THE MAKING OF AMERICA: OHIO VALLEY

VOL. 168, NO. 6 DECEMBER 1985

NATIONAL GEOGRAPHIC

HOW WE FOUND TITANIC

BY ROBERT D. BALLARD

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

WHEN the Royal Mail Steamer *Titanic* slid beneath the waves on April 15, 1912, more than an "unsinkable" ship went down. An age of ostentatious and arrogant worship of wealth also began a fast slide into oblivion. It was the end of Mark Twain's "Gilded Age," when a young, brash America saw millionaires assume the aura of royalty, and the French phrase *nouveau riche* had become part of our vocabulary. Faith that money could fix anything and that man had conquered nature was confounded when the sea swallowed the proudest ship afloat. Like Humpty-Dumpty, all the king's horses and all the king's men couldn't bring her back.

World War I, Marxist revolution in Russia, and the graduated income tax all came along soon after. An epitaph for this arrogant era was mouthed by a sailor in Southampton: "Lady, God himself couldn't sink this ship."

Titanic, whose very name rang with invincibility, thus became a symbol. Her sudden disappearance enhanced an already mythical reputation. Now her dark grave has been penetrated for the first time in 73 years. The team that found her tells the story in this issue.

There are those who would raise her. Massive amounts of money might make it possible, but for what purpose? The band won't begin playing again, the era won't rise with her. Let us leave her and those who died with her in peace.

We also bring you the story of Nicaragua, a country whose suffering signals the end of another era. The age of the banana republics will not sink as quietly as *Titanic*—but just as surely and with a far greater loss of life. In the year the great ship sank, U. S. Marines came ashore in Nicaragua a second time to reinforce a U. S.-backed regime. Except for a nine-month period they stayed until 1933. Today we send no Marines—only dollars.

A third article describes another era of profound change. In the single lifetime of Daniel Boone 1.8 million square miles of North America changed hands as the United States was formed out of the colonial lands of England, France, and Spain.

The *Titanic* that rests on the bottom today isn't the same as the one that sank. The banana republics have changed even more. The wilderness that Boone loved is gone forever. For better or worse, no amount of money nor all the king's men can raise or revive any of them—or the eras they represent.

Wilbur E. Garrett

EDITOR

NATIONAL GEOGRAPHIC

December 1985

COVER: *A rattail fish glides in the deep above* Titanic's *foredeck, port rail, and mooring bitts. Photograph courtesy WHOI, IFREMER, and Robert D. Ballard.*

THE NATIONAL GEOGRAPHIC MAGAZINE
IS THE JOURNAL OF
THE NATIONAL GEOGRAPHIC SOCIETY
FOUNDED 1888

How We Found TITANIC

By ROBERT D. BALLARD WOODS HOLE OCEANOGRAPHIC INSTITUTION

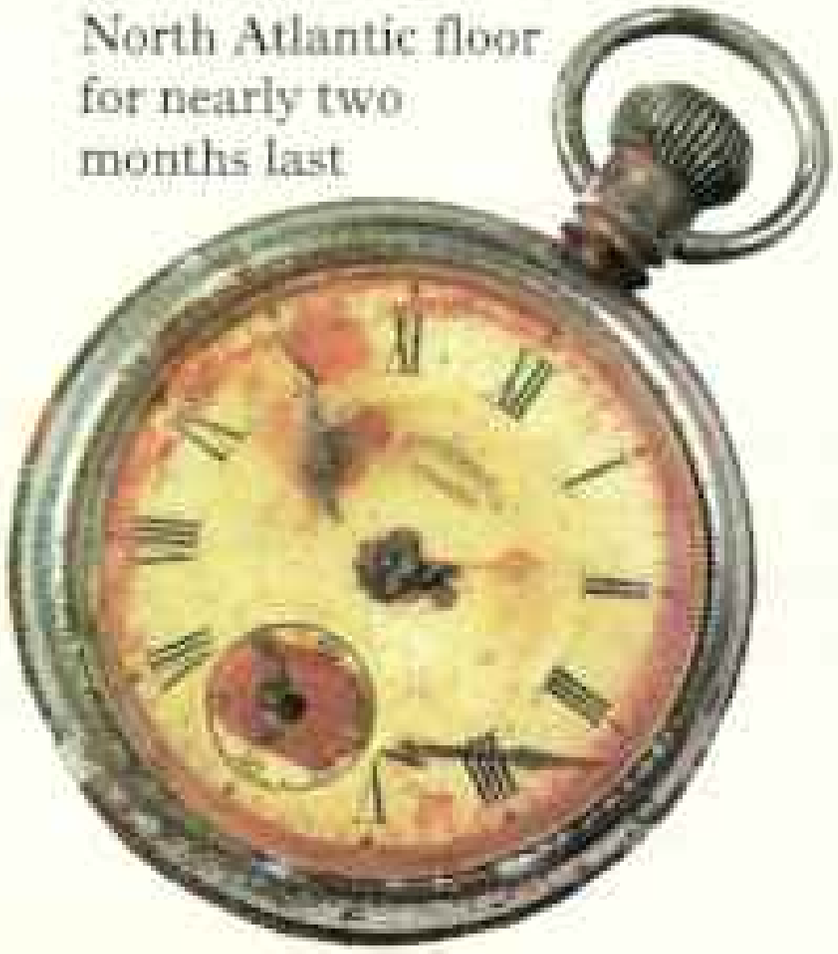
In association with

JEAN-LOUIS MICHEL INSTITUT FRANÇAIS DE RECHERCHES POUR L'EXPLOITATION DES MERS (IFREMER)

I CANNOT BELIEVE my eyes. From the abyss two and a half miles beneath the sea the bow of a great vessel emerges in ghostly detail (***right***). I have never seen the ship—nor has anyone for 73 years—yet I know nearly every feature of her. She is S.S. *Titanic*, the luxury liner lost after collision with an iceberg in 1912 at a cost of 1,522 lives.

The sea has preserved her well. In this mosaic of two photographs the lines of the deck's teak planking are visible beneath a thin coating of "snow" formed by remains of marine organisms. Other features stand out in the strobe lights of our towed undersea vehicle. Twin anchor chains run from windlasses, lower right, beneath a tangle of cables to hawsepipes near the bow. A ventilator shaft lies open between the chains, and capstan heads stand on either side. Twin bitts for securing mooring lines and spool-like rollers to guide them stand along the port rail, bottom. In the peak of the bow an extra anchor for emergencies lies beneath its handling boom.

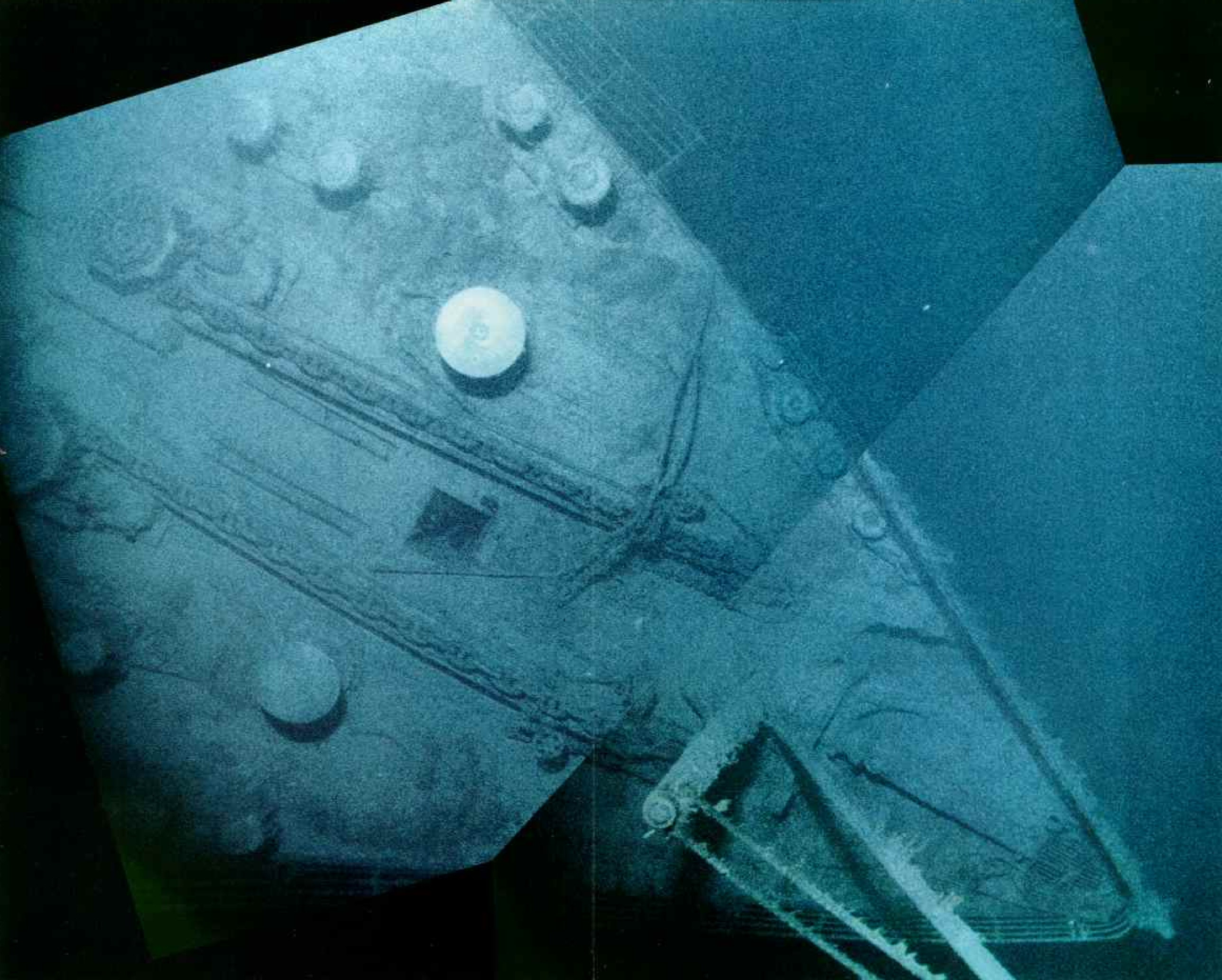
These historic photographs are the work of U. S. and French scientists and technicians who searched the North Atlantic floor for nearly two months last summer to locate *Titanic*'s grave. A key figure throughout the project was my French colleague and fellow chief scientist of the expedition, Jean-Louis Michel, seen opposite me (***above***) with his chin in his hand aboard the Woods Hole research ship *Knorr*. U. S. Navy Lt. (jg.) George Rey joins us in studying plans of *Titanic*'s rigging, a constant hazard to our undersea vehicles.



A haunting memento, the watch (***left***) was recovered from the floating body of a victim on April 23, 1912, a week after the disaster. A water stain on the dial indicates that the hour hand stood just short of two o'clock when the watch stopped. *Titanic* went down at 2:20 a.m. local time.

NATIONAL GEOGRAPHIC PHOTOGRAPHERS EMORY KRISTOF (ABOVE) AND BRUCE DALE (LEFT)

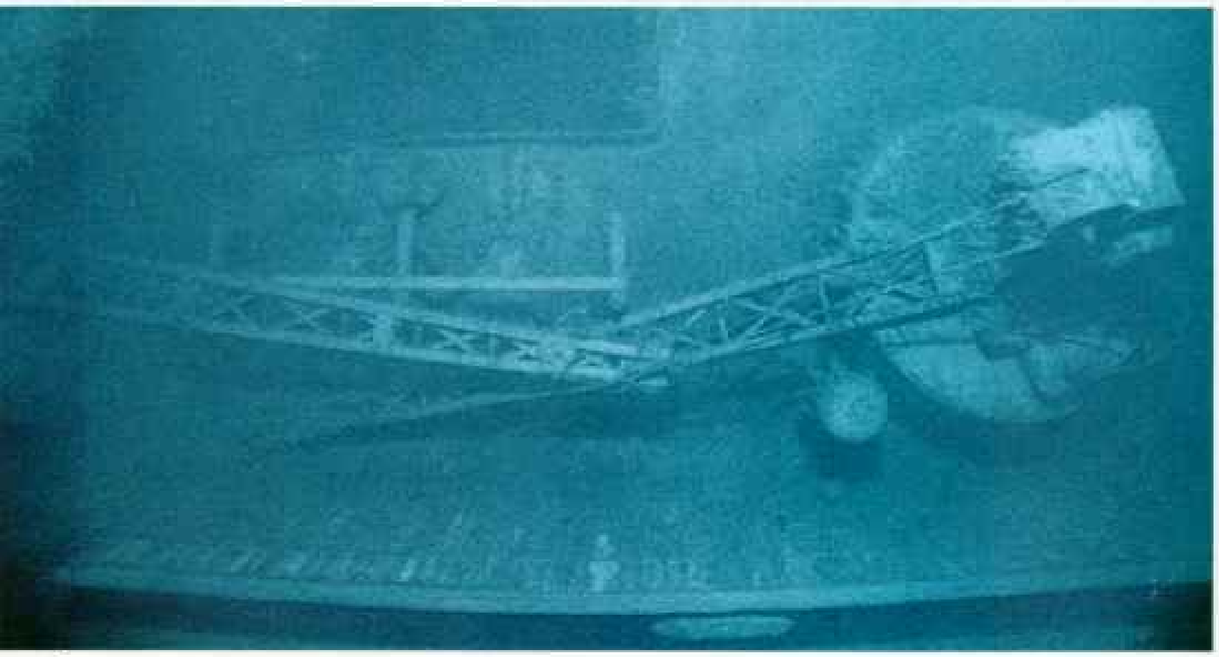
A
REFER TO RED LETTERS
ON PAINTING, FOLLOWING PAGES



Mute testimony of the wreckage

AS WITH ALL great disasters, eyewitness accounts of the loss of *Titanic* vary widely, and aspects of the event are still being argued. Our portrait of *Titanic*, though far from complete, sheds new light on details of her death as well as her present condition on the ocean floor. To produce the painting at right, National Geographic artist William H. Bond consulted builders' plans, leading experts, and our photographic files for accurate data. Letters are keyed to photographs throughout the article, giving the location aboard ship for each scene.

Our still photographs were taken from ANGUS—a "blind" camera sled towed from the surface and guided by means of sonic beacons on the seafloor. Only when ANGUS was raised and the film developed could we tell precisely where the craft had been. The scene (***below***) of two cargo cranes was recorded from a point dangerously close to *Titanic*'s bridge. Another (***bottom***) shows the after portion of the ship's forecastle with a partly open ventilator (top of photograph) forward of the twisted guardrail. A broken



B

C

UNDERWATER PHOTOGRAPHS COURTESY OF WOODS HOLE OCEANOGRAPHIC INSTITUTION, IFREMER, AND ROBERT D. BALLARD

D

lifeboat davit (***lower left***) with the block still attached lies alongside a collapsed bulkhead from the officers' quarters.

The great liner tilts only seconds before her plunge to the bottom—two hours and 40 minutes after the iceberg tore a gash some 300 feet long in her starboard side near the bow. Six of her 16 watertight compartments were flooded, and as the sea rose above the watertight bulkheads, adjoining compartments flooded like sections of an ice-cube tray. Yet *Titanic* stayed afloat more than an hour longer than most experts on board predicted.

Many of the 2,227 passengers and crew had abandoned ship or been swept away when the vessel briefly upended in the water, then settled back at an angle. All 20 lifeboats and rafts—less than half the number needed—had been launched, many of them only partly filled. Nearly all had pulled away from the ship for safety. That action doomed most survivors afloat, for the temperature of the sea was 28°F and none could last more than an hour or so. The nearest ship to respond was still two hours away.

One of our photographs confirms the loss of the foremost of *Titanic's* four giant stacks, not shown in the painting. Some accounts maintain that the funnel collapsed violently when the ship upended; others claim it worked loose as the water engulfed it. Our pictures support the former conclusion. During one sweep along the superstructure we took a photograph (***below***) showing the huge circular opening where the funnel once joined the deck. Massive steel flanges have been wrenched open like the lid of a sardine can.

PAINTING BY WILLIAM H. BOND, NATIONAL GEOGRAPHIC ARTIST; CONSULTANTS: CHARLES A. HAAS III AND JOHN P. EATON, TITANIC HISTORICAL SOCIETY

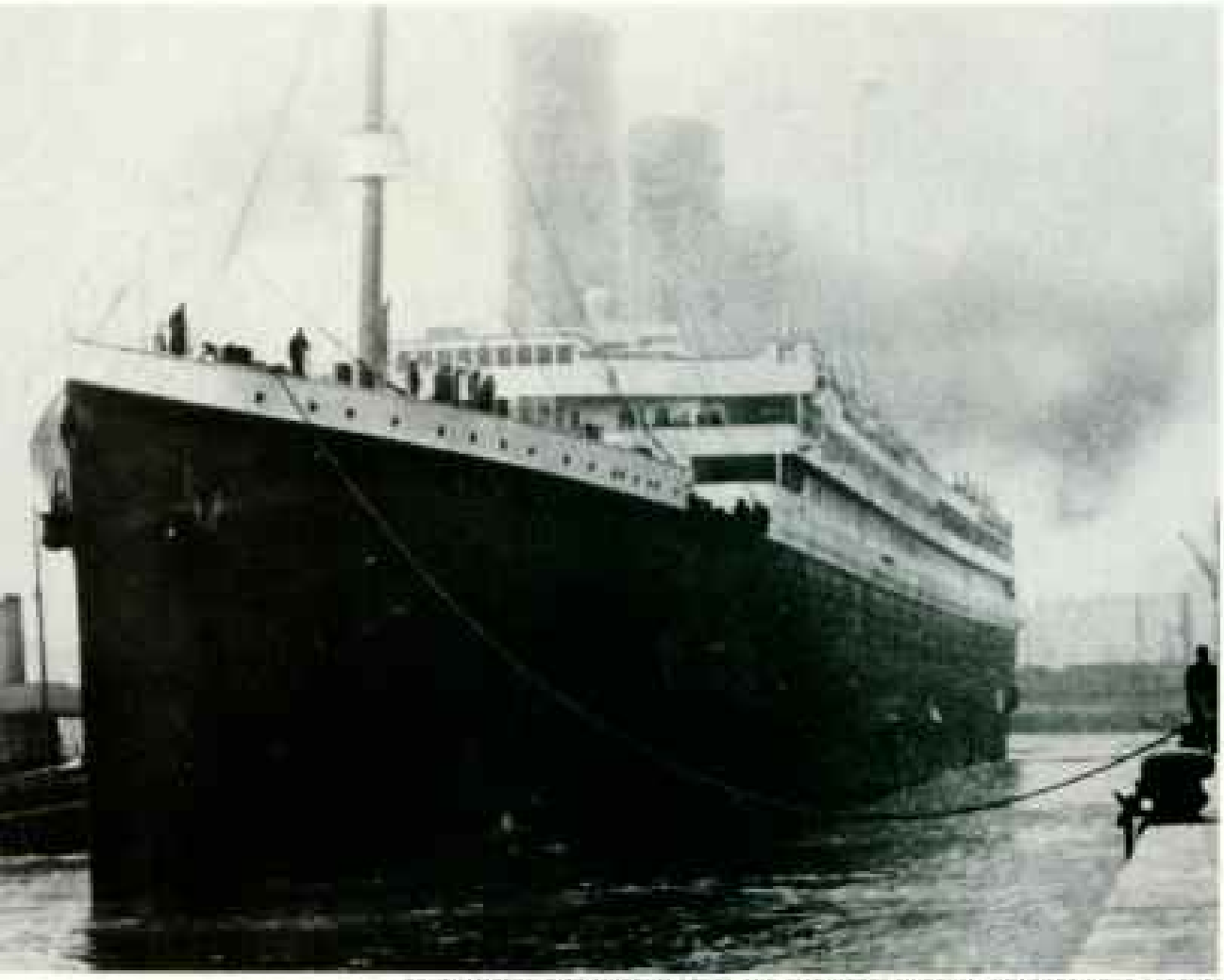
THIS PAGE FOLDS OUT

SYMBOL of disaster, *Titanic*'s hydroid-encrusted crow's nest (***opposite***) emerges in startling detail in a close-up. The same crow's nest shows clearly with two men in it in the scene below as the ship leaves Southampton, England, on her first and only voyage. Our underwater photographs reveal that when the forward funnel collapsed, it pulled the mast backward, so that today its top lies across the bridge. A circular windlass beneath the mast lies between open holds.

To me the view of the crow's nest most expresses the *Titanic* tragedy. It was from this station that lookout Fred Fleet, who survived, first sighted the iceberg one-fourth of a mile dead ahead. Instinctively he gave three rings on the bell above the crow's nest. The bell's bracket appears as a faucet-like fixture on the right of the mast Lower down a pair of circles marks the receptacle for the telephone over which Fleet warned the bridge, "Iceberg right ahead!"

Ironically, Fleet's words doomed *Titanic*. In response to the warning her officer-in-charge tried to reverse engines and turn hard to starboard. The reversal actually turned the ship slowly to port, and she suffered the fatal gash in her starboard side. Had she rammed the berg head-on, she would likely have flooded only two or three compartments and remained afloat.

Captain Edward J. Smith (***above left***), who was not on the bridge at the time, went down with his command.



SOUTHAMPTON CITY MUSEUM (TOP) AND MARINERS' MUSEUM, NEWPORT NEWS (ABOVE)

F

Sea search for a legend

OVER THE YEARS a number of expeditions have sought without success to locate *Titanic*—a problem compounded by the North Atlantic's unpredictable weather, the enormous depth at which *Titanic* lies, and conflicting accounts of her final moments. Organizing our search, Jean-Louis Michel and Jean Jarry, the French project leader, and I traced the movement of four ships before, during, and after the sinking. From the outset we discounted the reported position of *Californian*, the ship nearest to *Titanic* and the one that could have saved all aboard if *Californian*'s radio had not been off. That position has always been controversial. In the sequence above we reconstruct what we believe to be *Titanic*'s final hours:

• ***April 14, 11:00 p.m.:*** Steaming westward, *Titanic* approaches a barrier of field ice and bergs several miles wide stretching north and south some 400 miles off the coast of Newfoundland. *Californian*, halted by ice to the north, radios a warning and shortly shuts down her set.

• ***April 14, 11:40 p.m.:*** At a speed her navigator mistakenly believes to be more than 21 knots, *Titanic* hits an iceberg and radios a distress call with her estimated position (pink cross). But a consistent change in *Californian*'s reported positions indicates that a southeasterly current (arrow) was slowing *Titanic* and putting her off track. After midnight *Californian* and *Titanic* each see the lights of another ship in the other's direction. But according to the two ships' reported positions, the distance between them is too great. There must be another vessel between them—the "mystery ship" (dotted outline) that has intrigued historians ever since. Later *Californian* sees white rockets on the horizon but doesn't realize they are distress signals.

• ***April 15, 2:20 a.m.:*** *Titanic* goes under, with 705 survivors in lifeboats. The Cunard liner *Carpathia*, which had picked up the first distress call 58 miles to the southeast, continues steaming on a northwest course toward *Titanic*'s reported, but incorrect, position.

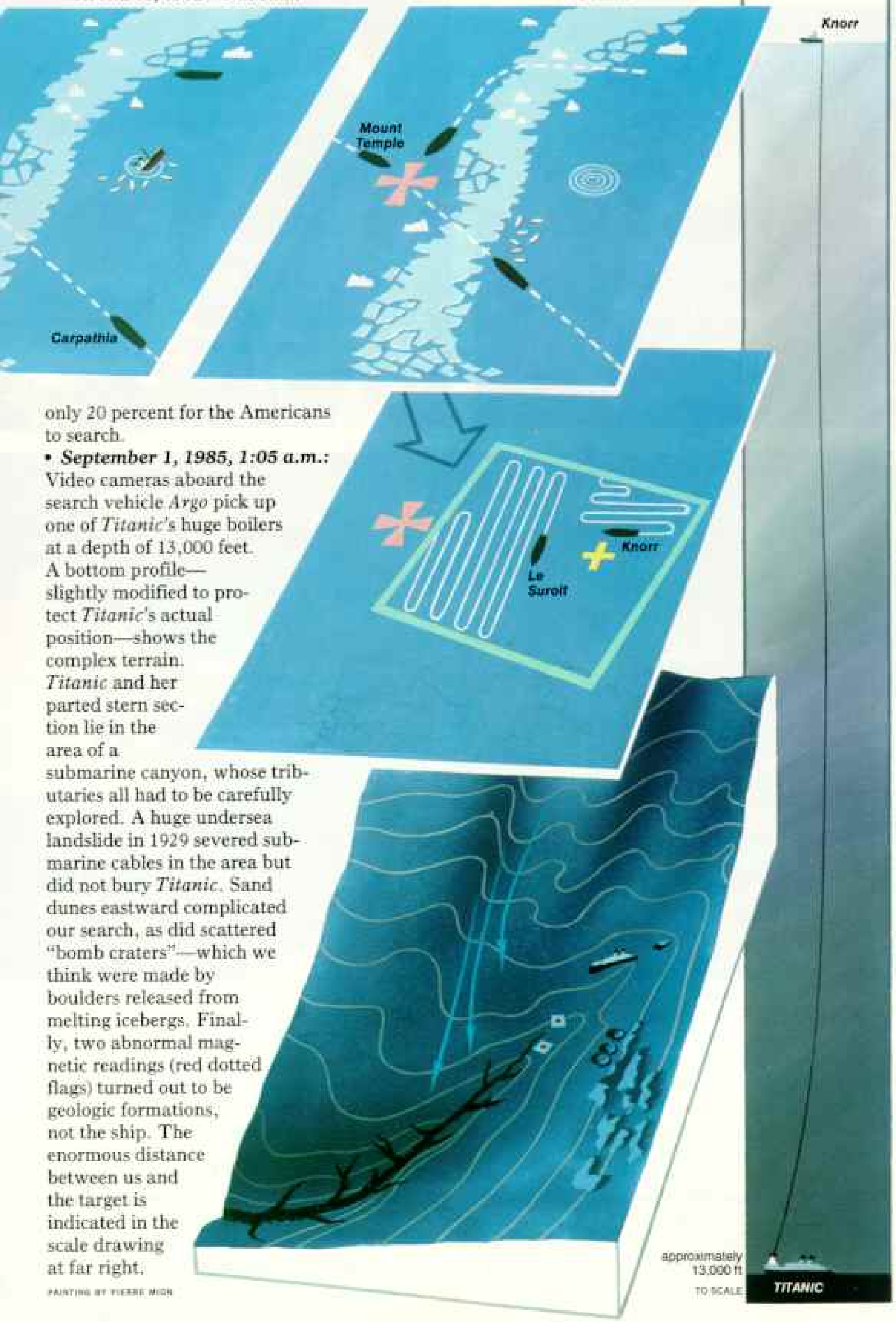
• ***April 15, 4:10 a.m.:*** *Carpathia* encounters the drifting lifeboats and begins rescue. Later *Californian*, which has finally turned on her radio, arrives at *Titanic*'s reported position with *Mount Temple* and other ships. The mystery ship, if it ever existed, has long ago vanished. Having taken all elements into account, Jean-Louis, Jean, and I conclude that *Titanic* must lie north of where *Carpathia* met the lifeboats.

• ***June 28, 1985:*** The French ship *Le Suroit* ("Sou'wester") begins "mowing the lawn"—systematically crossing the 150-square-mile target zone with her deep-search sonar. *Le Suroit* covers 80 percent of the zone, leaving

only 20 percent for the Americans to search.

• ***September 1, 1985, 1:05 a.m.:*** Video cameras aboard the search vehicle *Argo* pick up one of *Titanic*'s huge boilers at a depth of 13,000 feet. A bottom profile—slightly modified to protect *Titanic*'s actual position—shows the complex terrain. *Titanic* and her parted stern section lie in the area of a submarine canyon, whose tributaries all had to be carefully explored. A huge undersea landslide in 1929 severed submarine cables in the area but did not bury *Titanic*. Sand dunes eastward complicated our search, as did scattered "bomb craters"—which we think were made by boulders released from melting icebergs. Finally, two abnormal magnetic readings (red dotted flags) turned out to be geologic formations, not the ship. The enormous distance between us and the target is indicated in the scale drawing at far right.

PAINTING BY PIERRE MION



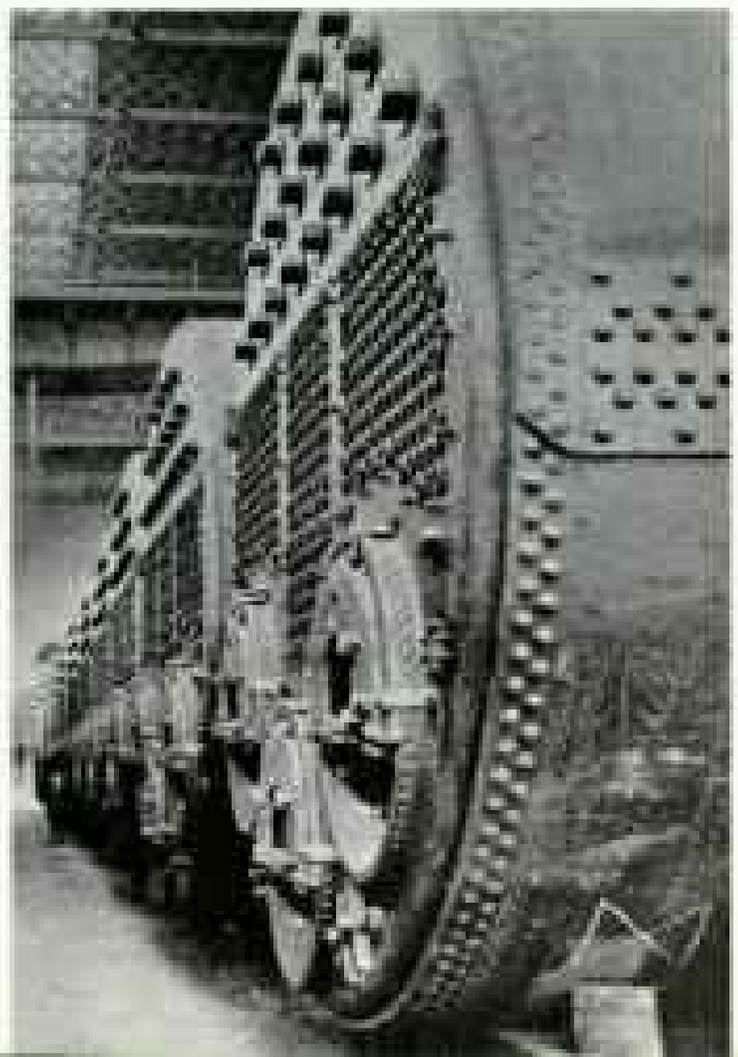
PHOTOGRAPHS THIS PAGE AND UPPER RIGHT BY EMORY KRISTOF

TEAMWORK and high technology combined to solve a historic puzzle. The French and Americans worked superbly together on a model project for future undersea exploration. A vital tool on the American side was our search vehicle *Argo* (**opposite, top**), seen beginning a two-hour descent to *Titanic*'s hull. The hollow steel frame supports video cameras, side-scan sonar, a computerized timing system, and a battery of other electronic gear.

Argo's support ship, the Woods Hole research vessel *Knorr* (**top left**), has two sets of rotary blades shaped like eggbeaters below the keel, allowing us to maneuver sideways as well as fore and aft.

The French team aboard the research ship *Le Suroit* (**top right**) prepares for a night launch of SAR, their revolutionary sonar search vehicle, which can survey a strip of ocean floor more than half a mile wide at each pass.

Aboard *Knorr* Jean-Louis Michel, standing next to me at far right, and others of our joint team survey the video screens (**above**) during a



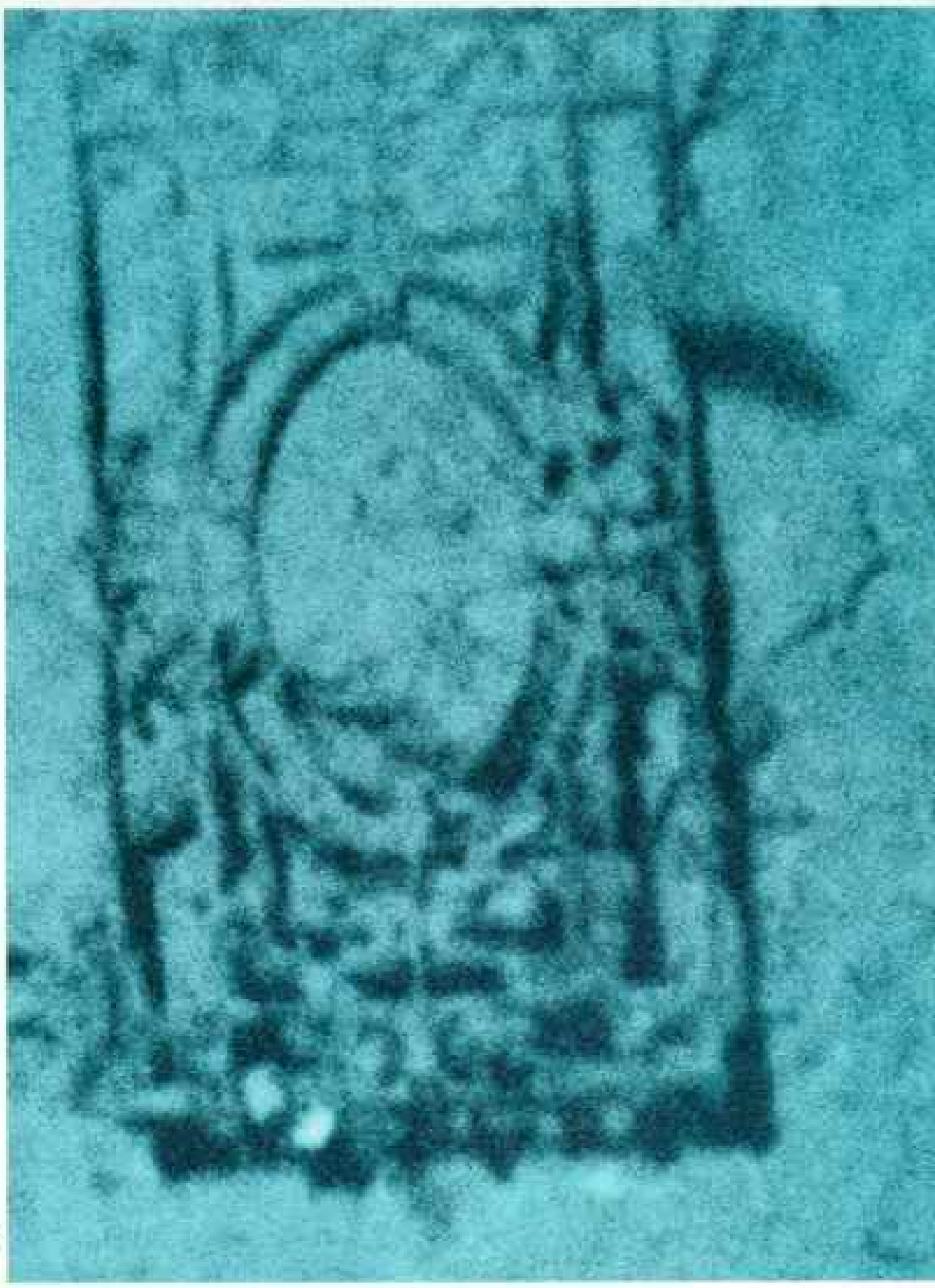
HARLAND AND WOLFF, LTD./CHARLES I. SACHS (LEFT)

run by *Argo*. The moment of triumph comes as the unmistakable form of one of the giant boilers (***left***) materializes. The three circular furnace doors match those shown in a historic photo (***far left***) taken during *Titanic*'s construction. A digital readout atop the screen records September 1, 1985; 4:05 a.m. Greenwich mean time; compass heading 214°.

PRECISION portrait of *Titanic*'s foredeck (***left***) reveals the remarkable preservative action of the deep sea. This view from 20 feet above the deck was made during our expedition's final photographic run. The direction of the bow is at upper right. Windlass heads, anchor chains, capstans, and mooring bitts all appear ready for action beneath a thin film of marine organisms. Not so *Titanic*'s human element. Marine scavengers long ago disposed of the victims' bodies. *Titanic* is more monument than tomb.

Elegance of a vanished age emerges in a beautifully designed cut-glass window (***right***) photographed by our cameras in a field of debris scattered across the ocean floor hundreds of yards astern of *Titanic*'s hull. We discovered the window in an early photograph of the ship's second-class smoking room (***upper right***). The window appears as a panel in the door at far left. To me the window symbolizes the striking contrast between violence and calm in *Titanic*'s last moments. In some areas of the ship one-inch-thick steel was crumpled like tin foil and in others, such as this, the most fragile ornaments survived intact. The photograph is slightly blurred, but it is possible that some glass panels remain unbroken and in place.

HARLAND AND WOLFF, LTD./CHARLES L. SACHS (ABOVE)



8
KEYED TO NUMBERS
IN DIAGRAM, PAGE 714

WORLD'S DEEPEST wine cellar lies scattered across the ocean floor in the area of the debris field. Traditional shapes of bottles, little changed in 73 years, lead experts to identify the bottle at upper left and those at left as Madeiras, ports, and possibly a champagne.

The bottle at lower right is probably a Bordeaux and the longer of the two at upper right a Riesling. They may still be drinkable, though extreme pressure may have forced seawater through the corks.

Lengths of twisted metal overlie the bottles. The digital readout in the bottom left corner gives the time: 1957 hours, 44 seconds, on the third day of the month, September. The compass heading is zero, indicating due north.

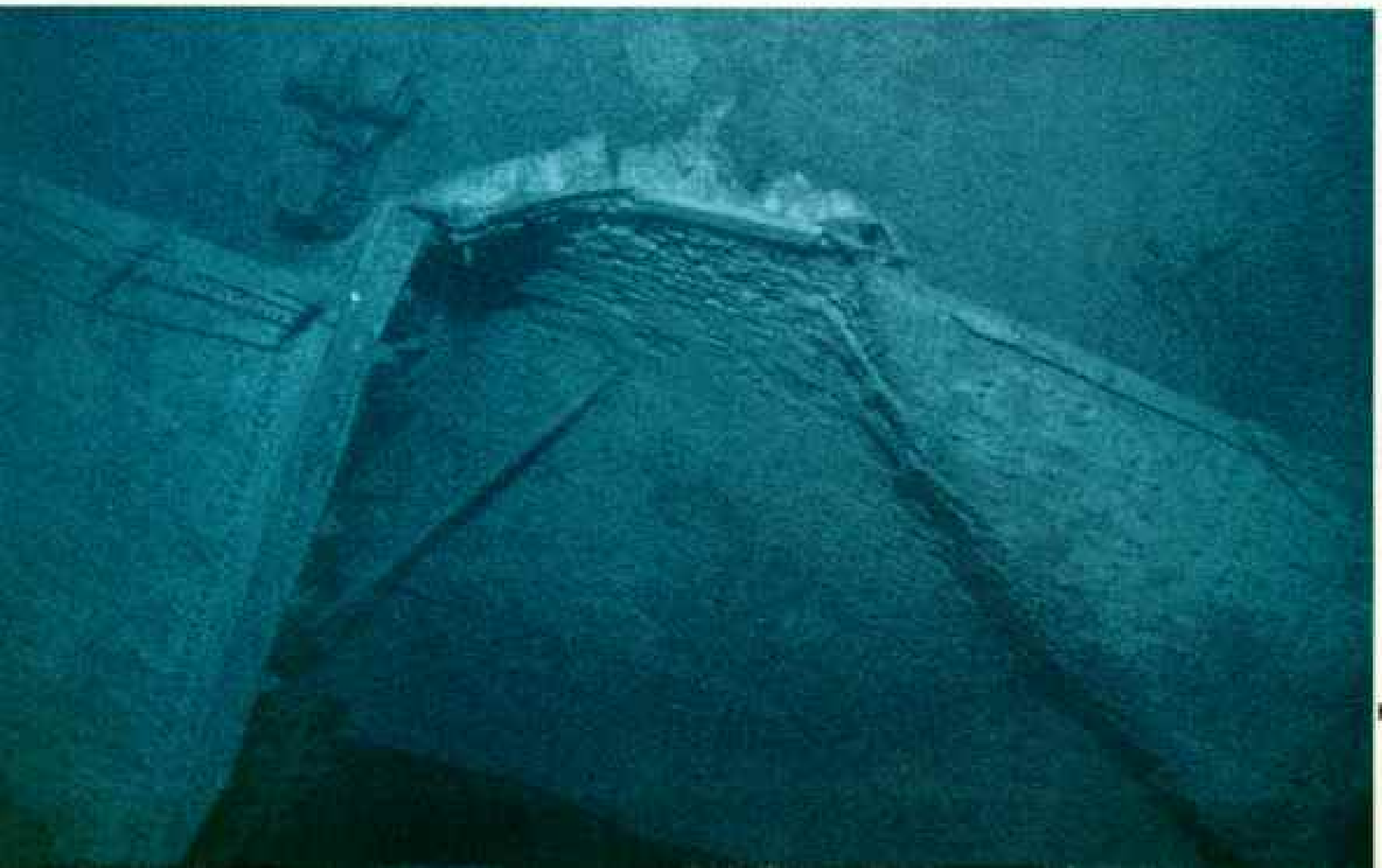
THE GRAND first-class entrance hall and staircase (***below right***) collapsed under the massive strains suffered by portions of the hull. The camera looks past twisted steel bulkheads (***bottom***) into the gaping hole once covered by the ornate glass dome. We saw no evidence of the elaborate stairway panel and clock, described at the time as representing "Honor and Glory crowning Time."

Titanic was not only the largest ship of her day—882 feet 9 inches in length and 66,000 tons displacement—she was also the most expensive. One-way passage in the finest of her first-class suites cost $4,350, the equivalent of nearly $50,000 in today's funds.

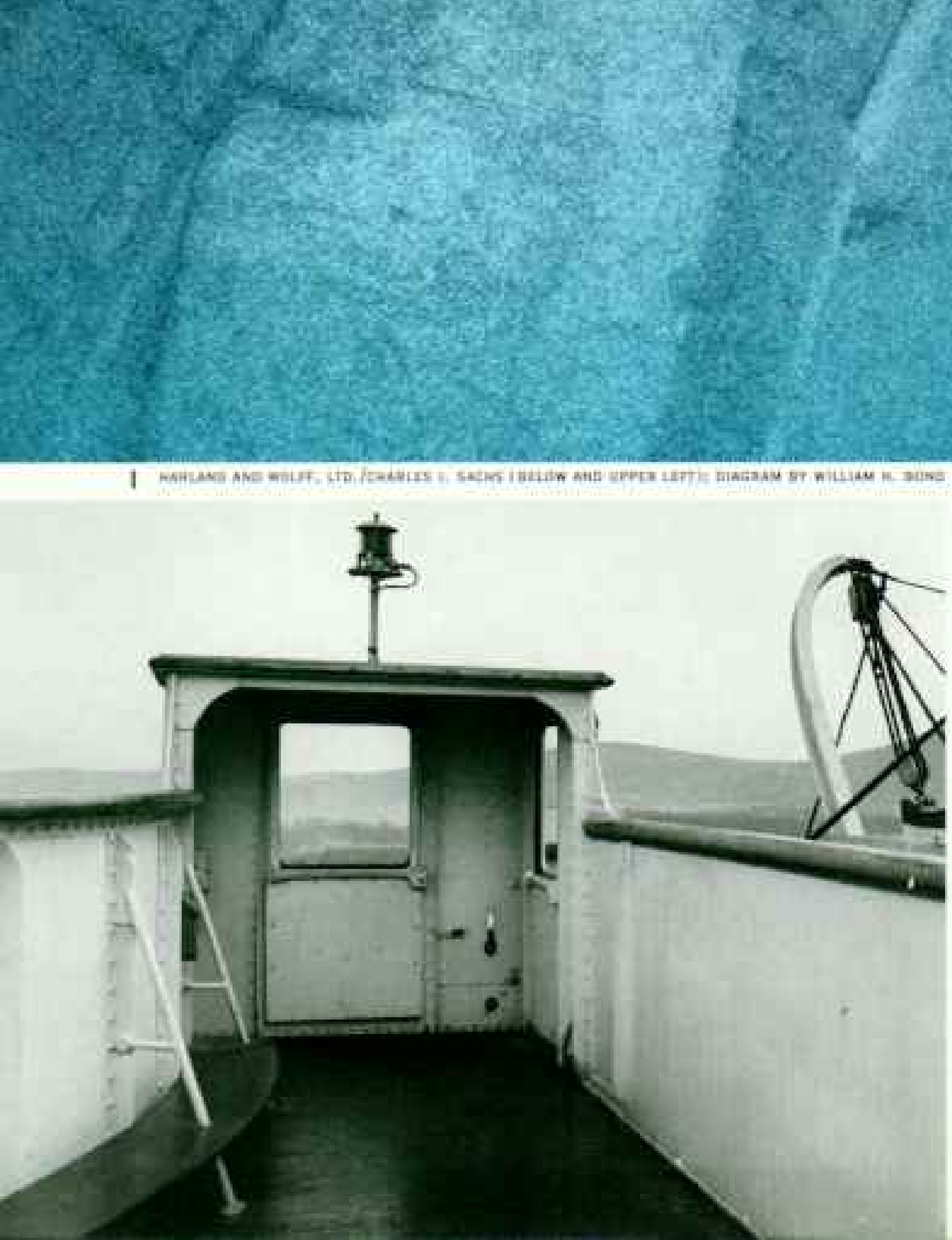
Unfortunately, when disaster struck, wealth sometimes made the difference between survival and death. First-class passengers were generally housed amidships nearest the lifeboats, while third class was quartered forward or aft far below. In some cases ship's personnel prevented third-class passengers from climbing topside until most of the boats had been loaded and launched.

