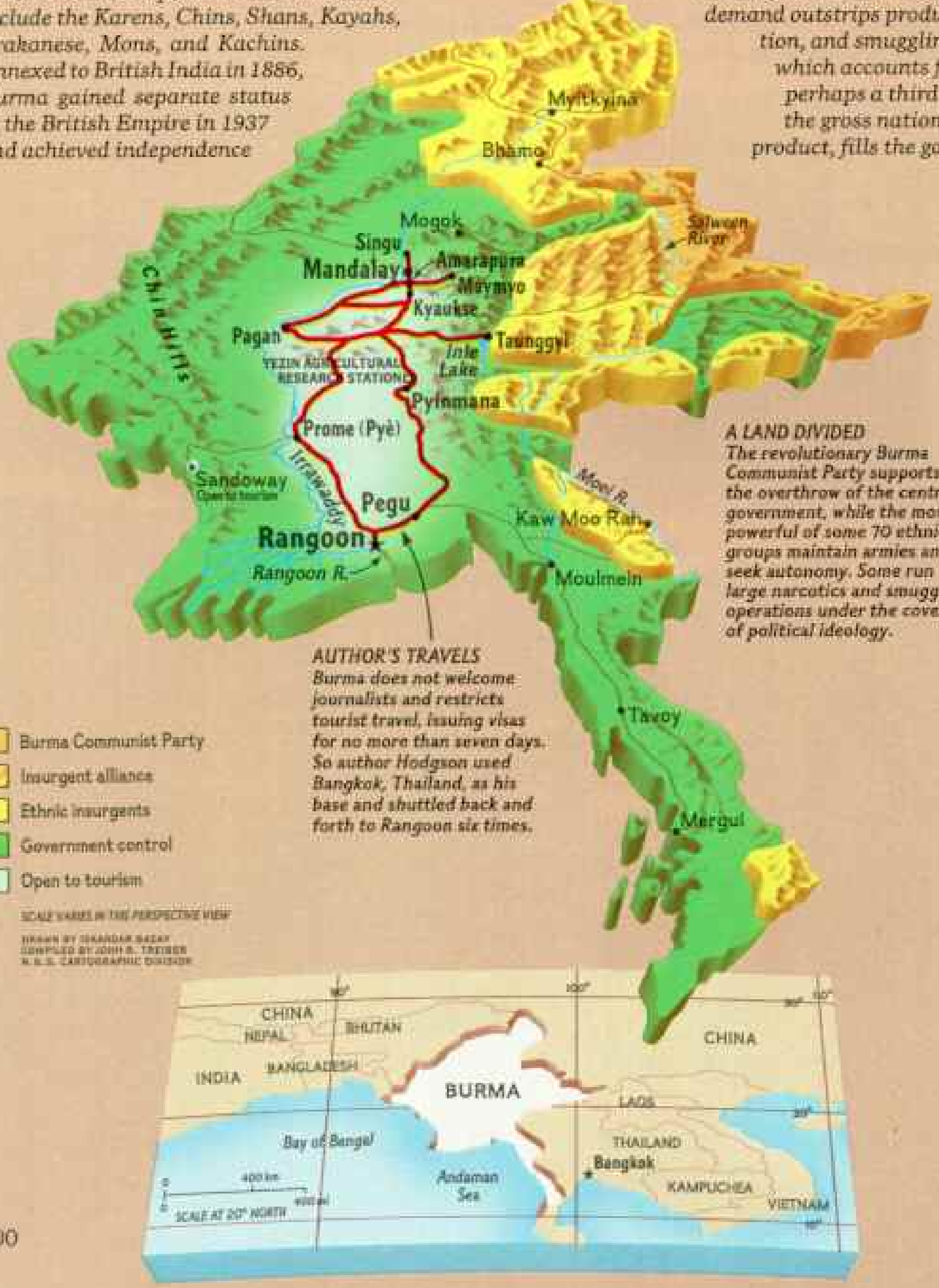
ON MY FIRST TRIP I found that the road to Mandalay was an asphalt thread through a tapestry of traditional village life. At Pegu I visited a

to Burma's major transportation route, the Irrawaddy River, which drains 65 percent of the country and remains navigable to shipping for 930 miles.



BURMA

SHAPED LIKE A KITE, *trailing its tail along the sea, Burma, the largest country on the Southeast Asian mainland, covers a Texas-size area. Though it ranks among the ten poorest nations in the world, it is self-sufficient in food. The Burmans, the dominant ethnic group, number some 25 million and inhabit the Irrawaddy River Basin. Groups with their own states include the Karens, Chins, Shans, Kayahs, Arakanese, Mons, and Kachins. Annexed to British India in 1886, Burma gained separate status in the British Empire in 1937 and achieved independence 11 years later. In 1962 General Ne Win seized power and gave Burma his own form of socialism. He resigned as president in 1981 but retains chairmanship of the ruling Burma Socialist Programme Party. Resolutely neutral, Burma recently increased acceptance of foreign aid. It manufactures goods such as blankets and bicycles. But domestic demand outstrips production, and smuggling, which accounts for perhaps a third of the gross national product, fills the gap.*



A LAND DIVIDED
The revolutionary Burma Communist Party supports the overthrow of the central government, while the most powerful of some 70 ethnic groups maintain armies and seek autonomy. Some run large narcotics and smuggling operations under the cover of political ideology.

AUTHOR'S TRAVELS
Burma does not welcome journalists and restricts tourist travel, issuing visas for no more than seven days. So author Hodgson used Bangkok, Thailand, as his base and shuttled back and forth to Rangoon six times.

centuries-old reclining Buddha known as Shwethalyaung, who smiled in monolithic bliss while pilgrims marveled at his 180-foot-long body and sparrows chirped on his 7½-foot nose.

His mood seemed to suffuse the land. Pony carts and trucks shared the highway companionably. Water buffalo wallowed luxuriously in algae-green pools before a drowsy audience of pigs and cows. Here a wheelwright cheerfully sweated red-hot iron tires onto intricately carved rims. There skilled men and women took leaves and straw and giant bamboo and made of them the roof thatch and mats and woven wall panels that would, when joined together, become a house.

OF HOUSES there was need. Everywhere small children scurried like chipmunks, their faces striped with a yellowish bark powder, called *thanaka*, to preserve their young complexions. I shared with them my roadside snacks of bright yellow watermelon that tasted pink, peanuts spiced with garlic and chili, and candy called jaggery, fresh from boiling caldrons of toddy palm juice. In return a young mother offered me my first Burmese cheroot, a fuming tube of corn husk that dribbled flaming fragments of tobacco, bark, and sundry leaves like a miniature forest fire.

There were many signs of prosperity, and a farmer named U Aung Kyaing gave us some reasons. He'd borrowed $1,000 from the government to install a 110-foot well and a diesel-powered pump. It had paid for itself in a year, allowing him to irrigate profitable dry-season crops of corn, chili peppers, and tomatoes. Now he could afford to hire laborers and send his three sons to school.

Aung Kyaing's inexpensive irrigation system is one of an estimated 40,000 that have helped to create a green revolution in Burma while nobody was looking.

"Tube wells and pumps make the most cost-effective irrigation system there is. They return about 20 percent on investment," a foreign hydrologist told me. "The trouble is they're not dramatic enough. The planners in Rangoon want to see big important dams and river diversions. Those systems cost about $1,000 per acre. With pumps I could do it for a tenth the cost."

Information about Burma's irrigation is hard to come by. Official statistics show that 12.5 percent of the country's 20 million acres of cropland receives some irrigation—one of the lowest ratios in Asia. But many experts believe the real figure is much lower, due to poor maintenance and bad engineering. So far only 15 percent of the irrigated land is said to be double-cropped.

And double-cropping is crucial if Burma's agricultural economy is not to stagnate.

Beauty in full bloom, *Su Su Win, age 22, awaits the start of her wedding ceremony. Despite their inferior status in Buddhist doctrine, Burmese women are considered equal to men by law and custom. Married women keep their names, retain their own property, and handle family finances.*

Heaving teak logs *that may weigh as much as four tons each, a bullock team shoulders timbers onto a cart near a Mandalay wharf. Burma supplies 80 percent of the world's teak*

and in 1983 exported more than a hundred million dollars' worth of hardwoods, mostly teak. But slash-and-burn deforestation and unregulated harvesting could wipe out forests in ten years.

"We've gone about as far as we can with miracle strains of rice," an agronomist told me at Yezin Agricultural Research Station near Pyinmana. "We've raised rice production by 63 percent since 1977. That has helped save the economy, since rice earns half our foreign exchange. But the world rice market is weak. We need to diversify into crops such as corn, legumes, and peanuts. With proper irrigation we could harvest two or even three crops a year, as they do in California's Central Valley."

Although the rice production boom stems from high-yielding varieties developed overseas, some researchers at Yezin believe that Burma could offer the world an agricultural revolution of its own.

As many as 30,000 rice varieties may exist in the country's northern areas, which many plant geneticists believe to be among a handful of dwindling zones in the world that preserve the genetic history of commercial food crops. More than 2,000 rice strains have been identified at Yezin—some of them deep-water varieties capable of surviving floods that destroy vast areas of rice seedlings each year. Yezin's researchers have also discovered wild varieties of sugarcane

that are more disease resistant than strains now in use.

WHAT a year-round garden land Burma could be I saw at Kyaukse, where white pagodas march in dozens up the low-lying hills, about 35 miles south of Mandalay. Beneath them the flat lands bloomed with fruit trees, chilies, sesame, and cotton, and nurseries of rice seedlings shone jade green in silver pools.

Even the temperature seemed to drop a few degrees.

Kyaukse's fruitfulness was engineered 900 years ago by an irrigation system ordered by King Anawrahta, who once ruled all Burma from Pagan. The British modernized the system in 1926, and it is still the country's most efficient and productive.

Britain had left its gardens too, most notably at Maymyo, a mountain town some 50 road miles east of Mandalay. Here, with half-timbered houses, rose arbors, and steepled churches, colonial officials had created a portion of English countryside, complete with cloudy nights and balmy summer days.

They'd also founded a 432-acre arboretum that contained specimens of most of the trees and bushes found in Burma's northern forests. I walked there with special interest, since it was as close to a forest as I was likely to get. Here were tall straight teak trees, graceful silver oaks, and brooding hardwoods called pyinkado and padauk. Acacias flourished pink and white blossoms, and massed rhododendrons lurked in dense shade, marshaling their energies for spring. Giant bamboo stalks clattered in the wind, and in a patch of sunlight I found opium poppies standing demurely among English petunias and phlox.

Under Burmese rule the arboretum had become a forest research center, and I came upon a man carefully transplanting seedlings into pots. There were coffee bushes, apple trees, chestnuts, grapefruit, and even cinnamon.

"We hope to see great stands of these plants growing in the hills," he said. "Our natural forests are rapidly disappearing."

His hope—and fear—confirmed ominous opinions I'd heard from experts in Rangoon.

In the Shan hills, beyond government control, slash-and-burn agriculture had destroyed at least half the forest cover. In other northern areas near navigable rivers, firewood gathering had become a major industry, serving southern regions denuded long ago. The destruction was spreading at a rate of 250,000 acres a year.

With the harvest in the bag, *villagers near Pegu ready rice for milling. Last year's crop yielded ten million tons. Sold to Singapore and Malaysia, among others, rice accounts for half of Burma's export earnings.*

"Wherever we can, we're trying to get the frontier peoples to grow fruit and other cash crops that preserve the topsoil," the man said. "We've had some success. The Palaung people in northern Shan State have become very prosperous as tea growers. Grapefruit is doing very well near Mogok, and we now have many apple orchards in the Chin Hills. But much of the native foliage in the Chin and northern Kachin States is gone. The land is eroding rapidly. Without soil, there is no hope at all."

