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A detailed illustration of the Brooklyn Bridge under construction. The scene is viewed from a high angle looking down from the bridge's structure. Several workers are on a wooden platform, one is climbing a rope ladder. Below, the East River is filled with various boats, including a large steamship and several smaller vessels. The bridge's massive steel cables and structure are prominent in the foreground and background.

# NATIONAL GEOGRAPHIC

A CENTURY OLD,  
THE WONDERFUL

## Brooklyn Bridge

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**W**HY IS IT that everyone loves the Brooklyn Bridge? There are other bridges that are longer, higher, stronger, older, and a few, like the small ones in Concord and at Antietam, that are a part of the fabric of our early history. But that great highway in the sky to old Brooklyn maintains a special place in American sentiment.

I think it is because of what it was at the time of its dedication in 1883—the symbol of a young nation, scarcely a century old, that had survived a nearly fatal civil war and was emerging as a world power, eventually to grow to a superpower.

The bridge was an engineering achievement that served notice on Europe that something new was astir on this side of the Atlantic. It had to do with mines and factories and railroad tracks that spanned 3,000 miles of plain, mountain, and desert; with interchangeable parts and mass production; and with organizations like the Knights of Labor that talked of collective bargaining and a minimum wage.

The industrial power that would transform a former agricultural colony into a modern state so quickly was evident in the colossal, romantic shape over the East River between Manhattan and the Brooklyn waterfront.

The nation has passed through some dark and troublesome times since then, and some triumphant ones as well. It is older, perhaps wiser, and no longer so prone to universal senses of optimism, or of pessimism. But it remembers the glory days when "Made in America" always meant quality, and there was opportunity waiting on every corner.

As a symbol of the century past she's a beauty. With new refurbishing and a halo of fireworks this month, perhaps not only the old romance but also the old optimism will be rekindled—optimism that with imagination and hard work this nation of immigrants can do anything its national will and spirit demand. So happy anniversary, B. B.!

*Wilbur E. Garrett*

EDITOR

# NATIONAL GEOGRAPHIC

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May 1983

## The Wonderful Brooklyn Bridge 565

*On its 100th birthday, one of the world's great engineering achievements remains hale and hearty. John G. Morris and Donal F. Holway pay their respects.*

## Brooklyn: The Other Side of the Bridge 580

*The Dodgers are gone, but New York City's most populous borough still holds 2.2 million diverse and disputatious people. Alice J. Hall and Robert W. Madden explore this quintessential bit of America.*

## Ethiopia: Revolution in an Ancient Empire 614

*Nine years after Emperor Haile Selassie was deposed, Ethiopian literacy, health, and welfare are on the upswing. But the political rigors of a Marxist-Leninist leadership show no signs of softening. Article and photographs by Robert Caputo.*

## Henry VIII's Lost Warship 646

*For more than four centuries the Mary Rose kept her secrets. Archaeologist Margaret Rule tells the story of a great English naval disaster, and of discovery and raising of the wreck. With paintings by Richard Schlecht, introduction by Peter Miller.*

## Tasmania's Wild Side 676

*In the rugged southwest corner of Australia's island state, a battle rages: conservationists versus dam builders. Carolyn Bennett Patterson and photographers David Hiser and Melinda Berge record what may be lost forever if a mammoth hydroelectric project goes through.*

## The Roadrunner: Desert Clown 694

*Seemingly zany antics are part of savvy survival by a flightless but fast-stepping member of the cuckoo family. By Martha Whitson and Bruce Dale.*

**COVER:** *Former sailors string suspenders for the Brooklyn Bridge, whose construction in the 1870s and 1880s provided "the most entertaining, and the best-attended circus in the world."*

FRANK LESLIE'S ILLUSTRATED NEWSPAPER, 1878



# A CENTURY OLD, THE WONDERFUL Brooklyn Bridge

**I**NFANT AMID THE WONDERS of the world, the 100-year-old Brooklyn Bridge ranks among the most graceful works of man and the greatest engineering feats of all time. Spanning the fierce tides of the East River, it was at its opening the longest suspension bridge on earth. Its story is an epic written by the determination and sacrifice of two engineering geniuses, father and son.

They were the Roeblings, pioneer builders of big suspension bridges, who here for the first time utilized steel-wire cables instead of wrought iron. The cables give the lazy catenary curve of a suspended hammock, one of the loveliest of forms (*left*). The Gothic arches in the granite towers of the Brooklyn Bridge make a cathedral of the sky, as sea gulls ply the nave and aisles. Ocean-bound vessels, from schooners to naval cruisers, glide beneath, and an occasional small airplane—flouting the rules—flies under it.

The bridge brought unity to New York, joining Manhattan to the then separate city of Brooklyn. On opening day, May 24, 1883, its dedication, attended by President Chester A. Arthur, set off the biggest celebration either city had seen (*below*) since the opening of the Erie Canal in 1825. New Yorkers dreamed, and later realized, that their city was the capital of the world.



MUSEUM OF THE CITY OF NEW YORK

By JOHN G. MORRIS

Photographs by DONAL F. HOLWAY



PHOTOGRAPHED COURTESY PAUL ROEBLING AND THE MUNICIPAL ARCHIVES OF THE CITY OF NEW YORK

**T**HE FAMILY that built the bridge: Immigrant engineer John A. Roebling, center, probably found inspiration in the iron-chain suspension bridge of Bamberg that he sketched in a diary he brought from Germany.

His son and successor, Col.

Washington A. Roebling, right, whose notes appear on this drawing of a hoisting frame, directed the construction of his father's design despite being impaired by caisson disease—the bends. He relied on his energetic wife, Emily, “a strong tower to lean upon.”



STATEN ISLAND FERRY    SOUTH FERRY    WALL STREET FERRY    FULTON FERRY    TRINITY CHURCH    FULTON MARKET    WESTERN UNION TELEGRAPH BUILDING    ST. PAUL'S CHAPEL    SHOT TOWER    POST OFFICE  
 STATEN ISLAND FERRY TERMINAL    HELIPORT    WALL STREET    SOUTH STREET SEAPORT    AMERICAN INTERNATIONAL BUILDING (1932)    SCHERMERHORN ROW    CHASE MANHATTAN BANK (1960)    FULTON FISH MARKET    WORLD TRADE CENTER (1973)    WOOLWORTH BUILDING (1913)



FAMOUS SKYLINE has sprung up along the East River in lower Manhattan, as attested by these panoramas taken a century apart. In 1876 Joshua H. Beal hoisted a

bulky camera and glass plates to the top of the bridge's Brooklyn tower to take five views that he spliced into a seven-foot-wide photograph. The unfinished New York tower, 276 feet above



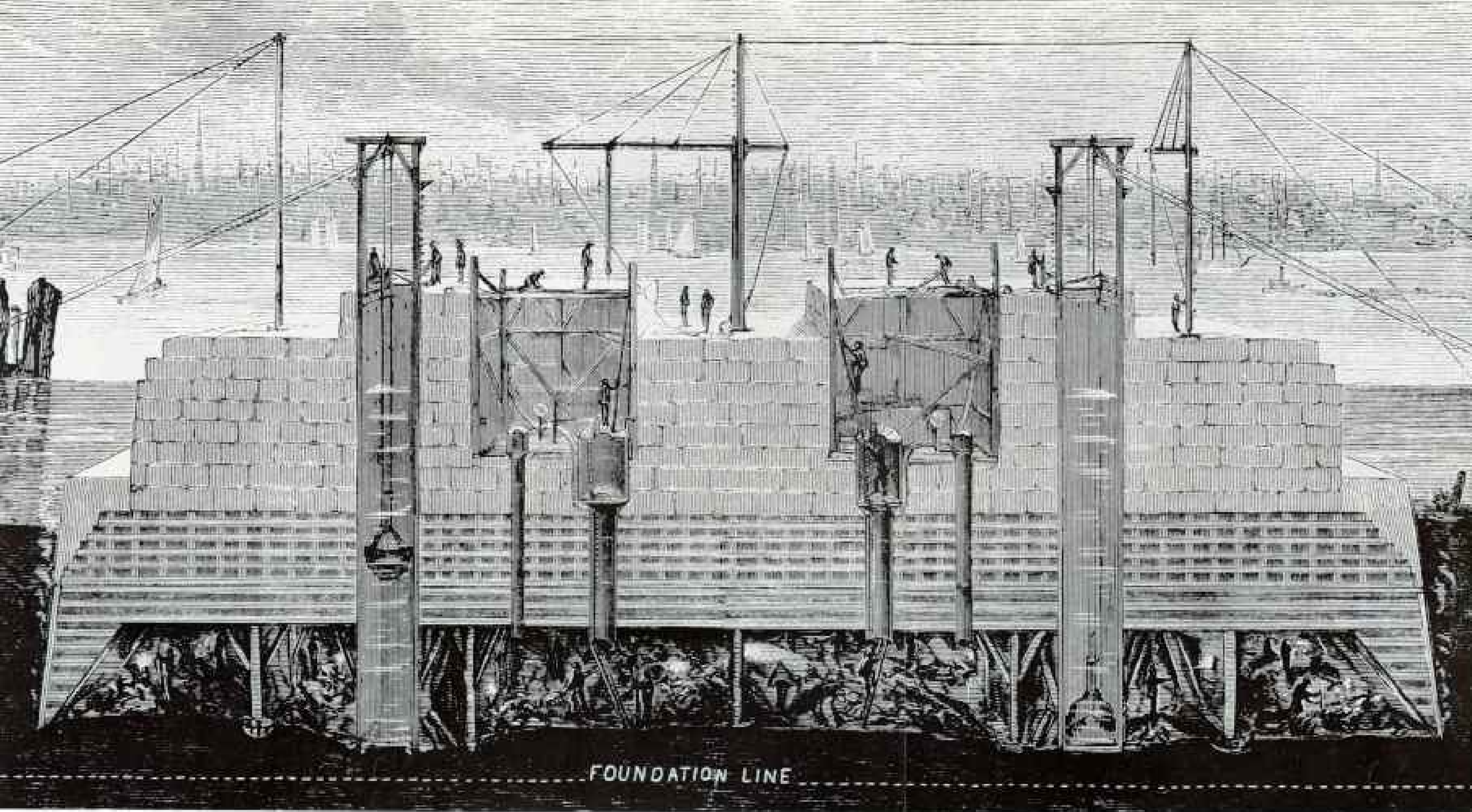
BROOKLYN BRIDGE UNDER CONSTRUCTION) ROOSEVELT STREET FERRY SHOT TOWER STEAMER TO PHILADELPHIA CATHARINE FERRY MUSEUM OF THE CITY OF NEW YORK

BROOKLYN BRIDGE U.S. COURTHOUSE (1936) GOV. ALFRED E. SMITH HOUSES (1952) NEW YORK POST (1927) PENN PLAZA (1966) EMPIRE STATE BUILDING (1931) MANHATTAN BRIDGE (1909)



high tide on completion, dominated the lower island, rivaled only by the spire of Trinity Church. Last fall Donal Holway, duplicating Beal's feat, found the bridge lost in a forest of skyscrapers;

Schermerhorn Row is among the more well-known remaining landmarks. Once-numerous commuter ferries have disappeared, except that to Staten Island.



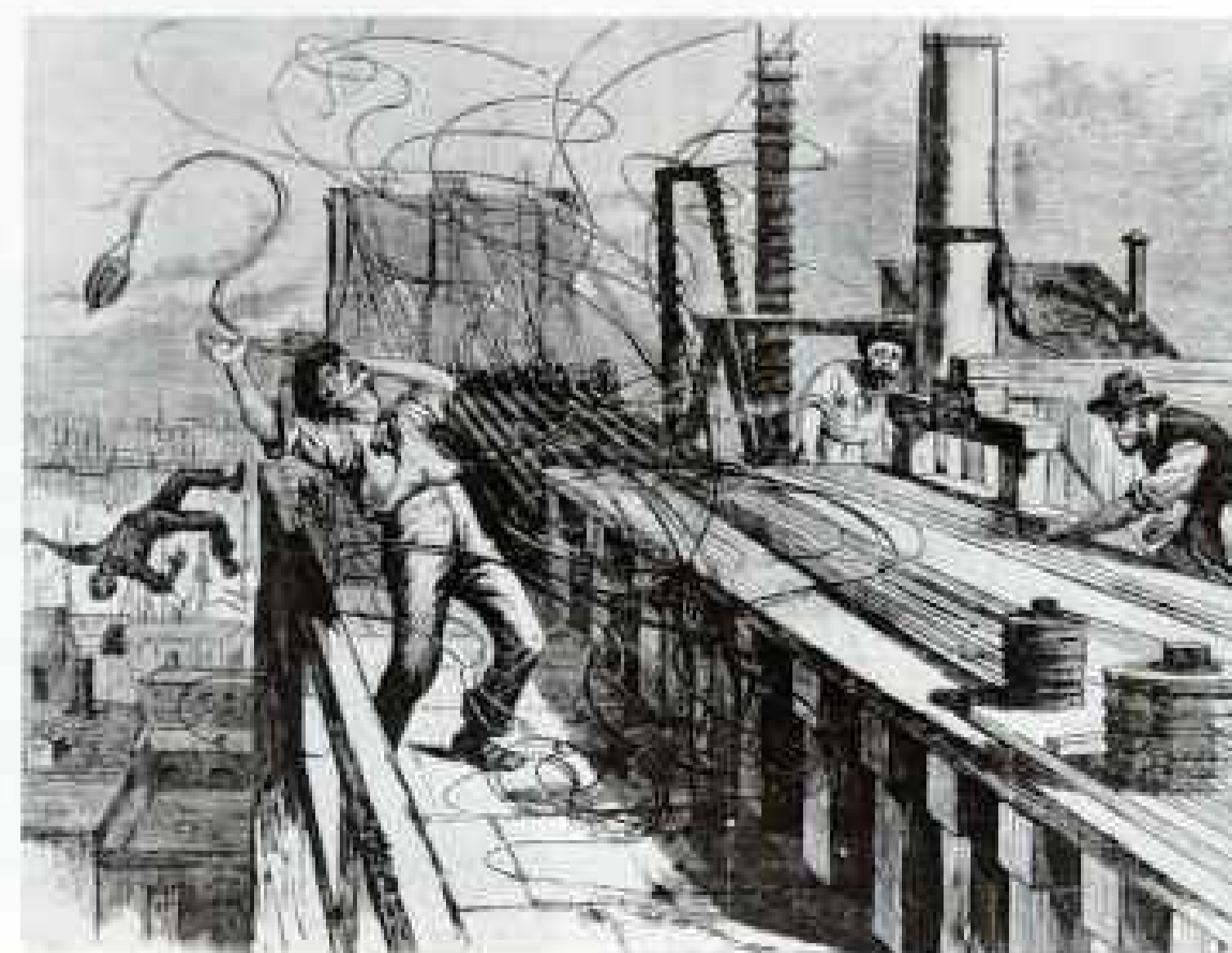
ROSELLEAER POLYTECHNIC INSTITUTE ARCHIVES

*"Its most conspicuous features, the great towers, will serve as landmarks to the adjoining cities, and they will be entitled to be ranked as national monuments."*

JOHN A. ROEBLING



HARPER'S WEEKLY



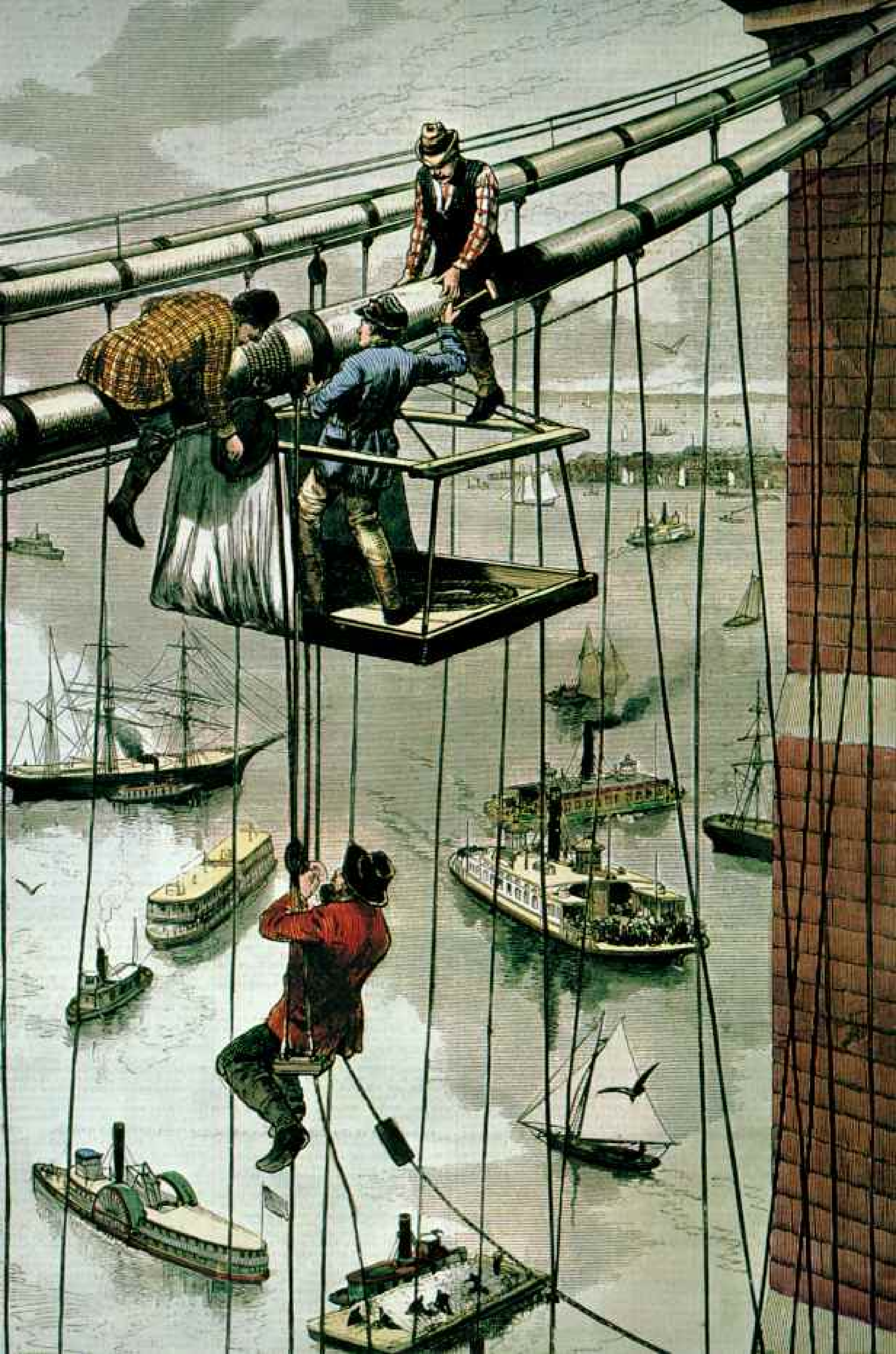
SPORN BROTHERS

**T**O SUPPORT the giant towers, the Roeblings designed airtight timber caissons, each the size of half a city block (*left*), to be sunk in the riverbed and filled with concrete. To excavate, men had to descend through air locks and dig within veritable dungeons (*far left*) that gave a "sense of Dante's inferno." Clamshell buckets raised the muck through water-filled shafts; compressed air kept water from flooding in. Progress was slow, danger constant. Many men, along with Washington Roebling, were afflicted by caisson disease. After a four-day strike, pay was raised from \$2.25 to \$2.75 a day.

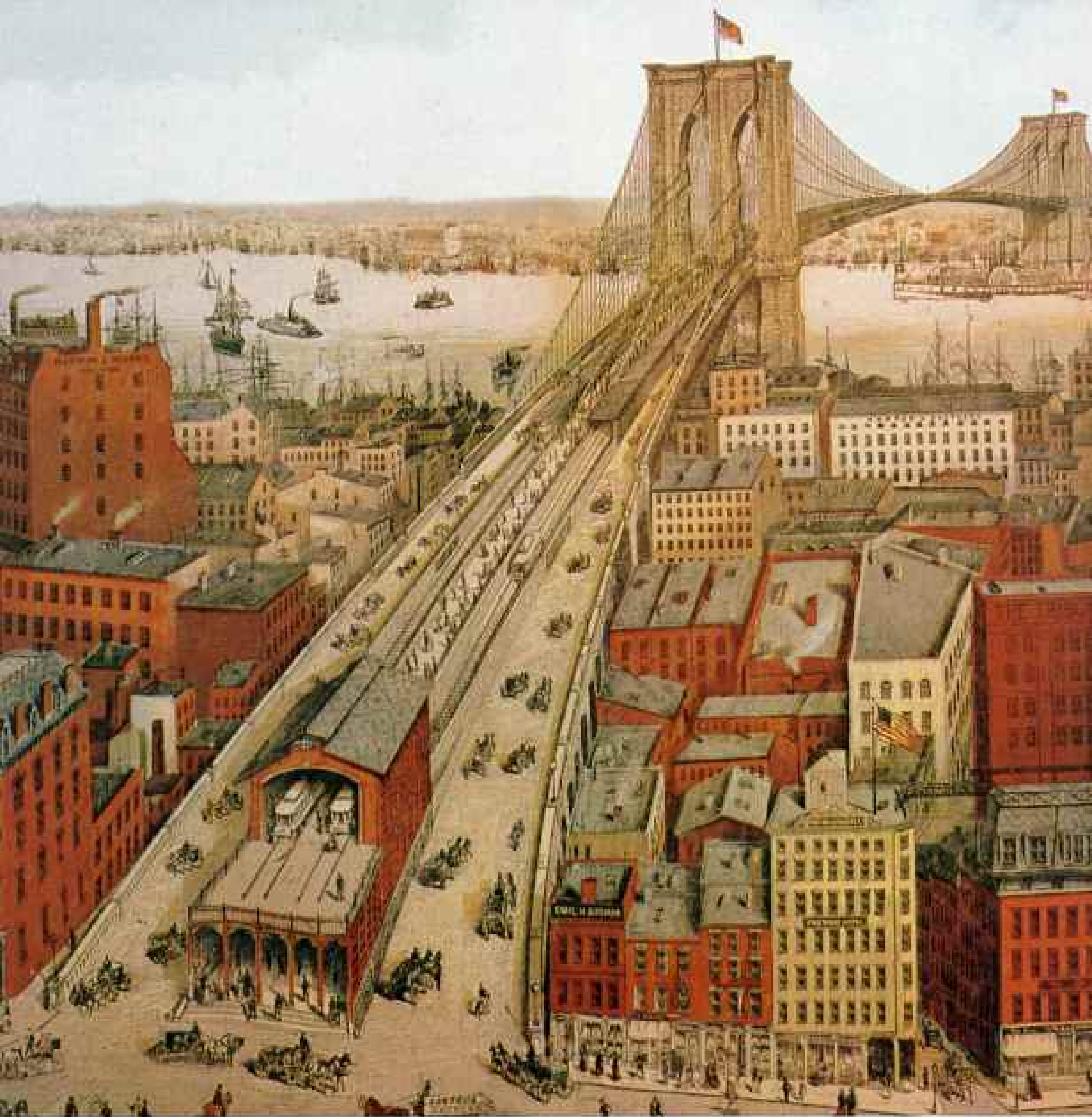
In 1877 "spinning the cables" began. Like fishing line, steel wire was reeled across the river from anchorage to anchorage. For each of the four main cables, 3,515 miles of wire strung back and forth was compacted into a bundle 15½ inches in diameter and tightly wrapped with wire. On June 14, 1878, with a deafening report, a completed strand of 278 wires broke loose on the New York anchorage (*below left*), killing two men. Work continued. Sailors, used to high rigging (*right and cover*), strung more than 1,500 suspenders for the bridge deck, each composed of seven twisted bundles of seven steel wires (cross section, shown actual size, *below*).



PHOTOGRAPHED COURTESY BROOKLYN MUSEUM; FRANK LESLIE'S ILLUSTRATED NEWSPAPER (RIGHT)







**I**T HAS ALL COME to pass, just as John Roebling proposed in an 1857 letter to Horace Greeley's *New York Tribune*: "a wire suspension bridge crossing the East River by one single span at such an elevation as will not impede the navigation." All but the tallest ships still clear the 135-foot center.

The bridge was longer than any other by half. It measures 1,595 feet in its central span, with expansive approaches—

1,562 feet on the New York side (*above*). According to plan, the 85-foot-wide deck had tracks for a cable railway (*right*), flanked by carriageways.

Reassured by the success of the cable-car system in San Francisco, Washington Roebling followed his father's proposal for trains hauled by an endless cable powered by a steam engine on the Brooklyn side. Operating at ten miles an hour, cable trains carried the

bulk of bridge traffic for years. During the first half of this century the track was joined to the elevated in Brooklyn. The city removed trains and tracks in 1944, and now 100,000 vehicles cross daily in six lanes.

When the bridge opened in 1883, it was called the eighth wonder of the world. It had taken 14 years to construct and cost at least 20 lives and 15 million dollars, twice John Roebling's original estimate.



“THE ELEVATED promenade” was the elder Roebling’s special inspiration, designed to “allow people of leisure, and old and young invalids . . . to enjoy the beautiful views and the pure air. . . .” To this day New Yorkers bike, jog, and stroll the unique walkway (*below*), reconstructed in 1982 at the cost of a million dollars.

The bridge inspires poems and songs, TV commercials and jokes (Psst, wanna buy the Brooklyn Bridge?). Stage, movie, and fashion designers use it as a backdrop; artists paint it; and daredevils and the desperate choose it for a long—perhaps last—leap.



MUSEUM OF THE CITY OF NEW YORK (ABOVE LEFT); NEW-YORK HISTORICAL SOCIETY (BELOW)



**P**ROUD PORTAL to Brooklyn (*below*), the span immediately upstaged the ferries plying beneath it. Today a renaissance around the Fulton Ferry landing at its base brings new residences and restaurants, such as the River Café in a barge beside the tower. The 90-year-old red-brick Eagle Warehouse & Storage Company, to the right of the tower, holds apartments. The top-floor clock window (*below right*) still offers a spectacular



JAMES KELLY INSTITUTE, ST. FRANCIS COLLEGE



BOTH BY NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT W. HADDEN



view—similar to the one Washington Roebling (*left*) had from his house a quarter mile south in Brooklyn Heights. In a home nearby, his father had died of tetanus in 1869 after his foot had been crushed by a ferry as he surveyed the tower site. Washington also paid his dues to the bridge. Twice he collapsed after work in the caissons, suffering horribly from the bends. Beset by a nervous disorder, he was confined to a sickroom for a decade, reading

and writing with difficulty. But his mind was alert, and he supervised every detail of bridge construction by dictating instructions to his wife.

Emily also fought his battles with skeptical experts and dishonest contractors. Some defective wire went into the great cables before the contractor who had switched it for inspected materials was caught. Roebling decided that the cable, with a six-fold safety factor, would not have to be replaced.

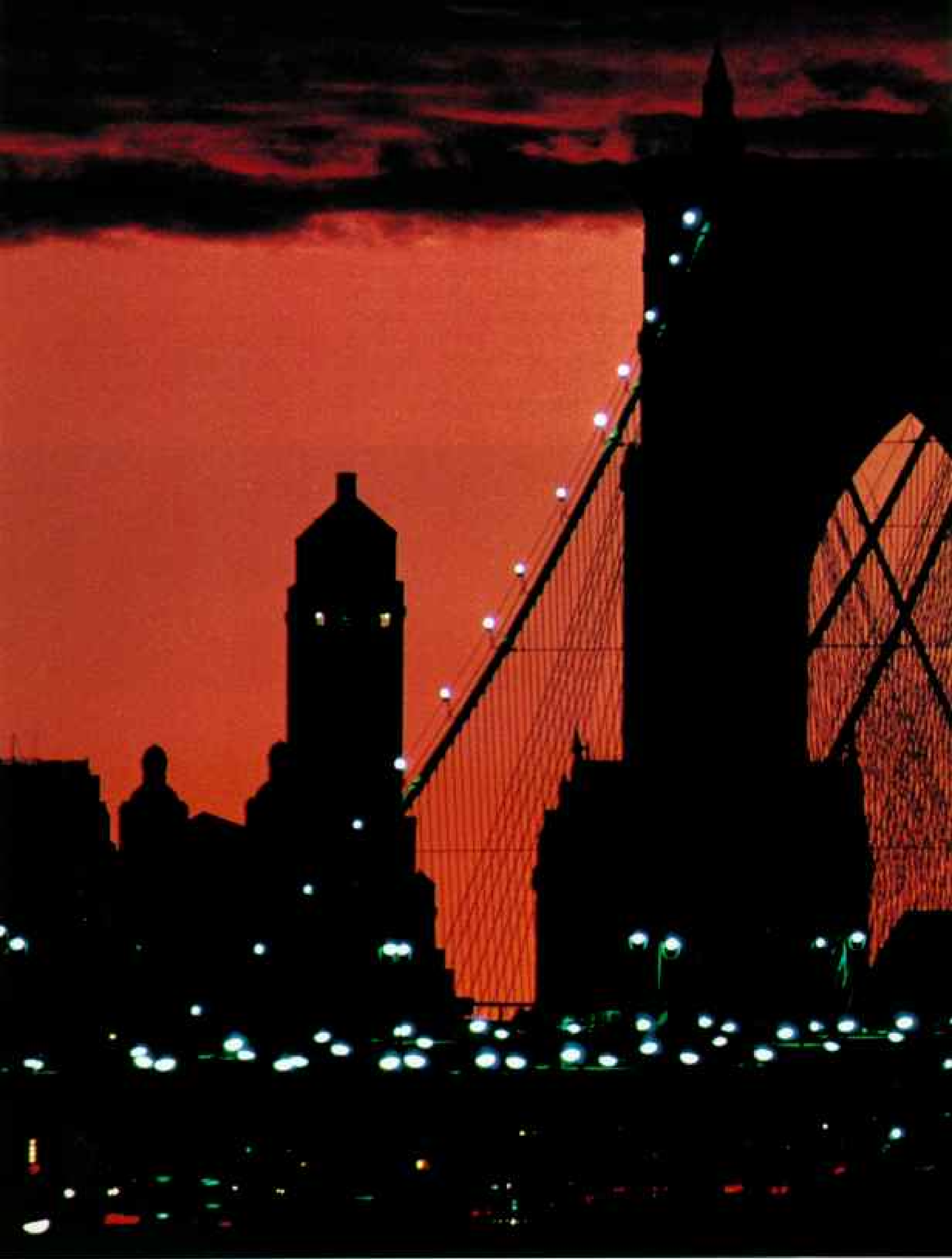
When Roebling was unable to attend the inaugural festivities, President Arthur led dignitaries to his house. Perhaps no tribute was ever harder earned.

Roebling recovered much of his strength and later ran the family wire factories in New Jersey until his death in 1926.

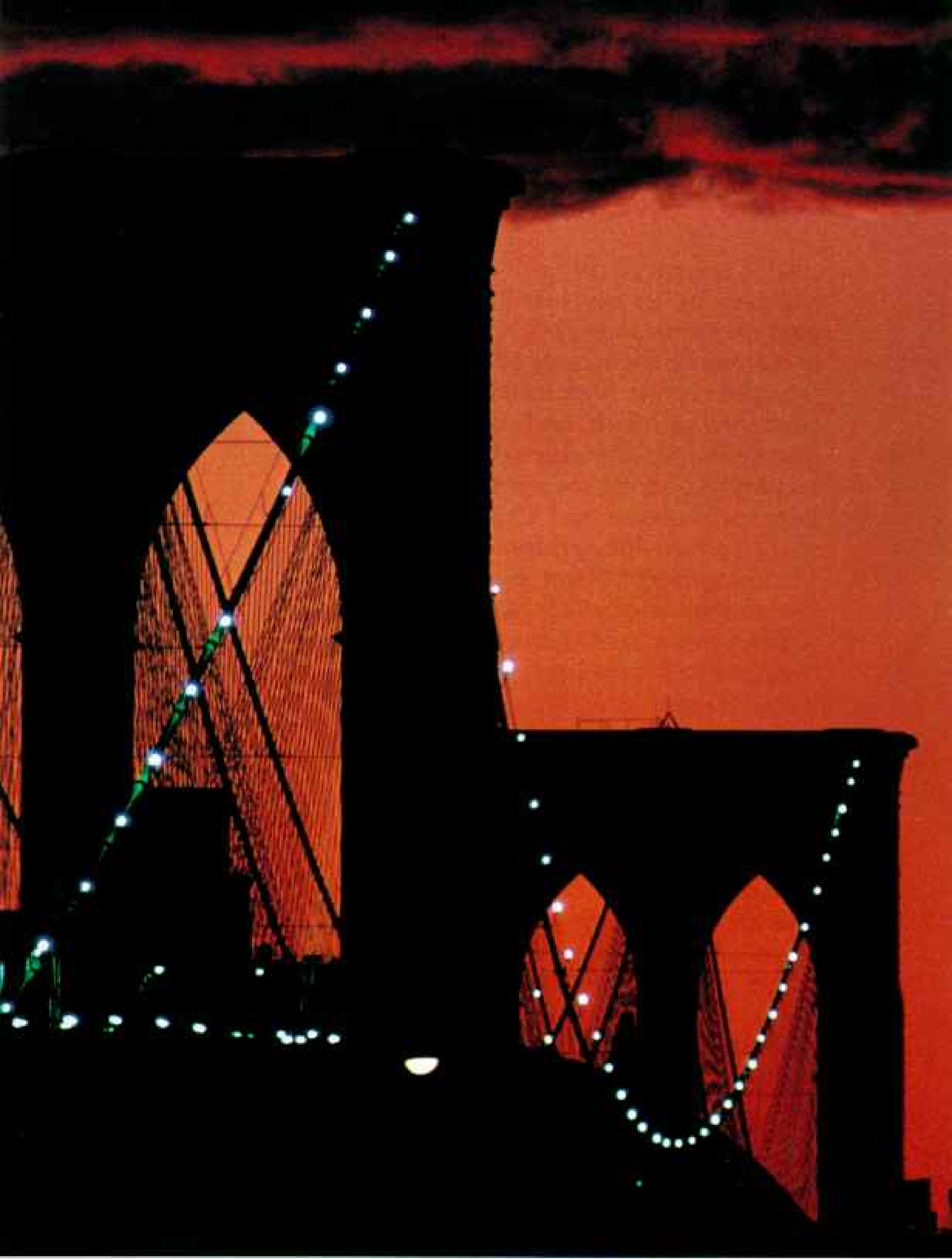
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Free-lance contributor **John G. Morris**, a former picture editor for *Life* and the *New York Times*, has also written for *Harper's* and *Holiday*.