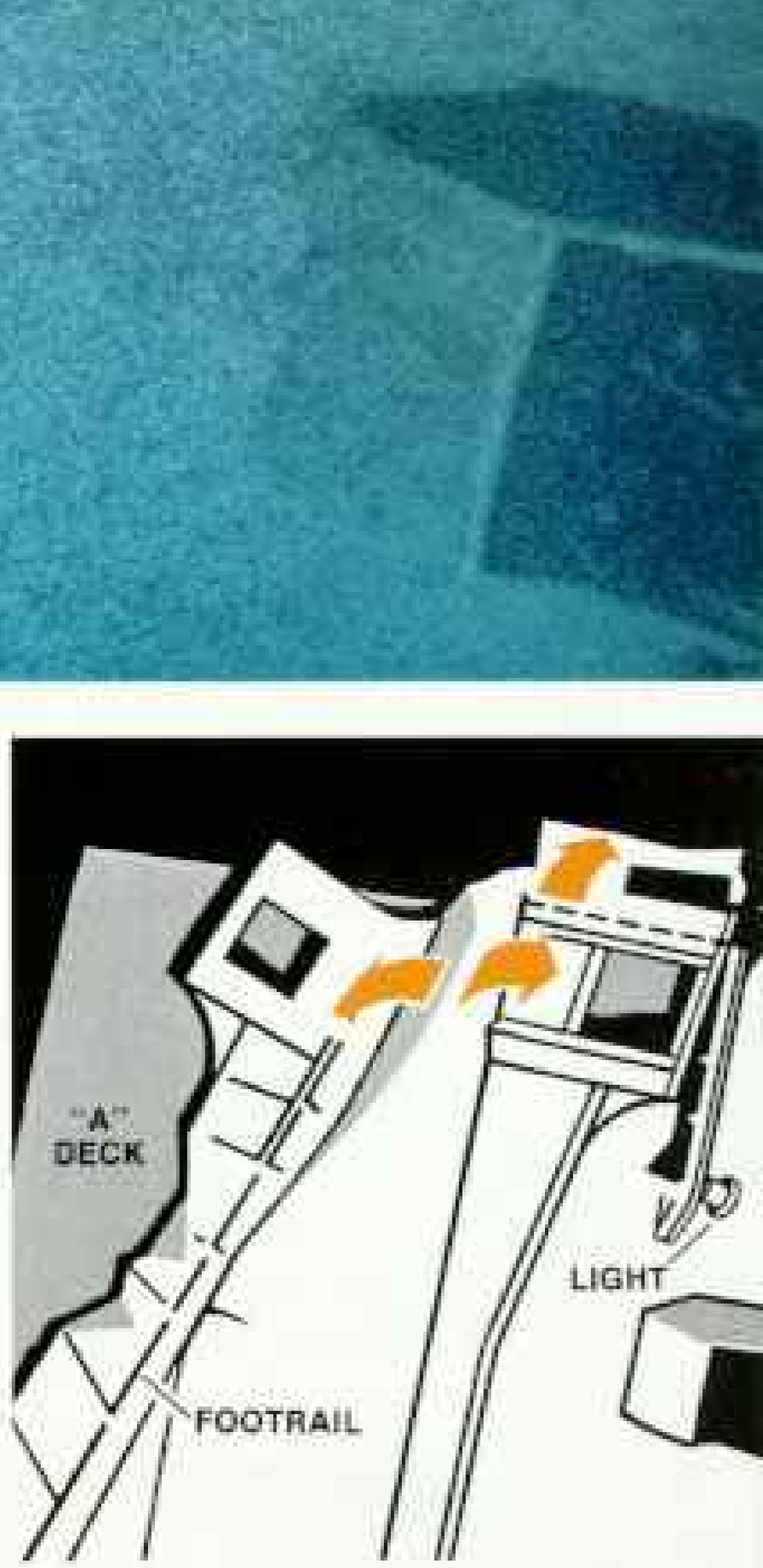
The photographs opposite call to mind *Titanic*'s most famous passenger, one whose enormous wealth proved no advantage. Refused space in a lifeboat with his wife, U. S. millionaire John Jacob Astor is said to have made his way to the starboard wing bridge, identical to one (***opposite, lower left***) aboard *Titanic*'s sister ship, *Olympic*. There, according to survivors, Astor was standing when the forward funnel smashed across the bridge.

Our photograph of the same area (***right***) confirms the total destruction of the wing bridge, as detailed in the diagram at lower right. All three bulkheads of the bridge have been wrenched apart and flattened as though by a giant steamroller, yet by some fluke the overhead light remains attached to the roof. No human could have survived such a cataclysm, and in fact Astor's body was found afloat but horribly mangled a week after the sinking.



HARLAND AND WOLFF, LTD. /CHARLES E. SACHS | BELOW AND UPPER LEFT |: DIAGRAM BY WILLIAM H. BOND





Mosaic of clues to a parted stern section

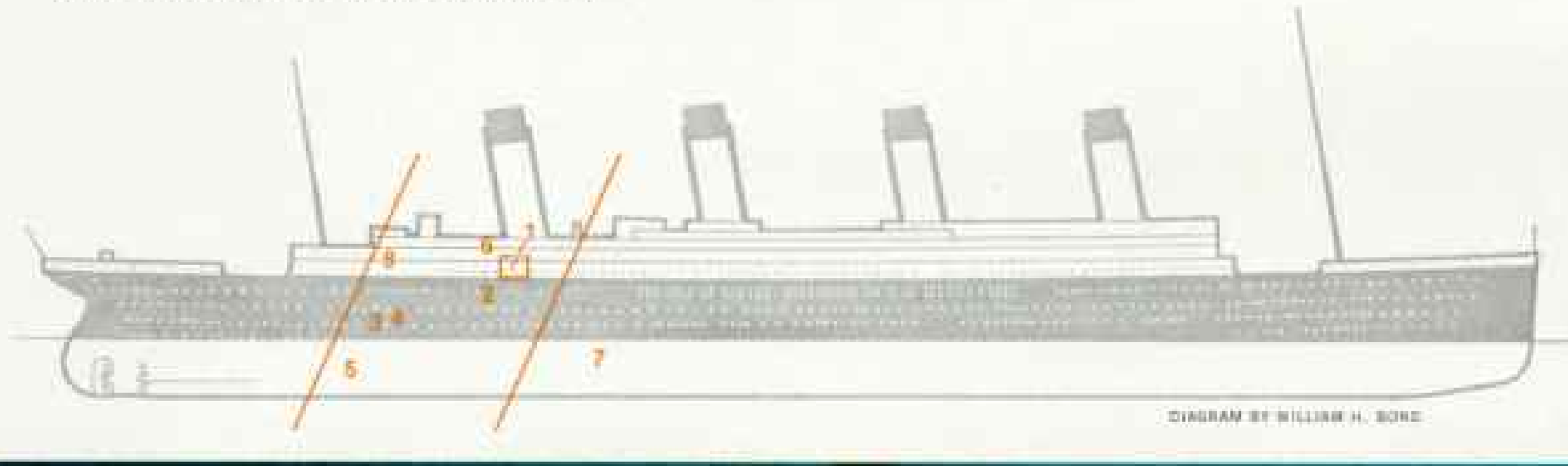
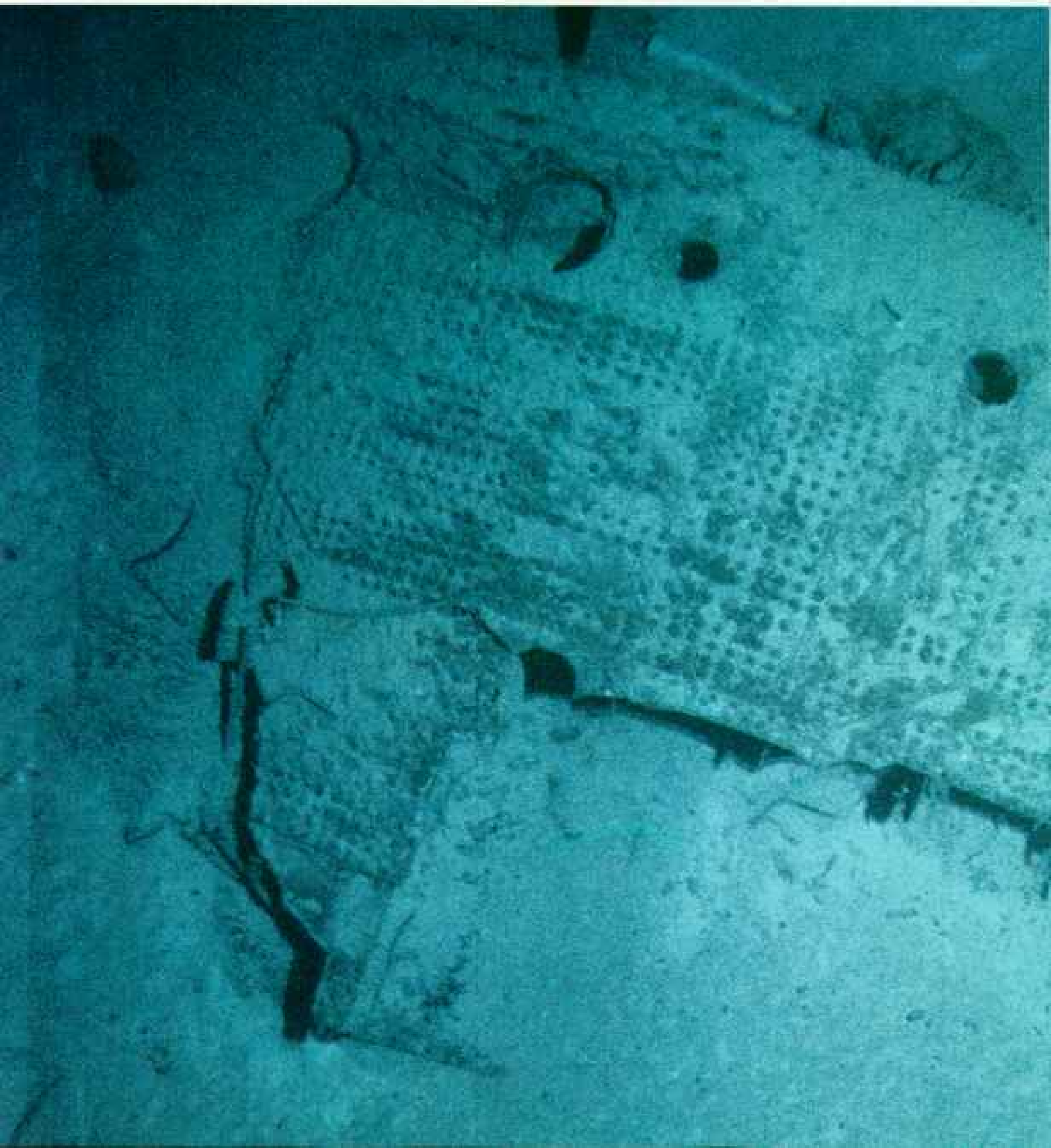


DIAGRAM BY WILLIAM H. BOND

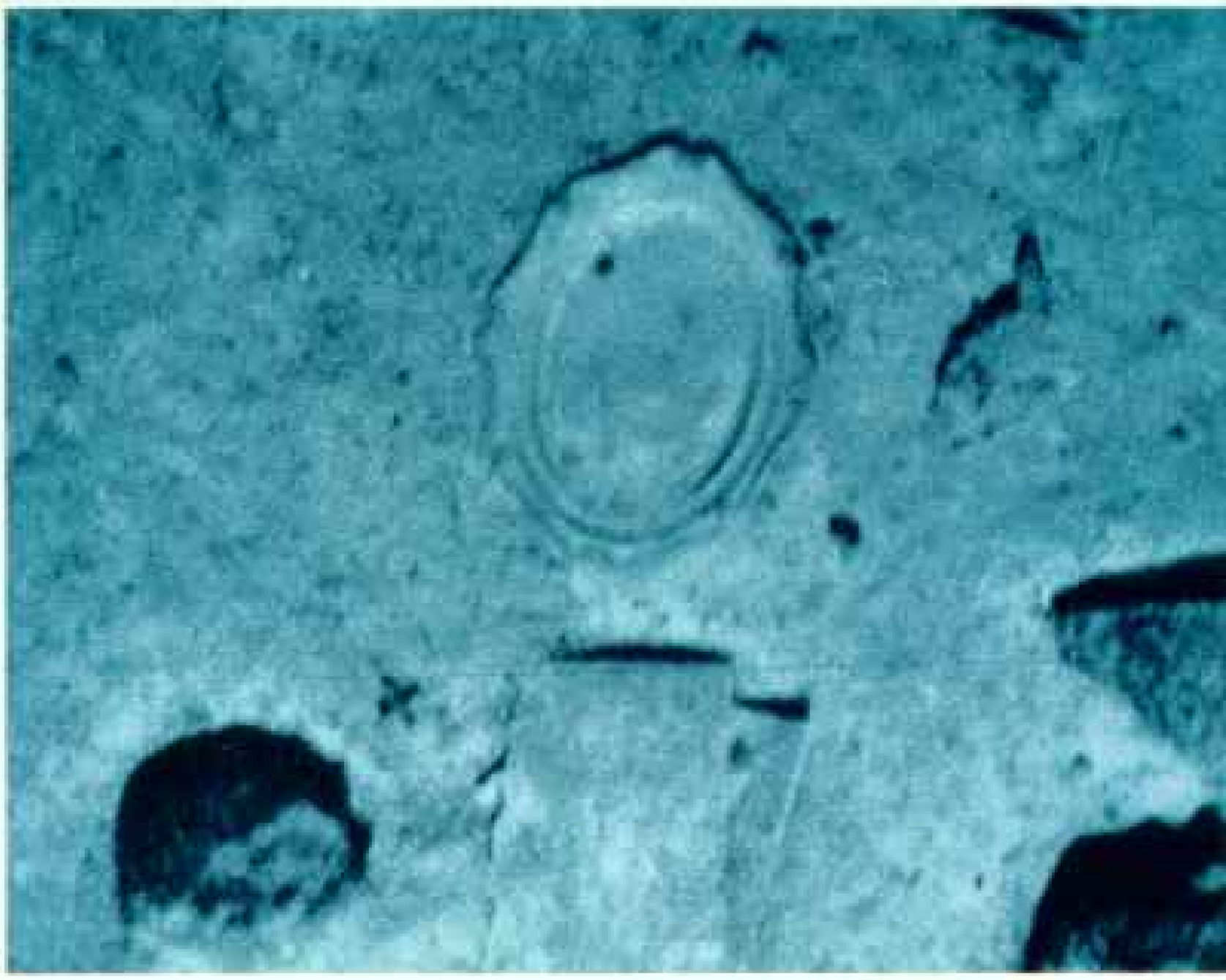


IN EXAMINING these and other photographs of the debris field astern of *Titanic*, we noticed a striking coincidence: All the items identified came from the same area of the hull, though from different deck levels (***diagram, left***). Earlier photographs had told us the stern section was missing, and the implication was clear—the hull had torn in two in this area, where in fact there was an expansion joint to relieve stress on the hull in heavy seas.

The strongest proof came from a photograph (***lower left***), which shows a section of hull plating with a unique pattern of large and small portholes. Construction blueprints reveal that the section could only have come from one part of the hull—the exact location of the other items.

Numbers are keyed to the items photographed: (1) hull section; (2) metal platter, surrounded by lumps of boiler coal; (3) set of bedsprings, whose narrow width suggests second or third class; (4) chamber pot. Items not shown but also found in the debris field include (5) ship's generator; (6) first-class smoking room tile; (7) water evaporator; (8) second-class smoking room window (***page 709***).

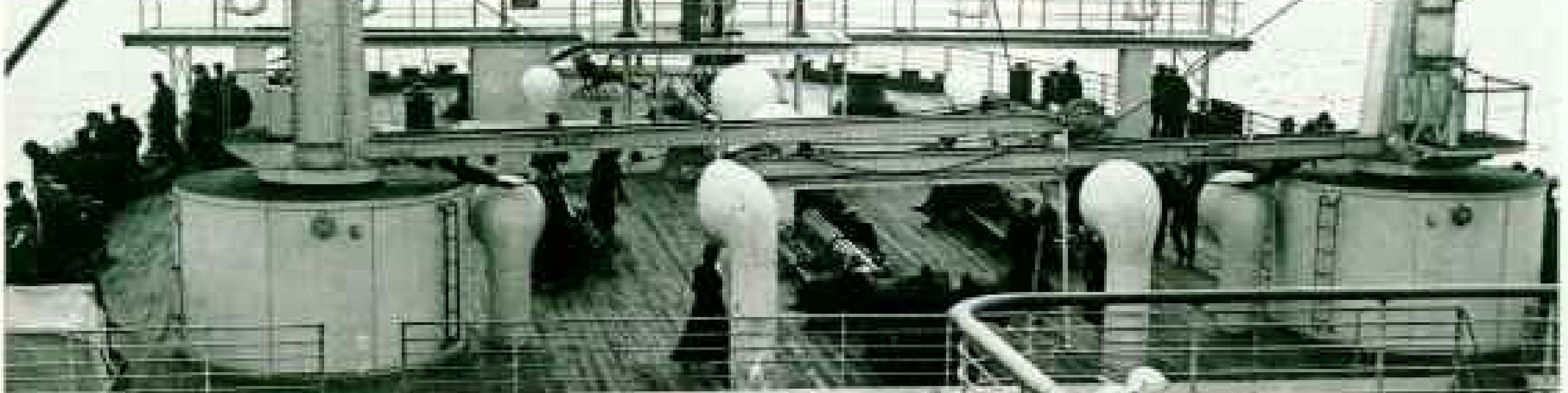
1



2

3

4



CORK EXAMINER, COURTESY TITANIC HISTORICAL SOCIETY (ABOVE)

J

STARBOARD QUARTER of *Titanic*'s detached stern (***left***) was photographed in the debris field, though we were unable to determine the fragment's exact size. Whether *Titanic*'s entire stern lies within the debris field is still unknown, but identification of this fragment and the items associated with it is confirmed by a photograph taken in 1912 of the ship's stern area (***far left, bottom***). Items still attached to the deck of the fragment include a twisted section of railing at upper right, spool-like mooring guides along the after gunwale, and part of a steel support, at left, that plainly belonged to the docking bridge seen in the background of the 1912 photograph.

K

Even more conclusive are pieces of equipment photographed in the area of the stern fragment. The engine-room telegraph (***below left***) matches the two in the center of the docking bridge, which was used only for maneuvering the vessel in port. The bell-shaped fixture (***bottom center***) was the foundation for one of the two cargo cranes located forward of the docking bridge on either side of the ship. The tower of one of the cranes, with its distinctive shape like a giraffe's head, appears (***below***) beside its boom.

Despite the obvious damage suffered by *Titanic*, I believe she hit bottom fairly gently—certainly not at the 100-mile-an-hour speed suggested by some authorities. Much of the damage, including fracture of the hull, may have occurred at the surface, or perhaps as she "kited," or twisted, her way to the bottom.

Over the space of four days our undersea cameras shot more than 20,000 frames of film covering some 8,000 different scenes. Yet we have only sketched in the bare outline of *Titanic;* the full portrait is still to come.

L

M

BY BRUCE DALE. ARTIFACTS COURTESY MERSEYSIDE MARITIME MUSEUM, LIVERPOOL; SOUTHAMPTON CITY MUSEUM; ULSTER FOLK AND TRANSPORT MUSEUM; AND PETER BOYD-SMITH (BELOW)

EPILOGUE to a tragedy endures in the remaining survivors of *Titanic* and a few emblems of the golden age she represented. Two survivors, Bertram Dean and Eva Hart (***above***) examine ship mementos at Merseyside Maritime Museum in Liverpool, England. The items include a 20-foot-long builder's model with a cork lifejacket by the bow, Captain Smith's dress sword, a silver spoon, a recovered victim's watch and keys, and a lifeboat nameplate. Because she carried mail for the crown, *Titanic* also bore the honorary initials R.M.S., for Royal Mail Steamer.

Miss Hart, who was seven at the time of the sinking, lost her father but rode a lifeboat to safety with her mother. She recalls that her mother refused to go to bed aboard *Titanic*, "because she had this premonition, solely based on the fact that she said to declare a vessel unsinkable was flying in the face of God." Of *Titanic*'s final moments she says simply: "I saw that ship sink. I saw all the horror of its sinking. And I heard, even more dreadful, the cries of drowning people."

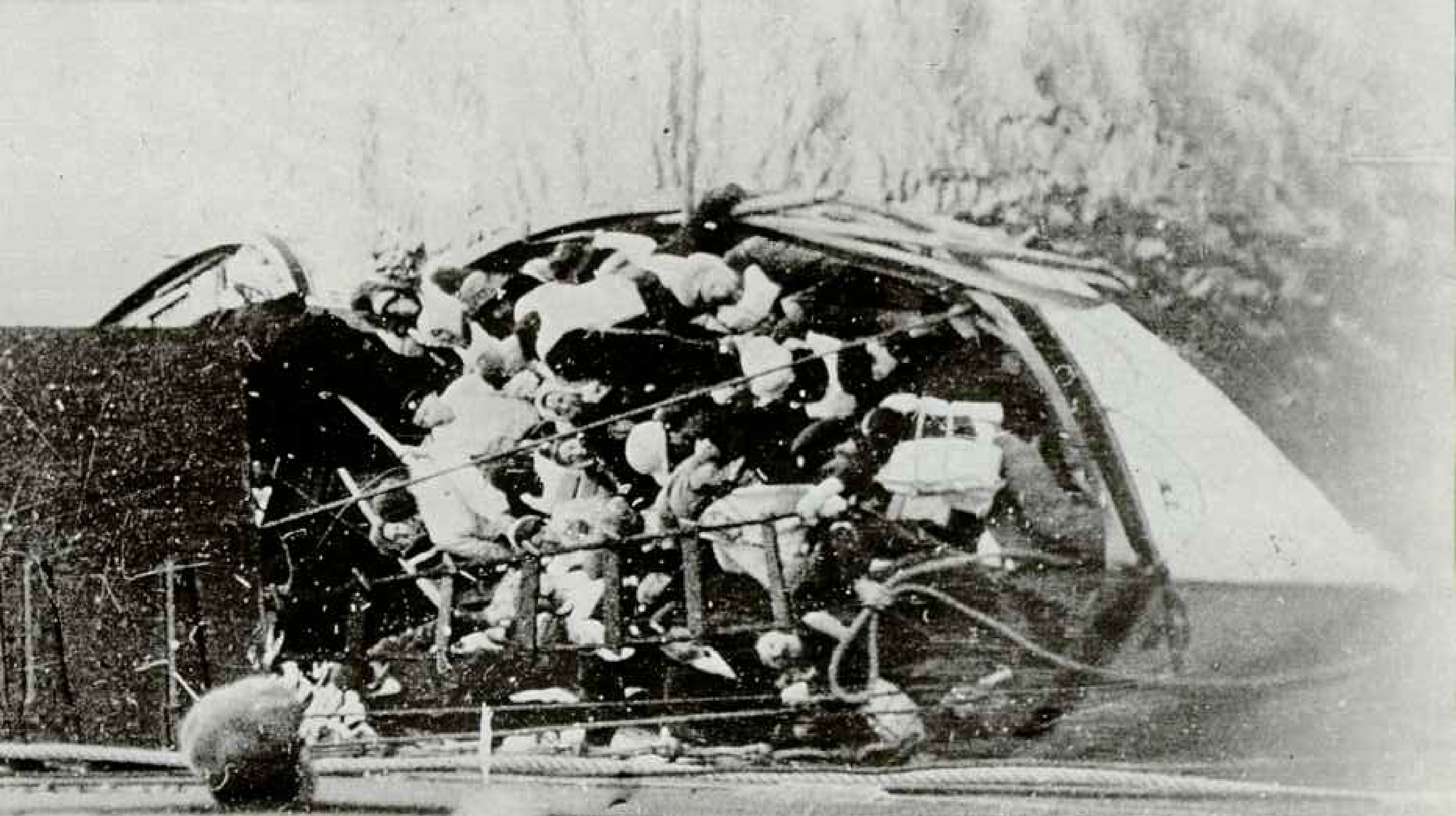
Like most other survivors, Eva Hart believes *Titanic* should be left intact as a memorial to those who went down with her.

Another memento, a first-class deck chair (***below left***) was salvaged from the floating wreckage by the Reverend Henry Ward Cunningham, who went out with a ship to recover bodies. He later donated the chair to the Maritime Museum of the Atlantic at Halifax, Nova Scotia. Here it stands on the deck of *Acadia*, berthed at the museum.

In a memorable scene (***right***), one of *Titanic*'s lifeboats comes alongside the rescue ship *Carpathia* several hours after the sinking. The relief of rescue was tempered by a grim statistic: While all children in first and second class were saved, two-thirds of the children in third class perished. Nor were the ship's owners disposed to generosity toward survivors. Against claims amounting to more than 16 million dollars, the White Star Line reportedly paid a total of $663,000.

With luck we will return one day to explore further into the mysteries of *Titanic*. But it must be a gentle exploration, in a realm I tried to describe on our return last September to Woods Hole: "It is a quiet and peaceful place—a fitting place for the remains of this greatest of sea tragedies to rest. Forever may it remain that way." □

NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH H. BAILEY, BY COURTESY OF MARITIME MUSEUM OF THE ATLANTIC, HALIFAX (LEFT); BROWN BROTHERS (RIGHT)



VATICAN CITY

By JAMES FALLOWS

Photographs by JAMES L. STANFIELD
NATIONAL GEOGRAPHIC PHOTOGRAPHER

It is the world's smallest country, a sovereign enclave within the city of Rome, devoted to the spiritual guidance and temporal management of the world's largest congregation, the Roman Catholic Church. The state's monarch, the Pope, Bishop of Rome, reigns as the proclaimed Vicar of Christ, successor to the Apostle Peter, who was charged by Jesus to head His earthly church.

A holy site from the early days of Christianity and home to the popes since the late 14th century, the modern State of Vatican City has existed by treaty with Italy only since 1929. But no other Western office has endured as long as the papacy—the Holy See.

Recent popes have curtailed and humanized the pomp of the Vatican. But to journalist and Vatican observer Paul Hofmann,

who was raised a Catholic, it remains a "costly religious Disneyland," saddled with an overly complex and secretive bureaucracy.

From the grandeur to the simple daily chores, James Fallows and photographer James L. Stanfield look at the very human heart of this state raised to the glory of God.

Delivering Easter tidings *in 56 languages, John Paul II—the 264th Bishop of Rome and first non-Italian Pope since 1523—speaks from the balcony of St. Peter's* (**right**).

Nuns and their students cheer (**above**) *as the Polish Pope, the former Karol Cardinal Wojtyła, appears on the balcony of his study to bless a walking marathon for schoolchildren, sponsored by the Rome newspaper* Il Tempo.

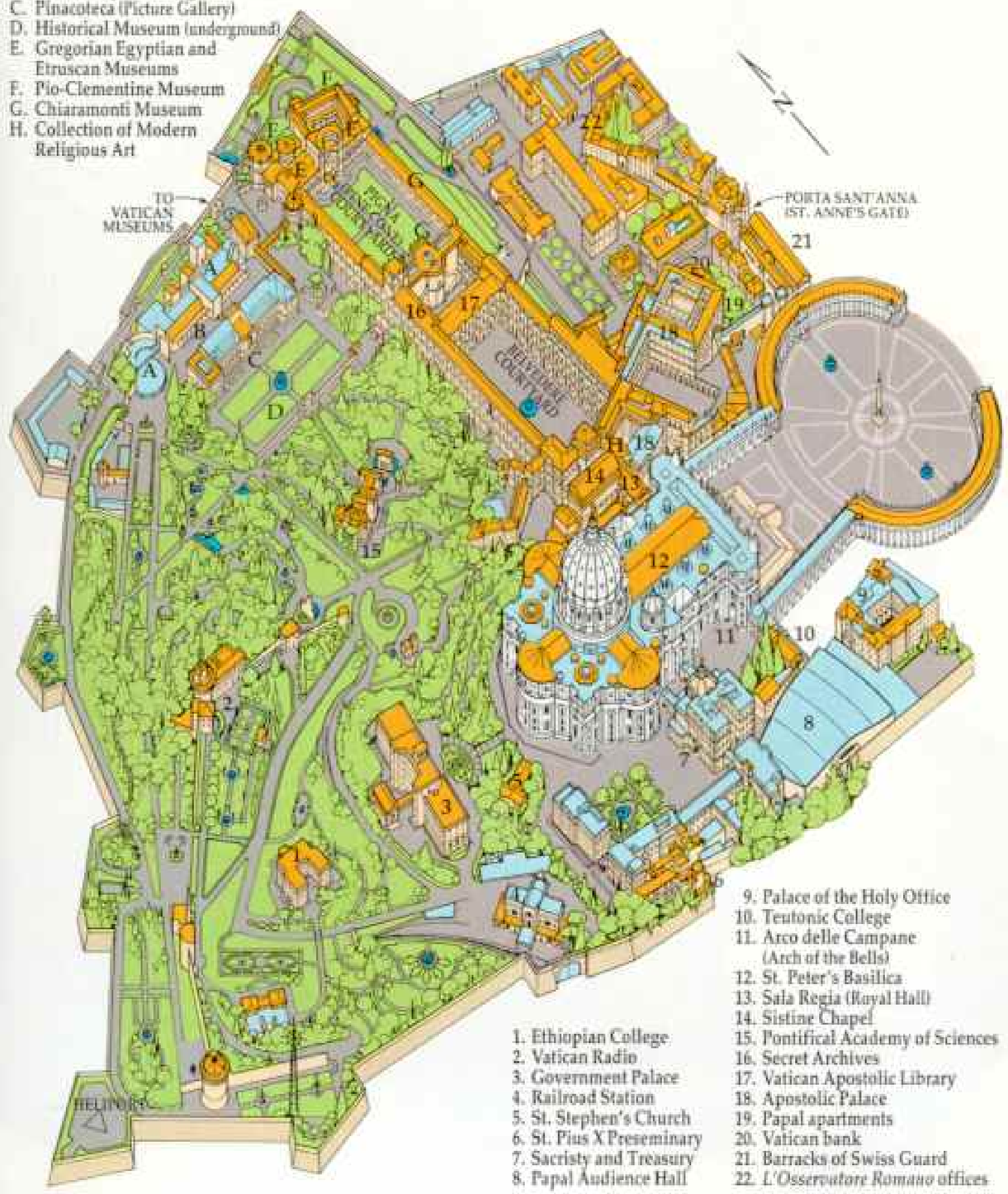
Inside St. Peter's Basilica (**foldout, pages 720-22**) *candidates for priesthood from 22 countries lie prostrate in humility before the high altar as they take their vows during an ordination Mass celebrated by Pope John Paul II.*

The State of Vatican City

DOMINATED by St. Peter's Basilica and its embracing colonnade, Vatican City covers 108.7 acres on a site known to ancient Romans as Mons Vaticanus (**left** and **diagram below**). Popes lost political power over Rome and the surrounding Papal States with the unification of Italy (1861-70) but remained in residence as self-styled "prisoners of the Vatican." Mussolini's government recognized Vatican City as an independent state in the 1929 Lateran Treaty.

Operating its own bank, post office, pharmacy, and commissary, Vatican City employs nearly 2,000 people, mostly lay workers from Rome, and counts about 300 residents.

ILLUSTRATION: LISA BIGANZOLI
RESEARCH: DAVID B. MILLER
PRODUCTION: ROBERT W. CRONAN



Surrounded by Michelangelo's frescoes, cardinals meet in the Sistine Chapel (1) on the death of a pope to elect a new pontiff.

Usually bricked over, the Holy Door (2) is ceremonially opened by the Pope only during a Holy Year, a period of special contemplation that usually falls every 25 years.

Sunlight magnified by a yellow stained-glass window illuminates Bernini's "Throne of St. Peter" in the apse (3).

The Basilica and Piazza of St. Peter

ON THE BONES OF ST. PETER —*tradition holds—the world's largest church took shape in the hands of Italy's great Renaissance and baroque artists. Consecrated in 1626 after more than a century of planning and building, it replaced the first St. Peter's Basilica, raised by the Christian Roman Emperor Constantine in the early fourth century.*

*Nearly 700 feet long and 450 feet wide, the travertine-stone church can hold 50,000 worshipers. On the holiest days, nearly a quarter of a million people gather in the piazza (**4**), designed by Bernini in the mid-17th century. A cross symbolizing the triumph of Christianity tops an 82-foot-high Egyptian obelisk (**5**), moved here in 1586 from the site of the Roman circus where St. Peter is believed to have been crucified around* A.D. *65.*

*More than 400 feet high, a lantern tower (**6**) crowns Michelangelo's incomparable dome. The tower centers above the now subterranean shrine (**7**) that was venerated by early Christians as St. Peter's burial place. The grave lies behind and below the mosaic of Christ illuminated in the confessio—tomb of a martyr—a floor below the high altar (**right**). Bernini created the altar's towering bronze baldachin, along with much of the basilica's breathtaking interior decoration.*

Crossroads of the Vatican's inner sanctum, *the Sala Regia leads diplomats and dignitaries to the Sistine Chapel and the Pauline Chapel, where private papal*

JAMES L. STANFIELD AND NATIONAL GEOGRAPHIC PHOTOGRAPHER VICTOR R. BOSWELL JR.

Masses are said. Art patron Pope Paul III commissioned the renovation of the royal reception room in 1538. Giorgio Vasari, among others, executed the frescoes.

HUGGING herself tightly and leaping for joy, the pretty young Italian nun came hurtling through the throngs in St. Peter's Square in search of her sisters. Moments before, in the bright spring sunshine that poured down upon the crowd gathered for the weekly general audience of John Paul II, the Pope had blessed her, pressing his palms to her forehead. One by one, awestruck sisters of her order placed their hands where his had been.

Each Wednesday morning when the weather is fair, the Pope presents himself to the faithful, and to the merely curious, in the magnificent piazza before St. Peter's Basilica, where the Roman Catholic Church, in the person of this absolute monarch who is its breathing symbol, touches the world. The ceremony begins a few minutes after eleven, when a white open-topped Fiat jeep passes through the Arco delle Campane, a large archway abutting the south side of St. Peter's. On its rear seat, white-haired and sheathed in white from crown to ankle, which is to say, from his white skullcap to the white socks he wears above his brown Italian loafers, is the former Karol Cardinal Wojtyła, who since October 16, 1978, has been leader of the world's 800 million Roman Catholics.

The Pope can see before him, contained by the two great encircling arms of Bernini's colonnade, a crowd of 30,000 to 40,000 people gathered in St. Peter's Square. The little jeep enters the piazza and for 20 minutes follows a crisscross route through the crowd. The driver skillfully maneuvers so that the Pope's extended fingertips barely brush the desperately outstretched hands of the people who have piled themselves against the barriers in hopes of touching the Holy Father.

Then, from a platform bearing a white throne, he delivers his sermon—first in Italian and then, with varying fluency, in French, English, German, Spanish, and Portuguese, speaking finally, to the crowd's most heartfelt cheers, in his native Polish. When the Pope passes among the crowd, it answers in the same exuberant mixture of tongues: "*Viva il Papa!*" "Hi, Holy Father—we love ya in Minneapolis!" The Pope hears excited chants in Polish. Flags wave; handkerchiefs flutter.

The Pope bestows on all his apostolic blessing—a gift within his unique competence, since by Roman Catholic doctrine he is the 264th Bishop of Rome, and thereby linked in direct succession to the first bishop, St. Peter, prince of the Apostles. Thousands of hands raise rosaries and crosses to receive the blessing; vendors elevate boxes full of religious articles that are later sold, despite official prohibition by the church, as papally blessed.

Now the Pope walks for at least another half hour among the pilgrims, posing for photographs with groups of children, placing his arms around their small shoulders or laying his big hands on their heads. He walks slowly down the ranks of the wheelchair-bound and disabled, placing his hand on each forehead or cheek. He beams, brushes back the forelock that flops loose from his skullcap, and seems to shrink only when the devout reach to kiss his ring.

To his face, the Pope is addressed as *Santissimo Padre*—Holy Father—or, more decorously, as *Sua Santità*, Your Holiness. In the authoritative Vatican yearbook, *Annuario Pontificio*, his official title occupies nine lines of type, starting with "Bishop of Rome, Vicar of Jesus Christ," and ending with "Servant of the Servants of God." But within the sovereign state over which he reigns, John Paul II is often referred to more simply as *this* Pope. The Vatican's peculiar usage—an American President's assistants, for example, speak of him as "the" President, not "this" one—reflects the sharp awareness that where this Pope sits, others have preceded him and many more will follow. It is a subtle linguistic reminder of the sense of historical continuity, the sometimes overwhelming long view, that makes Vatican City different from any other state.

In many ways the Vatican's aura of timelessness is an illusion. The Vatican City State, its national boundaries encompassing 108.7 acres, dates its existence only from 1929, when the Lateran Treaty between Mussolini's Italian government and the

---

James Fallows, whose book on the American class system will be published in 1986, is Washington editor of the *Atlantic*.

Holy See resolved a long dispute by recognizing the Vatican's sovereignty and establishing its borders.

Throughout the Vatican there are reminders of the purportedly unbroken papal succession from St. Peter to John Paul II. A plaque in the passageway leading from the basilica to the sacristy bears the names of the 142 popes, starting with Peter himself, said to be there interred. Yet the first several dozen names on the list were not generally recognized as popes until hundreds of years after their deaths. During their lifetimes they were at best bishops of Rome, contending for prestige with other bishops in Antioch, Alexandria, Constantinople, and elsewhere. Several were deposed, had to struggle with antipopes, or reigned without serenity. Most popes said to be buried at the Vatican never lived there. For nearly a thousand years they resided near the church that is still the Pope's official seat as Bishop of Rome—the Cathedral of St. John Lateran, on the other side of the city. For most of the 14th century, popes were based not in Italy but in Avignon, France.

The Pope's role as an international celebrity has increased greatly in the past 200 years, since the time when Pius VII, who had been captured by Napoleon in 1809 and held prisoner for five humiliating years in France, returned in triumph to Italy, drawing admiring throngs along the way. For hundreds of years before that, popes had often been barely distinguishable from other feuding European princes.

The idea of the Pope as a purely spiritual figure, wielding influence solely through his moral force and presence, is a relatively modern development. Had Joseph Stalin asked his derisive question, "How many divisions has the Pope?" at any point before 1870 when the forces of the Italian Risorgimento completed their conquest of the 16,000-square-mile Papal States in central Italy, the response would have been a list of infantry and armor.

The Spanish Inquisition began as a cooperative effort between the 15th-century papacy and Ferdinand and Isabella, who having joined the Catholic kingdoms of Castile and Aragon through their marriage, were eager to root out the Moors, Jews, and unbelievers who complicated their goal of creating a unified Spain. (Under Spain's first grand inquisitor, the Dominican monk Tomás de Torquemada, some 2,000 heretics were burned at the stake. The last auto-da-fé, the ceremonial denunciation of a heretic, took place only a little more than a century ago, in Mexico.)

During the Renaissance worldly Borgia and Medici popes schemed, debauched, warred, and plundered on a Caesarean

The papal stole *marks a confessional in St. Peter's, where John Paul II hears the sins of randomly chosen penitents on Good Friday. A tradition of his own making, it reflects the personable style of this Pope, who, in his avowed mission to evangelize and universalize the Catholic Church, has set a record for international papal travel since his 1978 election.*

scale. "Flee, we are in the hands of a wolf," one Medici said when a Borgia bought enough votes in the College of Cardinals to win election as Pope Alexander VI.

DESPITE THE WARTS on the visage of the papacy, there is justice in the Vatican's claim to timeless continuity. The historical explanation for the Vatican's importance in Roman Catholicism lies deep beneath St. Peter's, where it remained hidden for more than 1,500 years.

I had a chance to see what lies beneath the basilica in the company of the Reverend Daniel Pater, an irrepressible 32-year-old priest from Ohio, who is now in training for the Vatican diplomatic service, but who has used his time in Rome to become an amateur expert in archaeology.

Shining his large spelunker's flashlight, he led the way into the excavations, explaining that the new St. Peter's is the second basilica to stand on this site. (Unlike "cathedral," which refers specifically to the church that is a bishop's official seat in his diocese, "basilica," derived from the Greek word for king, implies churches built to regal scale, with a long central nave and aisles on each side.)

In the early fourth century A.D., Emperor Constantine built the first church on Vatican Hill. "The question is, why did he build

Tickled by a tortoise, *Sister Catherine of the Handmaids of Jesus Crucified* ***(above)*** *retrieves a wayward pet kept by the students of St. Pius X Preseminary, the school for Vatican altar boys. Sister Luisa* ***(left)*** *sets out mineral water and wine for lunch at the school. Women of the Vatican—predominantly nuns of religious orders assigned to the service of the Holy See—work chiefly as telephone operators and as cooks and housekeepers for the Pope and other prelates.*

it here?" Father Pater said. At the time, the Trastevere region, which included the area where the Vatican now stands, was a sparsely settled outskirt of Rome. Alongside a road thought to be the Via Cornelia was a Roman necropolis of aboveground burial houses and a Roman circus at least a thousand feet long, somewhat smaller than the famous Circus Maximus.

"With the circus, there was a reasonably flat building area," Father Pater said. "But that's not where Constantine put his basilica." He rummaged in his knapsack for a schematic drawing and spread it in front of me. "Instead, he built it into the slope of the hill. You have to ask yourself, why there?

They had to move a million cubic feet of dirt to get a level building surface.

"Not to keep you in suspense . . . ," continued Father Pater—only to pause interminably as he refolded his drawing—"the answer seems to be that there was something in this particular place that dictated the location of the basilica. That something seems to have been St. Peter's grave."

According to Catholic tradition, it was in the nearby circus that Simon Peter, entrusted by Jesus with the leadership of His church, was crucified upside down around A.D. 65 during a wave of brutal anti-Christian persecution under Emperor Nero, after the burning of Rome. Peter's body was taken by the faithful to the nearby burial ground, and later, among the sarcophagi and elegant redbrick mausoleums, it was secretly venerated.

"That's what we will see," Father Pater said. "The foundation of the church."

FOR THE FAITHFUL there had always been sufficient evidence that Peter's grave did in fact lie beneath the altar of the basilica, since before the time of Constantine this had been the Roman

Molding pontifical soldiers, *Sgt. Martino Utz teaches use of the halberd, the traditional weapon of the Swiss Guard. Charged with guarding the Pope, the 100-member force dates from the early 1500s, when Pope Julius II hired Swiss mercenaries to battle for the Papal States.*

Church's belief. But archaeological evidence for this proposition did not begin to emerge until the middle of this century. The crucial step was taken in 1939, soon after the death of Pope Pius XI.

The old Pope had expressed a desire to be buried as close as possible to the tomb of Pope Pius X. The new Pope, the austere Roman aristocrat Eugenio Pacelli, Pius XII, approved a plan of renovation in the grottoes beneath the basilica, where many previous popes had been interred, to make room for Pius XI's tomb and create another chapel. But almost as soon as the workers began digging, they broke through to ancient, concealed layers. Eventually Pius XII ordered a thorough excavation of the area underneath the altar, so as to determine with full scientific rigor whether there was any evidence of Peter's grave (pages 744-5).

For the next ten years, through warfare, occupation, and liberation—and always in secrecy—the painstaking work went on.

As Father Pater led the way into the excavations, we moved simultaneously downward into the earth and back in time. First we passed ponderous foundation walls of Constantine's old St. Peter's, eight or nine feet thick and so massive that they still bear part of the weight of the new basilica. Stopping every few feet, Father Pater pointed out how closely the architects of the new St. Peter's had copied the placement of the old basilica's nave and the location of the altar.

We kept moving down, through increasingly cramped and twisting stone passages, until we reached the ancient Roman necropolis, much of its masonry so well preserved that it might have been built two, rather than 2,000, years ago. Father Pater led the way down a narrow street, beaming his flashlight into the doorway of each burial house to reveal square masonry chambers 10 to 15 feet on a side, decorated with frescoes and mosaics.

"Notice how the ceilings have been broken off," he said. "Constantine's builders did that, packing the necropolis with dirt to create a firm base. That explains why it's so well preserved."

Some of the rooms still contained magnificent funeral urns or marble sarcophagi—which Constantine's men, obeying the Roman prohibition on desecrating graves, had left in place. In many chambers, once brilliant frescoes had begun fading toward invisibility; they had withstood centuries of burial but were rapidly losing their battle against the constantly changing humidity of

Signaling the Trinity *with raised fingers, a new Swiss Guard* ***(above)*** *swears allegiance to the Pope during the annual May 6 commemoration of the 1527 sack of Rome. Most of the Swiss unit died helping Pope Clement VII escape the rampaging troops of Holy Roman Emperor Charles V.*

Today's guards patrol with halberds and swords, though guns and other weapons are kept at ready in the barracks. Since the May 1981 assassination attempt on John Paul II, recruits undergo training in karate and judo at the hands of Italian black-belt master Gaddi Pio ***(left)****.*

the air. Father Pater motioned me into one chamber where the decorations seemed especially faint. I started to back out, but he pushed me back in and directed his beam upward. There, with some glass pieces missing but the remainder in brilliant, unfaded condition, was the famous mosaic known as "Christ Helios"—the earliest such depiction of Jesus, in a pose reminiscent of Apollo, the Greco-Roman sun god.