There were other forest predators as well, living very far from the frontiers. Burma possesses some 80 percent of the world's teak, which is worth more than $160 a ton. In a drive to increase foreign earnings, Burma's Timber Corporation had spent hundreds of millions of borrowed dollars to mechanize teak harvesting. It was cutting about 540,000 tons a year.

"We estimate that the allowable harvest from the entire country is 628,000 tons a year," the man told me. "But most of the trees are in the insurgent areas, and we are simply clear-cutting in the small forests we control. Replanting has been very slow. Unless something changes, we will run out of marketable teak within ten years."

I WAS READY for better news, and I found it after a white-knuckle ride down the twisting mountain highway from Maymyo to Mandalay.

"Within three to six months you will have success," said 73-year-old Daw Thein Khin, a spirit medium famed for her familiarity and influence with powerful netherworld spirits called nats. I'd met her by chance, after walking down a dusty side street to investigate a cheerful clamor of flutes and drums, and found myself invited to a *nat pwe*, or festival, to honor three nats who had brought a businessman great good fortune.

She was presiding before an altar covered with offerings of rum intended to keep the spirits in a good mood. Frequently their moods are bad, she said, because they had achieved their status by means of peculiarly unpleasant deaths.

"We are honoring Ko Gyi Kyaw and the Brother Nats of Taungbyon," she said, explaining that the brothers were particularly powerful because they had been killed by having their testicles crushed.

Although worship of nats may embarrass intellectual Burmese, belief in their powers has been deeply rooted for longer than history records. Almost every pagoda has nat shrines standing in the precincts of the serene Buddha.

Mandalay's protector nat is known as Bo Bo Gyi, a Brahmin who wandered to

In the service of royalty, *a sacred golden goose (**facing page**), set with gems, once held betel nuts. Among scores of treasures taken by the British in 1886, it was returned to Burma in 1964. Then, as a gesture of goodwill, the goose was given to London's Victoria and Albert Museum by Ne Win. Unique in its stance, the Shweyattaw Buddha (**above**) points to the location of the Royal Palace in Mandalay.*

Burma from India and became a councillor at an ancient court. His statue, wreathed with offerings of towels and silken scarves, stands partway up an interminable flight of stone steps that lead to the top of Mandalay Hill. From there you can gaze down on a dusty sprawl of buildings once called the Golden City. At its heart is a mile-square space surrounded by huge stone battlements that sheltered the exquisitely carved and gilded palace of Thibaw, the last and most tyrannical of Burma's kings. He assumed the throne in 1878, assassinating more than 70 family rivals, and surrendered it in 1885 to the British, who had already conquered much of Burma in two earlier wars.

The Royal Palace was destroyed by shellfire when the British recaptured Mandalay from the Japanese in 1945. Now the battlements shelter little but bare ground, which members of Burma's socialist elite find useful for polishing their golf game.

BUDDHIST MONASTERIES and shrines almost beyond numbering make Rangoon a holy city. But it is perhaps Burma's unholiest as well, for there is a flourishing black market whose shops and stalls display quite openly the illegal treasures of the outside world—plastic toys and cheap watches, face powder and soap, T-shirts and jeans, and sewing machines with names like Porsche, BMW, and Ferrari. This was commerce in the timeless Asian tradition, humped in backpacks over mountains and rivers from faraway places. There was a curious innocence about it.

"I think the government recognizes that we need these things and turns a blind eye," said a Mandalay University student who was showing me around.

The black market serves more serious needs as well. Some stalls were full of antibiotics and surgical instruments. Burma manufactures only 20 percent of the drugs needed by its people, and public health is a matter of having the cash to pay premium prices for defense against malaria and dysentery, leading causes of death. Contraceptives are black-market items too, since official policy bans family planning—despite a birthrate of 2.3 percent that adds some 875,000 babies a year to a population of 38,000,000. *(Continued on page 114)*

***Princely** in garments of embroidered silk, Zaw Phome Kyaw reigns as the center of attention at his shinbyu ceremony (**facing page**), marking his initiation as a novice monk and regarded as the most important moment of a young boy's life. Following a feast given by the family, his head is shaved (**above**) and his robes bestowed (**below**). Boys generally remain monks for several weeks or months, then return to a normal life-style.*

Piety parades *before the colonial facades of the town of Maymyo, as Buddhist nuns step out on alms rounds. Set in the cool highlands above Mandalay, Maymyo*

became summer headquarters for British officials, who first came here to suppress a rebellion ignited by British annexation of Burma to India in 1886.

Taking cover *from a downpour, a soldier of the insurgent Karen National Liberation Army pauses during a lull in the shelling of the village of Kaw Moo Rah* (**left**) *by Burmese government forces. Wearing a garland of grenades, another Karen soldier* (**right**) *reflects the toughness that has enabled the Karen people to maintain their rule over a 400-mile slice of territory on Burma's eastern border. For thirty years, the Karen minority has waged a guerrilla war for independence, often under pressure from superior Burmese forces. The Karen National Liberation Army claims about 10,000 armed soldiers, mostly supported by a levy on smuggled goods sneaked over the Thai border in Karen-controlled sections.*

Here during the first day of the prolonged government siege of Kaw Moo Rah last summer, a family (**below**) *tries to stick it out barricaded in a bunker made of earth and teak. They later fled across the river into Thailand along with 2,000 other villagers.*

Sex is the one black-market item seemingly unavailable in Mandalay or anywhere else in Burma. When I saw a sign advertising Burmese Indigenous Massage, I knew it meant steely fingers applied to nerve bundles in shoulders, arms, and legs, a form of fingertip acupuncture. You have to be in shape for it. I'd had such a massage at Pegu, and my left arm was still numb.

SOUTH of Mandalay is Amarapura, where King Bodawpaya built a sumptuous capital in 1783. The site may well be one of the oldest centers of civilization in Burma, according to a studious monk named U Pyinnya Zawta, whom I met at the Taung Lay Lone Monastery.

While digging foundations for a new building, he had discovered artifacts dating from the first century B.C. to the third century A.D.—an exquisitely carved head, no more than two inches high, a crudely carved block bearing a fertility goddess and a lotus blossom. Later excavations revealed skeletons and funerary urns, finely wrought star-shaped stone rings, and many bone tools.

"We believe these artifacts disprove the theory that Burmese culture was the product of a sudden migration from the north," he told me. "Until recently we had no

artifacts earlier than the Pyu period of the eighth century. Now there is much work to do to discover the real roots of our culture."

For me, learning about Burma's past was no easier than learning about the present. Archaeology has been shrouded in government secrecy since a Mandalay researcher incautiously mentioned his work to an American scholar in 1979. He was suspended in disgrace when his work was cited in Western scientific journals. So violent was the reaction that Chairman Ne Win observed the 70th anniversary of the British-founded Burma Research Society by announcing its abolishment. He decreed that all archaeological publication would henceforth be done by the government.

"We have not published a significant paper since," a Mandalay University graduate student told me. "I can't even tell you what we have found. But it has been extremely significant."

It was another tantalizing hint of what Burma had to offer. My store of such hints seemed by now to overwhelm what I had actually seen and learned. I'd taken a day-long trip on the Irrawaddy River to the north of Mandalay and relished its leisurely commerce of graceful sampans, piled high with meticulous arrangements of fruit and vegetables and wood and great clay urns. At the river's edge I'd seen a timeless water festival of splashing children, of fishermen, of women bathing with infinitely graceful modesty.

But the Irrawaddy is 1,300 miles long, and I would see very little of it.

At Inle Lake I'd marveled at the world of floating gardens and stilted villages created by the Intha people and caught glimpses of the tough and turbaned Shans who lived in the hills beyond. I would not see their villages or learn their ways.

At Pagan I had walked amid thousands of old and crumbling pagodas, overwhelmed by such ancient prodigies of faith. But I was more curious about the glittering lights across the river, which marked production facilities of a huge new gas field that could, for all I knew, be the key to Burma's future.

What had I accomplished then with my touristic pretense?

I'd found it easy to learn what other journalists had learned: There are many negative things to say about poor planning, inefficiency, and waste, caused largely by a welter of bureaucracies that compete more for the favor of an almost royal master than for the well-being of the state.

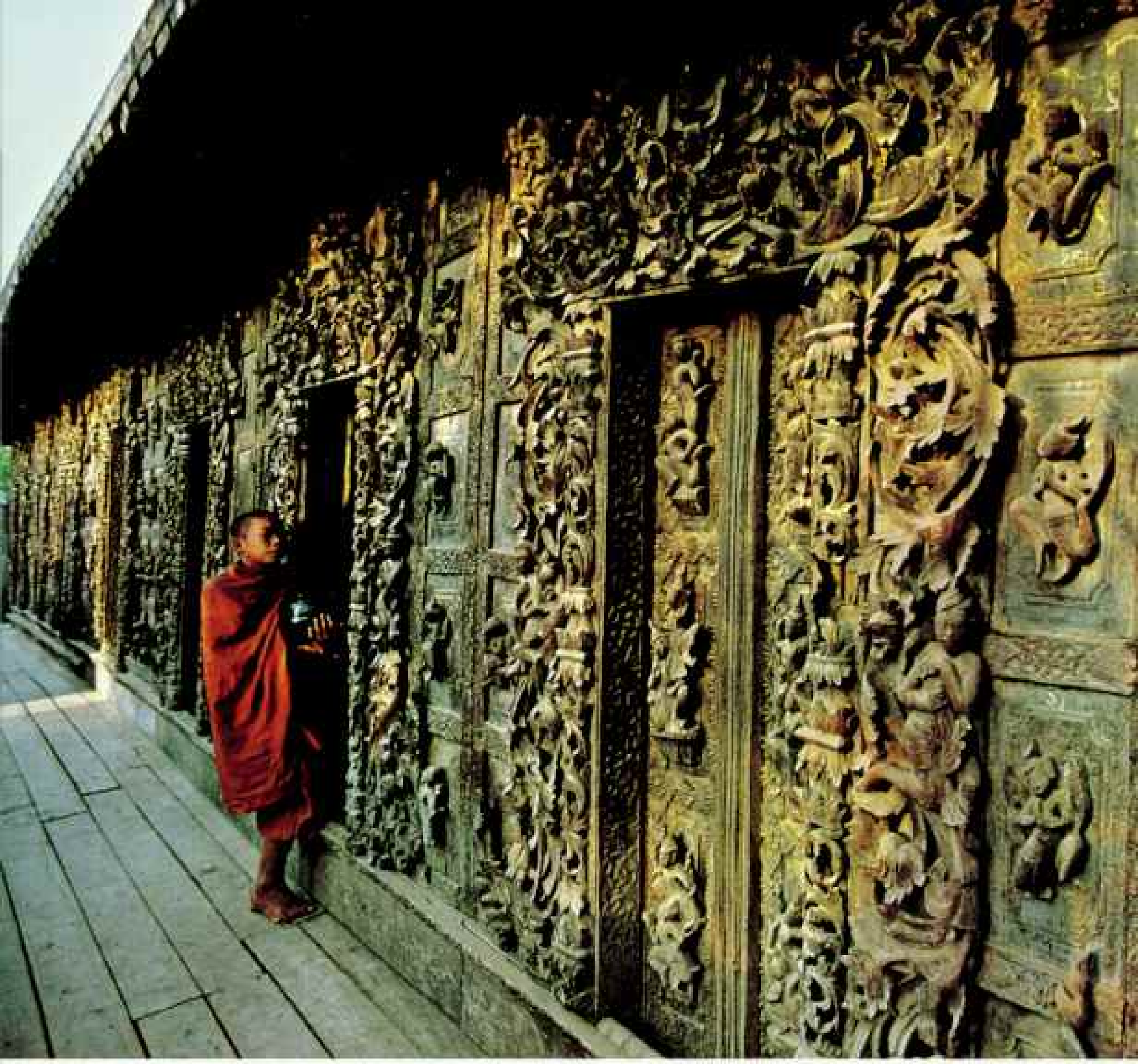
Frustrated journalists write bitter stories, and for 22 years Burma had suffered them in rejective silence.