**T**HE FIRST BRIDGE LIGHTED by electricity was illuminated on May 24, 1883. The next day the *New York Sun* reported: "The great buildings in New York loomed up black as ink against the brilliant background of



the sky. . . . Then one by one the series of electric lights on the bridge leaped up until the chain was made from Brooklyn to New York." And so it is today, as the bridge is readied for its centennial celebration. \* \* \*

# BROOKLYN: The

By ALICE J. HALL

*And there, on the other side of that highway in the sky, lies Brooklyn – a vast way station to America for the hundreds of thousands of immigrants who poured through it in the past century and a half, and now a place of neighborhoods where dreams can be played out, where a young would-be John Travolta and his friends star in a real-life version of the film Saturday Night Fever, made on location nearby, while the officer, who has seen such youthful braggadocio come and go, casts a watchful eye.*

*Dreams have been the essence of it – an anchor, a root, a beginning in the city between the wharf and the road to somewhere else. But for those who stayed, Brooklyn became a homeplace, with a character of its own that passed into American legend: the tough guy with the heart of a marshmallow, “Kill dem bums!”, Cookie Lavagetto, Arthur Miller, the myriad hospitals and schools and cemeteries made by Irish, Italian, and Jew – ingredients of the melting pot that wouldn’t, and wouldn’t want to. Much abused, much maligned, and much loved Brooklyn remains an authentic American amalgam, with all its achievement and failure. It is no small place, but a true place it is.*



# Other Side of the Bridge

Photographs by ROBERT W. MADDEN BOTH NATIONAL GEOGRAPHIC STAFF







**W**HEN YOU FIRST traveled to New York City to see Broadway shows, did your mother warn "Be careful on the subway, or you'll end up in Brooklyn"? That happened to a friend of mine 40 years ago. Today she lives in Brooklyn, by choice.

Recently, a New Jersey acquaintance eagerly transferred there only to have her father erupt, "I spent my whole life working to get us out of Bayonne, and you move to Brooklyn!"

Such derogatory remarks about New York City's most populous borough have persisted for years, fodder for comics in the 1940s. Sample: Doctor examining a young soldier: "Son, where were you born?"

Soldier: "Brooklyn."

Doctor: "Any other defects?"

Pressed for details, even the most vocal detractor will admit, on the positive side, it's a place with lots of neighborhoods and ethnic Americans. And it's where the Dodgers came from. Its Army Terminal processed every GI sailing for Europe during World War II. Its Navy Yard built the battleships *Maine* (1890), *Arizona* (1915), and *Missouri* (1944). Brooklyn College and Pratt Institute draw students from around the world. And the Brooklyn Museum houses one of the finest collections of Egyptian art anywhere.

How can a place so desirable to some be so offensive to others? The answer lies in part in those old neighborhoods. For Brooklyn is Palermo and Odessa; it is Jerusalem and South Bronx; Des Moines and Gdańsk; Georgetown in Guyana, and Georgetown in Washington, D. C.

Most of all, it is not Manhattan. That fact is both boast and regret to residents of the legendary realm beyond the Brooklyn Bridge. They look back with ambivalent feelings from their low-rise, 19th-century, church-steepled milieu at the glittering fantasy, the 21st-century mirage they call "the

City." Never mind that Brooklyn is as much New York City as Manhattan; that in 1898, when Brooklyn was one of the nation's industrial colossuses and its fourth largest city, it relinquished its independence to become an outer borough, along with Queens, Richmond (Staten Island), and the Bronx, to queen bee Manhattan.

Small wonder that Brooklynites, losing face in the great metropolis, find their identity in the neighborhoods that spread out from downtown in the 1800s and early 1900s as bedroom communities. Built by speculators, the communities took on the character of their original inhabitants, from the nouveaux riches of Manhattan to the poorest immigrants from Europe. They have been changing ever since.

For a time last summer I had the good fortune to live in one of them—Prospect Heights—house-sitting an elegant 1870s brownstone and dog-sitting a gentle Dalmatian. I became a statistic. One out of every seven Americans, it is said, was born, or has relatives, or has lived in Brooklyn. Second in area to Queens, this 70-square-mile borough is home to more than 2.2 million people. That's more than in any of 17 states. Though it has declined by 370,000 since 1970, the population has topped two million since 1920 and encompasses nearly every race and religion on earth.

For such multitudes Brooklyn requires 38 zip codes and 4.5 representatives in Congress. (The .5 represents Republican Bay Ridge, which in the last reapportionment was joined to Staten Island, helping to make a safe district for the GOP.) Otherwise, Brooklyn—synonymous with Kings County—is solidly Democratic. With the largest block of voters in New York State, it is a power to be reckoned with, having launched former Governor Hugh Carey and the first black congresswoman, Shirley Chisholm. Yet because Brooklyn lacks a major hotel or

***"While to the stranger's eye one street was no different from another, we all knew where our 'neighborhood' somehow ended. . . . Beyond that, a person was . . . a stranger."***

ARTHUR MILLER, PLAYWRIGHT RAISED IN BROOKLYN

*From the glistening arch at Grand Army Plaza radiate some of the many diverse neighborhoods that make up the foundation stones of Brooklyn. Towers of lower Manhattan break the horizon, but Brooklyn has built no higher than 512-foot Williamsburgh Savings Bank, opened in 1929.*



To Brooklyn's early mix of Dutch, Yankees, Irish, and Germans came waves of 20th-century migrants. Brooklyn in the 1930s became the largest Jewish center in the world. Most assimilated into American life, but pockets of traditionalists persisted. Sephardic Jews from Syria and Egypt build synagogues and recreation centers on Ocean Parkway, a fine promenade for Sabbath strolls (left).

In the early 1940s ultra-orthodox Hasidic sects found refuge in Crown Heights, world headquarters of the proselytizing, pro-Israel Lubavitchers, and in Williamsburg (below). There the anti-Zionist Satmars, in fur hats and prayer shawls on the Sabbath, shun outside influences. Other Hasidic sects make their home in Borough Park.

***"The great migrations of the Jews, the Italians, the Scandinavians . . . made the borough . . . one of the most heterogeneous centers on the planet."***

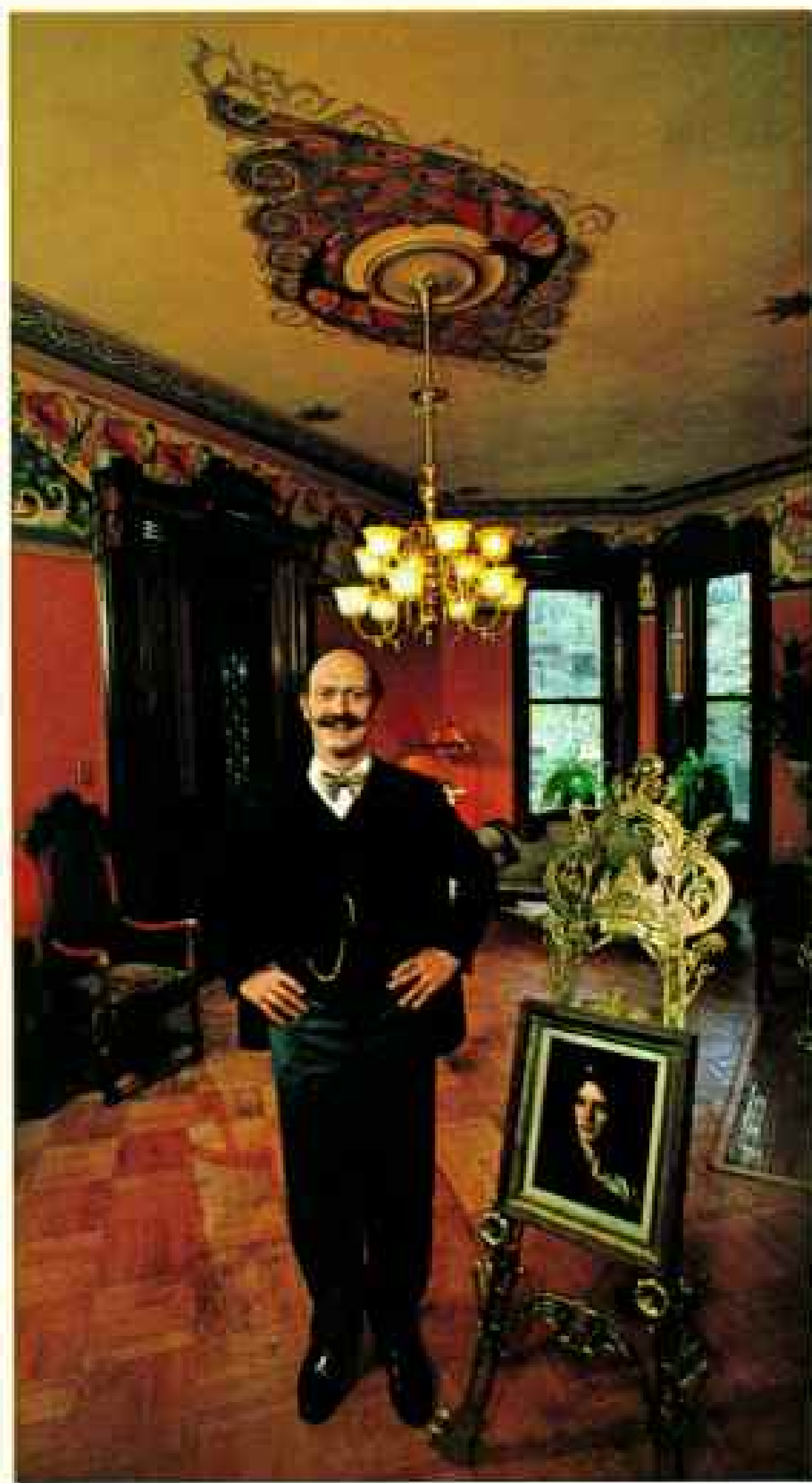
RALPH FOSTER WELD, BROOKLYN JOURNALIST

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**"The alternative to renovation is the slum."**

CLEM LABINE, BROOKLYN PUBLISHER



*Bringing unprecedented elegance to his century-old brownstone in Park Slope, Clem Labine became so interested in restoration that he began the Old-House Journal to help others facing his dilemmas. While the renovation and co-op conversion spreading through older Brooklyn neighborhoods revive deteriorating blocks, they sometimes displace moderate- and low-income families.*

convention center, the state's biggest political bash, the Kings County Democratic Dinner, is held in Manhattan.

**W**ANNA HOT DOG?" The roasted frank was proffered in a fold of white bread by a young Italian in a white T-shirt—and gratefully accepted on my first day in residence. My street came alive at noon as people from Phoenix House, a drug-rehabilitation center across the way, set up charcoal grills and a thrift-shop assortment of tables and chairs. Soon their guests—senior citizens, who make up 13 percent of Brooklyn's residents—arrived in vans, and a block party was in full swing, with bingo games, high-decibel rock, and endless supplies of potato salad, coleslaw, burgers, and franks. A fleet of giggling neighborhood girls in pomponed roller skates sailed past, graceful as windsurfers on an asphalt lagoon. Later, fathers home from work kneed and ankled a soccer ball, suggesting their West Indian heritage. An elderly lady admired my dog: "You're so lucky. We can't keep pets in my building."

I was lucky in other ways—to live near Grand Army Plaza, a splendid traffic circle with its petite Arc de Triomphe, reminiscent of L'Étoile in Paris. Just beyond beckoned a world-class library, museum, botanic garden, and park. Frederick Law Olmsted and Calvert Vaux planned Prospect Park and preferred it to Central Park, their earlier effort in Manhattan.

My immediate neighbors were mostly homeowners, unlike the majority of New Yorkers who rent. Here they included hospital orderlies and tile setters, teachers and social workers, Wall Street brokers and lawyers who call themselves "refugees from Manhattan's Upper West Side," with its escalating prices. Set designers and artists were working in high-ceilinged studios overlooking the continuous greenery of deep backyards unbroken by alleys. Retired people were holding on to homes where they were born, and plaster-dusted, paint-smearing renovators were updating some of the Victorian mini-mansions. Many had come first on house tours, those urban rites of spring when the proud open their private spaces to the curious.

I found the quintessential renovator in

nearby Park Slope, a fast-reviving area with the charm of a New England university town. Clem Labine, publisher of the *Old-House Journal*, insisted, "I fell in with a passel of proselytizing brownstoners at a New Year's Eve party. I was dragooned."

Until that night at the close of 1967, the Labines were typical New Yorkers, a career couple, renting but looking to buy in the suburbs. Then his wife became interested in Park Slope. How absurd, Clem thought; the narrow, dark old row houses were dreary. But his wife found a four-story vacant rooming house she liked on Berkeley Place for \$25,000. Clem tried to see past the layers of paint and linoleum, the partitions, and the aging bathtub set in a dining-room alcove.

Callused hands and an imaginative eye have since brought unsurpassed elegance to the 1883 row house. Clem ushered me into a parlor where hand-painted peacocks paraded near the 14-foot ceiling (left). "This," he said, "is my Victorian fantasy."

As Clem changed his ideas about old houses, he changed his looks, growing a dashing handlebar mustache and sideburns. And he switched jobs, leaving a Manhattan publishing house to start his journal for renovators in 1973. "Buying this house was the most significant thing I ever did," he concluded. "It changed the direction of my entire life."

Thousands of such individual decisions added up to a movement, here called "brownstoning," after the sandstone used to face some brick houses. The movement has revitalized much of old Brooklyn, said to contain the largest, most varied collection of Victorian homes in the U. S.

The neighborhoods had fallen on hard times. During World War II, when employment at the Navy Yard jumped from 17,000 to 71,000, homeowners let out furnished rooms. After the war, federal low-interest loans lured veterans to the suburbs, while banks and insurance companies circled inner-city maps in red ink for no loans, a practice known as redlining. New York City permitted its famous subway system to decline. Expressways built through neighborhoods such as Greenpoint and Sunset Park sped the flight to suburbia.

In the 1960s city voters approved the most generous social programs anywhere,

funneling money to welfare, hospitals, education, and pensions for municipal workers to the detriment of police, fire, and sanitation. Taxpayers rapidly assumed the steepest per capita burden in the nation. Still, revenues lagged behind expenditures, and in 1975 the city barely escaped bankruptcy.

Businesses and middle-class families moved out, making room for aspiring families from southern farms and Puerto Rico, the British West Indies, and southern Italy. As housing prices declined in Brooklyn, sons and daughters of suburbia and city alike found their way back as brownstoners.

The brownstoning spirit spread, even as far as the nation's seventh largest gas utility. "We realized we couldn't move the gas lines, that we had to rebuild our business here," Charles Inniss, urban-affairs manager for Brooklyn Union Gas, told me. The company sponsored a demonstration building renovation in Park Slope in 1966 in a program aptly dubbed Cinderella. Since then it has helped transform 200 scullery maids into princesses, and seen customers and profits grow. BUG spends \$700,000 a year to spur business and community projects such as subway-station renovation; it lent initial support for the rediscovery of the legendary Atlantic Avenue Tunnel.

**O**NE SUNDAY AFTERNOON I donned hard hat and overalls and eased myself down a manhole at a busy intersection near Brooklyn Heights, feeling like that other Alice who entered a rabbit hole, "never once considering how in the world she was to get out again."

My white rabbit was a cherubic 22-year-old engineering student from Flatbush, Robert Diamond. Fired by the insatiable curiosity of the very bright, Robert searched until in 1980 in the recesses of Borough Hall, Brooklyn's former city hall, he found blueprints for the railroad tunnel. Closed in 1861, it has been subject to wild speculation ever since.

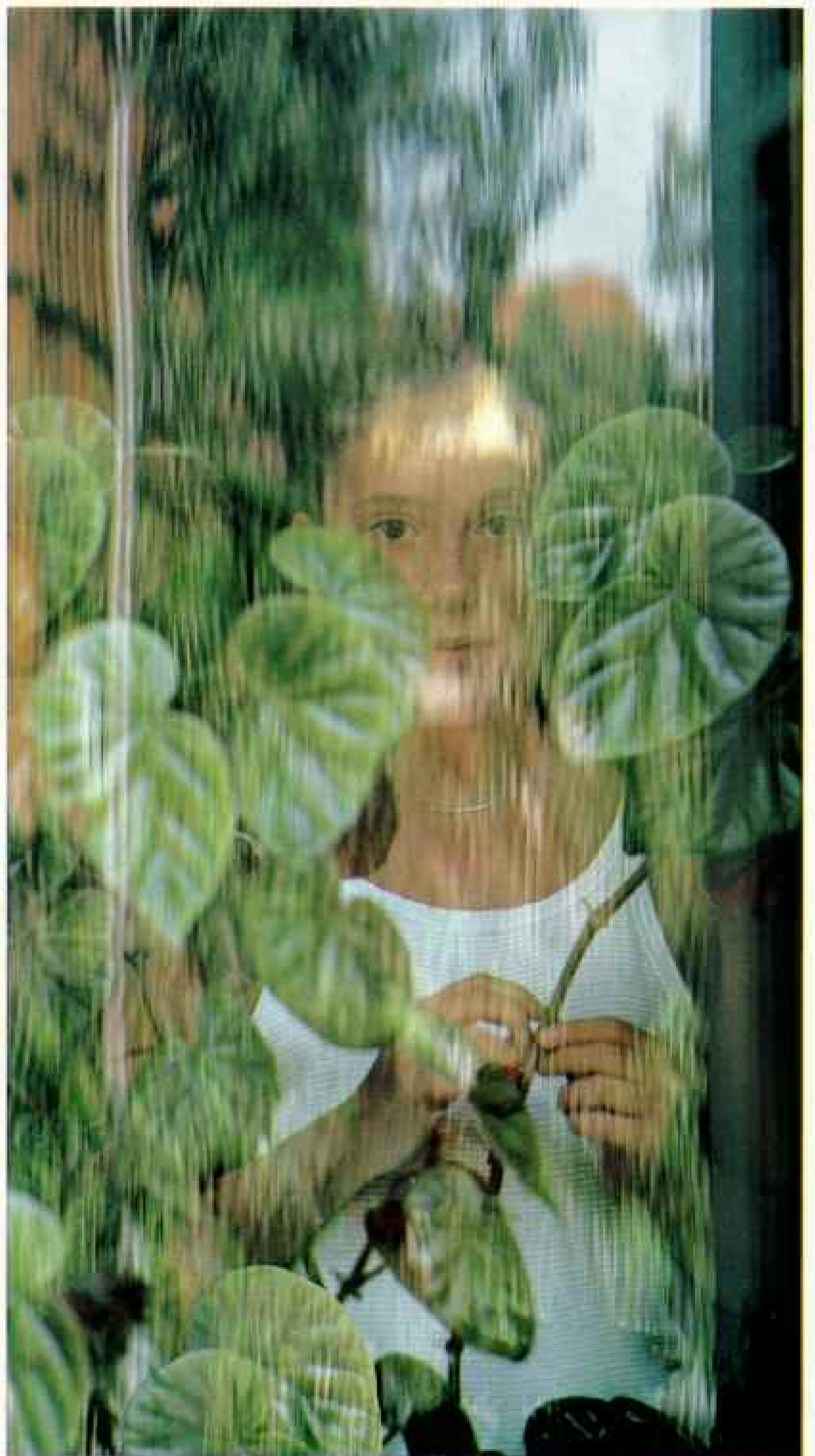
Was it a link in the Underground Railroad? Brooklyn had been a hotbed for abolitionists like Henry Ward Beecher, who preached here for 40 years.

Was it a gangster graveyard or site of a still during Prohibition? The assassins of Murder, Inc., (Continued on page 594)



*“Cheerfully austere, as elegant and other-era as formal calling cards, these houses bespeak an age of able servants and solid fireside ease; of horses in musical harness. . . .”*

TRUMAN CAPOTE, AUTHOR, ONETIME BROOKLYN HEIGHTS RESIDENT



*Manhattan's first suburb, Brooklyn Heights became an easy commute after the inauguration of Robert Fulton's steam-powered ferry service in 1814. Row houses rose on 25-by-100-foot lots. Many were renovated after World War II, and the area won designation as New York City's first historic district in 1965. A similar regeneration occurs in Park Slope, where Suzanne Shanahan tends a plant-filled window (above).*



# BROOKLYN



STATUE OF LIBERTY

Governors Island

BROOKLYN BRIDGE

MANHATTAN BRIDGE

WILLIAMSBURG BRIDGE

WILLIAMSBURG

NAVY YARD BASIN

BROOKLYN HEIGHTS

COBBLE HILL

BOERUM HILL

WILLIAMSBURG SAVINGS BANK

BROOKLYN-QUEENS EXPRESSWAY

CLINTON HILL

GARROLL GARDENS

RED HOOK

PROSPECT HEIGHTS

ERIE BASIN

MEMORIAL ARCH

CROWN HEIGHTS

STATEN ISLAND FERRY

PARK SLOPE

Prospect Park

CEMETERY GATES

Green-Wood Cemetery

SUNSET PARK

BAY RIDGE

BOROUGH PARK

VERRAZANO-NARROWS BRIDGE

FLATBUSH

BENSONHURST

DITMAS PARK

SHORE PARKWAY

NEW UTRECHT

FLATLANDS

PARACHUTE JUMP

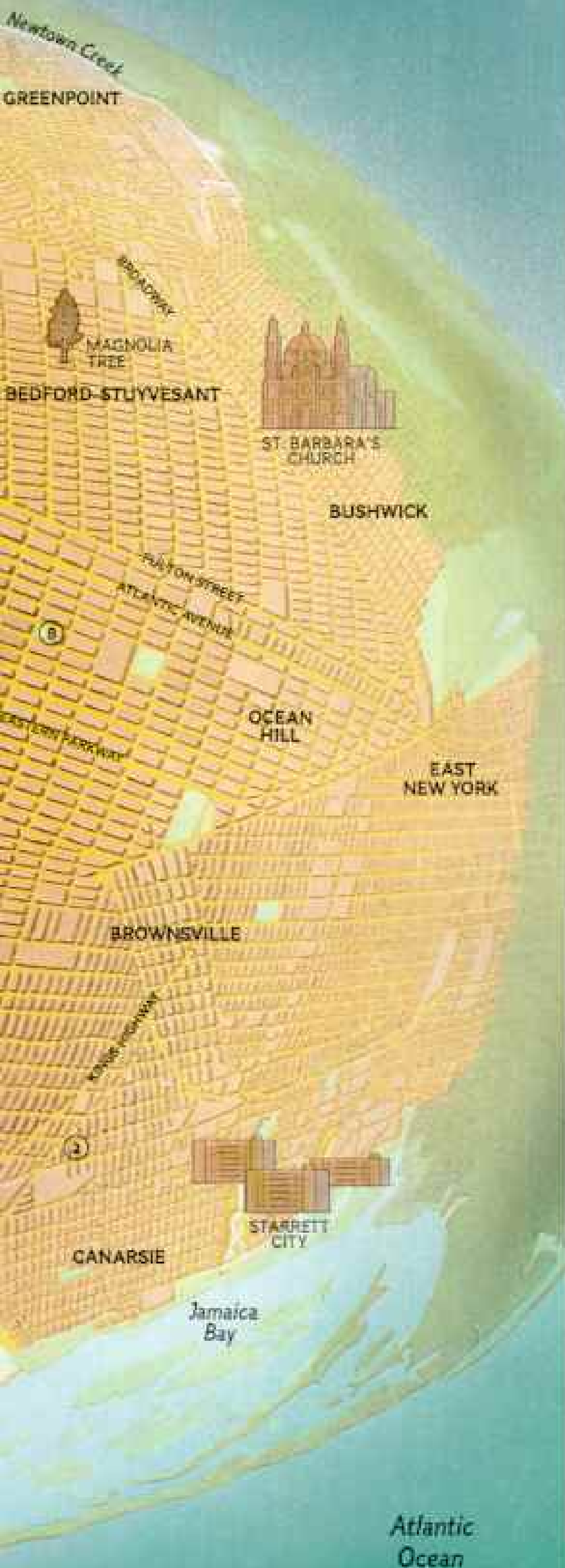
GRAVESEND





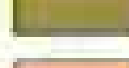



MARINE PARK

CONEY ISLAND

BRIGHTON BEACH

SHEEPSHEAD BAY



	AMERICAN BLACK		ITALIAN
	FOREIGN-BORN BLACK		SCANDINAVIAN
	HISPANIC		IRISH
	JEWISH		NO PREDOMINANT GROUP

Colors show areas where different ethnic groups predominate. Of the total borough population of 2.2 million, about 31% are black, 18% Hispanic, 18% Jewish, and 16% Italian.

*Voices from the past echo in the neighborhoods of the borough's 70 square miles. Canarsie is named for Indians displaced by 17th-century Dutch farmers. Five Dutch communities grew up: Brooklyn, Bushwick, Flatbush, New Utrecht, and Flatlands. Gravesend was founded by English religious separatist Lady Deborah Moody, who probably lies buried in the original cemetery (1). The shingled farmhouse of early settler Pieter Wyckoff (2) is now being restored. Flatbush Reformed Protestant Dutch Church (3) has held services for more than 300 years.*

*In the late 1800s and early 1900s Brooklyn with its breweries, refineries, and shipyards reached its apogee as an industrial city. New districts were laid out in varying grids. Charles Pratt founded Pratt Institute (4). Great cultural institutions arose: the Brooklyn Museum (5), the Public Library (6), Botanic Garden (7), Children's Museum (8), and Academy of Music (9). Green-Wood Cemetery was a popular picnic site; a hill there is the highest point of land in the borough.*

*Today Brooklyn enjoys a rebirth: Neighborhoods are revitalized and even renamed. Brooklyn College (10) expands; Polytechnic Institute of New York designs a high-tech center (11), near Borough Hall (12). Developers prepare splashy proposals to refurbish the waterfront (13).*

*"I knew the neighborhood was changing when couples came in the store and asked for paint stripper and rubber gloves."*

GAIL STEELE, STEELE  
HARDWARE, BEDFORD-STUYVESANT



Artist turned entrepreneur, Gail Steele (right, at right) took over the family hardware store when her father fell ill last year. With help from her brother Mike and close friends such as Rue Zalia Watkins, left, she reorganized the stock, put Beethoven and cool jazz on the stereo, and learned the business from customers. Blacks, present in Brooklyn since Dutch colonial days, now make up 31 percent of the population and become increasingly diverse with infusions of African crafts people, Black Muslims, Rastafarians, and a large community of West Indians, who stage a Carnival parade each Labor Day.

On the waterfront, steel-plate cutter James E. Long (above) works on Navy contracts at Coastal Dry Dock.





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THE MASTER  
KEY

(Continued from page 587) grew up in Brownsville, and several Mafia dons once lived in Bensonhurst.

As I left daylight, I considered a less romantic possibility. Was it full of rats?

On elbows and knees I crawled 30 yards or so in the dry silty underbelly of the city, encouraged by the voice of youth, "It's just a little farther."

Squeezing through a hole in a blockading wall, I climbed down a chain ladder and stood. There in the flickering flashlight beam rose a great vault in empty glory.

As we walked along the 2,000-foot-long roadbed, Robert told of his research: "It took a thousand men—mostly Irish immigrants—nearly seven months in 1844 to dig a trench, set these granite block walls, and arch the brick vault 17 feet overhead. Then they filled in and repaved the street. It was the earliest railroad tunnel anywhere built by the cut-and-cover technique used later in the subways."

The tunnel was meant to solve a problem. Railroad passengers and freight from eastern Long Island bound for Manhattan had to be transferred to horse-drawn wagons to cross a steep ridge to a ferry slip. The tunnel permitted trains to reach the waterfront.

"There's where the ties were." Robert pointed to evenly spaced impressions left by rotted timbers. Broken bottles amid charcoal suggested a moonshiner had bored his way in. But no bodies and no rats. Heaps of crushed bricks were once air shafts that belched soot day and night. Complaints of homeowners and reported rivalries among railroads led to a state law in 1859 banning steam locomotives within Brooklyn.

Now, in the summer of 1982, Robert with a band of volunteers was clearing the entrance and forming a nonprofit corporation to preserve the historic site. He hopes to reopen the tunnel as a tourist railroad, after he and his friends lay new track and link it to an unused rail line along the waterfront ending at the Brooklyn Bridge.

"Streetcar enthusiasts have promised old trolley cars," Robert added, "and I've spotted an abandoned steam locomotive in Greenpoint. If parts are missing, we can fabricate new ones. All it is is a plumbing job on wheels."

I found my way out of the tunnel, Robert's

determined refrain echoing, "This will be built for very little money. Maybe it will set an example to others—to get things done."

**W**ITH BELTS TIGHTENING in most New York City departments, community activists have increasingly organized within Brooklyn neighborhoods to get things done. Bay Ridgers contributed to a volunteer ambulance service called Bravo. Polish, Hispanic, and Italian neighbors in the Greenpoint area staged a sit-in to stop the fire department from closing their station; now their ongoing organization, called the People's Firehouse, Inc., fields local problems and educates other communities in arson prevention. And in Bedford-Stuyvesant, the "magnolia-tree lady," 82-year-old Hattie Carthan, promotes urban ecology (facing page).

Hattie's neighborhood—really a city of 133,000—is home to a sixth of Brooklyn's black population. She has known it well since 1953, when "Vernon Avenue was one of the better brownstone blocks in Brooklyn, and I was one of the first blacks to buy here." Carrying white gloves for our outing, she laughed at the thought of being an inadvertent blockbuster. "I had sons to consider, and I worked 24 hours a day to make payments; I even rented out rooms."

Hattie had worked in market research, surveying on the street and by phone, developing such finely honed language skills that people assume she was an English teacher.

"No, dear, I was silly enough to get married at 17, and I never got to college."

She turned her skills to volunteer work when she saw her block deteriorating as hard-pressed families lost their mortgages or put off maintenance. She decided Vernon Avenue needed a block association, so she surveyed her block and sent an invitation to every house. Their first barbecue raised \$200, and "we thought we were rich as Croesus." Hattie talked the group into buying street trees to beautify the block; then she worked with the Parks Department on a matching program—for every four trees an association purchased, the city would buy six more. Then she helped save a rare magnolia and founded an urban ecology center. Hattie was emphatic: "They say people aren't interested. No, they are just waiting

for direction. I don't have education; I don't have expertise, but I know what we have done. We are a minority community leading the way."

Her neighborhood has also led the way in supporting a model restoration corporation that draws visitors from England to Zimbabwe. The idea was born in 1966 after local leaders asked their U.S. senator, Robert Kennedy, to view the ravages of unemployment, poverty, and neglect. He and his staff, later aided by Senator Jacob Javits, devised a three-pronged attack on community ills, involving local resources, federal funding, and Manhattan's business giants.

Centerpiece of the Bedford-Stuyvesant Restoration Corporation is a stylish shopping plaza opened in 1975. In a design that architectural historian Elliot Willensky calls "Brooklyn's answer to San Francisco's Ghirardelli Square," brown-brick offices are integrated with a handsome old milk-bottling plant; garlanded cow-head decorations still look down on Fulton Street, a strip not yet totally renovated. The plaza houses corporation headquarters, shops, an ice-skating rink, the Billie Holiday Theater, a recording studio called the Platinum Factory, a supermarket, and a mortgage company that generates as much as a million dollars a month in loans.

Nearby blocks have been uplifted by apartment complexes built by the Restoration Corporation. More than 4,000 brownstones bear the fresh paint of corporation face-lifting. With Restoration encouragement IBM built a small manufacturing facility here employing 400 people.

The complex problems of inner-city poverty and unemployment keep many organizations busy. At summer classes in a local school, sponsored by a group called Vanguard, I watched squirming youngsters pencil word lists: actress, plumber. . . . Their assignment for the term: to learn about ten careers. Teacher Brenda McFarland-Anderson explained, "Many kids just aren't exposed to the working world. Older ones say to me, 'Why should I learn when I can get money running numbers?' I want to give them another perspective."