In a further twisting progression through stone-sided passageways, Pater led on toward our goal: the site, directly under the altar of Constantine's basilica, where Christians in the second century had built a modest shrine, seemingly marking the site as a holy place for Peter.

THE CONTENTION that the shrine marked Peter's actual grave arose from two lines of reasoning and research. One, conducted by an Italian scholar named Margherita Guarducci, involved an exhaustive and, in the view of her critics, imaginative interpretation of the graffiti that covered some walls in the zone known to archaeologists as Area P. Much of the writing sounded Christian themes; moreover, a chunk of plaster from a partition known as the Red Wall bore Greek words that Dr. Guarducci read as saying *Petros eni*, which could have meant "Peter is within."

The other evidence was forensic. The excavators' hopes had soared when they found a cache of bones beneath the Red Wall, only to be dashed when, in an examination that began in 1956, the bones proved to come from goats, cows, horses, sheep, and several human beings. It was not until the early 1960s that another group of bones was discovered—bones that had been taken from a repository near the Red Wall and then unaccountably dumped in a storeroom. These bones, by happy contrast, seemed to come from one individual—a man, of robust build, who had died at an age between 60 and 70. The description fit the traditional profile of St. Peter. There were only fragments of skull—a happy sign for the faithful, since the skull of St. Peter has long been the holiest relic of St. John Lateran.

In the summer of 1968 Pope Paul VI made the startling public announcement that

bones had been found and, as far as he was concerned, they belonged to St. Peter. That same year the bones were reinterred, along with those of a mouse, according to some accounts, that sometime in the past 1,800 years had found its way into the repository and perished there, ignorant of the glory it had found.

NO ONE HAS scientifically established that Peter was crucified in Nero's circus, or that the bones beneath the altar were indisputably his. But at a minimum, it is arguable that within a century or two of Christ's death, Christians in Rome believed that their shrine marked Peter's holy place, and probably his grave, and that Constantine located his basilica where he did in an effort to venerate the shrine. If a plumb line were dropped from the dome of St. Peter's, through the present high altar, through the altar erected in the seventh century above the ancient shrine to Peter, through the Niche of the Pallia that encloses the shrine, and on into the Roman necropolis, it would come to rest within mere inches of . . . someone's grave.

As we began moving out from Area P toward the higher ground and daylight, Father Pater showed me the curving brick surface that is now an interior wall but was once the exterior of the apse of Constantine's basilica, at the old church's most westerly tip. Just beyond it, on the same axis as the church's nave, was the sarcophagus of Pius XII, who allowed the excavations to begin.

"I suppose he deserves to be there as much as anyone does," Father Pater said.

The architecture that now surmounts the ancient grave is mainly the product of a wave of creative energy that lasted throughout the 16th and 17th centuries. By the early 1500s the original basilica was showing signs of structural decay, and Julius II, the "warrior Pope," dreamed of grand new structures that would enhance the church's glory and his own. The artist Donato Bramante drew up designs for a new basilica with the floor plan of a Greek cross—four legs of equal length—topped by a large cupola. After Bramante's death several artists (including Raphael) revised the plans. By the time construction was fully under way, the elderly and ailing Michelangelo had agreed to act as supervisor, having insisted on full architectural control. His ambition was to move construction along far enough that his plans could not be undone.

Michelangelo's design for the dome was carried out, but the basilica's floor plan and facade were radically altered after his death. On orders of Paul V, Carlo Maderno lengthened the nave, changing the floor plan to a Latin cross (with one long leg) and obscuring the view of the dome from the piazza.

A happier set of revisions was made in the early 17th century by the great Gian Lorenzo Bernini, whose statuary adorns the basilica, whose bronze twisted-column baldachin provides a canopy over the altar, and whose grand colonnade, formed of two semicircles surmounted by heroic statues of the saints, makes St. Peter's Square one of the most magnificent outdoor spaces in the world. At the age of 31, Bernini was appointed architect of St. Peter's by Pope Urban VIII, who seems to have wanted to sculpt Bernini into another Michelangelo. In fact the unity of their genius is visible to every visitor to St. Peter's. The Pope, of the Barberini family, expropriated bronze from the Pantheon for Bernini's baldachin, prompting the Roman witticism *Quod non fecerunt barbari, fecerunt Barberini*—What the barbarians didn't do, the Barberinis did.

THE MODERN VATICAN is the smallest sovereign state in the world—Liechtenstein is 360 times as large—and has a permanent resident population of about 300. Still it retains all the trappings of nationhood—its own postage stamps, its own diplomatic corps, its own flag, its own "army," the familiar Swiss Guard, and the right under international compact to have its own navy.

Vatican City's total work force numbers slightly less than 2,000; of those, more than 90 percent are ordinary Romans who cross the national frontiers on their way to work each day. The largest employers are Vatican Radio—which is run by the Jesuit order but employs nearly 400 broadcasters, administrators, secretaries, and other lay workers—and the technical services and maintenance division, including janitors, craftsmen, and laborers—the time-honored *sampietrini* (men of St. Peter's).

Only about 400 people possess Vatican citizenship, and of them, two-thirds are either Swiss Guards or members of the Holy See's diplomatic corps serving abroad. Of the 300 people who sleep within the Vatican's walls, a hundred are Swiss Guards; the rest include cardinals, altar boys, members of religious orders, students at the Ethiopian and Teutonic Colleges, a few families of sampietrini, and John Paul II.

For the most part, they live like ordinary residents of Rome, waking not to a penitential system of bells but to the buzz of electric alarm clocks, coping with Roman traffic, drinking in Rome's cafés, dining in its trattorias or hosterias. When thrown back upon their own refectories, they drink wine (or, in this pontificate, Polish beer) and dine on pasta and scallopine (and Polish sausage), usually prepared by nuns. The most prodigious trenchermen are the Swiss Guards; I watched in amazement at 3:30 on a Sunday afternoon as one snacked on an entire roast chicken and another put away six or seven feet of sausage.

The church's table of organization and roster of leaders occupies 2,000 pages of close-set type in the Vatican's *Annuario Pontificio*. At the top of the ecclesiastical pyramid are the cardinals, bishops, and monsignors of the Curia Romana, the Vatican's legendary bureaucracy, made up of congregations, tribunals, offices, secretariats, and commissions. Each is presided over by a committee of "most eminent and most reverend cardinals" and other clergymen. A cardinal prefect is in charge of each congregation.

The most important body in the curia is the Secretariat of State, which is responsible for coordinating the actions of all the rest of the bureaucracy and for conducting the Vatican's business with the outside world. Its principal, the cardinal secretary of state, is Agostino Cardinal Casaroli, a 71-year-old Italian who joined the curia at 26, became well known for his negotiations with Eastern European governments, and is often referred to as "the Vatican's Kissinger."

The working force of the curia is made up of clerical and lay employees, scrupulously segregated by the *Annuario* into "major officials of the second class," "minor officials of the first degree," and so on.

THE BUREAUCRACY of the Vatican is profoundly international, even though its superficial traits are all Italian—or more precisely, Roman. John Paul II is the first non-Italian Pope since the Dutch Adrian VI, who died in 1523. Increasingly, the most influential congregations are headed by non-Italians—Bernardin Cardinal Gantin, from Benin, heads the congregation that selects new bishops, and

At play in the Pope's backyard, *Kathleen and Clare Roggen are growing up in Vatican City as daughters of Swiss Guard Hans Roggen and his American wife, Carol. Vatican citizens, they live below the Apostolic Palace, where John Paul II lives in an apartment on the third floor.*

William Cardinal Baum of the United States directs Catholic education worldwide.

Ten years ago there were seven cardinals from Africa; today there are 16. Then, there were four cardinals from Eastern Europe; now, 11. Polish priests and nuns have never before been so numerous in the Vatican. Still, members of the curia claim that the personal trait most prized, in addition to piety, is *romanitas*, defined as the sense of calmness and perspective that comes from living in an ancient city and learning to laugh at the follies of man.

APART FROM THE POPE and the cardinals, the most famous class within the Vatican is the Swiss Guard, who are so picturesquely evident in all ceremonies involving the Pope. In their outlandish multicolored uniforms these polite young men illustrate an anthropological truth about the Vatican: Here the males present the beautiful sartorial display, while the females are drab background figures.

The Swiss Guard was formed in the early 1500s, at about the time that Michelangelo was painting the Sistine Chapel, Martin Luther was preparing to break from the church, and construction of the "new" St. Peter's was getting under way. These days the guard numbers about a hundred; each year it accepts several dozen young men for training, provided that they are Catholic, have completed the four-month army training that is mandatory for Swiss males, and have the recommendation of their pastor. They stay for a minimum of two years; only a handful remain longer, to make a career.

The guard proved its mettle shortly after its formation when the armies of Charles V, the Holy Roman Emperor, besieged the city in the episode known as the sack of Rome. On May 6, 1527, the guard made a heroic last-ditch defense, attempting to hold off the invaders long enough for Pope Clement VII to escape through a passageway (which still exists) to the nearby fortress known as Castel Sant'Angelo. The Pope was safe, but 147 of the 189 Swiss Guards lost their lives (taking some 800 of the enemy with them). On

each May 6 the guard assembles for a solemn ceremony to induct new halberdiers and rededicate itself to the defense of the Pope. On this one occasion the men wear breastplates that have been handed down from guard to guard for generations and military-style decorations bearing likenesses of the Pope and the Virgin Mary

The guard is responsible for the personal protection of the Pope, a task taken even more seriously since the attempted assassination by Mehmet Ali Agca in 1981. Training has become more rigorous; recruits learn karate, judo, and the use of weapons.

"I was *very* close to him when he was shot," Hans Roggen, a 39-year-old sergeant of the guard who travels with the Pope, told me, his customary smile suddenly disappearing. "The Pope can be a difficult object to protect," he said. "You can't be pushy or rude or nasty around a pope. He wouldn't like that."

After joining the guard, Hans Roggen met Carol Mysza, a young woman from Illinois who had come to Rome to study; they were married in 1977. From his apartment windows the Pope can gaze down onto the Roggens' terrace. Had he chosen this moment to do so, he would have seen five-year-old Kathleen and two-year-old Clare, the Roggen children, splashing in their green-plastic wading pool.

"There's really nothing at all unusual about raising a family in the Vatican," Carol Roggen said unconvincingly, as her children's yells bounced off the walls of the papal apartments. "The kids climb over old statues in the gardens, but they'd be climbing over something wherever they were."

IN THE WAKE of the liberalizations and experiments in church law that followed the Second Vatican Council in the early 1960s, John Paul II has been determined to reclarify Catholic doctrine. The main institutional vehicle for this campaign has been the Congregation for the Doctrine of the Faith—often referred to as the Holy Office and officially known until the turn of the 20th century as the Sacred Inquisition.

Where is St. Peter buried? *A 1939 excavation ordered by Pope Pius XII brought new insight. Breaking through the grotto level, where many popes are buried, archaeologists confirmed that Constantine had built the first St. Peter's Basilica on top of a necropolis.*

*Among the tombs of pagans and early Christians, excavators found an early third-century A.D. marble sarcophagus carved for the Marcius family, bearing a corner mask of a pagan deity (**left**). A hundred feet away, far beneath the high altar, they found a shrine amid the rubble (**right**). Most scholars concur that the small column at right is part of a second-century A.D. shrine built by Rome's small Christian community on the site where they believed Peter was buried. The grave it rests upon may have held a set of bones found nearby. Not everyone agrees, but in 1968 Pope Paul VI stated that there were "convincing reasons" to believe that the bones were the Apostle's remains.*

Beekeeper vestments *shield a student of St. Pius X Preseminary* ***(left)*** *as he assists in the biannual gathering of honey from the school's ten hives. Contemplating a career in the priesthood, 30 to 40 boys, most from northern Italy, attend the three-year school for Vatican altar boys, starting at age 11.*

Before seven o'clock each morning they gather in the sacristy of St. Peter's to dress and prepare the Communion chalices ***(above)****. Until classes begin two hours later, the altar boys wait here to be called to assist resident and visiting priests, most of whom say Mass daily. Trading soccer cards* ***(below)*** *helps pass spare time. Nearly all the boys play the game after school in the Vatican gardens. "They have fun," says the photographer, "and it's expected." Those who choose a priestly vocation continue their studies in Rome.*

Under Joseph Cardinal Ratzinger, a former theology professor and archbishop of Munich, who is now in his late 50s, the Holy Office has left no doubt about the church's opposition to artificial birth control, the ordination of women, and the quasi-Marxist aspects of liberation theology, which has attracted a following among militant priests and nuns, especially in Latin America. One of Cardinal Ratzinger's "minor officials of the second degree" explained to me that the Vatican's vision was of a leaner, more disciplined church: Those who could not accept the clarified doctrine could choose to leave, and those who remained would be stronger in their faith.

ALSO WITHIN the world bound by religious vows are the dozens of priests who serve in the basilica. They hear confession in booths bearing placards announcing the languages the confessor can understand. The priests also conduct baptisms, celebrate Mass in the chapels, and participate in ceremonies, such as the installation of a cardinal, that display the church's pageantry at its most sumptuous.

Monks and nuns from a wide variety of religious orders serve within the Vatican. In one well-lit workshop near the Vatican's tradesmen's entrance, the Porta Sant'Anna, I watched Sister Sebastia, an 82-year-old Hungarian who once hoped to be a missionary in China but has spent the last 50 years tirelessly restoring frayed and crumbling tapestries. "I am still a missionary," she told me, obviously setting up a punch line she had delivered many, many times before. "In 1939 the Pope [the newly elected Pius XII] came to our workshop and told me, 'Your mission is here!' I have never wanted to be anywhere else." With a quick smile she turned back to a tapestry based on a drawing by Raphael, which would serve as her mission for the next two or three years.

The most numerous and enthusiastic religious figures are the students, selected by bishops around the world for the coveted right to go to Rome. Their studies at Rome's five pontifical universities are under the auspices of the Vatican, but students from two other schools, the Teutonic College and the Ethiopian College, actually live within the borders of Vatican City.

"Everyone is surprised to find us here," said Ethiopian College rector Luca Kelati, a lean, dignified monk dressed in the black-and-white hooded robes of the Cistercian order. "Especially the Americans. They say, 'We with all our riches and all our dollars can't have a college in the middle of the Vatican. How can you Ethiopians do it?' "

For nearly 600 years the faithful of Ethiopia—where Christianity had been protected against fearsome Islamic proselytizers by even more fearsome geography—had made their pilgrimage to Rome. So numerous were they in the 15th century that Pope Sixtus IV provided a special hospice for them on the Vatican grounds and gave them St. Stephen's Church, a fifth-century structure just behind St. Peter's whose shadowy, spare interior in its way rivals the spirituality of the great basilica itself.

The college, designed to hold 30 students, now has only five—vocations for the priesthood are down worldwide. The slap of Father Kelati's sandals echoed through the empty hallways as he led me among paintings of Ethiopia's bishops and Bibles in Ethiopic script.

The atmosphere is very different in the hallways of the Pontifical North American College, which looks down from neighboring Janiculum Hill. Its styleless, 1950s-vintage buildings could be those of any midwestern state university—except that through the students' windows looms the bulk of St. Peter's dome. The college was opened around the time of the Civil War, when the United States was still classified by the church as mission territory.

SOME OF THE STUDENTS at the college say that they have known they wanted to be priests for as long as they can remember; others, that they have entered the seminary precisely to determine whether this is the life for them. Don Prisby, for example, a 23-year-old son of a Navy family, with the blond looks and the happy bearing of a beach boy, was enrolled in a seminary even while an undergraduate at the University of San Diego and came straight on to Rome.

Joe Quinn, a red-haired, affable 35-year-old from Scranton, Pennsylvania, took a less straightforward route. Soon after finishing

law school, at the prodigious age of 25, he was appointed a federal magistrate. Six years later he resigned, having applied to his diocese to become a seminarian, and he was sent to Rome. He lived at the North American College and studied at the Gregorian University as one of 2,700 students from 92 countries. Last summer he returned to Scranton to start his work as a parish priest.

For priests from any corner of the world, going to Rome is important not simply for its cultural, spiritual, and intellectual stimulation, but also because of the contacts students can make there. Since the church is an international institution, positions in its upper reaches are awarded to those who have friendships, training, and reputations beyond the borders of their diocese or nation.

Daniel Pater, the part-time archaeologist, is one of the five Americans being prepared for diplomatic service at the Pontifical Ecclesiastical Academy. Training for the diplomatic corps is among the Vatican's highest honors, since all candidates must be invited to attend. I asked Pater what had surprised him most about his colleagues. "I was struck by the fact that the diplomatic students weren't as ambitious as you would expect—and not just because it would be a mistake to seem ambitious," he said. "These are men of prayer. They are people I like. I can live among them without keeping up my defenses."

The altar boys who rustle in their red cassocks and white surplices through the small chapels inside St. Peter's, bearing chalices and swinging censers, make up the youngest part of the Vatican's population. Their *preseminario*, hidden behind one of the Vatican's office buildings, is an island of homeyness among buildings devoted to solemn public purpose. Its airy classrooms and dormitories surround a terrace, across which a large land turtle sometimes lumbers.

"The boys enjoy animals," the prefect, Father Mario Laurenti, explained superfluously one day last spring as he steered me around the turtle and nearly knocked over one of several cages containing chirping birds. Don Mario, as he is called, is a handsome, soft-spoken young Maltese, who once was an altar boy here himself.

The boys, most of whom are from northern Italy, come to the preseminario when they are 11 or 12 years old. Most stay for three years; a few remain as "big boys," having decided to prepare for the priesthood themselves. "Some of these young boys—you can just see it from far away," Don Mario said, "they are so serious. They know how to pray." Even for such as they, however, the daily routine seems to be a trial—up at 6:30 every morning to assist at services in

An imposing figure *in the Vatican, Archbishop Paul C. Marcinkus jokes with altar boys gathered to see John Paul II off on a trip. Chief of daily operations for the State of Vatican City and also president of the Vatican bank, the American prelate was investigated but not charged in connection with the collapse of Banco Ambrosiano, Italy's largest private bank, which had loans tied to Vatican funds.*

Advisers and electors of the popes *since the late 11th century, the College of Cardinals gathered last May when John Paul II named 28 new cardinals,*

six of them from Third World countries. Only a few of the 152 cardinals live in Vatican City; most serve as archbishops and bishops in their native lands.

the basilica, then back by 9:30 to start a full day of school.

"For teenage boys the hardest thing is getting up so early," Don Mario said. Then, uncharacteristically, his expression darkened. "Something's changed," he said with a sigh that bore the weight of all his 31 years. "It didn't use to seem so hard."

One of the boys' releases is their soccer team, which hosts visiting groups of altar boys; another, the school's beehives, whose honey is served in the dining hall and presented to the Pope. Like bees elsewhere, those in the Vatican hives occasionally swarm, often ending up in buzzing clusters on the walls of St. Peter's.

"We try to get them down with ladders," Don Mario said, as he returned from a hidden larder and handed me a jar of the cherished honey. "But sometimes we have to call the firemen for help."

FOR HUNDREDS OF YEARS, the Catholic Church has simultaneously displayed wealth and pleaded poverty. The church possesses countless treasures, but its dioceses are always scraping to build a new school or pay the electric bill.

The Vatican seems to represent this pattern on a larger scale. The only thing that is certain about its assets is that they are vast. Apart from its portion of the world's artistic patrimony, it has extensive international investments, notably in real estate. At one time it owned shares of the Watergate complex in Washington, D. C., the Pan American building in Paris, and the Hilton hotel in Rome.

Some of the Vatican's investments were intertwined with those of two Italian bankers, Michele Sindona and the late Roberto Calvi, each of whom has been at the center of a long-running financial scandal. Several books and articles have questioned the role of Vatican officials, especially that of a robust American archbishop named Paul Marcinkus, who has for years supervised the Vatican's bank. The Vatican rarely responds publicly to criticism and has chosen to place itself above the controversy. "It's best just to say, 'These things are sent to try us,' " the Reverend Lambert Greenan, editor of the weekly English-language edition of *L'Osservatore Romano*, told me.

I conversed with Archbishop Marcinkus inside the medieval fortress that houses the Institute for Works of Religion, the Vatican's bank. With his plainspoken manner and air of bonhomie, he could easily have passed for a machine politician from his native Chicago suburb of Cicero. Yet the archbishop, 63, has spent most of the past 30 years in the Vatican, serving as a one-man advance team for the foreign travels of Pope Paul VI and Pope John Paul II. He is also in effect the mayor of Vatican City.

"We've got the museums and gardens and buildings here, and people think that it all just takes care of itself," he told me. "But we're like any other state. If we want electricity, we've got to generate it ourselves or buy it." The Vatican has turbines to generate much of its own power.

Late one afternoon last spring, as the light fell in long beams through the fretwork of his window and onto a red-tiled floor, a 75-year-old Italian archbishop named Lino Zanini gave me a course in Vatican frugality. Archbishop Zanini supervises the Vatican's Fabbrica, which is in charge of the physical maintenance of the basilica and its treasures. Archbishop Zanini had recently received money from the Knights of Columbus to clean and refurbish the front of St. Peter's. This project accounts for the green protective netting that visitors will see on the basilica's facade for several months.

Archbishop Zanini brought out a series of postcards, showing stately sarcophagi in which popes had been interred. He poked the photograph of John Paul I's sarcophagus several times, named a construction company, and asked, "Do you know what they wanted to do this job? They wanted one month and 30 million lire [about $15,000]. Thirty million! And do you know what we did it in? Working with great devotion, we did it in 58 hours, for *two million lire!*" He paused, beaming, then—as a large jeweled ring dangled loosely on his finger—pointed to the antique marble pillars, adorned with angels, at the front corners of the sarcophagus. "Of course," he said modestly, "I already had the angels in my storeroom."

Working at the Vatican might be called a mixed blessing. The workday begins at 8 a.m. and ends at 2 p.m., six days a week. Salaries are lower than in Rome, but the

As Jesus washed His disciples' feet *at the Last Supper, so John Paul II washes and kisses the feet of 12 priests on Holy Thursday in the Cathedral of St. John Lateran, the Pope's episcopal seat as Bishop of Rome. The papal residence was moved from the Lateran to Avignon, France, in the early 1300s and to the Vatican some 70 years later.*

Known as "the Vatican's Kissinger" for his deftness in negotiation, Secretary of State Agostino Cardinal Casaroli oversees the curia—the Vatican bureaucracy—and all international affairs. "I practice patience," he says, "with just a little bit of aggressive pressure." The Vatican maintains diplomatic relations with 111 countries—including, since 1984, the United States.

Vatican is never going to close down like a steel mill, it very rarely lays anyone off, and its employees pay no income tax.

Nevertheless, a certain unrest exists. Monks and nuns might have committed themselves to a life of sacrifice. Ordinary Roman employees in the late 20th century are less willing to do so. Until recently, the sampietrini were a hereditary caste. Where a father had repaired lead plates on the dome of St. Peter's, so would a son. Maurizio Parodi has restored paintings for the past 30 years—the same job his father held. "It seems like I am stuck," said a worker who had spent 20 years in the same job classification as we walked from one workshop to another. "It does not seem right to have no hope of changing, and that the cardinals should care so little about me as a man."

In 1979 the Association of Vatican Lay Employees was created. Its founders carefully avoid the word "union," though they can produce citations from papal statements about the respectability and doctrinal correctness of the labor movement. Under the leadership of Mariano Cerullo, a Vatican Radio employee, the association from time to time raises the prospect of a strike, to win more respect for lay employees.

Vatican Radio's first broadcast beamed out the words of Pope Pius XI in 1931, with Guglielmo Marconi at the controls. Now it broadcasts to the world in 35 languages, 15 of which are Eastern European and one of

which is Esperanto. Its towers sprout up at several points in the Vatican gardens, but its main broadcast center is 15 miles outside Rome, at Santa Maria di Galeria. Its studios, near the Vatican, resemble those of any other modern radio station—except for the colorful assortment of full-bearded Russians, Indians in saris, Chinese, Poles, and other broadcasters trooping in and out.

"No matter where we are broadcasting, our purpose is to report the words and actions of the Pope and news of the church," said Sesto Quercetti, an Italian Jesuit who is director of programming. "But the way we do that differs, depending on whether we're broadcasting to Sweden or Japan or the Soviet Union." Programs for the Soviet Union are mainly liturgical, since listeners there may be prevented from attending church. Only rarely, said Father Quercetti, are broadcasts jammed by the Communists: "Fifteen minutes a day is not enough for them to worry about, I suppose."

WITH ITS REACH across the continents, Vatican Radio is one expression of the Holy See's international view. Another is the Pontifical Academy of Sciences, housed in a beautiful villa called Casina Pio IV, nestled in the gardens behind the Vatican Museums.

So far has the church come since the days when it tormented scientists that the Pontifical Academy is proud to claim Galileo as one of its progenitors. "This is the only truly worldwide academy," Father Enrico di Rovasenda, an elderly monk in voluminous white robes, told me. "We have Jews, Catholics, all types of Christians, Muslims, Hindus." The only common trait is scientific distinction: 22 of the 70 current members have won a Nobel prize.

The academy's research includes basic research, in astrophysics, for example, or the evolution of primates; applied research of general value—commercial uses of satellites, for instance; applied research of specific value to developing countries, such as control of parasitic diseases; and research about peace and war in the nuclear age.

At the Vatican Museums, secretary and treasurer Walter Persegati, a trim Italian in his 60s, told me: "We had nearly two million visitors last year. That may not sound too exciting for a museum built to today's demands, but it is certainly a challenge for us."

The Vatican's Museums were in many cases never intended to be museums at all but were designed instead as apartments or residences. As a result, visitors wend their way through the bottlenecks and blind passages that contain many of the most beautiful works.

Wandering through the museums and monuments, I came to think that sheer random abundance distinguished the Vatican collections from most others in the world. Treasures that would elsewhere justify reverent display turn up here almost hidden in obscure corners. On my way toward the Sistine Chapel one afternoon, I pushed through another cramped passageway and turned through another small door into another murky room—and found myself five feet away from Raphael's luminous fresco "The Liberation of St. Peter," which I had admired in art books for years.

In one sunny, sequestered courtyard, the Vatican curators offhandedly display two of the most famous statues of antiquity—the "Apollo Belvedere," an epitome of male beauty sculpted about A.D. 130 but rediscovered only in the late 1400s; and the 2,000-year-old "Laocoön" group, which depicts an episode from the Trojan War in which Laocoön struggles to free himself and his sons from the encircling serpents' grasp. The "Laocoön" was celebrated by Pliny as the pinnacle of classical sculpture and was then lost for a thousand years until its rediscovery in Rome in 1506.

It has been 13 years since a crazed Hungarian-born Australian took a hammer to Michelangelo's "Pietà" in St. Peter's Basilica. To avoid such incidents, the Vatican Museums deploy plainclothesmen throughout the display rooms. From a central control room, supervisors keep watch on a battery of 25 closed-circuit television screens for signs of trouble. Still, marble statues crumble and silk tapestries rot. Often the damage is compounded by previous well-intentioned efforts. When statues grew shaky, restorers would insert iron rods to reinforce their arms and legs. But iron rusts—and in rusting swells, forcing the statues apart from within. (These days stainless steel is used.)

In his role as peacemaker, *John Paul II signs in May 1985 the final papers* ***(right)*** *of a Vatican-negotiated treaty between Argentina and Chile, who nearly went to war over rights to the Beagle Channel at the tip of South America.*

Recording session tapes baroque music at Vatican Radio ***(below)****, which beams 700 programs a week around the world in 35 languages, including Esperanto.*

"WHAT COULD be more exciting than what we're about to see?" exclaimed Patricia Bonicatti, an energetic American who assists Persegati. She urged me up a series of rickety ladders at one end of the Sistine Chapel. There, one of the most dramatic restorations in artistic history is under way.

The frescoes on the chapel's ceiling were finished in 1512, when Michelangelo was 37. It wasn't long before they became grimy from the charcoal braziers used in the chapel. Uncertain how to remove the dark, smoky coating, and perhaps fearful of harming the frescoes, restorers of earlier centuries relied on varnishes and animal glues, which imparted a temporary sheen. "But it was *only* temporary," Mrs. Bonicatti said. "In time the animal glues discolored and became opaque—and then the paintings would look even darker, and they'd put more varnish on them, and the cycle would continue."

In some eras restorers even painted dark shadows onto the figures, in an effort to make the surrounding surface look comparatively bright. All the while, explosions, leaks, and other natural disasters added to the toll.

Only in the past 50 years did the art and science of restoration reach a point at which a historic cleansing of the frescoes could be contemplated. With its customary frugality the Vatican struck a deal with a Japanese TV network, which is paying three million dollars for the rights to chronicle the restoration. The work will be tedious and slow, requiring 12 years from start to finish.

As soon as the first stage was undertaken, the restorers saw that they would be making, or at least recovering, history. The lunettes, large semicircles at the top of the walls, were even grimier than the ceiling,

perhaps because they had been easier for previous restorers to reach.

After a painstaking process of testing and timing to make sure they would be removing nothing but dirt, the restorers applied chemical solvents followed by distilled water and found paintings different from those previously known. On the surface all that could be seen were ocher, black, maroon, and olive—but underneath, hitherto concealed by centuries of grime, glowed astonishing lemon yellows, lime greens, neon shades of purple and pink.

These original colors of Michelangelo not only made the paintings far more vivid, but they also called into question long-standing theories about Michelangelo's technique as a fresco artist.

"Remember that our knowledge of Michelangelo as a painter is based solely on these paintings," said Gianluigi Colalucci, the chief restorer. "People have only been able to judge these pictures in this state. There was even one theory that the lunettes represented Michelangelo's dark, despairing view of sinful humanity. Now we see it's not that at all—the pictures were just dirty!" Most artists and art historians are excited about the findings, Colalucci said, but a few of them are resentful and suspicious: "The Michelangelo we have known for 300 years has suddenly disappeared."

Visitors can already begin judging for themselves, from the restored lunettes that can be seen from the chapel floor. Over the next three years, as the restorers work their way across the ceiling, the results should be more and more visible. But to view them at close range left me dumbstruck—not so much at the accomplishments of the restorers as at those of the artist. The more I looked, however, the more I was impressed

First major snowfall in 14 years dusts worshipers leaving the January 6, 1985,

Mass celebrating the Epiphany – the visit of the Magi to the Christ child.

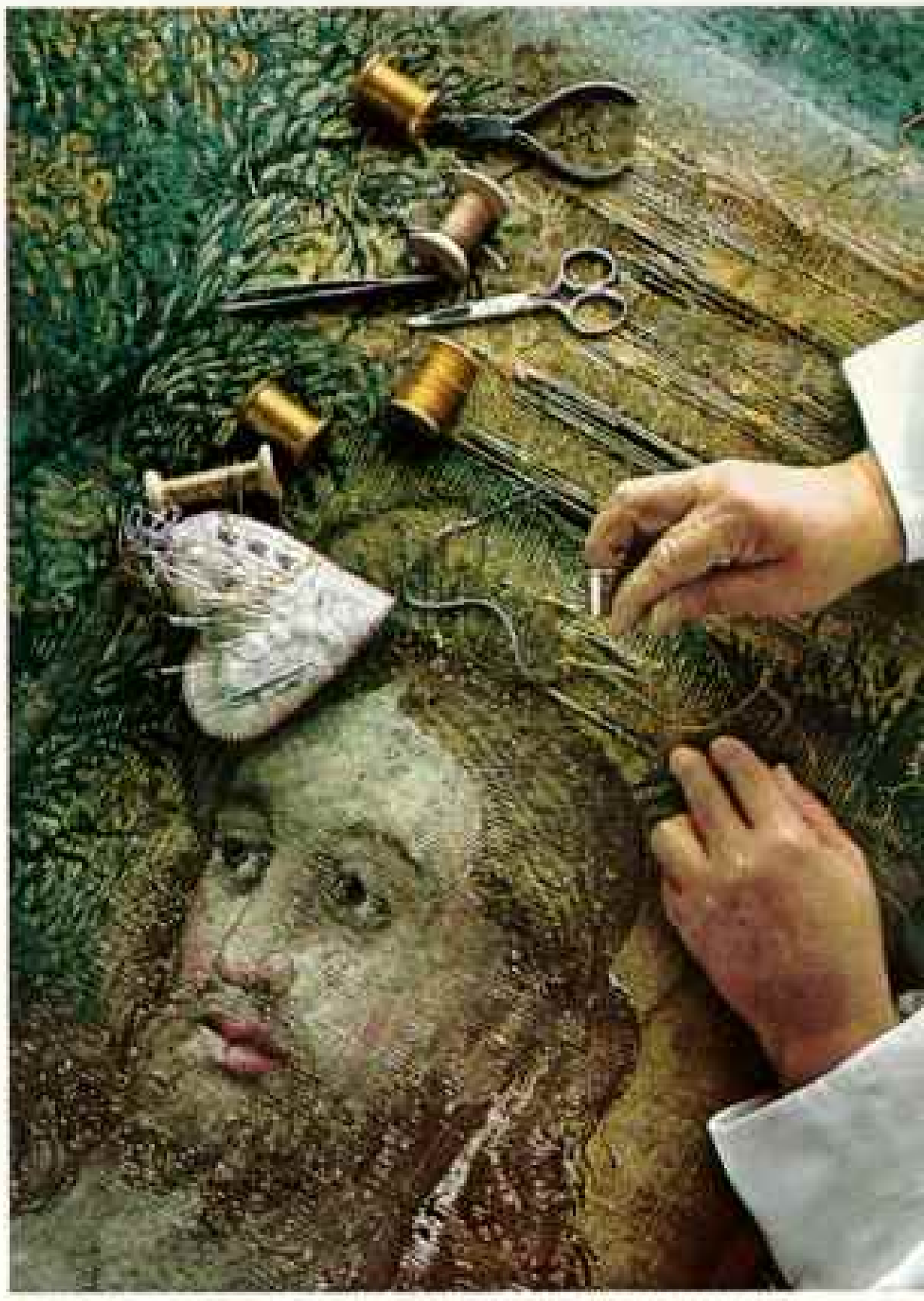
with what had not changed—what the cleaning only made more dramatic. The line and power of the painting, impressive from a range of seventy feet, are astounding at a range of inches.

Where a robe had been muddy maroon, now it was red with dramatic violet highlights. Where a face had been gray, it was now a fresh-painted rosy pink. While cleaning the figure of the Prophet Zacharias, the restorers discovered that his back and arm had been given an entirely different shape—plumper and more imposing—some time after the original painting was made. One of the deputy restorers, Maurizio Rossi, told me that by all odds the alteration was some post-Michelangelo tinkering, but on the chance that it might have been one of Michelangelo's own revisions, they asked the museum's laboratory to date and identify the different layers of paint.

Of course, the Vatican cannot really take credit for the genius of Michelangelo—or for Bernini, or Bramante, or the other artists who have adorned it over the years. But to have inspired so much devotion and creation, over so many ages, places it on a unique plane as a patron of the arts. When other organizations have survived and inspired over two millennia, let them question and judge.

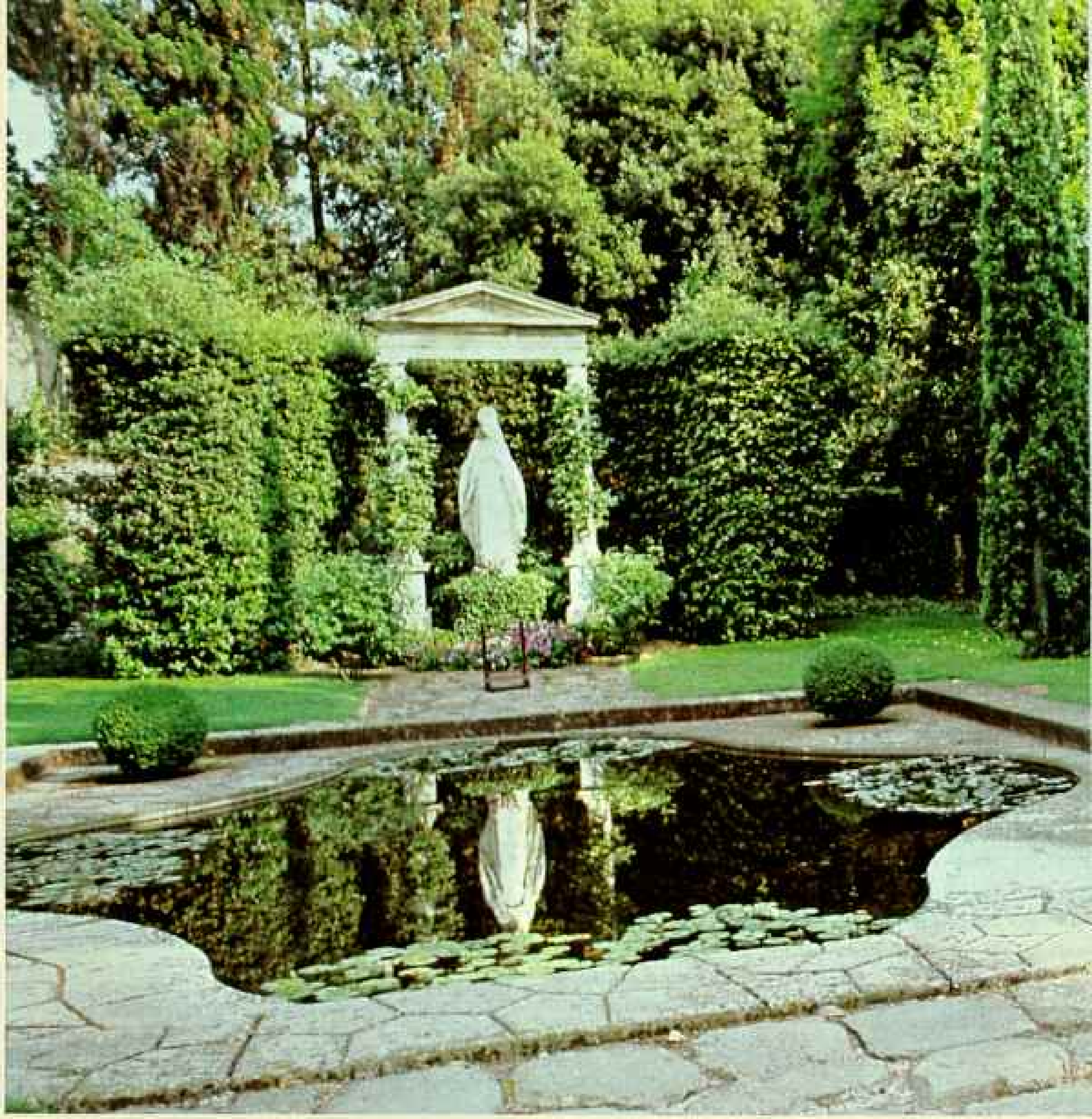
AT THE END OF A TALK in a Roman café, filled with detailed complaints about the Vatican's indirectness and Mediterranean inefficiency, a middle-aged Jesuit of Teutonic origin and temperament leaned back and let out a stream of tobacco smoke. "I suppose none of it really matters," he said of the organizational defects he had named. Then he added a phrase I had grown accustomed to hearing in almost every conversation I'd had in Rome: "Whatever the church is doing wrong, it's done it for 2,000 years."

In that statement lingered all the smugness that, in an earlier age, convinced the church that it had answers to every question and could brook no dispute. But it also reflected something more admirable about the Vatican—a quality that I, a non-Catholic, came to respect and even envy as I watched seminarians going to classes, minor officials drafting documents in Latin, sampietrini polishing lamps. Few institutions have survived as long as the Vatican has, and few still manage to give even a handful of people a sense of daily mission—an idea that their efforts count. If this sovereign state continues to prevail, as others crumble and fall, its citizens will give thanks to God—which is another way of saying that its survival depends on the extraordinary devotion of ordinary women and men. * * *



FACING PAGE: PHOTOGRAPHED COURTESY NIPPON TELEVISION NETWORK CORPORATION

Michelangelo's masterwork *glows with newfound vividness as a restorer using a solvent removes centuries of grime from the frescoes of the Sistine Chapel* ***(facing page)****. Japanese television is financing the three-million-dollar project in return for rights to document the tedious work, expected to take 12 years. Michelangelo spent nine years over the course of two decades creating the paintings. Drawing on a stock of more than 6,000 colors of thread, a nun repairs a tapestry* ***(above)*** *designed by Raphael, in which Peter receives the keys to the church from Christ.*

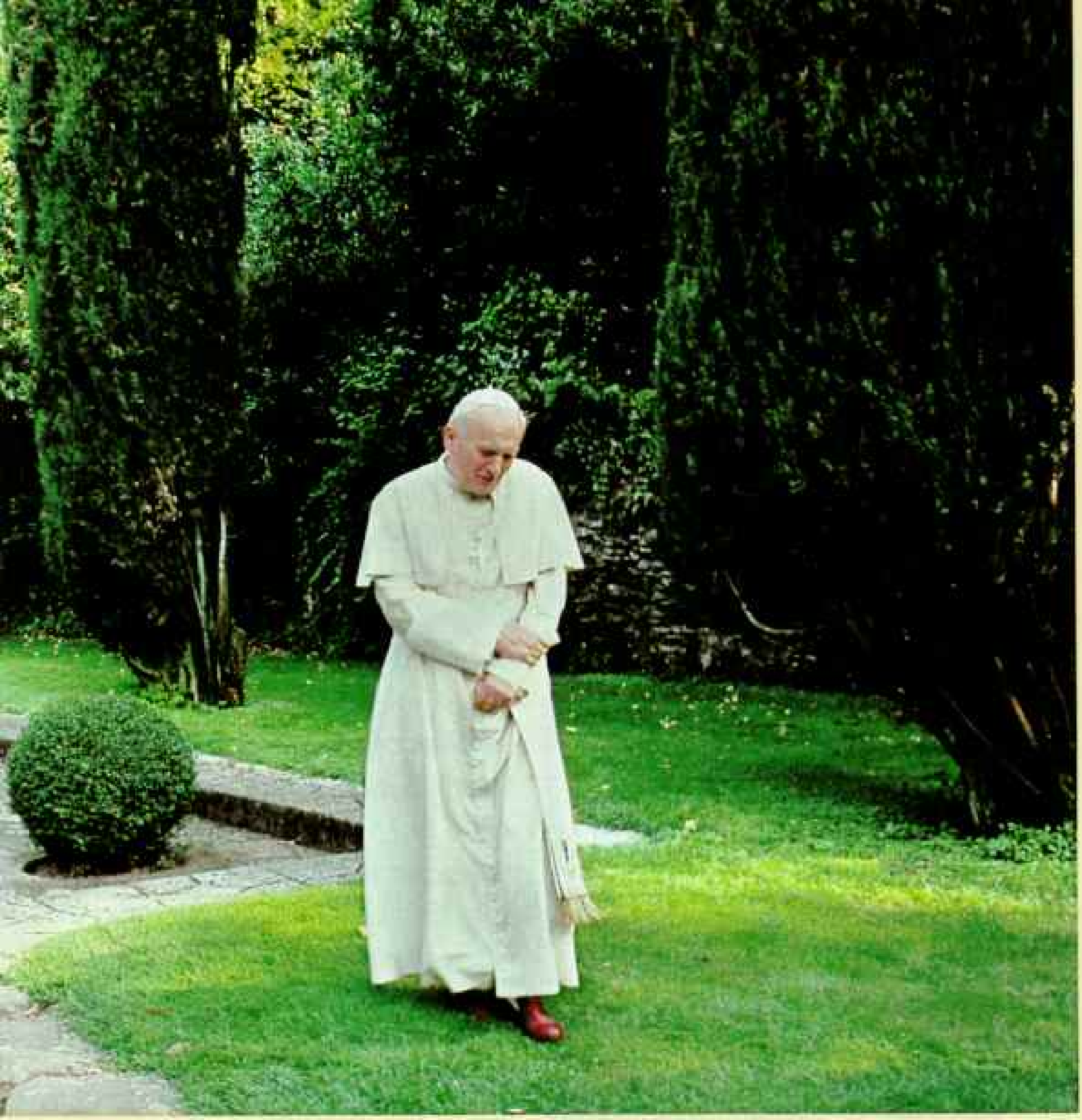


The Photographer's Perspective

By JAMES L. STANFIELD

A POPE walks alone in the quiet of afternoon at Castel Gandolfo—not the public Pontiff we are used to seeing, surrounded by massive throngs wherever he travels around the world, but a private, serene, and prayerful man. That is why this photograph means something special to me among thousands I made in the Vatican.

