VOL. 146, NO. 5 NOVEMBER 1974

NATIONAL GEOGRAPHIC

GUATEMALA, MAYA AND MODERN

THE VIRGINIANS

2,300-YEAR-OLD GREEK SHIP REACHES PORT AT LAST

THE RENAISSANCE LIVES ON IN TUSCANY

SCOTLAND'S HAUNTING INNER HEBRIDES

THE RED SEA'S SHARKPROOF FISH

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

NATIONAL GEOGRAPHIC

THE NATIONAL GEOGRAPHIC MAGAZINE VOL. 146 NO. 5
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THE FIRST ISSUE of NATIONAL GEOGRAPHIC appeared 86 years ago. In that exceptional life-span, 5,575 articles have documented momentous changes in man's knowledge and in man's society. We like to believe that each of those articles met the test of our editorial policy: They were factual, of enduring value, and held up the light of knowledge without generating the heat of controversy.

In this age of "advocacy journalism," of rapidly changing institutions and customs, and of recurrent political crisis, adherence to this policy becomes ever more difficult. Scientific evidence often provides new facts that reshape old ideas; witness the present ferment in the field of carbon-14 dating.

An average of 3,000 letters a month arrives at the Geographic's editorial offices. We answer every one that poses a serious question. Even so, we have felt an increasing need to communicate directly with our 9,000,000 members, acknowledging their comments and sharing their concerns. We hope that this monthly column will satisfy that need.

Our objective—to keep current, to remain factual, to report without speculating—is most challenging in the field of human society. When we published Gordon Young's recent report on Chile and Ken MacLeish's timely essay on Cyprus, we anticipated the conflicts that thrust those places into the headlines.

But occasionally events move too fast for us and we must pay the price. Such was the case with Robert Azzi's article on Damascus in April 1974, a portion of which described the dwindling Jewish community in that Arab capital. For years we had been unable to report on Damascus at all, though the Geographic's Middle East coverage in the past decade alone has included seven major articles on Israel, as well as others on Jordan, Lebanon, Saudi Arabia, Yemen, Egypt, and Kuwait.

Mr. Azzi, a free-lance journalist, interviewed a leading rabbi in Damascus and reported a good deal of tolerance in Syria's treatment of its Jewish minority. As is our custom, we checked every fact in the article, both with those quoted and with experts. The difficulty of obtaining reliable nonpartisan information was compounded by a new round of fighting; as the article came off the presses, reports from Damascus of the barbaric murder of four Jewish women focused world attention on the plight of Damascene Jews. Many of our Jewish members sharply criticized us for not delineating in greater detail the harsh conditions under which that small community has been forced to exist since 1948. We began to wonder if we had unwittingly failed to reflect the true situation. Now, after months of carefully reviewing the evidence, we have concluded that our critics were right. We erred.

Ironically, Mr. Azzi has been declared persona non grata in Syria—for the "pro-Zionist" stand of his article! Finding the middle ground in the Middle East is a precarious undertaking.

We realize that to report at all on the modern world is to risk such eventualities. It is our hope that this page will provide a forum to air valid differences that arise from our articles. And we will continue to publish background reports on sensitive areas of the world—sticking not to our guns but to the facts as we find them.

Gilbert M. Grosvenor

November 1974

The Virginians 588

There's a bit of the Old Dominion in us all, staff writer Mike Edwards and photographer David Alan Harvey discover as they visit the people of Virginia—and the Virginians in turn talk of their state's founders.

Last Port for the Oldest Ship 618

Up from the sea floor off Cyprus comes a 2,300-year-old jigsaw puzzle. Marine archeologists Susan and Michael Katzev tell how it was pieced together.

The Renaissance Lives On in Tuscany 626

Luis Marden, veteran chief of the Geographic's foreign editorial staff, explores the region that—more than any other—gave birth to modern man. Photographs by Albert Moldvay.

Guatemala, Maya and Modern 661

Louis de la Haba describes the two faces of this Central American land: one Indian and fiercely traditional, the other contemporary and swiftly changing. Photographs by Joseph J. Scherschel.

Scotland's Haunting Inner Hebrides 690

Of Highland blood himself, Kenneth MacLeish seeks out the fragile folkways of these "highland islands" moored in the North Atlantic. Photographs by R. Stephen Uzzell III.

The Red Sea's Sharkproof Fish 718

An unassuming sole holds its own against the sea's most efficient predator. Studying its defense mechanism, famed zoologist Eugenie Clark finds that its toxin may, at last, lead to development of effective chemical protection against shark attack. Photographs by David Doubilet.

COVER: *"San Juaneros"—Indians of remote San Juan Atitán, in Guatemala's highlands—gossip on a Saturday as one spins thread for a homespun garment (pages 661-89). Photograph by Joseph J. Scherschel.*

Heirs to a bittersweet heritage of peace and war, they knew a golden age two centuries ago—and build tomorrow while remembering yesterday. Here, viewed in cross section, are

The Virginians

By MIKE W. EDWARDS
NATIONAL GEOGRAPHIC STAFF

Photographs by DAVID ALAN HARVEY

"A SLUNK, that's what I call a run-down shad like this." Will Custalow, a great mountain of a man, sat in the stern of his skiff (**right**) and scowled at the slack-sided fish in his gill net.