I was not inclined to join that chorus. I had made *(Continued on page 121)*

Fleeing to safety, *people of Kaw Moo Rah cross the Moei River into Thailand after Burmese government forces unleash a barrage of shells.*

The derelict splendor *of thousand-year-old Pagan is backdrop for the labors of farmers. Some 2,000 temples, remnants of Burma's first imperial capital, follow*

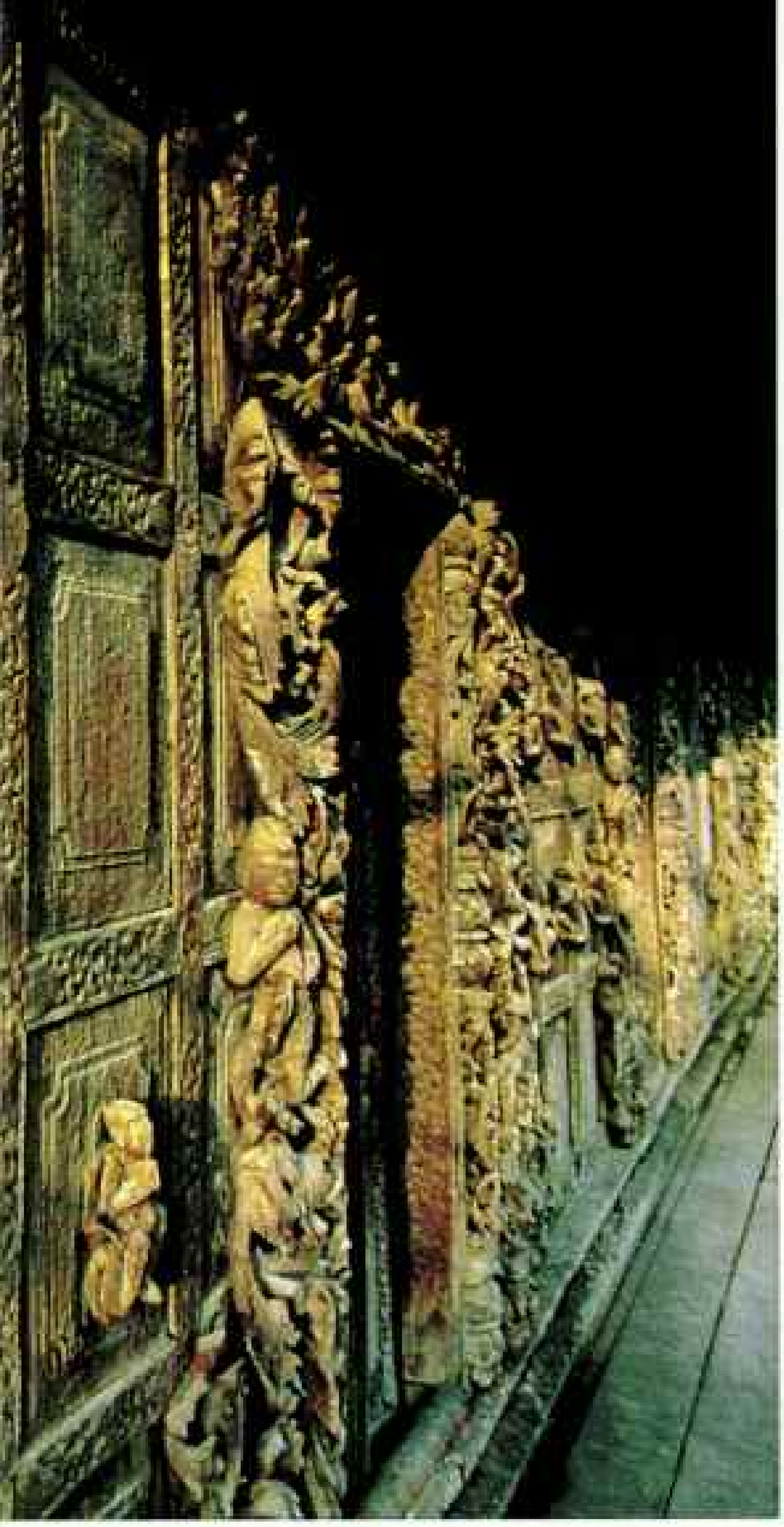
an eight-mile-long curve of the Irrawaddy. An earthquake severely damaged many of the spires in 1975, but most of the major temples have been repaired.

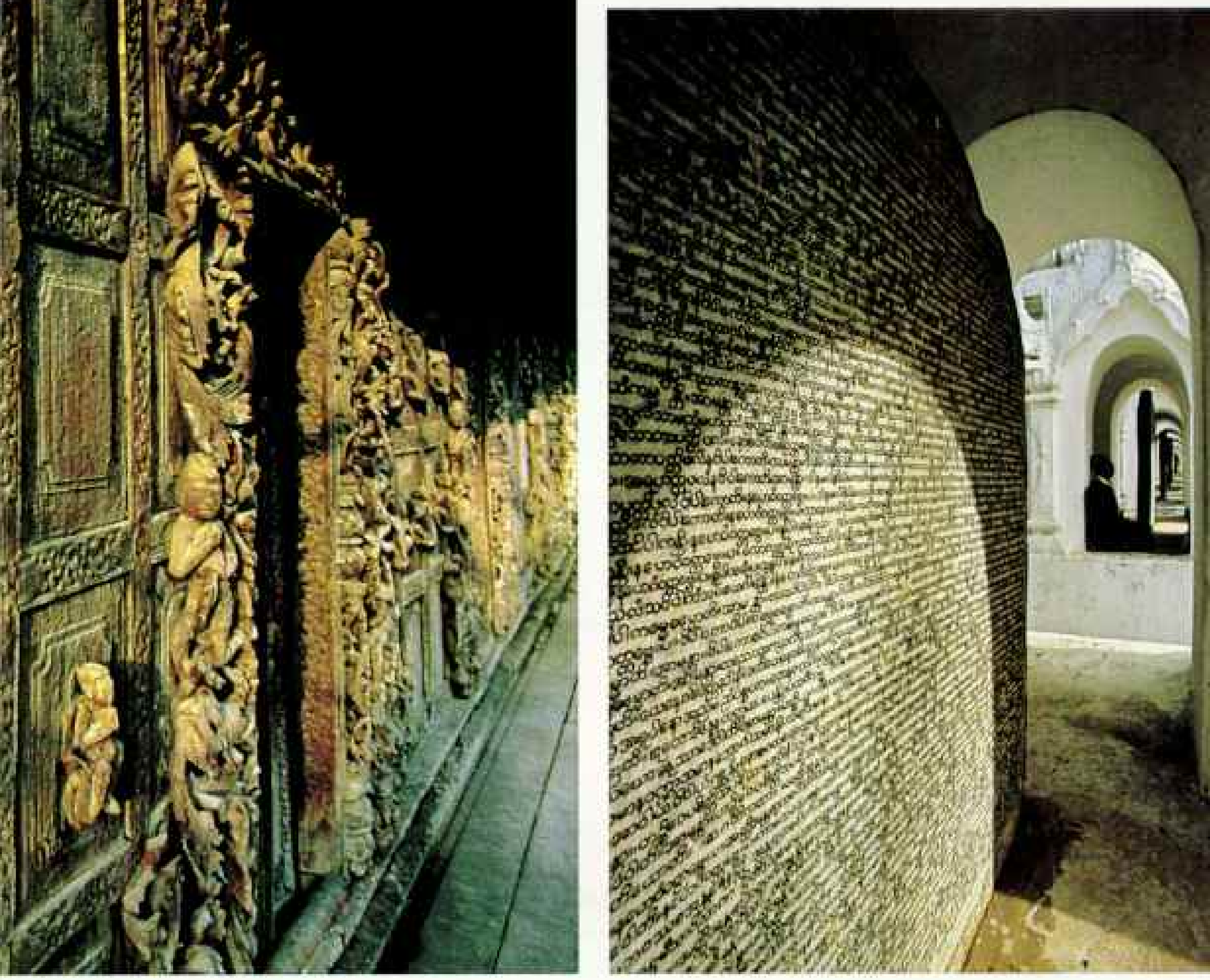


Monumental handiwork, *carved teak panels embellish Shwe Nandaw Monastery in Mandalay* ***(above)****. At one time part of the Royal Palace, it was used as an apartment by King Mindon, Mandalay's founder and an enlightened 19th-century ruler, who sent young Burmese men to Europe for study and took steps toward the modernization of Burma. The structure was dismantled by his son Thibaw, moved one mile to its present site northeast of where the palace stood, and presented to the monkhood in 1879.*

Holy words written in stone fill marble slabs housed in 729 stupas at the Kuthodaw Pagoda ***(right)****. The individually housed slabs* ***(above right)*** *contain the entire Buddhist canon. Sometimes called the "world's largest book," it was created in 1872 under orders of King Mindon with the help of 2,400 monks who required almost six months merely to recite the text.*

Burma's last royal capital, known as the Golden City, Mandalay suffered heavy devastation during World War II when shelling destroyed the Royal Palace and numerous pagodas. Today a dusty, sprawling town of 600,000, it remains a center of art and crafts, as well as the spiritual heart of the country.





WILBUR E. GARRETT (BELOW)

too many friends and found too many men and women of strength, imagination, and warmth. And besides, whatever its woes, Burma had avoided the genocidal wars that had swept most of Southeast Asia. Its people had never starved. Its leaders had conducted themselves with scrupulous honor in world affairs, helping to found the Non-Aligned Movement, and then denouncing it and walking out when Cuba tried to take it over in 1979.

ON MY LAST VISIT TO RANGOON I discovered one positive thing that I could do.

At the national museum I'd seen a photograph of five tiny and exquisite bronze figurines dug up in 1967 from a Pyu site near Prome (Pyè), dating from the sixth or seventh century. They were dancers and musicians, escorted by a jester, and with their fluid grace they seemed to embody a spirit of Burma that I'd only sensed, not seen.

Four of them had been stolen within a month of their discovery. A distinguished archaeologist asked me if I could try to find out where they had been sold.

On my return to Washington, D. C., I made discreet inquiries, expecting to meet with secretiveness and suspicion.

I was wrong. Within a few weeks the figurines—worth almost $250,000 to collectors—were found and on their way back to Rangoon.

Later I saw the ecstatic stories in Burmese newspapers, with photographs of officials beaming and applauding at the official presentation.

These were the men I'd never managed to meet, who might have made it possible to tell a different story than I have told.

But still, I had come uninvited to Burma. I'd stolen a minor treasure of new experiences in a reclusive land.