But jobs are hard to generate. New York City lost nearly 450,000 in the 1970s. And

***"We are not Park Avenue people, but we can have the same features for our streets and children."***

HATTIE CARTHAN, BEDFORD-STUYVESANT RESIDENT



*Volunteer who packs a punch, 82-year-old Hattie Carthan spearheaded a tree-planting program that has spread citywide, organized a Neighborhood Tree Corps, and transformed vacant lots into community gardens. Through her efforts, this century-old Magnolia grandiflora—rare so far north—was designated a living landmark, and in the houses behind it the Magnolia Tree Earth Center teaches urban ecology.*



*“Block associations are an anchor for any community. They allow the 98 percent who care to reassert control over the few who would stand on the corner and menace them.”*

FRANKLIN THOMAS, BEDFORD-STUYVESANT RESIDENT,  
AND PRESIDENT, FORD FOUNDATION





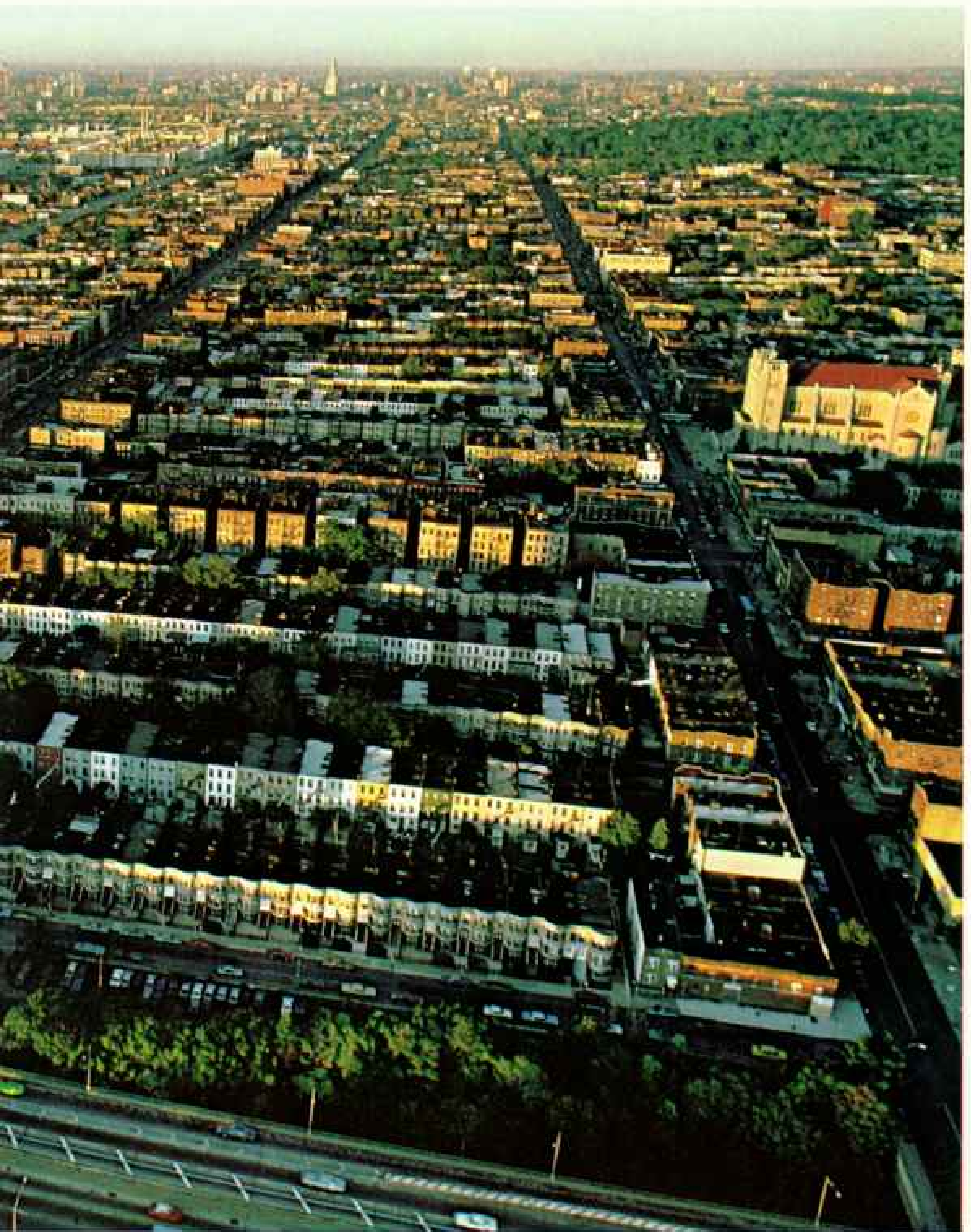
*Celebrating togetherness, Madison Street between Tompkins and Throop gives its annual summer block party in Bedford-Stuyvesant, long a community of political and social activists. These owners and tenants band together to keep their brownstone block clean and crime free. An oft-seen sign (left), this one on Dean Street in Crown Heights, denotes a strong block association. The police department in Brooklyn assists thousands of block associations, helping to set up neighborhood watches and auxiliary police patrols. In Greenpoint such patrols—sometimes staffed by grandmothers armed with walkie-talkies—have cut street crime substantially.*





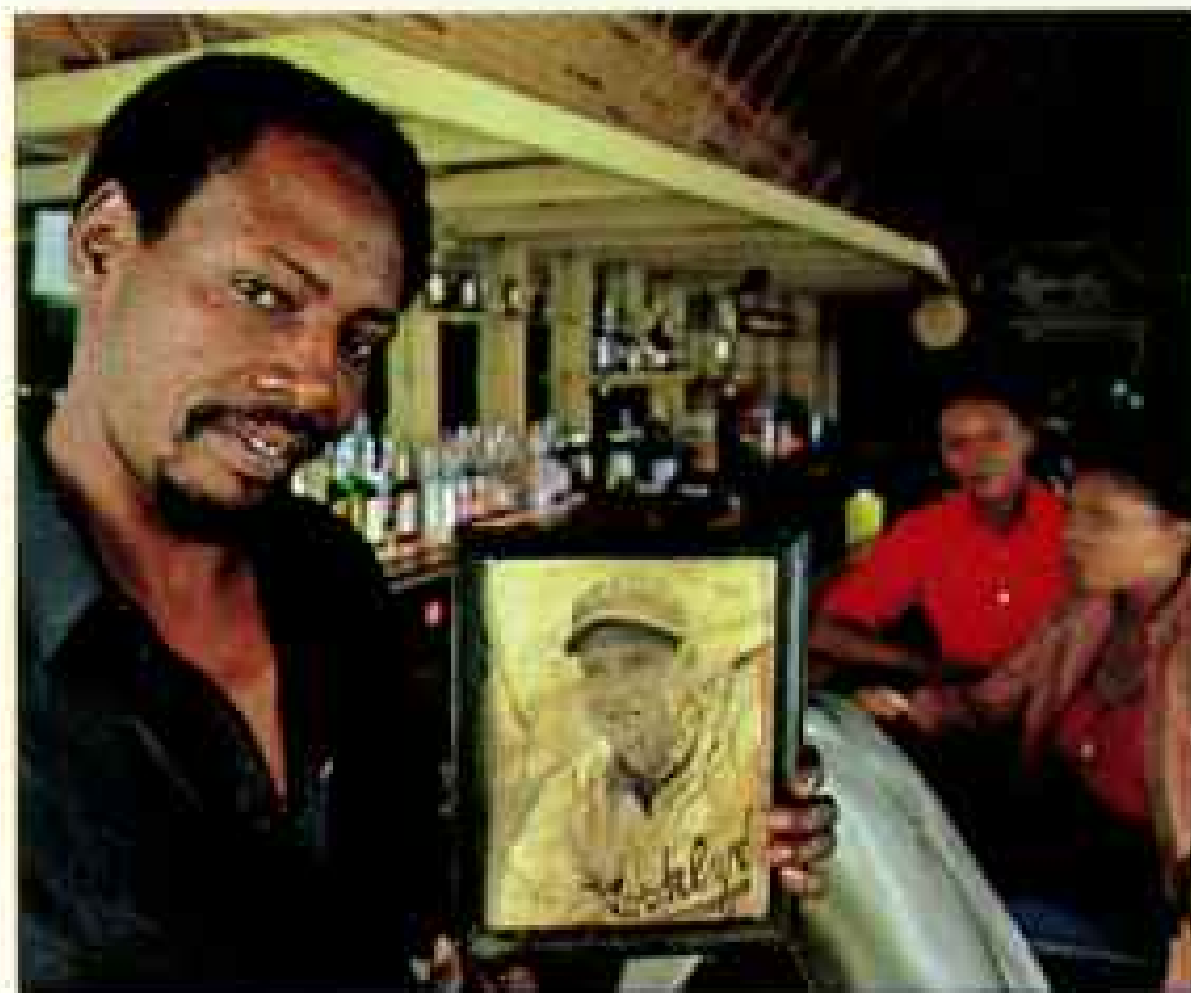
*“People have run roughshod over our community; they drive by, fleeing to suburbia with no sense of our neighborhood.”*

WILFREDO LUGO, SUNSET PARK REDEVELOPMENT COMMITTEE



*Making a recovery, Sunset Park—once an area of Poles and Scandinavians—has overcome the problems experienced when a ten-lane roadway ripped out Third Avenue, a main shopping street. Now young homeowners, including many Puerto Ricans, are improving row houses and supporting community projects, such as the conversion of a factory into a facility for Lutheran Medical Center, far left.*

**"I won't ever, as long as I live, see the Dodgers play again under the summer sun of Brooklyn. But they are all mine still, artifacts in the treasure-house of memory."** FETE HAMILL, JOURNALIST



Big-league baseball in Brooklyn is as dead as Henry Chadwick, a codifier of the rules, who lies under crossed bats in Green-Wood Cemetery (top). The Dodgers left Ebbets Field in 1957, and Joe's Tavern nearby, where Robert Best displays a portrait of pitcher Hugh Casey, is now the Miss Leo Club.

Brooklyn has that old image problem in attracting new ones. As a Japanese businessman searching for business sites in New York quipped, "Brooklyn has two images—negative and nonexistent."

The negatives are painted by neighborhoods like Bushwick, where as one resident said, "It looks like a war came, and nobody told us." In what seems a biblical fitness, a preacher of Dutch ancestry bears witness to the apocalypse that visited this neighborhood settled by Dutch farmers more than 300 years ago. An Iowa farm boy turned minister, tall, spare Charles Vander Beek took over the 130-year-old South Bushwick Reformed Church in 1968 because he believed that "what happens in the city and with the masses is what happens both within the nation and the kingdom of God."

The Reverend Vander Beek drove photographer Robert Madden and me around empty acres razed for urban renewal, past houses burned out and bricked up, past knots of sullen men. "This was still a proud community in the sixties," he said. "Mostly working class; the wood-frame houses were old but neat; everyone swept. In ten years we lost a third of our people, and a fifth of our housing."

It happened partly because of what Vander Beek called the "poverty pimps," people who fed on misfortune. In a giant scam that reached into East New York, Brownsville, Sunset Park, and other areas, unscrupulous speculators bought houses cheap and sold them dear to unqualified buyers, mostly black and Hispanic, shading the truth on FHA mortgage insurance applications. When new homeowners defaulted, the speculators and lenders collected big from FHA. Meanwhile, landlords got "finders' fees" from the city for renting to welfare families, shuttling them in and out in weeks. Or they let their buildings go for taxes. Or hired an arsonist and collected insurance. Fire calls in Bushwick topped 6,000 a year, signal of a community in distress.

Eventually, indictments were brought against real estate agents, lawyers, government officials, and corporations involved. But Bushwick had added its share to the nearly 3,000 vacant, city-owned buildings in Brooklyn. Now 40 percent of Bushwick residents are on public assistance.

**O**F ALL THE PEOPLE who fled Brooklyn, none created a greater stir than Walter O'Malley. On October 8, 1957, the announcement came that he was moving the Dodgers baseball club to Los Angeles. The fans, the Flatbush Faithful, were stunned, brokenhearted, outraged. Tom Knight is still boiling.

The tall, gray-haired Brooklynite, a local columnist, growled: "O'Malley would have taken the team to the Sahara if he could have made money there. It was despicable. The blackest day in baseball, and a body blow to Brooklyn. That was the only thing we had left to give us national recognition."

The team had done that since it was organized in 1884; Ebbets Field had been home base since 1913. Sure, the stadium was out of date, and that section of Flatbush was "changing." But there Branch Rickey had transformed the course of sports by introducing Jackie Robinson as the first black in the major leagues in 1947. There the Dodgers had won their first World Series, beating the Yankees in 1955.

Pee Wee Reese, then team captain, remembered: "I don't think there was ever anything like a Brooklyn fan, or ever will be." In the soft full voice reflecting his mid-Kentucky home, he reminisced recently at an old-timers game in Washington, D. C.: "I remember standing at shortstop and recognizing faces in the upper deck. I remember Hilda Chester clanging her cowbells and the Sym-Phoney playing "Three Blind Mice" when the umpires walked in. I haven't been back once."

Just as well, for Ebbets Field has been replaced by a middle-income apartment complex housing 3,000 people.

Reese grew pensive. "I just didn't think we would move. O'Malley had one thing in mind, to go to the coast, which he saw as the future. It was," and here Reese sighed for the way of the world, "a smart thing to do because they've been very successful out there. But it took a lot out of Brooklyn."

Funny thing was, Reese hadn't really wanted to come to Brooklyn in 1940 when he joined the team. But after he married and moved to Bay Ridge with its expansive views of New York harbor, he found "everyone was so nice to my family when I was on the road. I loved those people and the

fans; now I think Brooklyn was the best thing that ever happened to me."

Often the only way up in Brooklyn is out. Especially from old-time tenement districts in East New York and Brownsville. From them came comedian Danny Kaye and writers Norman Podhoretz and Alfred Kazin, fleeing what Kazin called "The early hopelessness. . . in New York's rawest, remotest, cheapest ghetto."

**L**ARRY PAHL got out too—like so many, to a better Brooklyn neighborhood. In Flatbush I met the proprietor of Larry's Pianoland in a storefront surrounded by used pianos resting on their sides on movers' dollies, like paintings at a gallery awaiting inspection. As a couple examined a grand piano without its works, stripped of finish, its walnut inlaid with a floral pattern, the robust, balding owner unreeled a staccato line: "New strings, pins, key tops, refinished to your choice, delivered, and one home tuning. How much can you put down? Whatever you can, the rest at delivery. You'll have a very bee-ut-i-ful pi-ano."

In the back-room workshop the box would be brought to life to take its place in a spacious colonial-revival frame house in nearby Ditmas Park.

Larry steered the next couple with a little girl to another storefront full of 200 pianos, where, in a half squat, he demonstrated. Suddenly from the stocky fingers came an angel's whisper—phrases of Mozart, Bach, and classical improvisations. He recommended a modest spinet of Korean origin. They would think about it.

"I always feel good about a person getting a piano," Larry told me, as business slowed. "Not just making a living, but the pleasurable days." Larry had reason to smile. He was born in East New York in 1930, son of a house painter driven from Poland by intimations of the holocaust to come. Larry recalled: "That railroad flat was really cold; in the morning you dashed to the kitchen to light a coal stove, and then hurried to school to get real warm. It was tough. I said to myself I'd like to become a concert pianist."

Larry had talent and won a place in a performing-arts high school in Manhattan. Eventually he realized "all the practice in the world can't make you what you're not."



He became, in turn, a teacher, piano tuner, and repairman. Then, with a \$75 deposit, \$75 a month for rent, and four old uprights, he rented a storefront. Gradually he built a citywide reputation.

"It wasn't easy," he said. "I used to work till midnight teaching, buying old pianos, renovating them, even moving them—before I got shot."

Shot?

"I was in the store on a nice bright day like today, and two gentlemen came in like customers and pulled guns. 'This is a holdup. Give me your wallet,' one said.

"I said, 'You must be kidding.' Then it felt like a torpedo went into my stomach."

Larry reached down and pulled up his T-shirt to expose ragged scars across his stomach. A .22 had pierced liver and intestines.

"When I got out of the hospital, I was ready to run. By then I'd moved my family out to Long Island—by the water—it's real nice out there. Then I said I don't feel like being run out. My door stays open, and what will be, will be."

But Larry had been accosted again, just a week earlier, by a man with a shotgun. He foiled that robbery attempt by grabbing the weapon; it discharged into the floor. Still he's not leaving.

"This is an ethnic city, all types of people, nice people. Look at the wonderful men who work for me—black and white. Then there are the crazies. I should hate them, but I almost sympathize. I was brought up as poor as they think they are. At least they're warm. I remember that cold flat, and I still wear my socks to bed."

**L**ARRY IS PART of a retail tradition that has characterized Brooklyn since the mid-1800s. Wide avenues became shopping strips lined with two- and three-story buildings housing owners upstairs. Such storefronts still offer opportunity to would-be entrepreneurs.

Yemenis open cafés among older Arab markets and restaurants on Atlantic Avenue. Puerto Ricans create bodegas, social clubs, and Pentecostal churches. Sicilians found Italian-style carryouts. And shopping for groceries remains a lively, though time-consuming adventure as you visit your local butcher, baker, cheese seller, delicatessen,

**"Everything that is good,  
and everything that is  
bad, you can find in  
Brooklyn."**

RECENT CARIBBEAN  
IMMIGRANT



*Like festering cadavers, abandoned buildings in many areas become targets for vandals and backdrops for those who strip some of New York City's 100,000 stolen cars. Photographed last summer (facing page), a row on Sixth Avenue in Sunset Park is getting a second chance. "We're bringing this body back to life," says Wilfredo Lugo (above), president of the non-profit Sunset Park Redevelopment Committee. Coordinating private investors and city officials, it is rehabbing the row into 36 low- and moderate-income units. Good, reasonably priced housing is so scarce that 500 families have applied.*



Urban folk artists to some, wielders of spray-paint cans coat the subways, giving the 3.3 million daily riders something to read, as one wry comment goes. In a program to stem turnstile jumping and other petty violations, first offenders clear the record by cleaning off graffiti (above).

Adopting a school wall in Ocean Hill for his illegal work, Caesar Gonzalez (right) is angered by an artist who defiled his graffiti with . . . graffiti.





*“The graffiti are so extensive and so dreadful it is hard to believe that the perpetrators are not the recipients of some enormous foundation grant.”*

PAUL THEROUX, AUTHOR

and greengrocer. But some of the business strips are failing; their boarded-up stores are used as warehouses.

Revitalizing commercial strips, encouraging shopkeepers, these have been priorities for second-term borough president Howard Golden, who as a youth worked in his mother's deli in Flatbush. Now he presides over a Greek Revival Borough Hall whose palatial chambers are undergoing an impressive restoration.

Golden talked to me not only about Brooklyn's attributes but also about its problems: a suspected undercount in the 1980 census, crime, unemployment, undocumented aliens, and competing plans for waterfront redevelopment. But primarily he believes “the direction of the city is Manhattan oriented, to the detriment of the citizenry. During my six years in office a dozen luxury hotels were built in Manhattan on the East Side; one was given a 21-million-dollar tax abatement. If you gave those breaks in Brooklyn, builders would come here.”

Changing that trend is unlikely, since a borough president has only one of 11 votes on the Board of Estimate, the city's governing body. Golden shook his head. “Brooklyn's got a lot of land—prime areas—lying fallow. Coney Island, for instance, should be a garden spot.”

**C**ONEY ISLAND. The breath-catching, heart-pounding hurtle through dark tunnels, the sudden glare illuminating the captive silent crowd, the wide-eyed newcomers, the bored old-timers, the air heavy with stale popcorn, the graffiti everywhere, the screech of brakes . . . and that's just the ride on the D-train to get there.

For the past 80 years subways have carried the multitudes to the shore. Once Brooklyn boasted the largest collection of seaside resorts of any city in America—gracious hotels, racetracks, Irish music halls, theaters, glittering amusement parks called Luna, Dreamland, and Steeplechase. Now empty urban-renewal land surrounds monotonous high-rise apartments, and the amusement area has shrunk to a few blocks and souvenir stands. Short, acerbic Alex Silverman, who has run one for 35 years, announced, “Next stop, Fort Lauderdale. The old Coney Island will never come back. The





*“The whole idea of a beach is that no matter how crowded it gets you can always squeeze another thousand people in.”*

NORMAN BOSTEN, BROOKLYN WRITER



*The great three-mile strand at Coney Island proves Rosten's point on a hot June Saturday, joining 800,000 diverse people in pursuit of sun and sea. Coney Island attracts beachgoers from the entire metropolitan area with neither time nor cash for the trip to eastern Long Island. Along the boardwalk, stand-up counters serve hot dogs, raw clams, and knishes. Few visitors care that the neighborhood is dominated by high rises and empty lots; the great resort of the past is no more.*

long-time midway operators have died, and the young ones are milking the public, and you can quote me. But listen, I've got some rare items, old postcards, some so rare people offer \$100 for them."

A woman browsing among the beach hats walked out with an airy wave at the area, "I don't know what's so rare about this place; ain't nothin' down here."

I beg to differ. "The most gorgeous boardwalk anywhere" in Silverman's words, overlooks "the Riviera of the poor," three miles of shining sand on Lower New York Bay that attract half a million bodies on a summer's day.

Stroll that promenade and marvel at humanity . . . the teenager in shorts lugging a stereo box; the sun-greedy grandmother sitting on a bench, her nylons rolled around her ankles; the child clutching a two-fisted treat, a can of cherry soda and a Russian-style knish, fresh from the oven. Detour a few steps to the New York Aquarium, where sharks behind plate glass swim open-mouthed inches from your face, a live act better than any midway. Follow the sounds—the *swooka-swooka* of paddle tennis, the clack of shuffleboard, the splash of bodies in saltwater pools—to the Brighton Beach Baths. For \$25 you can join this private club for a day, this sandbox for seniors.

Some 6,000 members each summer day crowd the 15 acres, divided into designated play areas: for sunning only, card playing only, dancing only. Member for 41 years, Reggie Braunstein in a bright bathing suit and straw hat paused on her way to dance class. "You should come in the winter. Even when it's bitter cold, you dance and strip down to a light dress. You come out of here ten years younger. Friends from Florida say to me, when are you coming down. I say, why should I leave. When I have my worst dream, it is of having to leave this place."

Few Brooklynites speak with more understanding of the Brooklyn experience than a former cashier at the Baths who took his earnings home to his Italian immigrant parents nearly 50 years ago. Today Francis J. Mugavero—whose bald pate and resonant voice remind me of Telly Savalas—is the Roman Catholic Bishop of Brooklyn. His diocese includes Queens and is the most populous in the country, with 1,400,000



Sicily seems reborn on 18th Avenue in Bensonhurst. Typical of newcomers, Gino Pollari brought his family from Palermo in 1970 to live near his mother and five brothers. His cafeteria, here visited by his in-laws, Philip and Elena Orofino (center),

# FOCACCERIA

TALIAN KITCHEN

FOCACCERIA

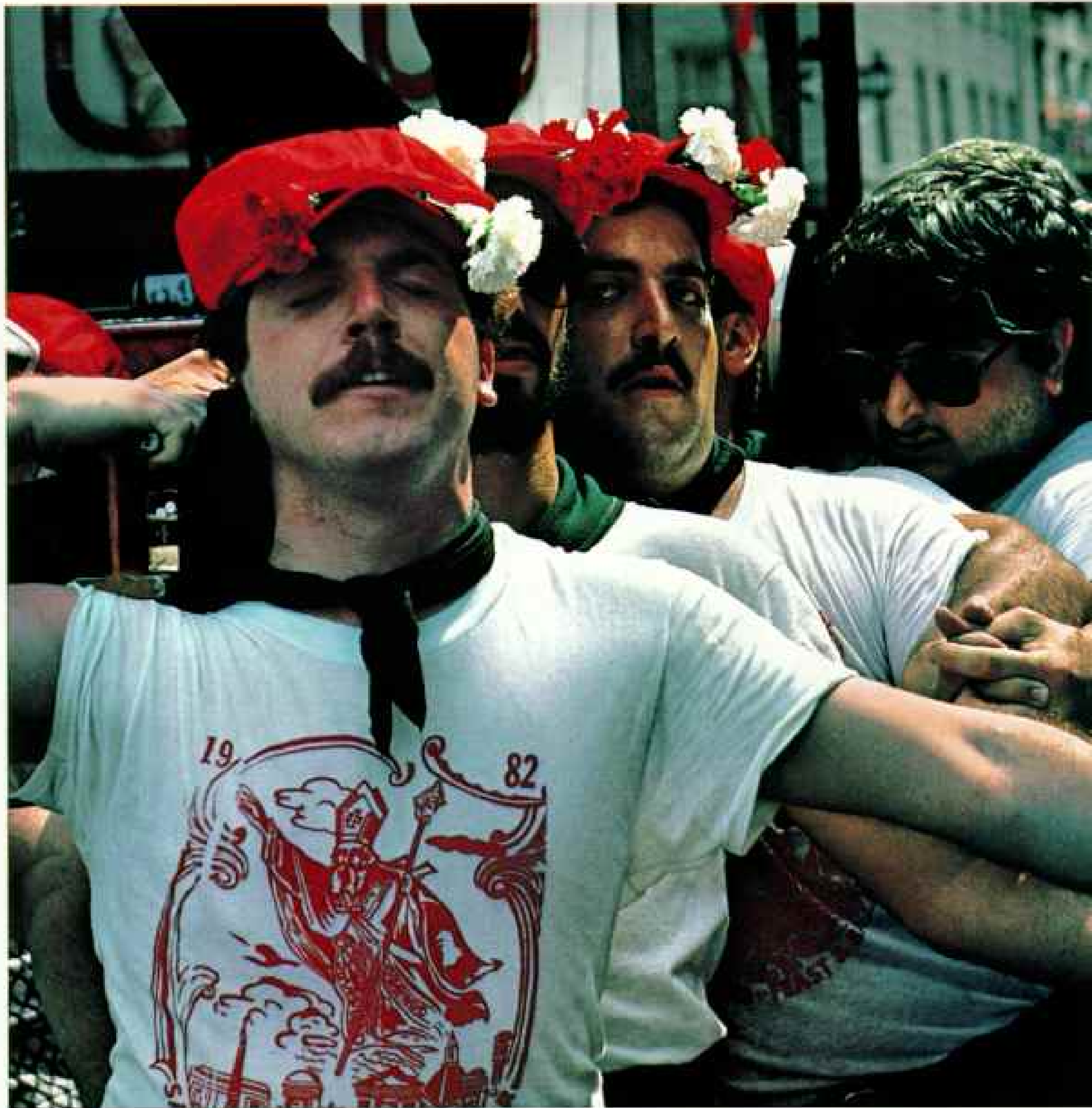
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*gives work to offspring, from left, Elena, Philip, Maria, and Emanuele. Ethnic diversity makes Brooklyn a United Nations of cuisines: Korean greengrocers sell tropical fruits, Greeks open new diners, and some chefs dish up kosher Chinese.*

***“I just got back from five weeks in Europe. I could have accomplished that same trip in Brooklyn.”***

BUDDY HACKETT, COMEDIAN FROM BENSONHURST



***“Long ago some Italians were kidnapped by pirates, and we had this saint who gave himself up to rescue them. If that happened today, we would do the same thing he did.”***

A LIFTER AT THE DANCE OF THE GIGLIO, GREENPOINT

*Together in piety and in play, Italians of Greenpoint commemorate a legend of sacrifice by Paulinus, Bishop of Nola, 16 centuries ago. After exchanging himself for captives of bandits and later being released, he was greeted with lilies by his people in the town near Naples. To this day they celebrate annually by carrying towers named for the lily, or giglio. Immigrants from Nola who settled in Greenpoint have reenacted the festival for the past 78 summers.*

*Wearing T-shirts silk-screened*



by a fellow parishioner, lifters (above) hoist a four-ton load (right), a platform bearing a brass band and an 85-foot tower topped by the saint's statue. An honorary capoperanza directs as the men—with a wiggle in their walk—dance with the tower past Our Lady of Mount Carmel Shrine Church, at left. The band plays the U. S. and Italian national anthems, then popular and religious tunes. Wives and girl friends cheer. As one comments, "Half of us are related; that's why we get along so well."



**"Nobody can know  
Brooklyn, because  
Brooklyn is the world."**

ARTHUR MILLER



Source of sadness to the Jews who sold their synagogue when they left deteriorating Ocean Hill, this building represents an accomplishment to the Bright Light Baptist Church, which bought and refurbished it. For successive groups, churches and synagogues serve as fortresses of communal life in a strange land and, as the sign broadcasts, help fulfill Brooklyn's promise to the world.

communicants. In the chancery office, about 20 blocks from his birthplace in "Bed-Stuy," the bishop stroked his head and joked, "My father was a barber."

He sees Brooklyn as history repeating itself. "When the Irish came in the early 1800s, here to Fort Greene, they were absolutely impoverished, they lived in rude huts. Then came the Germans, and the great inroad in the 1890s was the Italians—again they got the worst housing, the lowest jobs. Then the Jewish people from Delancey Street [in Manhattan], and more recently blacks from the South and the Caribbean, and more Spanish-speaking people. The next big group will be the Orientals, I think.

"We have in the process learned that you welcome newcomers. We have an immigration office; every priest is asked to have a second language. We celebrate Mass in 14 tongues. They like to come to Brooklyn, and that's great. It's a struggle, and there is still prejudice. But they are going to take their place in society. Of course, after they make a few bucks, they go out to Long Island, and Brooklyn loses population!"

TALK ABOUT immigrants or Brighton Beach and you are soon speaking of the Russian Jews. When the Kremlin eased emigration for its Jews in the 1970s, many chose the U. S. About 30,000 live in Brooklyn, 15,000 of them around Brighton Beach, where they have opened storefront markets, bookstores, and nightclubs, giving Brooklyn a new Russian neighborhood. Since most newcomers hail from the Black Sea port of Odessa, Brighton has been nicknamed Odessa by the Sea. Near Brighton's main street—gloomy, littered, and noisy under the rusting superstructure of an elevated train—apartments are cheap. They were vacated by elderly Jews who emigrated from the *shtetlach*, little towns, of Poland and the Soviet Union years ago.

The two groups have little in common, according to Sasha and Misha, émigrés working at the Shorefront Young Men's-Young Women's Hebrew Association. They shared observations with American colleagues and me over lunch at a café named Primorsky—by the sea—after one in Odessa.

"In the Soviet Union, Jewish was a nationality not a religion," Misha explained.

"Here we are considered Russian, which to us was another nationality and synonymous with gentile. It is all very confusing."

In Brooklyn, American Jews follow varied religious paths—Reform, Conservative, Orthodox, and Hasidic\*—and none. Many speak some Yiddish and follow kosher dietary restrictions. They want the newcomers to go to synagogue and join political and social organizations. They want to see children in yeshivas. They don't approve of nightclubs.

Both men work with Y programs to help Soviet teenagers deal with the dual problem of becoming adult and adjusting to a new culture. Curiously, when young people do become acclimated, they look just like the Italian teenagers of Bensonhurst.

In that large, well-established community, in Carroll Gardens, and in some blocks of Greenpoint live first- and second- and third-generation Italian-Americans. They treasure small two-family homes, fronted by wrought-iron grilles and backed by grape arbors and lush gardens of tomatoes and basil. They identify with their parish, and they expect their kids to behave.

My friend Lena Cohen guided me along the main street of Bensonhurst, 18th Avenue, to aromatic delis, choice pastry shops, and on a side street to an antique gas-fired contraption that roasted coffee beans to order. Then it was home to lunch in her parents' kitchen. Papa came from Calabria in 1908 to build a railroad in Ontario. When he settled here, he worked as a drapery cutter, raised his family, and now in retirement enjoys gardening with his wife. Would he go back? "Never, America is best."

Borough Park, the next-door neighborhood, is mostly Jewish, and on many blocks the two groups mix. Maurice Sendak, creator of children's books, has spoken of Jewish and Italian mothers who both had a third eye for knowing what kids were up to. "I thought Italians were just . . . Jews who had wine with dinner."

In such an environment my properly raised Catholic friend Lena met and married a Jewish man; they now live in Ditmas Park. She laughed, "My folks like my husband, and they were glad to see me married."

\*Harvey Arden wrote of Brooklyn's Hasidic Jews in the August 1975 NATIONAL GEOGRAPHIC.

**I**N MORE THAN a few instances, Brooklyn proved to me the aptness of an ancient Buddhist concept, "Out of the mud grows the lotus." Literally, in fact; the world-acclaimed Brooklyn Botanic Garden, a 50-acre paradise, rose in 1910 out of an ash heap. Now, on an annual budget of 3.6 million dollars, a staff of 100 oversees the rose garden, herb beds, fragrance garden for the blind, and Japanese gardens. A children's garden introduces Brooklyn youngsters to the joys—and trouble—of growing broccoli, eggplant, sunflowers, zucchini. Kemba Francis with her partner, Annette Salas, was hoeing: "Every week it's weeds, weeds, weeds. I like harvest best."

Mothers sometimes come as volunteers. Maconis Burrowes explained: "I heard they needed help. I had time, so I called and asked if they could use me. Things don't come to you in Brooklyn. You have to go out and see what the community has to offer and what you have to offer the community."

That's the way Mary Carmel Sullivan was raised. Among the green-shirted instructors, red-haired Mary stood out as the only Brooklyn native. Daughter of an Irish cop, she grew up with seven sisters in Marine Park. She got hooked by the garden at 16 and went to the University of Maryland to major in horticulture. There, she found, "People think you have limited vision if you grew up in Brooklyn. That it's so stifling. That's not true. My parents took advantage of the Academy of Music, the libraries. I'm thrilled to be back."

Mary rents in Park Slope, but she will have to move if her building is converted to \$130,000-a-floor co-ops as rumored. She realizes "You have to expect change. You could get blown away—mentally—by the litter, the noise, and the crime. You have to protect your heart—like ignoring the junkies seeking handouts—and yet be sensitive to those in need. It's like living in a jungle—it can be dangerous, but the rewards are terrific. This garden is number one."

Mary's parents retired and moved to Massachusetts. "To get out of Brooklyn was the American dream," she told me. "The funny thing is, sometimes they miss it."

I, too, got out of Brooklyn. Funny thing is, at the oddest moments I, too, miss the place. □



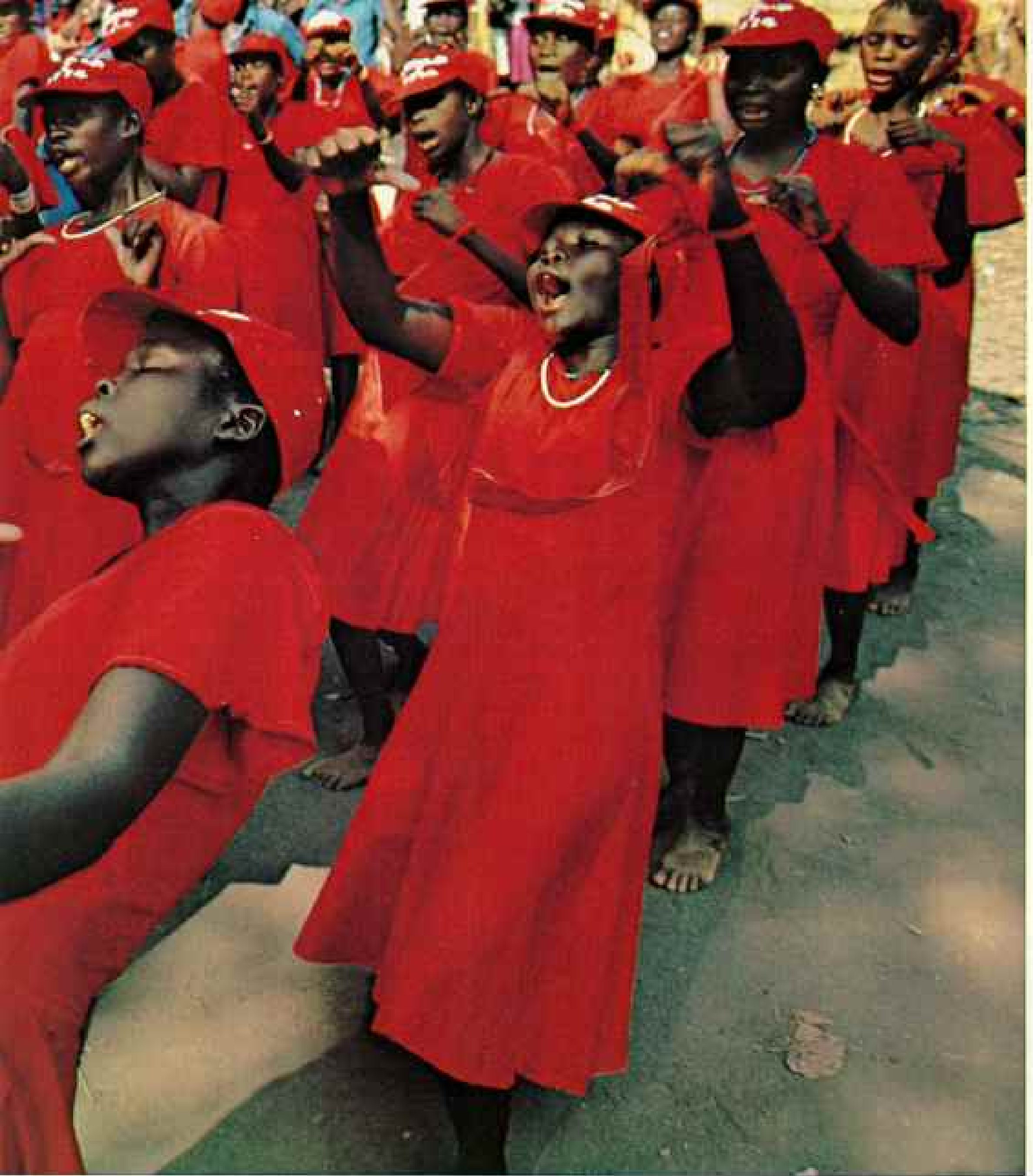


# Ethiopia: Revolution in an

**I**T WAS VERY HOT in Itang, a village in the low plains near the Sudan border. I was standing with 300 Anuak people in the shade of a huge mango tree, waiting for the dancing to begin. Suddenly red-uniformed dancers burst into the clearing (*above*), their hats emblazoned with the

hammer and sickle of revolutionary Ethiopia. With precisely timed movements they portrayed the triumph of the people and the downfall in 1974 of Emperor Haile Selassie.

"Revolutionary motherland or death," they cried. "ETHIOPIA!" the crowd roared back, and clenched fists flew into the air.



# Ancient Empire

ARTICLE AND  
PHOTOGRAPHS BY  
ROBERT CAPUTO

Addis Ababa, the capital, lay hundreds of miles away, but the changes that had been wrought there had rippled through the countryside to the edges of this ancient land.

The dancers disappeared. People began to jockey for positions at the front; waves of excitement swept the crowd. Uniformed

policemen pushed the crowd back to keep the center clear. Gourds of local beer that the Anuaks make from sorghum were passed around among the men.