For five months I practically lived in the Vatican, covering each of the public Masses of His Holiness Pope John Paul II, his Wednesday general audiences, all ceremonies. But I was always kept at a distance from the Holy Father. Even so, I learned through my viewfinder that he is a man of



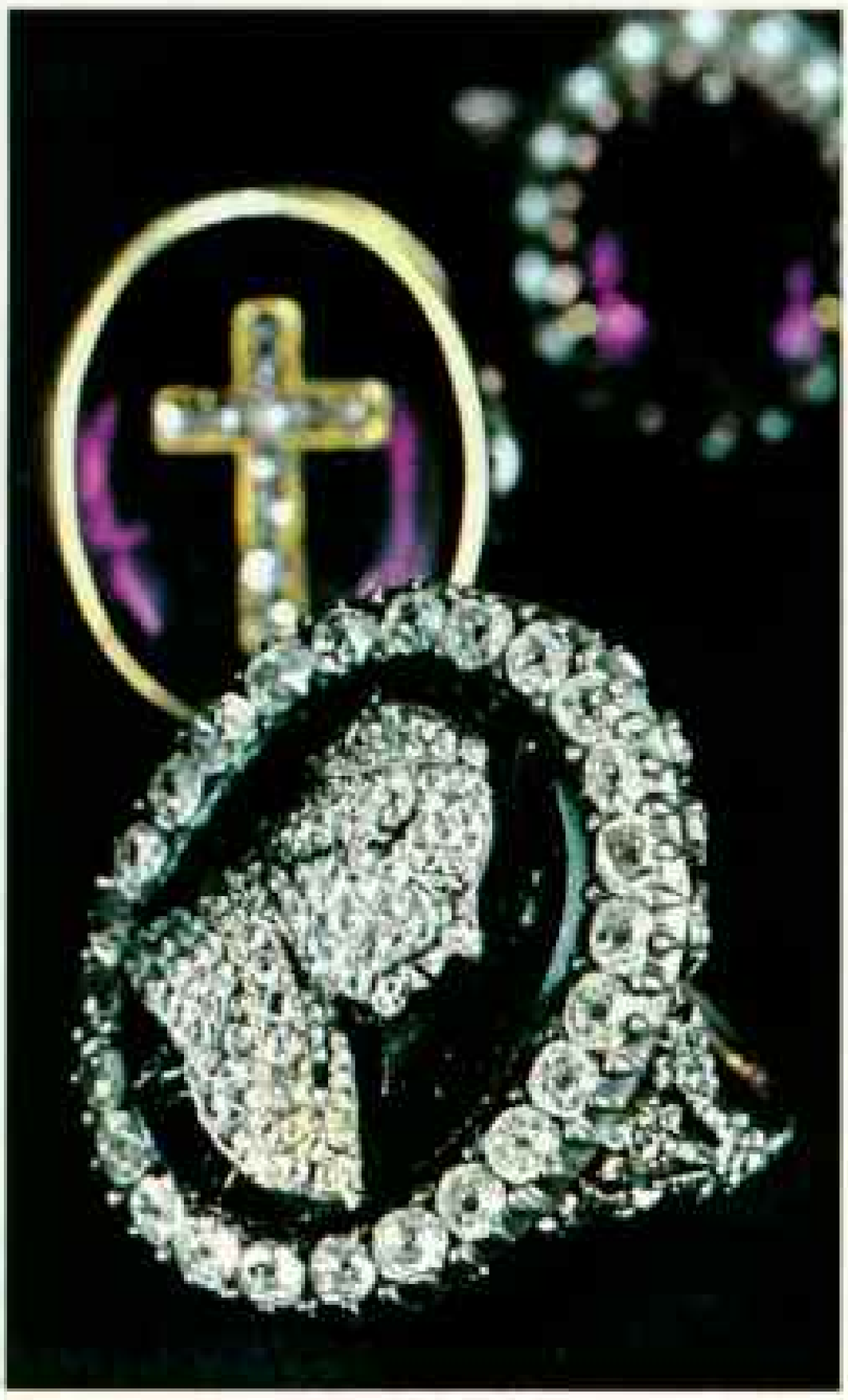
exceptional vigor, who can outwalk his security men, leaving them puffing, and still swim every day. I learned he likes natural foods—a hearty breakfast, rarely more than a salad for lunch, and fruit (usually an apple) with a small bite of cheese and mineral water (no ice) for dinner. And he likes natural people. I could tell that he does not care for the bowing and scraping and ring kissing, but that he will converse warmly with statesmen or children, without overlooking the underprivileged or handicapped.

As those months were drawing to a close, I was invited to the Vatican helicopter pad to accompany the Holy Father to his hilly summer retreat at Castel Gandolfo. As the Pope was making his way to the chopper, saying good-byes to the altar boys, bishops, and friends, I backpedaled away from him recording the activity. Then, through my viewfinder, I saw him extending his hand to me. "You're an American, aren't you?" he asked. "I'm familiar with your journal, keep up the good work. God bless you." Later that day I was able to follow him to the private garden and make the picture I had waited for. The frustration, disappointments, and puzzling obstacles of months suddenly faded. I felt I had scaled the Vatican wall.

* * *

TREASURES OF THE VATICAN

*During the more than 16 centuries since Emperor Constantine founded the first Church of St. Peter on Vatican Hill, the Holy See has amassed one of the world's most extensive art collections. Works range from grand and heroic frescoes in the Sistine Chapel to exquisite diamond-encrusted papal rings, one bearing the likeness of Pope Pius IX (**left**), who presided from 1846 to 1878. He is said to have commissioned a dazzling chalice (**right**) made from gold and precious stones contained in the trappings of a horse presented to him by a Turkish sultan. The Vatican is far more than the administrative center of the Roman Catholic Church. Its museums, chapels, and library constitute a unique and wondrous treasury. Here are preserved some of the most sublime creations of man, inspired by his eternal yearning to give expression to the divine spirit.*



Photographs by
JAMES L. STANFIELD and VICTOR R. BOSWELL, JR.

Elaborate celebrations *of knowledge embellish a wing of the Vatican Library, where paintings honor the written word and learned men of antiquity. The*

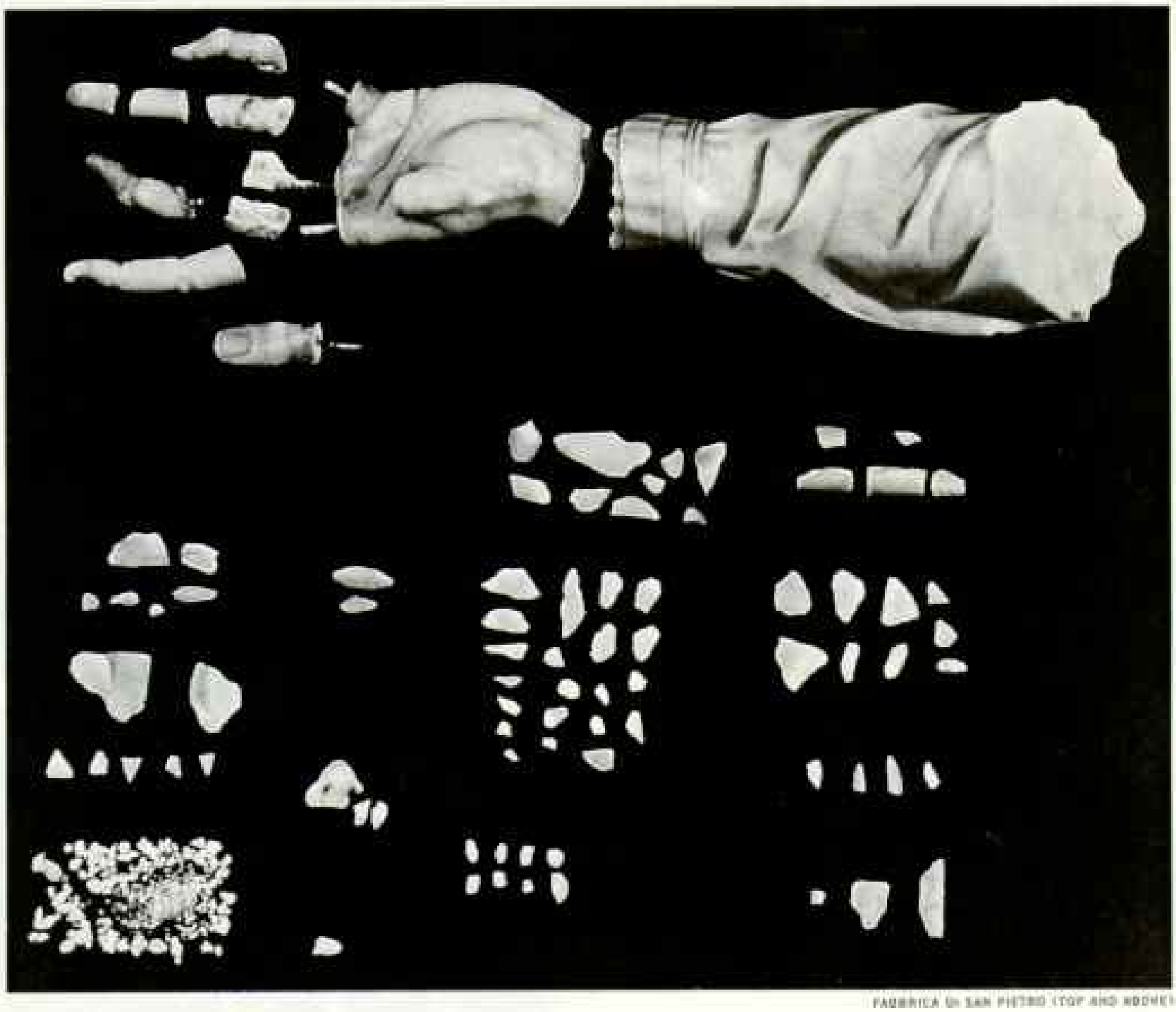
JAMES L. STANFIELD, VICTOR R. BOSWELL JR., AND PHILIP B. LEONARD, NGS STAFF

Vatican's stature in contemporary research is enhanced by the Pontifical Academy of Sciences, a group of 70 scholars, 22 of whom are Nobel Prize winners.

MARTYRDOM AND SORROW *find poignant expression in Michelangelo's beloved "Pietà," the only statue the artist ever signed. Mary and the crucified Jesus were carved from a block of Carrara marble when Michelangelo was in his 20s. Completed around 1500, the statue appears in nearly perfect condition* (**left**)*, despite a deranged man's attempt to destroy it. On May 21, 1972, a young Hungarian-born Australian, claiming he was Jesus Christ, attacked the statue with a hammer, delivering 15 blows before he was pulled away.*

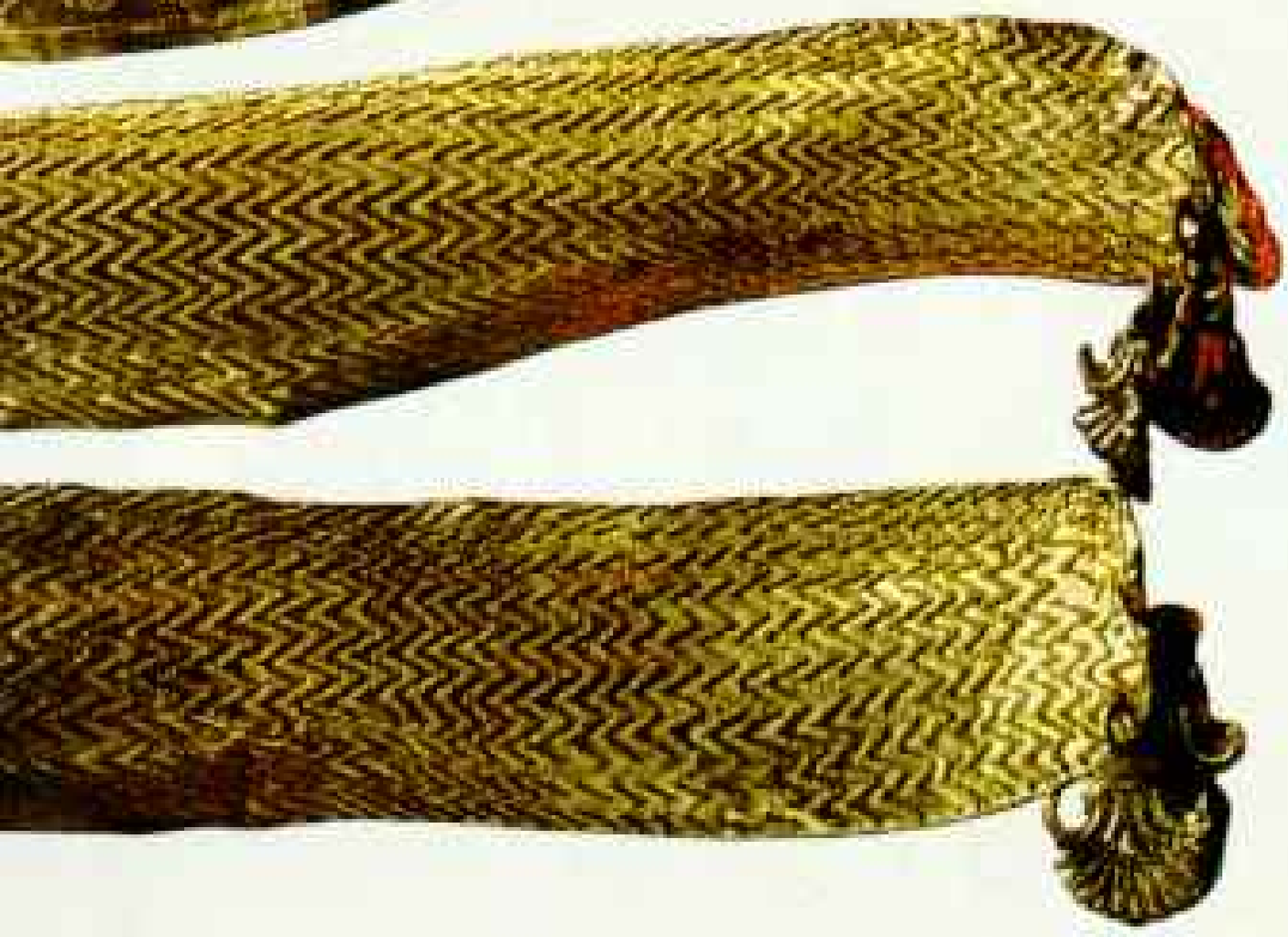
Mary's face suffered a chipped eyelid and broken nose (**right**)*. Her shattered left arm was recovered along with dozens of smaller fragments* (**below**)*. The Vatican Museums' laboratories took on the challenging job of reconstruction. Guided by a plaster cast of the statue made 40 years earlier, restorers reaffixed the fragments with a polyester resin that dried even harder than the marble. The most difficult task: reattachment of the*

arm, using a stainless-steel pin secured with resin. Restoration was completed shortly before Christmas, 1972. Today the "Pietà" remains on display in St. Peter's Basilica behind bulletproof glass.



FABBRICA DI SAN PIETRO (TOP AND ABOVE)

PRIDE OF LIONS *parades across the catch plate of a fibula, or clasp* ***(left)****. It and a similarly ornate armlet* ***(below)****, both made of gold, were found in 1836 at Cerveteri, near Rome, during excavation of a seventh-century* B.C. *tomb. The discovery led to the founding of the Gregorian Etruscan Museum by Pope Gregory XVI. Today the museum preserves some 20,000*



artifacts, roughly spanning the first millennium before Christ.

The interest of Vatican scholars in ancient cultures was further demonstrated with the opening of the Gregorian Egyptian Museum in 1839, the original goal being the cultivation of understanding of life in Old Testament days. The Gregorian Pagan Museum preserves Roman antiquities, primarily ancient sculpture found in the papal state, that were formerly in the Lateran Museum and were moved to the Vatican at the request of Pope John XXIII.

GIANT SERPENTS *slay Laocoön and his two sons* (**left**) *in this famous statue dating from around the time of Christ. According to Virgil's Aeneid, the priest suffered a violent death after warning fellow Trojans against Greeks bearing gifts—the giant wooden horse concealing soldiers who conquered Troy. The statue was discovered in 1506 and became the property of the Vatican. Laocoön's missing right arm was found in 1905.*

A 19th-century statuette in wood and copper (**below**) *from Gabon is in the collection of ancient and modern religious art of primarily non-Christian cultures housed in the Missionary-Ethnological Museum.*


SANCTISSIMO IN CH

"MOST BLESSED FATHER . . . *the cause concerning the marriage of the most invincible prince, our sovereign lord, the King of England . . . does for sundry great and weighty reasons require and demand the aid of your Holiness, that it may be brought to that brief end." So was the Pope addressed in this unsuccessful 1530 petition for an annulment of the marriage of Henry VIII from his first of six wives, Catherine of Aragon. Signed by 85 members of the English clergy, nobility, and gentry and weighted by their wax seals, it rests today in the Secret Archives of the Vatican—an extraordinary trove documenting the Roman Catholic Church and its impact on the history of the Western world.*

Henry's marriage to the daughter of Ferdinand and Isabella had required papal dispensation to begin with, since she had previously been wed to his late brother. Henry argued that this violated divine law and accounted for her failure to provide a male heir to the throne. But Pope Clement VII stalled. Troops of Catherine's nephew, Emperor Charles V, had recently sacked Rome.

In 1533 Henry secretly wed Anne Boleyn. The Vatican Library preserves 12 love letters he wrote to her. Henry then broke with Rome, made himself head of the Church of England, and hastened the tide of the Protestant Reformation—launched in 1517 by the German monk Martin Luther.

Luther burned his excommunication bull issued by Pope Leo X in 1521, but the Secret Archives, opened to scholars in 1880, still hold the Vatican's copy, along with letters from Luther protesting the massive sale of indulgences—releases from penance—authorized by Leo X to finance the building of the new St. Peter's Basilica.

While leading the church during a revitalizing Counter-Reformation, Pope Gregory XIII built an observatory, now part of the building housing the Secret Archives, to study the heavens and devise a more accurate calendar. In 1582 the Gregorian calendar went into effect in Catholic countries and today measures time for virtually all the world. □

NICARAGUA

By MIKE EDWARDS
NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by JAMES NACHTWEY
BLACK STAR

Nation in Conflict

Endless war and upheaval have stolen Christina Blandón's childhood. Next to her home in northern Nicaragua lies a Soviet-built reconnaissance vehicle disabled by rebels. Equally young and battered, her nation's revolution faces an angry array of dissent.

ON A DAY of stupefying heat the plains of Chinandega, in northwest Nicaragua, send dust devils spiraling into the sky. It is good soil, this powdery stuff, and Enrique José Saravia doesn't intend to leave it.

Some of his neighbors fled after the Sandinistas took power in 1979. Some were Somocistas, allies of the deposed Somoza regime. Some were scared of the new government that spoke of redistributing the wealth. One former neighbor became a bank guard in the United States—"as close as he gets to money now," Señor Saravia says.

A mile-high volcano, San Cristóbal, puffs a white semaphore near Señor Saravia's farm. In the 1970s it spewed ash, replenishing soil nutrients while stimulating church attendance in a wide area.

Nicaragua needs what this soil produces well, which is cotton—needs it to buy cloth from Taiwan and trucks from Japan. Señor Saravia, gray at 42—from hard work, he says—intends to do his part. About a third of Nicaragua's farmland has been expropriated, but he thinks that if he keeps working hard the government will not take his 360 *manzanas* (630 acres) of cotton land. "Our tactic is that if every day we are more efficient, every day the government will depend more on us," he says. And the Sandinistas want to keep efficient farmers like him in business.

It is not easy. Laborers dazzled by revolutionary promises show a disinclination to labor. Well before the United States imposed trade sanctions this year, tractor parts were scarce. The government sets the price of cotton and other major crops and controls imports of fertilizer and most other goods.

But consider the alternative. "Here I am Enrique Saravia, producer and businessman. I do not want to be a bank guard."

Ever a realm of physical upheaval—studded on its Pacific side by 27 volcanoes (eight working) and trembling as crustal plates slip and grind—Nicaragua today sends political tremors through the Americas. Six and a half years after revolution opened the way to power for spiritual heirs of guerrilla leader Augusto César Sandino (about whom, more later), upheaval has brought forth a peculiar onion. Peel a layer and you discern a regime armed and partially subsidized by the Soviet bloc. Peel another layer and there is Enrique Saravia, capitalist.

For the three million citizens of Alabama-size Nicaragua, two organizations keep score on human rights: one working with the government, the other opposed. Politics has sundered families, sending sons into exile and into the camps of the counterrevolutionaries—the U. S.-backed contras—while other sons labor for the regime. Fissures run deep into the church, and Nicaragua is 80 percent Roman Catholic.

Amid preelection hoopla *in Matagalpa, troops get the heave-ho from supporters of Daniel Ortega, presidential candidate of the Sandinista National Liberation Front. The party has ruled since spearheading the overthrow of the Somoza regime in 1979. Seven parties campaigned, but the most vocal opponents boycotted the 1984 election. The Sandinistas won with 67 percent of the vote; turnout was 75 percent.*

In the parish of El Calvario in the small city of Esteli, two hours north of Managua on the Pan American Highway, Jesus wore a big sombrero. A crowd waited while four men in jeans placed the plaster Christ on a donkey. Then, surrounding their *campesino* Christ, the people began the Palm Sunday procession to the cathedral in Esteli's plaza.

The parishioners of El Calvario had been in the forefront of the fight against the Somoza dictatorship. They were prodded toward revolution by their priest, Julio

López, one of many priests who took Christ into the revolution. Some have taken Him even into the Sandinista government, where three priests hold high positions. For his part, Father López had to flee from the Guardia, the Somoza National Guard, to be hidden by nuns in another city.

Five thousand people died fighting the Guardia in Estelí. Many buildings still bear, like medals, the scars of combat.

On Good Friday I joined a vast crowd in the capital. Following a crucifix, the procession moved mournfully through the streets where downtown Managua was—where it was until the earthquake of 1972, which destroyed the city's hub, with a loss of life reckoned at 10,000. What is left is a 250-block grid of pavement and ruin (pages 788-89).

This traditional crucifix might have led a Good Friday procession anywhere in Latin America. Behind it came the Archbishop of Managua (now elevated to cardinal). Miguel Obando y Bravo (page 782) finds much to criticize in the Sandinistas. To attend his Mass is, for many, a political act.

I PEELED the Nicaraguan onion for two and a half months this year. I viewed the Pacific from Corinto, where Soviet ships off-load arms; on the Caribbean side I chugged through lagoons to a Miskito Indian village (map, page 786). I found Nicaraguans loquacious and, whether pro-Sandinista or anti-, not hostile to a visiting gringo. There's a cool self-assurance in these people, earned, I think, in overthrowing the Somoza regime, perhaps also acquired from living with earthquakes and volcanoes.

Just 15 miles south of Managua, the volcano called Masaya sends up a great steamy reminder of nature's potency. On the rim I met Alain Creusot-Eon, a Frenchman who regards belching Masaya as a normal being would a lovely alpine lake. For 13 years Alain has studied volcanoes, a help in developing geothermal energy in oilless Nicaragua. Steam from beneath another volcano, Momotombo, produces energy enough to trim the nation's fuel bill by a fifth. Additional energy is to be harnessed with Canadian, Italian, and French loans.

Once a month Alain checks Masaya's rumble. If it's going to blow, he will be the first to know. I followed him into the crater. The descent was vertical in places and, lordy, I hadn't rappelled in years. On the floor I trod lava swirled as if by a giant spatula and choked on sulfurous fumes. Alain thought it a dandy outing.

Before the conquistadores arrived in the 1500s, Indians tossed maidens and children into Masaya's maw, hoping to appease a god. The Spaniards heard from the Indians the name Nicaragua, meaning, perhaps, "here near the lake." Settlements dotted the shore of Lake Nicaragua, which, at 3,100 square miles, is almost an inland sea.

The Indian population was soon devastated; many were taken as slaves to the mines of Peru. Only on Nicaragua's Caribbean side do Indians survive in numbers.

Masaya enjoys protection in a national park—fortunately, for Managua is headed its way. The capital counts 900,000 souls

Hard times, hard play: *With her school lacking desks, a student who has found one* ***(right)*** *carries it home each day in a barrio of Managua, the capital. A mass campaign in 1980 reportedly taught 400,000 persons basic literacy. Baseball-mad Managuans cheer the national playoffs* ***(left)*** *of a sport popularized by U. S. Marines in the early 1900s.*

A church divided *worries Archbishop of Managua Miguel Obando y Bravo* ***(left)****, now elevated to cardinal. His orthodox views clash with those of priests holding government posts in defiance of the Vatican. During Holy Week a statue of Christ in a country church at Niquinohomo* ***(right)*** *is blindfolded and fettered with garlands to symbolize Jesus on trial. Rooster recalls Peter's denial.*

and is growing by 6 or 7 percent a year. Shacks sprawl everywhere.

There are also posh neighborhoods—where houses that domiciled Somoza colonels have become offices or homes of officials. The Sandinistas have confiscated 3,500 Somocista homes nationwide, as well as farms and businesses, and also property abandoned by citizens leaving the country. Thus, about 40 percent of the economy is in government hands.

Revolution has made Managua almost exotic. Leftists came from Chile, Argentina, Peru. One night I was lectured on the Middle East; my companion was a physician sent by the Palestine Liberation Organization, which sees value for its cause in helping Nicaragua. Canadians and West Europeans pass through—as do thousands of U. S. citizens. Many offer help and expressions of support. Technicians and advisers from the Soviet Union, along with Cubans both civilian and military, are also present, though less visible.

NOTHING OF WAR IS VISIBLE in Granada, half an hour's drive south of Masaya. Home of aristocrats, Granada took little part in the 1979 uprising, and the contras haven't reached it. Its lovely arcaded plaza is a vision of Spain.

This plaza has seen turmoil, however. William Walker torched its buildings. U. S. biographers call the Tennessee-born Walker a "filibuster," a soldier of fortune. Sandinistas call him a Yankee imperialist.

Walker came to take part in a feud between two bitter factions, the Liberals, based in the city of León, and the Conservatives of Granada. The Liberals hired him and 58 followers in 1855. He easily took Granada—then made himself Nicaragua's president. Armies from other Central American nations combined to defeat him in 1857—after his retreat from Granada's ashes.*

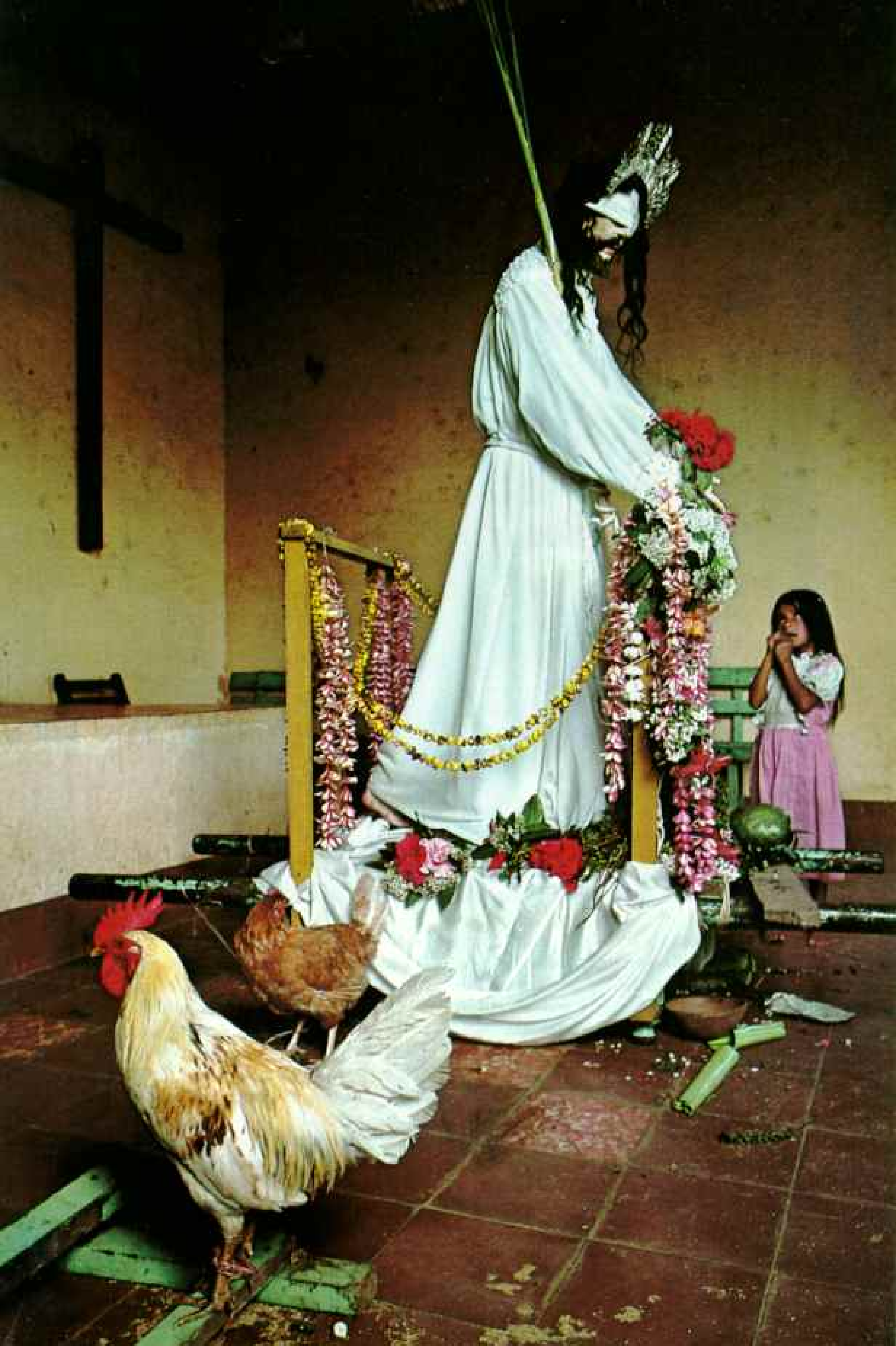
All this happened at another time when Nicaragua was receiving thousands of visitors, thanks to the California gold rush.

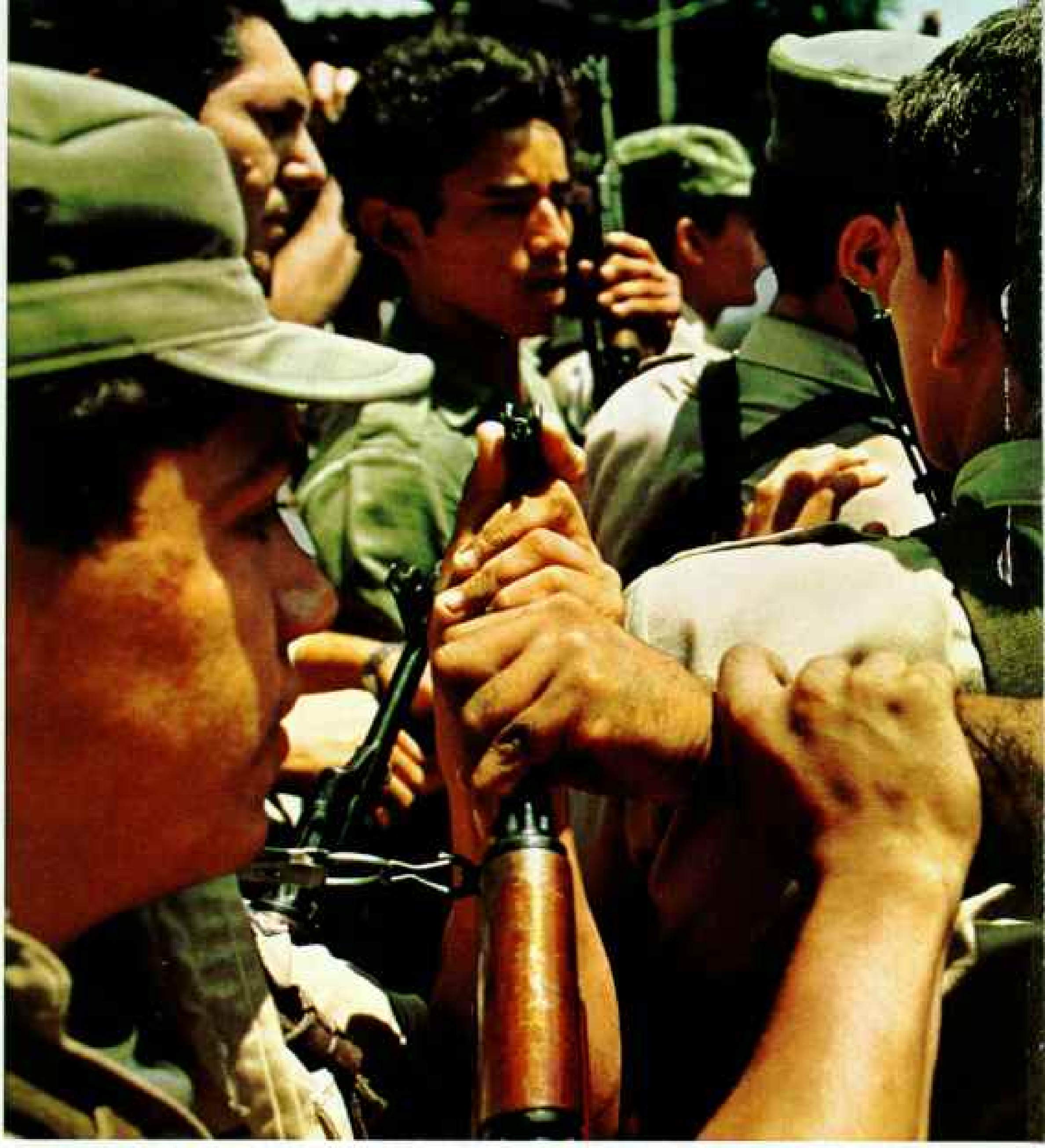
Arriving by ship on the Caribbean coast, they proceeded up the Río San Juan and crossed Lake Nicaragua. Then they took coaches across the 12-mile-wide isthmus that divides the lake from the Pacific. At San Juan del Sur they boarded ships for California. The whole trip, New York City to San Francisco, took 25 days—weeks shorter than crossing the United States.

World statesmen, meanwhile, pored over maps. They had long considered Nicaragua an ideal site for a transoceanic canal. The canal idea was the dominant element of U. S.-Nicaraguan relations well into the 20th century.

But the canal did not happen, and today, minimally blessed with industry, Nicaragua exports cotton, coffee, sugar, beef, shellfish, bananas, tobacco. After the Reagan Administration banned trade with Nicaragua this year, Nicaragua found European and Arab buyers for some of its products. In recent years exports earned about 400 million dollars. But Nicaragua has been importing nonmilitary goods worth 800 million dollars a year, and Soviet aid makes up only half the deficit. Forty percent of government revenue goes to the war effort. Hence,

*For more on Walker, see "Honduras: Eye of the Storm," by the author, NATIONAL GEOGRAPHIC, November 1983.





nonessentials have vanished. The prudent traveler carries his own light bulbs.

And he wants to shield his backsides. Swarms of vaccinators are out inoculating against measles, polio, and other diseases, helping to reduce infant mortality by two-thirds.

There is much enthusiasm, also, for education. In Estelí I looked in a schoolyard and saw 60 adults being trained as teachers. After taking over, the Sandinistas taught thousands to read simple texts and write at least their names. The Estelí volunteers would work in a follow-up campaign.

Education suffers from a shortage of texts. And it is often political. A math teacher's manual for instruction in logic suggests this true-false question: "The Sandinista Front is the vanguard of the nation."

NORTH OF MANAGUA spreads a vital agricultural region, one that has seen much fighting with contras moving down from Honduras. I rented a van and hired Orlando Medina, free-lance *chófer*. He scrounged coupons for gas (rationed) and filled jerry cans.

We transited a sere landscape; in March the lowlands must wait two months for rain. The road climbed foothills to Matagalpa.

East German army trucks and Soviet jeeps rumbled in the streets. Soldiers with *akas*—Soviet AK assault rifles—waited for rides. The war is not far away. We taped "TV" in big letters on the van. That means "press"—we hoped the contras knew it.

Beyond Matagalpa, mountains rising to 6,900 feet were greened by the moisture from scudding clouds. Coffee grows in the cooler elevations. The crop is important to Nicaragua's economy—worth as much as 157 million dollars a year.

We took an undulating dirt road, passing the scorched hulks of trucks ambushed by contras, and got to La Rica in time to see the

"¡No pasarán! They shall not pass!" *Appropriating an anti-imperialist slogan, anti-government unionists taunt Sandinista police during a confrontation in Managua last May 1—international workers' day. In an unrelated event the same day, U. S. President Ronald Reagan imposed economic sanctions against Nicaragua, citing its alleged support for Central American leftists.*

Blaming U. S. "terrorist policies," President Ortega in October announced a one-year suspension of rights—to strike, form unions, freely assemble, express ideas, move about the country.

NGS CARTOGRAPHIC DIVISION DESIGN: NANCY SCHWEICKART. RESEARCH: DAVID B. MILLER, WILLIAM L. BLEWITT. PRODUCTION: ELLEN J. LARSEMAN. MAP EDITOR: SID PLATH

"**Free homeland or death**" *were tall words from a pint-size rebel named Augusto César Sandino* (**right,** *at center*) *—the Sandinistas' inspiration. In 1927 he roused machete-wielding campesinos to harass the "Barbaric Colossus of the North"—U. S. Marines such as these* (**facing page**) *overseeing 1928 elections. After years of shoring up pro-U. S. regimes, the troops pulled out in 1933. The next year, after a presidential dinner party in his honor, Sandino was assassinated by order of the National Guard chief, Anastasio Somoza García.*

Nicaragua: Troubled Heart of Central America

WITH ROOM TO GROW and geothermal energy and hydroelectricity to tap, Central America's largest nation, relatively uncrowded, concentrates its people on the volcano-studded Pacific coast.

Spaniards arriving in 1522 enslaved the Indians. Independence came in 1821 as the cities of León and Granada grew into rival powers. Their quarrels led William Walker, a volatile filibuster from Tennessee, to attack Granada's forces and have himself briefly declared Nicaragua's president in 1856. He tried to control a vital route used during the gold rush to transport U. S. miners more quickly to California via Río San Juan, Lake Nicaragua, and a narrow isthmus to the Pacific for a final run by steamer. Partly to bar an interoceanic canal that would have competed with the Panama Canal, U. S. Marines landed in 1909. They later trained the Nicaraguan National Guard, whose first native commander, the elder Somoza, soon became president. He and his sons held power for four decades, as charges of repression and corruption mounted. After the 1979 overthrow, aided by Cuba and other Latin neighbors, guerrillas, some backed by the U. S., began attacking on three broad fronts (**map, left**).

AREA: 130,000 sq km (50,193 sq mi). **POPULATION:** 3 million, 75 percent mestizos; also Miskito, Sumo, and Rama Indians, Garifuna or Black Caribs, whites, and Creoles. **CAPITAL:** Managua, pop. 900,000. **LANGUAGES:** Spanish, English, Miskito. **RELIGIONS:** Roman Catholic, Moravian, other Protestant denominations. **ECONOMY:** GNP (1984): 2.4 billion dollars. Inflation rate: 100 percent. Unemployment rate: 20 percent. Chief exports: cotton, coffee, sugar, beef, shellfish, bananas, tobacco.

BOTH PHOTOGRAPHS FROM NATIONAL ARCHIVES

village coming down. The campesinos were removed to a compact new settlement closer to the protection of soldiers. Boys knocked rafters loose. A man stacked roofing tin. These would be trucked away, for building materials are expensive.

Some 70,000 people were evacuated from war zones. The massive relocation usually is explained by Sandinistas as an effort to save lives and to prevent campesinos from being press-ganged by the contras. Also . . .

"The contras were thriving in La Rica," said a resettlement official. "They were taking chickens, cows, corn. If the government sent out food for the people, the contras bought it or stole it. The government was practically supporting the contras."

The La Ricans departed reluctantly. "It's not our fault," a man with a big mustache said. "Yes, the contras took food from us. So did the army. They both ask for food. If you don't give it to them. . . ." He finished with a swing of his fist.

MANY REMOTE VILLAGERS have been so little touched by any government that they have no basis upon which to choose sides. Some have willingly joined the contra bands that find sanctuary in the chaotic mountainscape; some have been forced to join.

The Sandinistas press for support, too,

MIKE EDWARDS

Ghost of Christmas past *still haunts downtown Managua. On December 23, 1972, an earthquake killed about 10,000 people and devastated 250 blocks. Today the ruins are often taken over by the homeless* (**top**)*. Beyond that building, seen from the wrecked First National City Bank* (**left**)*, lie the relatively unscathed National Palace, the heavily damaged Cathedral of Managua, and Lake Managua. Reconstruction, slowed in the 1970s amid charges of aid profiteering by Somoza and his lieutenants, has created sprawling satellite communities. In the well-to-do suburb of Los Robles, businessman Ramiro Lacayo and his wife, Gloria* (**above**)*, stayed to support the Sandinista revolution—and still do.*

and can be heavy-handed. I talked with a farmer recently released from jail. "I was accused of recruiting for the contras and of giving them a million cordobas' worth of medicine," he said. "That's ridiculous. All we're eating is our fingernails these days." Of the security police who arrested him, he declared, "If they don't like somebody's looks, they denounce him to their superiors." He had a name for them: vultures.

Released after friends intervened, he found his farm buildings had been burned. "I was told the contras did it," he said. His shrug questioned this. His jeep and truck reappeared after he was freed; the security police had been using them.

The contras hit and run, ambushing army convoys, firing into villages. The civilian toll is high: teachers, telephone repairmen, anyone linked to the government. Even soldiers' mothers have been ambushed.

The contras have tried hard to stop the coffee harvest—economic warfare. I met three women whose sons, 12 and 13 years old, were captured while picking coffee. Three months had passed, and nothing had been heard from them. They turned up a few weeks later, having escaped from a contra camp by way of Honduras.

On a lonely road the contras fired on a truckload of coffee pickers. "People fell all around me," said Carlos Pérez. "A girl next

What you don't see *at the grocery store is usually available at Managua's Oriental Market. Beyond these domestic goods* (**left**) *are what consumers want—soap, toothpaste, and other scarce imported goods offered on the officially tolerated black market. A pair of designer jeans costs a secretary a month's pay. Deeply in debt, with defense outlays eating up 40 percent of its budget, the government imports few nonessentials.*

This year 200 million dollars in economic aid was pledged from Western Europe, an equal amount from the Soviet bloc. With spare parts for U. S.-made vehicles embargoed, transportation is chaotic; bus fare includes a workout for patrons stranded en route to Masaya (**above**).

to me was hit. She was screaming, 'Don't leave me!' "He jumped out and hid in a ditch. Luis Jorge Briones, another survivor, said the contras shot others who jumped out. He peered from the ditch to see the truck afire.

Some 24 persons died, including a five-year-old boy. An exact count could not be made because many bodies were so badly burned, and one or more survivors may have been taken away by the contras.

A woman in San Sebastián de Yalí said food is expensive because there is no one to grow it—"The men are soldiers or contras or dead." I asked her to compare the present with the Somoza days. "There was plenty of food then," she said. "And there was no war." She added: "It's not the government's fault. They try to balance things: defend the country, grow enough food."

IN A YALÍ CANTINA soldiers danced to Michael Jackson's music. I passed several hours in debate with a taut, confident fellow named Gerardo Barreto Sequeira. His job was dispensing propaganda and boosting morale. Hence to the troops he was "Politico." Good weapons and good morale assure Sandinista success, Politico declared. Then, giving his version of Vietnam: "U. S. soldiers don't fight well because they don't know what they are fighting for."

I asked if he had been trained by Cubans.

"No—I was trained by Nicaraguans who were trained by Cubans."

I went with him one day to a camp of combat troops near a river. Cabbage soup bubbled on a field stove.

Politico addressed a platoon, delivering propaganda from *Barricada*, the Sandinista newspaper. And he led the men in cheers, like this one: "Do you want to eat?"

"No!" came the chorus.

"Do you want to sleep?"

"No!"

"What do you want?"

"To fight!"

Though we disagreed on many things (such as whether all U. S. workers are exploited), I think Politico liked the first gringo he'd ever really talked to. A month later he was shot in the head in an ambush and died instantly. He was 19.

THE ROUGH COUNTRY roads tortured our van. Wires shook loose. When a pin sheared in the clutch linkage, Orlando replaced it with a nail. And when that broke, with another nail.

This was in the department of Nueva Segovia, just south of Honduras. Many of its towns are part of the legend of Augusto César Sandino, whom modern Sandinistas honor in their name, Sandinista National Liberation Front (FSLN).

San Albino is all rubble and rust today. Buildings here once served a gold mine, U. S. owned. Eulogio Espinales, now a weathered 68, remembers visiting it with his father in 1926 and meeting a man not much taller than five feet. This was Sandino, the mine's assistant paymaster.

"The mine didn't pay money," Señor Espinales said. "They gave paper that would buy things only at their store." Sandino tried to organize a protest among the miners. When he took up arms a few months later, some of them joined him. They would fight U. S. Marines.

The possibility of a Nicaraguan canal had much to do with the arrival of Marines in 1909. The U. S. already had chosen Panama as a canal site, but José Santos Zelaya, Nicaragua's Liberal dictator—Liberals and Conservatives were still feuding—tried to interest Britain or Japan in digging a competing waterway.

Zelaya already had angered the United States by attacking Honduras, stirring trouble in a region the U. S. considered its own, and by canceling business concessions.

Four hundred Marines were landed to protect U. S. property—and to help bring down Zelaya. In numbers ranging from 100 to 2,800, Marines would remain most of the time until 1933, while U. S. involvement deepened. New York banks controlled finances; U. S. arms and money kept pliant regimes—usually Conservative—in power.

Illegitimate son of a landowner and a mestizo servant girl, Sandino as both a nationalist and a passionate Liberal resented U. S. interference. His little army carried machetes, old rifles, a few machine guns. Sardine cans packed with rocks and dynamite became bombs.

Ocotal, 25 miles west of San Albino, was garrisoned by U. S. Marines and the Nicaraguan National Guard. Sandino fired telegrams to Capt. G. D. Hatfield, the commander. From nearby San Fernando: "Shall I wait for you here or shall I go to you?" Hatfield telegraphed back, demanding Sandino's surrender. Sandino answered: "I want a free homeland or death."