At least I could feel that I'd helped to even the score. □

Bearing a burden of faith, *a Burmese dockworker wears a spiked harness in a Hindu ritual practiced only by a small sect. Cultures and religions combine and sometimes clash in a country resolutely staking out its own path in the world.*

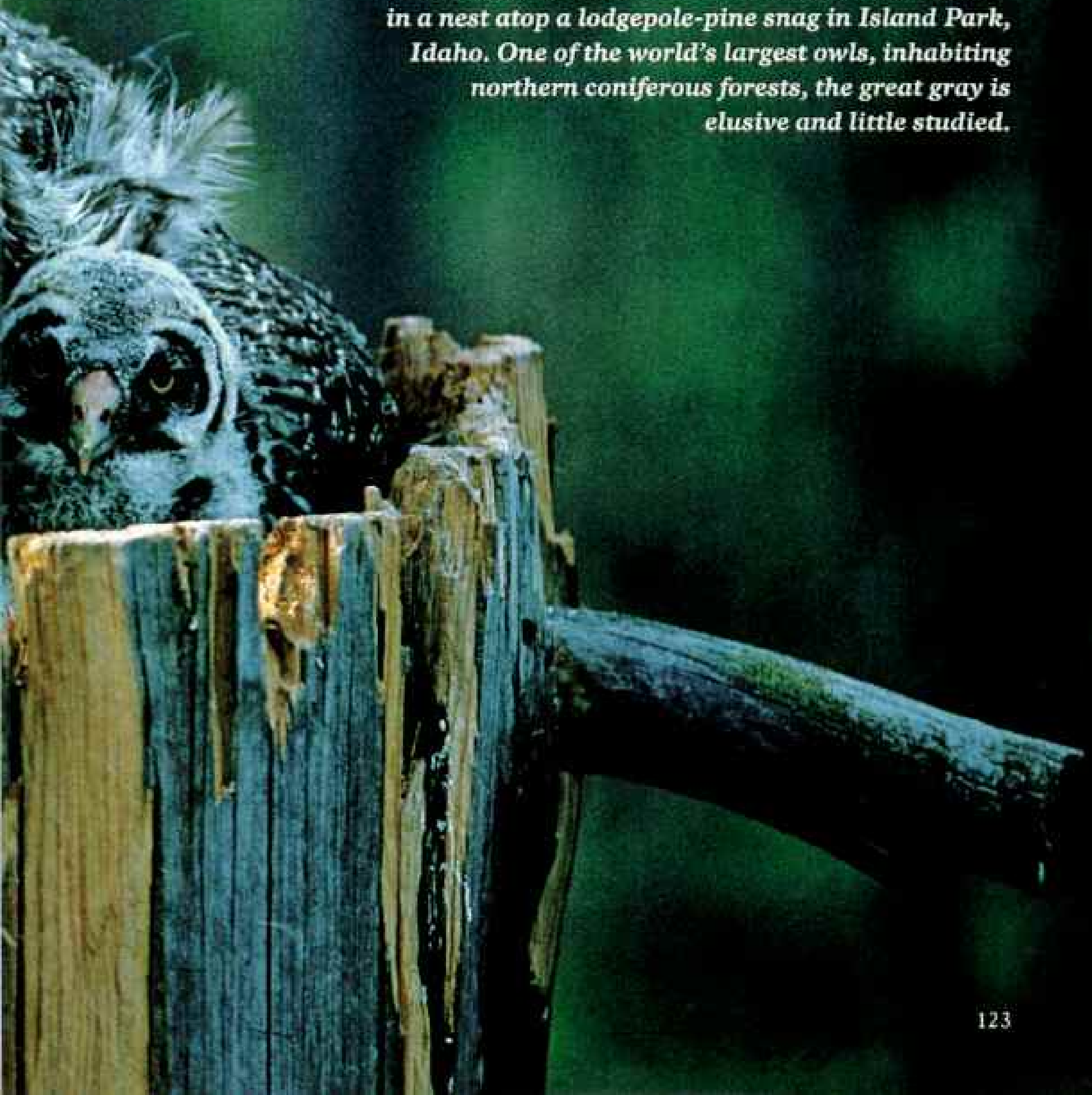
WILBUR E. GARRETT

LIFE OF A FOREST HUNTER

The Great Gray Owl

ARTICLE AND PHOTOGRAPHS BY MICHAEL S. QUINTON

BEDRAGGLED AFTER A NIGHT'S RAIN, a great gray owl shelters her owlets—hatched a few days apart—in a nest atop a lodgepole-pine snag in Island Park, Idaho. One of the world's largest owls, inhabiting northern coniferous forests, the great gray is elusive and little studied.



CINDY QUARTON (ABOVE AND LEFT)

GETTING TO KNOW the wild and reclusive great gray owl was the challenge of my life. For two years I lived with this marvelous bird, *Strix nebulosa*, in the forests of Island Park in eastern Idaho, just west of Yellowstone National Park. An estimated 50,000 great grays inhabit North America; an unknown number live in the northern reaches of Europe and Asia.

Great grays are squatters; they use nests other birds build. So, to get close to them, I built a nest (***upper left***) by sawing off the top of a lodgepole pine. I hoped they would use it, and they did.

After the owls moved in and their eggs hatched, I built a blind nearby (***right***). The owls were remarkably tolerant of humans, and I was able to get quite close to them. At another nest, however, a mother owl (***above***) came right for me, feet clenched like fists. I'd been hit by those fists before. That's why I'm wearing a hard hat.

DIVE-BOMBING, a great gray (***above***) in Yellowstone swoops down on a pocket gopher in a burrow just under the surface of the ground. Prey clutched in its claws, another owl I photographed in Island Park flies back to the nest (***right***). The owls feed primarily on voles, shrews, and other small mammals; here they concentrate on the abundant gophers. Because these owls evolved in northern latitudes, where there are long periods of daylight, great grays hunt as efficiently by day as by night.

Perching in trees overlooking grassy meadows crisscrossed with gopher tunnels, the birds listen with remarkable ears to the faint sounds of moving gophers. The feathers surrounding each eye function like a dish antenna, directing sound to the ears. Since the right ear opening is slightly larger and higher than the left, each receives sound at a different volume and angle, allowing the owls to pinpoint a sound's source through triangulation with uncanny accuracy. Keen vision also aids their hunting: By reeling in an artificial mouse across snow, ornithologist Dr. Robert W. Nero has enticed great grays from as far away as 300 yards.

An owl signals its hunting pounce by straightening up and flexing its wings and its tail. Then it suddenly swoops down. Some birds hover over their prey before the dive—a headlong plummet that ends with one of the owl's feet jammed into the gopher hole.

You can tell right away if the owl's got one. There is a distinct flinching of the foot that's in the gopher hole, and the leg jerks convulsively. Then the bird reaches down with its bill and kills the gopher with a bite to the back of the head.

During winter, when five-foot snows make such hunting impossible in Island Park, the owls move from the high ground down to farmland farther south, where there is less snow. Even then they can plunge through a foot and a half of snow, including crust half an inch thick, to catch prey.

REINFORCING THE BONDS of courtship, a male great gray (***left***) perches on a branch of a lodgepole pine in Island Park, offering the pocket gopher he has in his bill to his mate on a lower branch. I had been waiting for this to happen. The female was sitting by herself, a short distance from the nest where her young had already hatched.

During courtship a similar ritual takes place; if the female accepts the food offering, bonding is evidently assured, and the pair mates. Presumably the male has demonstrated that he can provide food for the family—for the female during the nesting period and for the young when the eggs hatch. Owls start looking for nesting sites as early as mid-February. Eggs are laid between mid-March and June.

Loving pair (***below***), a male at left and his mate engage in

preening and nuzzling. First they begin to nibble each other's facial feathers. They also use their talons to preen the facial feathers and later move to the breast and back plumage. Feathers that are out of place are readjusted.

Here the owls are rubbing against each other, much as a cat rubs itself against your leg. The whole activity lasts about five minutes. I think mutual preening also reinforces the pair bond and, apparently, fosters continuing trust and cooperation.

THE MORNING AFTER a violent snow- and windstorm whirled through Island Park in late May, a mother (***above***) still sits faithfully on her eggs. A male is left holding a gopher (***facing page, top***) that his mate has rejected. Males often perch in a nearby tree and wait till the mother signals with a chirping sound to approach with food. A great gray lays an average of three or four

eggs, which take about 30 days to hatch. Two hatchlings (***middle***) wear white egg teeth used to crack the shell of their eggs. Spreading its wings for balance, a four-week-old owlet (***bottom***) clambers to a higher perch after jumping from its nest—a common occurrence as chicks seek shade from the sun. Parents continue to feed and watch over them. At about two months, owlets take their first flights.

THRASHING HIS WINGS, a male bathes on a hot July afternoon (**above**). For a long time the bird resisted my efforts to photograph him bathing. I followed him as he flew toward the stream. Every time he got into the water and I came within camera range, about 50 feet away, he'd take off. I continued the pursuit, chasing him all the way up the stream until finally he flew off through the forest. I followed. Though the owl was determined to take a bath, I was just as determined to take his picture.

About 400 yards away there was another stream, and after more owl-and-photographer games the owl finally gave up, and I came as close as ten feet. After a thorough bath the bird tightroped out of the water on a log (**right**) and flew to a tree. He faced the sun to dry off a bit, and then he began to preen, running each individual feather through his bill—even his toe feathers. Afterward he moved to a shady perch and rested.

GLIDING ON SILENT WINGS, a mother owl returns to her nest (***right***). Great grays do not migrate, but they do become nomads if their food supply runs thin.

David against Goliath (***below left***), a robin bores in on an owl perched too close to the robin's nest. The robin flew right into the owl's body, but the owl didn't budge. When the robin attacked again and again, the owl finally got the message and moved away.

Great grays have few predators; the birds' worst enemy is man, who encroaches on their habitat for lumber and clears it for farmland. Traps, guns, and traffic are also hazards: Over a period of two and a half months Dr. Nero recovered the remains of 50 great grays struck by automobiles and trucks on a 35-mile stretch of Highway 1 east of Winnipeg.

In a clear-cut area of Island Park (***below right***) a male perches on a snag, listening for gophers. There are lots of them there, but very few perches for listening posts. I followed this bird for two hours, and he didn't make a single kill.

LIKE A CHAMELEON ON A LOG, a great gray owl blends with the bark of a cottonwood tree. When I spotted this owl, I moved to a better point to photograph it. Then the bird seemed to disappear, its camouflage virtually perfect. I located it again when it turned and I could see its yellow eyes.

I've photographed elk, grizzlies, mule deer, moose, pronghorns, otters, coyotes, badgers, martens, weasels, skunks, eagles, ospreys, red-tailed hawks, and other kinds of owls. But the great gray—that bird is special. It's number four on the American Birding Association's list of Most Wanted Birds. It's number one on mine. □

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THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D.C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization. Since 1890 the Society has supported more than 2,500 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; its books, globes, atlases, filmstrips, and educational films; *National Geographic WORLD*, a magazine for children age 8 and older; information services; technical reports; exhibits in Explorers Hall; and television.