A man in animal skins and beads, spear raised overhead, thrust through the crowd and into the circle. He danced wildly—

whirling, crouching, leaping at the onlookers, driving them back with his fierce stare. The other dancers followed. All had discarded their bright new uniforms and donned traditional Anuak dress.

Songs, ululations, and dust filled the air as their feet beat the earth in their ancient courtship dance. The men strutted cocklike to impress the women, rolled in mock battles with each other over the most desirable mates. The spectators broke the police circle and joined the dance. Where before there had been tightly choreographed revolutionary dances, there was now a chaotic swirl of gleaming bodies. The revolutionary songs had implored the people to continue the struggle for the new society. But the old ways do not vanish overnight; the traditional dance has a stronger pull on their hearts.

**I**T WAS NEAR the beginning of my five-month visit to Ethiopia that I drove to Itang. I was among the first Western journalists to travel freely in Ethiopia since the revolution, and this disparity

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American free-lance photojournalist **Robert Caputo** has been covering Africa for more than a decade. His article on Sudan appeared in the March 1982 *NATIONAL GEOGRAPHIC*.

between old ways and new I was to see again and again.

The Ethiopians trace their roots back 2,000 years to the kingdom of Aksum and cling fiercely to their traditions. But since the revolutionary victory in 1974, Ethiopia has witnessed one of Africa's most dramatic social changes. It was a rebellion not against a foreign colonial power but against their own ancient system. A new drum beats in Ethiopia. As with the Anuaks, the new dance is quite different from the old. It will take time to learn the steps.

Ethiopia, nearly three times the size of California, lies in the Horn of Africa (map, page 622). Unlike other African countries, it was never colonized by a European power—Ethiopia was itself expansionist. Beginning about the first century A.D., the Aksumite and then the Christian Amhara empire spread out from the highlands, seizing land and incorporating peoples well into the 19th century. The British, French, and Italians, then scrambling for Africa, were compelled to treat the emperor of Ethiopia as an equal, and signed treaties with him delineating areas of respective control. Though Eritrea was colonized by the Italians in 1890, Ethiopia as a whole remained independent except



*Rituals of old help usher in the new as Ethiopia casts its future in the socialist mold. With the fall of Emperor Haile Selassie in 1974, cultural troupes now proselytize among the nation's 80-some tribes and peoples. In the far-western village of Itang, a spirited Anuak tribesman performs in a courtship dance as women, at right, wait to join in. The dancers celebrated their return to the village after a three-month indoctrination course in the ways of the new regime.*

for the Italian occupation from 1936 to 1941.

Modern Ethiopia includes about 80 ethnic groups. Some, notably in Eritrea and the Ogaden region, have never been happy about being incorporated into the empire, and their struggles against the government continue today.

Apart from political fragmentation, the Ethiopian environment is diverse. The south and west have low hot grasslands and acacia woods. The center is a rugged landscape of high mountains and deep gorges. In the east a low coastal strip lies between the highlands and the Red Sea.

The hub of the country is Addis Ababa, which means "new flower," a blossom of Menelik II, who founded the city in 1887. The physical climate of Addis is almost perfect. At 8,000 feet—its modern buildings rising from a sea of mud-walled huts—the sprawling, wide-avenued city of more than a million people has warm but not hot days, and pleasantly cool evenings. From here Haile Selassie, King of Kings, reigned for 45 years as the 225th emperor claiming descent from the union of King Solomon and the Queen of Sheba.

But the ancient feudal system of the empire was outmoded in the 20th century. Aristocratic Amhara landlords and the church owned most of the land. Poor tenant farmers were forced to pay a portion of their crops in rent, but got little in return. The few schools and hospitals were in urban areas and served the elite.

"Haile Selassie began some modest reforms," a Western observer in Addis told me. "He pulled Ethiopia out of the 12th century . . . into the 13th. Like the former shah of Iran, he seemed unaware of the discontent sweeping his realm."

Years of unrest and frustration erupted in military mutinies, strikes, and demonstrations in 1974. A group of junior officers and noncommissioned officers, having imprisoned their commanders, formed a committee called the Derg and seized power. It deposed Haile Selassie in September (he died in detention in 1975). Lt. Col. Mengistu Haile Mariam, rising ruthlessly to become chairman, proclaimed the country Marxist-Leninist.

But the struggle for power between military and civilians during the revolution has

left its scars. Some civilians launched a campaign of assassination to get the Derg to heed their demand for a civilian government. Mengistu's response was the "red terror." Violence swept the streets of Addis for several months in 1977 and 1978 as the Derg's forces rounded up "counterrevolutionaries." At least 10,000 people died.

David Wood, reporting for *Time*, recalls hearing gunshots every night and going out in the morning to find bodies in the street. In the beginning, as a further humiliation, relatives of some of those slain had to pay the government before they could claim the bodies for burial—to reimburse the authorities for the cost of the bullets.

**C**HAIRMAN MENGISTU and the Derg are still securely in power; many political prisoners have recently been released, though thousands remain behind bars. Still, the Derg's security seems largely based on coercion and fear. Critics of the regime are afraid to talk openly. To them the Derg is a new elite, and Mengistu as autocratic as the old emperor.

The press is as censored now as it was under Haile Selassie. Strikes are almost unknown, and dissent is branded counterrevolutionary. Critics see little change in the style of government: "Ethiopians are used to autocratic rule," one Addis resident told me. "It is our tradition to obey strong rulers. Haile Selassie was the 'Elect of God, Defender of the True Religion.' Mengistu is the 'Elect of Marx, Defender of Socialism.' We are very religious people, you see. Dissent has always been heresy."

An enormous poster of Marx, Lenin, and Engels, the "new Trinity," gazes down on Revolution Square, but the King of Kings cannot be entirely erased from people's minds. I stopped a passerby to ask the name of one of the main streets. He paused, then laughed. "It used to be Haile Selassie Avenue, but now I don't know what it is."

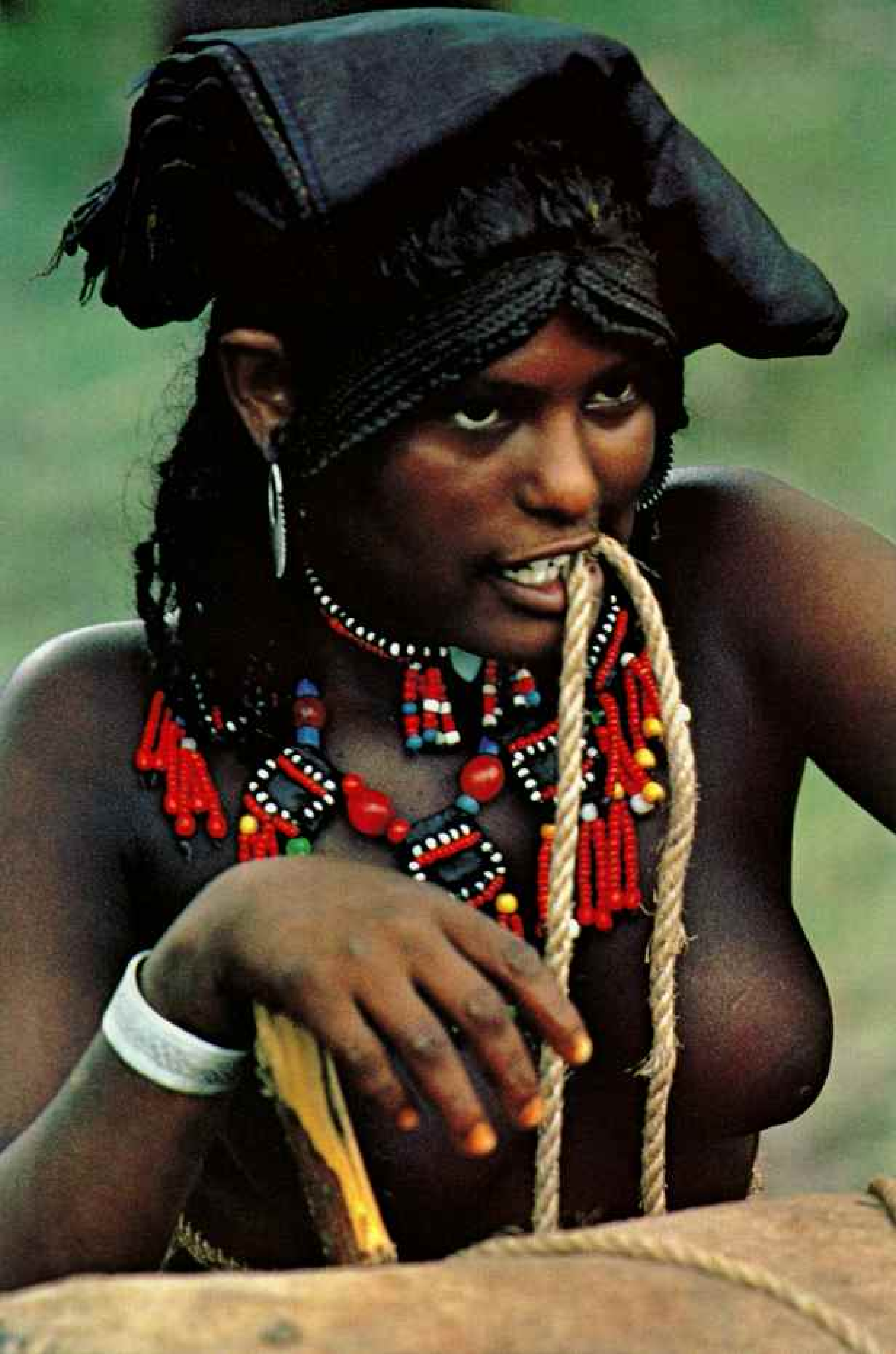
From the end of World War II until the revolution, Ethiopia was the United States' closest ally in Africa, mostly because of its strategic position at the door to the oil-rich Middle East. Haile Selassie's government received millions in aid and military supplies and was host to hundreds of American advisers. *(Continued on page 623)*

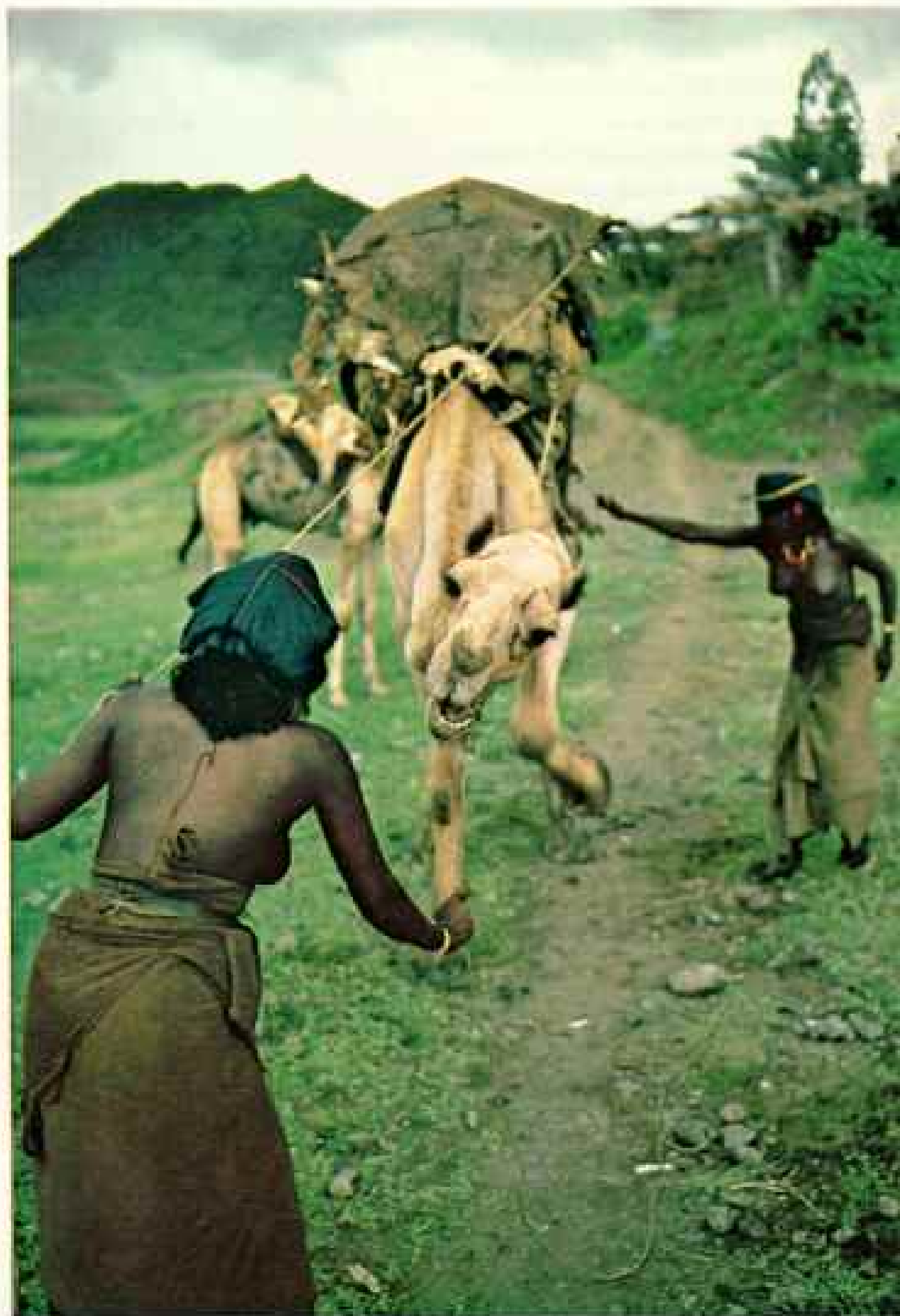


*Blue mountain majesty overlooks the rich grassland of the Bale area, where cattle of the Oromo people graze beneath acacia trees. Like other Ethiopian peoples, the Oromos—the nation's largest ethnic group, with some ten million people—were subjugated by the Amharas, who ruled as feudal landlords and*



*claimed half of all crops, as well as labor service. With socialist leadership came sweeping change. The land-reform act of 1975 banned tenant farming and nationalized rural land. The government promised each peasant family the right to farm as many as ten hectares (25 acres).*





*Toughened by rigors of the desert, two gritty Afar women contend with 120°F temperatures, temperamental camels, and a week's journey just to get to Sunday market. Leading camels loaded with goatskins, butter, and milk, the nomadic Afars trade for cooking oil, onions, and grain in the highland Oromo village of Sampati. A determined cameleer (left) secures a bundle atop her beast before heading for home in the Danakil Depression, lowest point in Africa. Protesting its burden, the animal rose snapping and snarling (above). To ward off bad luck, these Muslim women wear leather amulets containing herbs or verses from the Koran. Legendary descendants of the biblical Ham, the fierce, proud Afars—also called Danakiis—chafe under today's regime; like other tribes, they are agitating for change.*





- ✦ Medieval Ethiopian church cluster
- △ Refugee shelter area
- ✦ U.S.S.R. military access (air, naval)
- ✦ U.S. military access (air, naval)
- BALE—administrative region

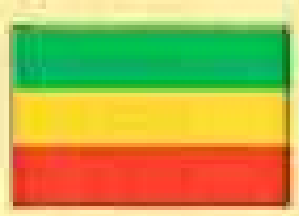
Ethnic groups in red  
(Maji and Kara: subgroups of Sidamo)

0 200  
0 200  
KILOMETERS  
STATUTE MILES

# Ethiopia

**A**FRICA'S OLDEST independent country traces its roots to the ancient kingdom of Aksum, forged during Roman times by Semitic tribes from the southern Arabian Peninsula. As the empire evolved, the Amhara people rose to the top level of the feudal society. The royal family claimed a succession that began with a son born of the legendary meeting of King Solomon and the Queen of Sheba. Haile Selassie, 225th in that line, died in detention in 1975.

**AREA:** 1,221,900 sq km. **POPULATION:** 31,000,000. **CAPITAL:** Addis Ababa. **RELIGION:** Muslim, Ethiopian Orthodox (Christian), animist. **LANGUAGES:** Amharic, Oromo, Tigrinya, English. **LITERACY:** 35 percent. **LIFE EXPECTANCY:** 40. **GEOGRAPHY:** Mountainous; high, temperate plateaus; hot lowlands and desert. **GOVERNMENT:** Provisional military. **NATURAL RESOURCES:** Potash, salt, gold, copper, platinum. **ECONOMY:** Coffee, cereals, oilseeds, sugar, livestock, hides, cotton, textiles, processed foods, cement, hydroelectric power.



MAP BY JAMES E. HIGLALARD, COMPILED BY DAVID C. CHERR, NATIONAL GEOGRAPHIC CARTOGRAPHIC DIVISION

(Continued from page 617)

Now Ethiopia is allied with the Soviet Union. The Russians have supplied the continuing wars in Eritrea and the Ogaden, first on the side of the Eritrean and Somali secessionists, but since 1977 on the side of the Derg. These wars, now planned and directed by Soviet and Cuban cadres, have left the Ethiopians with a debt to the Russians of more than two billion dollars for arms and ammunition. For the world's sixth poorest country, this can only be described as a staggering debt, which has led to heavy dependence on the Soviet Union.

But the Russians are not very popular with the Ethiopian people. In Addis's huge market, as I made photographs, I was often mistaken for a Russian, or for one of the 15,000 Cuban troops brought in to support the government in the Ogaden war in 1977, and who remain. Children ran after me yelling "comrade," or "Cuba, Cuba." The adults, however, usually glared.

At one stall I asked a woman whether I could make a photograph. She shook her head. When I persisted, she asked whether I was Russian. "No," I replied. "I am from America." Her face broke into a smile, and she asked me in, saying I could make as many photographs as I wanted.

"The Russians have no manners," a university-educated Ethiopian friend told me. "They do not even know how to say hello. They stay by themselves. When the Italians came, they mixed, even though there was war. They opened restaurants, married Ethiopians, and lived *in* Ethiopia. Americans were the same. They were curious and open. They went to bars, ate our food, and mixed with the people. The Cubans we feel sorry for; they are here because the Russians tell them to be, and they are mostly children, those young soldiers."

**A**T THE TIME of the revolution, Ethiopia was one of Africa's poorest countries and had the lowest life expectancy of any country in the world—39 years. Ethiopia is still poor, but the revolutionary government is bringing very real changes.

In Addis I visited a class that was part of the massive literacy campaign the Derg launched in 1979. Though Ethiopians have had their own written language for 2,000

years, the illiteracy rate was 93 percent. In just three years, they say, it has fallen to 65.

"I used to think that reading and writing were something magic, something for people of high birth," Tiruwork Yilma told me. A woman of 50, she was experiencing her first exposure to education. "Now I can sign my own name instead of using my thumbprint, and I can read the numbers on the bus. I feel part of a larger world."



*Portable road show: An itinerant tradesman at a market in the southwestern village of Kako charged customers a hefty price to look through a View-Master at "Pilgrimage to Mecca" or "Pluto Tries to Become a Circus Dog." This Bana tribesman exhibits the traditional headdress of hair matted with colored clay and topped by an ostrich plume.*



*Showing the flag in its allegiance to socialism, Addis Ababa (above) decorates for May Day, international socialist workers' day. On a banner overlooking a service station and Revolution Square beyond, a hammer-wielding worker prepares to smite an octopus wearing an Uncle Sam hat labeled "Imperialism" in Amharic. Pursuing a less didactic craft, Zerihun Yetimgeta (left), a teacher at Addis Ababa Fine Arts School, modernizes traditional Ethiopian religious motifs. Students cram for final exams at the former Haile Selassie University (right), renamed the University of Addis Ababa.*



The new government is not doing so well with food and housing in Addis, where both are in short supply and bakery breadlines common. The rural people—85 percent of Ethiopia's 31 million—have benefited most from the revolution, just as they were the worst off before it.

I drove south past the lakes and hot springs of the Great Rift Valley, and then east into the mountains of the Bale area, inhabited by the Oromos, largest group in Ethiopia. The Oromos, many of them Muslim farmers, have lived here for 400 years.

Emperor Menelik II conquered Bale at the end of the 19th century and divided up the land and the services of the people among the royal family, the church, soldiers of the conquering army, and other friends of the crown. Collaborators became government agents and landlords over their own people. The farmers became mere landless tenants.

These tenants, as tenants everywhere in Ethiopia, had to surrender as much as half of their crops and stand ready to provide unlimited labor to their landlords.

**T**ODAY IT IS DIFFERENT. Oromo farmer Ayyele Neggo, behind his ox plow preparing his field for barley planting, told me: "Life is much better here now, because everything I grow is mine. Before, I had to give half to the landlord, but what did I ever get in return? Nothing. Now my family has more to eat, and there is a school and a health station. I go to literacy class for two hours every morning. I can read a little and am learning to write. It may not do much for me—I am old. But my children, they can already read and write. They will have a better life."

(Before the revolution Bale had 32 schools, only one a secondary school. Now it has 186 primary, 15 junior secondary, and three senior secondary schools, plus the adult literacy campaign.)

Stretching east from Bale to the border with Somalia lies the Ogaden region, where the national revolution is less in evidence than war. The posters of Marx, Lenin, and Engels were here replaced by another trinity—Mengistu, the late Leonid Brezhnev, and Fidel Castro, men more immediately concerned with the area. Here I saw Soviet

military officers and many Cuban troops.

The Cuban presence dates from the 1977 invasion by Somalia, which contends that the Ogaden people, who are ethnically Somali, should be part of Somalia, not Ethiopia. The Russians shipped massive arms supplies to Ethiopia, and the Cuban troops were flown in to spearhead the counterattack. Neither Soviet advisers nor Cuban soldiers show any intention of leaving.

**T**HE SIGNS OF WAR are everywhere in the Ogaden. I drove east from Dire Dawa to Jijiga, a town about 40 miles from the Somali border that had been overrun in 1977. Along the road that marked the progress of the Somali invasion and the Cuban-led counteroffensive, I saw burned-out tanks. At each bridge and atop hills, army outposts kept watch for guerrillas, who still seek self-determination.

Jijiga seemed to be made up entirely of soldiers—Ethiopian and Cuban—and refugees. At the refugee camp on the outskirts of town about 12,000 people live in four-foot-high huts (pages 634-5). This is not the way these nomads are used to living, but they have become completely dependent on the food and medicine in the camp. All in all, more than a million people have been forced into camps in Ethiopia and Somalia by the continuing conflict over the Ogaden.\*

"When the war started we lost all our camels and cows," Mohamud Mohammed explained. "We were frightened and had to flee. I came here three years ago—I have nothing of my old life left. Now I must live with my family in this little hut. There are seven of us, and in this little place we must cook, sleep, and seek shelter."

On the day I was in the camp, a relief agency was handing out sorghum from sacks emblazoned with "Furnished by the people of the United States of America." Everywhere I went, I saw food from America—wheat, cooking oil, soya and milk powder. It struck me as ironic that the Ethiopians' closest ally, the Soviet Union, supplies them with weapons, while America, which they condemn, keeps them from starving to death.

\*Robert Paul Jordan reported in the June 1981 *GEOGRAPHIC* on this strategic region, guerrilla warfare, and wretched refugee conditions.

By contrast to the Ogaden, the remote valley of the Omo River, just north of Lake Turkana and Kenya, has been untouched by international conflict. On the southern fringes of Ethiopia, the region had been only nominally part of the empire. I wondered if it had become part of the revolution.

I borrowed a Land Cruiser from the Omo park headquarters at Mui and set off to explore. The Omo Valley is quite unlike high, cool Addis. The grasslands stretch off to the horizon, broken by stands of flat-topped acacia trees. Herds of buffalo, zebra, and antelope crossed the dry plains in search of water. At night, elephants circled my camp to a small stream nearby. A pool in the stream, I discovered as I was about to dive in to seek refuge from the oppressive heat, was full of crocodiles.

I had arranged for a car from Addis to meet me on the east bank, and I left the park, crossing the Omo in a canoe to the land of the Karas. Like other small tribes, the Karas eke out their living by cultivating the banks as the rainy season floods subside.

"Our life is the Omo," Galefo, an old Karas man, said. "When the flood is good, our lives are good. When it is bad, then we are suffering. It has always been like this."

**S**ET UP CAMP near the river, and some Karas came to watch me erect my little orange "hut," hoping to sell me firewood or water brought up from the river. We sat around the campfire and cooked a goat I had bought from them.

While we shared the goat meat, Galefo explained that the Ethiopian revolution has been felt even in his remote Omo Valley. "Students came from Addis and told us about the revolution. They said we should organize into a peasant association and elect someone to speak for us. The people chose me to be chairman because I am the only one who can speak Amharic [Ethiopia's official language], and the only one who has ever been to Addis."

Was life much different for the Karas now? "In this new government, if there is hunger or drought, they send us help. Last year they sent us maize, flour, and butter. The old government never helped us."

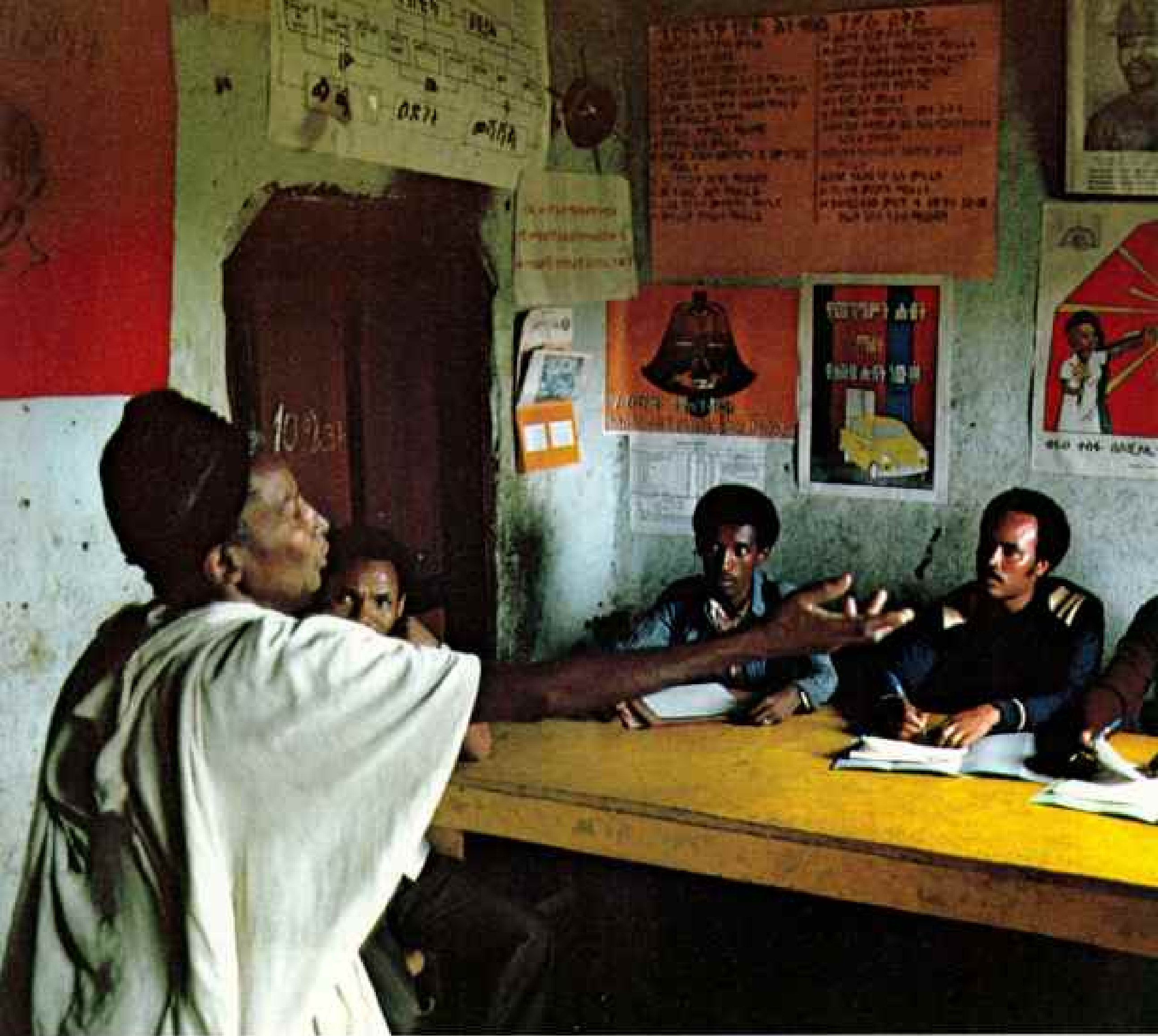
In the early 1970s, Galefo said, there was severe drought and famine in the northern



provinces of Welo and Tigray. Haile Selassie's government tried to cover up. It refused to seek aid from international relief agencies. Largely because of this official neglect, some 200,000 people eventually starved to death. The famine was one of the direct causes of the revolution.

I left the Karas and the hot Omo Valley, driving northeast and ascending to Jinka, a small town that serves as an administrative outpost for this remote part of Ethiopia.

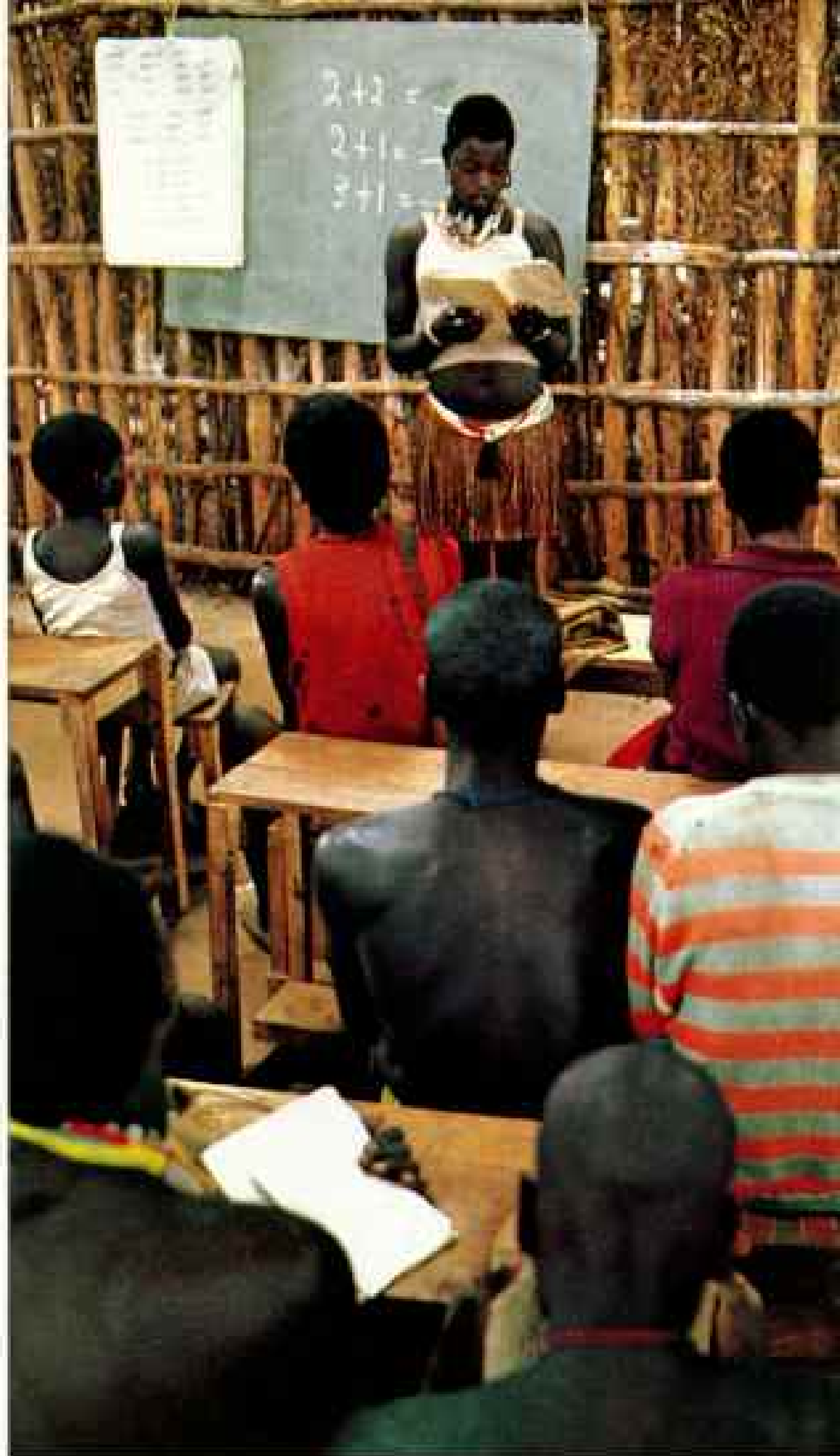
*Like an echo, Italianate decor and cuisine linger in an Asmera restaurant, recalling Eritrea's days as part of Italian East Africa. Once dominated by Ethiopians and Turks, Eritrea was a colony of Italy from 1890 to 1941, when it came under British control. Federation with Ethiopia in 1952 was rescinded by Haile Selassie a decade later, triggering a rebellion that continues as Africa's oldest war.*



*Judge and jury, city council and school board—the kebele, or urban dwellers' association, steers the course of life at the local level. Each kebele elects a minimum of 15 members who provide civil authority. After two lower courts ruled against her in a civil case, a woman makes her third and last try before the kebele appeals court in the southwest town of Jinka (above). Posters bear such slogans as "The people's hope is the path of socialism" and "The property of the government is the property of the people." Revolutionary Ethiopia's leader, Mengistu Haile Mariam, presides in portrait over the courtroom. Mengistu's power lies in his chairmanship of the Derg, the central committee, which runs the provisional*

*military government. Determined to follow its own course, the Derg has yet to adopt a constitution or form a Communist party, an irritant to its Soviet allies.*

*In the manner of their urban counterparts, peasant associations administer health and welfare programs. In the southern region of Gamo Gofa a woman recites in Amharic before her literacy class (upper right). To fight infant mortality, mothers are taught simple techniques for diagnosing and treating common ailments. A government worker near Beneta (right, at left) helps a Maji woman weigh her baby in a program assisted by Medical Missionaries of Mary, an Irish Catholic order.*





*Grass-roots supporters for women's rights, Jinka villagers fall in behind the national flag during the International Women's Day observance. But only one of the six speakers was a woman, and most merely extolled the revolution. Even so, female enrollment in literacy schools is high—especially among younger women—and some men now baby-sit to enable their wives to attend.*

"Under the old regime," said the area administrator, Tsehaye Alemayehu, "this area was forgotten. Our task is to get people to organize." The people of Jinka have already been organized into a *kebele*, the urban equivalent of the peasant association, responsible for carrying out collective projects. Its elected officers also serve as judge and jury in court cases.

I spent a week in Jinka and in the evenings ate the traditional Ethiopian meal of *injera*



and *wat*, a flat pancake-like bread and stew. Etalem Legessa, the owner of the small restaurant, sat with me one evening. She was dressed in the green uniform of the people's militia. Her young daughter, Abyot (Revolution), sat on her knee.