On July 16, 1927, Sandino's 800 men attacked but could not dislodge the defenders. Next day five Marine biplanes appeared. They bombed and strafed for 45 minutes. Sandino withdrew, having lost some 300 men. Defender casualties: five.

Thereafter Sandino avoided pitched battles. Planes sought his hideouts. He lay in wait for columns on the ground. An ambush near Quilalí: five Marines and two guardsmen killed. An attack on a pack train: five Marines dead. Both sides slew prisoners.

The U. S. had no enthusiasm for this war. In 1933 all Marines were withdrawn; the National Guard would do the fighting. Trained by U. S. officers, it was led by Anastasio Somoza García, known as "Tacho."

Peace was made with Sandino in 1933. The next year Somoza had him shot. In 1936 Somoza took over the government, launching a dictatorship—supported by the U. S. —known for avarice and brutality. After Tacho was assassinated in 1956, two sons took his mantle.

In Sandino the FSLN, organized in 1961, had a symbol who was valiant, tough, and

at times eloquent: His "free homeland or death" is a party watchword. He was a socialist who condemned capitalist exploitation; for its part, the FSLN has pledged to "end the anarchy characteristic of the capitalist system."

That Marxism is an element of *Sandinismo*, the party philosophy, is readily admitted by President Daniel Ortega, one of the nine *comandantes* on the directorate. Some critics, divining that party has become synonymous with government, or even dominates it, say the sterner stuff of Leninism is part of the code as well. It comes as no surprise that nationalism also is part of Sandinismo; the FSLN fiercely denounces U. S. imperialism. The third ingredient the president cited, Christianity, represents, in combination with Marxism, another peculiar layer of the onion.

I spent most of an hour with Señor Ortega in Managua one evening. At 39 he keeps trim by running and walking some five miles daily. Somoza jailed him for seven years.

The FSLN's goal, he said, besides peace, is "to benefit the large sectors of workers who have been on the fringes historically . . . to reach a fairer distribution of the wealth." About a sixth of Nicaragua's people have been given land since 1979.

Señor Ortega contends that the U. S. doesn't understand Latin America and its problems. "Many times they don't understand what they *should* understand," he said of U. S. lawmakers. "The most comfortable policy for the U. S. is to have countries that are called friends but that are really no more than submissive."

President Ortega surprised many U. S. Congressmen by traveling to Moscow last April, right after the House of Representatives rejected a 14-million-dollar appropriation for the contras. A month later the House approved 27 million dollars in aid. Some Congressmen credited Señor Ortega's timing for the about-face.

"The Congress knows perfectly well I've been to Moscow on [six] other occasions," the president said—declaring that his trip became "one more pretext" for U. S. help for his opponents.

FEW MEN HAD a greater influence on Nicaraguan events than Pedro Joaquín Chamorro. As editor of *La Prensa*, Chamorro was the Somoza regime's severest critic. The Somozas responded with censorship. Chamorro fought back in the 1950s with photos of Ava Gardner. When a story was banned, the actress took its place. Readers understood the code.

When another period of censorship ended in 1977, Chamorro loaded the newspaper with a 33-month accumulation of prohibited stories about abuse and malfeasance.

In January 1978 he was gunned down—some 30 wounds. Managua rioted. Businessmen and teachers concluded that revolt

One-horse-power *ingenuity lets an entrepreneur in Jinotega deliver produce from store to store without buying expensive gasoline. Foreign oil costs the nation a third to a half its export earnings.*

Child of the fields *cuts shade-grown tobacco* (**bottom**) *under a gauzy covering at Piedra Azul state farm near Estelí* (**right**). *At a factory cigars are inspected by Miguel Pineda* (**below**). *With the major U. S. market for the cash crop now up in smoke, the government seeks new buyers in Europe. Despite expropriations, more than half of all farmland remains privately owned.*

was the only answer. The FSLN was the core of the 1979 revolt, but people from every walk of life took part in the uprising, in which untold thousands died.

Chamorro's brother Jaime is *La Prensa*'s co-editor today. I was with him as the paper was being put to bed. On a proof of the front page, a story about union complaints against the regime was penciled through. Yes, *La Prensa* is censored again.

But banned stories appear; *La Prensa* posts them outside its offices. Here I read of citizens complaining of high prices, of soldiers taking grain from a shop, of an engineer predicting trouble in the rainy season because Managua's sewers are inadequate.

Then, across town, I met Capt. Nelba Cecilia Blandón, 27. Pencil in hand, she reads all three daily newspapers. Educated in law, she wears a uniform and, like other interior ministry personnel, carries a pistol.

"*La Prensa* is not in agreement with the changes that are taking place," she said. "It

criticizes the government's errors and tries to make people feel discouraged."

I asked why, for example, she had killed the sewer story. "It should have pointed out that Somoza never spent money for water channels where poor people lived and that the present government can't afford to do so." By itself that article would not undermine the government, she conceded. "The problem is that it would be followed tomorrow by another, then another. They bombard the people with problems without saying, 'Here are steps that can be taken.'"

The government of heaven would find it difficult to coexist with *La Prensa*, which is not only pugnacious but selectively edited as well (and has received $100,000 in U. S. government funds). A reader would hardly know that there is fighting in Nicaragua. It likes stories about Soviet troops fighting in Afghanistan and alcoholism in the U.S.S.R. Captain Blandón at times overlooks these.

La Prensa is tolerated, Jaime Chamorro believes, "because the government needs the support of Western Europe, Latin America, and public opinion in the United States. As long as they want to show they are democratic, they need *La Prensa*.

"But their final goal is a Marxist-Leninist regime, and they try to weaken all the democratic institutions. They have weakened private property; its value is reduced because it can be confiscated." Jaime managed a wry smile. "Somoza might kill you, but he wouldn't take your house."

I went to *El Nuevo Diario*, whose editor is Jaime's brother Xavier. His newspaper favors the regime; it seldom has problems with the censor. He said, "I felt we should be part of the revolution—be inside the boat." With many *La Prensa* staffers, he started *El Nuevo Diario* five and a half years ago.

Then I went to *Barricada*, organ of the FSLN. The tall young editor is also a Chamorro—Carlos. Pedro was his father. Nicaragua "is full of poverty and needs a more

Well-earned break *from a seven-day workweek is taken by a picker whose bed is destined for local consumption. Top-quality bananas, once shipped exclusively to California, now go to Belgium and beyond.*

just social system," Carlos said. "I decided it was worth the effort, worth the pain, to devote my life to the revolution."

The editors sometimes meet at family get-togethers—surely the only gatherings in Nicaragua where politics is never discussed.

DANIEL BONILLA, a manufacturer, said: "The government calls us members of the CIA and a nest of traitors." He was speaking of COSEP, the Superior Council of Private Enterprise, which claims a membership of thousands of capitalists not expropriated thus far. He is secretary of its industrial section.

His view of the revolution is: "The Sandinistas were just one part. But they had the rifles and pushed everybody else aside." COSEP wants "democracy, freedom, pluralism"—promised, he said, in 1979, when men of moderate to right persuasions allied themselves with the FSLN, hoping to have influence in the new government. For a short time they were influential. Then the Sandinistas, much better organized, began making decisions on their own. A dozen political parties still lend an aura of pluralism; six that participated in elections last year won a total of 35 seats in the 96-seat National Assembly. The FSLN took the rest.

COSEP leaders believe they pay a price now for speaking out. Farms belonging to Enrique Bolaños were taken this year, ostensibly for distribution to campesinos. Though he was offered other lands, Señor Bolaños called this "camouflaged reprisal" for antigovernment statements he had made as COSEP president. Another COSEP leader, implicated in an antigovernment plot in 1980, was slain in disputed circumstances. His friends called it murder.

Lino Hernández, a lawyer, heads the privately supported Permanent Commission on Human Rights. "There may be as many as 5,000 political prisoners," he said. "The government accuses union members, members of political parties, anyone who criticizes the government." Señor Hernández said the government refuses to accept mail with the commission's name on the envelope. So when sending complaints of alleged rights violations, he uses plain envelopes.

A few blocks from his office I met Mary Hartman, a nun from the United States. Sister Mary works for the National Commission for the Promotion and Protection of Human Rights. Church groups abroad and international welfare agencies support this commission financially; the Sandinista government pays staff salaries.

"There are no political prisoners," Mary insisted. "If you are in prison, you have violated some law—you have taken up arms or helped the counterrevolutionaries. Just the fact that you oppose the government, you're not going to be in prison for that.

"Nicaragua is not a paradise for human rights. We do have violations. But it is not government policy. It comes from people at

the lower levels." She said the government has jailed 300 soldiers and police who committed offenses.

THE OVERFLOW CROWD at a May Day Mass broke into a cheer: "O-ban-do! O-ban-do!" Presently Miguel Obando y Bravo spoke, calling for dialogue to solve Nicaragua's factionalism.

Cardinal Obando y Bravo has long urged the Sandinistas to talk to the contras, a position echoed by the U. S. "But," he told me in his office, "the government said it did not want to have dialogue except through the mouths of machine guns."

Sandinistas say that the Vatican opposes them because it equates Marxism with atheism. The cardinal complains of the war's toll, of censorship, and of 17 priests expelled from the country for acts the government considered unfriendly.

Most clergy who side with the government, the cardinal said, are "foreigners." (Priests from several nations help overcome Nicaragua's shortage of clergy.) "Some of them think there can be no reconciliation between the oppressors and the oppressed, and that the oppressors are all those who do not follow the Marxist line."

There are indeed Marxist priests. Ernesto Cardenal, who serves as minister of culture—using as offices an elegant Somoza home—calls himself a Marxist Christian. He insists there is no contradiction.

Another liberal priest declares of his own theology: "It does not come from Marxism, it comes from within the church." Antonio Castro (Nicaragua-born) means that "liberation theology," as his kind is labeled, was affirmed by the Second Vatican Council in 1965 and subsequent conferences of Latin American bishops. The bishops held that the church should "defend the rights of the oppressed."

Such words affected some lay Nicaraguans. "We looked around," said Miguel Vigil, U. S.-educated engineer, "and saw what had always been here—poverty, malnutrition, illiteracy, children dying from diseases that could be cured."

Señor Vigil and his wife, Pinita, came from wealthy families—as do many FSLN leaders. "Some people in our class left the country," he said. "I stayed because for the first time in my life I could do something for the people." He became minister of housing.

***"Café oro"—golden coffee**—dries in the sun near Matagalpa, its nickname reflecting the 157 million dollars that the crop earned this year. Knowing its value, insurgents hit the harvest hard.*

One midnight I walked in the Managua barrio called Larreynaga with members of the Sandinista Defense Committee. They are on alert nightly from 11 to 2 for crime or counterrevolutionary activity, including hoarding, which might be evinced by someone carrying sacks of sugar or corn. Such committees, FSLN sponsored and similar to those in Cuba, are most active in poorer neighborhoods.

I met Aristedes Martínez, a shopkeeper, at the curb in front of his home. As a vigilante he has never encountered anything more

A no-man's-land is declared *at La Rica* ***(above)****, where a soldier helps dismantle a farmer's home for reassembly elsewhere. Some 70,000 people have been removed from such areas, partly on grounds that they may be co-opted by the counterrevolutionaries, called contras. Some find new homes in resettlement camps such as La Paz* ***(facing page)****.*

sinister than a drunk or a domestic quarrel. "But we stay on the alert," he said.

Two blocks away a housewife watched the street from her doorway while keeping one eye on a TV program about soldiers. She had a son in the army—and two studying in the Soviet Union, and two more in Cuba.

Neighborhood committees participate in health campaigns and sponsor cleanup projects. Committee work is voluntary, but the reasons for cooperating are compelling. Want to move? Get a letter verifying your residence from your committee. Want to register a car? Take a letter to the officials. Want a sensitive government job? Get a letter. And the committees issue ration cards that allow people to buy rice and beans at subsidized prices. Officials have reminded the committees not to abuse their power.

"THIS IS MY PLACE," Onofre Suazo said. He had cleared the brush enough for me to see the timbers that once supported his house. Now they were just charred stumps. Beyond, the rain-swollen Río Coco looked like a stream of pea soup.

Onofre's house stood until 1982 in what was Waspam. The town had 8,000 people, schools, churches, theaters. Miskito Indians—Onofre is one—considered it the capital of their world. The Coco was a main stem, uniting 25,000 Nicaraguan Indians, Miskito and Sumo, living near its banks.

But the Coco (called the Wangki by Miskitos) also is the border with Honduras on Nicaragua's Caribbean side. When the war heated up, Sandinistas forced the Indians to leave, assertedly for their safety, surely also because they were not trusted. Many things about the Miskito situation are disputed, but there is no doubt that 10,000 Indians were marched to relocation camps, many miles from the river, in evacuations commencing in 1981. At least 10,000 fled to Honduras, others to Nicaraguan towns.

Elsewhere in northern Nicaragua, thousands of other Indians also were moved. Some old people and children were airlifted to camps—and 75 children died when a jam-packed helicopter crashed.

Last summer the Sandinistas permitted Río Coco people to begin to return. What they found was devastation (page 801). The army had burned buildings, presumably to prevent guerrillas from using them. Houses were destroyed in most Río Coco towns.

Waspam citizens lived under plastic sheets—at the height of the rainy season.

Juan and Enrita Ortiz and three children made a lean-to of salvaged tin. I regarded the slingshot in Juan's belt. "We have to eat," he said. The government provided rice and beans; Juan provided doves.

He had neither hammer nor nails. Starting over, he said, "I feel like a baby. But someday I can be like a man."

"This was such a lovely town," Enrita said. "There was a little café next to us, right over there. If God will lend us life, maybe this will be Waspam again."

Some Miskitos said they forgave the Sandinistas. But I think they won't soon forget.

Throughout history Nicaragua's Caribbean coast has always seemed far from Managua, separated by a great stretch of rain forest. Coastal people look instead toward the sea. Englishmen came in the 1630s, later establishing a protectorate. Blacks came from Caribbean islands, some as runaway slaves. Moravian missionaries came, first from Germany, then from the United States. Many people speak English, aspirating Jamaica style: *"coahst"* and fishing *"boahts."*

My headquarters in this region was Puerto Cabezas—"Port" to its citizens. Occasionally beleaguered by flare-ups of the war, it's a town of stilt-raised houses crimsoned with hibiscus. Churchgoing is a way of life here. Moravians predominate. All weekend long, hymns float on the heavy moist air, sometimes accompanied basso profundo by bullfrogs.

Sandinistas concede they made errors on the coast. They expected to expropriate

MIKE EDWARDS

Idyllic scene *near the Caribbean coast in the Miskito village of Krukira* ***(facing page)*** *belies a tragedy farther north along the Río Coco. To remove those Indians from rebel influence, the government relocated 10,000, often razing villages. At least that many fled to Honduras; some joined guerrilla forces. Admitting errors, officials are permitting the Indians to return and have pledged limited autonomy. At Waspam, one group cleans up the roofless Roman Catholic church* ***(above)****. Carrying a smoking pail against insects* ***(left)****, a farmer at Bilwasharma begins life anew.*

Charting his own course, *a Miskito fisherman plies Bismuna Lagoon (**below right**) in a dugout canoe with sails of plastic grain sacks. A timeless scene in Krukira (**right**) probably greeted English buccaneers who arrived in the 1630s to barter for green turtles such as these at Puerto Cabezas (**below**). They also found eager allies against the Spaniards, whom the Miskitos despised.*

lands, organize neighborhoods, bring people into the mainstream—unaware that here were folk accustomed to farming where they liked and fishing when they chose.

Administrators and soldiers arrived ignorant of local languages. Miskito leaders made demands; Sandinistas suspected disloyalty. Security police killed four Miskitos *at church*. Evidence points to a massacre of men, number uncertain, in another village. A fisherman told me he was beaten in jail by "the Spaniards," as those from the Pacific side are called. ("They think we're conquistadores," a soldier said.)

Leaders were arrested. Miskitos say about 80 persons who were detained between 1981 and 1983 have vanished, with some known to have been killed. Some say needless killing continues—just as Sandinistas say that the killing of government workers by guerrillas continues. Two Indian groups, Misura and Misurasata, are the backbone of the resistance on the Caribbean side, although a Misurasata leader tried this year to negotiate a treaty with the government.

Some Miskitos say the Sandinista regime has improved. I found locals, not "Spaniards," staffing some government offices. And the government now speaks of allowing measured autonomy, with the election of local leaders and participation in development decisions. But the Miskitos I met want more.

In a hammering rain I rode in a pickup to Krukira, an hour from Port. I was warned it might be in guerrilla hands. So on arrival, this being Sunday, I deemed it wise to go to church, where I heard three choirs fulfill the Moravian love of song.

I cannot say if there were guerrillas among Krukira's several hundred souls. I found people courteous—and opinionated.

On autonomy, a man said: "We want the lands." He meant lands guaranteed to villages when Britain renounced her claim to the coast in 1860.

Other Miskitos said autonomy should mean "we control the resources." These include rich fishing grounds; stands of Caribbean pine, a lumber tree; and gold mines.

Some Miskitos surely side with the U. S. in the war, hoping to see the Sandinistas toppled. But I think the first concerns of many are the right to develop as they wish and to enjoy the coast's considerable assets. Theirs is sort of a war within a war.

From Krukira's church I strolled down to a palm-fringed lagoon. The earth was carpeted with grass. Mango trees shaded houses levitated on stilts. No one, I think, can take that stroll without yearning to abandon pavement and telephones.

On another day I traveled, as many Miskitos do, by dugout. I shoved off from Lamlaya, a few miles from Port, and motored through lagoons and rivers to Wawa, a village matching Krukira in allure. Save for pounding surf, the loudest sound is the crash of plummeting mangoes.

On the way back to Lamlaya, as dark descended, the boatmen fouled the motor's wires. We began to paddle, with the prospect of three hours of vigorous exercise.

A multitude of stars sparkled. The lagoon sparkled too; feeding fish and darting shrimp touched off myriad bioluminescent flashes. It was as if we were inside two hemispheres of sparkles, with the lagoon's dark rim of mangroves as a seam.

The army imposes an 8 p.m. curfew on the water; we would not reach Lamlaya until past 11. We decided to go in making lots of noise in hopes that we wouldn't be mistaken for guerrillas. But, being jittery, we forgot about making noise and paddled in just waving two little flashlights.

Only after we beached did a soldier appear. "We knew you were coming," he said. But I think he had been asleep.

BACK IN MANAGUA, I went to see Tomás Borge, minister of interior and the only survivor of the trio that founded the FSLN in 1961. Jailed by Somoza, he spent 30 months in solitary confinement. The Guardia killed his wife.

He is a compact man who moves quickly, catlike. He spoke of the hard realities confronting Nicaragua today. In the FSLN's original plan, he said, "there was no talk of political pluralism or of a mixed economy. We only talked of national liberation."

He lit a cigar and continued. "Wouldn't it be easy to eliminate *La Prensa* and COSEP? All it takes is a phone call to jail the COSEP leaders and close the newspaper." But this is impractical because of "the reality we are living, because of forces in the world."

Translation: If the Sandinistas squeeze Nicaragua into a one-party nation, wholly socialized, they will lose important friends. Nicaragua receives as much economic aid from Western Europe—200 million dollars pledged this year—as it does from the U.S.S.R. and its satellites. It is aided by Latin America as well. Even Fidel Castro has advised the Sandinistas "to continue the mixed economy, the plural situation," a Borge aide told me. Perhaps Fidel thought it unlikely that the Soviet Union would underwrite Nicaragua's limping economy as heavily as it has Cuba's.

Most members of the ruling directorate go out often to galvanize the people. I found agriculture minister Jaime Wheelock, grandson of an English coffee grower, in Chinandega, perspiring and orating before sugar-refinery workers. "It is not the revolution but aggression that is causing the economic crisis," he told them. And, "What would happen if we gave up? Planes would be full of Somocistas coming back. We do not give up!" Then, from Sandino: "Free homeland or death!"

Near dark I climbed into Wheelock's van to ride back to Managua. He drove.

In the economic realm much depends upon what Wheelock, a boyish-looking man of 37, can do to improve agricultural output. Thanks to a major donation from Cuba, Nicaragua gained a refinery this year so

Shades of the Caribbean *decorate a house in Bluefields. Moravian hymns ride the breeze and Spanish gives way to English in this ethnic enclave on the southeast coast. Mixed blacks called Creoles, many descended from Jamaicans, make up 40 percent of the people. Elsewhere on this coast live Garifuna, or Black Caribs, as well as Miskito, Sumo, and Rama Indians. To many on this isolated shore, western Nicaraguans belong to a foreign country.*

that it could boost sugar production. Regime opponents snickered; the world is glutted with sugar.

But Wheelock is enthusiastic about sugar—"an energy source," he reminded me. From sugar, Nicaragua will produce alcohol to make electricity and to stretch its gasoline supply. "We are going to produce plastics too, using that alcohol. We are contracting for the equipment. Fertilizers later. . . . Imagine, if we put in five plants doing this. Or ten."

But, in dark humor, he suggested that if I returned to Nicaragua in 20 years I might find "only a big hole." Then: "The United States has to understand. There must be sympathy for change in Latin America."

The layers of the onion seem endless. "I've listened to people on both sides," a journalist said, "and you know what I think? Everybody is telling the truth." At some point in time, at some level, all Nicaragua's many voices probably speak truths.

A diplomat prophesied that Nicaragua won't change much in the next few years—that, in economic shambles, it will go creaking along with its odd blend of socialism and controlled capitalism.

We went humming along the highway, dodging potholes, while Wheelock went on dreaming of plastics and fertilizers. Dreams too are a layer of the onion. * * *

A Revolution Under Fire

ONE AT A TIME is how they usually die in a guerrilla war. In this one, the Sandinistas say that the trickle has become a torrent of carnage that has cost 4,000 Nicaraguans their lives. This is how one more lost his.

Last July photographer Jim Nachtwey went on patrol with one of several special Sandinista battalions charged with engaging contras in the north. Not far from San José de Bocay his 200-man group surprised about 300 rebels, called in artillery, and attacked. In the firefight one soldier sprays his AK-47 at the guerrillas (***above***). As the bullets fly overhead, a soldier lies dying (***right***), the sole Sandinista fatality. Nachtwey, a veteran combat photographer from Northern Ireland to El Salvador, says of his work: "It never gets easier. It only gets harder."

RESOLUTE but divided, the rebels fight on against a revolution that they feel has betrayed them. In northern Nicaragua, guerrillas of the Nicaraguan Democratic Force (FDN) pause for prayer (***left***). Claiming 18,000 troops including former National Guardsmen, the FDN received most of an estimated 80 million dollars in CIA-channeled U. S. aid to the rebels until Congress stopped arms funding last year. It later approved 27 million dollars in nonmilitary support.

Near the Costa Rican border, men of the Revolutionary Democratic Alliance (ARDE) fire a recoilless rifle (***below***) at Sandinistas in San Juan del Norte. ARDE leader Edén Pastora was a revolutionary hero known as Commander Zero before turning against the regime in 1981. After he refused to ally with the FDN, wary of its National Guard elements, the CIA cut off his funds, and his forces have withered.

M16s and AK-47s bristle from a mangrove swamp in a Miskito Indian camp south of Puerto Cabezas (***below left***). In 1982 the Indian movement split. Misura, to which these soldiers belong, fights in the northeast, while its rival, Misurasata, is based along the Costa Rican border.

BATTLE for hearts and minds as well as bodies catches rural *campesinos* uneasily in the middle. One is pressed into leading Sandinistas (***above***) toward contra forces near San José de Bocay and a firefight (***pages 806-7***). Yet if approached by rebels, the guide might well feel obligated to aid them. Both sides demand food, shelter, and able bodies; resistance is perilous. The Sandinistas have been charged with some atrocities, and the contras, claiming inability to care for captured troops and informers in their mobile campaign, stand accused of killing many of them.

Yet contras gain support from campesinos, who blame the government for poverty and fear its military draft. From a campesino home near the San José de Bocay skirmish, wary eyes stare from behind a government soldier (***right***).

Nicaragua has long been known as a nation of poets such as Pablo Antonio Cuadra, who warned during the Somoza era: "Do not believe in the alliance of money and the machinegun, for your children will inherit not the money, but the machinegun." The prophecy rings sadly true: No one has the money, and everyone has the guns. □

Daniel Boone

FIRST HERO OF THE FRONTIER

LET'S GET ONE THING straight at the start: Daniel Boone never wore a coonskin cap. He preferred the wide-brimmed beaver worn by his fellow Quakers. After all, it was a lot better for keeping the sun and rain out of his eyes.

Myths abound about the man who became the first hero of the westward movement in America. Indian fighter? True, but by his own admission he never killed many. First settler of Kentucky? Wrong, others got there before him. Brave? Often, but also foolish from time to time.

Yet Daniel Boone stands as the prototype frontiersman—a strong, silent figure moving swiftly through virgin timber, sighting a deer, felling it with one shot of his flintlock. He was indeed a superior woodsman and wilderness guide, who pioneered the overland route into Kentucky. On several occasions he was captured and escaped from Indians, whom he understood as well as or better than most. He fought valiantly on the frontier during the Revolutionary War, was twice wealthy in land only to lose it, and became internationally renowned for his adventures and exploits—a hero in his own time and beyond.

Two hundred fifty years ago much of the population of what was to become the United States was clustered on the eastern seaboard. With western settlement barred by the great wall of the Appalachian Mountains, often hostile Indians, and the presence of the French, British colonists looked primarily across the Atlantic to Europe.

But land and freedom were the reasons many had come to the New World, and as the coast became more crowded there were those who thought about moving on.

Eyes of a hunter *gaze from a portrait of Daniel Boone, painted on oilcloth in 1820 by Chester Harding from an oil sketch made just three months before Boone's death, at age 85, in Missouri. A cabin in St. Charles County, photographed in the late 1800s* ***(left)*** *and since torn down, is thought by many to have been built by Boone. The archetypal American woodsman, he left his signature—reproduced above in the title—on the nation's frontier as he moved ever westward in its vanguard.*

STATE HISTORICAL SOCIETY OF WISCONSIN (LEFT)

By ELIZABETH A. MOIZE

ASSISTANT EDITOR

Photographs by WILLIAM STRODE

Wanderlust was in Boone's genes. His Quaker grandfather emigrated from England in 1717, seeking religious freedom in Pennsylvania. Boone's father, Squire (his given name, not a title), moved his family to North Carolina. Daniel himself went to Kentucky and on to Missouri. His descendants pushed to the Rockies and beyond.

"They had the itching foot," wrote John Bakeless, the preeminent Boone biographer. "Something called. Something beyond the mountains always whispered."

DANIEL WAS BORN November 2, 1734, in Berks County, Pennsylvania, the sixth of Squire and Sarah Boone's 11 children. His formal schooling was scanty; his interests lay in the woods and hunting for the family larder.

When two of his children married non-Quakers and the family was censured by the community, Squire determined to leave Pennsylvania. The westward movement had not begun. Those seeking more and better land usually turned south, through the broad Shenandoah Valley of Virginia. And so went the Boones, settling in North Carolina's Yadkin River Valley about 1752.

It was rich land, with ample game, and to Daniel's liking. Many neighbors were old friends from Pennsylvania. The Joseph Bryan family lived on nearby Sugar Tree Creek. Daniel's sister Mary married William Bryan, and it was probably at their wedding that Daniel met 15-year-old Rebecca Bryan.

But wooing and woods wandering would

have to wait. War was brewing on the Ohio. In 1755 British Maj. Gen. Edward Braddock launched an expedition against the French at Fort Duquesne, the site of present-day Pittsburgh. His force of some 1,500 regular and colonial troops included George Washington, a 23-year-old colonel of the Virginia militia. Benjamin Franklin provided supplies and transport. The commissary was Dr. Thomas Walker, who in 1750 had become the first known white man to thread the Cumberland Gap. And two of the wagoners were John Finley, who had recently returned from trading with Indians in Kentucky, and young Daniel Boone.

It was a slow march from Fort Cumberland, Maryland, over a road laboriously axed out of the Pennsylvania wilderness for

State-of-the-art weapons *of their time, straight-shooting Kentucky long rifles were so named after Boone and others used them to open up that region. Hershel House of Morgantown, Kentucky, a modern maker of flintlock rifles, dresses as a woodsman of Boone's era to give a firing demonstration (**above left**).*

*Collectors of Boone memorabilia have long been faced with questions of authenticity. Two rifles and a powder horn (**above**) reputed to have been Boone's were probably not. Tradition has it that a rifle now owned by collector Vernon Nikkel (**top**) was traded to a neighbor by Boone for livestock.*

Daniel Boone's America

AMERICA'S BIRTH as an independent and lustily growing young nation took place when Boone was in his prime, and events of the country's early life are intertwined with his. Despite a ban on settlement west of the Appalachians by the Colonies' British rulers, Boone scouted eastern Kentucky, led a 1773 attempt to settle there—thwarted by Indian attack—and finally founded Boonesborough in 1775. After defending his successful settlement during the Revolutionary War, Boone surveyed lands for the flood of settlers who followed. In later years he moved again, to the Missouri region, which soon passed into American hands in the Louisiana Purchase.

IDAHO
Yellowstone Lake
WYOMING
ROCKY MTS.
UTAH
COLORADO
NEBRASKA
SOUTH DAKOTA
MINNESOTA
POSSIBLE ROUTE TO YELLOWSTONE
1815—In his last years Boone travels to his sons' saltworks at Boone's Lick, visits Fort Osage, and ranges even farther west, some believe to the Yellowstone country.
Platte
Missouri
Fort Osage
KAN.
OKLA.
TEXAS

Boone's Kentucky

0 50 km
0 50 mi

Dayton
Xenia
Old Chillicothe
Little Miami
Scioto
OHIO
WARRIORS' PATH (INDIAN TRAIL)
INDIANA
Cincinnati
Licking
Limestone (Maysville)
Blue Licks
Carlisle
Kentucky
Ohio
Louisville
Frankfort
Bryan's Station
Lexington
Boone's Station (Athens)
Boonesborough
Harrodsburg
Richmond
Twitty's Fort
Berea
Red
Otter Creek
Irvine
DANIEL BOONE NATIONAL FOREST
Logan's Fort (Stanford)
BOONE GAP
BOONE TRACE
Hazel Patch
Rockcastle River
Green
KENTUCKY
WILDERNESS ROAD
London
Station Camp creek
Flat Lick
Pineville
Middlesboro
Mountain
Powell
Clinch
Long Island (Kingsport)
VIRGINIA
N.C.
Cumberland
Holston
CUMBERLAND GAP
TENNESSEE
Cumberland
Yadkin River

1769—Only a handful of white men have traversed the Cumberland Gap when Boone first crosses it to enter Kentucky.

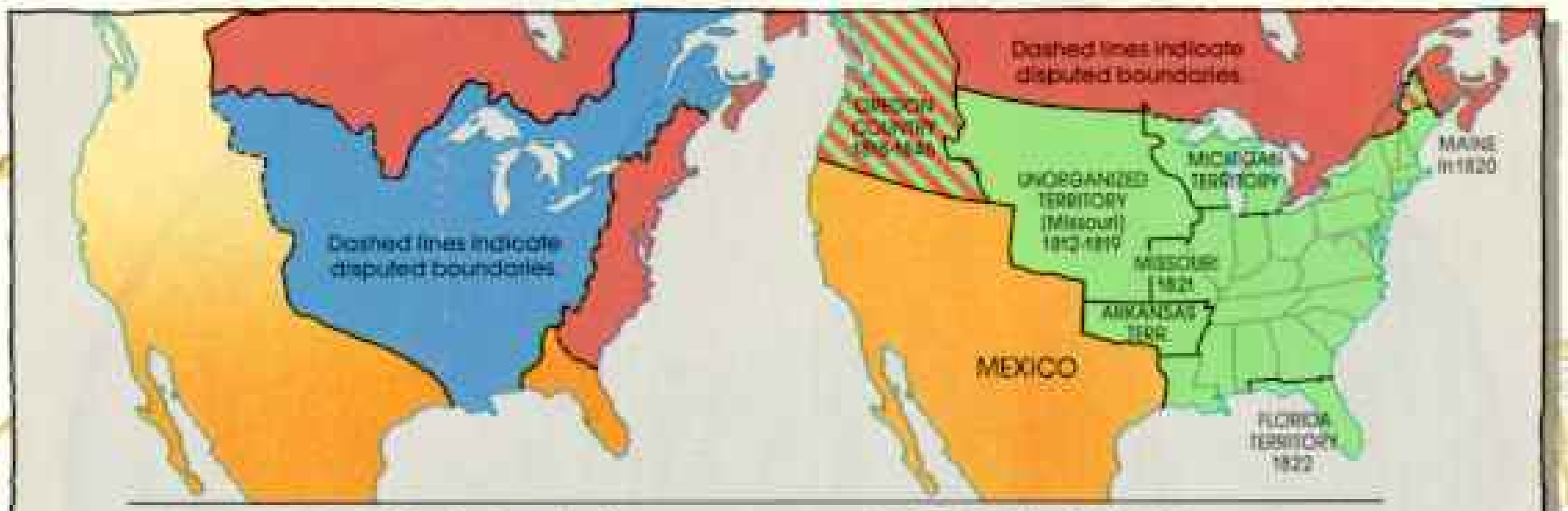
1774—James Harrod and his followers build the first permanent white settlement in Kentucky.

1775—Tribal lands in Kentucky are sold to Judge Richard Henderson by the Cherokee. Boone assembles woodsmen at Long Island to begin clearing the Boone Trace, forerunner of the Wilderness Road.

1775—Where Otter Creek empties into the Kentucky River, Boone's party begins building Fort Boone (Boonesborough).

1778—On a salt-making expedition, Boone and 26 other settlers are captured by the Shawnee. Boone is taken to Old Chillicothe and adopted by Chief Blackfish. Four months later he escapes in time to warn Boonesborough of an Indian attack.

1782—The "last battle of the Revolution" is fought at Blue Licks. The settlers are badly defeated by Indians and British officers.



1754 Colonial North America in Daniel Boone's 21st year

CLAIMED BY ENGLAND
CLAIMED BY FRANCE
CLAIMED BY SPAIN

1820 The United States at Daniel Boone's death (age 85)

BRITISH TERRITORY
THE UNITED STATES
SPANISH TERRITORY

WISCONSIN
Lake Michigan
Fort Detroit (Detroit)
Lake Erie
MICHIGAN
PENNSYLVANIA
NEW JERSEY
Mississippi
IOWA
ILLINOIS
Wabash
INDIANA
OHIO
Ohio
WEST VIRGINIA
Cincinnati
Point Pleasant
Shenandoah
VIRGINIA
Yorktown
MARYLAND
Washington, D.C.
DEL.
Philadelphia
Fort Cumberland
Fort Duquesne (Pittsburgh)
Boone's Lick
Femme Osage district
St. Charles
St. Louis
Defiance
Boonesborough
Allegheny Mountains
Blue Ridge Mountains
Yadkin River
NORTH CAROLINA
Wilkesboro
Salisbury
KENTUCKY
CUMBERLAND GAP
MISSOURI
Cumberland
TENNESSEE
Tennessee
ARKANSAS
Arkansas
Mississippi
APPALACHIAN MOUNTAINS
SOUTH CAROLINA
Pee Dee
Atlantic Ocean
MISSISSIPPI
GEORGIA
ALABAMA
LOUISIANA
Pensacola
St. Augustine
FLORIDA
Gulf of Mexico

NOVEMBER 2, 1734
Daniel Boone is born in Berks County, Pennsylvania.

1755—As a wagoner on General Braddock's disastrous march on Fort Duquesne, Boone first hears of Kentucky from John Finley, who had entered the region via the Ohio River.

1799—At the invitation of the Spanish government, Boone leads a party of Boones, Callaways, and others to Femme Osage district.

SEPTEMBER 26, 1820
Daniel Boone dies near Defiance, Missouri.

1750—Following the Shenandoah Valley, the Boones set out for North Carolina.

1756—After settling in the Yadkin River Valley, Boone marries Rebecca Bryan. His long hunts take him into unexplored regions west of the Blue Ridge Mountains.

1765—Daniel Boone, his brother, and six others travel to Florida. According to legend, Daniel signs a note to buy a house, but he never returns.

1765 EXPEDITION

ENLARGED AT LEFT

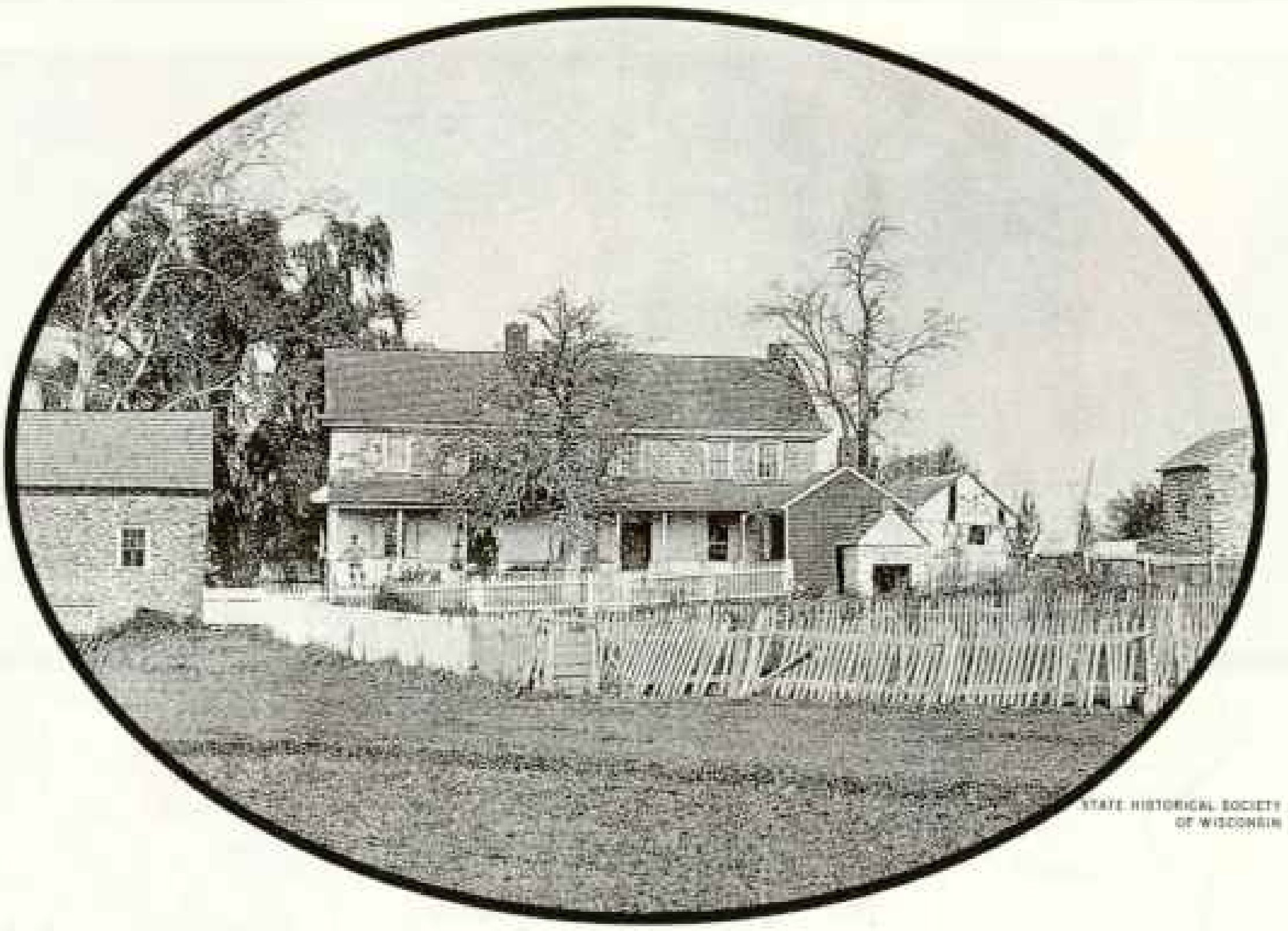
DANIEL BOONE'S MAJOR TRAVELS SHOWN IN RED

Names in parentheses are modern town names.

Map reflects modern shorelines, political boundaries, and drainage.

0 150 km
0 150 mi

NGS CARTOGRAPHIC DIVISION
DESIGN: CHRISTOPHER A. KLEIN
RESEARCH: JAN HAMBLING, LINDA KRISTE
PRODUCTION: HARRIET NURNAY, ISAARDAH BARAT
MAP EDITOR: JOHN T. BLOOD
PRINCIPAL CONSULTANT: MICHAEL R. LUCHEY, UNIVERSITY OF TENNESSEE



STATE HISTORICAL SOCIETY OF WISCONSIN

More than a century old *when photographed in the late 1800s, a stone farmhouse near Reading, Pennsylvania* ***(above)****, stands on portions of the foundations of Daniel Boone's log-cabin birthplace. A spring that served the household in the 1730s and '40s still wells up in the cellar* ***(below)****. By 1752 Daniel's father had moved the family to the edge of settlement in North Carolina's Yadkin River Valley.*

troops, artillery, and wagons. It is easy to imagine Boone listening raptly to Finley's campfire tales of a land rich beyond measure in buffalo, deer, bear, and turkey.

Braddock, insisting on the ordered ranks of European battle, marched into French and Indian ambush—and a disaster that cost him his life—near Fort Duquesne. The routed British fled. Boone, cutting the traces on his wagon team, leapt on a horse and rode to safety, carrying with him his vision of Kentucky.

Back on the Yadkin, Daniel married Rebecca Bryan, by most reports a tall brunette, who was to be his wife for 56 years. Of her ten children, two were killed by Indians. She could mold bullets, shoot a flintlock, and skin a deer. She was often alone for long periods of time, not knowing if her husband was alive or dead. A contemporary relates that after one long absence hunting and exploring, Daniel returned to find a new child in Rebecca's arms. She confessed that one of his brothers was the father. "Well," Boone reportedly replied, "if the name's the same, it's all the same," and he loved the child as his own.

The only painting of Daniel from life was done just before he died. The artist asked him if he had ever been lost. "No," Boone quipped, "I can't say as ever I was lost, but I was *bewildered* once for three days."

John James Audubon also met Boone late in his life and described his physical stature as "gigantic," influenced, no doubt, by his reputation as hunter and woodsman *extraordinaire*. Nathan Boone described his father as "five feet eight inches high, with broad shoulders and chest. . . . about one hundred and seventy five pounds . . . eyes blue, and skin fair."

Boone owed his fame largely to John Filson, a schoolteacher and real estate entrepreneur who had purchased large tracts of land in Kentucky and hoped to lure settlers with his *The Discovery, Settlement and present State of Kentucke*. Published in 1784, the book included the purportedly autobiographical "Adventures of Col. Daniel Boon." Although Boone's "autobiography" is full of classical references and effusive phrases that are pure Filson, Boone declared, "All true! Every word true! Not a lie in it!" Critics have challenged Boone's loyalty, good sense, and woodsmanship, but all agree that he had a good press agent.

When copies of Filson were published in France, England, and Germany, Europeans saw Boone as the epitome of Rousseau's natural man. A young French diplomat recommended *Kentucke* to Ambassador Thomas Jefferson, and Lord Byron extolled the frontiersman in his epic *Don Juan:*

Of the great names which in our faces stare,
The General Boon, back-woodsman of Kentucky,
Was happiest amongst mortals anywhere. . . .

Daniel and Rebecca made their first home on North Carolina's Bear Creek, a Yadkin tributary. The region is gently rolling, its fields now given to grazing and crops of corn, tobacco, and soybeans. When freshly plowed, the earth shows brick-red clay that, according to a local resident, "is good dirt but takes careful working. If you plow it wet, you get boulders."

Daniel wasn't much interested in farming anyway. There was money in deer hides, used for all manner of goods, including clothes and footwear. Perhaps in search of more game, or to get closer to his beloved mountains, or possibly to escape creditors, Daniel in the late 1760s took his growing family farther west on the Yadkin, near present-day Wilkesboro, North Carolina.

Let the girls do the spelling and
Dan will do the shooting.

—Squire Boone

When hunting was good, there was ample money for supplies. But Indians often robbed him of hides and he had to buy powder and shot on credit. Throughout his life he fluctuated between plenty and poverty.

As he hunted deeper into the Appalachians, Boone began to leave those now famous reminders of his presence. "D. Boon cilled A Bar on tree in the year 1760" appeared on a beech in eastern Tennessee. He was prolific with his inscriptions, but the authenticity of some is doubtful. Dr. Thomas D. Clark, a renowned Kentucky historian, relates that a friend admitted to carving "D. Boon" on every beech tree in Henderson County. "You'd understand," Clark said

A glorious land *beckoned beyond the mountains in Kentucky, where autumn blazes Rebels Rock* ***(above)*** *in Harlan County. Boone and a few companions crossed the Cumberland Gap in 1769, ranging through this region on a hunting trip that lasted two years.*

For three of those months he lived alone, exploring as far as the site of future Louisville on the Ohio River. Biographers have suggested that his solitary wanderings in Virginia, North Carolina, Tennessee, and Kentucky constituted the happiest time of his life.