"What I want is a nice roe shad, not one of these ol' grumpy things." We paddled on, watching for bobbing floats on the knotted nylon Will had payed into the Mattaponi River. Prized for both meat and roe, the shad are annual spring visitors to Virginia's Tidewater. Long before white men came, Indians like Will waited for the silvery schools.

Historians have sketched the Tidewater Indians as the Jamestown settlers saw them: handsome men and women who gathered clams and oysters, shot deer, snared wildfowl, grew corn and beans and squash, and fished with nets of woven grass.

Chief Deerfoot Buries the Hatchet

As I waited with Will for the shad that afternoon, I think I came as close as I ever will to glimpsing Virginia at the threshold.

Of the considerable tribal lands guaranteed by treaties, only postage-stamp reservations remain: 800 acres belonging to the Pamunkey tribe, 125 to Will's brothers, the Mattaponis. The true First Families of Virginia were cheated out of much of the rest, while white men's diseases and white men's weapons whittled their numbers. In 1607 the 32 tribes ruled by crafty Wahunsonacock, known to the English as Powhatan, numbered some 10,000 souls. A century later there were about 1,500.

"What happened happened, that's all," shrugged Chief Tecumseh Deerfoot Cook of the Pamunkeys, a wiry man with skin the color of oiled leather. "I don't hold a grudge against the paleface."

Though the Indians' culture has largely vanished, a few traditions survive, and one is that many members of these two tribes are descended from Powhatan, "a tall well proportioned man, with a sower looke," as John Smith wrote. Some historians believe Powhatan was a Pamunkey, but none profess knowledge of his burial place. When I mentioned that to Mr. Cook, he shot me a look that would have shattered glass. "Come on," he said.

At the edge of the Pamunkey River, we ascended a low grassy mound.

"Right here is where my daddy told me Powhatan is buried," he declared. "That's what his daddy told him, and what *his* daddy told him, and what *his* daddy told him. I can't prove it; I wasn't at the funeral. But if he isn't buried here, you tell me where he is buried, 'cause I'd like to know."

I've collected glimpses of Virginia for a long time, marveling at their diversity. Birthplace of eight Presidents, she guards the homes of seven, among them Washington's Mount Vernon, Jefferson's Monticello, Madison's

Montpelier, and Monroe's Oak Hill. Scarred by war, she enshrines two places of peace, Yorktown and Appomattox.

She can be as quaint as a cobbler's shop in Williamsburg, as modern as nuclear ships at Newport News, as timeless as a Shenandoah barn. And she is the only state that can make me weep.

Driving across the Potomac River from my home in Washington, I cross Bull Run and stop at Manassas battlefield. Then the tears brim. Not tears for a lost cause: tears for the agony of a war of brothers and of a nation sundered; for courage, fear, pain. On the whispering breeze I hear Gen. Barnard Bee exhorting his frightened men above the baptismal shriek and thunder of the Civil War's first major battle: "Look, there stands Jackson like a stone wall. Rally behind the Virginians!" When Virginia speaks, it often is with monumental eloquence.