Photographed by Luiz Claudio Marigo. ***Giant Anteater:*** ***Genus:*** *Myrmecophaga* ***Species:*** *tridactyla* ***Adult size:*** *Average about 2m in length* ***Adult weight:*** *About 32kg* ***Habitat:*** *Tropical forests and grasslands ranging from Central America to northern Argentina* ***Surviving number:*** *No estimates. Endangered over much of its range, but still prevalent in parts of Brazil where it is protected*

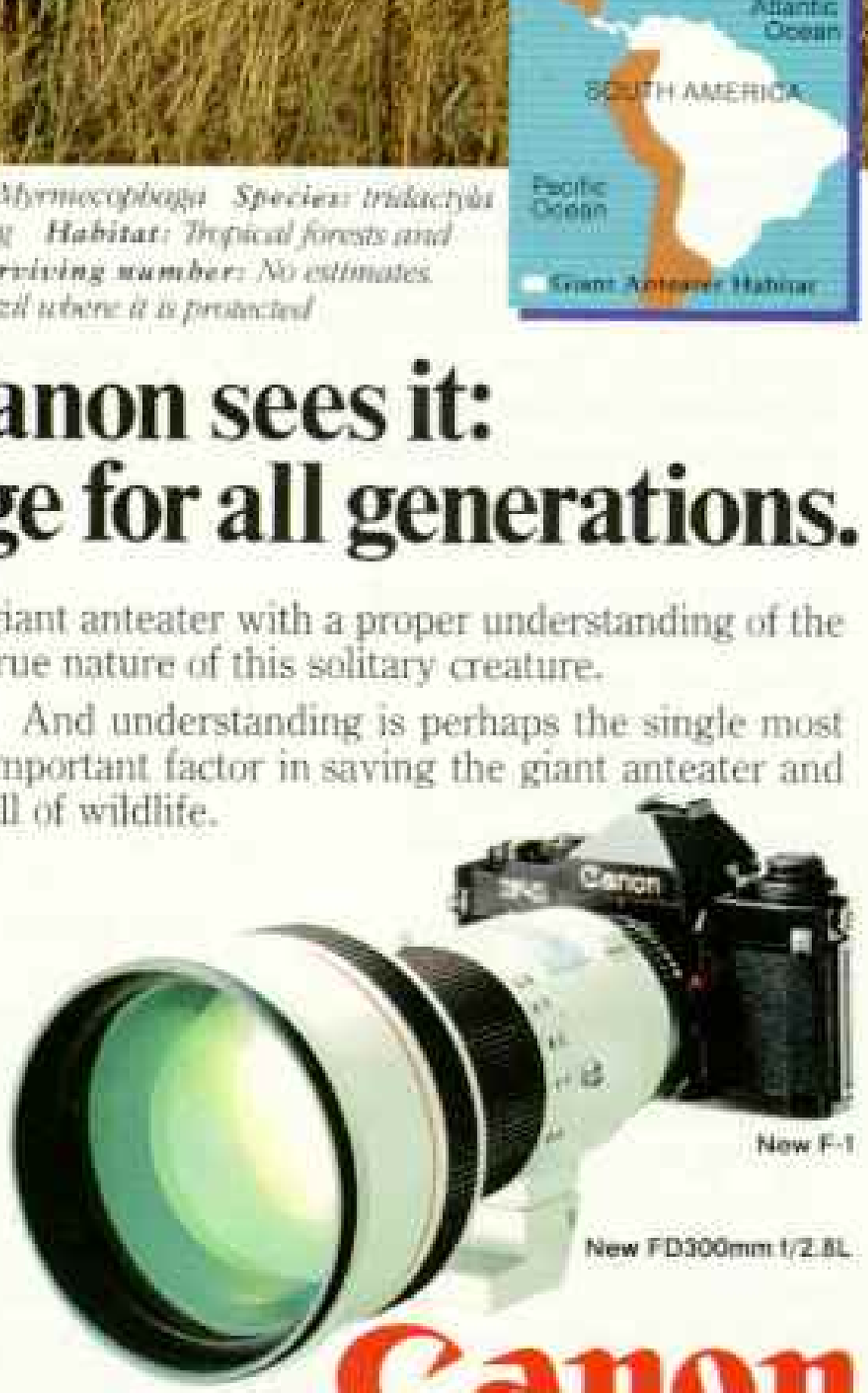
Wildlife as Canon sees it: A photographic heritage for all generations.

The range of the giant anteater covers a vast area, yet this curious-looking animal has vanished from much of its habitat. Related to armadillos and sloths, the giant anteater is threatened by indiscriminate hunting and loss of habitat. This slow-moving, unwary animal even has difficulty escaping grass fires. Its poor vision and hearing, low reproductive rate and specialized food habits further increase its vulnerability.

The giant anteater could never be brought back should it vanish completely. And while photography can record it for posterity, more importantly photography can help save it and the rest of wildlife.

An invaluable research tool, photography can assist in efforts to save the giant anteater. Continued protection and preservation of its natural habitat are required to ensure its safety. Photography can also help replace certain myths about the giant anteater with a proper understanding of the true nature of this solitary creature.

And understanding is perhaps the single most important factor in saving the giant anteater and all of wildlife.



Canon

Images for all time

THE CONSERVATION FUELS

How coal and uranium save oil

To reduce our dependence on oil, Americans are using more electricity, and our utilities are using more coal and uranium to generate it. These secure, domestic fuels help conserve oil, so we depend less on imports, we send less money overseas, and we can use our existing oil and gas where they're really needed.

When people see lower oil prices and hear about an "oil glut," conserving oil doesn't seem so important.

But the recession that spurred the oil glut—by putting energy-intensive industries into decline and turning consumers into conservers—is going away.

As the American economy recovers, we will be using more and more electricity. America's use of electricity has historically grown hand in hand with our GNP. We need enough electricity to sustain a healthy economy. But we need to conserve oil, too. Here's how we can do both.

Why we still need to conserve oil

Conserving oil is still critically important for several reasons:

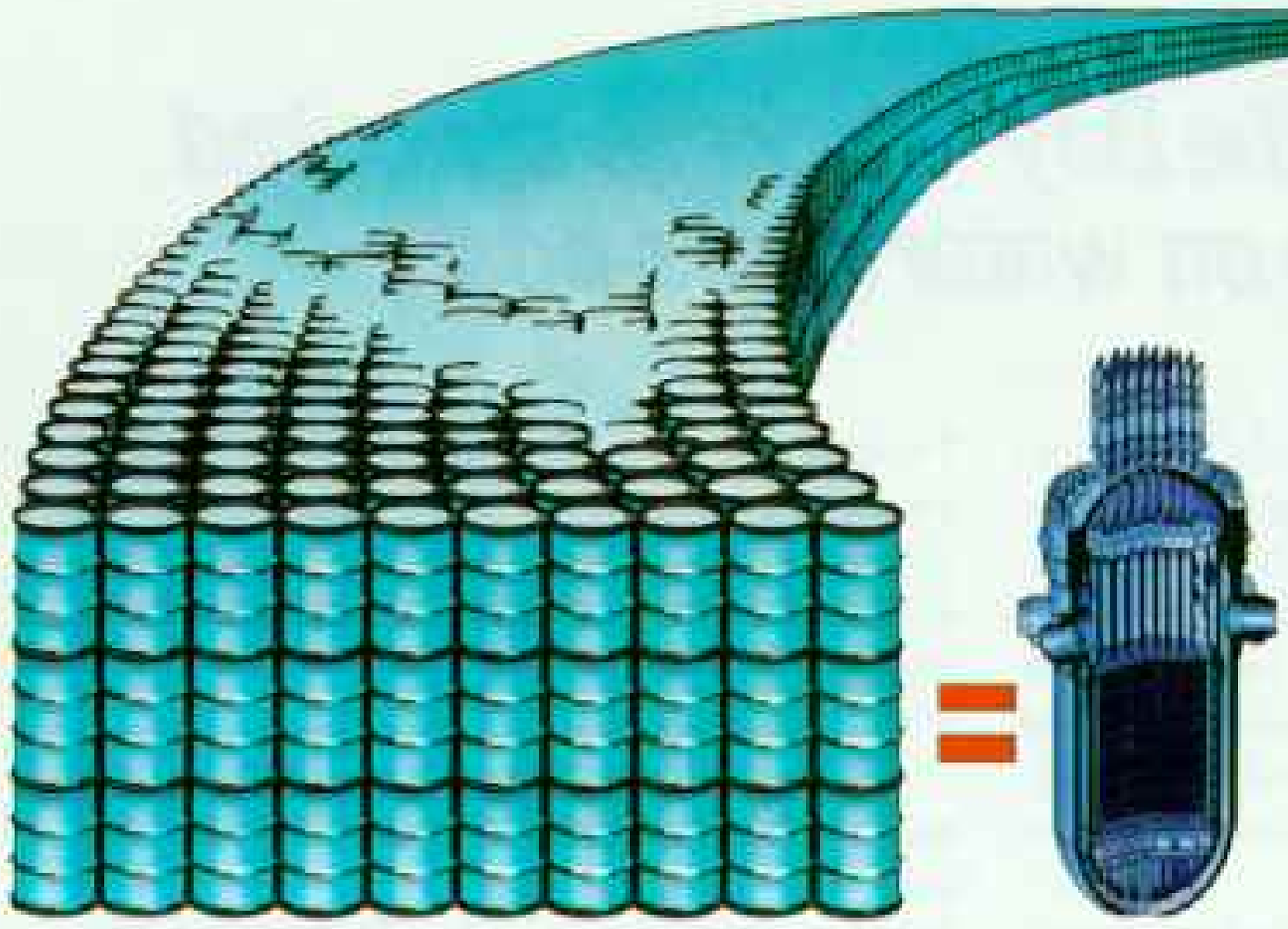
- The U.S. Geological Survey estimates that even with new discoveries, our oil resources will be depleted in 36 years, at current production levels.
- We now import approximately 25 percent of our oil at a cost of about $60 billion a year, and our imports are again growing, increasing our trade deficit and our vulnerability to foreign suppliers.
- Economic recovery worldwide will trigger increased oil importing by other countries. Greater demand could push prices up again.
- With the political uncertainties in the Middle East, another oil disruption is a real possibility.
- Our existing oil and gas supplies need to be preserved for more essential uses: oil for transportation and petrochemicals; gas for home heating and certain industrial uses.

The government recognized the value of oil and gas years ago and passed the 1978 Fuel Use Act, restricting the construction of any major new oil- or gas-fired electricity plants.

Electricity: a conservation tool

Electricity is often more efficient than the direct burning of oil or gas, and many industries have switched increasingly to electricity to improve productivity.

This has made electricity an integral part of our growing economy. But since oil is no longer a wise choice for electricity generation, what sources can we count on for a secure, dependable supply?



A 1,000-megawatt nuclear electricity plant can be fueled for three years by one uranium fuel core. A similar-size oil-fired plant would require 30,000,000 barrels of oil.

Coal and uranium: the conservation fuels

Over the past decade, while America's use of electricity grew over 25 percent, our electric utilities reduced their use of oil by over 55 percent by using more coal and uranium-fueled nuclear power. Today, about two-thirds of our electricity comes from these two secure, economical fuels.

We have enough coal to last hundreds of years, and far more uranium than we need for the lifetimes of all our nuclear plants both operating and under construction.