Boone left signs of his roamings on both sides of the Appalachians: A carved piece of bark removed from a beech tree ***(top right)*** *near Kingsport, Tennessee—preserved by the landowner's descendants—is thought to be authentic among numerous bark forgeries.*

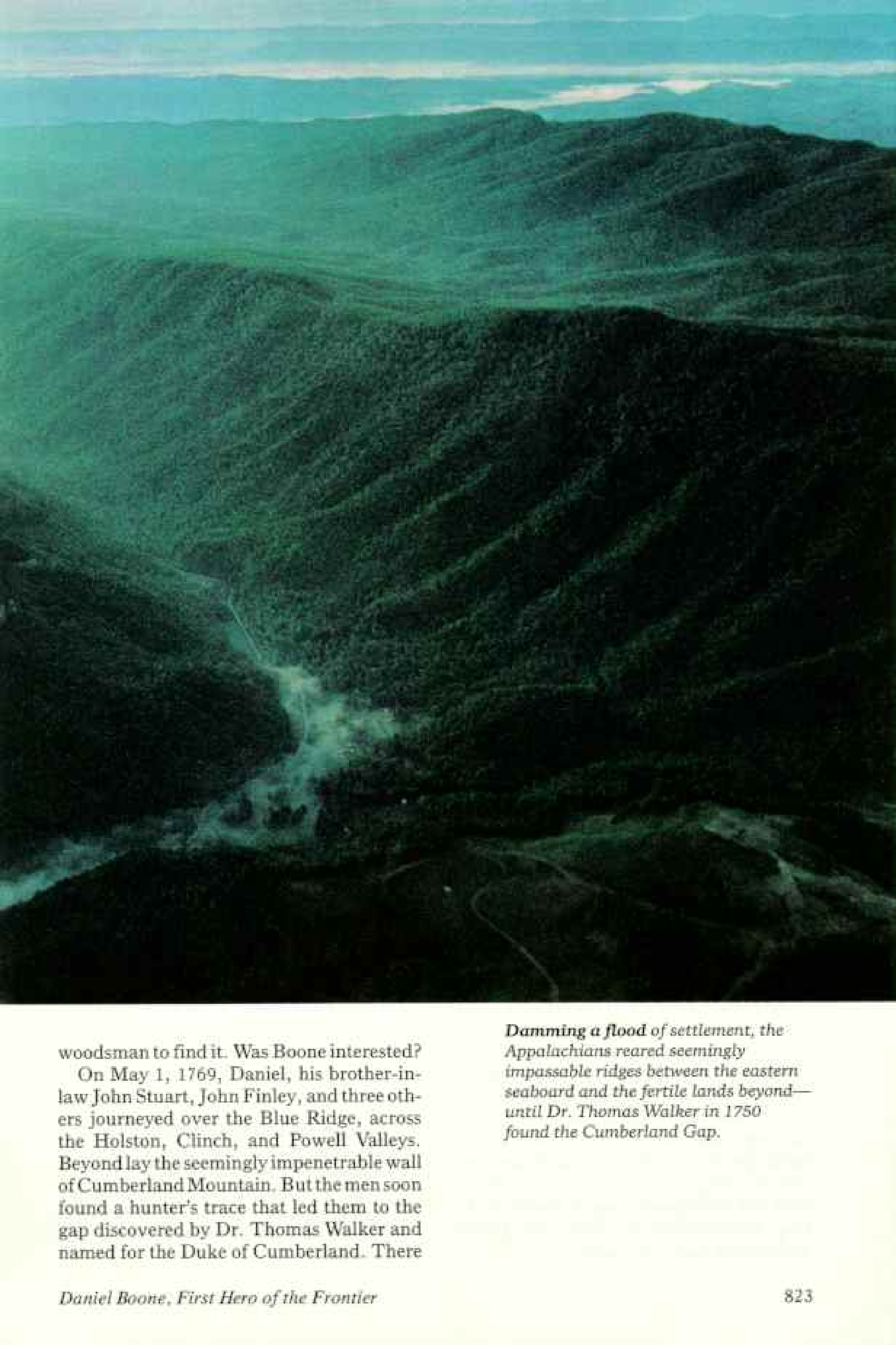
Authenticity is the watchword for Boone buff David Wright, who enjoys a restful moment ***(far right)*** *after a week spent in eastern Tennessee's woods, living off the land in a re-creation of a long hunt. An artist who specializes in paintings of frontier life, Wright carefully researches his clothing and such gear as the flintlock fowling piece beside him. Boone once carried game in a macramé-and-leather hunting bag* ***(right)****, validated by the Carnegie Museum of Natural History in Pittsburgh.*


D. BOOM
KILLA

with a twinkle in his eye, "if you'd ever been a boy with a new pocketknife and a beech tree in front of you."

BY THE LATE 1760s Boone probably knew the Blue Ridge and eastern Alleghenies as well as any man, but he still dreamed of Kentucky. Then in the winter of 1768-69, John Finley showed up on his cabin doorstep, 14 years after they had fled the scene of Braddock's defeat. Boone's son Nathan recalled listening to Finley tell tales of Kentucky by the fireside—of huge buffalo herds feeding on great stands of cane, deer at every salt lick, and lush land for the taking.

Finley had reached Kentucky via the Ohio River, but he had heard of an overland trail—the Warriors' Path—that led through the mountains. It would take a good



Damming a flood *of settlement, the Appalachians reared seemingly impassable ridges between the eastern seaboard and the fertile lands beyond—until Dr. Thomas Walker in 1750 found the Cumberland Gap.*

woodsman to find it. Was Boone interested?

On May 1, 1769, Daniel, his brother-in-law John Stuart, John Finley, and three others journeyed over the Blue Ridge, across the Holston, Clinch, and Powell Valleys. Beyond lay the seemingly impenetrable wall of Cumberland Mountain. But the men soon found a hunter's trace that led them to the gap discovered by Dr. Thomas Walker and named for the Duke of Cumberland. There

they turned north up the Warriors' Path, a route traveled by hunting and war parties of the Cherokee and Shawnee. Except for brief periods, the Indians built no villages in Kentucky, reserving the land for hunting. The absence of Indians was one reason white settlers were attracted to the region.

At the end of May, Boone and his companions set up a base camp on a creek still called Station Camp, near present-day Irvine, Kentucky. Although most of the vast canebrakes that once fed the buffalo herds have fallen to cultivation, I found a goodly patch of the bamboo-like grass still growing on a nearby flat.

Bob Collins, retired forest supervisor of Daniel Boone National Forest, cut a pencil-thin stalk with his penknife. Measured next to ranger Clarence Moore's six-and-a-half-foot height, it looked easily nine feet.

"This is where they pitched their camp," said Collins, "stacking small logs on corner posts to create a shelter facing the fire."

Exploring out of the camp, Boone had his first view of the Bluegrass country. His autobiography states: "We found ourselves on Red-River . . . and, from the top of an eminence, saw with pleasure the beautiful level of Kentucke."

My footsteps have often been marked with blood.... —Daniel Boone

---

After seven months of excellent hunting, reported Boone, "the time of our sorrow was now arrived." Surprised by Shawnee, his party was robbed of the horses and all the deer skins—a hazard bitterly recorded on a tree by another group of hijacked hunters: "2300 Deer Skins Lost. Ruination By God."

All except Boone and Stuart returned to the settlements, but they were not alone for long. Incredibly, in that great wilderness, Boone's brother Squire found the hunters, bringing fresh horses and ammunition, a feat he was to duplicate two more times—carrying skins back to the Yadkin and returning with supplies—during Boone's two-year hunting and exploration trip. But on the brothers' journey home in March of 1771 they arrived empty-handed. The Indians had robbed them once again.

Daniel first attempted to settle in Kentucky in 1773. The Boones and a few score others, including some Bryan in-laws, set out with a packtrain, cattle, and household goods. Near Powell Valley, Boone sent his eldest son, James, back for more supplies. Dark caught the 16-year-old and his companions only three miles from rejoining the pioneers. Indians attacked. James and his friend Henry Russell were tortured to death. They were buried there, wrapped in one of Rebecca's linen sheets.

Scared and disheartened, the would-be settlers convinced Boone to turn back. The first effort to settle Kentucky was a failure.

A MAN with a grand design for settlement—a whole new colony—was North Carolina's Judge Richard Henderson, an old friend and advocate of Boone. Britain had forbidden further westward settlements, but American rebellion was beginning to boil. Henderson proceeded with his plans.

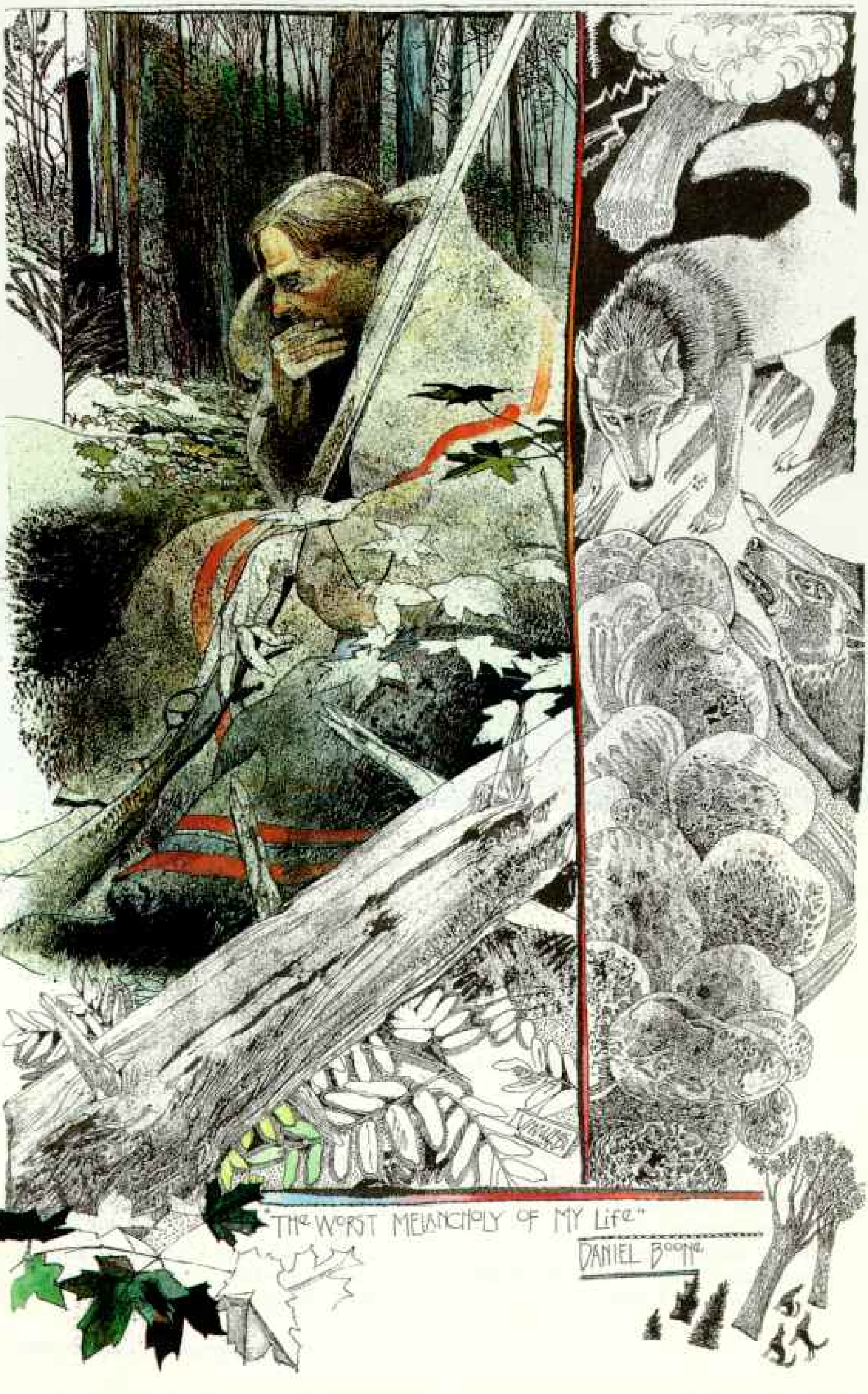
His Transylvania Company paid 10,000 pounds in goods to the Cherokee for 20 million acres between the Kentucky and Cumberland Rivers. Not all the Cherokee were in favor. Dragging Canoe took Boone by the hand and said, "Brother, we have given you a fine land, but I believe you will have much trouble in settling it."

Hired by Henderson to cut a path for the new settlers, Boone on March 10, 1775, assembled 30 mounted axmen at Long Island in the Holston River. This starting point, a four-mile-long teardrop of land, now lies in the middle of Kingsport, Tennessee, and bristles with the stacks of a huge chemical plant. Only the northern tip is undeveloped.

"This was a sacred island to the Cherokee," related Ray Hunt, a local-history buff. "They didn't give it up until 1806. And now the city has given back this tip of the island, three and a half acres of it, to the eastern band of the Cherokee."

Boone's darkest hour *came at his son's graveside in Virginia's Powell Valley, a year after James was killed by Indians on Boone's first attempt to settle Kentucky. A storm deepened his despair at finding the grave disturbed by wolves.*

PAINTING BY JACK UNRUH


"The Worst Melancholy of My Life"
Daniel Boone

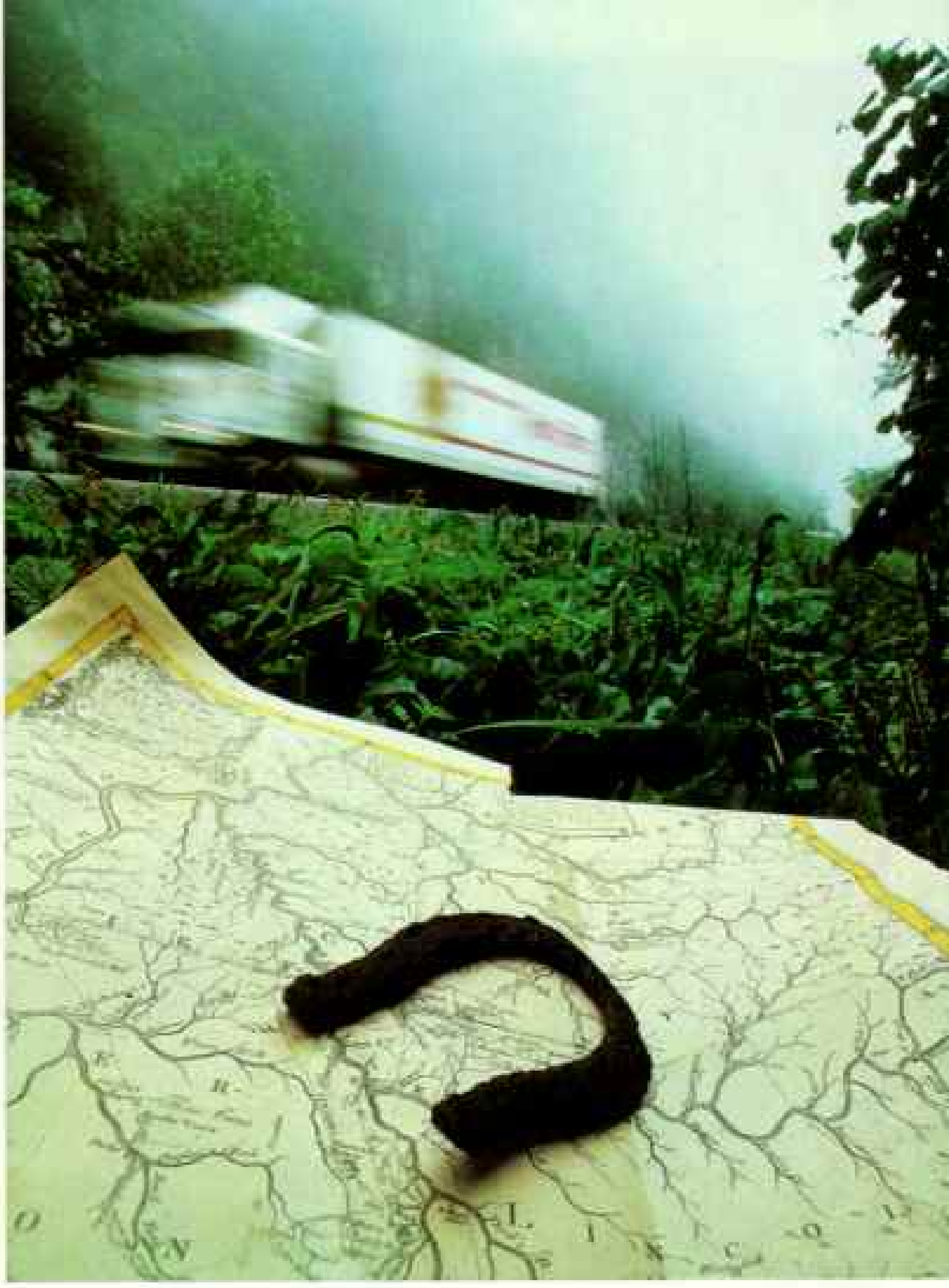
***First road** to Kentucky was cut by Boone and a party of axmen in 1775, leading the way to settlement of Boonesborough. A portion of this footpath, later called the Wilderness Road, is preserved **(above)** within Cumberland*

I set off to follow the axmen's trail, much of it now overlaid with macadam. The soft, worn ribs of the Alleghenies rolled across my path as they had Boone's. U. S. Route 58 generally follows his track into the southwest corner of Virginia. As I drove down Powell Valley, the great white face of Cumberland Mountain loomed on my right. To the hundreds of settlers who plodded in Boone's wake, this signaled the gateway to Kentucky (map, pages 816-17).

The gap and much of Cumberland Mountain is protected today as a national historical park. Park historian Keith Morgan led the way up a steep, narrow trail that is thought to be a part of the Boone Trace.

"We don't say this is definitely the footpath," he said. "It might have been part of the wagon-wide Wilderness Road that supplanted the trace in 1796. But they were undoubtedly in the same vicinity."

I spent that night in the Wilderness Road Campground and woke to a mizzling rain—weather not unlike that reported by William Calk, who traveled with the closely following Henderson party. "This is a very loury morning & like for Rain But we all agree to Start Early we Cross Cumberland River & travel Down it about 10 miles through Some turrabel Cainbrakes. . . ."



Gap National Historical Park. Overlying much of the original route through the gap is modern U. S. Highway 25-E (**above right**). *A mule shoe from Boone's era found during construction of the highway rests on a map from an "autobiography" of Boone ghostwritten by John Filson. A tunnel is being cut to divert traffic from the gap.*

The modern road threads a fast-food corridor on the edge of Middlesboro, Kentucky, skirts some of Boone's beloved mountains, now girdled with strip mines, crosses the Cumberland at Pineville, and heads north to Flat Lick. Here Boone and his men left the Warriors' Path and began to cut their way through deadfall and dense rhododendron and laurel thickets.

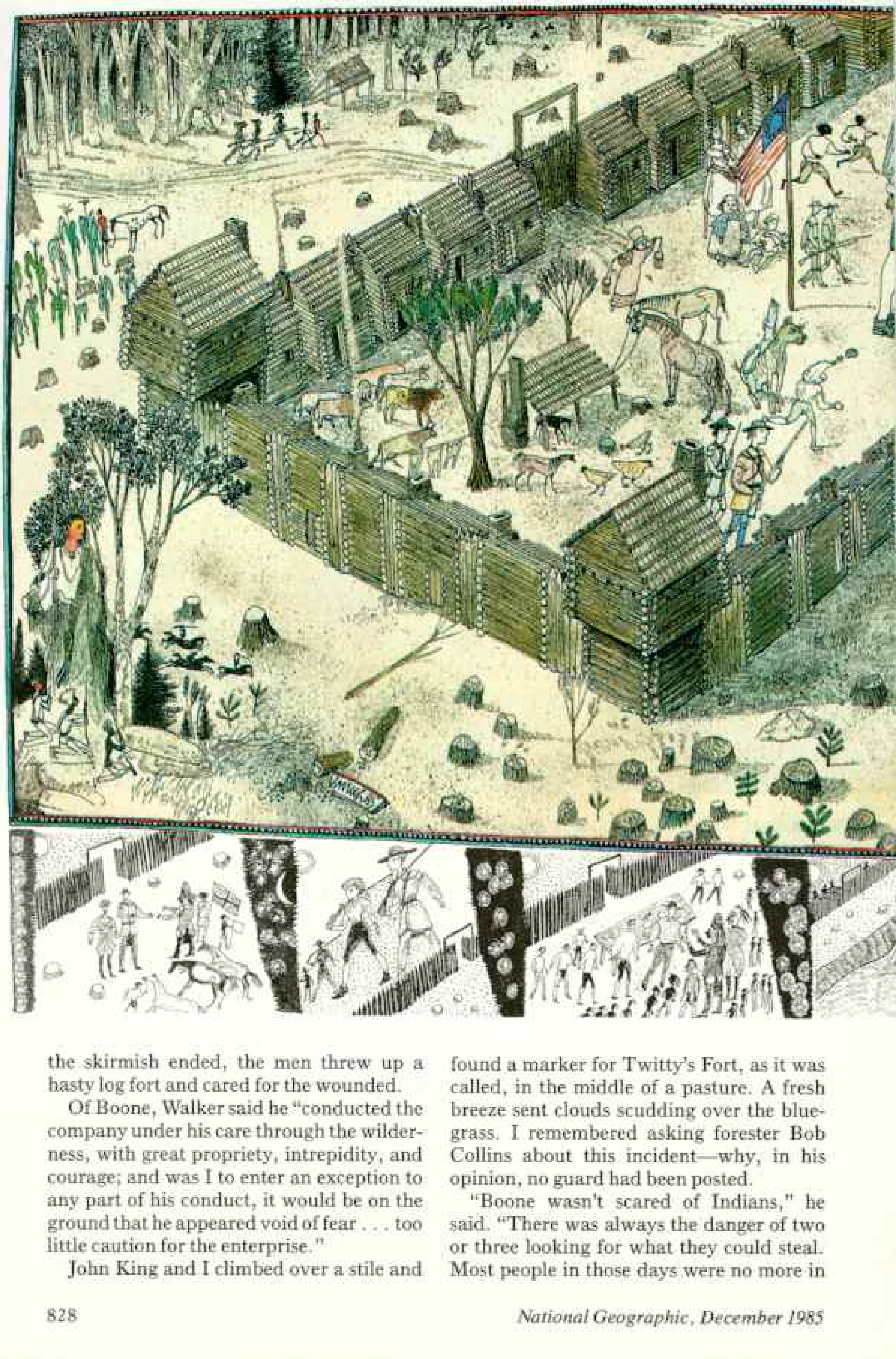
Retired U. S. forester John King guided me over much of the trace from London, Kentucky, to Fort Boonesborough.

"I'm going to show you the good with the bad," he warned. The bad was at Boone Gap, near Berea, where a section of old road has become a pigsty and undesignated garbage dump, marked by a defaced stone commemorating Boone's passage.

ON MARCH 24 BOONE and his exhausted party camped on gently rolling country south of present-day Richmond, Kentucky.

Years later Felix Walker recalled: "We were fired on by the Indians . . . about an hour before day. Captain [Twitty] was shot in both knees, and died the third day after. . . . myself badly wounded."

Some of the men panicked and ran, others grabbed their rifles and fired back. When

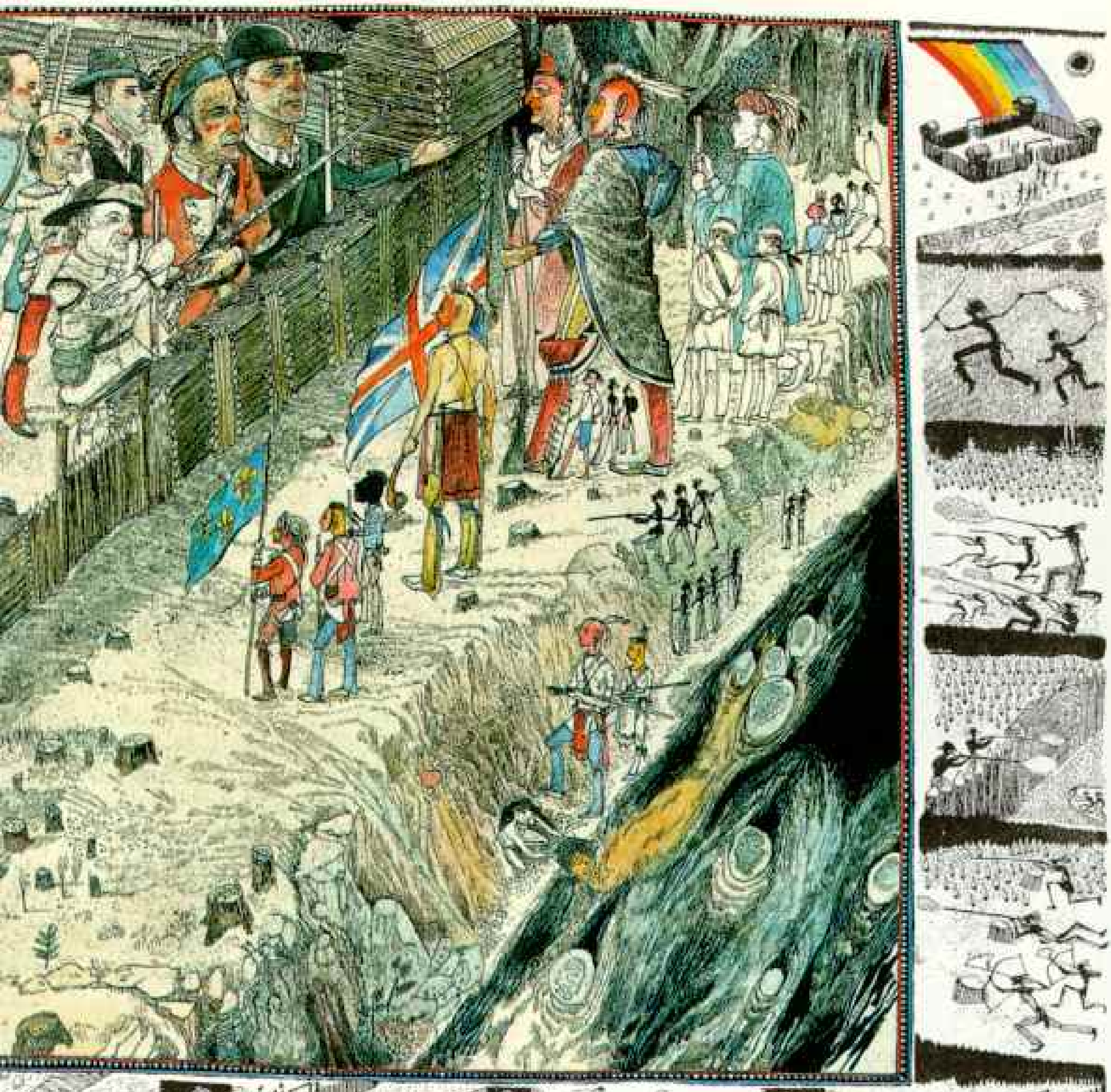


the skirmish ended, the men threw up a hasty log fort and cared for the wounded.

Of Boone, Walker said he "conducted the company under his care through the wilderness, with great propriety, intrepidity, and courage; and was I to enter an exception to any part of his conduct, it would be on the ground that he appeared void of fear . . . too little caution for the enterprise."

John King and I climbed over a stile and found a marker for Twitty's Fort, as it was called, in the middle of a pasture. A fresh breeze sent clouds scudding over the bluegrass. I remembered asking forester Bob Collins about this incident—why, in his opinion, no guard had been posted.

"Boone wasn't scared of Indians," he said. "There was always the danger of two or three looking for what they could steal. Most people in those days were no more in



PAINTING BY JACK UNRUH

Trial by fire *came to Boonesborough in 1778 during a seven-day Indian siege led by British officers and Shawnee Chief Blackfish—the large figure in British military headdress at upper right in this painting done in Indian pictographic style.*

The Indians and their allies first demanded surrender from Boone—the large figure in broad-brimmed hat—and other pioneer leaders. Stalling in hopes of reinforcements, the settlers negotiated for three days. Finally the Indians attacked, and the siege began.

Frames around the painting chronicle the events: first meeting and negotiations; the Indians' false withdrawal; tunneling by Indians and counter-digging by settlers, who threw rocks at their besiegers; assaults with rifles and torches. All ended with a providential rainstorm that forced the Indians' departure, heralded by a rainbow above the fort.

terror of Indians than we are of burglars. We don't post guards against burglars."

Courage failed some of the men, and they turned for home. The remaining trailblazers placed Walker on a litter and followed Otter Creek to the Kentucky River. There, Walker recounts, "we made a station, and called it Boonesborough."

As with most of the territory associated with Boone, the region around Fort Boonesborough State Park today blazons with signs bearing the family name: Daniel Boone Riding Stable and Wilderness Camping Ground, Rebecca Boone Gift Shop, and the Daniel Boone Inn, which claims the coldest beer on the Kentucky River.

A stone wall bearing the names of the original settlers stands on the fort site. A recreation, built in 1974 from a sketch of the original, crowns a hill above park facilities.

"The historians were very upset because it wasn't put on the original site," said then superintendent Juett "Bucky" Walters. "But in December 1979 we had a major flood. Water was six feet deep in the riverside office. The fort would have been wiped out."

The newness of the pencil-straight and sharpened pine logs of the reproduction startles the eye. Inside, from April 1 through October 31, craftsmen weave cloth and baskets and make soap, dolls, and other items of the time. Some of the 26 cabins and one of the four blockhouses are furnished as they might have been in the fort's early years.

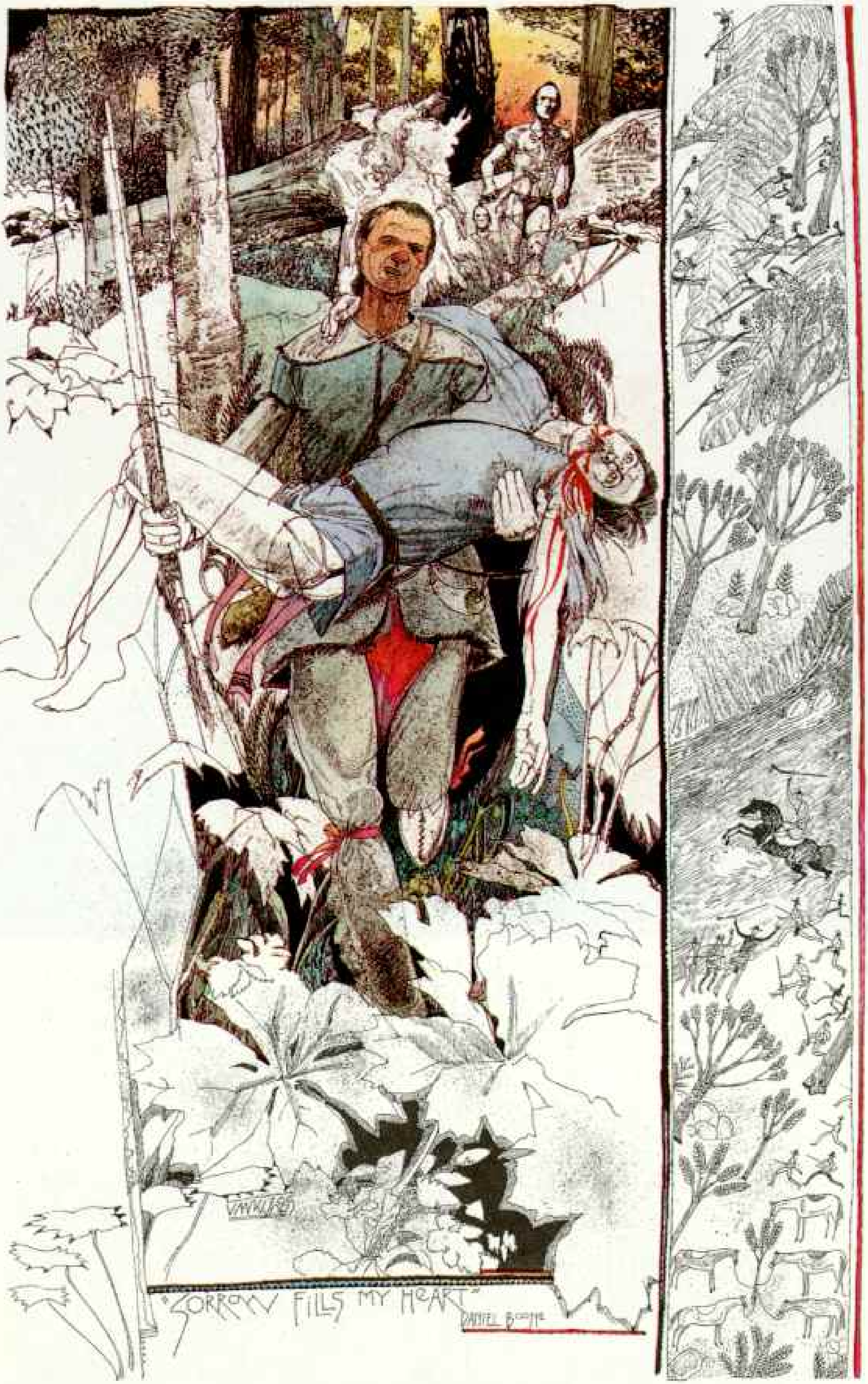
***Foolhardy charge** brought disaster when Maj. Hugh McGary, riding into the Licking River (**opposite**, far right), led settlers into Indian ambush at the Battle of Blue Licks in 1782. Boone carried his son Israel's body from the rout. Animals had long visited the salt lick here, as evidenced by mastodon fossils (**above**). Settlers also came, boiling brine in a kettle that dates from Boone's time.* PAINTING (OPPOSITE) BY JACK UNRUH

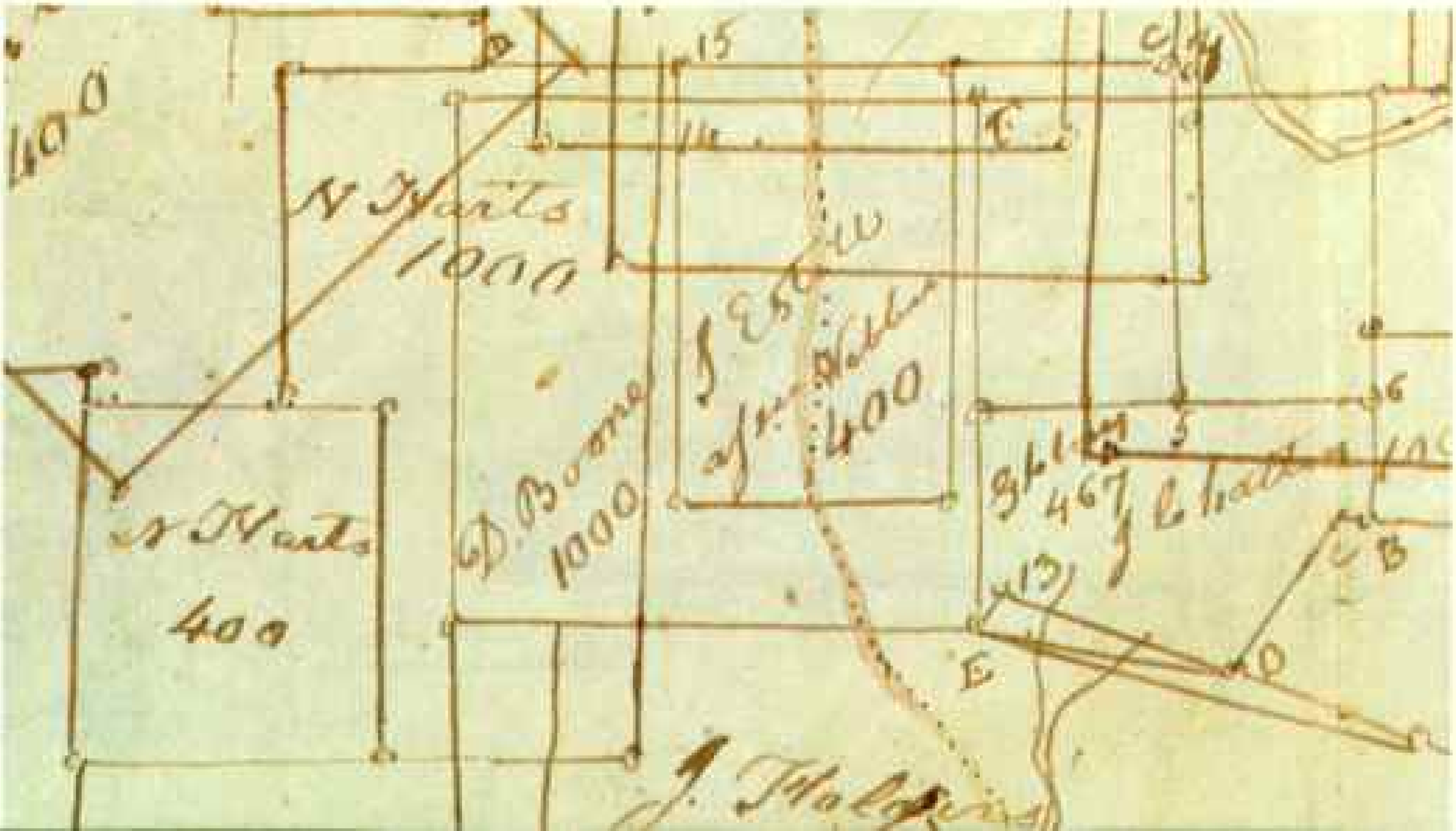
IN THOSE FIRST DAYS of Boonesborough most of the men were too busy claiming land to build fortifications and put in crops. Henderson, who arrived with his group on April 20, complained a month later of "no meat but fat bear. Almost starved. Drank a little coffee & trust to luck for dinner."

A convention to form the new government of Transylvania was held at Boonesborough beginning May 23, 1775. Among those attending was James Harrod, who in 1774 had beaten Boone in founding the first permanent British settlement in Kentucky —Harrodsburg. Courts were established, the militia organized, and laws passed to protect the game. Speeches of the day referred to the British crown; no one knew that the battles of Lexington and Concord had been fought a month earlier.

Kentucky soon felt the effects of the war. Raids by Indians allied with the British became common. Fearing for their lives, more than half the new settlers left. At one time only 12 women remained in Kentucky, among them Rebecca Boone and her four daughters.

Just after the first Independence Day a small band of Shawnee and Cherokee watched from a canebrake as Jemima Boone and her friends Betsey and Fanny Callaway


"SORROW FILLS MY HEART"


N Harts
1000
N Harts
400
D. Boone
1000
400
15
467

The peace of home *eluded Boone after the Revolutionary War, even as settlers poured into Kentucky. Working as a surveyor and land agent, he amassed thousands of acres, but inadequate record keeping, conflicting land claims, and Kentucky's change from a county of Virginia to a state cost him most of his property.*

Confusion over land engendered ill will and financial claims against Boone by settlers whose lands he had surveyed. Early surveys' overlapping claims gave the name to "shingled maps." One such map shows the conflicting boundaries ***(left)*** *claimed by Boone and others in Madison County, Kentucky. Disillusioned, Boone retired to trap and hunt from a cabin he built at Brushy Fork. His last Kentucky home stands restored near its original site* ***(above)****.*

He had settled in that country to end his Days, but they got up so maney squabbles over land, that it anoied him, and he Did not want to Die among them. —B. T. Goe


I promise to pay or cause to be paid unto James
Colaway Eighteen Dollars in good Mill Stand
Merchantable pelltry on or before the first
of December Next ensuing for Value Rd
of him as Witness my hand
June the first 1802
Daniel Boone
Francis Hood
his mark
Daniel Boone
Commander of the District
of the Femme osage

MISSOURI HISTORICAL SOCIETY (ABOVE)

Still revered *as a pioneer, Boone accepted Spain's invitation to lead his family and other immigrants to Missouri in 1799. Highly regarded for his fairness, Boone was made syndic, or magistrate, settling legal and financial matters* ***(left)*** *under the Judgment Tree. The tree's location is disputed. A likely spot is near the boundary of Boone's farm, south of Defiance* ***(below)****, where the present owner and a neighbor stand beyond old photographs of an elm thought to be the historic tree.*

drifted down the Kentucky in a canoe. Suddenly the girls were overpowered and kidnapped. When they were discovered missing, Boone and others set off in pursuit. Guided by signs the plucky girls had managed to leave, the men caught up with the band on the third day. As the long rifles fired, Jemima yelled, "That's Daddy!"

The rescue was major news in the settlements and was later recounted in Boone's autobiography. A similar incident occurs in James Fenimore Cooper's *The Last of the Mohicans*, and many believe the hero, Hawkeye, was based on Boone.

In January of 1778 Boonesborough was desperately in need of salt. The Indians usually kept close to home in winter, so Boone took 30 men to boil a supply at the mineral springs at Blue Licks, 70 miles to the north. Weeks later, off hunting alone, Boone himself was surprised and captured by Indians. At their camp he was shocked to find a force of more than a hundred painted Shawnee. They were eager to avenge the murder of their great chief, Cornstalk, who a few months earlier had been killed by whites while on a mission of peace.

The Shawnee were led by Chief Blackfish, who knew of the saltmakers' camp and intended to attack nearly defenseless Boonesborough. Putting on his friendliest face, Boone promised to surrender the men at Blue Licks, but he persuaded Blackfish that it would be better to take Boonesborough in the spring when the women and children could more easily survive the trek north, either to be adopted by the Indians or sold to the British.

The captured Kentuckians were marched to Old Chillicothe, a Shawnee community on the Little Miami River, near present-day Xenia, Ohio. Boone and ten others were taken to Lt. Gov. Henry Hamilton in Detroit, who paid a bounty for all but Boone, whom Blackfish refused to surrender. Alluding to British sympathies in Kentucky and showing his old commission as a British militia captain, Boone convinced not only the Shawnee and Hamilton of his Loyalist leanings, but even some of his own men.

Taken back to Old Chillicothe, Boone, who had been adopted by Blackfish, became known as Sheltowee—Big Turtle.

"I was exceedingly familiar and friendly with them," he says in the Filson autobiography. "I was careful not to exceed many of them in shooting; for no people are more envious than they in this sport."

THE SITE of the Indian village is now a broad cornfield on the outskirts of Xenia. Tukemas Pope, artist and chief of the 600-member Remnant Shawnee, lives in nearby Dayton in a home resplendent with Indian artifacts and paraphernalia. His group descends from remnants of Tecumseh's band, which was defeated in the War of 1812.

"Big Turtle was adopted for his bravery," Tukemas said. "He was stealing at Blue Licks when we caught him, because it was our salt, but that is no big thing. We stole

horses constantly. We took them from the settlers and they took them from us. That was part of the game."

Daniel obviously had an affinity with the Indians. He had known them all his life. "They shared a love of the forest, hunting, and freedom," said Steven Channing, formerly a professor of history at the University of Kentucky, who is now working on a film about Boone. "On the other hand, he was usually a loner, and that was alien to them."

When the Shawnee allowed Boone to hunt—under supervision—he began to hoard powder and lead, and "now began to meditate an escape." When a large war party gathered in June, Boone realized that the attack on Boonesborough was imminent. Slipping away from a hunting party, he covered 160 miles in four days and staggered into the settlement. By now he looked more Indian than white. Of his family, he found only Jemima. Rebecca, thinking him dead, had returned to North Carolina.

"The famous partisan," as the *Virginia Gazette* called him, quickly saw to the repair and completion of Boonesborough's fortifications and sent to nearby settlements and the Virginia militia for help. In early September the enemy force—450 Indians and French Canadians—arrived on the north bank of the Kentucky.

Playing for time, Boone agreed to talk to

WESTERN MANUSCRIPT COLLECTION (ABOVE)

Hunter's last hearth *was in the home of his son Nathan, where he died after an attack of indigestion brought on by eating too many sweet potatoes. Boone helped build the stone house and, some say, carved the walnut mantels. A wooden porch and side addition, seen in a 19th-century photograph* **(above)**, *were removed in restorations that opened the house to the public in 1959.*

A powder horn, believed to be Boone's, rests on a table in the bedroom where he died in 1820, seven years after his beloved wife, Rebecca. His property in Missouri, like that in Kentucky, dwindled, both through land disputes and Boone's repayment of old debts. In his last years, as best as he was able, he continued to pursue his first loves: hunting, trapping, and wandering.

He was going to make a powder-horn as he intended to go out and hunt in the fall. —Nathan Kouns

Blackfish. Kentucky settler Josiah Collins reported the conversation:

"Well, Boone, how d'y?"

"How d'y, Blackfish."