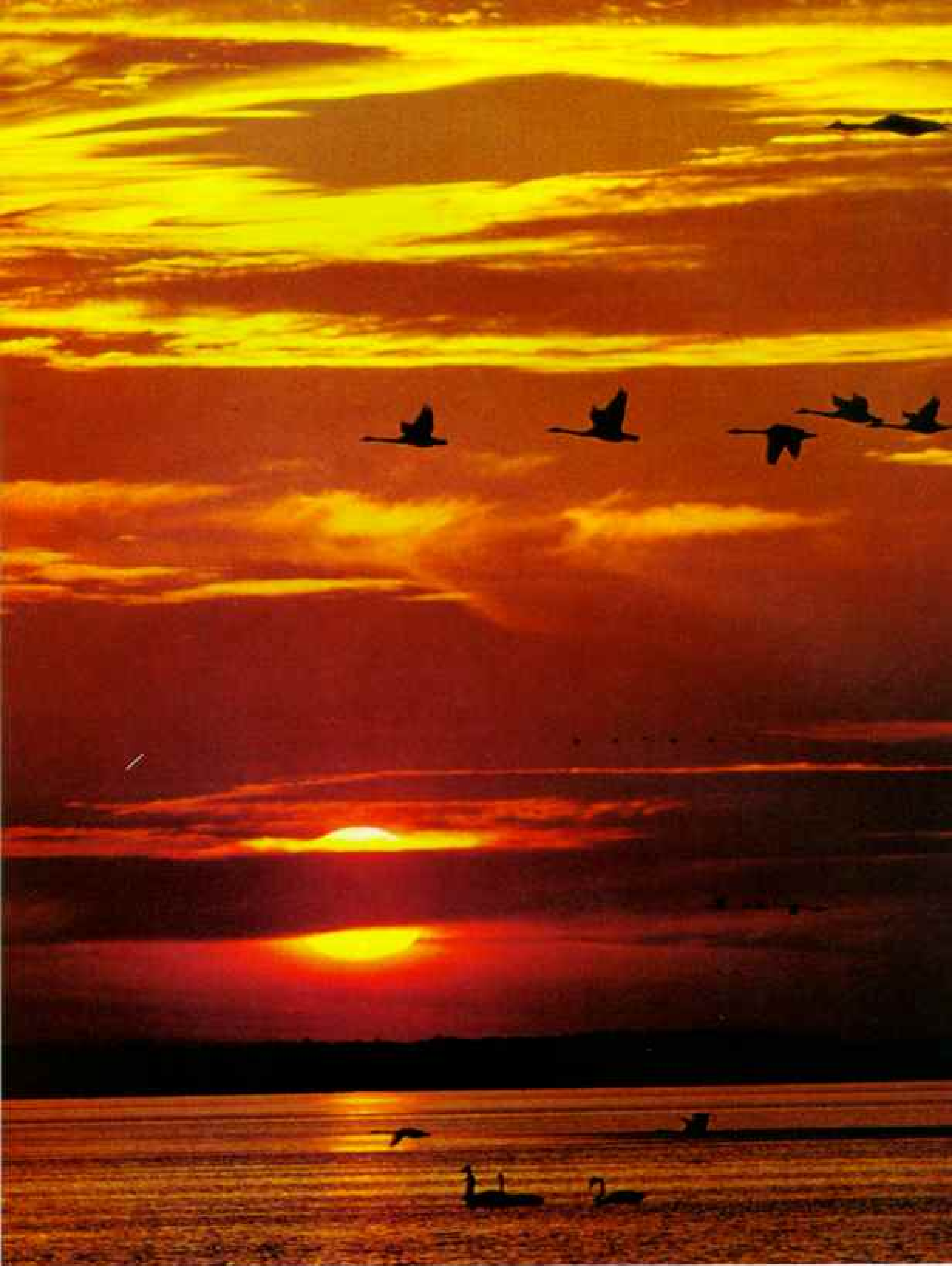
Jamestown Taught a Hard Lesson

In almost any corner of the Old Dominion I can hear her voices. But most often they speak beside the rivers that tumble out of her mountains, drain the rolling Piedmont, and empty, finally, across the low Tidewater region into Chesapeake Bay. First as highways of exploration and settlement, then of commerce and expansion, these waterways all have their stories. John Smith mapped them. It was beside the Rappahannock that George Washington grew up, beside the Potomac that he enjoyed the vista from Mount Vernon, beside the York, of which the Mattaponi and Pamunkey are tributaries, that he fought the final battle of the Revolution.

And then there is the James. Wriggling out of the Alleghenies, spreading wide in the Tidewater, it is the most special of all. It is the heart artery of Virginia, the stream of New World destiny.

On a sunny winter day I reveled in the rare pleasure of having Jamestown Island almost to myself—no other tourists except two Japanese, far off, snapping pictures. A landscape of cropped grass and tall trees conjured no

Small fry skitter through autumn leaves near the Colonial Capitol at Williamsburg. The city became a backwater when the state capital moved to Richmond. Then, in the 1920's, John D. Rockefeller, Jr., began the restoration—today a world-famous model.



Whistling swans wing through the scarlet-and-gold dusk of Back Bay National Wildlife Refuge. Winter resort for tens of thousands of waterfowl, the refuge's 4,600 acres

also resound with the cries of snow geese, Canada geese, and more than 240 other species of birds.

vision of the appalling suffering of the colonists. But a historical painting was almost physical in its impact. It showed a handful of breathing skeletons burying one of their lot during the "starving time" of 1609-1610, when all but 60 of the 500 residents perished.

Many of the original 104 settlers who voyaged up the James in 1607 were unskilled "gentlemen"; few besides the bold soldier of fortune John Smith were prepared to survive in the wilderness. "Our men were destroyed with cruell diseases, as Swellings, Flixes, Burning Fevers . . . but for the most part they died of meere famine," wrote a survivor.

"Of course they weren't prepared for the challenge," agreed Paul Hudson, curator of Jamestown National Historic Site. "Where could they have gotten any training?"

The miracle is that Jamestown survived at all. Yet somehow the colonists held on, coping, setting a pattern of nation building that others repeated as the continent was spanned.

"They learned how to conquer the wilderness and how to get along with the Indians—or at least, to defeat them after suffering two dreadful massacres," Mr. Hudson continued. "When settlers went across the Blue Ridge, they had to do the same things: clear the land, build a house, raise a family, get along. And when they crossed the Mississippi, the same process again—all the way to the Pacific."

The history of Virginia is that of our nation in microcosm.