"My life has completely changed," Etalem said. "Before, women had to do as they were told, and if you upset your husband, he could beat you. Now all that is gone. Now I have my own business, and if anyone abuses

me, I can go to the kebele and complain."

Ethiopian women were quick to realize that new opportunities were arising from the revolution. In Addis, Mr. Gudeta Mammo, head of the Adult Education Department, told me: "Seventy percent of the people who enrolled at the beginning of the literacy campaign were women, though their husbands often tried to keep them at home. One woman threatened to divorce her husband unless he attended classes with her."

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*Bouquets of kat peddled by a train-station vendor (below) will help ease the journey on the Addis Ababa-to-Djibouti railway. Legally grown and sold, leaves of the prolific plant are chewed for their mildly stimulating effect, a popular boost for field workers. Consumed in quantity, the habit-forming juice produces euphoria. Women of the Adari people chew kat and smoke tobacco in the women's section of a house in the walled Muslim city of Harer (right).*



Great strides have no doubt been made in freeing Ethiopian women, but on International Women's Day in Jinka, of six speeches only one was delivered by a woman.

**S**O FARI had been traveling in the newer parts of the empire. Now I moved into the Abyssinia of old, north of Addis, the heartland of the ancient Christian Amhara kingdom, foundation of Ethiopia's long tradition. Here the Ethiopian Orthodox Church arose in the fourth century when the king of Aksum was converted by a Syrian monk, and here it maintains its



medieval splendor and strong hold on the people. Here I was told the Ethiopian story of creation:

"When God made men, He molded them from clay. He put the first batch in the fire, but left them in too long and they came out burned and black. He threw them away down south. The second batch He took out too soon and they were pasty white. He threw these away to the north. The third batch came out just right, and He put them in Ethiopia."

The Ethiopian Orthodox Church pervades the life of most Amharas, who believe

they are the chosen ones of God. They are convinced that Menelik I, the son of King Solomon and the Queen of Sheba, took the true Ark of the Covenant containing the stone tablets of the law from Jerusalem and brought it to Ethiopia, where its presence has bestowed a special grace on the people.

I drove northwest from Addis through rich farmland and the deep gash of the Blue Nile gorge. I was headed for Gonder, one of the early capitals of the empire. For centuries emperors had moved their seats of governments and entourages around to keep regional dukes in line. In the rolling hills 633





*Stranded by conflict, thousands of ethnic Somali nomads huddle at Jijiga refugee camp in the Ogaden (above), victims of the 1977 war between Ethiopia and Somalia. A cow finds meager grazing beside a Soviet-built*

*Somali tank cannibalized for parts. The government cooperates with relief agencies in distributing sorghum donated by the United States (right). Children age six and under receive milk and beans twice a day (below).*





north of Lake Tana the imperial court settled down, and the emperors built wondrous castles unique on the African Continent.

At Gonder they also built many churches. It was Easter Saturday when I arrived, and at 8:30 that evening I went to Mass at the church of Debre Berhan Selassie. The building is 300 years old, but the feeling of the Mass was much older, harking back to the early days of Christianity. In the semidarkness the choir of 20 white-robed deacons beat drums and sang slow chants. The priests read from the Bible in the ancient liturgical language Geez, which only a minority understand. Incense burners filled the old church with frankincense, and candles cast flickering golden light on the holy paintings on walls and ceiling.

The Mass went on into the night. The *tabot*, the representation of the true Ark, was brought out of the holy of holies and paraded three times around the church, preceded by a bell ringer. There were no pews in the church, and most of the congregation was huddled on the floor, exhausted by the late hour and a two-day fast. At three in the morning the service drew to a close.

**T**HESE OLD RITUALS have changed little since Christianity arrived. Invasions and now a revolution have buffeted the church, but it has clung to its ways, just as the people have clung to it. "These are the things we know from our fathers, these are the important things," an Amhara farmer said.

After the revolution the Derg cracked down on the church—nationalizing church land and imprisoning the patriarch. The government could nationalize land, but not people's beliefs. Their faith was not something the people wanted tampered with; the government soon changed its mind.

With their strong belief in their own ancient traditions, the Amharas are not impressed by Johnny-come-lately Marxism. "This Marxism, it is just more *ferengi* [foreigner] nonsense," I heard over a glass of beer in a bar. "When the Italians came, they thought they would be here forever, but they are gone. Now it is our friends from the East—they have come with their ideas. But it is we Amharas who were here yesterday, and it is we who will be here tomorrow."



**F**ROM GONDER I wound along a track that climbs to Simien Mountains National Park headquarters at Sankaber. Looking from there, I understood why the ancient customs have so endured in north-central Ethiopia. As far as I could see stretched flat-topped mesas, called *ambas*, and high ridges, separated by gorges thousands of feet deep. The rivers that carved the gorges are unnavigable, and during the rainy season cannot even be crossed. The people who cultivate the rocky soil of the *ambas* live two or three days' walk from the nearest road. Their contact with the rest of the world is now, as it always has been, extremely limited.

In Sankaber I hired some horses and guides and set off into the mountains. The trail winds around the steep slopes, emerging onto a 12,000-foot-high grassland. There I found the village of Geech, settled by Muslim farmers generations ago.

There may be as many Muslims as Christians in Ethiopia, though Muslims were beyond the pale in the empire, forbidden to own land or hold public office. They were segregated in their own villages or in ghettos. Many Muslims became merchants or craftsmen, occupations Amharas considered beneath their dignity.

One of the most dramatic events of the revolution was in April 1974, when 100,000 Muslims marched through the streets of Addis demanding an end to religious discrimination. One of the first acts of the new government was to put Islam on an equal footing with Christianity.

The Simien village of Bweiteras is the home of another formerly persecuted religious group, the Beta Israel, or Falasha. They were not allowed to own land and were forced to make their living as potters and ironsmiths. These are the black Jews of Ethiopia, led here from Jerusalem, some say, by Abba Musie (Moses). When their existence became widely known in the 1860s, they were surprised to learn there were other Jews in the world. In the face of all efforts by

Christians and Muslims to convert them, some 30,000 have maintained their religion.

Despite the claim that they are a lost tribe of Israel, the Beta Israel are probably remnants of indigenous people of the highlands who resisted the advance of Christianity and clung to Judaism, an earlier import. They are Amharas in language and customs. But religious difference was enough for discrimination, and they were forced to live by providing services for the Christians.

After my encounter with the age-old ways of the hinterlands it was a shock to return to Addis and the strident speeches of May Day.

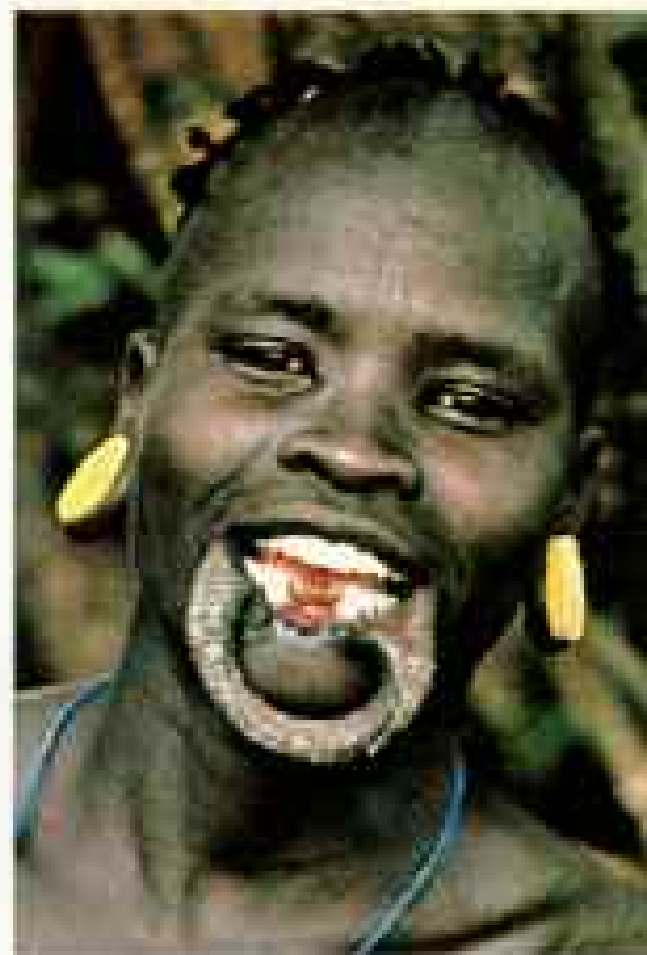
Chairman Mengistu went on about the machinations of "Western imperialists," and their manipulation of the "bandits" who are fighting guerrilla wars in the Ogaden, Eritrea, and other parts of Ethiopia.

Like Emperor Haile Selassie before him, Mengistu tends to blame outsiders for Ethiopia's problems. He has also condemned the United States for having military access to facilities in the Horn of Africa (such as the naval base in Berbera in Somalia), but was silent about the Russians' Ethiopian anchorage in the Dahlak Archipelago of the Red Sea.

Though Mengistu's speech was full of Marxist rhetoric, there is some question about how much of a Marxist he is. A diplomat in Addis told me, "The Russians have been pushing him to form a Communist party for years, but he keeps putting them off. He is probably much more of a nationalist than a Marxist. The slogan of the revolution, after all, is 'Ethiopia First.'"

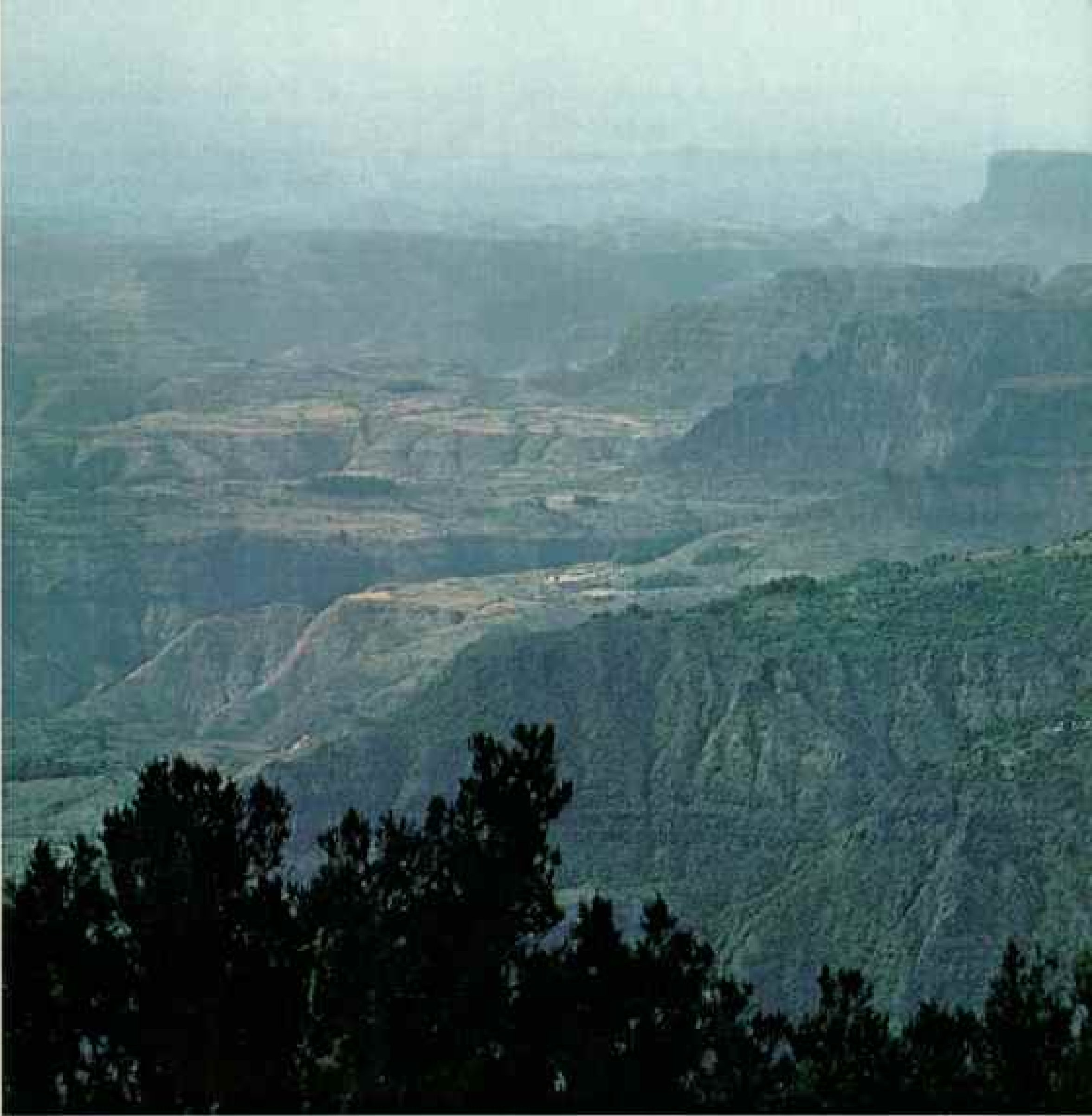
My last side trip was to Eritrea, which became a

*(Continued on page 642)*



*Reward of beauty follows a years-long regimen for Mursi women of the Omo Valley. From childhood on, a progression of clay plates are fitted into a lip hole, stretching the skin to the desired size (left). Space provided by removal of the lower front teeth (above) helps hold the plate in place.*







*Rugged aeries shelter man and animal in the Simien Mountains (above). Yet the walia ibex (left) stands close to extinction, with only about 300 surviving. Nearly all roam the 87-square-mile Simien Mountains National Park. Some attribute the ibex's initial decline to the Italian occupation during World War II, when peasants resorted to slaughtering them for meat. The encroachment of agriculture has replaced poaching as the greatest threat to the goat.*

*Rare but not endangered, the elusive gelada baboon (right) flees when alarmed. It feeds in troops of as many as 300. Tilling clifftop plots, Amhara farmers raise barley and wheat, then load mules for the perilous descent to market.*





*Safeguarding her keepsakes, an Amhara woman wears remembrances of her wedding day, tattooed just after marriage: a tier of necklaces and her maiden name, which she carries throughout life. The cross design, repeated in her embroidery, typifies the garb of the devoutly Christian Amharas. The cross also dictated the shape of Beta Giyorgis (left), an Ethiopian Orthodox church cut out of bedrock. It is one of 11 carved at Lalibela in the 12th and 13th centuries. A priest of Narga Selassie Church at Lake Tana (right) steps from behind doors guarded by angels. Within lies the tabot, representing the fabled Ark of the Covenant. Since the revolution the Derg has inventoried church relics and placed some priests on salary.*



source of trouble for Ethiopia centuries ago—and still is. This northern region includes the low coastal strip along the Red Sea, which, because of its strategic location, has been dominated by various foreign powers. The Italians held the region as a colony from 1890 till 1941. In 1952 Eritrea was federated with Ethiopia but was supposed to retain considerable regional autonomy. This did not sit well with Haile Selassie, and in 1962 Eritrea was incorporated into the empire as just another province as the Eritreans waged their war of independence.

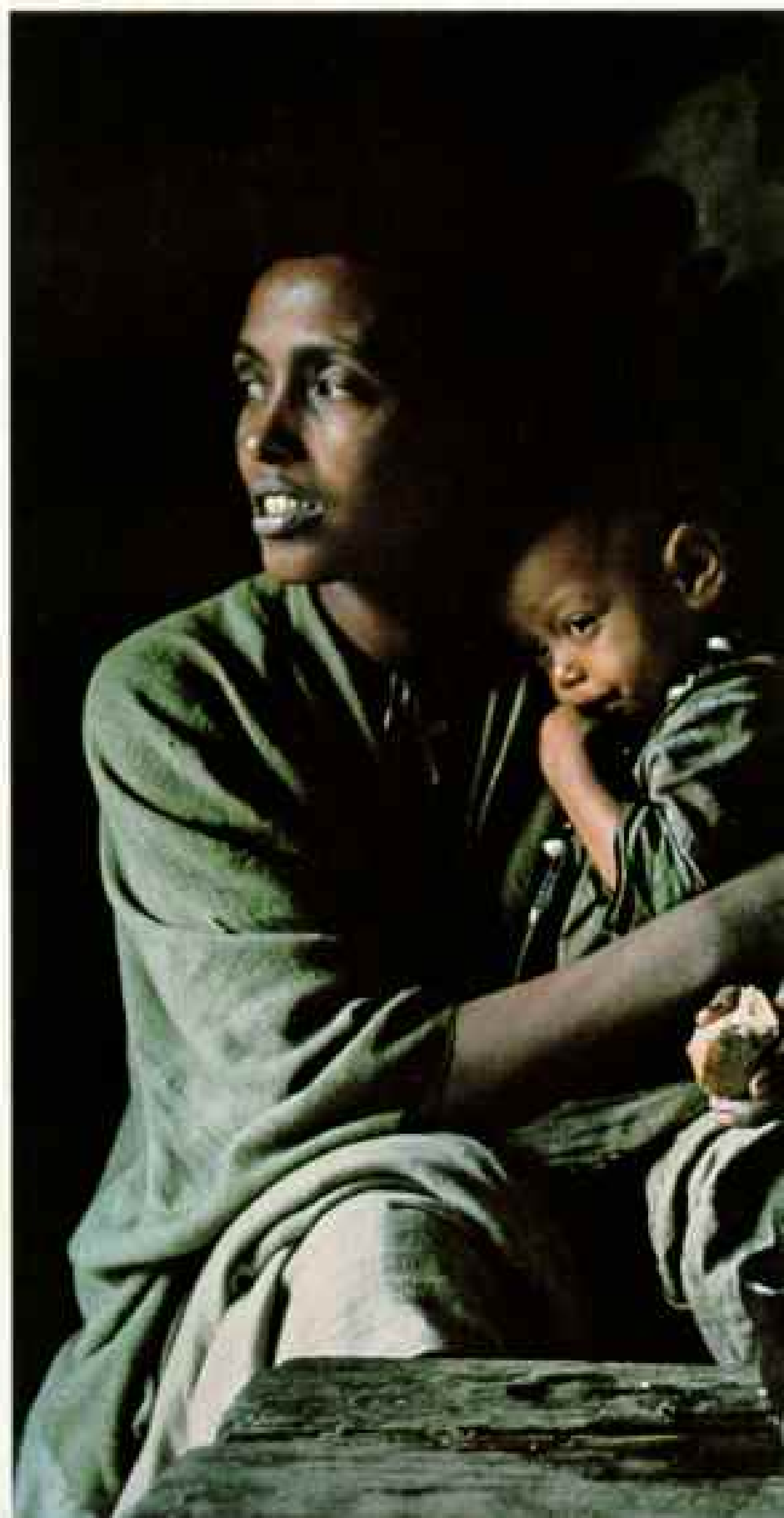
The Derg inherited the Eritrean problem, and in January 1982 it launched the Red Star campaign to “wipe out the secessionist bandits” in two months. Despite Soviet military advisers and vast quantities of Soviet arms, Mengistu’s 130,000 troops were still bogged down when I arrived in Eritrea four months after the campaign had begun.

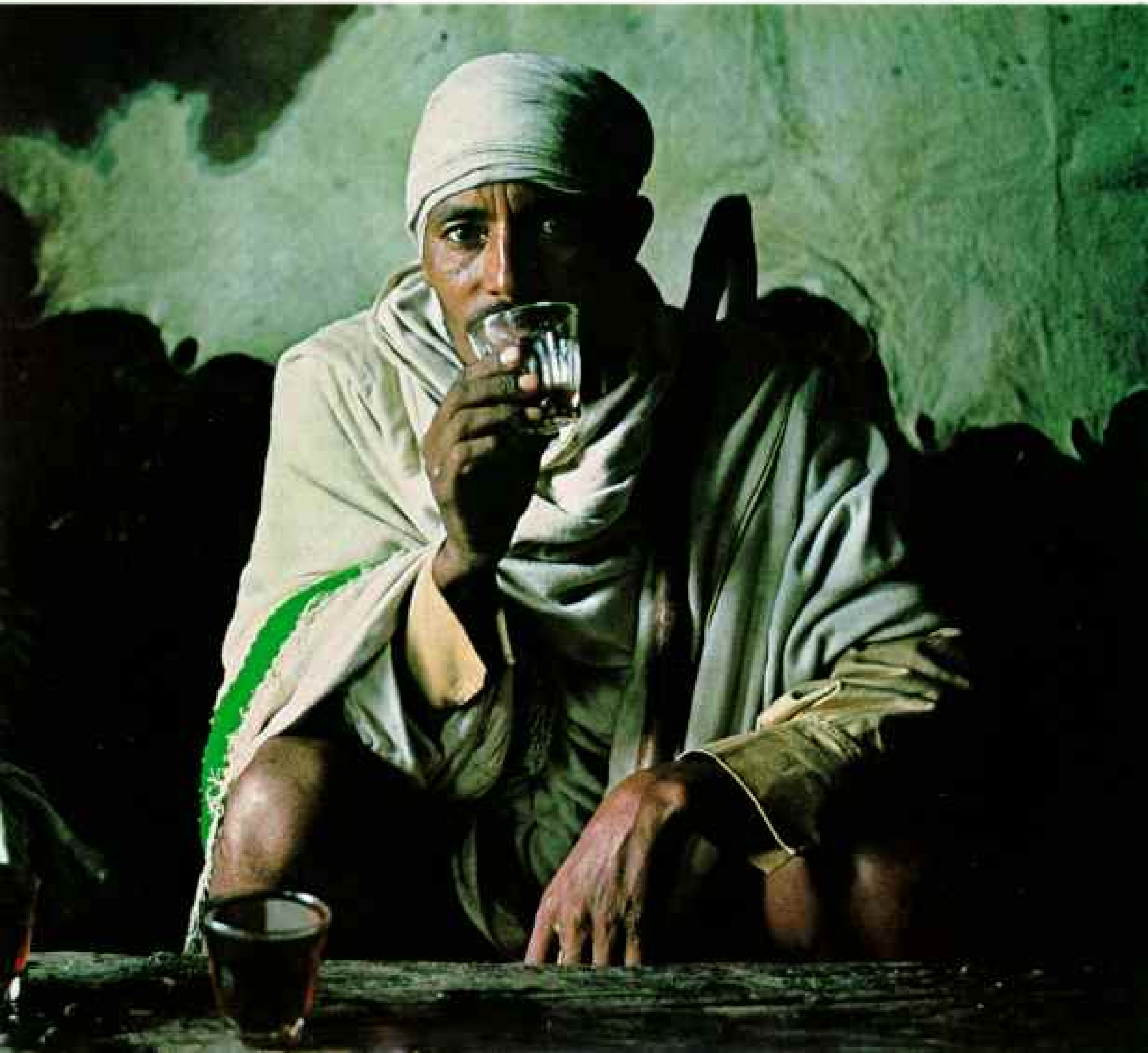
Among the “bandits” they are pursuing are the guerrilla fighters of the Eritrean People’s Liberation Front (EPLF), a Marxist group that is fighting for independence from Ethiopia. Until 1974 many guerrillas were armed and trained by the Soviet Union and Cuba. It is one of the ironies of the tangled politics of the Horn of Africa that the Russians are now trying to help the Marxist regime in Addis to exterminate the Russians’ former friends, who are also Marxist. Like the Eritrean population in general, the EPLF is about half Muslim. Since losing Soviet and Cuban support, the guerrillas have been aided by a host of neighboring Arab states. So far, 70,000 people have died and another 440,000 have been forced to flee to refugee camps in Sudan.

**WHAT STRUCK ME** particularly in Asmera, capital of Eritrea, was that I was no stranger to the people. Americans had once been numerous there; 1,800 of them had been stationed at the U. S. communications facility in the town in the mid-1960s. Several people asked me whether my presence meant that the Americans were coming back. Now things are different, though, and it was the Soviet military men I saw wandering the streets of Asmera.

Asmera, at the edge of a high plateau, is still a beautiful town. Built mostly by the Italians, it has wide palm-lined avenues,

*Weary and anxious after a half-day walk up the Blue Nile gorge, an Amhara couple and their ailing daughter rest in a teahouse at Tis Abbai (below). Facing a 20-mile journey to a hospital, the woman, Monyinnet Aynalem, looks for a ride as her husband, Geddif Ashagire, sips black tea. The couple accepted a lift in the author’s Land Cruiser, giving the terrified woman her first ride in a motor vehicle. For Ethiopia’s peasantry—85 percent of the population—even unpaved roads are a rarity. Such isolation leaves rural areas little affected by Western fashions, increasingly popular in cities. At a coffeehouse in Debarq near the Simien Mountains (right), an Amhara man, at left, and woman wear traditional gabbis.*





open piazzas, and pastel buildings. Tiled sidewalks edge European-looking shops and kiosks. In cafés old Ethiopian and Italian men, dressed identically in baggy suits and small hats, sip cappuccino, eat pastry, and converse in Italian.

But the spell was broken by the sandbags and machine guns at street intersections and on rooftops. Asmera is still a place at war, and, though it has the look and feel of a care-free Mediterranean town, there is no laughter here.

"The people of Asmera are suffering from this war," an old Eritrean told me. "Everyone has a relative who is fighting on one side or the other. Young men go off to fight, and you don't hear from them for five or six years—you don't know if they are alive or dead. We don't even care who wins any more; we just want the war to be finished."

From Asmera the road descends sharply to Mitsiwa, the old island port on the hot Red Sea coast. In 1977-78 the EPLF had controlled 95 percent of Eritrea and laid siege to Asmera and Mitsiwa for months. The shells of houses and churches testify to the ferocity of the fighting, which ended with the guerrillas being driven off.

At the entrance to the port, high on a pedestal, is a statue of Haile Selassie riding a horse. As if uncertain about future political currents, the people had not pulled down the statue but covered it with straw mats. Nothing of the old emperor can be seen except his right arm, sticking out from under the mats, pointing blindly out to sea.

**B**ACK IN ADDIS, I thought about the changes since the revolution and about things that had stayed the same. The land reform, the literacy campaign, and the dramatic increase in schools and health facilities are undeniably good. The kebeles and peasant associations may give people a level of participation in their government that was unknown under the old regime.

But Ethiopia is still a vast underdeveloped country with much poverty and

disease. The struggle for power after the revolution has left bitterness and fear; thousands of families still grieve for children slain in the red terror. The Derg's heavy hand caused many skilled Ethiopians to flee their country. Industry and agriculture were disrupted. There are still food and housing shortages and too few jobs for the graduates of the expanded education system. The regional guerrilla wars are costing dearly in human lives and have incurred a staggering debt to the Russians.

Dr. Tadesse Tamrat, a professor of history at the University of Addis Ababa and head of the Institute of Ethiopian Studies, told me: "We are making a new social fabric. But it is just beginning. The kebeles and peasant associations will one day replace the feudal system and the church as the warp of our social fabric. It is a challenge, but I think we can make it—the people can make it."

**P**ERHAPS that day will come, but the old ways die hard. "An Ethiopian is like a leopard," an old saying goes. "No matter how many times you wash him, he's not going to lose his spots."

Certainly the church is in no immediate danger of being washed out of Ethiopian life. I went to Mass at the old church of Entoto Mariam, high on a hill overlooking Addis. Once again it was like stepping back into the Bible. Chanting deacons beat their drums. The urban congregation responded to the priests' readings in Geez with the same sincerity as their simple country brothers.

The tabot was paraded around the church on the head of a priest, then brought out to the courtyard. The deacons sang and danced before it, incense burners swayed, and the colored umbrellas that shielded the tabot sparkled in the sunlight. The priests turned to replace the tabot in the holy of holies. As it passed, the people prostrated themselves, then rushed forward to kiss the ground where it had been, as their ancestors had when the true Ark arrived 3,000 years ago, before the blossoming of Ethiopia. □

*Heralding the birth of a great river, waters from Lake Tana rush 140 feet over the Blue Nile Falls, called Great River Smoke by the Ethiopians. Coursing through deep canyons, the Blue Nile winds for 850 miles to Khartoum in Sudan, where it joins the White Nile, supplying more than half of the water of the world's longest river.*





LEGACY FROM THE DEEP

# Henry VIII's



# Lost Warship

**T**HE YOUNGEST on board was 14. The oldest about 44. They were seamen and officers, archers and gunners, cooks, shipwrights, a surgeon, and soldiers in armor. Seven hundred men in all, they were the crew and fighting men of the Tudor warship *Mary Rose*, one of England's first modern battleships.

They gambled at backgammon and threw dice when they got the chance. They liked the lively music of tabor and pipes, ate heartily, and enjoyed reasonably good health. They knew what their job was. They were a powerful force of destruction.

It was Henry VIII's idea, one that he borrowed from Mediterranean navies, to mount heavy artillery on *Mary Rose*'s lower decks. Thus he helped change the course of English naval strategy, for her elegant cast-bronze cannon could cripple an enemy ship with deadly broadsides at long range, rendering obsolete medieval methods of ramming and boarding.

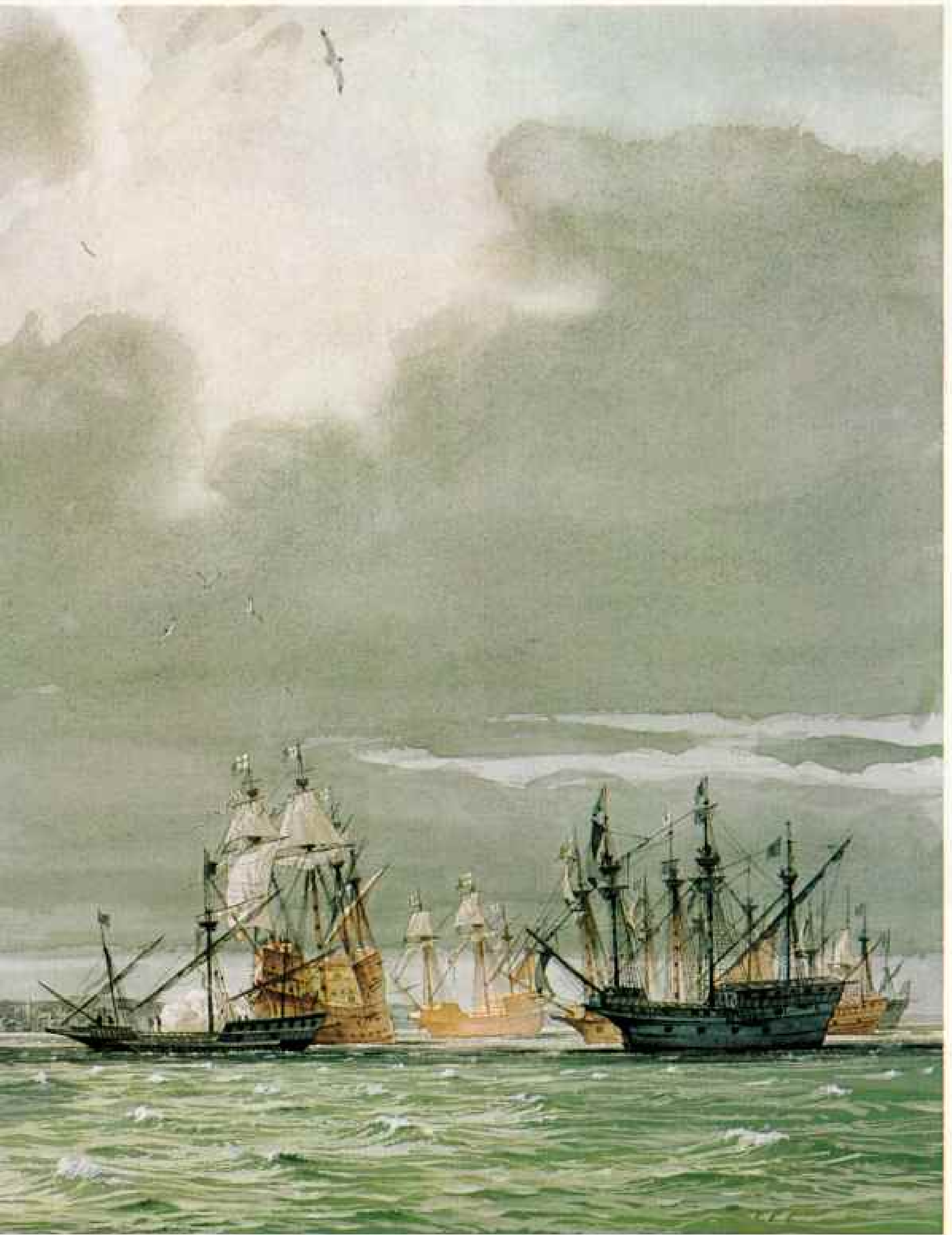
She was serving the king in battle on July 19, 1545. Just two years before Henry's death, the aging monarch was facing one of the gravest perils of his reign. A French invasion force—larger than the armada that Spain would send four decades later—had been deployed by Francis I to attack the English fleet at Portsmouth. For the first time Henry stood alone without allies among the powers of Europe, his alliance with Charles V of Spain finally exhausted. But *Mary Rose* was not destined to prove her prowess that day. A bizarre accident before the king's unbelieving eyes would cheat her crew of battle glory. And their remarkable bronze cannon would join their bones in the deep.