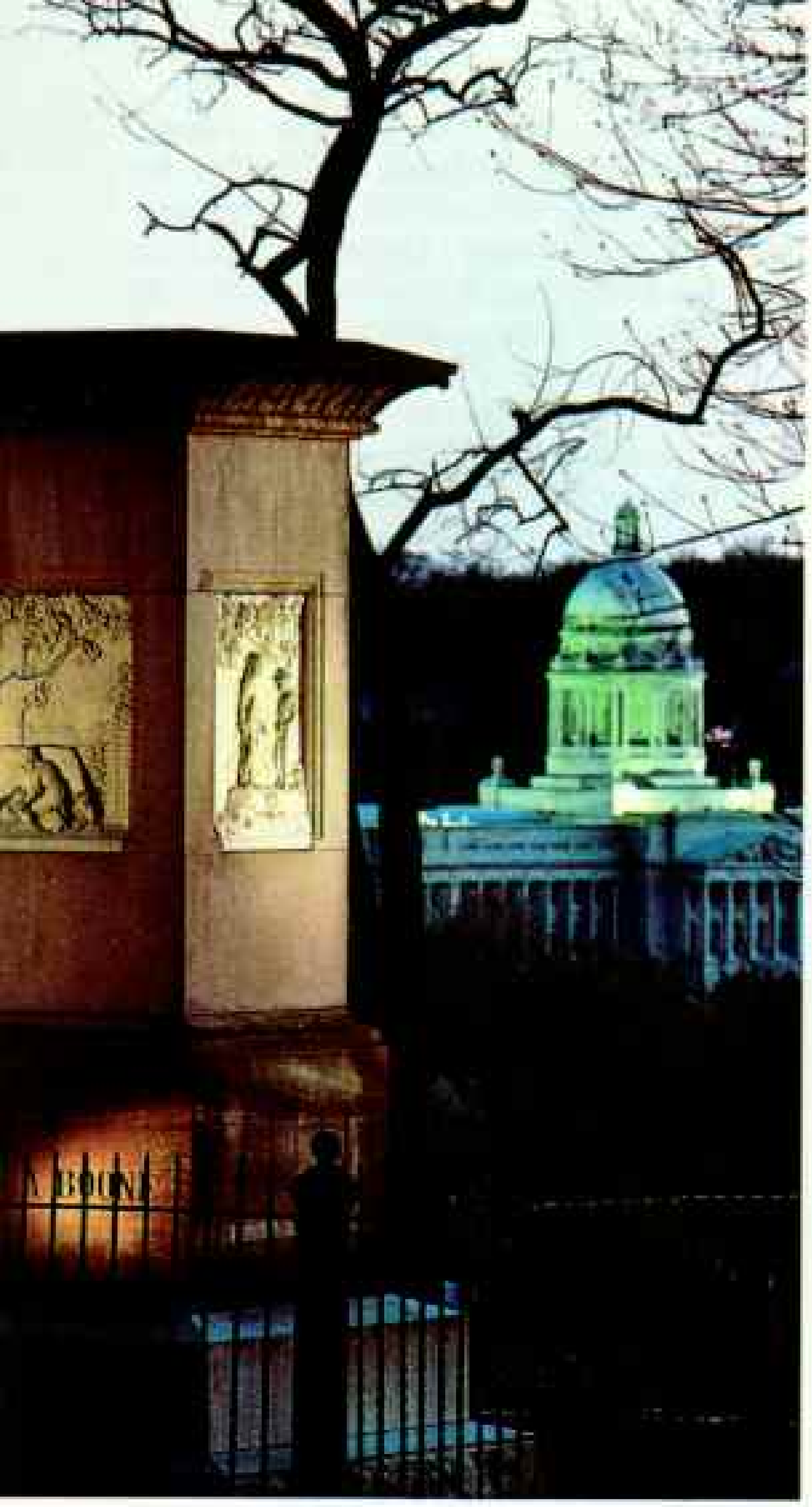
"Well, Boone, what made you run away from me?"

"Why, because I wanted to see my wife and children."

"Well, you needn't have run away. If you'd asked me, I'd let you come."

The defenders parleyed and stalled for three days; Blackfish and his allies then suggested a peace treaty. Ostensibly shaking hands in friendship, the Indians seized eight Kentucky negotiators, who broke loose and dashed for the fort. The siege of Boonesborough had begun (pages 828-9).

For days fierce rifle fire was exchanged. The Indians tried fire arrows and a tunnel into the fort, but rain thwarted both efforts. Finally, the eighth day dawned soggy but quiet. Sometime in the night the attackers had stolen away. Boone tallied 37 of the enemy killed and a great number wounded. Of the defenders, two were killed and four



wounded; his daughter Jemima reportedly was struck in the backside by a spent bullet. Boone said "we picked up one hundred and twenty-five pounds weight of bullets."

DANGER PAST, his seeming collusion with the British surfaced. His wife had Tory relatives, which didn't help allay those suspicions. A court-martial was held at Logan's Fort, where spectators heard Boone maintain that "he was Deceiving the British Officers, and Indians. That he was now come home to help his own people fight. . . ." Daniel was not only acquitted but also promoted from captain to major.

When Daniel brought Rebecca back from North Carolina, war still raged on the frontier. Large detachments of British and Indians forced the surrender of several settlements. Boone's brother Edward was killed when the two were on a salt-gathering and hunting expedition. Atrocities occurred on both sides. At least 90 Christian Indians were brutally massacred by whites at a Moravian settlement in the Ohio country.

In 1782 a large contingent of the enemy, including the infamous Simon Girty, laid siege to Bryan's Station, and some 150 men from Boonesborough, Lexington, and Harrodsburg set off to rescue the settlement. The warriors withdrew toward Blue Licks. Suspicious of the foe's leisurely retreat and obvious trail, Boone warned of an ambush. Just beyond the Licking River, Indians could be seen casually strolling a ridgetop.

Journey's end *proved as elusive in death as in life. A fenced monument marks where Boone was laid near Rebecca in a family graveyard* ***(above)*** *in Warren County, Missouri. In 1845 Kentucky petitioned to rebury the couple on a commanding site above its state capitol in Frankfort* ***(upper left)****. But witnesses at the disinterment later said Kentucky got the body of a slave found at Rebecca's side when Daniel was first buried—a story supported by forensic anthropologist David Wolf* ***(right)****, examining a plaster cast of the skull of the grave's occupant.*

Suddenly Maj. Hugh McGary rode into the river hollering, "All who are not damned cowards follow me, and I'll soon show you the Indians!" The undisciplined frontier troops rushed in his wake. Boone and the other officers had no choice but to follow. Within minutes the battle was over and 60 Kentuckians lay dead.

Dow all the good to my Nighbour and my Self that I Can and Do as Little harm as I Can help and trust in gods marcy for the Rest.

—Daniel Boone

Nearly a year after Cornwallis's surrender at Yorktown, the "last battle of the Revolution," as it has been called, cost Boone a heavy price. Running in retreat, Daniel had grabbed a horse and handed the reins to his son Israel, who cried, "Father, I won't leave you." A shot rang out, and Boone lost another son.

Today a Kentucky state park protects the Blue Licks battle site. A granite shaft bears the names of the fallen, and markers show their mass grave. Boone took his boy's body back to Boone's Station, now called Athens, where he had settled in 1779.

In the years following, Boone kept the family on the move. They lived for a time in Limestone (today's Maysville, Kentucky), where he prospered as an innkeeper, surveyor, and trader in furs, hides, and ginseng. Later they lived at Point Pleasant, where he continued as a representative to the Virginia General Assembly, to which he was first elected in 1780. (Kentucky did not become a state until 1792.)

But his trials were not over. Land was the lure of Kentucky, and Boone was often asked to buy tracts for wealthy Virginians. He agreed, for a share of the land. At one point he owned 100,000 acres himself—or thought he did. He was, unfortunately, careless about filing procedures.

While Daniel could usually hold his own against the Indians, he was no match for lawyers and unscrupulous land merchants. Kentucky maps of the period are shingled with overlapping claims (page 832). When those of his clients proved faulty, Boone had to sell some of his holdings to pay them.

Embittered, he turned to hunting, his first love. He settled for a time on Brushy Fork, only ten miles from Blue Licks, the site that had brought him so much grief. Now restored, the only Boone cabin left in Kentucky overlooks a placid pond on a large farm near Carlisle (pages 832-3), its only occupant a silent black snake.

Kentucky seemed to turn her back on Boone. Game was becoming harder to find. Much of his remaining land was taken for taxes. He was more vilified than praised. His son Daniel Morgan Boone, who had visited the Missouri region (then the Spanish possession of Upper Louisiana), told him he would be welcomed and rewarded if he would lead immigrants to St. Louis.

In 1799 Boone hewed a canoe from a giant tulip poplar to carry his family down the Ohio to the Mississippi. Once again, relatives and friends accompanied him. At Cincinnati crowds gathered at the riverside to see the renowned woodsman. Asked why he was moving on, he replied, "Too many people! Too crowded. . . . I want more elbow room!"

Boone arrived in St. Louis in October to waving flags and a military parade in his honor. The Spanish allowed him to parcel out 400 acres to each new family. Boone received 1,000 arpents (850 acres) when he first arrived and 10,000 arpents later in the Femme Osage district, some 40 miles west of St. Louis. Finally it seemed that the land he had always sought was to be his.

Appointed syndic, or magistrate, he dispensed justice under an elm that came to be called the Judgment Tree (pages 834-5). His judicial decisions seemed to suit his neighbors, though they were often as unorthodox as his spelling. One document declares: "I do Cartify that I gave Benjamon gardner purmistion to Satel on a pees of vacant Land Coled the Little purrarey on the Misurry Sum time in Desember 1802. . . ."

Then Boone's bubble burst with the Louisiana Purchase. Spain had ceded the territory to France, which in turn sold it to the young United States of America. A U. S. commission ruled Boone's land titles illegal, and he, along with scores of others, was stripped of his holdings.

The famous woodsman had some powerful friends in Congress, but before they could help, the War of 1812 intervened. (Daniel volunteered, but was turned down because of age—he was 78.) Finally in 1814 the Committee on Public Lands awarded him 850 acres—but he did not hold even this grant long.

A few Kentuckians rushed to Missouri claiming Boone owed them money, and he sold every acre to satisfy them. The husband of an orphan girl to whom Boone had given land arrived seeking redress for what had turned out to be worthless property.

"You have come a great distance to suck a bull," the weary hunter said. "And, I reckon you will have to go home dry."

TO THE END OF HIS DAYS he hunted and trapped the western reaches—some say he went as far as the Yellowstone country. Rebecca died March 18, 1813, and Daniel lived his last years with his children. He helped Nathan build a large house of blue limestone quarried on the property, and it stands today near Defiance, Missouri, wreathed in ivy (page 836).

It was here in the front bedroom that the old hunter died on September 26, 1820, just five weeks shy of his 86th birthday.

He was buried, in a cherry-wood coffin he had had made years before, next to Rebecca on a hill that looks over rich Missouri bottomland. Laid to rest—but not forever.

In 1845 Kentucky petitioned to bring home the bones of her most famous founding father, and Missouri acceded. With much pomp and panoply Daniel and Rebecca were reinterred on a hilltop in Frankfort overlooking the Kentucky River and the state capitol.

But there are those in Missouri who say that Kentucky has Rebecca, but not Daniel; that when they went to bury him beside his beloved wife, they found the grave of a slave and so placed the woodsman at her feet instead. And that it is the bones of the slave that now rest in that Kentucky hill.

David Wolf, state forensic anthropologist, recently studied a cast taken of the skull just before reburial in Frankfort. "The cast was poorly made," he told me, "and was only of the cranium. But the round forehead and long, narrow head are typical of Negroids, and the apparent young age at death certainly casts doubt that it is Boone's."

Nobody knows for sure, and maybe that's best. Both states that he gave so much to can now claim the man who loomed so large in life and legend. The myths will probably never go away. After all, the monuments in both cemeteries show Daniel Boone wearing a coonskin cap. □

Across generations *the coonskin cap has symbolized Boone, although he never wore one—a detail lost on a youngster meeting Dan Boone, a direct descendant who portrays his forebear in the Boone County State Bank in Lebanon, Indiana.*

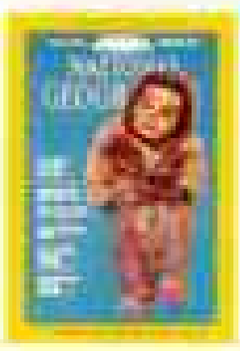
Key to '85



KOKO'S KITTEN, Trumpeter Swans, Planet Earth, the Pearl, Israel, Sichuan, the Vietnam Veterans Memorial.

Find your favorite 1985 articles in a flash with this key. Detailed six-month indexes are free upon request to Dept. 4671. The January-June index (Vol. 167) is available now; July-December (Vol. 168) will be ready in January.

To greatly enhance the usefulness of your collection, the handsomely illustrated 608-page *National Geographic Index 1947-1983*—covering articles, books, maps, and television specials—is available from the Society for $13.95.


JANUARY

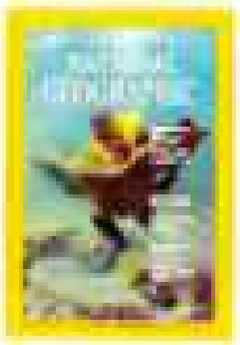
FEBRUARY

MARCH

APRIL

MAY

JUNE



JULY

AUGUST

SEPTEMBER



OCTOBER

NOVEMBER

DECEMBER

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

GILBERT HOVEY GROSVENOR

Editor, 1899-1954; President, 1920-1954
Chairman of the Board, 1954-1966

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization. Since 1890 the Society has supported more than 2,800 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky.

MELVIN M. PAYNE *Chairman of the Board*

NATIONAL GEOGRAPHIC MAGAZINE

GILBERT M. GROSVENOR *President*
WILBUR E. GARRETT *Editor*
JOSEPH JUDGE *Senior Associate Editor*
THOMAS R. SMITH *Associate Editor*

SENIOR ASSISTANT EDITORS

Richard C. Clarkson, *Photographs* John B. Garver, Jr., *Cartographic*
William Graves, *Expeditions* Robert P. Jordan, *Special Projects*
Edward J. Linehan, *Manuscripts* Samuel W. Matthews, *Production*
O. Louis Mazzatenta, *Central Center* Charles McCarry, *Contract Writers*
Howard E. Paine, *Art* Carolyn Bennett Patterson, *Legends*
W. Allan Royce, *Illustrations* Mary G. Smith, *Research Grant Projects*
Kenneth F. Weaver, *Science* Ann K. Wendt, *Research*

TEXT

ASSISTANT EDITORS: Kent Britt, Thomas Y. Canby, Rowe Findley, Bart McDowell, Elizabeth A. Moize, Merle Severy
SENIOR WRITERS: Thomas J. Abercrombie, David S. Boyer, Mike Edwards, William S. Ellis, Rick Gore, Noel Grove, John J. Putman, Peter T. White
SENIOR EDITORIAL STAFF: Harvey Arden, Robert Booth, Allen A. Boraiko, John L. Eliot, Boyd Gibbons, Alice J. Hall, Bryan Hodgson, David Jeffery, Michael E. Long, Priit J. Vesilind. *Production:* John L. McIntosh
EDITORIAL STAFF: Judith Brown, Larry Kohl, Douglas Lee, Louise E. Levathes, Peter Miller, Cathy Newman, Cliff Tarpy, Jane Vessels
RESEARCH: Lesley B. Rogers (Assoc. Dir.); Michaelene A. Sweeney (Asst. Dir.); *Researcher-Editor:* Susan L. Anderson. *Researchers:* Carolyn H. Anderson, Rebecca Beall, Ann B. Henry, Jan Holderness, Kathy B. Maher, Barbara W. McConnell, Jean B. McConville, Margaret S. Nottingham, Jeanne E. Peters, Frances W. Shaffer, Abigail A. Tipton. *Legends:* Victoria C. Duchesneaux. *Planning Council:* Julia G. Grover, Mary McPeak

ILLUSTRATIONS

PHOTOGRAPHERS: Dean Conger, Joseph J. Scherschel (Assistant Directors); James L. Amos, Joseph H. Bailey, James P. Blair, Victor R. Boswell, Jr., Jodi Cobb, Bruce Dale, David Alan Harvey, Otis Imboden, Emory Kristof, Joseph D. Lavenburg, Bianca Lavies, Bates Littlehales, George F. Mobley, Steve Raymer, Robert F. Sisson (*Nat. Science*), James L. Stanfield. *Admin.:* Claude E. Petrone, Susan A. Smith
ILLUSTRATIONS EDITORS: Robert W. Hernandez (Assistant Director); William L. Allen, David L. Arnold, William T. Douther, Taylor Gregg, Kent J. Kobersteen, Bruce A. McElfresh, Charlene Murphy, Robert S. Patton, Elie S. Rogers, Jon Schneeberger, Susan Welchman
LAYOUT: Robert W. Madden (Assistant Director); Constance H. Phelps
ART: Jan Adkins, J. Robert Teringo (Associate Directors); Allen Carroll (Asst. Dir.); *Artist:* William H. Bond. *Design:* Charles C. Uhl (Asst. Dir.); Betty Clayman-DeAlley
ENGRAVING AND PRINTING: William W. Smith (Director); James R. Whitney (Assoc. Dir.); Bill M. Aldridge, John T. Dunn, Judy L. Garvey, John W. Gergel

CARTOGRAPHY

John F. Shupe (Assoc. Dir.); Harold E. Aber, Jr. (Sr. Asst. Dir.); Walter Q. Crowe, John F. Dorr, Harold A. Hanson, Harry D. Kauhane, Richard K. Rogers, Elie Sabban (Asst. Dirs.). *Map Editors:* Thomas A. Walsh (Supvr.); John T. Blozis, Russel G. Fritz, Charles W. Gotthardt, Jr., Thomas L. Gray, Gus Platis. *Artists:* Lisa Biganzoli, John W. Lothers, Nancy Schweickart, Sally Suominen-Summerall, Tibor G. Toth. *Archaeologist:* George E. Stuart. *Geographer:* Ted Dachtera. *Researchers:* Timothy J. Carter, Ross M. Emerson, Gail C. Foley, Marguerite B. Hunsiker, Gaither G. Kyhos, Mary C. Latham, Dorothy A. Nicholson, Douglas A. Strobel, John R. Treiber, Susan Young. *Text:* Oliver G. A. M. Payne. *Map Artists:* Roland R. Nichols, Leo B. Zeharth (Supvrs.); Iskandar Baday, James E. McClelland, Jr., Alfred L. Zebarth. *Specialists:* Charles F. Case, Richard J. Darley, Martin J. Golden, Thomas A. Wall. *Scheduling:* Charles L. Miller, Henri A. Delanghe. *Admin.:* Catherine M. Hart

EDITORIAL SERVICES

ADMINISTRATION: M. Jean Vile (Asst. to the Editor); Elaine Rice Ames, Marie L. Barnes, G. Merrill Clift, Marisa Domeyko, Neva L. Folk, Lilian Davidson, Virginia H. Finnegan, Eleanor W. Hahne, Ellen E. Kohlberg, Lisa Maurer, Katherine P. McGown, Lucille L. McInerney, Carol D. Rhoads, Emmy Scammahorn. *Picture Requests:* Barbara A. Shattuck. *Correspondence:* Carolyn F. Clewell, Gwendolyn C. Blackman, Joseph M. Blanton, Jr. *Indexes:* Juliene M. Blozis. *Travel:* Virginia A. Bachant
LIBRARIES: *Publications:* Susan Filer Canby (Director); Patricia Murphy Smith, Margery K. Barkdull, Ariene T. Drewes, Carolyn Locke, Marta Strada. *Records & Illustrations:* Lorie Northrop (Director); L. Fern Dame, Mary Anne McMillen, Carolyn J. Harrison, Jeannette S. Mooberry, Meaneu M. Smith. *Films:* Betty G. Kotcher
NEWS SERVICE: Paul Sampson (Director), Joy Aschenbach, Mercer Cross, Kenneth C. Danforth, Donald J. Frederick, Barbara S. Moffet, Boris Weintraub. *Radio:* Robert C. Radcliffe
AUDIOVISUAL: Joanne M. Hess (Director); Jon H. Larimore (Tech. Director); Ronald S. Altemus, Robert G. Fleegal, Paul Gorski, Gerald L. Wiley

RELATED EDUCATIONAL SERVICES OF THE SOCIETY

ROBERT L. BREEDEN *Vice President*

William R. Gray (Exec. Asst.); Suzanne J. Jacobson (Asst. to the Vice Pres.)
BOOK SERVICE: Charles O. Hyman (Director and Sr. Asst. Ed.); Ross Bennett (Assoc. Dir.); David M. Seager (Art Dir.); Greta Arnold, Mary Dickinson, Karen F. Edwards, Anne D. Kober, J. Edward Lanouette, Carol B. Lutyk, Linda B. Meyerriecks, Elizabeth Newhouse, Melanie Patt-Corner, R. M. Poole, Suzanne K. Poole, David F. Robinson, Lise Sajewski, Shirley Scott, Margaret Sedeen, Susan E. Sidman, Penelope Timbers, Jonathan Tourtellot, Richard Wain. **SPECIAL PUBLICATIONS:** Donald J. Crump (Director and Sr. Asst. Ed.); Philip B. Silcott (Assoc. Dir.); Jody Bolt (Art Dir.); John G. Agnone, Jane H. Buxton, Margery G. Dunn, Seymour L. Fishbein, Ron Fisher, Patricia F. Frakes, Barbara Graziani, Sallie M. Greenwood, Mary Ann Harrell, Charles E. Herron, Stephen J. Hubbard, Bonnie S. Lawrence, Christine E. Lee, Tee Loftin, Jane R. McCauley, Tom Melham, Robert Messer, H. Robert Morrison, Thomas O'Neill, Barbara A. Payne, Thomas B. Powell III, Cynthia Ramsay, David V. Showers, Gene S. Stuart, Jennifer C. Urquhart. **WORLD:** Pat Robbins (Editor); Margaret McKelway (Assoc. Ed.); Ursula Vosseler (Art Dir.); Jacqueline Geschickter, Pat Holland, Joan Hurst, Veronica Morrison, Judith Rinard, Eleanor Shannahan. **EDUCATIONAL MEDIA:** George Peterson (Director); Jimmie Abercrombie, David F. Beacom, James B. Caffrey, Toni Eugene, Sandra L. Matthews. **TRAVELER:** Joan Tapper (Editor); David R. Bridge (Illus. Dir.); Suez B. Kehl (Art Dir.). **PUBLICATIONS ART:** John D. Garst, Jr. (Director); Virginia L. Baza (Asst. Dir.). *Map Artists:* Isaac Ortiz, Peter J. Balch
TELEVISION AND FILMS: Dennis B. Kane (Director); Sidney Platt (Director, Educational Films); Donald M. Cooper, Anne B. Keiser, Yeorgos N. Lampathakis, Karen S. Marsh, Louise C. Millikan, Marjorie M. Mooney, Nola L. Shrewsberry, Kathleen F. Teter, Carl E. Zirbe.

AT&T. The reason you've always taken long distance services for granted.

Whenever you wanted to feel close to someone faraway, when you wanted to share a smile or just felt like a chat, you gave them a call. You didn't worry about the call. Because you took for granted that you could reach wherever you wanted, and that you'd get a clear long distance connection.

AT&T's Long Distance services have always been there for you to call upon. In fact, few things are as reliable, as dependable as AT&T.

Only AT&T has over 35,000 long distance operators to offer any assistance you may need.

Only AT&T lets you reach out anywhere you want. Not just coast-to-coast, but also to over 250 countries and faraway locations worldwide.

What's more, all these services come with savings. Dial direct state-to-state Sunday-Friday from 5pm-11pm and save 40% off AT&T's Day Rate. Friday from 11pm-Sunday 5pm and nightly from 11pm-8am, save 60%. (Different discounts apply to Alaska.)

Plus, AT&T has special programs and plans that can help your long distance dollars go farther.

You know with AT&T you can continue to take these services for granted. Because there's someone we'll never take for granted: you.

Reach out and touch someone.®

AT&T
The right choice.

A Preview of Ford Taurus New Standards of Automotive

The new Ford Taurus and Mercury Sable contain over 300 engineering details designed to answer the American Driver's call for higher quality. They set new standards for six passenger roominess and comfort. And new standards in their engines, their transmis-

- Unique rear suspension in station wagons for maximum cargo capacity
- Optional integral station wagon picnic tray
- Station wagon load floor tie downs
- Two way liftgate on station wagon
- Aerodynamically designed corrosion resistant station wagon luggage rack
- Easy access lockable under floor storage compartment on station wagon
- Station wagon 60/40 rear seat back with convenient access release
- Aerodynamic flush glass all around for less wind noise
- Long windshield blades and large spray pattern
- Convenient single key for door and ignition
- Optional Insta-Clear® windshield for quick clearing of ice or frost
- Loss-proof tethered gas cap

Ford Taurus LX Wagon

- Optional automatic overdrive four speed transaxle
- Non-corrosive fuel lines
- Power front disc/rear drum brakes
- Front wheel drive with advanced four wheel fully independent suspension
- Long life nitrogen gas pressurized shocks and struts
- Extensive Corrosion Protection, including lower bodyside protection
- Stainless Steel muffler and exhaust system – standard with 3.0L V-6 engine
- "Lubed for life" suspension and steering components
- Permanent set front alignment (caster & camber)
- Power rack-and-pinion linear steering

- Conveniently located swing-down fuse box with extra fuses
- Low brake fluid-warning light
- 5 MPH polycarbonate corrosion free; scuff resistant bumpers
- Aerodynamic halogen headlamps
- All season tread steel-belted radial ply tires
- Illuminated safety designed front door trim panel and rear door reflectors
- Clearcoat over metallic paint option
- Front and rear door courtesy lights
- One-piece shingled doors seal for easier closing

Buckle up—Together we can save lives.

and Mercury Sable: Quality from the inside out.

sions, their suspensions. Part-by-part, feature-by-feature, Ford Taurus and Mercury Sable have been designed from the inside out to be the best cars we've ever made. They'll be available at Ford and Lincoln Mercury dealer showrooms in late December.

- 2.5L HSC 4-cylinder fuel injected engine
- 3.0L EFI multiple port injected V-6 engine
- Most advanced electronic engine controls (EEC IV) with "memory"
- Hydraulic engine dampers contributing to a comfortable and quiet ride
- Yellow highlighted underhood, "self-check" features
- Easy-open hood with gas cylinder hood assist struts
- "Easy-check" see-through fluid reservoirs
- Individual "shut-off" climate control registers
- Comfortable driver's left footrest, with larger accelerator pedal
- Self adjusting throttle controls
- All-new electronic search radio (optional on Taurus L)
- Power door and window switches for touch identification for "eyes on road" operation
- 100,000 mile tested seat design
- Ergonomically designed instruments, controls and gauges
- Floor angled and front seat tracks spaced for rear passenger foot comfort
- Rear seat heat ducts (standard except Taurus L)
- Wide vertical seat track release bar for easy seat adjustment
- Back-supported power lumbar option
- One hand operation for seat belts
- Power sliding moon roof option with rear tilt ventilation and sliding sun shade

Mercury Sable LS Sedan

Ford · Lincoln · Mercury · Merkur
Ford Trucks · Ford Tractors

Quality is Job 1.

P O W

*Suggested retail price. Offer expires 12.31.85. Pro Wonder is a registered trademark of RCA.

P R O W

O N D E R

FINALLY, A CAMERA AND RECORDER THAT'S GOT IT ALL TOGETHER, AUTOMATICALLY.

INTRODUCING THE PRO WONDER CAMCORDER FROM RCA.

Pro Wonder, the all-in-one video camera/recorder from RCA, makes it easier than ever to capture life's special moments. How much easier? Just drop in a standard VHS cassette, aim and shoot. From there on out, Pro Wonder does all the work for you—automatically. And it provides a full 2 hours and 40 minutes of recording time on a single cassette.

PRO WONDER IS FULLY AUTOMATIC.
It automatically adjusts the focus and compensates for changes in lighting conditions. So you can work under just about any lighting condition (7 lux rating) as simply as load, aim & shoot. Instant playback through the viewfinder allows you to review your tape on the spot.

PRO WONDER IS LIGHTWEIGHT.
Our new video system is packed with many of the features you would expect to find only on much heavier camera/recorders. Yet it weighs in at an incredible 5.5 lbs!

SPECIAL INTRODUCTORY OFFER.
Buy Pro Wonder now, and you'll receive this professional, hardshell camera case (worth $149) at no additional cost. Supplies are limited, so hurry to your participating RCA dealer before the supply runs out.* For more information, call 1-800-32VIDEO.

RCA

TECHNOLOGY THAT EXCITES THE SENSES.

O N D E R

PLYM

Voyager

Born in America is taking on a new belief, a renewed strength.

And Plymouth Voyager shows you why. Voyager is a creation of American imagination and technology. With its versatility, front-wheel drive, car-like handling, available room for up to eight,* excellent cargo space and a 5-year or 50,000-mile Protection Plan,** you understand why the Pride is Back.

Plymouth. The Best is Born in America. Again.

Plymouth
Division of Chrysler Corporation

BORN IN

BUCKLE UP FOR SAFETY. *Requires optional 2.6 engine and auto. trans. Some options not available on all models.

YOUTH

AMERICA

**Protects engine, powertrain and against outer body rust through. Restrictions apply. Excludes leases. See limited warranty at dealer.

Tectonics to Titanic

NATIONAL GEOGRAPHIC PHOTOGRAPHER EMORY KRISTOF

JUBILATION—there is no other word for it. The faces of the men above reflect a triumph years in the making, the result of a unique partnership in undersea exploration. The group watches a video screen aboard *Knorr*, a Woods Hole Oceanographic Institution research ship, gazing for the first time at the remains of the liner *Titanic* two and a half miles deep in the North Atlantic. Lost in 1912 after collision with an iceberg, the vessel eluded all attempts to locate her until this historic moment: 1:05 a.m. last September 1.

How that moment came about is described in this issue by expedition leader Robert D. Ballard (wearing cap), a senior marine geologist at Woods Hole. National Geographic projects with Bob—such as exploration of new life-forms in deep-sea vents—have resulted in six articles in the magazine, a book, two Television Specials, and three research grants, one of them to study plate tectonics on the Pacific floor.

In many cases our partnership with Bob and Woods Hole has included a familiar ally, the U. S. Navy, whose interest in ocean-floor imaging played a key role in funding and equipping the *Titanic* expedition. An equally important partner, the French government, supplied major funds and a second ship. The French project director, Jean Jarry, stands at Ballard's right.

The National Geographic Society takes pride in its contribution to such historic achievements. Over the years our Committee for Research and Exploration has made scores of underwater research grants totaling millions of dollars. Other contributions are less easily measured. National Geographic photographer and electronics expert Emory Kristof developed many of the photographic designs successfully utilized by the *Titanic* expedition. He was ably assisted by staff specialists Al Chandler, Claude Petrone, and Mike Schaeffer.

This month Bob Ballard, again with French colleagues, resumes his study of plate tectonics in the Pacific—the peaceful side of a career that Editor Bill Garrett fondly refers to as "Starfish Wars."

Whatever the results of that next chapter in man's study of the ocean realm, National Geographic intends to be aboard.

Gilbert H. Grosvenor

PRESIDENT, NATIONAL GEOGRAPHIC SOCIETY

If this is your idea of a gray day.
Blunt Ellis & Loewi can help.

Share the Success.

When the numbers add up right, it can be a very exciting day. It can mean getting the things you've always wanted. Like that new sailboat or that dream home you've been planning.

At Blunt Ellis & Loewi, we're experts at helping your dreams become a reality. Since 1928, helping people like you make money has been our only goal.

We have an investment plan for virtually everybody. From stocks and bonds to annuities to mutual funds to commodities. Over fifty investments in all. And every securities account we offer is protected to $30 million.

So, if your idea of a gray day includes nothing but life's silver linings— like a second home, or retirement income, or just traveling in style, give us a call. And become part of the Blunt Ellis & Loewi success story. We'll add color to your life.

Member NYSE Member SIPC

Blunt Ellis & Loewi
Incorporated

Kleinwort Group

No other big screen TV gives you impact like this.

Simulated TV picture.

A North American Philips Company

Introducing the Magnavox 37" TV stereo receiver/ monitor.

Big screen TV was invented for one reason and one reason only—to make viewing more lifelike. And no one does that like Magnavox.

After all, no one else has our exclusive liquid-coupled optics, which give 25% better contrast than our previous systems. What's more, we give you an advanced full comb filter, an innovation that produces sharper, crisper images.

Of course, the impact of our picture is only a part of the picture. Our new 37" set also has a special expanded stereo sound system. Its powerful integrated circuit creates a uniquely full sound that brings the picture you're watching even more alive.

In addition, we've added an 18-function remote control that lets you adjust the sound or even switch to VCR or cable without leaving your seat. A full jack panel that has computer monitor capability. And a stylish design that takes up less floor space than a 25" console.

The new Magnavox 37" TV. No matter how you look at it, it's a knockout.

THIS IS MAGNAVOX

National Geographic Files

Two sizes, colors. Lowest yearly cost.

Collect your Geographics for lifetime use. Back issues become valuable for reference, protected from soil, damage, wear. Sturdy bookbinder's board. Gold embossed fronts. Gold numbers for dating. Sold 25 years. Satisfaction guaranteed.

Six A-Size Files. Hold 3 years of Geographics. Book red fronts ... **$15.45** postpaid ($5.15 per year)

Three B-Size Files. Hold 3 years of Geographics. Yellow fronts ..... **$14.50** postpaid ($4.83 per year)

Map File. B-Size. Red or Yellow... each **$5.75** ppd.

Add $3.60 per package for shipping outside U.S.A.

Send order, or call us toll free 1-800-558-2110 (WI 1-800-558-3313) to charge Mastercard, VISA.

A-Red 8 issues | B-Yellow 12 issues

HIGHSMITH CO., INC., P.O. Box 800, Fort Atkinson, WI 53538

NATIONAL GEOGRAPHIC

OWNER AND PUBLISHER: National Geographic Society
EDITOR AND MANAGING EDITOR: Wilbur E. Garrett
HEADQUARTERS OF PUBLISHER AND PUBLICATION: 1145 Seventeenth Street, N.W., Washington, D. C. 20036
STOCKHOLDERS, BONDHOLDERS, MORTGAGES, OTHER SECURITY HOLDERS: None

		Average no. of copies each issue during preceding 12 mos.	Single issue nearest to filing date
A.	TOTAL COPIES PRINTED (Net Press Run)	July '84 - June '85: 10,667,326	June 1985: 10,667,267
B.	PAID CIRCULATION		
	1. Single Copy Sales	81,372	74,284
	2. Mail Subscription	10,326,926	10,348,890
C.	TOTAL PAID CIRCULATION	10,408,978	10,422,964
D.	FREE DISTRIBUTION (Inc. samples) BY MAIL, or OTHER MEANS (No News Agents)	110,041	102,348
E.	TOTAL DISTRIBUTION (Sum of C and D)	10,521,019	10,525,312
F.	OFFICE USE, LEFTOVER, ETC.	76,810	102,020
G.	TOTAL (Sum of E & F)	10,667,229	10,647,267

AUTHORS WANTED BY N.Y. PUBLISHER

A well-known New York subsidy book publisher is searching for manuscripts worthy of publication. Fiction, non-fiction, poetry, juveniles, travel, scientific, specialized and even controversial subjects will be considered. If you have a book length manuscript ready for publication (or are still working on it), and would like more information and a free booklet, please write:

VANTAGE PRESS, DEPT. NA
516 W. 34th St., New York, N.Y. 10001

EXPLORE THE WORLD WITHOUT LEAVING HOME

Host a foreign student for a year or summer.
Call TOLL FREE: 1-800-AFS-INFO.

afs **INTERNATIONAL EXCHANGE PROGRAMS**

313 E. 43rd St., NY NY 10017

No rock star is singing for this child.

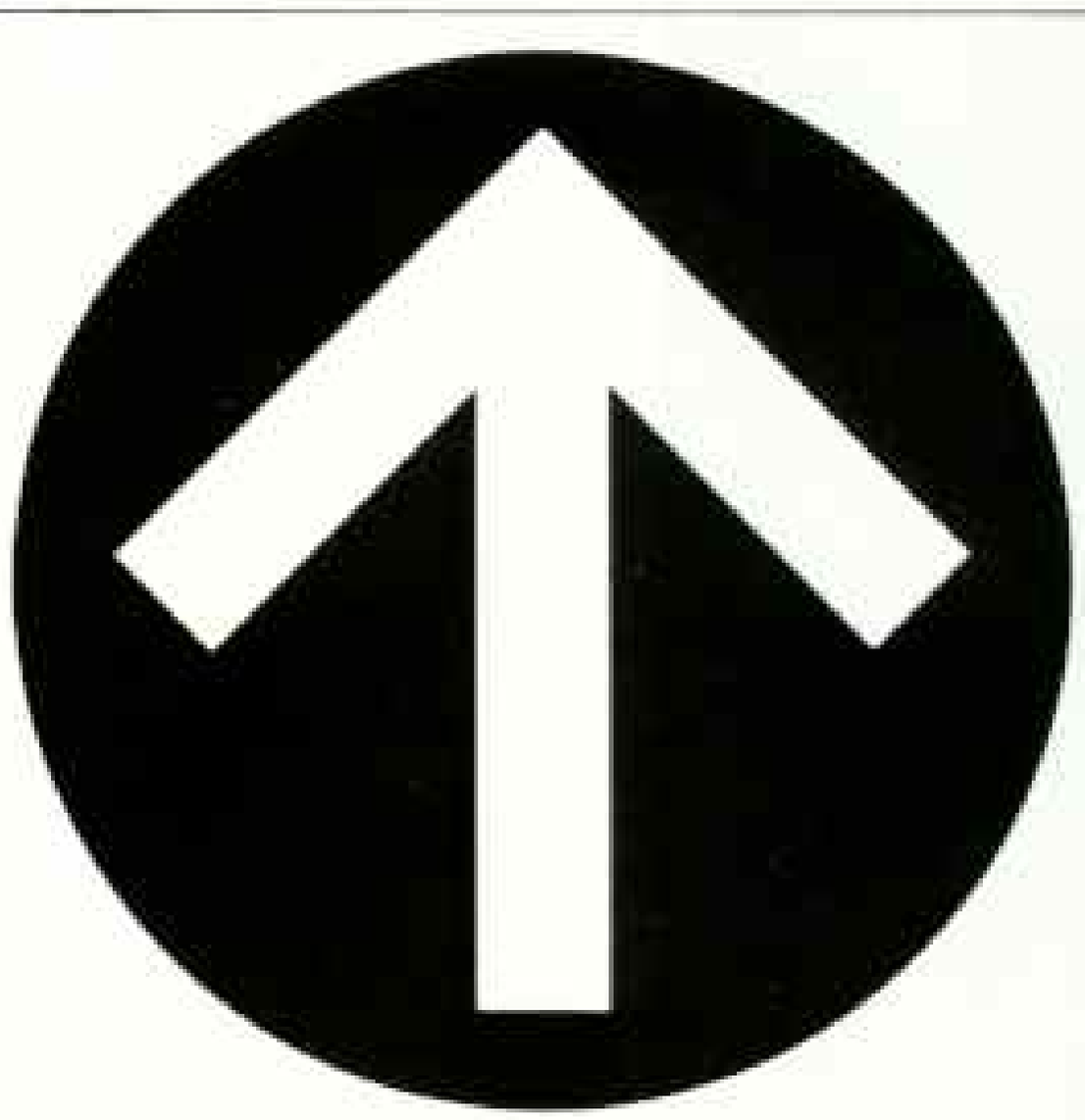
He's from Eritrea. Where millions of Africans are starving to death. Where there are no concerts or airlifts. Just hope. Hope that America will not leave his story unsung.

1 800 225-5669

The Eritrean Relief Committee

We reach the people with 92¢ of each of your dollars.

A non profit organization: 475 Riverside Dr., Rm 240, New York, N.Y. 10115



go for it!

use your library

American Library Association

IN THE WORLD OF HIGH-PERFORMANCE SEDANS MAXIMA SE THRIVES ON COMPARISON.

If a sports sedan doesn't make driving a charged experience, it has no right to exist. Nissan's Maxima SE does just that. In fact, the more you compare Maxima to the best the world has to offer, the better it looks.

Compare Maxima's engine: a fuel-injected, 3-liter V-6 power plant found in only one other car, the awesome 300 ZX. It generates more horsepower than a BMW 325e or an Audi 5000.

Compare Maxima's advanced technology: In addition to 4-wheel independent suspension, you can adjust its electronic shock absorbers 3 ways from the cockpit for a smoother ride over varying road surfaces. No European sports car offers this extraordinary feature.

Compare Maxima's standard equipment: with the Maxima SE, power windows, power brakes, power sunroof, all...standard. Where other cars offer stereo, only Maxima gives you a 6-speaker, AM and FM stereo system with graphic equalizer, Dolby cassette deck and automatic volume control.

Best of all, compare Maxima's price. When you consider everything that Maxima SE comes with, you'll be amazed at how little it goes for.

The Best Extended-Service Plan Available. *When you build a car this good, you can back it this good. Up to 5 years, 100,000 miles. Ask about Nissan's Security Plus® at participating Nissan dealers. If you're looking for performance ...the name is Nissan.*

NISSAN

THE NAME IS
NISSAN

The long and short of zoom lenses.

Nikon fixed focal length lenses have long been the undisputed choice of professional photographers.

What many people don't realize, however, is that Nikon also makes the world's largest selection of zoom lenses. Lenses so superior that pros, who traditionally haven't used zoom lenses, willingly use these.

That's because the same technology and care that goes into building Nikon fixed focal length lenses goes into building Nikon zooms. We offer special features like Nikon Integrated Coating and Nikon Extra-low Dispersion glass. Plus, unlike many lens companies, we make our own glass. So every Nikon zoom produces sharp, high-contrast images, and accurate color transmission.

So if you're looking for a zoom lens, visit your nearest Nikon dealer.

It's where you'll not only find the most. But what many consider the best.

Nikon

We take the world's greatest pictures.

Now Nikon lenses look even better.

NIKON LENS REBATE

Lens	Rebate
24mm f2.8 Nikkor	$25
28mm f2.8 Nikkor	$20
55mm f2.8 Micro Nikkor	$20
85mm f2 Nikkor	$25
105mm f2.5 Nikkor	$25
35-105mm f3.5-4.5 Nikkor	$15
35-135mm f3.5-4.5 Nikkor	$20
70-210mm f4 Series E	$40
80-200mm f4 Nikkor	$25

We're offering rebates on nine of our most popular lenses, from wide angles to telephotos and zooms. So you can get the lens you really want, instead of settling for a brand you don't.

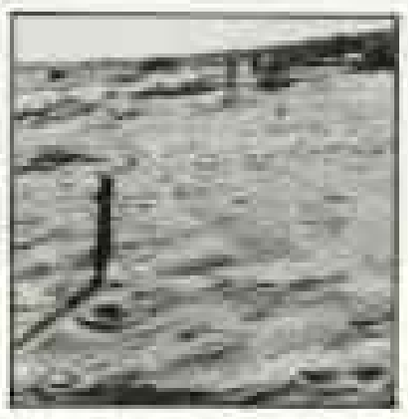
Just make sure the lens you buy comes with an official Nikon Inc. Warranty Application, and get a rebate application from your dealer. When you send in the applications, we'll send you a check—along with your Nikon USA Club membership.

Of course, a rebate offer alone may not convince you to buy a lens. But it might help you to buy the right one.

Nikon

We take the world's greatest pictures.®

COOL THE SUN



A cool shaded home and a searing landscape may seem worlds apart, but the only difference between the two are trees...Conservation Trees that can turn a desert into a cooling oasis.

Thanks to trees, we can cool the rays of the sun. When trees shade our homes, the temperature drops substantially. That means our air conditioners won't have to work so hard in the summer. We save energy, and money as well.

Conservation Trees do a whole lot more. Planted on steep hills, the trees' roots keep the land from washing away when it rains. And in the country, trees can be planted as shelterbelts keeping the soil from blowing away.

Find out how Conservation Trees can help you. For your free brochure, write: Conservation Trees, The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410.

conservation trees™

"As an AT&T systems technician, I know service isn't just a job, it's a way of life.

When a leading Wall Street firm caught fire, I was there before it was even out. Our team worked through the night and had the systems up before the bell rang on Wall Street.

We worked hard all night for one reason.

We can be the difference between a customer's business surviving or going up in smoke.

So we treat all our service calls as though the business were ours. Twenty-four hours a day, seven days a week, year in, year out, we're here to help. Nearly 20,000 of us, the most experienced service force in the country.

Committed to the same basic idea about service."

To find out more, call 1 800 247-1212.

Whether it's telephones, information or network systems, long distance services, or computers, AT&T is the right choice.

AT&T
The right choice.

Finally, an American family car that's changed as much as the American family.

Introducing the new, front-wheel-drive Buick LeSabre Sedan, an automobile designed for today's conditions — and today's families.

The new LeSabre is trim, sleek, aerodynamic.

But first, rest assured that LeSabre is still a genuine family car. It has room — make that comfort — for six passengers.