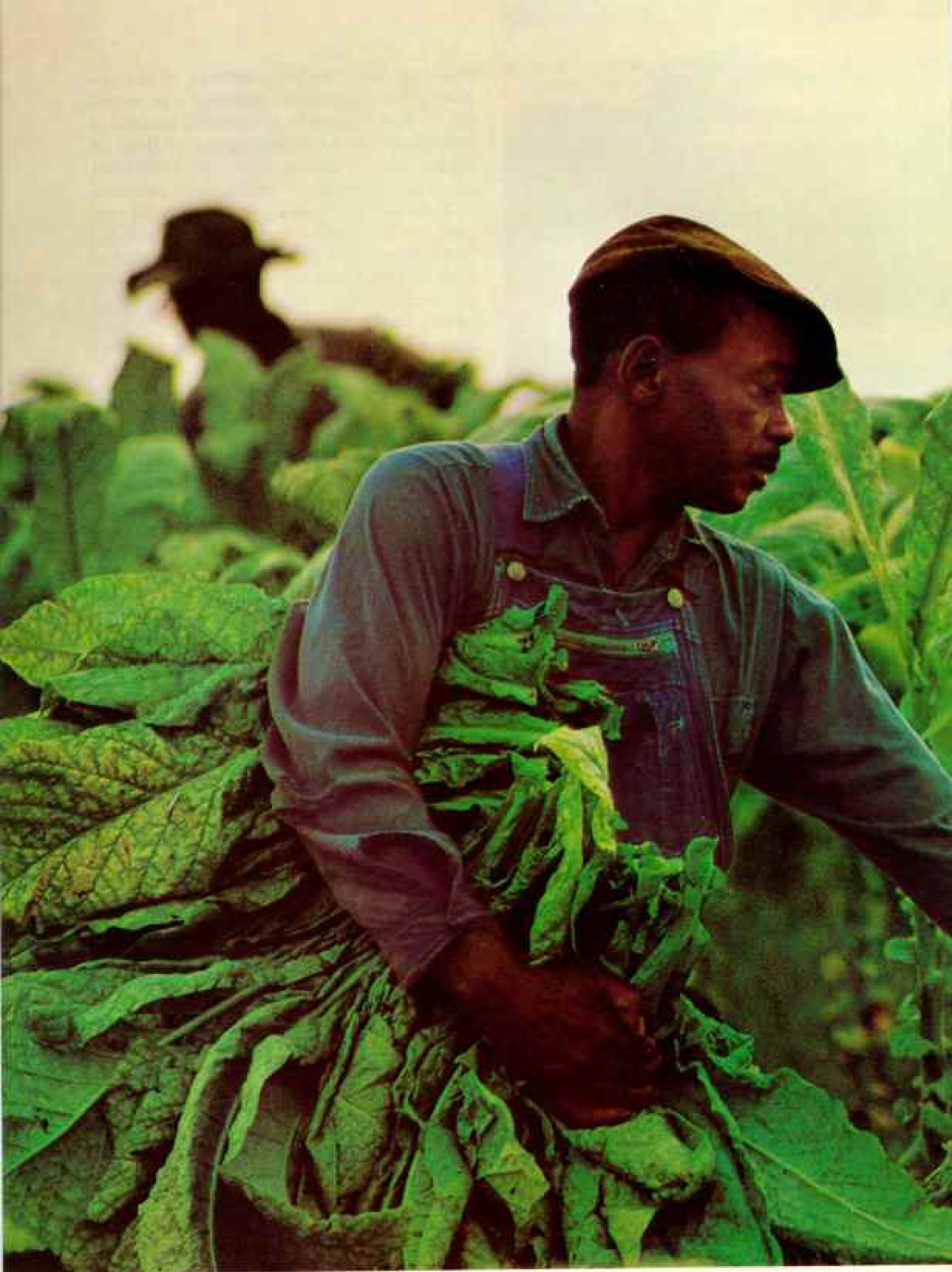
"Post Molds" Reveal a Colonial Saga

Thomas Pettus was one of those hardy settlers—a land clearer and housebuilder. When he arrived in 1641, land was available near Jamestown. He built on a tract four miles downriver from the settlement.

I came on Pettus's holdings on a hot July afternoon and met half a dozen young people who had cleared the land again—at least, a little of it. They scraped the earth with trowels; one brushed with a whisk broom.

From beneath his yellow hard hat—protection from the sun—archeologist William Kelso of the Virginia Historic Landmarks Commission explained that his team sought "post molds"—discolored earth that would disclose where posts had stood. Judging from the ashes here, this had been Pettus's smokehouse. "As you can see," Bill said, waving a hand toward rows of holes, "we've found the other buildings of his farmstead."

It was not a grand manor. Pettus built a



"Precious stink," an early settler called tobacco. Virginia was "founded upon smoak," wrote another. The staple guaranteed the economic survival of the colony

and remains the state's major crop. These leaves are destined for Danville, Virginia's biggest market, where 42 million pounds of bright leaf were auctioned last year.

George Washington's home, Mount Vernon, and his nearby tomb receive more than a million visitors each year.

John Marshall, fourth Chief Justice, was born in a log cabin near Midland.

Pocahontas befriended John Smith, but married John Rolfe, the colony's first cultivator of tobacco.

Yesterday's Virginians

"GOOD OLD DOMINION, the blessed mother of us all," wrote Thomas Jefferson of his native state. And the numbers of her children who helped make the nation great read like a roll of honor: from Pocahontas, who charmed the new colonists, to Adm. Richard E. Byrd, who charted the ends of the earth; from George Washington and seven other Presidents to Henry Clay, who would rather be right. Patrick Henry, Richard Henry Lee, George Mason—all helped lay the framework of the new country. Other Virginians: Lewis and Clark, who opened the West, and Cyrus McCormick, whose reaper helped tame it, the slave Nat Turner, who tried to incite his people to freedom, and Booker T. Washington, who strove to educate them.

Adm. Richard Evelyn Byrd, born in Winchester, was the first to fly over the North and South Poles.

Virginia mined 34 million tons of coal in 1973, mainly in the southwest.

Booker T. Washington National Monument honors the black leader and educator born here in 1856.

T-shaped house and haphazardly added outbuildings, all of wood. "It was almost a medieval layout," Bill continued. "In the 17th century, men like Pettus were concerned more with survival than pleasing architecture." He apparently possessed little china or crystal. "Mostly we've found items of local clay, crudely formed and crudely fired."