BOOTH BY WILLIAM H. CURTSINGER



**I**T HAPPENED so fast. A shore breeze came up and Mary Rose hoisted sail to engage the enemy. Then suddenly she swung away from the battle, heeling dangerously on her



*side. Water began flooding into her lower gunports, cannon crashing headlong across her slanting decks. In less than a minute she sank to the bottom like a stone.*



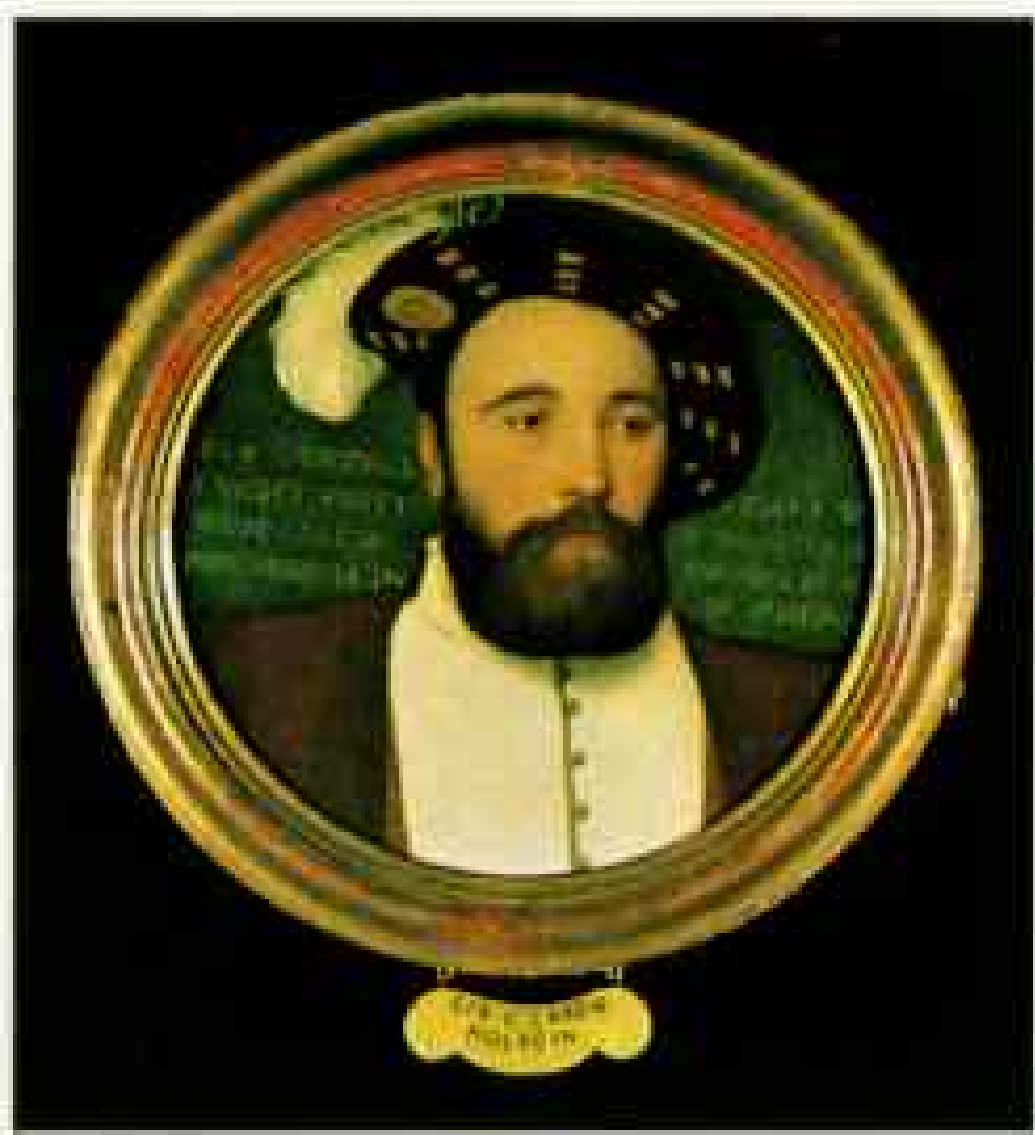
**B**Y THE TIME rescue boats reached *Mary Rose*, only the tops of two masts remained above the water (**above**, right). Henry VIII heard the dreadful cries of her drowning crew as he looked on helplessly from Southsea Castle.

Among those lost were Capt. Roger Grenville and Vice Adm. Sir George Carew (**right**), whose wife, also witnessing the tragedy from the castle, fainted dead away. The king, stricken with sorrow, tried to comfort the lady.

But the sinking of *Mary Rose* was not decisive to the battle. The French armada, depicted at left in this engraving from a contemporary painting, could not approach Portsmouth Harbour without bombardment from Henry's fortifications. The battle ended in a stalemate after fierce combat on the Isle of Wight, where a French detachment burned several villages before being driven back by English militiamen.



PORTSMOUTH CITY MUSEUM (ABOVE); THE RIGHT HONOURABLE THE EARL OF BRADFORD AT WESTON PARK



**F**OUNDERING as she prepared to meet the French fleet, Mary Rose disappeared into the murky waters of The Solent.



NATIONAL GEOGRAPHIC CARTOGRAPHIC DIVISION

**P**ANIC swept the weather deck of Mary Rose as the sea rushed in through a heavy rope antiboarding net strung overhead. Fewer than three dozen souls survived the tragedy, which occurred so swiftly that not even the ship's rats had time to escape.

Plunging into the soft mud a mile outside Portsmouth, Mary Rose and her crew lay trapped for centuries in their frozen moment of time. Now they live again in our imaginations as a team of archaeologists, scientists, conservators, and historians describes the priceless artifacts recovered from the ship's watery grave.

In the pages that follow, Margaret Rule, archaeological director of the Mary Rose Trust, reports some of the most exciting discoveries yet made about this great warship and why she went down. \* \* \*

Introduction and  
picture text by  
**PETER MILLER**  
NATIONAL GEOGRAPHIC STAFF

Paintings by  
**RICHARD SCHLECHT**







**L**IKE GREAT blackened molars the ship's timbers jutted above the sea-floor, massive and partially eroded. As I drifted slowly down on them through water clouded with silt and plankton, I could envision the great vessel that lay buried underneath.

I knew the ship well, though I had never set eyes on her: a vessel, in the measurement of her time, of some 700 tons burden that carried a crew of 415, mounted a total of 91 guns, and bore the name of a Tudor princess. She was the pride of England in her day, once described as "the flower, I trow, of all ships that ever sailed." Few ever met a more terrible end.

Hovering just off the bottom, I examined the huge timbers, each more than a foot square at the face. As I fanned silt away with my hand, the seabed fumed and smoked around me. I was delighted, for the silt that now obscured the wreck had entombed and preserved it for more than four centuries.

Beneath me lay the remains of one of the most fascinating ships in British naval history, *Mary Rose*. Others had found her, but it was to be my task to explore and recover her if it could be done. In a sense the job meant bringing her home, for she had barely left port on the dreadful day she died.

Sunday, the 19th of July, 1545, in the 36th year of Our Sovereign Lord, Henry VIII of England, dawned bright and clear—a perfect summer day. That morning the king stood beside Southsea Castle at his main naval base of Portsmouth on England's south coast. He gazed across the deepwater channel leading to the harbor entrance and waited to repel a French invasion.

Henry faced heavy odds. The French fleet then approaching Portsmouth numbered 235 ships and carried 30,000 troops. By contrast Henry had only 60 ships available. The

latter included *Mary Rose*, an aging vessel built 35 years earlier and named for the king's sister Mary Tudor, whose family symbol was a rose.

Although badly outnumbered, the English ships were well prepared. To wage war against his arch rival, France, Henry VIII had gathered some of the finest gun founders and smiths in all Europe to produce bronze and iron cannon for England's coastal defenses and for the royal fleet. In 1536 *Mary Rose* herself had been rebuilt, and her armament increased. At some point heavy bronze guns from the foundry at Houndsditch were added—guns that she had never been designed to carry.

Now on this bright, almost windless July day, *Mary Rose* slowly emerged from Portsmouth with the English fleet to engage the enemy. In addition to her normal crew of 415 the ship carried 285 heavily armed soldiers, many of them longbowmen whose job was to blanket the French ships under a steady hail of arrows. Together with their armor and equipment, these soldiers added another 24 or 25 tons to *Mary Rose's* weight high above the waterline.

As part of her defense, the ship carried an antiboarding net of woven rope stretched eight or ten feet above the open deck in the waist of the ship. All was in readiness for battle: bowmen stationed atop the sterncastle and in the fighting tops, cannon loaded, manned, and run forward through the gunports. All *Mary Rose* needed was a breath of wind to carry her into action. The first gust carried her to her grave.

As Henry watched from Southsea Castle, a breeze sprang up from land and the English ships surged forward. Suddenly *Mary Rose* veered sharply, her open gunports on the starboard side dipping dangerously close to the water. As another English ship passed

## The Search for *Mary Rose*

By MARGARET RULE

ARCHAEOLOGICAL DIRECTOR  
MARY ROSE TRUST

*More than 17,000 artifacts, large and small, were recovered from Mary Rose, the first well-preserved Tudor warship ever discovered. One of 500 divers who helped excavate the wreck, Bob Stewart (right) records the precise location of a cannon jutting up through the weather deck.* WILLIAM R. CURTIS/GETTY IMAGES



within hailing distance, her captain inquired what the trouble was. Vice Adm. Sir George Carew, in command aboard *Mary Rose*, replied: "I have the sort of knaves I cannot rule!"

It was to be the last message from *Mary Rose*. As Henry watched in horror from a mile away, the stricken ship heeled farther and farther to starboard, the sea rushing in through her gunports amid the screams of men trapped beneath the antiboarding net. The king and his followers could hear the screams plainly. Sir George Carew's wife, who stood beside Henry, fainted at the dreadful sound.

Within less than a minute, according to one account, *Mary Rose* vanished with "one long wailing cry." Out of 700 men aboard,

about 30—most of them fortunate enough to have been stationed in the fighting tops—survived one of the greatest naval disasters in English history. By contrast the loss, in a similar manner, of the Swedish warship *Vasa* nearly a century later claimed only about 50 lives.\*

**T**HE CAUSE of *Mary Rose*'s death remained in doubt over the next four centuries. French naval authorities of the time claimed that the ship had been sunk by French gunfire, but there was no evidence to support the claim. Sir George Carew's remark about knaves he could not rule suggests mishandling as the tragedy's cause.

\*See "Ghost From the Depths: the Warship *Vasa*," by Anders Franzen in the January 1962 *GEOGRAPHIC*.



*Rescuing history with science, conservator Simon Aked (left) applies polyester resin to the barrel of a wrought-iron cannon to strengthen and seal the metal. The barrel was first cleaned of marine deposits, then flushed with nitrogen and hydrogen and baked at 400°F in this furnace to stabilize the iron.*

The first wrought-iron gun recovered from *Mary Rose* in 1970 revealed an unexpected innovation—a new kind of barrel. Unlike others made from several long iron bars forge-welded into a cylinder, this barrel was formed from a single wrapped sheet of iron. Reinforced with heat-shrunk hoops and rings (right, inset), this strong barrel, more gas-tight than earlier models, was probably part of a high-velocity gun used to hit the superstructure of enemy ships from a distance. Other wrought-iron cannon, by contrast, were normally short-range weapons. All were breech-loaded with removable powder chambers (right), firing cast-iron or lead shot or stone shot that shattered on impact, hurling shrapnel-like pieces across a deck.

*Mary Rose*'s wrought-iron guns were also the earliest found aboard ship on wheeled carriages. These allowed the guns to be run back from the lidded gunports when they had to be closed.

LOUIE FEINSTEIN

Indeed, Sir George's younger brother, Peter Carew, later described *Mary Rose's* crew as among the finest mariners in all England. But, Carew added, there was such dissension among them that "contending in envy, [they] perished in frowardness."

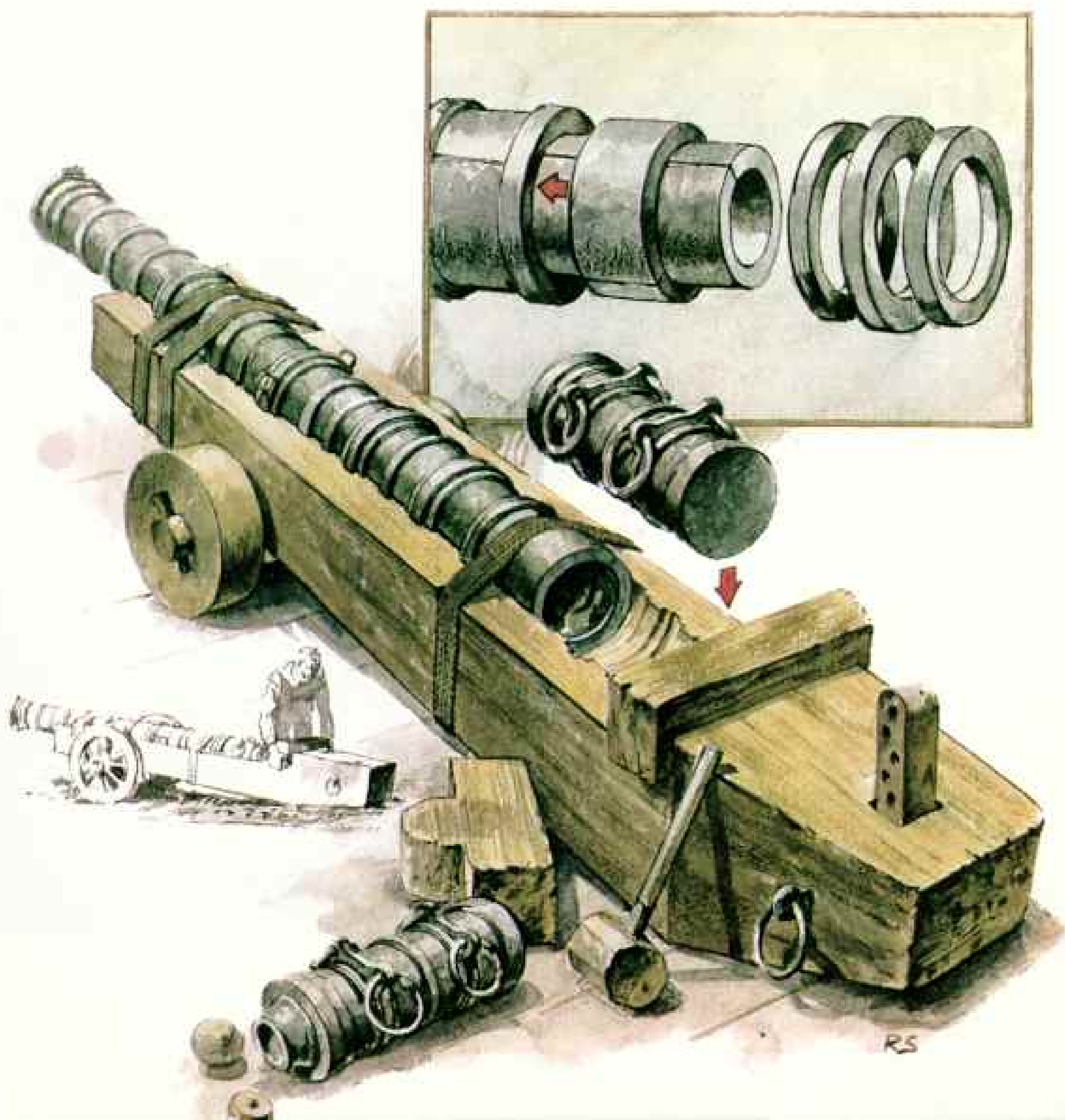
Finally, the extra weight of armored soldiers and heavy ordnance above deck had rendered *Mary Rose* dangerously top-heavy. Even a disciplined crew might have failed to avoid the tragedy that befell her.

Fortunately for Henry, the loss of *Mary Rose* had no apparent effect on the Battle of Portsmouth. After an inconclusive exchange the French fleet landed troops on the neighboring Isle of Wight, where they wreaked havoc for several days. They then briefly attacked the English coast to the

east before sailing back across the Channel.

The English made several attempts to salvage *Mary Rose*, the first one immediately after the sinking. Guns were salvaged as late as the 19th century. From the outset, salvage was hampered by the nature of The Solent, as the channel off Portsmouth is called. The bottom of The Solent consists of banks of sand, fine mud, and silt constantly stirred by tidal action. Hitting the soft seabed with tremendous momentum, *Mary Rose* began to dig her own grave, much as a pebble slowly buries itself on a wave-swept beach.

After the recovery of several cannon in the 1830s, attempts to salvage *Mary Rose* were abandoned. The silt that engulfed the remains of her hull was left undisturbed, and she lay entombed (Continued on page 662)





**T**OASTING THE SKILL of royal gun founders John and Robert Owen, "Bluff King Hal" lifts a mug at the Houndsditch Foundry, just beyond London's wall. In 1537, at the king's command, the brothers fashioned a cast-bronze gun later found on Mary Rose. It was a nearly 11-foot-long "bastard," so-called for its nonstandard caliber. Showing pride in their work, they patriotically identified themselves as "sonnes of an English" in an inscription (above right). Henry's name appears in Latin on another inscription, and a crowned emblem of the Tudor rose, symbol of his family, has also been cast on the weapon. Lion heads on either side of the barrel (far right) formed rings for ropes to lift the gun, one of the first of its kind made in England.

PHILIP J. BURNETT



ROBERT AND JOHN OWYN BRETHEKYN FORNE  
IN THE CYTE OF LONDON THE SONNES OF AN  
ENGLISH MADE THIS BASTARD ANNO DNI 1572



AGS PHOTOGRAPHER VICTOR W. BOWELL, JR.

# Treasures of Tudor life

**A***FTER CENTURIES* at sea bottom, personal items reveal much about Tudor man. The wearer of a wooden pomander (right) preferred spices to the smell of ship life. A punctual officer may have carried the wooden pocket sundial (below), its compass needle now lost.



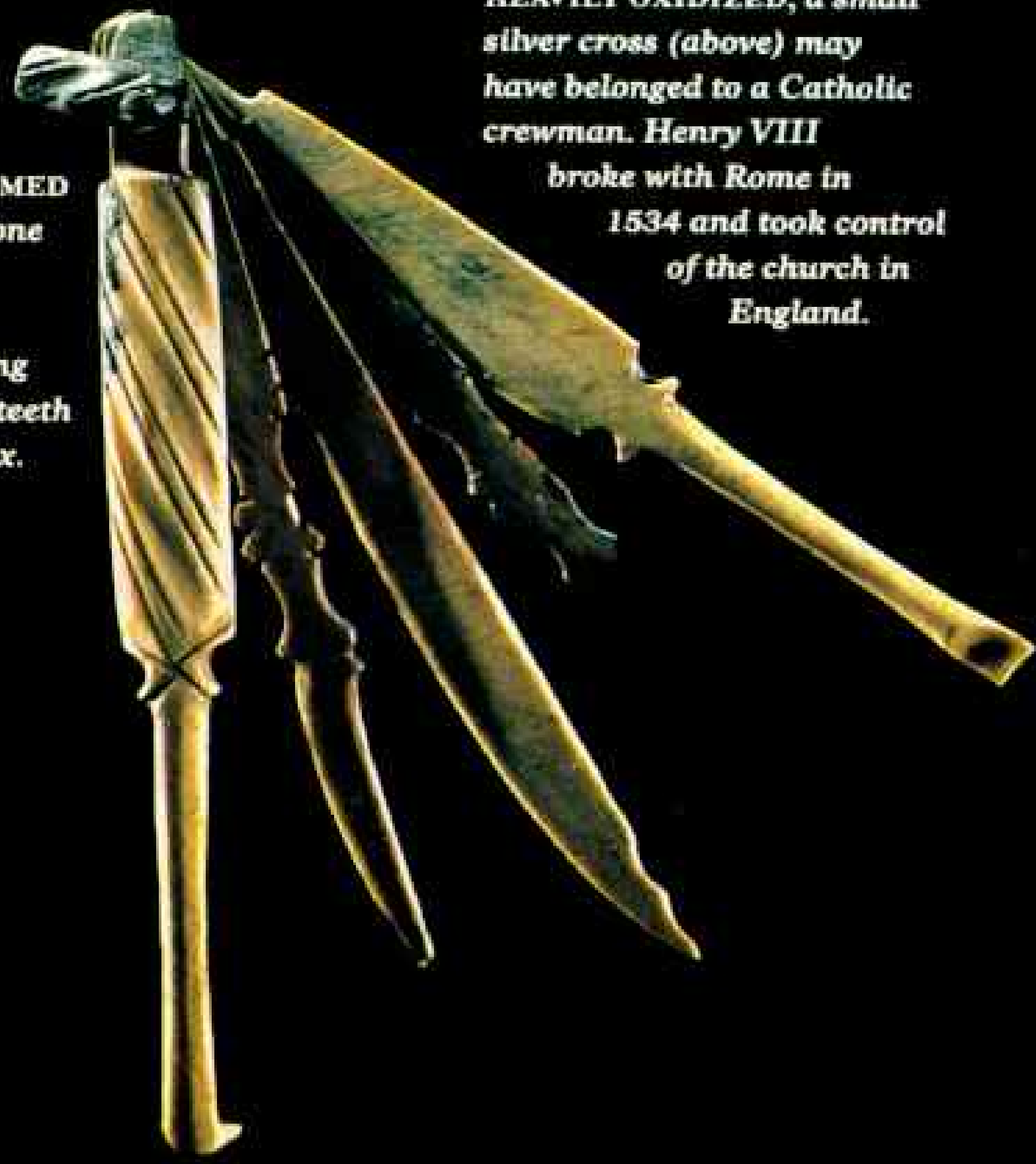
**THIS STURDY LEATHER SHOE** was probably worn by a crewman. Officers preferred dainty slippers, popular among the upper class.

A SINGLE GOLD COIN worth 40 pence was roughly a day's wages for the vice admiral, or more than a month's pay for an ordinary seaman. These of varying denominations (left) were among only two dozen gold coins recovered .



HEAVILY OXIDIZED, a small silver cross (above) may have belonged to a Catholic crewman. Henry VIII broke with Rome in 1534 and took control of the church in England.

FOR THE WELL-GROOMED Tudor gentleman, a bone manicure set (right) served many useful purposes, from cleaning fingernails to picking teeth or scooping out earwax.





at 40-foot depth in The Solent. There she might lie to this day, but for the vision and energy of a man named Alexander McKee.

He is a journalist, a scuba diver, and a military historian with a lifelong interest in historic ships. In 1965 McKee organized a search for underwater wrecks called Project Solent Ships, focusing on the coastal area off Portsmouth. Although I was strictly a land archaeologist at the time, I gladly accepted Alex McKee's invitation to join the group.

Over the next six years we spent every available summer weekend exploring the bottom of The Solent for historic wrecks, using scuba divers and underwater detection gear such as magnetometers. Perhaps the greatest help in pinpointing the location of wrecks was use of Dr. Harold Edgerton's sub-bottom and side-scan sonar to survey wide areas of the seafloor.

Although the search initially was aimed at wrecks of all kinds, the project gradually narrowed to finding *Mary Rose*. For one thing, she represented a key stage in evolution of the warship in northern Europe, being one of the earliest vessels built there to

carry heavy ordnance and to be equipped with gunports so that her main batteries could be housed belowdecks.

Moreover, Alex and I both believed that the massive buildup of silt around and within *Mary Rose* would have preserved her to a remarkable degree. If we could excavate the ship, along with her ordnance, stores, tools, and the personal possessions of her crew, we would shed valuable new light on the Tudor period of England, an era that has left far too few tangible remains of everyday life.

We had a series of winter storms to thank for our first actual glimpse of *Mary Rose*. In the fall of 1970 a team led by Alex McKee dredged up a 16th-century iron cannon near the point where our underwater detection instruments told us the wreck must lie.

The following spring our divers went down and discovered that winter storms had laid bare the ends of several massive ship's timbers, which resembled a row of great blackened teeth. In all my years of archaeological exploration I can recall no more beautiful sight. The long search for *Mary Rose* was over.



**D**URING THE YEARS that followed, we came to sympathize with those who had tried to salvage *Mary Rose* before us. In terms of water quality The Solent is a diver's nightmare, ranging at best from a milky haze to something on the order of lentil soup. What can be accomplished within a week or two in the crystal waters of the Caribbean often took us an entire diving season of several months.

To safeguard the wreck from looters, we had formed a Mary Rose Committee and leased the site from the crown for the munificent sum of one pound sterling a year. On that makeshift basis we enlisted a team of volunteer divers and technicians and began a careful survey of *Mary Rose* in her final resting-place.

In time we discovered that almost half of the hull remained intact. The ship had come to rest at a 60-degree angle on her starboard side, which had quickly settled into the mud and been preserved. Most of the superstructure and the hull's port side had remained exposed, and they eventually collapsed or were scoured away by tidal currents.

The hull itself contained an infinite variety of treasures. With each ebb and flow of the tide, fine silt had penetrated every corner of the remaining structure, gradually filling it and sealing everything inside from the corrosive effects of salt water and oxidation and destruction by microorganisms. Virtually everything that had gone down with the ship—weapons, tools, clothes, and even normally perishable stores—remained in a remarkable state of preservation.

The job of merely reaching those treasures took years, for at each stage we were determined to safeguard the hull. From my first view of those giant oak timbers projecting above the seabed, I had cherished the hope of one day bringing *Mary Rose* ashore to Portsmouth, where she had been built.

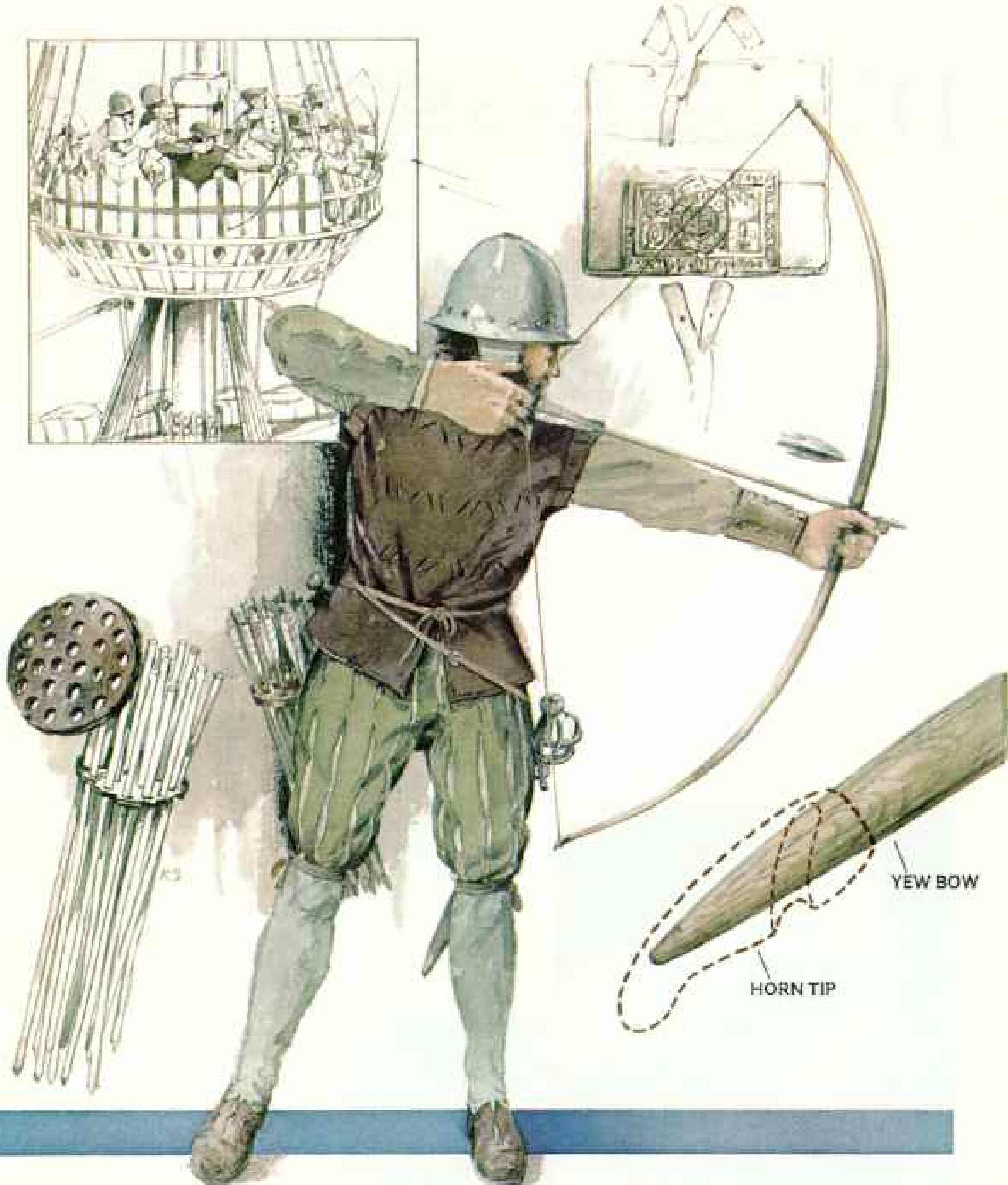
As a result, it was 1979 before we began to excavate inside the ship. By then *Mary Rose* was covered by the Protection of Wrecks Act of 1973, and our committee had been replaced by a nonprofit Mary Rose Trust, organized to direct operations and raise necessary funds.

His Royal Highness Prince Charles, who

CHRIS DOBBS, MARY ROSE TRUST (LEFT); LOUIE PEINHOFER



*More advanced than many historians expected, rigging tackle from Mary Rose has proved the sophisticated technology of ships in the age of discovery. Besides double blocks such as this masterfully carved one (far left) found amid the broken decks, divers recovered spare sets of ropes, lines, cables, parrels, and deadeyes from tightly sealed boxes deep in the ship's stores. Some of this rigging, still in nearly perfect condition, sits on a wall of Southsea Castle (left), from which the king saw his ship sink.*



**D**EADLY ACCURATE within 300 yards, longbowmen on the ship's upper deck and in the fighting tops (above) could clear an enemy deck with a shower of arrows. Using leather spacers as "ammunition clips" for two dozen steel-tipped, armor-piercing arrows, an archer could shoot about 12 rounds a minute. His six-foot-long yew bow was probably fitted with horn tips on its ends, though none survived attack by marine organisms over the years. An embossed leather or horn bracer

protected his wrist from abrasion by the bowstring.

The 2,500 arrows and 139 longbows recovered from Mary Rose were found in remarkable condition. Many of the bows examined by the author (facing page, top) were so well preserved that they could be restrung and used today. Trying his hand at a Mary Rose bow, actor Robert Hardy (right), an authority on the longbow, shows the strength needed to draw one.

had first dived with us on *Mary Rose* in 1975 and who showed a keen interest in her recovery, agreed to become president of the trust. Sir Eric Drake, a former chairman of British Petroleum, became chairman, and I was appointed chief archaeologist. Now at last, with a professional staff as well as volunteers, we began emptying *Mary Rose* of her precious cargo.

**N**ONE OF US, I think, will ever forget the archer. He had been a man in his mid-20s, sturdily built and of medium height, and he was obviously no newcomer to the longbow. His skeleton lay with that of a slightly younger man beside a ladder connecting the gun deck to the weather deck above. A bundle of arrows in a leather carrying device remained attached to the archer's spine by a leather thong, and the remnants of what appeared to be a leather jerkin lay scattered among his bones.

Clearly both men had sought to scramble to safety during *Mary Rose's* final moments. Probably the ship's extreme list to starboard had prevented them from climbing the ladder, and they were overwhelmed by inrushing water.

Careful analysis of the older man's skeleton confirmed that he was a professional archer. Two of his middle vertebrae had been pulled forward and twisted to the left, suggesting chronic pressure on his spine from that side. Also his lower left arm bone was noticeably enlarged and flattened, the result of prolonged strain. Obviously he had been right-handed and had spent long hours at the butts, as archery ranges are called.

Such men were legendary in their time. Massed bowmen had given England the margin of victory over France in the great land battles of Crécy, Poitiers, and Agincourt. Expert longbowmen could shoot arrows a distance of 300 yards on an average of one shaft every five seconds—more than six times the maximum rate for the French crossbow. "The English are the flowers of the archers of the world," declared a 16th-century French chronicler.

What *Mary Rose* taught us was that Tudor bowmen fought at sea even after the addition of heavy guns. Many historians have assumed that archers were carried aboard King Henry's ships merely for shore raids.

*The Search for Mary Rose*



ANDREW FIELDING, MARY ROSE TRUST (ABOVE); LOUIE PSIHODOS





But the archer on the gun deck had obviously been prepared for action at the moment *Mary Rose* went down. Elsewhere in the hull we found longbows and arrows at what clearly were battle stations.

The discovery of such weapons delighted experts in the field of archery, for *Mary Rose* has given us the only authentically dated Tudor bows and arrows. The total number we recovered was 2,500 arrows and 139 longbows, many of the latter in condition to be restrung and shot.

One specialized form of archery came to light with the discovery of two leather mittens packed in a wooden box among the longbows and arrows. The mittens were used by archers to protect their hands while shooting fire arrows. Only the hand holding the bow needed protection, as shown by the fact that both mittens were left-handed.

**A** MAJOR QUESTION regarding the loss of *Mary Rose* was whether she had actually engaged the enemy. The French long insisted they had sunk her by gunfire, while the English maintained that her loss was accidental. In a lower portion of the hull, below the level known as the orlop deck, we eventually found an answer.

As we excavated the hold carefully by hand and later with airlifts, we encountered skeletons on straw mattresses on the flint ballast. What were men doing stretched out in the lowest level of the ship while everyone else was at battle stations? One answer, of course, is that they had been wounded.

Might they have been merely ill? It's doubtful, for *Mary Rose* had just left port and would not have taken ailing crew members along. The men in the hold very likely had been wounded topside and had been hurried below so as not to demoralize their shipmates by their cries and appearance. The practice was common in navies of the period, when morale was considered more vital than treatment of the injured. Even the great Lord Nelson, when mortally wounded at Trafalgar two and a half centuries later, was unceremoniously rushed to the orlop, his face and medals covered, lest his crew recognize their fallen leader and lose heart.

*Mary Rose*, it seemed, had seen action and suffered casualties, though they were probably light and had little bearing on her loss. High above the orlop, in the raised sterncastle of the ship, we found a more likely cause of the sinking. There our divers came upon a large and handsome bronze



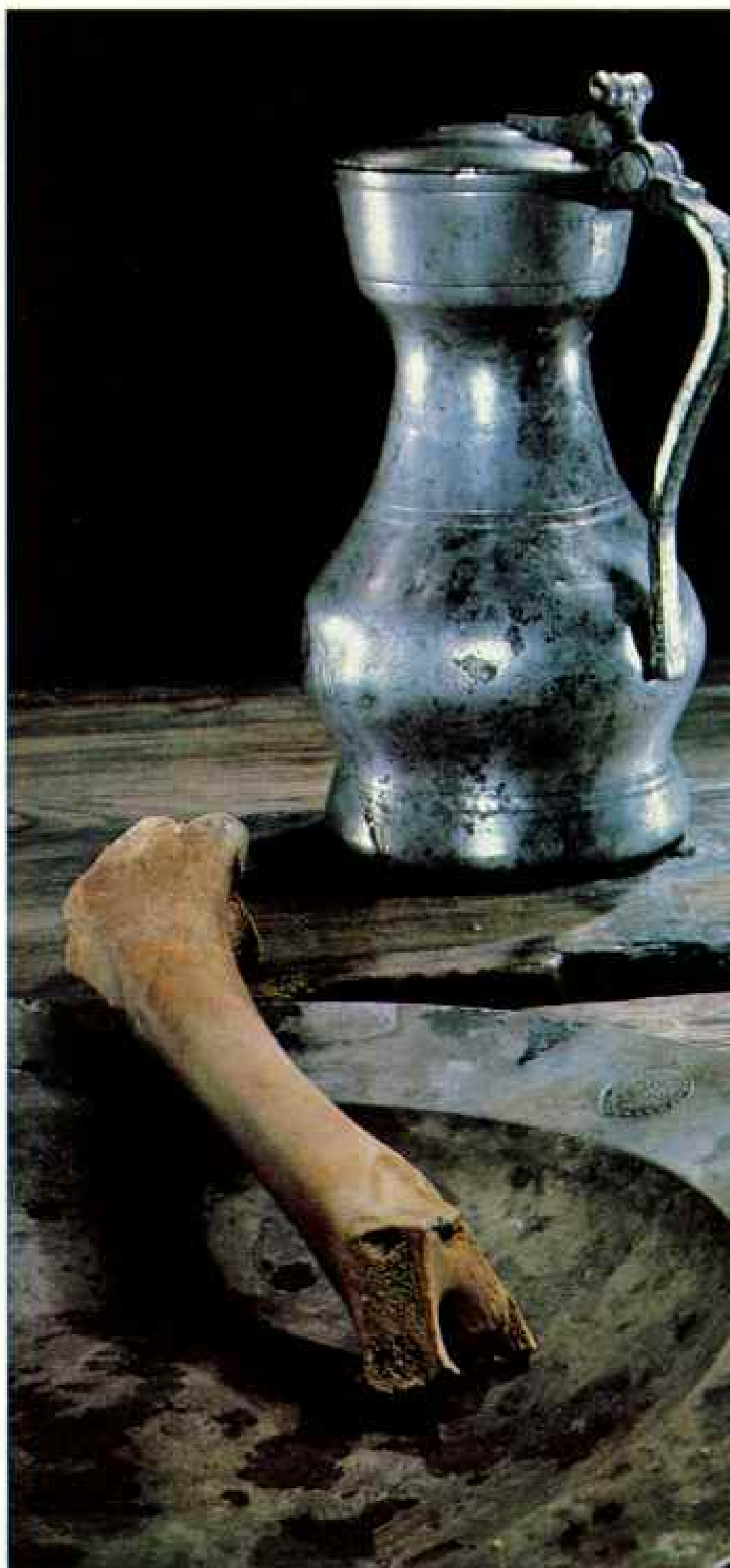
*Clenching fire in their teeth, dragons and crocodiles carved onto the heads of linstocks (left) held slow matches for firing the ship's cannon, here simulated with colorful sparklers.*

A fearsome antipersonnel weapon, the cast-iron "square murderer" (above) blasted boarders at close range with a lethal spray of hailshot (right). Small enough to be handled by one man, it was hooked over a rail for firing, a flange beneath the barrel absorbing the recoil. A wooden tiller fitted into the rear helped aim the small but deadly cannon.