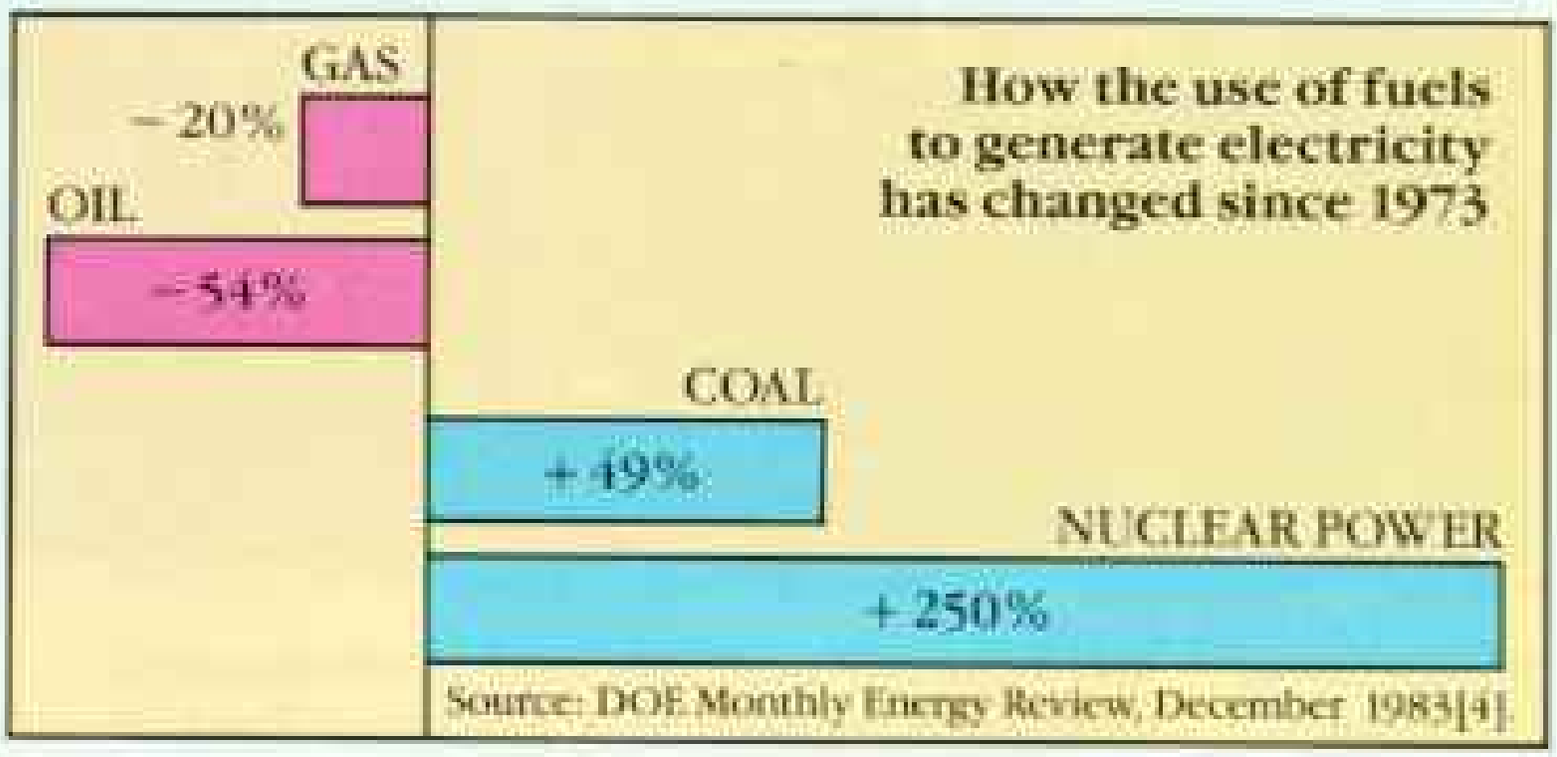
The conservation potential of uranium is truly remarkable. A 1,000-megawatt nuclear power plant can be fueled for three years by one uranium fuel core. A similar-size oil-fired plant would require 30 million barrels of oil.

The cost-savings of nuclear power

The average cost of electricity from the 80 operating nuclear plants in the U.S. is *less than half the cost of electricity from oil-burning power plants.* Since 1974, nuclear power has saved ratepayers an estimated $40 billion, and continues to save ratepayers $4-$6 billion each year.

The reason for the savings is the low cost of the uranium fuel. Even though a nuclear plant costs more to build, over the 30- to 40-year lifetime of the plant the lower fuel costs can result in savings when compared with the cost of oil-generated electricity.

Nuclear plants are also environmentally clean. And they have one of the best safety records of any major industrial enterprise.



America needs a balanced energy mix

Although we have plenty of coal, it is risky to become too dependent on any one source. And there are very few alternative sources that can make a *major* contribution to our national electricity needs. We need uranium as well as coal in our energy mix.

While speaking before the National Committee of the World Energy Conference (February 8, 1984), U.S. Secretary of Energy Donald Hodel said that nuclear power is "an imperative, not an option, for assuring reliable and adequate electricity supply in the United States and the rest of the world."

With uranium and coal, we can significantly reduce our dependence on foreign oil and still have the electric capacity we need for a healthy, growing economy.

If you would like more information about the electrical future of America and the energy sources that will help fuel it, fill out this coupon and mail it to:

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"Save the Bay" stickers sprouted ...even on watermen's boats

A GOOD IDEA in the hands of a few determined citizens remains a powerful force in America. That, after all, was the way this Society was begun, and examples are on every side. I've been especially impressed by the efforts of private groups working at the local or regional levels on behalf of conservation, with a case in point close to home and heart.

For 50 years I've spent time out on Chesapeake Bay, and like many others I have seen that great estuary deteriorate. Yet by the early 1960s flickers of public concern had not yet turned into action. Why not? That question was put to the then congressman for Maryland's Eastern Shore, the late Rogers C. B. Morton, by people at a Baltimore meeting. The genial Morton grew serious, even somber, Arthur W. Sherwood recalls, saying that the government could then do very little, and that significant remedies would require involvement of many concerned people and commitment of private resources. That's the challenge I throw back to you, he said.

CONFLUENCE OF CREEK AND BAY, COMMERCE AND LEISURE AT REEDVILLE, VIRGINIA. PHOTO BY NATHAN BENN

Sherwood picked it up and, with a small group helped by private philanthropy, founded the Chesapeake Bay Foundation (CBF). It was a tiny organization, a public-interest law firm later supplemented by a program in field education. CBF's growing pains were severe when it jumped into controversies and got, according to Sherwood, the reputation of being "a pretty cocksure outfit, maybe too big for its britches."

CBF nearly sank under that reputation, so Sherwood abandoned his law practice for ten years to serve as CBF director—organizing, stump speaking, and writing from a less militant perspective. CBF slowly revived. Programs were added piece by piece; the views of every side on Bay issues were considered. Hundreds of citizen members grew to thousands, and CBF "Save the Bay" stickers sprouted on bumpers and even on watermen's boats.

Awareness of the Bay's condition grew, and other private groups, such as the Citizens Program for the Chesapeake Bay, made contributions. The Environmental Protection Agency conducted a massive study; governors of Maryland, Virginia, and Pennsylvania met; state legislation and funding increased; and President Reagan singled out the Bay's plight in his 1984 State of the Union address.

CBF has also helped and grown—to more than 20,000 members and a staff of 40 conducting programs in environmental education and defense, in land conservation, and in public awareness. For CBF president William C. Baker, the challenges now are to manage growth and sustain public interest.

The Bay is far from saved; without citizen concern and action it might be all but dead.

Gilbert M. Grosvenor

PRESIDENT, NATIONAL GEOGRAPHIC SOCIETY

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An international panel of renowned music authorities was appointed to participate in the selection of these great recordings. This distinguished panel considered countless recordings of each of the greatest works of music—a momentous task.

For instance, members of the panel reviewed 24 recordings of Beethoven's 7th Symphony and chose the *one* they considered superior to all others: Toscanini with the New York Philharmonic. From 30 recordings of the Nutcracker Suite, the panel selected the *one* greatest performance: Fiedler and the Boston Pops.

Similarly, the recordings of other great symphonies, concertos, sonatas, rhapsodies, ballet and vocal music were carefully reviewed and the most outstanding performance in each instance was recommended by the panel.

The creation of this definitive collection has been made possible through the cooperation of leading record companies both here and abroad.

Among the works chosen for the collection are masterpieces by Beethoven, Brahms, Mozart, Tchaikovsky, Schubert, Rachmaninoff, Verdi—performed by Vladimir Horowitz, Jascha Heifetz, Enrico Caruso, Van Cliburn, Isaac Stern, Artur Rubinstein, Leontyne Price—with the world's great orchestras under the direction of Toscanini, Ormandy, Bernstein, Stokowski, von Karajan, among others.

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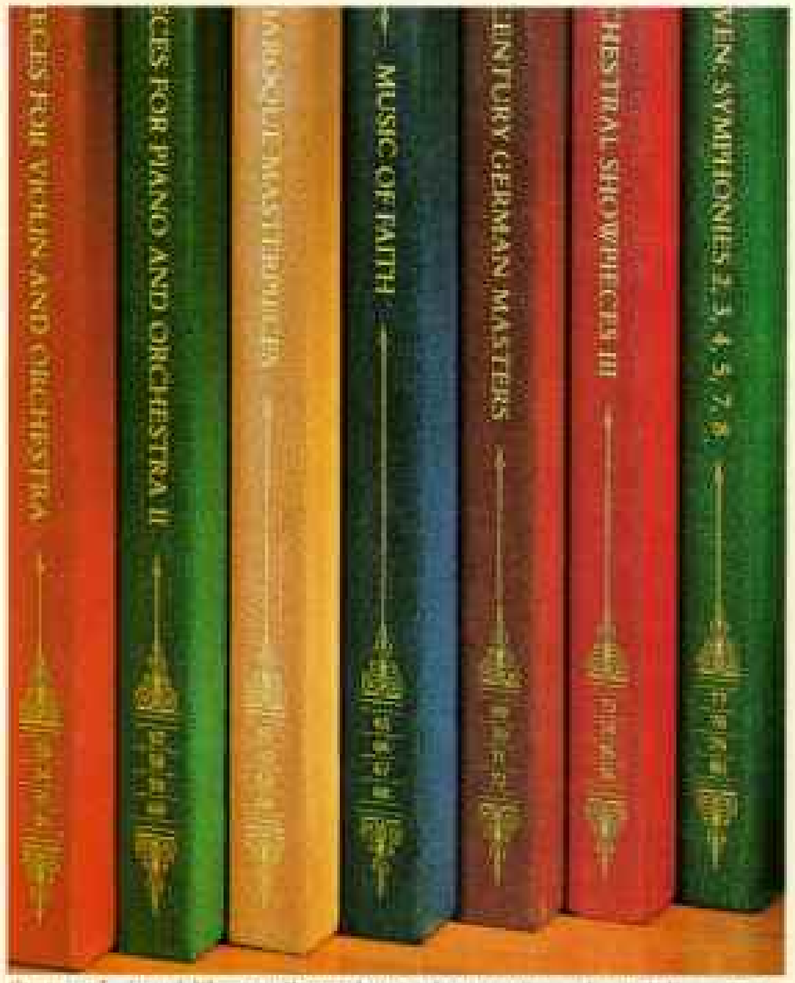
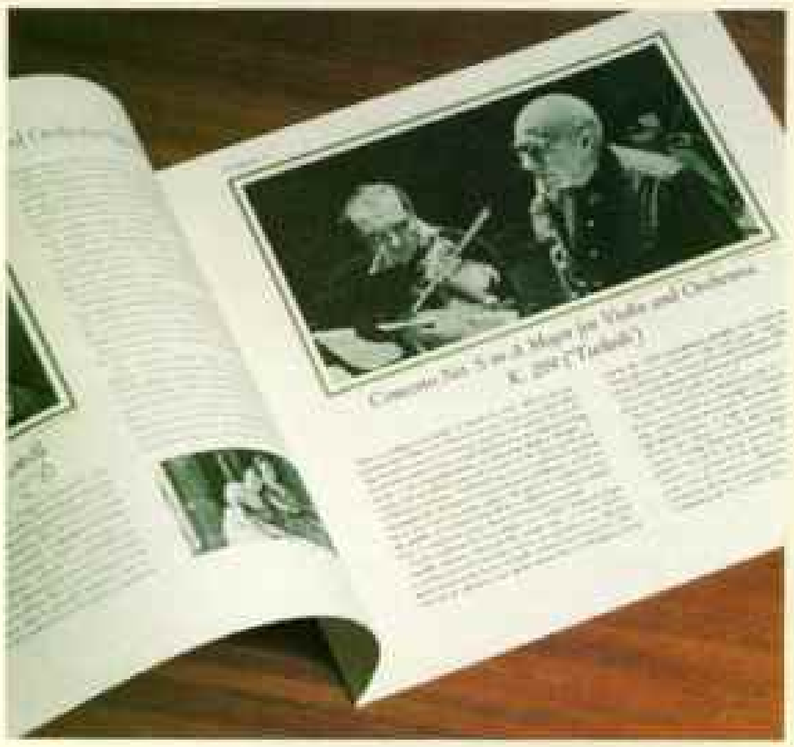


Custom-designed library albums house the records, and specially written, illustrated commentaries provide background on the music and performers.