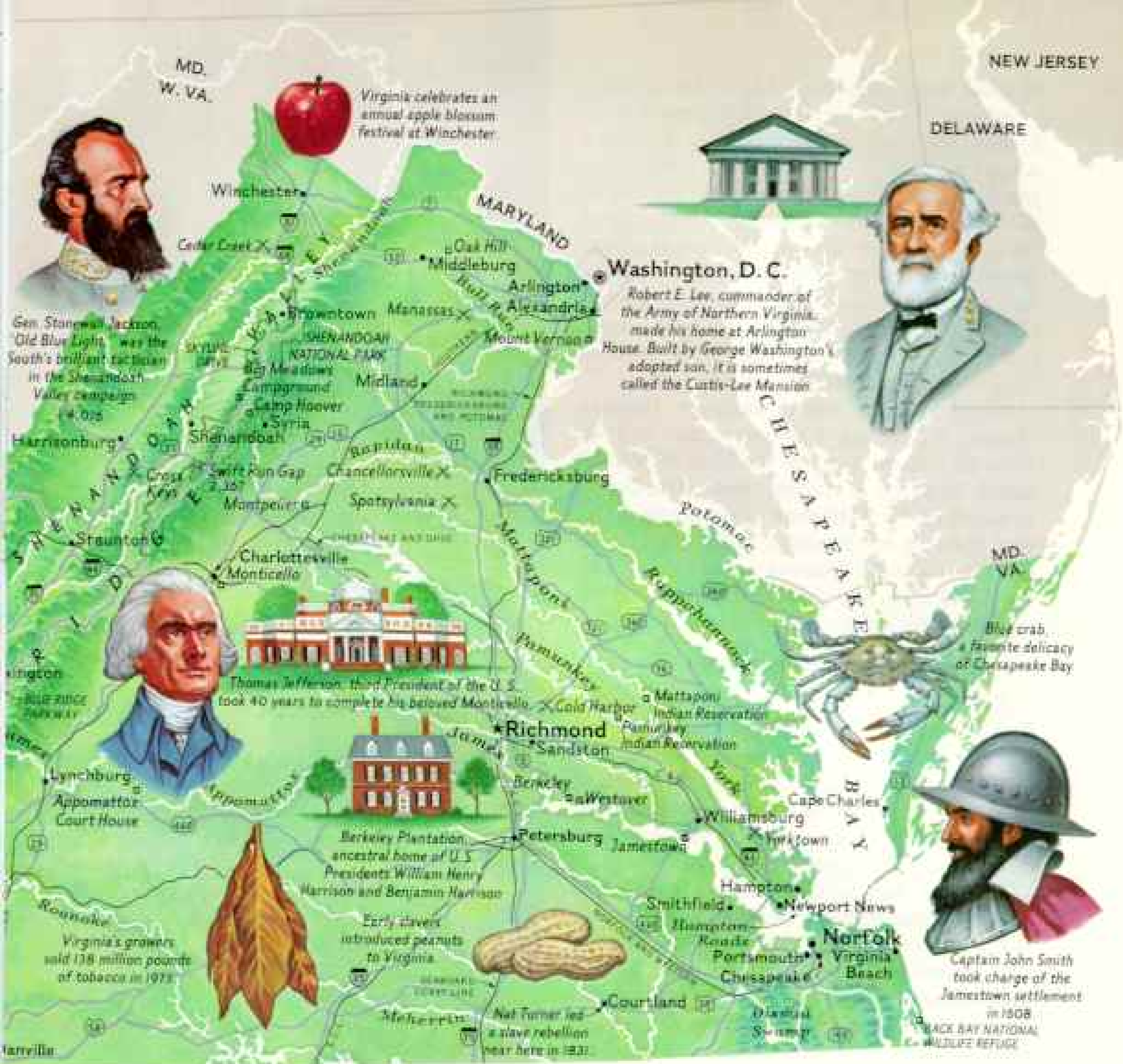
Tobacco Built a Golden Legend

Better known than Pettus's Spartan times—and more beloved, without doubt—is the image of Colonial Virginia that began to take form about 1720, when prosperous tobacco growers lavished their profits on elegant brick mansions along the James and other rivers. In this golden age, a man like Robert Carter could possess 300,000 acres and a thousand slaves; for good reason he was known as "King" Carter.

The flavor of that era lingers in the Tidewater, an intense, almost palpable legacy on the land. Off Highway 5, midway between Williamsburg and Richmond, I was drenched in it one spring afternoon as Malcolm Jamieson drove me along the little river road that joins Berkeley to Westover. Between the Georgian mansions of these plantations, three deer gamboled in a field of new grain—a scene as genteel, I think, as ever a planter knew.

By comparison, Benjamin Harrison IV, King Carter's son-in-law, seems a piker; he amassed only 30,000 acres. But Berkeley's builder invested a fortune in his home.

"The construction took about five years," Mr. Jamieson said as we walked through the



great boxy rooms with their 12-foot-high ceilings. "They had to cut the wood and dry it. They had to bake the bricks and grind oystershell for mortar. They knuckle-jointed and pegged the rafters and beams together. They laid pipes into the fields so the cellar would drain, and packed sand under the hearths for fire protection."

Were they building for the ages? "I think so. People wanted to show off their superiority in these tremendous houses."

Mortar and History Immortalize a Name

In flowing script, one Harrison left his name in the mortar of a wall. Others left their names in history. Benjamin Harrison V signed the Declaration of Independence. Mr. Jamieson took me to the upstairs bedroom where William Henry Harrison, ninth President of the United States, was born—though in the campaign of 1840 the victor at Tippecanoe was passed off as of log cabin origins. The family also produced the 23d President, another Benjamin, Ohio-born.