LOUIE PERHOYOS (LEFT)  
VICTOR R. BOWELL, JR.

*Hearty fare filled dinner tables on Mary Rose. Fish, venison, beef, chicken, mutton, and pork were among the dishes served to the crew, along with fresh vegetables, fruits, and nuts. Peas still in the pod were found buried with the wreck, as were shells from hazelnuts and pits from wild cherries and plums. The men washed down their meals with beer, some drinking vessels bearing a personal mark etched into the lid (below). This stave-built wooden one (bottom) belonged to a common seaman. Like many of the wooden artifacts, it was treated with polyethylene glycol to replace moisture with wax, then freeze-dried for preservation.*



*A privilege of rank, the pewter dinnerware used by officers (above) was considerably more elegant than the wooden plates for the rest of the crew. A graceful flagon at their table might well have contained a fine*



ALL BY VICTOR N. BOEWELL, JR.

wine. Even officers, however, were exposed to health hazards by the ship's uninvited rodent guests. The bones of rats—including the kind that carried fleas with bubonic plague—were found aboard ship, along with those of a small dog that may have chased them.





ALL BY LOUIE PERDUE

*Chief admirer of the lady warship, Prince Charles (left) made many dives to inspect her in his role as president of the Mary Rose Trust.*

*On the day before the ship was raised, a protective ring of small craft formed around the recovery site (below), where the crane barge Tog Mor waited to reverse history. The moment came the next morning, October 11, 1982, when the starboard half of the lost ship's hull—the only part preserved by The Solent's thick sediments—rose dripping from its grave in a giant steel cradle and lifting frame. It was then taken to Portsmouth to rest at a dry dock only yards from where its keel was laid in 1509.*



muzzle-loading cannon that weighed about two tons. The cannon had been loaded and run forward on its heavy wooden carriage through an unlidded gunport.

When we removed the cannon, we found a socket cut in the sill of the gunport, which had obviously once been used for a small swivel gun. The suggestion is strong that those who refitted *Mary Rose*, either in 1536 or perhaps before the Battle of Portsmouth, had increased her firepower at the risk of rendering her dangerously top-heavy—a factor that plainly contributed to her loss.

One of the richest finds aboard *Mary Rose* was a beautifully preserved barber-surgeon's chest. In the 16th century that title was used for one who practiced medicine,

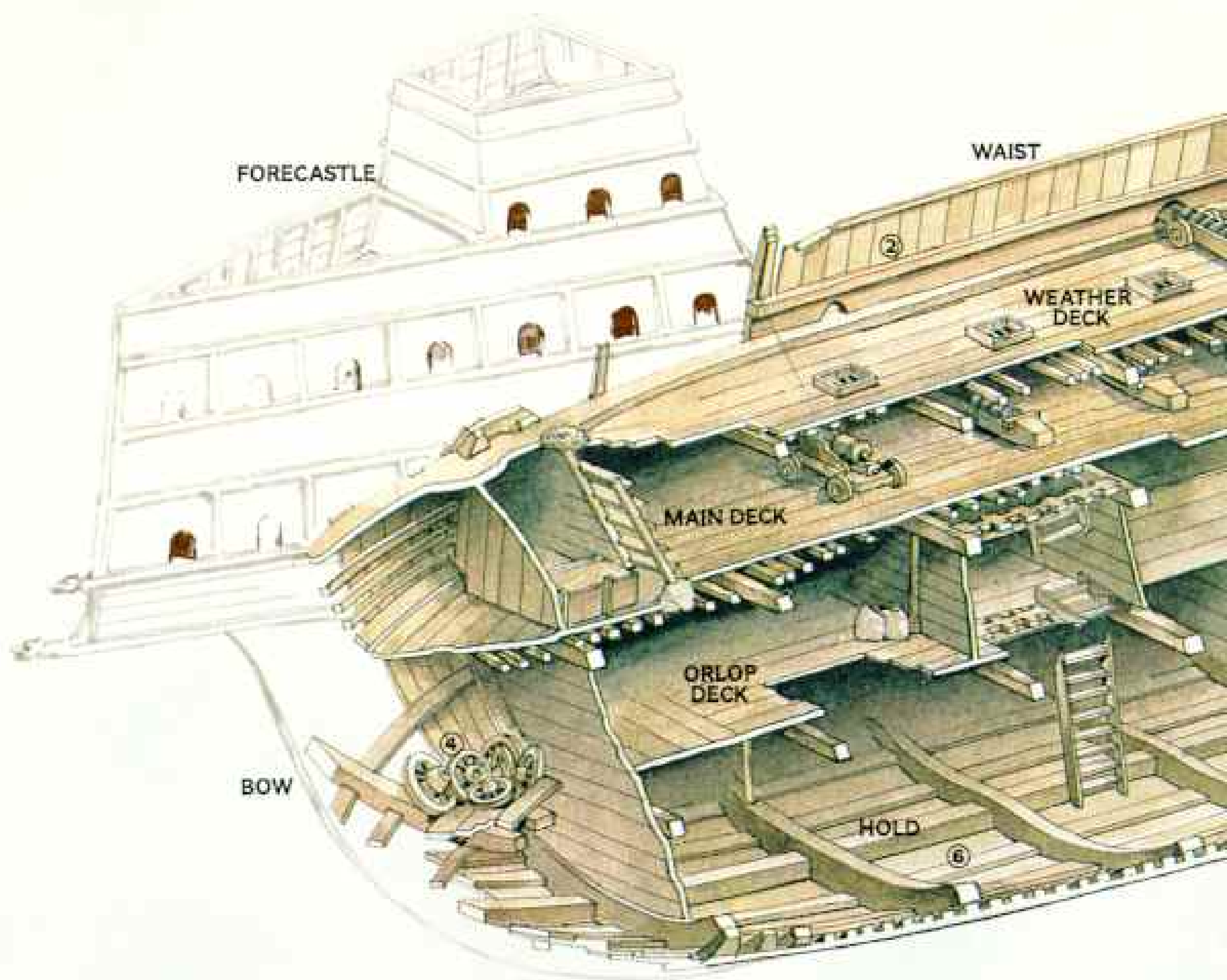
surgery, and dentistry as well as barbering. The chest was a treasure trove of Tudor medical instruments and supplies. Its contents were so completely preserved that ointment in one of the small wooden jars still bore the surgeon's finger marks from his last application of the salve 437 years before.

In all, there were 64 items in the chest, including drug flasks, razors, a pewter bowl for bloodletting, a mortar and pestle, a chafing dish to hold lighted charcoal for cauterization, and the wooden handle of what probably was an amputation saw whose iron blade had rusted away.

Most of the instruments appeared simple but effective. A large brass syringe came complete with an eight-inch-long hollow



# Inside a Tudor warship



**B**UILT FOR FIGHTING, *Mary Rose* reveals her military design in an artistic reconstruction (above) of her sunken remains. Unlike earlier English ships sent into combat, she was more than a converted merchant vessel beefed up with a few cannon. From her lofty castles to her low-slung gun decks, she posed a variety of threats.

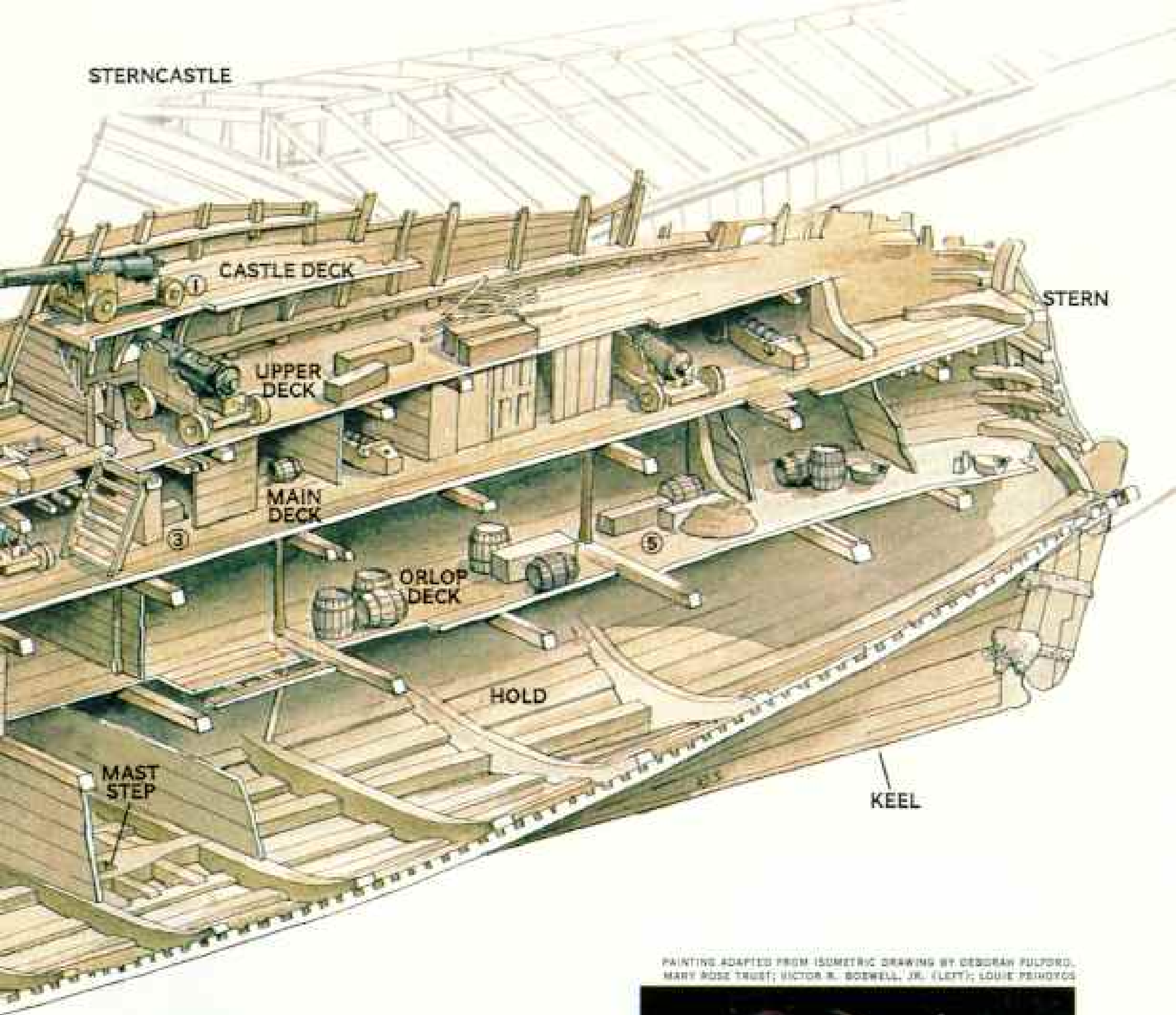
On the deck of her sterncastle, topmost of four decks that survived, a bronze gun (1) made by the Owen brothers stood prepared to bombard approaching ships. Soldiers armed with hailshot guns were stationed nearby to repel boarding parties.

Removable blinds (2) on the weather deck

protected the ship's archers, while wrought-iron cannon were run out through small semicircular gunports. A mix of bronze and iron guns—for long- and short-range protection—were lined up along the main deck, where a surgeon treated the sick and wounded in a small cabin (3).

Great oak timbers stretched beneath the decks to support the extra weight of the large guns. Spare wheels for gun carriages (4) were stored in the forepeak and spare longbows in boxes (5) farther aft. Seriously wounded men were whisked below to mats in the hold (6), where their suffering would not demoralize the crew during the battle.

STERNCASTLE



PAINTING ADAPTED FROM ISOMETRIC DRAWING BY DEBORAH FULFORD, MARY ROSE TRUST; VICTOR R. BOEWELL, JR. (LEFT); LOUIE PRIMOYOS

*Saved by accident from the effects of time, a Tudor nail (below) shines like new today because a workman dropped it into a caldron of tar four centuries ago. A ruler from the ship shows its size in inches. Wooden planes and other tools from the shipwright's cabin required more careful cleaning (right).*



needle, to be inserted into the urethra for treatment of bladder stones or that age-old scourge of mariners, gonorrhea.

Other implements were more terrifying in appearance than in actual use. Prominent in the collection was a large wooden mallet employed in anesthetizing patients. The victim, however, was never struck directly on the skull. Instead he wore a protective metal helmet designed to absorb the blow and create a series of vibrations that were said to numb his brain. So far no one on our staff has volunteered to test the theory.

A seaman's chest contained one item that has altered our entire view of Tudor navigation. It was a beautiful magnetic steering compass, suspended on gimbals in a wooden case, the oldest so far found in northern Europe. The compass was no fluke, for we later recovered two similar ones from the ship.

Unlike the compass, many artifacts found aboard *Mary Rose* were known to have been in use on land during Tudor times. Their interest stems in part from the discovery that they were not only carried aboard ship, but in many instances were even commonplace at sea. We have found so many pocket

sundials, for example, that they appear to have been as popular in their day as our modern wristwatches (page 660).

One ingenious device rarely found ashore was apparently favored by Tudor naval officers. We recovered half a dozen so-called pistol shields, panels of laminated wood and leather, each pierced in the middle by a hole for a handgun. Above the hole was another aperture for use as a gunsight.

The pistol shields from *Mary Rose* were in excellent condition, though none was quite as elaborate as the shield I once saw among a collection ashore. In addition to the hole for the handgun the shield featured the Tudor version of a secret weapon—a candle stand on top for night combat.

Other items from the ship came as no surprise. Many seamen's chests contained a hand fishing line and bobber, doubtless for recreation as well as to augment the ship's fare. Yet the men aboard *Mary Rose* had eaten well by navy standards, judging from the samples of food we have recovered. There were remnants of fresh pork, bones of venison, beef, and mutton, and a variety of other bones yet to be analyzed, skeletons



BOOK BY VICTOR A. BOYKELL, JR.

of fish, fresh peas still in the pod, plum or prune pits, one of them with a dead mite still attached. Inevitably we found remains of those unwelcome diners aboard any ship, rats and insects.

Perhaps the most fascinating skeleton we recovered was a small one, that of a frog. It seems unlikely the creature was brought along for food—one frog hardly makes a meal—though it could have been a pet. My own guess, however, is that the frog was a backup for the ship's compass.

As late as the 19th century some sailors clung to the belief that if one dropped a frog in a barrel of water aboard a ship, the frog would automatically swim toward land, no matter how far away. Another superstition maintained that the frog was an instinctive barometer: If a storm was approaching, the frog swam at the bottom of the barrel; if good weather was on the way, the frog swam at the surface. Finally, there is the more likely but prosaic explanation: The frog was kept alive in a barrel of water on deck simply to ensure that the water was fit to drink.

In four years our recovery teams made a total of 30,000 dives on *Mary Rose* and

brought up more than 17,000 artifacts. The same teams gradually dismantled the interior structure of the hull, removing piece after carefully recorded piece and leaving only the massive 120-foot-long outer section to be raised intact.

**T**HAT BREATH-taking moment finally arrived at 9:03 a.m. on October 11, 1982, after months of the most meticulous planning and preparation. Early one morning before the raising, I made a final dive on the hull with my friend Christopher Dobbs. By then *Mary Rose* hung suspended by a network of cables attached to a giant lifting frame, ready to be transferred to a specially designed steel cradle.

In the near darkness Chris and I wriggled our way through the narrow space between the hull and the bottom, and I put my hands flat against the great planks. There was something immensely reassuring about the feel of them as the ship moved gently in the current, and I thought to myself, "*Mary Rose* can take it."

And so she did, with seemingly half of England and a good bit of the world on hand in Portsmouth to welcome her home (pages 670-71). Later she was transferred for study and reassembly to a dry dock within a hundred yards of where she had been built nearly five centuries ago.

We have only just begun to learn from her, and the process will go on for many years. My colleague Richard Harrison of the *Mary Rose* Trust plans a 70,000-square-foot museum in Portsmouth to house the hull and some 2,500 selected artifacts.

To me one of the greatest satisfactions is that, in the process of recovering *Mary Rose*, we trained literally hundreds of young volunteer divers, archaeologists, and conservators to be professionals of proven ability. Of their unique contribution Prince Charles recently wrote: "The only real way of understanding and coping with the present is, I believe, through an adequate knowledge and interpretation of the past. From that point of view we are able, for once, to transform a contemporary naval disaster into a victory in terms of human awareness."

I can think of no better epitaph for *Mary Rose*. □



*Held gently in the lap of the sea since the unlucky day the ship went down, an embossed leather book cover (far left) outlasted by several centuries the pages it once enclosed. Like others found in the wreck, it probably covered a prayer book. One may have been graced by a carving of angels (left) on its spine. Emblems of the crew's humanity, artifacts like these enrich our understanding of the men who perished so long ago on the king's warship *Mary Rose*.*



# A Walk and Ride on

By CAROLYN BENNETT PATTERSON SENIOR ASSISTANT EDITOR Photographs by



LAND OBERON IN THE ARTHUR RANGE, MELINDA BERGE

# the Wild Side

DAVID HISER and MELINDA BERGE

*Proclaimed a world heritage, a vast wilderness in Australia's Tasmania holds dramatic peaks and mirrorlike lakes, incomparable beaches and seascapes, rare temperate rain forests, and a spectacular wild river, the Franklin, now direly threatened.*



**T**HE RIVER, as wild and beautiful a torrent as any on the face of the planet, picked its course eons ago and began its masterwork. On the body of the land it probed and sliced, cut, shaped, and carved, sculpturing the chasms and canyons that now glorify its passage. And it added an everlasting roar in celebration.

In time humans arrived to hunt along its banks, dwelling in caves. And there, some 20,000 years ago, they left their tools and their bones, whose recent discovery electrified the scientific world. The oldest site of Ice Age man yet discovered this far south!

For all that, the Franklin River in Australia's island state of Tasmania may well be doomed. The state government, faced with high unemployment and perceiving energy as a lure to industry, has decreed that the river must drown behind dams of a hydroelectric scheme. If and when that happens, the splendid Franklin will be the last of Tasmania's major wild rivers to be tamed, harnessed—and forever altered.

Across Australia and around the world, those who would save the river and the mountainous, seagirt wilderness that is Tasmania's southwest have lifted their voices in protest. About the size of Connecticut, the

area includes the Southwest National Park and the Franklin-Lower Gordon Wild Rivers National Park.

Last December UNESCO listed those national parks as a world heritage, recognizing the area as large enough "to permit the experience of solitude" and unusual enough for international protection. Moreover, the UNESCO committee stated that it is "seriously concerned with the likely effect of dam construction on those natural and cultural characteristics that make the property of outstanding universal value." It asked the Australian government to request that UNESCO designate the area "a World Heritage *in danger*" until the question of dam construction is resolved.

At the same time and in the weeks that followed, the alarmed Tasmanian Wilderness Society called out its "greenies" to demonstrate against construction at the site of the first of three dams proposed, this one on the Gordon River just below its confluence with the Franklin. Nearly 900 conservationists were arrested for trespassing. Those who would not promise to desist from further protests were jailed. The pressure mounted on the federal government of Australia to intervene in order to save the river.



MELONDA BERGE (LEFT); DAVID WISER

But I run ahead of my story. Having read of the rugged beauty of the southwest wilderness and of the dangers to it posed by development plans, I and free-lance photographers David Hiser and Melinda Berge went to Tasmania to see for ourselves its threatened wonders.

Since only the roughest of trails thread the area, uninhabited except for the oft-times seasonal presence of perhaps half a dozen people, the only way to experience it is to walk or paddle, carrying one's own food, clothing, and shelter. Our GEOGRAPHIC team explored the southwest with different parties of Tasmanians during several hikes and a 12-day run down the Franklin River.

**F**OR OUR FIRST ADVENTURE, Jan Ralph, a Tasmanian and chief of photography at the United Nations in New York, and his younger brother, Robert, who lives in Hobart, invited us along for a tramp of the South Coast and Port Davey Tracks, enlisting a young Hobart man, Mark Clough, as our guide.

We set off for the South Coast Track from Recherche Bay, named for a frigate of French Adm. Bruni d'Entrecasteaux, who precisely charted Tasmania's southern coast

in 1792. We quickly left behind all vestiges of civilization and encountered a land as raw and wild as the French found. Towering eucalyptus trees, many bare and ghostly white from the ravages of fire. Soggy plains of spiky button grass. Soaring, jagged peaks of distant mountains. Stretches of rare, temperate rain forest with leatherwood, myrtle, sassafras, and beech trees, huge ferns, and a scrub known as horizontal, because after attaining a few feet of vertical growth, it angles off sideways (below left).

After about five hours of walking, we stopped to rest at the top of a sandy cliff overlooking a broad beach scalloped with white-frothing waves. Lion Rock crouched just offshore, as majestic as the Sphinx. An immense jumble of boulders torn from the rocky headland spoke of the awesome power of gales that sweep unimpeded by land for thousands of miles across the Indian Ocean.

"What kind of people," I wondered out loud, "were the Aboriginals who could survive in a place like this?"

"Very hearty!" Jan Ralph answered. Then, serious: "They lived naked, except for grease and paint. As hunters and gatherers they built only crude shelters. But they adapted to this" (Continued on page 684)

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Uninhabited except for a few tin miners, the Tasmanian southwest beckons lovers of the wild. But the way to appreciation is hard. Bush walkers must backpack every necessity required for days away from civilization. Obstacles include nearly impenetrable stands of horizontal scrub (left) and tenacious mud such as the author (far left) slogs through on the South Coast Track. White-water runs on the Franklin River offer a look at beauty that may soon be drowned by a hydroelectric scheme, vigorously opposed by the Tasmanian Wilderness Society and conservationists worldwide.

Tasmania's Wild Side





*In the home of storms, the sun pays a quick call, thrusting its shafts of light through clouds to spotlight the sea off Surprise Beach. The winds of the roaring forties, masters of southwest weather, strike Tasmania after a sweep across*



MELINDA BERGF

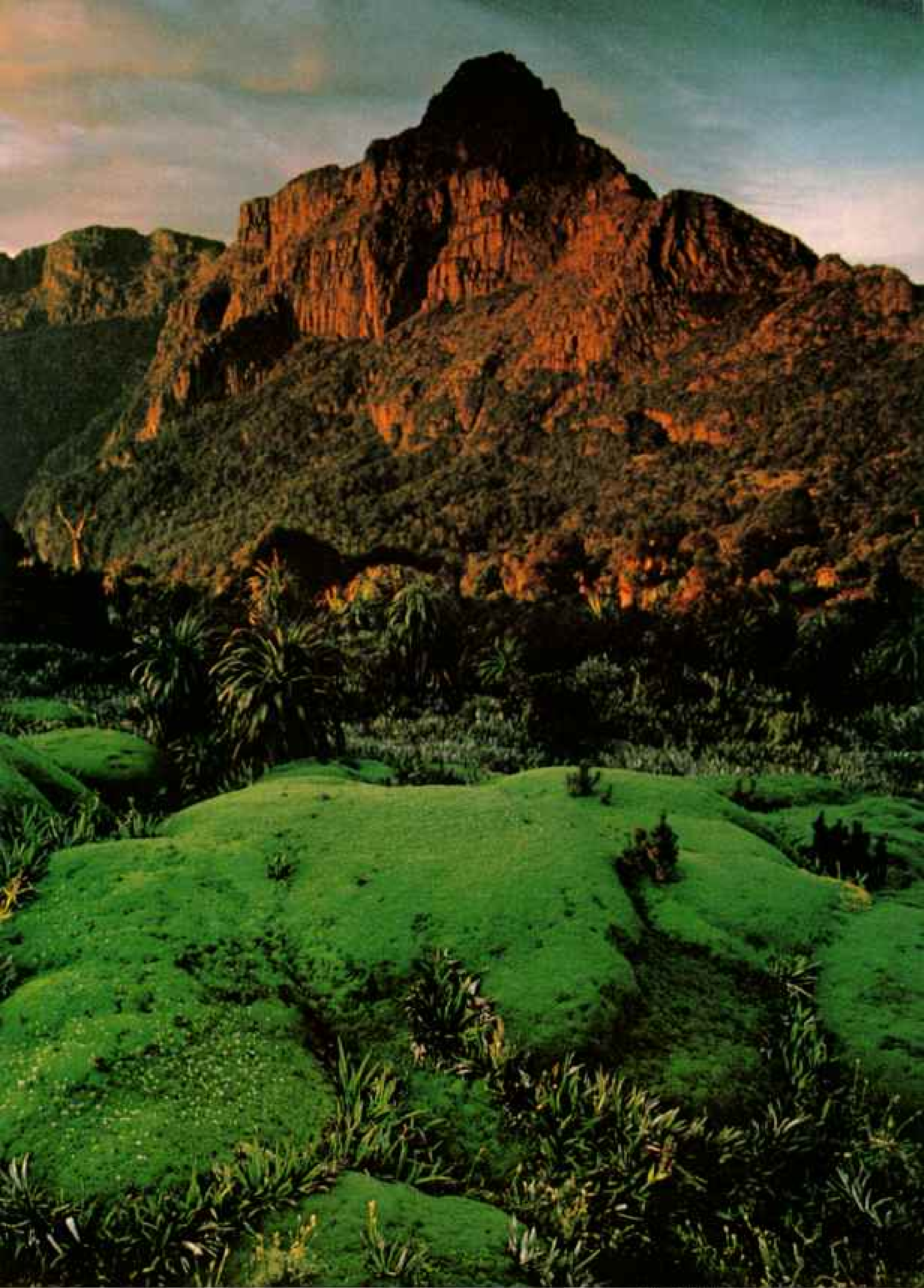
*thousands of miles of the empty Indian Ocean. Sudden gales can wipe out a summer day with fierce hail and annually dump as much as 135 inches of rain, making the area wet much of the time.*



With icy scalpel, a glacier sheared off the sides of Mount Anne (right) and gouged out the valley at its foot, here green with cushion plants. During much of the last glacial period, extending from 23,000 to 10,000 years ago, Tasmania was linked to the Australian mainland by a land bridge over which plants and animals migrated, together with human

hunters. But when glacial melt raised sea level, Tasmania was cut off, and many island plants developed forms unlike those in mainland Australia or anywhere on earth. Many species of the cushion plant live together, putting out thousands of branchlets in a dense mat, often sprinkled with other plants (above). Along many stretches of terrain, erosion has stripped away plants and soil to expose the bedrock of quartzite (below). Seen from a distance, the white rock appears to be snow.





DAVID HIBER (LOWER LEFT); MELINDA BERGE

environment and changed it profoundly.”

“But how?”

“By using fire,” Jan answered. “Although they didn’t know how to make it, they carried fire everywhere and with it cleared trails, trapped animals, signaled one another, and converted forestland to heath that was rich in plant and animal food. One of our archaeologists, Rhys Jones, called it ‘fire-stick farming.’”

As I stumbled down the cliff with my 50-pound burden of civilization—clothes, tent, sleeping mat and bag—I envied the Aboriginal his unencumbered freedom. After a “bit of a scramble”—Australian understatement—that left me dripping with perspiration, I longed for nakedness.

That night at our camp beside a stream known as the South Cape Rivulet, I learned a lesson in southwest weather. Looking to the heavens, I saw the stars, glorious in the clean air, and thought they promised a quiet night. No need to stake the tent. And so, blissfully, off to sleep.

Bang! Suddenly I was wide awake. A howling wind was shaking the tent with fury. Looking out, I felt a blast of sand and saw that another tent had been flattened. Looking up, I saw once again the stars—

incredibly twinkling through the storm.

So much for promises. I struggled outside and staked my tent.

The Tasmanian Aboriginal hated the night and believed it was ruled by his most frightening devil, Wraggeowrapper, said to be “like a black man, only very big and ugly . . . he travels like the wind.”

**I** THOUGHT of Wraggeowrapper a few weeks later when Melinda and I and two other Tasmanian friends, Victoria Sandford and Annie Ball, camped in a lush rain forest a day’s walk west from the South Cape Rivulet.

We had been climbing all day in the steady rain. The mud sucked at our boots and slicked the roots that were our foot- and handholds on vertical stretches. As twilight fell, we pitched our tents on a high headland with a window in the dense foliage that opened an awesome view of the sea.

Victoria did her magic with a piece of beef, a handful of fresh herbs, and a bag of fresh vegetables from her garden, concocting a steaming hot soup that dispelled the chill and lifted the spirits.

But Wraggeowrapper came anyway and howled through the night, using the trees as



MELINDA BERGE (ABOVE); DAVID WISER

his voice. He returned the following night when we camped at Granite Beach and made a surprising daytime appearance at Surprise Bay, delivering a hailstorm that turned the ground white.

We were thankful that Wraggeowrapper took time off when we reached Osmiridium Beach. In the warmth of the sun I went for a swim in the blue-white sea while Victoria and Annie tried their hand at fishing for lobsters with a bit of string and Melinda happily prowled with camera in hand.

At Prion Beach a deadly tiger snake as long as my body and thick as my wrist stood guard at the only level campsite, raising its head to strike if we came nearer and forcing us to camp on the muddy, rain-soaked slope. The next morning as we waited for a helicopter pickup, Wraggeowrapper sent hail, sleet, rain, and wind to trap us in misery.

It was easy to see why Tasmania's Aboriginals considered such dark, erratic, extreme weather to be evil itself. But the real evil did not look like a black man. The real evil had white skin.

At Cox Bight, where the Aboriginal mined the ocher to color his body, I heard from Jan Ralph the tragic end of the story that began with colonization in the 1800s.

"White men raped the Aboriginal women and stole their children. When the black men fought back with spears and wooden clubs, the British settlers answered with gunfire. During the Black War, an attempt was made to round up and isolate the Aboriginals. Most of them escaped. But eventually the settlers won, of course. They relentlessly tracked down and killed blacks for sport, organizing parties like fox hunts.

"The southwest coastal Aboriginals were the last to go—destroyed by resettlement attempts, low fertility, and lack of resistance to white man's diseases. The last pureblood Aboriginal in Tasmania died in 1876.

"It's interesting that today their descendants are fighting to save the Franklin River because they consider the bones found in the caves along its banks those of their ancestors—and therefore sacred."

**I**N THE SOUTHWEST, except for the explorer and occasional shipwrecked sailor, the first Europeans were convicts who were transported in 1821, condemned to death in life at Macquarie Harbor. Until the prison closed in 1834, the doomed men worked under the lash to cut two-thousand-year-old Huon pine and

*Boots off and drying, hikers seek the camaraderie of the campfire (left) after a grueling day. The author, left, guide Mark Clough, right, and Robert Ralph, at his side, exchange experiences with David Steane, an administrator of Tasmania's Lands Department, second from left, and Dick Ferris, who have just come from a run on the nearby Huon River. This is the party's fourth and last night on the Port Davey Track, memorable for spectacular views of the Arthur Range, a rainy-day infestation of leeches, and hazardous crossings of tannin-stained streams. Tasmanian Jan Ralph, chief of photography for the United Nations (right), leads the way over a makeshift log bridge.*

*Tasmania's Wild Side*









*Down the chute: Paddles fly as raftsmen navigate a narrow rapid through a chaos of rock on the Franklin River, named for a governor of Tasmania who led an expedition across the river in 1842. Huge stones as well as such forest debris as logs, branches, and stumps—continually rearranged with every flood—clog the river, making it one of the world's most challenging for white-water enthusiasts. The brutal labor of portaging (below) proves a test of endurance for the GEOGRAPHIC party, which also needs climbing skills for this tortuous passage around Thunderrush Rapid in the Great Ravine.*



BOTH BY DAVID HIDER

*Winding ribbon of water flutters between awesome canyons of green in this aerial view of the Franklin's middle section (below). Campsites are few, forcing many river runners to bed down on vertical terrain or atop rocks. If the proposed hydroelectric scheme goes through, most of the river seen here will be inundated. Also to be lost: a series of bankside limestone caves (right), some containing the 20,000-year-old bones and tools of Ice Age man, twice as old as any yet found so far south.*

build ships with its matchless timbers. Most who tried to escape died miserably in the impenetrable rain forest.

In the 1850s Port Davey attracted whalers and sealers, to be followed by the piners harvesting the Huon. But the gold rush at Queenstown in the late 1800s emptied the southwest; half a century later, maps still showed huge blank areas as unexplored.

Resupplied by plane at Melaleuca, we started up the Port Davey Track, first cut in 1836 to give shipwrecked sailors a way to settlements in the north and east.

Along the way, we marched into fairy-tale



glens of scaly-bark tea trees, as shaggy as sheep dogs. Shedding, the dense stands spread smooth brown carpets on the forest floor. We pushed across creeks, sometimes walking over logs (page 685), sometimes swinging on boughs, sometimes balancing on slippery rocks, sometimes just wading. We often tramped in pouring rain, seeing nothing but our feet and the step ahead. Once I asked David if he thought pictures in wet weather would be informative. "Yes," he replied, "of sheer suffering."

A morning-long rain began "Leech Day." Dozens of leeches from trilside vegetation

attached themselves to us, crawling under trousers and gaiters, down into socks, under shirts. We had regular leech breaks, stopping to peel off clothes and pick off the pests—once, 15 from Jan alone.

Fine weather on a later day opened to us awesome views of the Arthur Range, rising sudden and sheer (pages 676-7). Then, after so much beauty, our eyes were assaulted by the immense barren cut left by construction of Scotts Peak Dam on the Gordon River. We looked down on the reservoir that had drowned the original Lake Pedder and its rare white sand beach. And felt the anguish



of those who had fought so long to save it.

Back in Hobart we met the two leaders of our forthcoming river run, Martin Badham and Andy Roberts, young athletes from England. They would captain our two Avons, gray rubber rafts big enough to carry four people each with their food and gear.

Besides David, Melinda, and Jan and Rob Ralph, our party would include David "Davy" Harries, who was studying environmental sciences at the University of Tasmania, and Jim Bucirde, a 21-year-old champion canoeist.