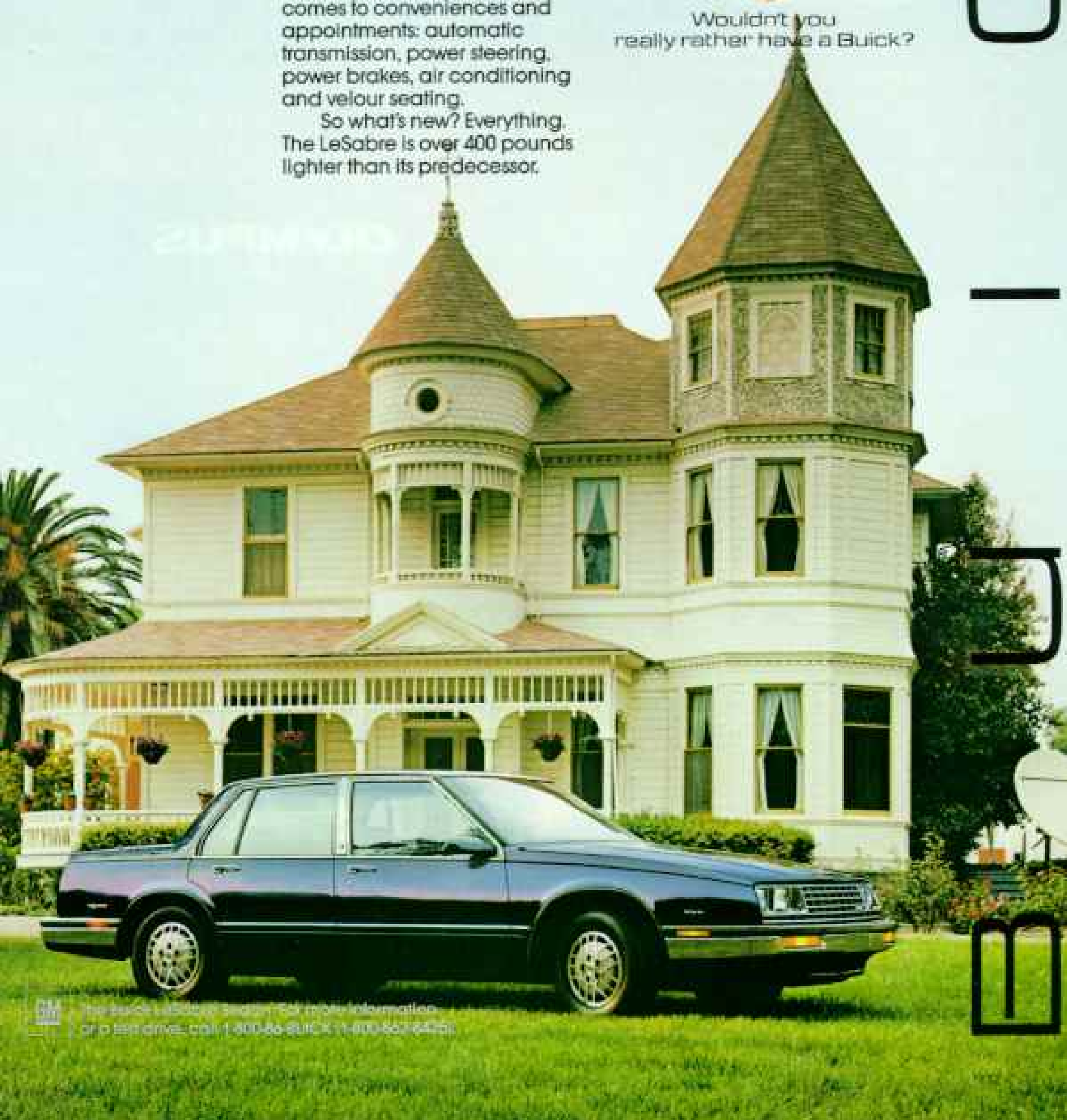
And it is very much a traditional, full-size Buick when it comes to conveniences and appointments: automatic transmission, power steering, power brakes, air conditioning and velour seating.

So what's new? Everything. The LeSabre is over 400 pounds lighter than its predecessor. Protected by clearcoat paint. Built with the aid of computers and robotics.

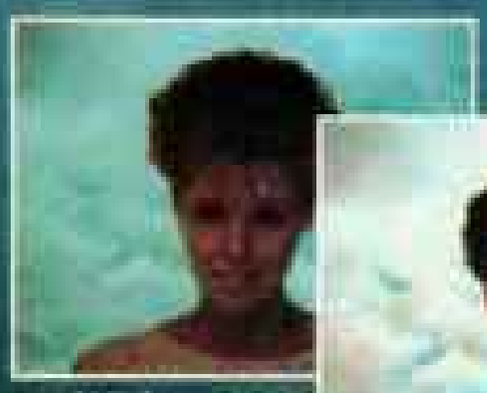
Perhaps best of all, the new LeSabre is responsive, with a 3.0-litre, multi-port fuel-injected engine (not available in California). It is well-mannered, with rack-and-pinion steering and fully independent suspension.

Buckle up and visit your Buick dealer. And experience a family car that's changed as much as your family.

Wouldn't you really rather have a Buick?



Olympus invents ESP for cameras.



Without ESP

With ESP

And suddenly the mind and the camera are one.

Because the new Olympus OM-PC has been blessed with ESP (Electro Selective Pattern metering).

So now you can skip that awkward stage known as beginner.

ESP is a mini-computer brain that intuitively knows what the eye is seeing, and automatically adjusts for light intensity and contrast. All the way from backlit to overlit.

And after you find the exact image you want in the viewfinder, Off-the-Film metering (OTF ™) lifts it out of the air on to film the instant you see it. Just as you see it.

Since the OM-PC also features a choice of Program, Automatic, or Manual modes and prevents all common lighting mistakes, it advances the beginner automatically. While offering the option of over 300 compatible OM System accessories.

You'll see the true value of ESP when you pick up your first set of photos. And discover rich, natural colors instead of washed out or murky prints.

Of course, if you were born with ESP, this whole ad was unnecessary.

You already know the OM-PC will be your first 35mm SLR.

OLYMPUS

There is no longer a choice.

Perceive more about the new OM-PC. Write Olympus, Dept.72, Woodbury, NY 11797. In Canada, W. Carsen Co. Ltd., Toronto.

Last chance to order the perfect gift.

National Geographic Society membership is sure to please everyone on your gift list . . . relatives, friends, and professional associates. Inexpensive and easy to give, it's also a gift your recipients will open with pleasure each month of the year . . . when NATIONAL GEOGRAPHIC brings the world and all its wonders into their homes.

To give Society membership this Christmas, complete the attached form and mail with dues in the envelope provided. Upon request, a gift card will be sent to each person you list. If the form is missing, write to:

National Geographic Society
Washington, D. C. 20036

Capture a butterfly.

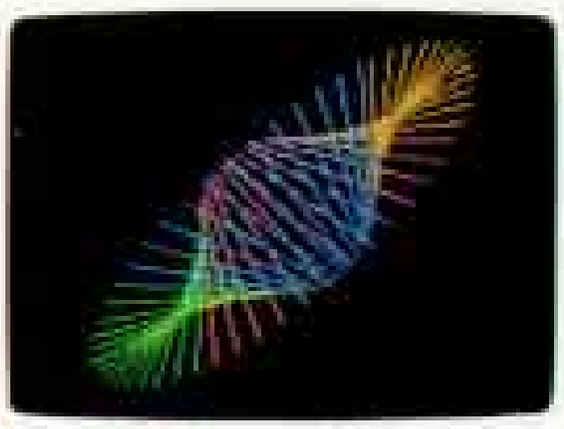
Learn to type.

Draw in living color.

Go around the world.

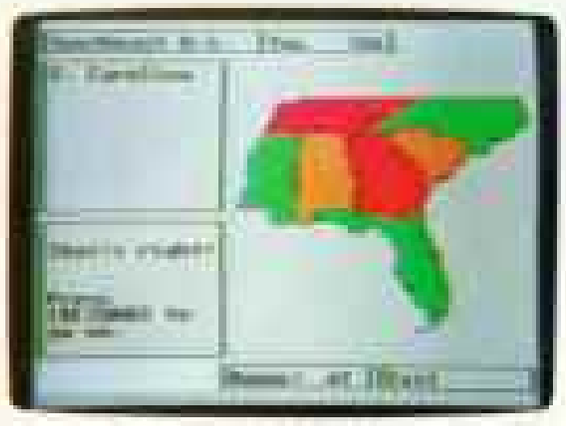
Keep up with the Dow Jones.

Discover new worlds.

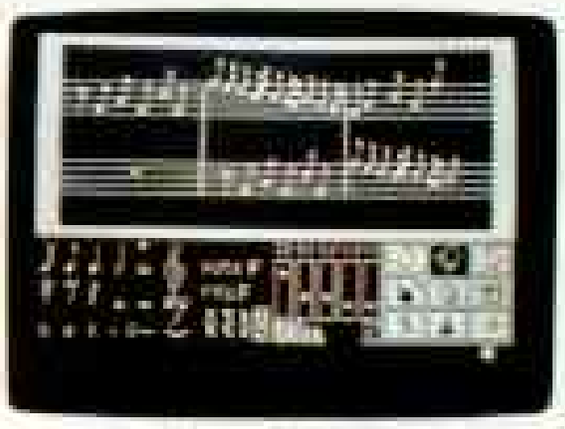


Make one of these.

Memorize your lines.



Teach your kids a lesson.



Name that tune.

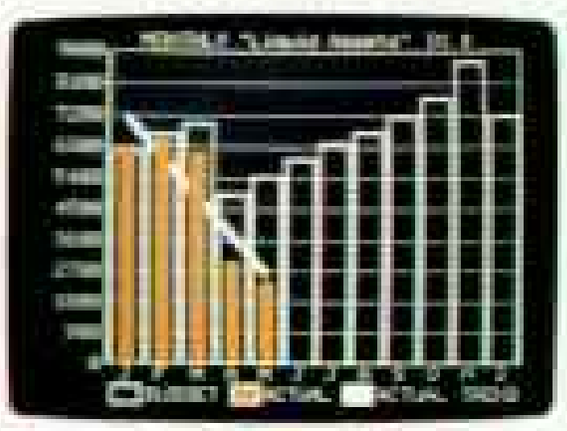
Use a mighty mouse.

You've got a secret.

Say the secret word.

To the moon, Alice.

Read to your kids.



Manage your money.

We have more good family programs than ABC, NBC and CBS combined.

You've taped every episode of the Bill Cosby Show. Twice.

You've flipped through the channels so often that it's worn the decals off your remote control.

And your eight-year-old just came downstairs wearing 12 of your best gold necklaces and asked you to give him a Mohawk haircut, *fool!*

If those are recurring plot themes around your house, maybe it's time you looked into an Apple® IIc Personal Computer.

It can run over 10,000 different programs, the world's largest library of personal computer software. So no matter what anyone in the family wants to do, an Apple IIc can help them do it.

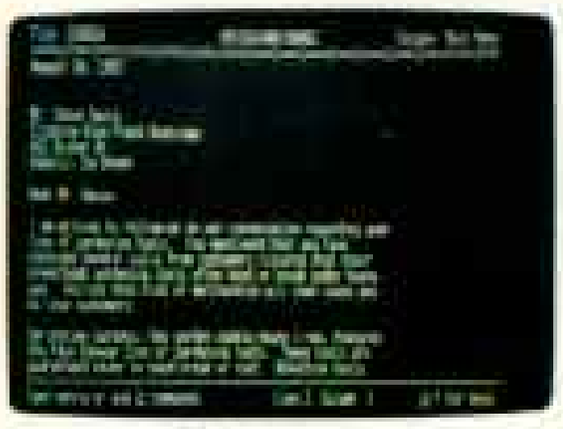
You can manage your personal finances with programs like Dollars and Sense, The Home Accountant and Tax Preparer.

Pop a program like AppleWorks™ into its disk drive, and you've got an integrated spreadsheet, word processor and data base to help you catch up with your work at home.

Or you can select from thousands of specialized

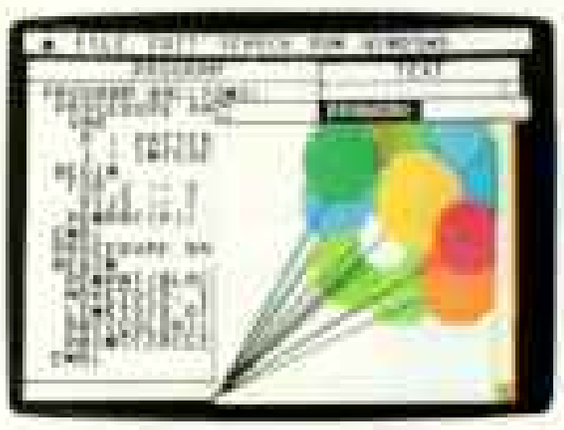
Organize your life.

Book a boat.

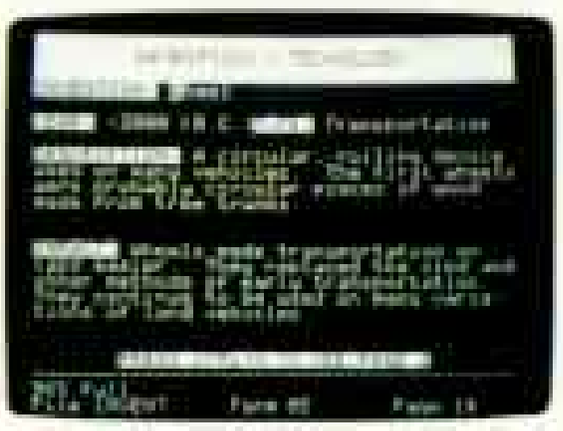


Write a symphony.

Compose a bedtime story.

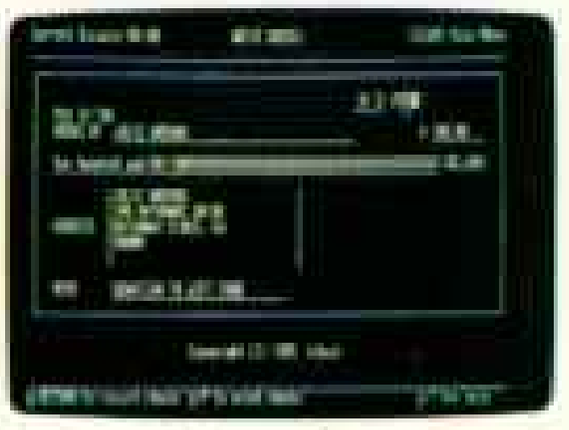


Draw on our resources.



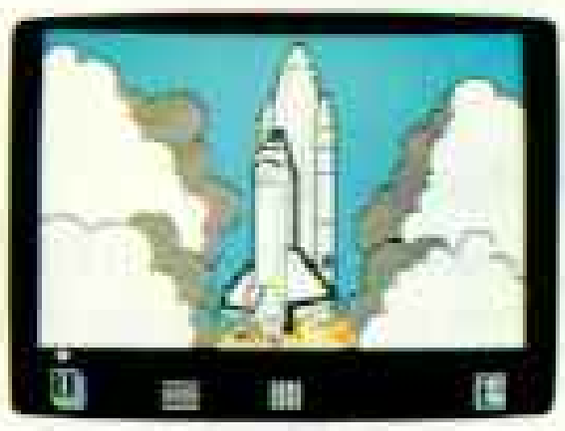
File useful information.

Learn to fly.



Check your finances.

Work at home.



Solve mysteries.

Check your math.

See what's on sale.

programs for doctors, lawyers, contractors, farmers, brokers, screenwriters or just about any other legitimate business.

And, the Apple IIc is a compact version of the computer that's used in schools more than all other computers combined — the Apple IIe.

So, unlike TV, it can teach kids more valuable lessons than how to drive a car through the side of a building without getting a scratch.

Of course, the Apple IIc isn't all work and no play. In fact, it can provide greater adventure fun and excitement than the networks during the new season premieres.

There are programs that let you travel space, solve mysteries,

If you can plug in a TV, you can hook up a IIc.

explore jungles, become an instant millionaire, get elected president and save the world.

And an Apple IIc is as easy to set up as the average VCR. Just take it out of the box, plug in two cords and you're ready to compute.

Plus you can just as easily add things like our new Color Monitor IIc, ImageWriter™ II printer, Apple Personal Modem, mouse and external disk drive.

To see everything an Apple IIc can do live and in person, visit any authorized Apple dealer.

While they may not have all 10,000 software packages on hand, you'll find plenty of programs the whole family will want to run.

And rerun.

An Apple IIc has more accessories than a Veg-O-Matic. Including our ImageWriter™ II printer, Apple Personal Modem and UniDisk™ disk drive.

Members Forum

Planet Earth and Fossils

The computer-generated graphics, informative text, and of course the photographs in the August 1985 issue were exceptional and sure to enlighten those who have never fully understood the mechanics and history of the planet.

Jeff W. Reynolds
Chapel Hill, North Carolina

It is seldom outside museums that one sees such a marvelous cornucopia of ancient living remains as in the "Fossils" article. The images have a most eerie quality, as if they were the product of a stop-action camera, of life caught in the fullness of its time and place.

D. A. Dispenja
Oregon City, Oregon

If evolution is true, then the Bible is a dead book, BUT, if the Bible is correct, evolution is a dead theory! They cannot both be valid.

Cynthia Keen
Jacksonville, Florida

The Book of Genesis, without benefit of 20th-century scientific knowledge, almost parallels the same sequences of Earth-life origins as presented in the August issue. A correlation? Certainly not coincidence. Food for thought.

Louis A. Jankoski
Piscataway, New Jersey

I'm becoming more distressed by the Society's attempt to educate everyone on its concept of the origin of the Earth. I'm tired of the attitude that evolution is a fact of life and not the controversial theory that it is. I would like to see research that promotes other theories.

Leonard Root
Angleton, Texas

Behind these NATIONAL GEOGRAPHIC articles lies a vast array of studies of the fossil record, geologic strata, radiometric dating, molecular biology, embryonic development, and comparative anatomy. This observable body of facts demonstrates that earlier life-forms were ancestral to later ones. Some early forms have been so successful at adapting to various environments that they have survived into the present while others have become extinct. Scientists theorize how new species develop out of parental stock, debating the importance of random change, mutation, and isolation, but very few dispute evolution itself.

Members Forum

In the September 1985 issue, a member perceived the presentation of the big bang theory as a fact and questioned, "Is it not just a theory?" The implication is that a fact is a more powerful explanation than a theory. Facts reflect the state of things as they are. But facts may be trivial, and they also change through time as knowledge increases. They are not unalterable truths.

A theory is a synthetic explanation that takes all the facts into account and provides an explanation for them; it makes predictions that can be tested. A theory is not a guess or a trivial explanation, as implied when frequently dismissed as "only a theory." To ascribe to a single fact a stability denied a theory is putting the cart before the horse.

William V. Mayer
Boulder, Colorado

Murray River

Louise Levathes and David Robert Austen blend their talents superbly in portraying the variegated beauty and distinctive charm of the River Murray (August 1985). Here at Albury-Wodonga, where the Murray leaves the mountains, we are developing a major new city—now the second largest inland center in Australia. High tech, both imported and indigenous, sits comfortably alongside the more traditional Aussie way of things. For the record, readers can mark Albury-Wodonga on the blank spot on the map, pages 256-7, and also mark it as the most happening city in Australia.

Gordon F. Craig
Albury, Australia

Albury-Wodonga (population 63,000) is located just west of the Hume Dam and should have been named. There is certainly a there, there.

Mexican Border

To those of us who live in close proximity to the Mexican border, the conditions in "Life on the Line" (June 1985) are a continuing horror story. As long as employers can hire illegal aliens without penalty, the border will never be under control. The refusal of Congress to pass the Simpson-Mazzoli bill condemned the illegals to conditions of servitude right out of the Dark Ages. Americans will say, "Without the illegals we couldn't get the crops out." A similar justification for slavery was offered in the antebellum South. The border problem will only get worse unless drastic action is taken. The information in your article will, perhaps, help bring about that action.

Olive Weber
Santee, California

As Mexico's population grows, the problems will only get worse. It won't be long before somebody

applies the rules of our national sport of self-criticism to Mexico, using the terms we would employ about ourselves if the U. S. were doing to another country what Mexico is now doing to us. The six million illegal residents will be termed an "outright invasion." The demands for the teaching of Spanish and Hispanic customs and for the creation of media to carry Spanish articles and programs will be called "cultural imperialism." The demands for restriction-free travel and employment for Mexican nationals within our borders will be termed "extreme arrogance."

Rick Waddell
Fort Lewis, Washington

How can you say illegal immigration is helping our economy? It helps the manufacturers, granted, but what of the working people in America who cannot get raises because of an overabundance of workers? What of us who are struggling to get a job without a skill? There are so many vying for unskilled jobs that there will not be a decent wage—ergo welfare. Tell me that doesn't hurt our economy. (It cost us a day's pay to order your magazine, and then you put something ridiculous in it.)

Gail Simmons
Santa Fe, Texas

Your author suggests that "In a sense the Mexicans are repopulating their own lost territories." This makes two false assumptions—first, that there was an appreciable Mexican population and authority in the lands ceded to the U. S. Second, that the cruel *yanqui* conquerors somehow depopulated that territory after winning it. Mexico inherited the old Spanish territorial claims but did even less than Spain to make them good. Mexico had little authority throughout those "lost provinces" in 1846. Mexican tradition is one thing, the sad facts are another.

Col. John R. Elting
Cornwall-on-Hudson, New York

The entire area that is now California, Nevada, and Utah, part of Arizona, New Mexico, and Colorado, and a slice of Wyoming was indeed part of Mexico at the time of the Mexican War. It contained approximately 80,000 people; all except about 2,000 became U. S. citizens after the Treaty of Guadalupe Hidalgo of 1848.

In your excellent article I disagree with the item that the U. S. paid a small price for the territory they have. My American history states that a small band of Texans was massacred at the Alamo by overwhelming Mexican forces. I am afraid some people don't consider a life much of a price.

Loran Ritchie
Belleville, Illinois

Members Forum

An article about Sam Houston, planned for 1986 and the Texas sesquicentennial, will explore such issues. It will be accompanied by a historical map of Texas.

Moguls

In the April 1985 issue Mike Edwards writes of "the destruction of [Hindu] temples as specified in the Koran." I have been reading the Quraan for the past 35 years and could not find such a specification. What I have found is to the contrary.

Mohammed Kottakode
Riyadh, Saudi Arabia

We should have made it clear that Mogul ruler Aurangzeb's interpretation of Islamic law led him to issue a firman, or decree, forbidding construction of new Hindu temples, and in 1669 to order provincial governors to demolish the schools and temples of "infidels."

Geographic Education

Regarding the survey of North Carolina students in your June 1985 President's Page, one means of relieving such ignorance of the world is the pursuit of amateur radio as a hobby.

Ham radio opens a new perspective on the geopolitical structure of our world. On a typical night recently I talked to Vas in Bombay about

the beginning of the rainy season, John in Newfoundland about his computer project, and Moshe in Israel about a terrible train crash. Rare and wonderful places are inhabited by hams, who spread their knowledge and ideas freely, without reference to race, color, or creed. The spirit of inquiry is fostered. The atlas becomes a true friend; how else do you find out where Ouagadougou is?

Roger Hill
Barbados, West Indies

If children can't learn geography in school, what better way to know the world than through your fantastic magazine! An example is my 75-year-old uncle who had never left Ecuador. When we took him to Europe last year to visit 14 countries, *he* was the one who pointed out the geographic marvels. How did he know? He had been a member of your Society for 50 years. My children read my issues now. *¡Muchas gracias de todo corazón!*

Alicia Duran-Ballen
Quito, Ecuador

You're welcome.

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.*

ENERGY INDEPENDENCE

Can nuclear energy and coal free America from foreign dependence?

Last year, we paid $58 billion to foreign suppliers for oil and natural gas. That was almost half of the entire U.S. trade deficit for 1984.

America still consumes a lot of energy from other countries. Greater use of nuclear energy and coal, which are domestic sources of our electricity, reduces this risky dependence.

The trouble with foreign energy supplies

The U.S. doesn't have much control over the future price or availability of energy from other countries.

For now, the price of oil (and of other energy sources as well) has stabilized. But no one knows how long this price stability will last. No one knows whether Persian Gulf oil will suddenly be cut off from the free world, which still depends heavily on it.

Such a cutoff could *double* the price of oil.

To lessen their dependence on foreign oil, countries like Japan, France and West Germany are all building more nuclear-electric plants.

Nuclear energy replaces oil

Here in America, nuclear-generated electricity has already saved between 1.7 and 2.7 *billion* barrels of oil. Completing the 32 plants under construction will help save billions more by the turn of the century.

The fact is, oil-burning power plants aren't used very much when you can get electricity from nuclear power plants instead. And the U.S. already has 95 licensed nuclear plants.

Nuclear energy has grown to become the nation's second leading source of electricity, behind coal.

Coal and nuclear: homegrown and plentiful

Another major source of "homegrown" energy is coal. We have more coal and more uranium than any other country in the world. Enough to last us hundreds of years, and enough to guard against a risky dependence on foreign energy sources.

Two-thirds of America's electricity now comes from coal and nuclear power. By 1990 it'll be three-fourths, according to the Federal government's energy forecast.

Safe, efficient use of these abundant resources will continue to strengthen U.S. energy security.

For a free booklet on the struggle for energy independence, write the U.S. Committee for Energy Awareness, P.O. Box 1537 (N14), Ridgely, MD 21681. Please allow 4-6 weeks for delivery.

Information about energy America can count on

U.S. COMMITTEE FOR ENERGY AWARENESS

DODGE CARAVAN
5/50 PROTECTION, STANDARD.

UNEQUALED.

GIVE THE PEOPLE WHAT THEY WANT...

Just two short years ago, Dodge Caravan carved a brand new niche in the American automotive marketplace. There was nothing quite like it and there still isn't. It's a combination economy car. Luxury car. Family sedan. Station wagon. And van. Evidently, it's just the right combination, because people keep buying them almost as quickly as we can build them.

HAULS PEOPLE. HAULS CARGO. YOU CAN EVEN SLEEP IN IT.

Caravan has an amazing capacity for people and things. It hauls plenty of cargo. (Up to 125 cubic feet.) Or, depending upon the type of seating you choose, up to eight adults. *Comfortably.* And, if you add the converta-bed that sleeps two, you'll find that Caravan can even become your home away from home.

Caravan measures up nicely on the outside, too. It's a mere 5'4" tall, which makes it easy to step in and out of—or to slip into your garage. And Caravan's actually shorter in length than a full-size station wagon. So it's easy to park, maneuver and handle.

THE ONE AND ONLY WITH 5/50 PROTECTION AND FRONT-WHEEL DRIVE.

Although the success of Caravan has prompted others to jump on the "mini-van" bandwagon, there's still nothing quite like it. No other vehicle of its kind offers front-wheel drive to move you easily through mud, snow and rain. And no other vehicle like it offers a standard 5 year/50,000 mile Protection Plan.* Which means Caravan is *still* at the head of its class.

GET YOUR OWN TRANSPORTATION REVOLUTION.

The revolutionary Caravan. Try one on for size...even buy or lease* your very own at your Dodge dealer. It has a capacity to please that remains unequaled...once again for 1986.

Dodge
DIVISION OF CHRYSLER CORPORATION

AN AMERICAN REVOLUTION

*Whichever comes first. Limited warranty on powertrain and outer body rust-through. Excludes leases. Restrictions apply. See copy at dealer.

BUCKLE UP FOR SAFETY.

Announcing the 1986 Seville.

The new essence of elegance.

You've never seen a Seville like this before. The tailored, smooth-flowing design looks invitingly contemporary, yet its understated elegance remains strictly Seville.

On the road, the 1986 Seville handles magnificently. Trim, taut, and responsive. Without sacrificing the luxury you expect from the ultimate Cadillac.

Behind the real American walnut-trimmed instrument panel lives an electronics system so advanced it was inconceivable a few short years ago. Technology not just for technology's sake, but technology designed to contribute to your driving comfort.

An especially revealing way to appreciate the 1986 Seville is to study the obvious attention to detail. The fit. The finish. The smooth flow of one design plane into the next. The precision of the electronic instrumentation. The quality of Seville is backed by a 4-year/50,000-mile limited warranty. In some cases, a deductible applies. See your dealer for details.

Destined to become another American classic, the 1986 Seville. The perfect combination of luxury and technology.

1986 SEVILLE

BEST OF ALL...
IT'S A CADILLAC.

Introducing New Maragor Bold From Taster's Choice®. A Superior Dark Roasted Coffee.

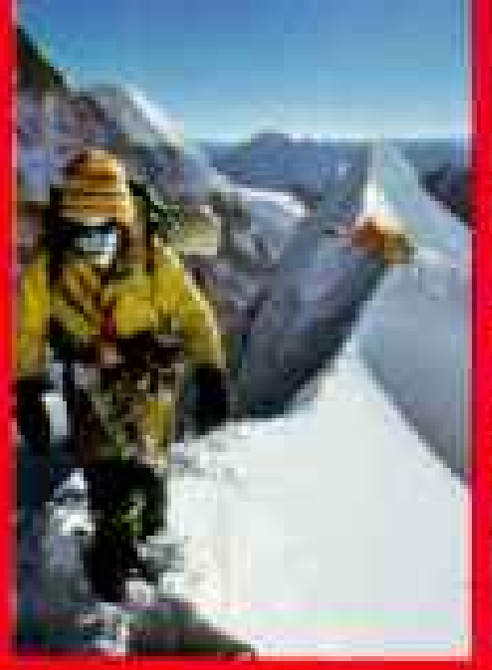
The taste is bold, strong, smooth.

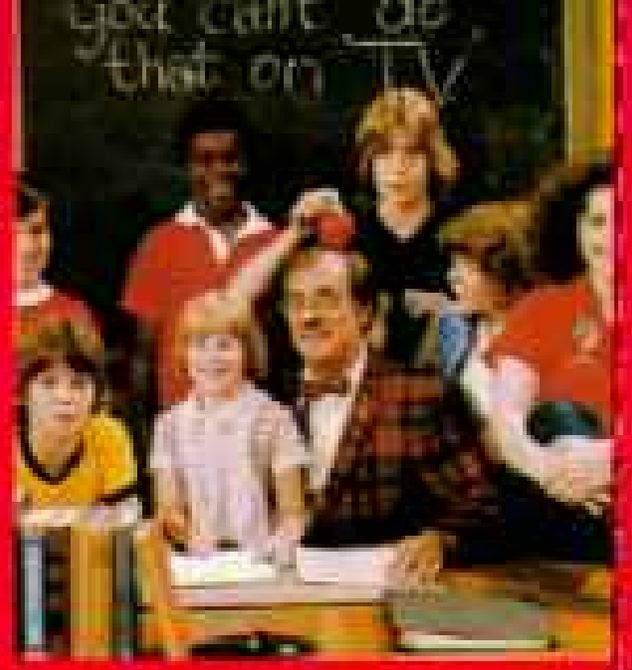
New Maragor Bold™ begins with the world's fullest-flavored gourmet coffee beans, specially selected for dark roasting.

Then they're roasted long and roasted dark until they practically burst with rich, bold coffee flavor.

For a superior, stronger coffee, try new Maragor Bold. And Maragor Bold Naturally Decaffeinated.

The Choice For Taste.





Nickelodeon, America's most respected cable network for children, is now for adults, too! We've enriched our programming with the prestigious National Geographic EXPLORER series. And thanks to the new Nick at Nite, Nickelodeon brings you quality television 24 hours a day.
To get Nickelodeon, call your local cable company.

December on Nickelodeon!

EASTERN TIME	MONDAY THROUGH FRIDAY
6:00–6:30 AM	Dangermouse ★
6:30–7:00	Nick Rocks
7:00–7:30	Black Beauty ★
7:30–8:00	Lassie
8:00–8:30	The Little Prince/Belle & Sebastian
8:30–9:00	Today's Special
9:00–2:00 PM	Pinwheel ★
2:00–2:30	Today's Special
2:30–3:00	The Little Prince/Belle & Sebastian
3:00–3:30	Black Beauty
3:30–4:00	Lassie
4:00–4:30	You Can't Do That On Television
4:30–5:30	Turkey Television
5:30–6:00	Dennis the Menace
6:00–6:30	Mr. Wizard's World
6:30–7:00	Nick Rocks
7:00–7:30	You Can't Do That On Television
7:30–8:00	Dangermouse/Bananaman

	SATURDAY	SUNDAY
6:00–6:30 AM	Dangermouse ★	
6:30–7:00	Nick Rocks	
7:00–7:30	Powerhouse	
7:30–8:00	Kids Writes ★	
8:00–8:30	Out of Control	
8:30–9:00	Belle & Sebastian ★	
9:00–9:30	Star Trek "Animated"	The Little Prince
9:30–10:00	Mr. Wizard's World	
10:00–10:30	Lassie	
10:30–11:00	Dennis the Menace	Turkey Television
11:00–11:30	Nick Rocks	Dangermouse/ Bananaman
11:30–12:00		Star Trek "Animated"
12:00–12:30 PM	You Can't Do That On Television	
12:30–1:00	The Little Prince	Nick Rocks
1:00–1:30	Belle & Sebastian	
1:30–2:00	Lassie	
2:00–4:00	Special Delivery	
4:00–5:00	Standby... Lights! Camera! Action!	
5:00–6:00	Livewire	EXPLORER
6:00–6:30	Out of Control	
6:30–7:00	Star Trek "Animated"	
7:00–7:30	YCDTOTV	
7:30–8:00	Dangermouse/ Bananaman	

Nick at Nite™

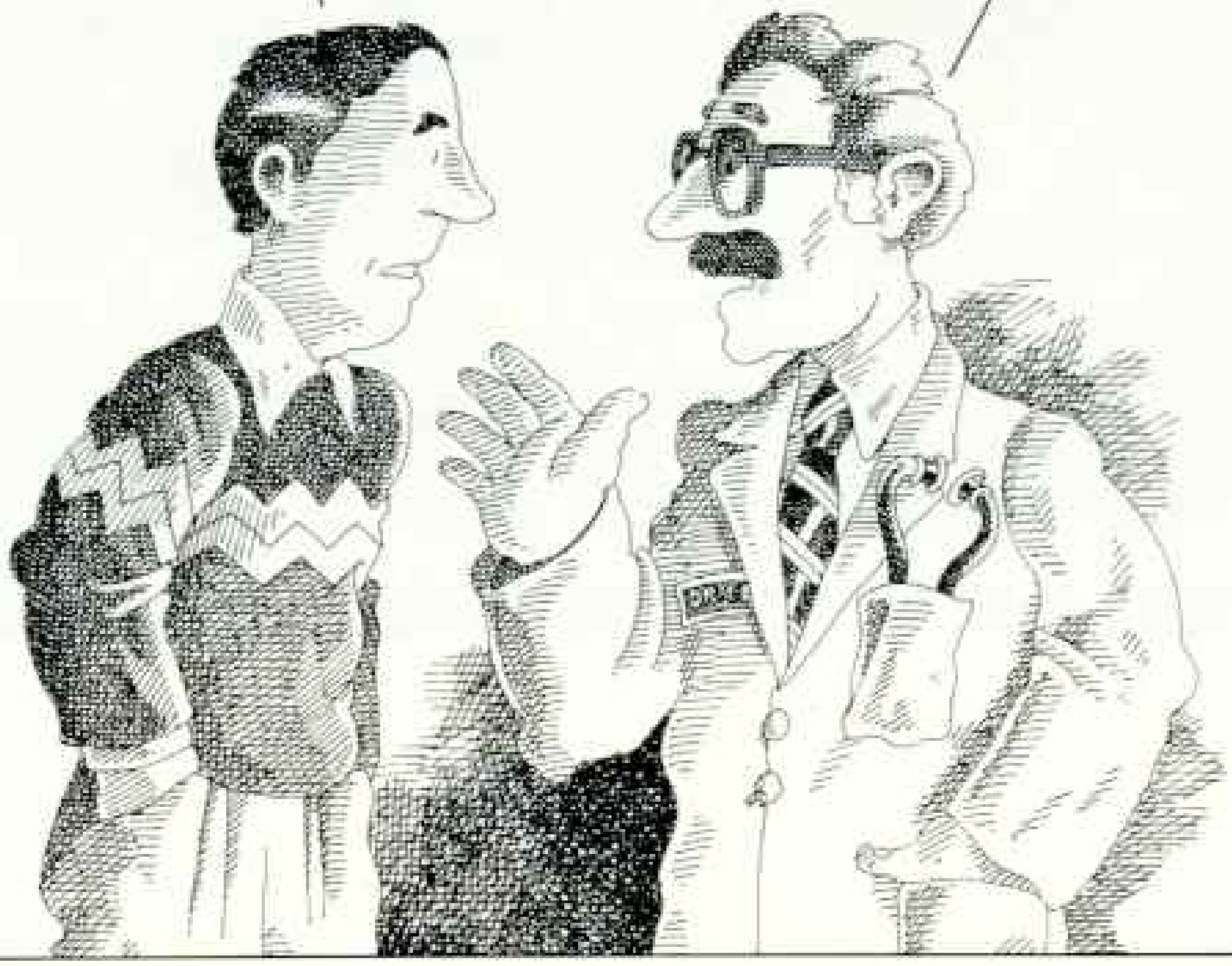
	MONDAY THROUGH FRIDAY	SATURDAY	SUNDAY
8:00–8:30	My Three Sons	EXPLORER	My Three Sons
8:30–9:00	The Donna Reed Show		Donna Reed
9:00–11:00	Nick at Nite Movie		Movie
11:00–12:00	Turkey Television	Turkey Television	
12:00–1:00 AM	Route 66	Route 66	
1:00–1:30	Dennis the Menace	EXPLORER	My Three Sons
1:30–3:00	The Donna Reed Show		Donna Reed
2:00–4:00	Nick at Nite Movie		Movie
4:00–5:00	Turkey Television	Turkey Television	
5:00–6:00	Route 66	Route 66	

Schedule is subject to change without notice.

★ Watch Bill Cosby on "Picture Pages" after the shows indicated. During "Pinwheel," "Picture Pages" is on at approximately 9:55 am and 12:55 pm.

"I take my
high blood pressure
pills only when
I'm nervous
or upset."

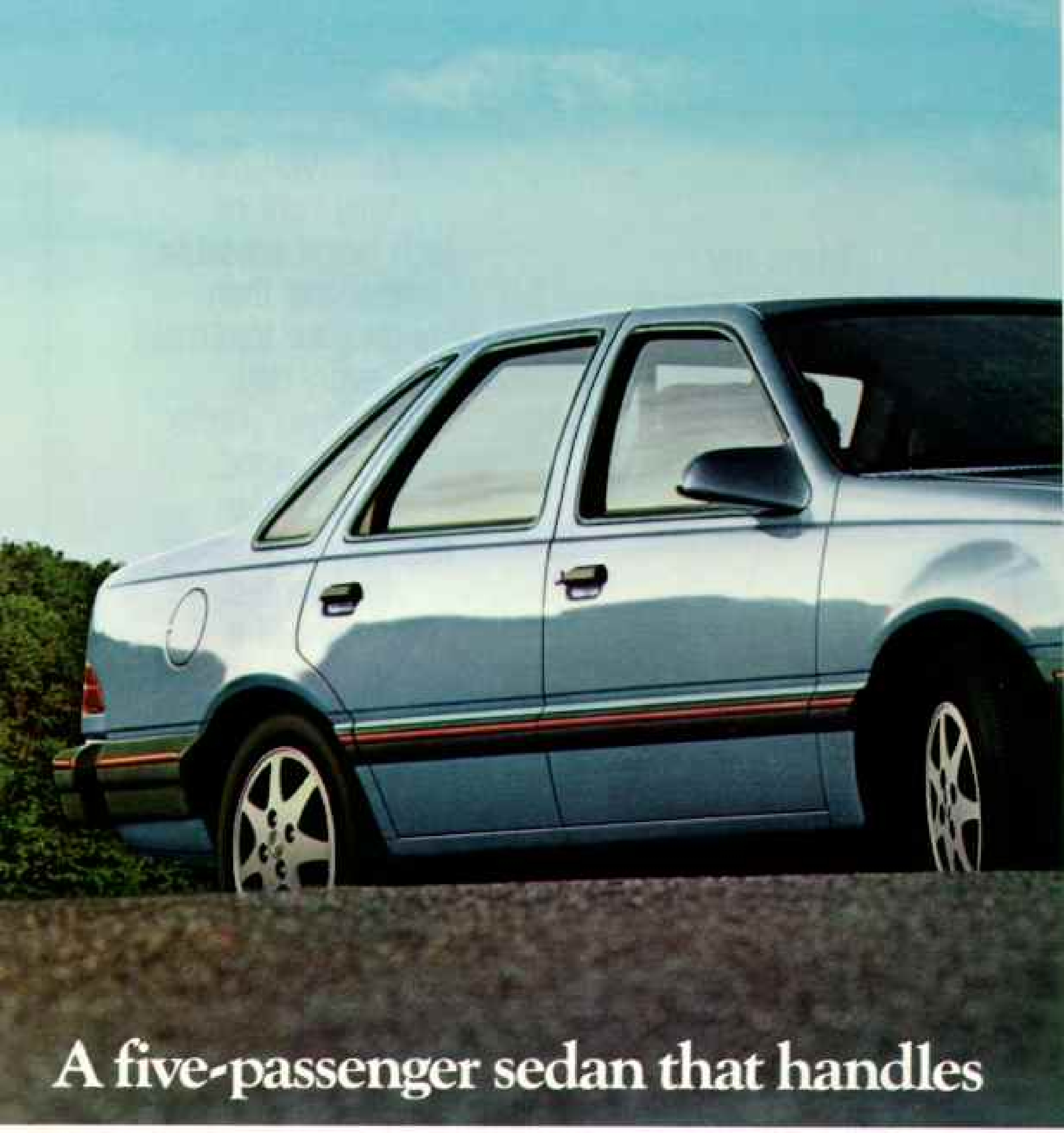
"No. . . you can't
take care of
high blood pressure
now and then.
Stay on your treatment
every day.
Even when you're
feeling good.
Don't take
high blood pressure
for granted.
Take care of it. . .
every day."



HIGH BLOOD PRESSURE

Treat it for life.

The National High Blood Pressure Education Program
The National Heart, Lung, and Blood Institute, National Institutes of Health
Public Health Service, U.S. Department of Health and Human Services



A five-passenger sedan that handles

For those to whom the phrase "passenger car" conjures up images of hard-to-drive machines, we proudly present an easy handling modification of that term: Ford Tempo.

On the open road.

Tempo's 4-wheel independent suspension helps to keep disturbances at one wheel isolated from the rest of the car for a smooth ride. A specially developed 2.3 liter fuel-injected engine provides smooth, tractable power.

Of course, the most noticeable difference in Tempo's definition of "passenger car" is in the way it looks: a smoothly rounded shape and raised rear deck manages airflow to reduce front and rear lift. One result is increased stability and road control. Another is a remarkably commodious trunk.

In the open interior.

Tempo's clean shape reduces wind noise. A computer was used to design the interior, resulting in well-

Ford Tempo. The for

Buckle up—Together we can save lives.

conceived placement of controls, and a space-efficient, comfortable passenger compartment. If your passengers happen to be of the small variety, Tempo even comes with child-proof door locks, standard.

Ford Tempo. Designed to handle roads. And passengers. And luggage. And...

"Quality is Job 1."

A 1985 survey established that Ford makes the best-built American cars. This is based on an average of problems reported in the prior 6 months on 1981-1984 models designed and built in the U.S.

Lifetime Service Guarantee.

Participating Ford Dealers stand behind their work, in writing with a free Lifetime Service Guarantee for as long as you own your Ford car or light truck. Ask to see this guarantee when you visit your participating dealer, where you can buy or lease a Ford Tempo.

Have you driven a Ford... lately?

Ford

ward thinking car.

On Assignment

VICTOR R. BOSWELL, JR.

"SO YOU'RE THE ONE," said Pope John Paul II to GEOGRAPHIC photographer ***Jim Stanfield,*** far right, who with his wife, Barbara, and Director of Photography ***Robert E. Gilka*** and his wife, Jan, attended an audience in St. Peter's Square last May. "I had been covering Vatican City for months and asking to shoot a lot of subjects out of the ordinary," explains Jim. "The Pope had seen me around, but this was the first time we spoke."

Jim often worked with fellow GEOGRAPHIC photographer ***Vic Boswell,*** as when they spent six hours positioning 33 photo lights in the Vatican Library and then "about 20 minutes making the picture" (pages 766-7).

Certain that he had worn out his welcome, Jim was surprised when one of our editors received a letter from Marjorie Weeke, Vatican liaison for the media. "His name has gone down in Vatican history," she wrote. "I'm sure that if I go to the audience this morning in the piazza, the Holy Father himself will look around and ask: 'Where's Stanfield?'"

Such perseverance is a trait encouraged by Bob Gilka, one of the most respected figures in photojournalism, who retired in July after 22 years as the GEOGRAPHIC's photo chief. Speaking for his colleagues, Jim says, "Bob was always looking for a fresh eye and encouraging young photographers. Early in my career, about 1964, he wrote me: 'Strive to be an individual. Once you're satisfied with photographing the subject in the same style or manner, you're defeated.' He always wanted more out of you, and you were willing to do it, no matter what it took." Yet Bob was a man of few words. "If you got one grunt," says Jim, "you did pretty well. If you got two grunts, the story must have been a blockbuster."

Deeply committed to the educational efforts of the National Press Photographers Association, Bob made his mark outside the Society as well, judging photo contests and teaching—work from which he plans no retirement.

Photographed by Tsuneo Hayashida *Red-crowned Crane: Genus: Grus Species: japonensis*
Adult size: *Stands 1.5m tall; females are slightly smaller* ***Adult weight:*** *Approximately 10kg*
Habitat: *Wetlands in portions of China, Siberia, Korea and Hokkaido, Japan*
Surviving number: *319 in Japan; estimated 700 in China, Siberia and Korea*

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

During the harsh winters on Hokkaido, Japan's northern island, red-crowned cranes roost communally in shallow unfrozen rivers where water temperatures are considerably warmer than the air. The Hokkaido population is non-migratory, but on the Asian mainland these birds migrate thousands of miles between their breeding and wintering grounds. Also known as Japanese cranes, red-crowned cranes are threatened today by the continuing development of their wetland habitat, and depend entirely on strict protection for their future survival.

Nothing could bring back the red-crowned crane 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 ancient symbol of love and happiness, the red-crowned crane has inspired countless generations of poets and artists in the Orient. More recently, photography has offered people around the world the opportunity to understand and appreciate this magnificent bird.

And understanding is perhaps the single most important factor in saving the red-crowned crane and all of wildlife.

Canon

Images for all time