But what tobacco bestowed upon the Tidewater country it also took away, exhausting the soil. Well before the Civil War, the Harrison family had lost Berkeley to debt. Until Mr. Jamieson began to restore the plantation 40 years ago—living, meanwhile, in William Henry's birth room—the house had long been used as a barn.

Below Berkeley and near the wide sheet of water called Hampton Roads, where the James joins Chesapeake Bay, the colonists found "goodly tall Trees." In a few years some

of these were being raised as masts on ships.

Among many visits to Hampton Roads, I shall always remember the day I carried a load of Love to Norfolk. That journey began in Roanoke, in southwestern Virginia. In the dark of a winter morning I climbed into the cab of a Norfolk and Western Railway diesel. Behind us stretched 178 cars brimming not only with Love but also with Gertie, Orange, Gee, and Wilfred—shippers' identifying names for export coal from western Virginia, West Virginia, and Kentucky.

"Clear block," called engineer Herman Hogan, Jr., spying a green signal, and we were off toward a gap in the Blue Ridge. We bored through a tunnel near Goodview, rumbled past tiny Moneta as the general store was opening for business. Later we crossed flat piney woods, saluting small towns with the diesel horn, and swung south through the tangles at the edge of the Dismal Swamp.

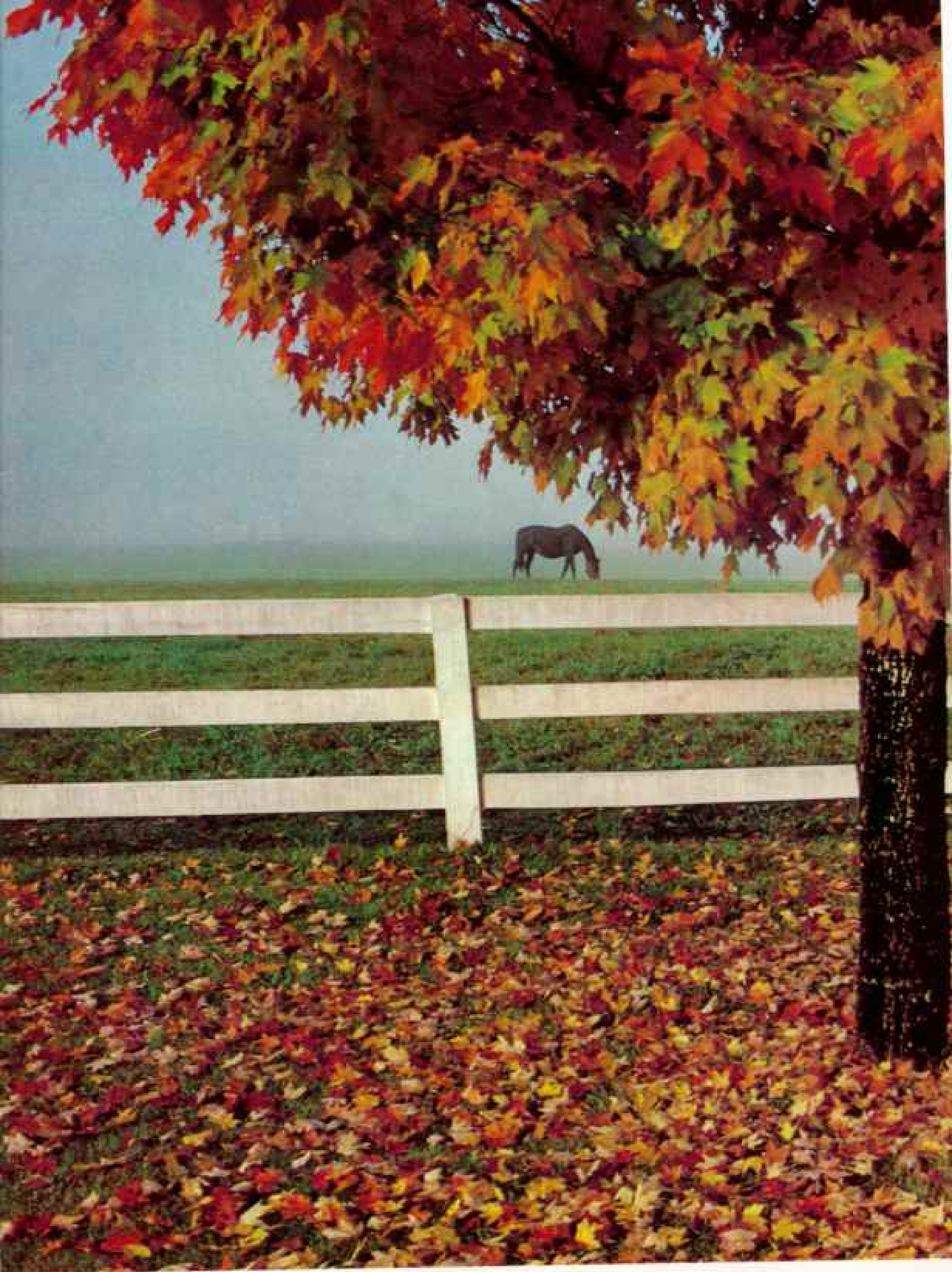
Naval Duel Ushers in a New Era

Even before the oil shortage, Hampton Roads was the world's largest coal exporter, sending an average of 35 million tons a year to ports all over the globe. Crowding around the 25-square-mile roadstead are not only vast rail yards, but six cities and numerous Navy installations, piers, and docks.