"Make no mistake," said Martin. "Rafting the Franklin River is hard. The difficulty is not so much in the rapids, although some are big and dangerous. The difficulty is in the isolation, the remoteness. There is just no help if we get into trouble."

Martin failed to mention another serious difficulty. The Franklin is a world-class obstacle course, with the danger from the usual stationary stone obstacles compounded by uprooted trees and stumps, limbs and sticks. Redistributed with every heavy rain or flood, this forest debris creates a new river for each party of rafters, making mastery of its 75-mile-long course unattainable. And as luck would have it, we hit the Franklin when its water was devastatingly low.

**WEARING LIFE JACKETS** and wet suits, we headed downstream, only to come to a jarring halt atop mid-river stones and logs. Everyone jumped into the water to maneuver the 275 pounds of raft and gear over the obstacles. "One, two, three, *move*," cried the captains. Pulling, straining, pushing, lifting, we took the Avons slowly downstream.

At one point, Martin, pushing his boat, suddenly lost his footing. The torrent swept him away, bumping him against midstream boulders. David Hiser, who normally can do anything, tried to help Martin but was himself carried downstream. David escaped injury, but Martin hurt his right leg—badly.

That night in a wooded campsite on a

bluff above the Franklin, the rigors of the day faded before my astonishment at it all.

"Today I saw the chaos of creation," I wrote in my journal. "Immense boulders tumbled from the cliffsides sit amid the ceaseless clamor of water. Rock walls undulate with the grace of ferns. Mighty trees are tossed like jackstraws into the river."

In the next two days our pattern of travel emerged. We would all paddle forward, lifting our boats over shallows when necessary, until a growing roar signaled rapids ahead. Pulling into an eddy, Andy and Martin would get out and inspect the rapids. Like a couple of doctors in consultation, the two men would point, nod, disagree, ponder. Brows would knit, heads shake.

If the rapids were deemed safe to run, our captains told us what water channel we would take and what instructions we would likely get during the run. If the risk was too great, we would get out and let the loaded boats go down at the end of a line. As a last resort we would portage, laboriously off-loading all gear and carrying everything, including the boats, around the rapids.

Late in the morning of the third day we paddled through the Irenabyss—whose Greek name translates "chasm of peace"—a narrow, serpentine gorge, here and there shafted with sunlight, as beautiful and tranquil as its name.

Setting up camp just below it, Melinda and I found a secluded spot to strip and bathe. Delicious. That evening we watched the sunset as Jan and Rob cast for trout. Idyllic. The Irenabyss had allowed us to share its peace.

But our sense of well-being was soon shattered. Martin's injured knee had now swollen to twice its normal size. He could not continue the run. The next day he left us to hobble out on the Fincham Track, a ten-mile trail to the nearest road. For nine hours he labored, in excruciating pain, fighting off with a big stick a number of venomous tiger snakes, boldly aggressive in mating season.

On day five disaster sideswiped us. As we

*What inspires wonder? A waterfall at the misnamed Pig Trough waves its plume as it tumbles in two stages over sheer cliffs, greened by a velvety cushion of moss. "Every country needs wilderness," says mountaineer Sir Edmund Hillary, "where people can go—young and old—to have a renewal of spirit."* DAVID HISER



ran a rapid, my Avon hit a snag and I heard a muffled explosion. The rear pontoon that was my seat began to sink rapidly. We had suffered a puncture, and Andy's voice—"Fast forward. Draw right. . . . Spin. Spin. Spin!"—told me it was serious.

As we struggled toward the riverbank, the raft's stern went underwater and the heavy gear, lashed amidships, was suddenly in my lap, pinning my legs under the sinking craft. Finally, kicking deep, I swam out into the raging current and to shore as the others managed to pull in the swamped boat.

It took two hours to repair the gash in the pontoon, and a surgeon could not have been more meticulous or skilled than Andy. He, far more than anyone, recognized that the boat was our lifeline to civilization.

The next day we reached the Churn, the beginning of the Great Ravine where sheer cliffs, soaring to infinity, wall the river to create its most dramatic scenery—all to be lost if a second proposed dam is constructed.

To portage the Churn we had to scale the face of the cliff carrying everything with us. That night I bedded down atop an immense rock in midstream. My night music was the river in full voice; my show, an hours-long parade of brilliant stars with the

waning moon making a cameo appearance.

We gave our seventh day to portaging the Great Ravine—five times, with as many linings over a three-mile distance. On that day twilight came at noon as a smoky haze covered the sun and a steady rain of ashes began. Forest fire!

**B**Y EVENING the wind was hot, the sky red. The fire was very near. We considered the chance of its sweeping over the heights above the river and destroying everything to the water's edge. Davy recalled the terrible tragedy of Tasmania's 1967 fire. "In five hours it burned 1,000 square miles, took more than 50 lives, and left 7,000 homeless. It was called a 'descent into hell.'"

With welcome rain and a rising river we hit Glen Calder, where we slipped with ease and pleasure over the first Stepped Falls, with its three-foot drop. The second Stepped Falls, just downstream, was a more serious matter. There the water dropped six feet, striking an enormous rock on the right that diverted the mainstream to the left.

Alas, when we went over the brink, we were in disarray. At the last minute I put in a stroke to turn the boat. Too late. Not

## The front line in the fight to save the Franklin

**A** RMS RAISED in victory, "greenies" signal a brief triumph over police by stepping onto the Gordon River construction site of the hydroelectric project that would flood the Franklin River. Thereafter, the members of the Tasmanian Wilderness Society peacefully submit to arrest, to be hauled away with their fellows in the police launch. Other greenies in small boats blockade the river. During such confrontations last December, January, and early February, nearly 900 were arrested, with more than 400 jailed.

This biggest conservation battle in Australia's history began in 1979 when Tasmania's Hydro Electric Commission announced a 453-million-dollar scheme to develop the Franklin, the last major wild river in the state suitable for power use.

Upon the election last May of the Tasmanian Liberal Party, Premier Robin Gray vowed to flood the Franklin, believing that the project would alleviate high unemployment and attract industry. He called the river "a brown, leech-ridden ditch."

Conservationists across Australia rallied to the cry "No Dams," triggering Prime Minister Malcolm Fraser of the Liberal Party to offer 500 million dollars to build and operate a thermal power station fired by Australia's plentiful coal. The offer was promptly refused by Mr. Gray. The Australian Labor Party went even further with a pledge that if it won coming elections it would stop dam construction—a pledge that opened the door for the conservation vote to topple the federal government. ROBERT LANGERWALTER

enough. The boat crashed against the rock, hitting it broadside, near the stern. And I was knocked into the air and out of the raft.

But not totally out. I seized Andy's leg, and Andy, as he said, "grabbed a chunk of Carolyn." Together we pulled me back aboard, and we all rode to safety.

The most beautiful portage was our last, the misnamed Pig Trough. Here the river makes a huge bend, cutting away at bedrock and tumbling into its course enormous, jagged boulders. At one point the river has created a cliff-sided island topped with trees, vines, and ferns—a never-never garden from the scenery of dreams that will also drown if the Franklin is dammed.

At the same time the inundating waters will claim a treasure of mankind. In eight limestone caves along the banks of the lower Franklin, archaeologists have discovered evidence that prehistoric man was here 20,000 years ago—some 10,000 years earlier than at any other habitation this far south.

So rich is this find, considered of world significance in piecing together the story of early man, that archaeologists have yet to collect all the artifacts. Prowling beneath the stalactites of Fraser Cave, we saw still scattered about its floor the millennia-old

bones of men and animals, along with the stone tools used for killing and butchering wallaby and wombat.

The lower Franklin is a broad, almost pastoral river, quiet except for the last two rapids—Double Fall and Big Fall. We ran Double Fall perfectly and celebrated the thrill with hoots of glee. Big Fall, Andy decreed, was too big to run. And so it proved only a day later when it claimed the life of a young experienced raftsman.

**W**ITH ALL RAPIDS behind us and only hours before the Gordon River and our pickup by boat, I set to memorizing the bankside beauties that may soon disappear forever.

Though always in good company then and throughout my Tasmanian sojourn, I had, nevertheless, been permitted "the experience of solitude." And I had come to believe what Bob Brown, head of the Tasmanian Wilderness Society, says of the wilderness he tries to protect: "Above all, it is an environment for finding a new kind of self, something better than the self that exists in the everyday world."

That bequest of wilderness, I felt, had come to me. And I was grateful. □







*THE ROADRUNNER*

# *Clown of the Desert*

By MARTHA A. WHITSON

Photographs by BRUCE DALE

NATIONAL GEOGRAPHIC PHOTOGRAPHER



**T**HE MERCURY hovered above 100°F in the west Texas desert. Motorists in their air-conditioned cars must have found me a strange sight. Wearing thick trousers, boots, and a field jacket, I would scurry through the brush, stop short, then proceed at a snail's pace.

I was pursuing a greater

roadrunner, hoping to locate its roost for my behavioral study. Mimicking the bird's erratic movements was the only way to keep up with it; my heavy clothing protected me from the cactus and thorny acacia bushes.

But the chase wasn't easy. Though they measure only nine inches tall and less than two feet long, adults such

as this Death Valley, California, resident (*above*) can run as fast as 20 miles an hour. A member of the diverse cuckoo family, *Geococcyx californianus* can also glide for short distances, although it much prefers to run.

My persistence finally paid off when the Texas bird led me to its roost 15 feet up in a mesquite tree.



**W**HILE WORKING on my doctoral degree in animal behavior, I was surprised to learn how little is known about the roadrunner. Many people think the bird exists only in the roadrunner cartoon series. Lecture audiences regularly ask me: "Do coyotes really chase them? Do they run only on the road? Do they really go 'beep, beep'?"

I have never seen a coyote pursue a roadrunner, nor found any published accounts, though it might happen. Animator Chuck Jones describes his series—in which the efforts of Wile E. Coyote are forever frustrated—as a parody of all chase scenes.

Mexicans were calling the bird *corre camino*—"it runs the road"—long before modern highways. I have followed roadrunners

along deer trails and other animal pathways that provide both an edge of vegetation for foraging and numerous insects living on animal wastes.

Rather than a "beep" like an automobile horn, the bird when startled or alarmed makes a "clack" by rattling together the upper and lower parts of its bill. In all, I have identified 16 different sounds, including a cooing call during courtship and a whine by the female during nest building.

Roadrunners satisfy their voracious appetites with an astonishing variety of prey. Though they occasionally eat bits of plants, their diet leans heavily toward insects, a boon to farmers. The seemingly fearless birds also feed on other birds, snails, mice, bats, scorpions, tarantulas, and black widow

spiders. The diet of nestlings is almost entirely reptiles. At Big Bend National Park in Texas, these nestlings anticipate a feast on a patch-nosed snake (*facing page*). As fledglings they will begin to shift their diet toward insects.

I found that food plays an important role in courtship, as photographer Bruce Dale shows. In Death Valley a bold suitor jumped into Bruce's van, offering him a freshly caught lizard (*below*). It returned twice the same day, once with a twig and again with a cigarette butt. Austrian ethologist Konrad Lorenz attributes such amorous behavior to imprinting, the development of the species-recognition faculty. If exposed to people during a brief but crucial period of youth, the bird may later mistake a human for its own kind.



**WHEN ONE** roadrunner ventures onto another's turf, the reaction is either fight or flirt. For an experiment, I presented a decoy to several nesting birds. Males either attacked the model viciously or courted it royally, depending upon their stage in

the reproductive cycle.

My model was of neither gender; to humans, male and female appear identical, with iridescent plumage of dark green, blue, or black, depending on the angle of light, and an orange patch of skin behind the eye.

When a roadrunner passes a

parked car, it will attack its own reflection in the hubcap. Such attacks often increase in aggressiveness since the "rival" always refuses to back down.

In order to obtain closeup pictures of such aggressive behavior, Bruce Dale constructed a model bird and mounted it and a camera on



a motorized toy tank, operating both by remote control.

Camouflaged by pieces of brush, the tank slowly crawled across the Texas desert, soon attracting a curious onlooker (**upper right**). The visitor's first reaction was amorous. Offering a twig (**bottom**) is

an act of courtship, the roadrunner's way of saying "Let's make a nest." At a later stage in courtship, he would say "Let's raise a family" by bringing the female a lizard or snake, the primary food of nestlings. But he would craftily delay the actual offering of the gift

until mating was complete.

Getting no response from his advances to the model, the bird tried the opposite approach. As Dale triggered the shutter from his vantage point on a mound of dirt hundreds of feet away, the bird leaped at the model and struck with his claws (**left**).





**R**OADRUNNERS rush in where most desert dwellers, including humans, fear to tread—into a rattlesnake's reach. The lore of the West contains many stories of roadrunners killing rattlesnakes. I had never

witnessed such battles until I released several rattlers in roadrunner territory during my field study.

I found the two predators a good match in quickness. The bird struck repeatedly at the snake's head, avoiding injury

by leaping up (*above*) and spreading its wing feathers, which are unharmed by counter strikes. Eventually the snake coiled and hid its head. Unable to see the target, the bird finally gave up and left.

Superbly adapted to the desert,



roadrunners benefit from a special internal energy-conservation mechanism. At night, when the temperature can drop 50 degrees or more, the roadrunner's body temperature drops as much as seven degrees below its normal 101°F.

Conversely, the bird spends long periods sunning itself during the early morning hours. Starting at sunrise, the bird turns its back to the sun, lifts the feathers of the lower neck and upper back, and holds its

wings out (*above*). This exposes a dark patch of skin on the back that acts as a solar panel. Raising its temperature without expending energy, the bird can save about 550 calories an hour.





**I**N MEXICO roadrunner meat is sometimes eaten. It is prescribed as a medicine by *curanderos*, or folk healers, in recognition of the bird's formidable ability to digest poisonous animals. In the town of Ojinaga in Chihuahua, Crispina Gonzáles de Martínez, a 92-year-old curandera, told me that tuberculosis could be cured by eating a stew of roadrunner meat, onions, tomatoes, and garlic. This elixir is also good for backaches, itches, boils, lung problems, and leprosy, she claimed.

In Valle Nuevo, Chihuahua, Eleuterio Salazar Olivas (**above**) holds a cleaned but still feathered bird that

he just took from his freezer to prepare a meal for guests. "Unfortunately, I chose a leg," one recalled. "It was like chewing on rubber bands."

Even though birds may end up on the dinner table, Mexicans have a great fondness for the roadrunner. In northern Mexico and the U. S. Southwest, the bird is referred to as *paisano*, which means "countryman." The roadrunner is the state bird of New Mexico and the emblem of the Texas Folklore Society. Some Mexicans claim the bird is an omen for travelers, saying that if a roadrunner crosses your path, you will have a safe trip.

Unlike many other birds,

roadrunners seem quite compatible with humans. In Las Cruces, New Mexico, I found that city birds nest earlier and hatch more young than their cousins in the arid countryside. Since the early 1900s the species has spread from southwestern states into Kansas, Missouri, Arkansas, and Louisiana.

Though some view him as a clown, I see the roadrunner as demonstrating a sensible approach to survival that we humans would do well to understand. Any winged creature that has traded the freedom of the air for life on the desert floor—and made a success of it—has much to teach us. □





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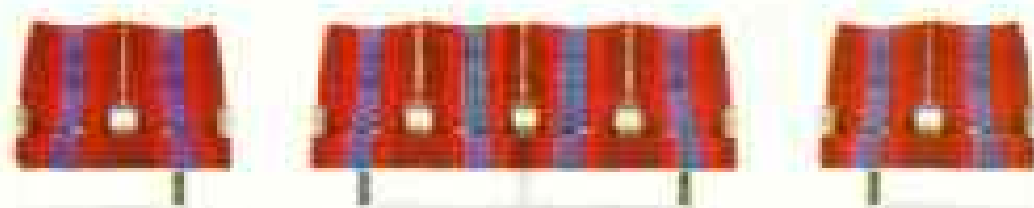


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# Members Forum

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## RAIN FORESTS

Beautiful reporting on rain forests (January 1983), but you are doomed to failure in trying to save them. Man gets his comfort from savagely exploiting the natural environment: destruction of virgin forests, ripping up the land for mining, obliteration of virgin prairie, extinction of buffalo and other animals and birds. You are preaching, standing upon their very bones, and who in the world is going to listen to you?

Maynard Philbeck  
Shelby, North Carolina

Your mathematics needs some reexamination. Page 42 states that one billion hectares equals 40,000 square miles. One billion hectares is 2,471,100,000 acres, which, at 640 acres per square mile, would be 3,861,094 square miles.

Walter E. Klippert  
Peninsula, Ohio

*In rounding off the figure to 4,000,000 square miles, we lost two zeros, a substantial difference.*

I am disappointed that greater emphasis was not given the two principal nemeses of the jungle—spontaneous colonization of land for agricultural purposes and the local need for wood or charcoal for fuel. In fact, the FAO reports these combined factors annually account for 92 percent of all timber felled in Colombia, 80 percent in Indonesia, Papua New Guinea, and Brazil, and 73 percent in the Philippines.

Is the author's low-key reference to this point due to the enormous breadth of this problem worldwide versus the ease of pointing a finger at the forest industry? Correctly, the author acknowledges that formulating an answer to sustain current timber inventory (and thus maintain refuge for its inhabitants) is a difficult and complex task. Yet, when political-economic push finally comes to shove, what single industry will be called upon to provide and implement the answer? The same industry that makes printing our magazine possible and a joy to read each month.

Stephen C. Metke  
Portland, Oregon

## RAIN FOREST LIFE

In "Teeming Life of a Rain Forest," it was stated that "the basilisk stays on the surface by sheer blinding speed." The laws of physics refute this, in that horizontal velocity has no effect on the

force of gravity. For example, a bullet shot horizontally will hit the ground at the same time as does a nonfired bullet dropped from the same height. The basilisk actually is capable of running on water, even starting from a submerged position, by spreading out its feet in the downward thrust for maximum lift and withdrawing them folded up to produce the least resistance. The East Indian water lizard (*Hydrosaurus amboinensis*) is also capable of this feat.

William Voelker, M. D.  
Paradise, California

*You're right that the basilisk's toe flaps aid its ability to walk on water. Speed and lightness are also important, however, as shown by young lizards that can skip across water for 60 feet or more.*

I have never seen such incredible pictures. Those in "Teeming Life of a Rain Forest" were so vividly and crisply closeup that I viewed each at least three times before moving to the written word. That waterdrop in the wasp's mouth and the fungus growing from the ant are stories by themselves. The foldout paintings (pages 13-18) are glorious examples of artwork; I learned so much just from them. That there are so many species of animals is difficult to comprehend.

Thomas A. Young  
Chugiak, Alaska

## RAIN FOREST TV SPECIAL

The National Geographic Special "Rain Forest" on PBS was a masterpiece. David and Carol Hughes have taken what, in my opinion, in years past has been a bland and unimaginative process of gathering information and turned it into an art form. Their documentary was not only informative, it was beautifully filmed and written. Anyone can gather information and film, but the Hugheses have added beauty, sensitivity, even a bit of mystery.

Mary B. Wheeler  
Hazel Green, Alabama

## WASHINGTON, D. C.

Bravo! Your January 1983 article "Hometown Washington, D. C." was long awaited by this chronically homesick Washingtonian. It brought many a lump in my throat and a tear to my eye to read your delightfully informative and fair portrait of my hometown. Pardon me, I must lay down my pen and make my reservations to get home in time for the cherry blossoms.

Kathleen Ward  
Houston, Texas

In my recurring visits to our nation's capital, I have consistently had the feeling I am just an intruder in a city that is being run for the benefit of

those who work there, and in his "Hometown Washington, D. C." Henry Mitchell's condescending and derogatory portrayal of the tourists only confirms what I have suspected all along.

Warren Hall  
Waltham, Massachusetts

I wish to thank Henry Mitchell for his splendid article. It stirred memories of the thirties. To have called upon Todd Duncan (of *Porgy and Bess*) was a stroke of good judgment. Who else could have painted a clearer tableau of the Negroes and whites of that period?

Edouard Du Buron  
Kingston, Massachusetts

#### BOROBUDUR

As someone who has lived in Indonesia and experienced its culture, I was delighted with your article on Indonesia's restoration of the Buddhist monument Borobudur (January 1983). The work involved in the restoration is a fine example of the Indonesian spirit *gotong royong*—people working together to achieve a common goal.

Patricia R. Henschen  
Sherman, Texas

#### SURFACE TEMPERATURE

Little wonder that the world cannot decide which catastrophe poses the greatest danger to

the earth. In the November 1982 issue, Brian Toon is quoted as saying he expects the average surface temperature of the Northern Hemisphere to cool by at least a quarter of a degree Celsius (page 673). Now I read in January 1983 that "scientists generally agree that the greenhouse effect is causing a global warming" (page 20). This cautions me to study carefully the parochial viewpoint of each scientific discipline.

Robert A. Kubitschek  
Concord, California

*It's a matter of time. Brian Toon is predicting a minor variation over the next few years, while the statement concerning the greenhouse effect goes on to say "sometime in the next century."*

#### GAZA ARCHAEOLOGY

In the December 1982 issue you make several disparaging references to grave robbers. By what sanctimonious reasoning can a degree in archaeology make it any less desecration and robbery to be fiddling with dead people's bones and possessions? I am not convinced that the ancients constructed and furnished their tombs for the exclusive exploitation of Trude Dothan and crew or any other special-interest group.

Francis L. Cummings  
Makakilo City, Hawaii

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*Archaeologists add to mankind's knowledge of the past, grave robbers only to their pocketbooks.*

## MEDITERRANEAN MAP

In the December 1982 issue of NATIONAL GEOGRAPHIC there is a fascinating map named "The Historic Mediterranean." However, it shows the Golan Heights and a part of the West Bank east of Jerusalem as parts of Israel. Does the National Geographic Society want to make itself a spokesman in favor of these unilateral annexations by Israel, against the policy of the United Nations as well as the stand of the U. S. government? I hope not. I would very much like an editorial comment on whether this is a simple mistake or a political stand by the Society.

Sven-Olof Lundqvist  
Hägersten, Sweden

*The current political boundaries shown on this historical map depict the region as it is, without regard to legalities or recognition—a cartographic policy long adhered to by the National Geographic Society. A dashed line delineates the Israeli-occupied West Bank; the annexed Golan Heights are shown as part of Israel. Similarly, Society maps show Estonia, Latvia, and Lithuania as parts of the Soviet Union, though their in-*

*corporation has never been recognized by the United States.*

## HUNGARY

Your Hungary piece (February 1983) showed the many fascinating sides of its people. As an economist, I was particularly struck by the statement of the director of the state farm at Tata, "And now it is important to gain profit . . . with a part going to the workers as bonuses. So people use their minds, their brains." Yet in our country many people criticize the very profit motive that has helped Hungarians retain a sense of control over their own destiny.

Frank D. Tinari  
Florham Park, New Jersey

John J. Putman's article on Hungary was the best I have ever read, because he captured the true spirit of a very proud people.

Helen Kovacs  
New Milford, New Jersey

Letters should be addressed to **Members Forum**, National Geographic Magazine, Box 37448, Washington, D. C. 20013, and should include sender's address and telephone number. Not all letters can be used. Those that are will often be edited and excerpted.



Dodge and Plymouth dealers take the shock out, put the value in. With more standard features than Toyota Celica GT or Datsun 200SX, Challenger and Sapporo also boast a bigger engine, the 2.6 Silent Shaft MCA-Jet. They also offer such comfort and convenience refinements as reclining buckets with adjustable lumbar support for the driver and memory return on the passenger side; fuel filler door with inside remote control; digital clock, all just for starters. Plus the kind of mileage numbers you'd never expect from road-handlers like these: 36 estimated highway, [24] EPA estimated MPG.\* Challenger and Sapporo are imported only for Dodge and Plymouth. Cars shown, with aluminum road wheels, 4-wheel disc brakes with 9" vacuum booster, **\$8698**. Sticker Price, excluding title, taxes, license and destination charge.

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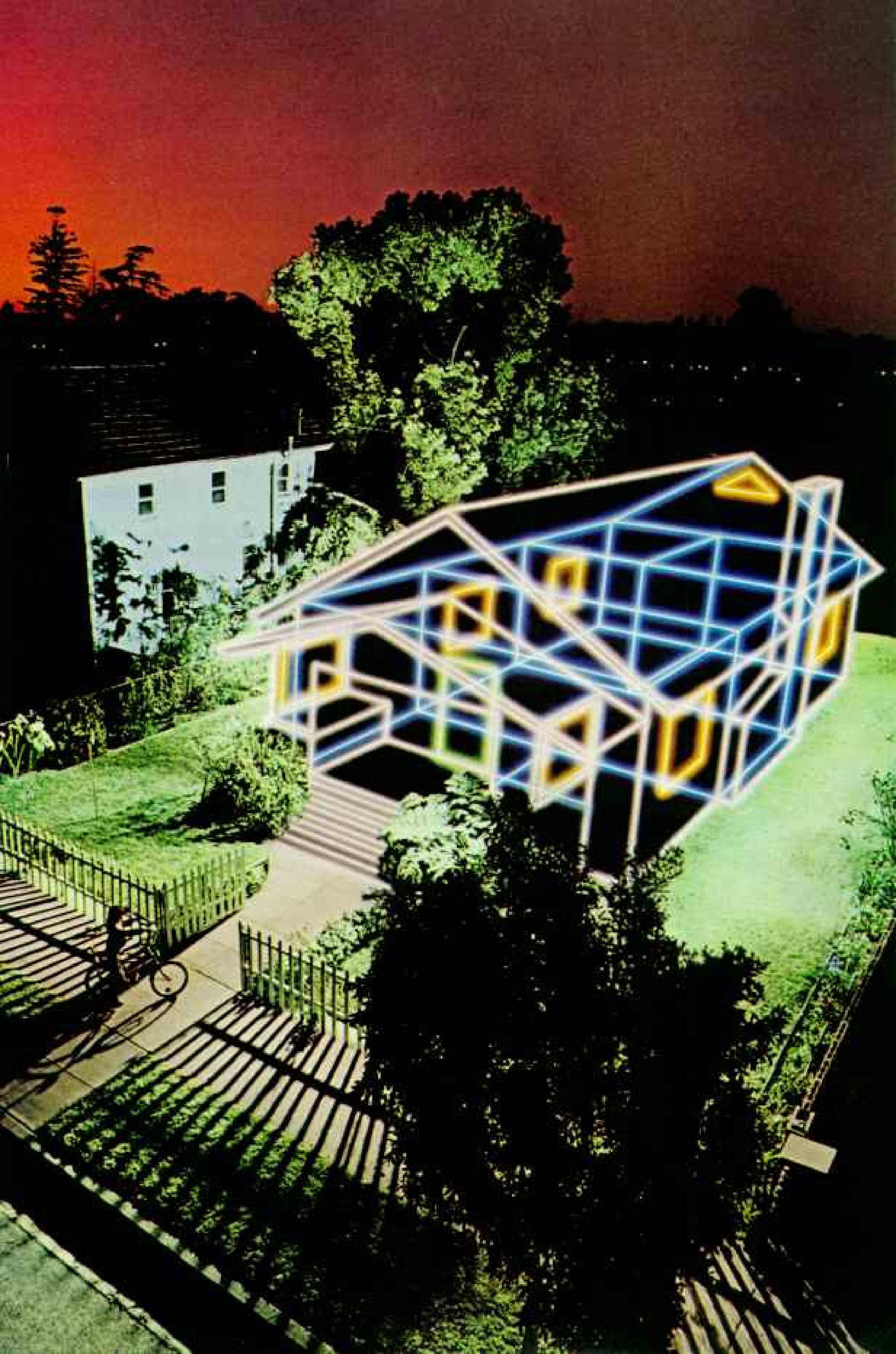


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tronically. Transmit a report to your office in a matter of seconds.

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An important part of that technology is lightwave fiber, already in use in some areas. Bell engineers are working on a lightwave system that can carry more than 100,000 telephone conversations simultaneously. And transmit them all over fibers about one-tenth the thickness of a human hair.

And lightwave fiber, while providing even better transmission quality, is much less expensive

than copper cable of comparable capacity.

Things like that are important to us at the Bell System. After all, changing for the future isn't changing for the better if you're not able to afford it.

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## On Assignment

**A**LWAYS LOOKING for a better angle, photographers soon took advantage of the height of the new Brooklyn Bridge. At the turn of the century, an unidentified, properly clad Victorian (*upper right*) climbed atop a bridge tower to record panoramic views of New York City with an early motion-picture camera.

Last fall New York City free-lance photographer **Donal F. Holway**, who admits he's not terribly fond of heights, walked up a main cable to shoot Manhattan from the same windy vantage point (*bottom right*).

The opening of the bridge in 1883 made getting to Brooklyn's open spaces and cheap housing easier for the immigrants who flocked to settle in their distinctive neighborhoods.

Today some of those areas are tough communities where carrying around expensive cameras is risky business. Staff photographer **Robert W. Madden** replaced his office business suit (*lower left*) with jeans, a T-shirt, and dark glasses (*upper left*). He also hired a street-smart local called Sindbad. "He was invaluable," says Madden of the itinerant artist and ex-convict who now runs an art school for kids. "He told me

where it was safe to park my car and when to move on, and acted as lookout when I had my face pressed to the camera."

But the bad reputation of many neighborhoods was undeserved, Madden discovered. "My major shocks were cultural. Visiting ethnic communities, I traveled from 19th-century Russia to Sicily in 30 minutes."



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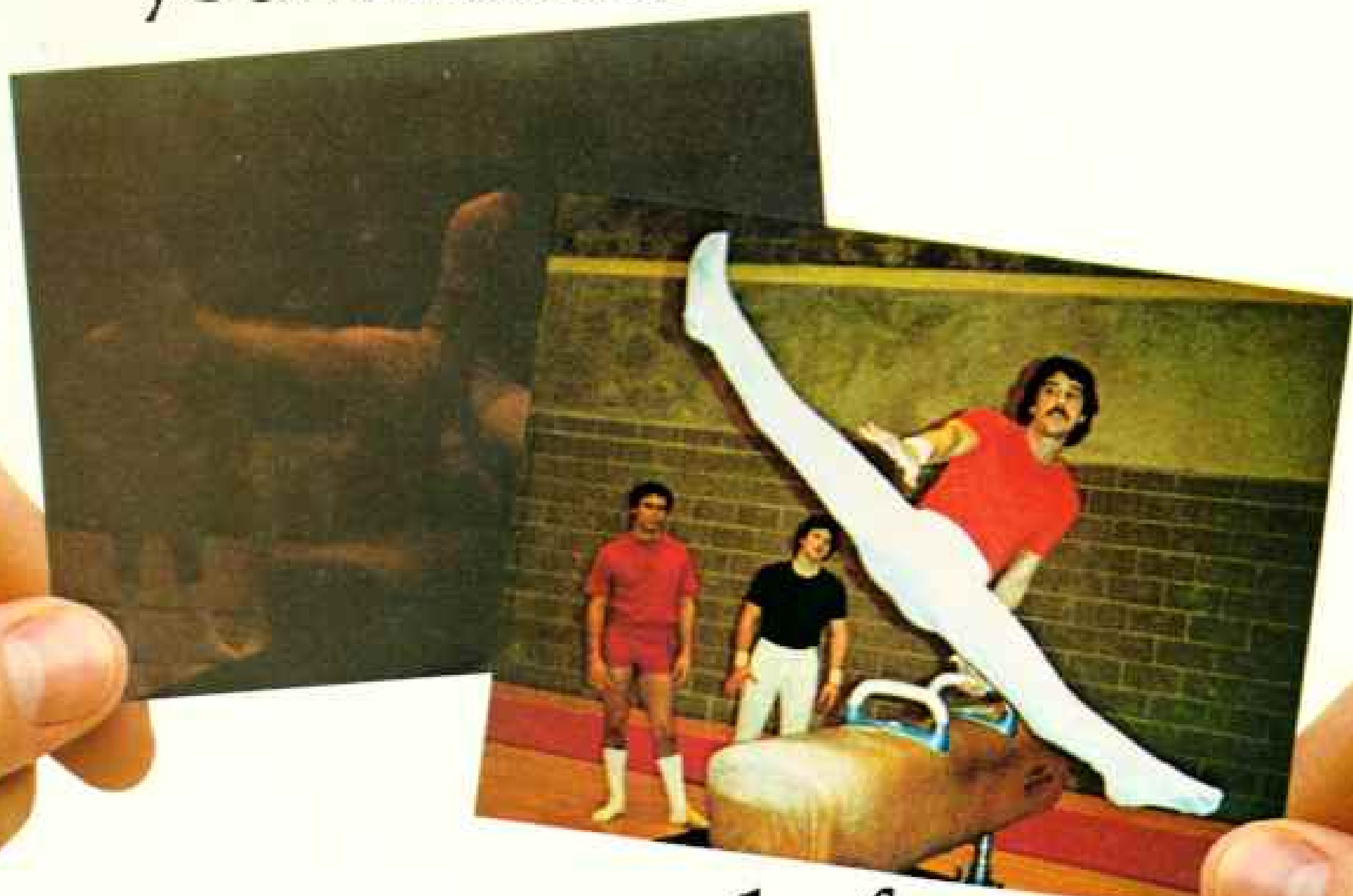
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Photographed by Andy Young. *Muriqui: Genus: Brachyteles Species: brachyteles*  
Adult size: 55–61cm head and body, 67–84cm tail. Adult weight: 10–15kg.  
Habitat: Occurs only in the Atlantic coastal forests of southeastern Brazil.  
Surviving number: 150–200.



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

The muriqui or woolly spider monkey was once so abundant, it was found throughout the coastal forests of southeastern Brazil. Today, this large, ape-like monkey unique to Brazil is one of the world's most endangered primates. Faced with the destruction of its habitat and a target of illegal hunting, it is now confined to four or five isolated areas hemmed in by development. And so far, all attempts to breed it in captivity have failed.

The muriqui 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 important aid to conservation efforts, photography makes it possible to observe and study the muriqui in the wild without disturbing the animal. In addition, photography can bring us the beauty of the muriqui in its natural habitat, and by doing so, it can give us an intimation of the vital and crucial

relationship of the muriqui with its environment, consequently helping us to better understand our own relationship with nature.

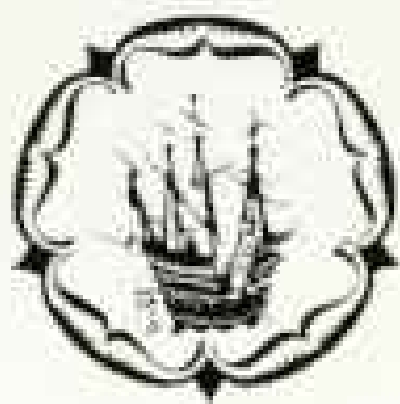
And understanding is perhaps the single most important factor in saving the muriqui and all of wildlife.



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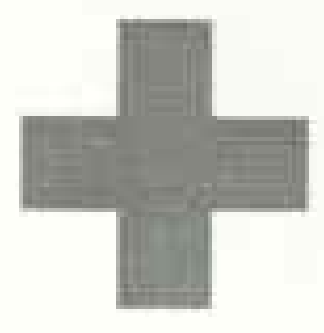
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