The Advisory Panel

MARTIN BOOKSPAN, music critic, commentator of New York Philharmonic radio concerts

SCHUYLER G. CHAPIN, Dean of the School of the Arts, Columbia University

FRANCO FERRARA, member of the faculty of the Accademia di Santa Cecilia, Rome

R. GALLOIS MONTBRUN, Directeur, the Conservatoire National Superieur de Musique, Paris

IRVING KOLODIN, music editor of The Saturday Review, faculty member, the Juilliard School

WILLIAM MANN, senior music critic of The London Times, author of books on Mozart, Bach, Wagner

MARCEL PRAWY, Professor, Vienna Academy of Music

ANDRE PREVIN, Music Director of the Pittsburgh Symphony Orchestra, composer, pianist

WILLIAM SCHUMAN, composer, first winner of Pulitzer Prize for music

H.H. STUCKENSCHMIDT, member of the Akademie der Kuenste, West Berlin

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For the full story see page 71. For the rest of the story see your Honda dealer.

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Members Forum

Hologram Cover

Lost my balance and fell into your March 1984 cover. Might have been seriously injured.

Fortunately, the eagle was dozing!

Robert L. Kocher
Thousand Oaks, California

Beautiful and fascinating—but I may never get beyond the cover.

Roy Trelease
Norwalk, Connecticut

Superb, absolutely superb.

Natalie Parkison
Brighton, Colorado

Few readers, I suspect, experienced my thrill of seeing a bold 3-D image of the eagle. Full depth perception was something I haven't had since an aviation accident 36 years ago deprived me of the sight of my right eye. I don't pretend to understand the mechanism by which one eye can perceive a three-dimensional image from a flat hologram, but it certainly works. Perhaps one day books will be illustrated with such images, to the delight of readers with single vision as well as those with normal sight.

Frank B. Brady
Annapolis, Maryland

I wonder how many others automatically looked on the other side of the marvelous hologram cover to see what was behind it!

Elizabeth R. Goree
Prairie du Chien, Wisconsin

We do know of one reader who tried to scrape away the foil to find a prizewinning number.

You state that the hologram on the cover is the first such to be published by a "major magazine." My memory suggests that many years ago, before its demise, *Look* magazine published a hologram.

Charles O. Houston
Kalamazoo, Michigan

The 3-D picture you refer to was a stereoscopic color photograph covered by lenticular plastic. It was not a hologram.

Why is it that when viewed upside down, the image reverses itself: The wings of the eagle come forward, and the body takes on the appearance of a mold?

Frank O. Shaw
Seattle, Washington

You have discovered that our hologram has two personalities. Turning the eagle upside down produces a new set of light waves, and each eye now sees what the other did before, reversing depth perception and making the eagle's wings bulge outward and its chest inward.

Lasers

The March issue's feature on the laser was excellent! The article, however, did not mention the "cold laser" now being utilized by physical therapists. This helium/neon laser provides clinicians with a method of enhancing healing of open wounds. In addition, this brilliant red beam has been shown to serve as an analgesic when targeted at acupuncture and trigger points on the skin. Currently under clinical investigation, the cold laser promises to be a valuable adjunct to physical therapists and colleagues in allied health professions.

Joseph Kahn
State University of New York
Stony Brook, New York

Rhinos

I was very interested in the article on the killing of rhinos (March 1984). I detest seeing these magnificent beasts killed just for their horns. Is it possible that rangers and game management personnel could dart-tranquilize many of the rhinos and remove the horns? They could bandage the wound, give appropriate antibiotics—if needed—and release the animal. Since the horn grows back, the rhino would not be permanently disfigured, but its value to poachers would be greatly reduced.

Clay Lasiter
Harlingen, Texas

This idea has been suggested by a number of our readers. However, besides the prohibitive expense of finding, darting, and dehorning the rhinos at repeated intervals, hornless rhino cows might be less able to defend their calves.

A "white" rhino indeed! The color is little different on either the white or black. Not white, but the Dutch word *weit*, referring to the upper lip. It was misunderstood for white, and the misnomer stuck. It is really the *wide* rhino.

Bob Aungst
Edina, Minnesota

The name does derive from the wide square snout and not the skin color, which takes on the hue of the soil in which the rhino wallows. Ceratotherium simum *is now officially known as the square-lipped or white rhinoceros, also* Witrenoster.

Calgary

A large metropolis develops its character and personality not only from the concrete-and-glass inner city but also from its geologic location. Your feature on Calgary (March 1984) totally ignored both the rolling hills and formidable Rocky Mountains that form Calgary's western backdrop. Calgary is a conglomerate of prairie farms, foothill ranches, and mountain tourism, with oil and gas throughout.

R. Rebitt
Calgary, Alberta

As a native Calgarian, I was surprised to learn that Calgary meant "bay farm." I was always under the impression that the Scottish meaning of Calgary was "clear running water."

Cindy Enns
Calgary, Alberta

"Clear running water" was an early translation. Experts now agree that "preserved pasture at the harbor" or "bay farm" is more correct.

China's Remote Peoples

I greatly enjoyed your article "Peoples of China's Far Provinces" (March 1984) with the colorful view of so many people, but the past and present injustice to the Tibetan nation comes across a bit

flat. The caption on page 309 tells us that 1.27 million Tibetans remained in 1957, and that this number has steadily risen. Tibetan reports I've read quote the figure at six million! The population couldn't have grown so quickly, considering that about 100,000 Tibetans left in the late 1950s and early '60s, and at least that many were killed in the Chinese takeover.

James Moore
Wauconda, Washington

The latest official Chinese population figure is 1,892,393 for 1982. The six million figure may refer to Tibetans around the world. Following a population decline due to celibacy, abysmal health standards, and child mortality—and the exodus of 100,000 Tibetans in 1959 after the Chinese takeover—the trend has reversed with an estimated increase of about 2 percent annually.

The slender steel cables shown across the Dadu River are a wonderful modernization of the woven-bamboo cables we saw in western Yunan Province in 1947. The cables were two inches thick, and the traveling harness was a cotton sash. As the traveler sped down the cable, he made a judgment as to when to press a forked stick against the cable to provide braking. If he braked too soon, his momentum was lost, and he would have to pull himself hand over hand up the

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cable. If he did not brake soon enough, the momentum was so great that he would slam into a tree on the other side of the river.

Milton E. Ballard
Tucson, Arizona

Praying Mantis

A most interesting article by Edward S. Ross in your February 1984 issue. There is one point, however, where I can prove him wrong. He states that the mantis *never* takes its intended victim in flight. I noticed a large green mantis munching a bee held in its left arm. Bees started circling at high speed around the mantis. And then it happened. . . . With its right arm it struck out at lightning speed and had a bee in its right arm. It calmly turned its attention to bee number one, polished it off, and started on its new victim.

J. J. Wiehahn
Upington, South Africa

West Texas

On page 222 in the February 1984 issue, it states that "Turkey vultures like to sun themselves in the heat of the day." Any old turkey buzzard knows they are not sunning themselves, but are cooling themselves by facing into the wind, allowing the heat to dissipate as the breeze blows over the exposed skin under their wings.

Javon P. Stanley
Dallas, Texas

Turkey vultures, say ornithologists, do lift their wings to let the heat dissipate or to dry themselves in the sun after bathing.

Silk

Thank you for the beautiful and informative article "Silk, the Queen of Textiles" (January 1984). Although the photograph on page 18 shows the fine skill required to embroider the cat on a sheer panel, I witnessed an even more amazing skill shown by a Chinese woman during the Chinese Exhibit at the Ontario Science Centre in Toronto. The artist was doing double-image embroidery, which she had invented in 1980, whereby on one side of a panel she might embroider the image of a tiger, but on the other side it would appear as a monkey. It takes her one year to complete one such double image.

Maria Zaremba
Agincourt, Ontario

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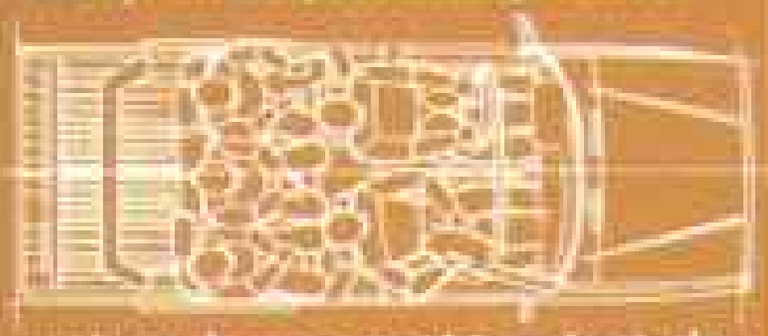
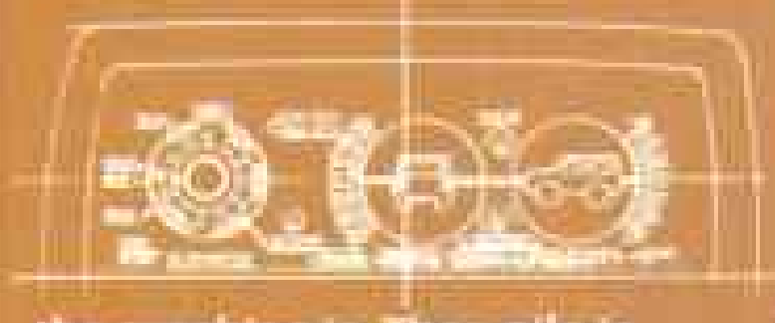


and you have a machine that's the king of the hill, ruler of the ridges.

But the 4Runner SR5 isn't just for sheer climbing. It's great for running in the sun, too. First take off the removable rear top and let



the sunshine in. Then pile in. Kick it into four-wheel drive and blaze a trail to your favorite spot. Now that's having a good time with style.

Inside the 4Runner SR5 you'll find 41.5 inches of legroom and plenty of romp-around room for your friends or family of five. Or if you prefer, fold down the split rear seats and make room for over 6½ feet of cargo. More room than you'll find in *any* similar size competitor. There's plush carpeting, an AM/FM/MPX stereo and full instrumentation, including an inclinometer and altimeter. There's even an optional 7-way adjustable driver's sport seat. Talk about comfort and convenience.