The best way to view all this is from the water. So one summer Sunday, with the sun still a low orange disk, I boarded the *American Archer* at Norfolk International Terminals. Cranes lifted aboard the last of the freight containers. On the bridge the harbor pilot, Capt. J. A. Jones, lean as rope and known as "Ruff," called out the course.

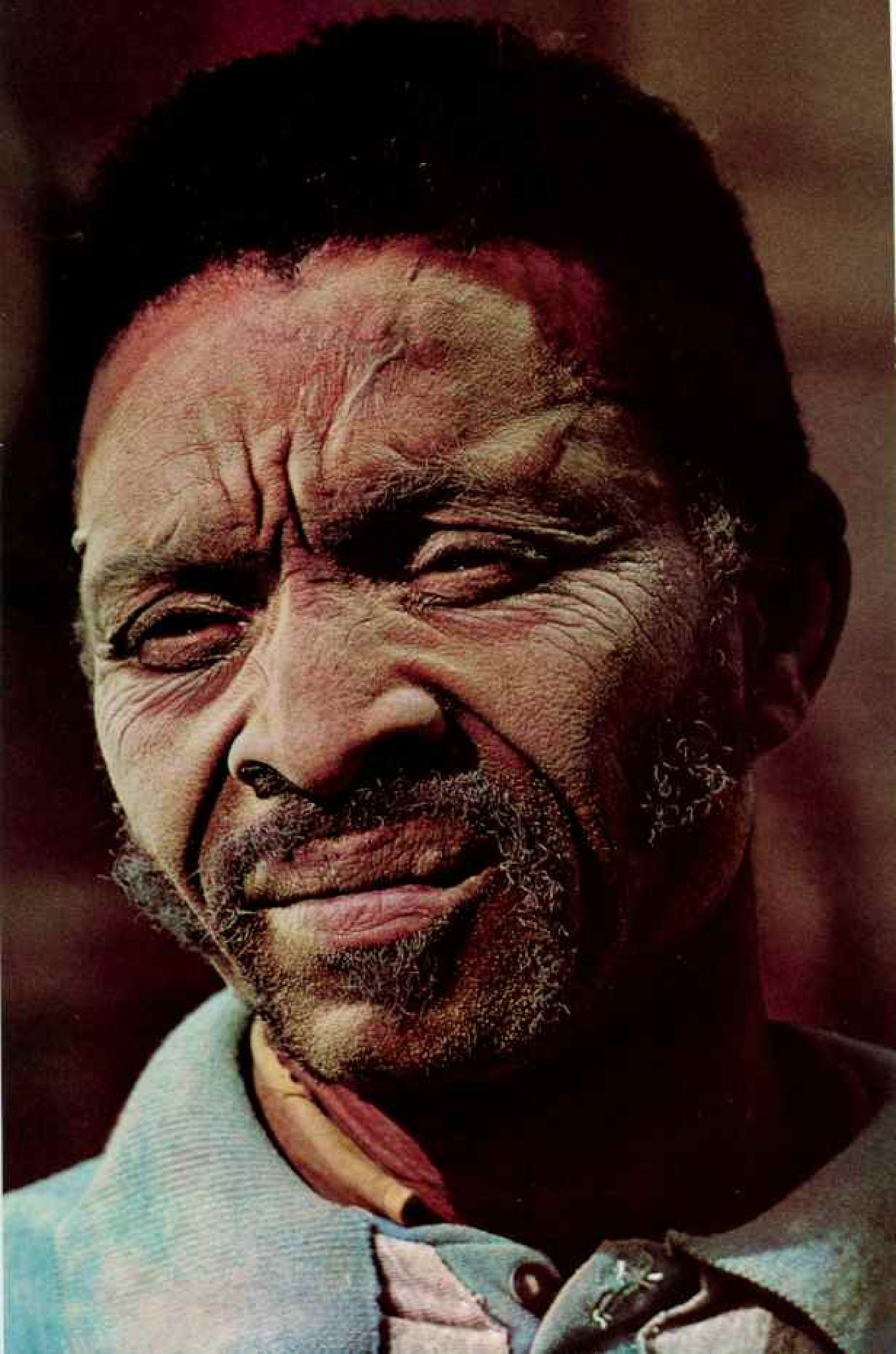
We eased past a clutch of submarines and destroyer escorts, and met the incoming *African Dawn* as she experienced a Virginia dawn. Opposite the city of Hampton, Ruff pointed out a historic stretch of water. Dueling there on March 9, 1862, the ironclads *Monitor* and *Virginia*—the rechristened *Merrimack*—failed *(Continued on page 603)*

Ghosts of the Confederacy come to life—some in pieces of Yankee uniform—as National Park Service volunteers re-create a Civil War camp at Chancellorsville, near Fredericksburg. In the spring of 1863 thirty thousand troops were lost there—including Confederate Lt. Gen. Stonewall Jackson, mistakenly shot by his own men.



Far from the finish lines that her foals have crossed, a brood mare grazes at Verulam Thoroughbred Horse Farm, near Charlottesville. The noble stock of Virginia's

horse country dates from 1730, when the Thoroughbred stallion Bulle Rock was imported from England. Last year, Virginia-born Secretariat wore the Derby's roses.



to land mortal blows but doomed wooden men-of-war forever.