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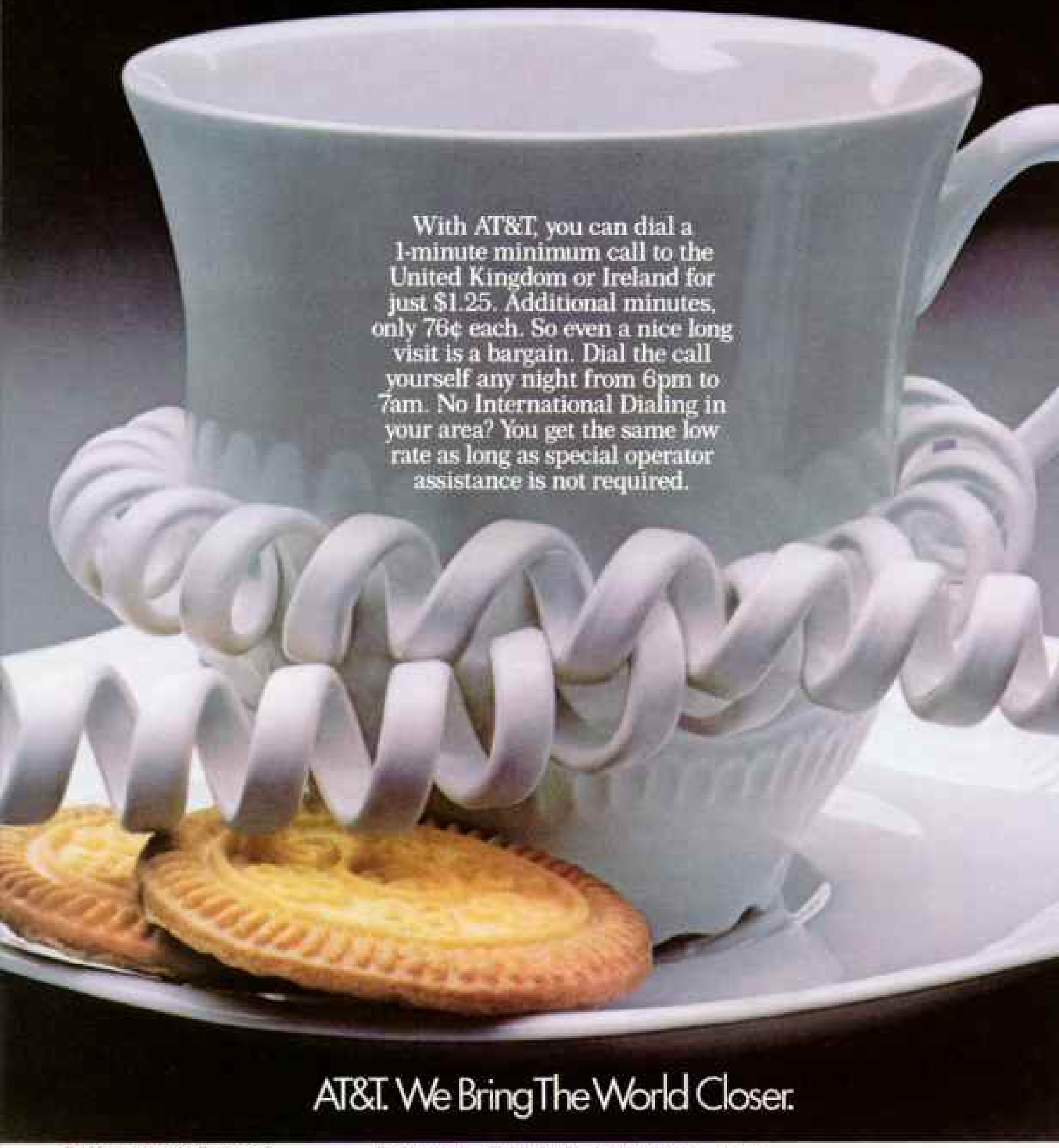

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Finally, we put our washers and dryers to the ultimate "water" test: our Quality Test Track. It's the kind of quality control that gives all Frigidaire appliances, from washers and dryers to our electric ranges, refrigerators and dishwashers, a reputation for being so reliable.

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On Assignment

PHOTOGRAPH BY SARAH LEEN

HOBBY TURNED TO OBSESSION for ***Charles L. Blockson*** (***above***), who over the past 40 years has tracked black history across the United States, Canada, and Europe. He amassed a remarkable 20,000-item collection of Afro-American materials, which he donated last year to Temple University in Philadelphia; he serves now as its curator.

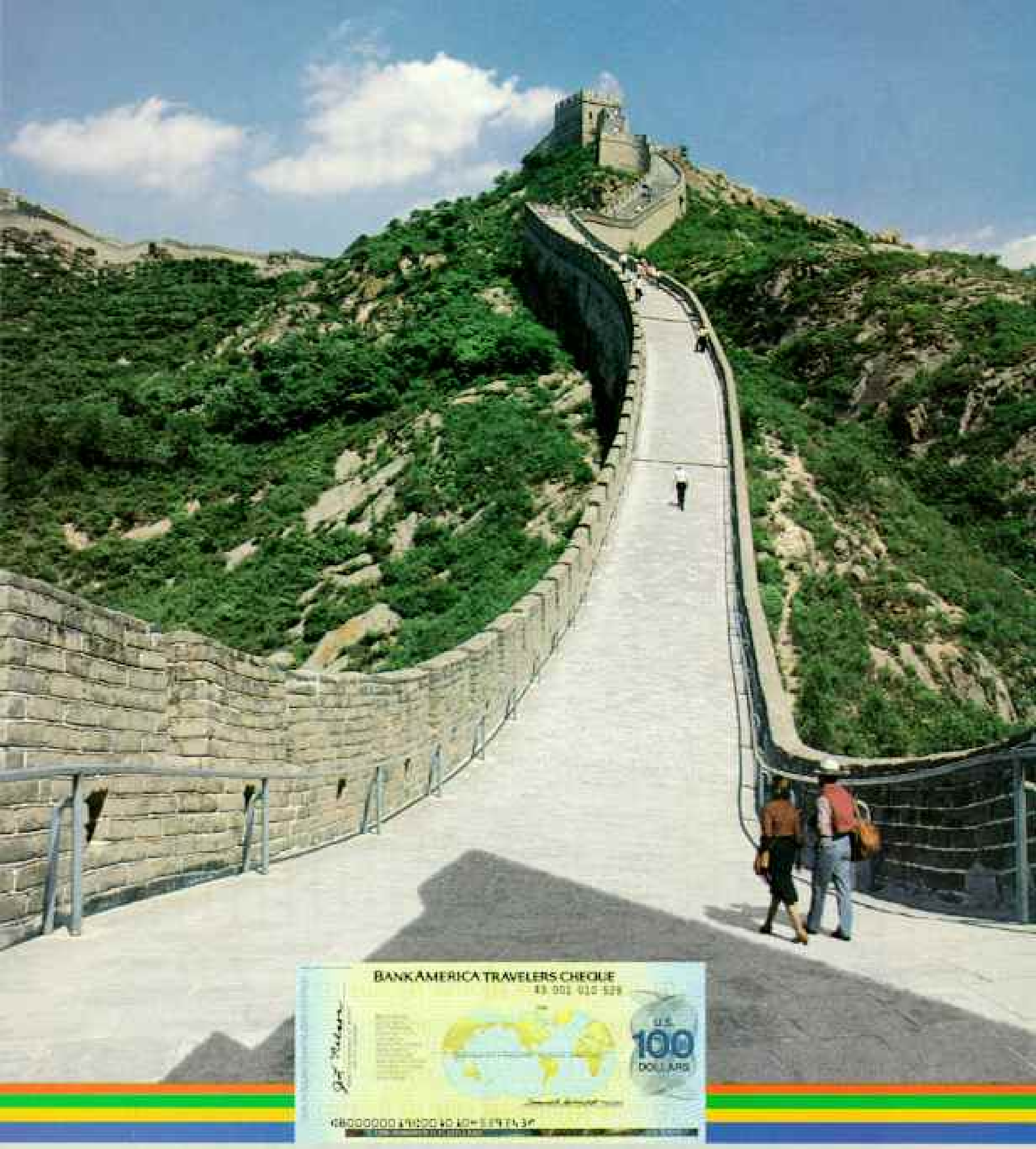
College lecturer and author of *The Underground Railroad in Pennsylvania, Pennsylvania's Black History,* and *Black Genealogy,* Blockson and photographer ***Louie Psihoyos*** located many hiding places of runaway slaves for the article in this issue. Here at Plymouth Meeting, Pennsylvania, Blockson visits the property of George Corson, where abolitionists once gathered and fugitives found shelter.

In a Rochester, New York, attic Blockson found he couldn't recapture a runaway's experience because the trapdoor was too small for his six-foot-three frame. "If I were escaping, I would have had to find another place to hide." In Toronto, a northern destination for escaped slaves, he visited the Underground Railroad Restaurant, which displays memorabilia and features traditional southern cooking.

His collecting days began as a child, when a white teacher told him that there were only a few notable black Americans, such as George Washington Carver. Challenged, Blockson set out to prove her wrong. He began to collect books and soon realized blacks had participated in most famous episodes of American history, including the Boston Massacre.

On road trips as a Penn State fullback, he often left roommates Roosevelt Grier and Lenny Moore and prowled bookstores and flea markets. Later, as a public-school counselor, he continued his search, picking up such finds as a 1632 edition of the works of explorer Leo Africanus, African grammars written by missionaries, American slave narratives, English abolitionist tracts, pro- and antislavery essays, sheet music, and art objects.

"Collecting expeditions have been a delightful diversion," Mr. Blockson said, "helping me to fight ignorance—in many ways the worst form of slavery."



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128K of internal memory, twice the power of computers twice its size. A built-in disk drive that could cost $400 if it weren't.

And built-in connections that let you add printers, phone modems and an extra disk drive without adding $150 goodies called "interface cards."

Two views of the IIc, shown here with its perfect match—the IIc 9" Monitor

You can also plug in an AppleMouse—that little device that lets you tell a computer what you want simply by pointing.

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In fact, the Apple IIc can run more educational and business software than any other computer save one: the Apple IIe.

Speaking of which, the Apple IIc is on speaking terms with the entire Apple II family of computers and accessories. Including its very own Scribe Printer—Apple's first full-color text and graphics print-on-anything printer for under $300.

Small as it is, the Apple IIc is very easy to find—at over 3,000 authorized Apple dealers worldwide. So come in and get your hands on one.

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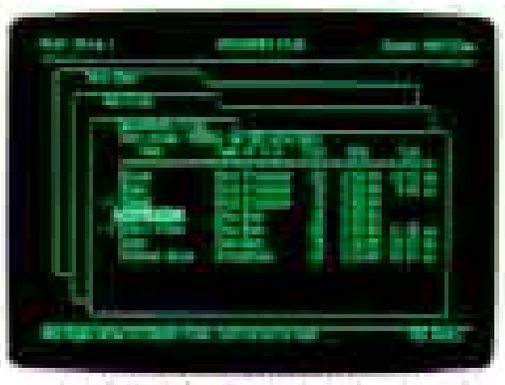
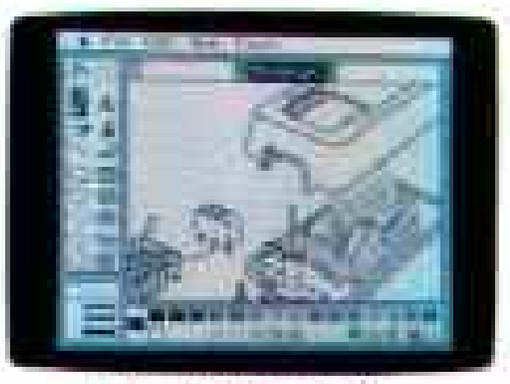


AppleWorks 3-in-1 integrated business software.



MousePaint™ can draw out your artistic talents.

**Don't asterisks make you suspicious as all get out? Well, all this one means is that the IIc alone weighs 7.5 pounds. The power pack, monitor, an extra disk drive, a printer and several bricks will make the IIc weigh more. Our lawyers were concerned that you might not be able to figure this out for yourself.*

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