The *Archer* was bound for Europe, Ruff and I only to the pilot boat, 14 miles out. As the engines slowed, I followed him uncertainly over the side and down a swaying rope ladder to a bobbing launch. "Just remember not to let go with both hands at once," he instructed. I remembered.

Ironclad's Dock Serves Nuclear Subs

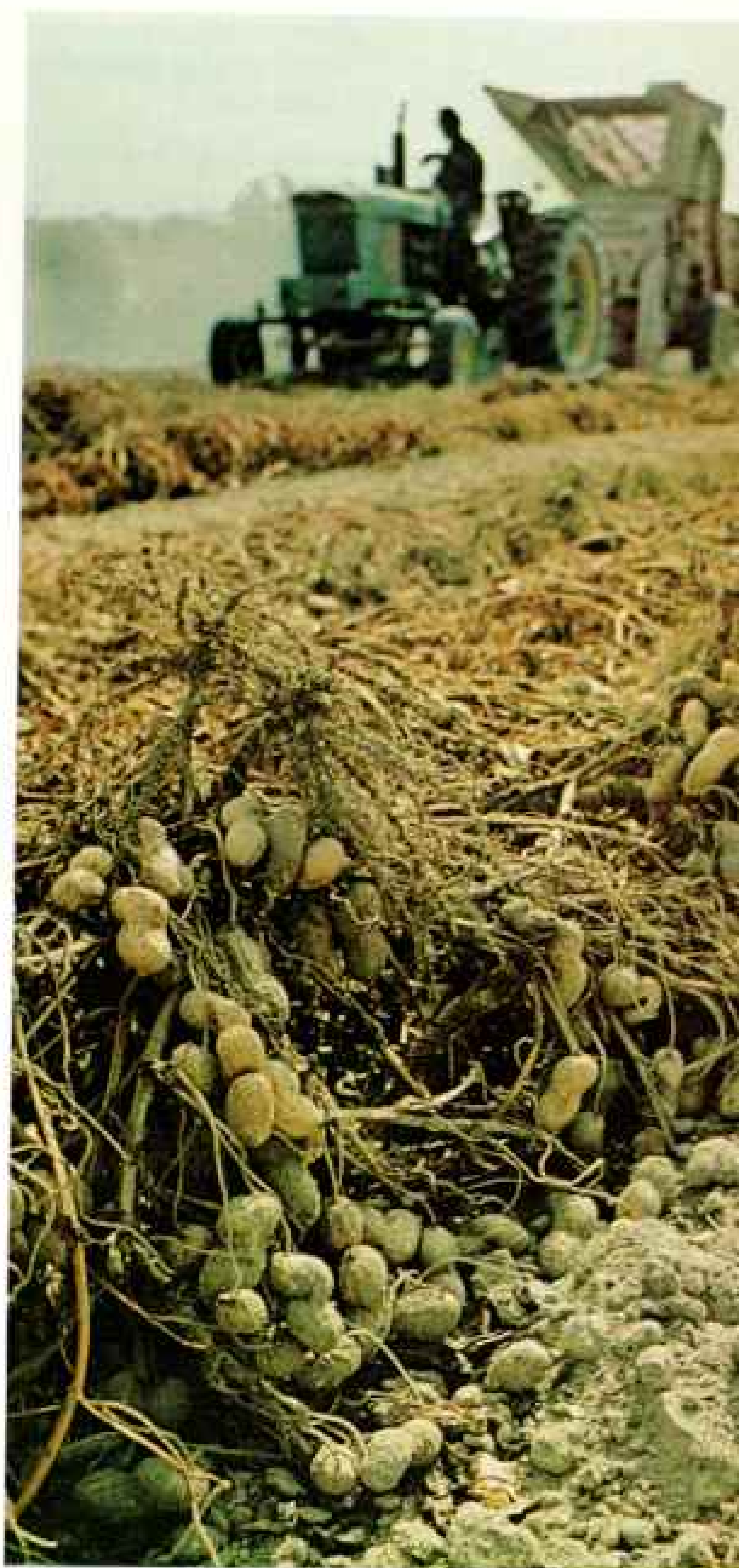
I visited the busy Norfolk Naval Shipyard in hope of seeing Drydock No. 1, where Confederates sheathed the *Virginia* with four inches of iron. But I was permitted only the briefest peek into the granite-walled well; engineers overhauling nuclear subs have filled its floor with facilities off limits to visitors.

Later I came on a quieter mooring, chockablock with buttoned-up minesweepers and destroyers. One of these hulls is the *Miller,* which helped sink a Japanese destroyer at Leyte Gulf and screened carriers during the Okinawa and Iwo Jima landings; another, the *Cotten,* won nine battle stars in World War II. I boarded the submarine tender *Bushnell* and met Comdr. Bruce Slawson, skipper of the Inactive Ships Maintenance Facility. He wore five rows of ribbons.

Does a career officer chafe in command of a fleet that may never sail? "I thought it would be that way when I first came here," he said. "But look at it like this—if this old fleet ever goes to sea again, it would mean we were at war, and I don't think there's a man in the Navy who wants that."

On the ways of Newport News Shipbuilding and Dry Dock Co., the world's largest privately owned shipyard, welders' sparks flew from the nearly completed aircraft carrier *Nimitz.* Under construction nearby were knife-prowed frigates, fat subs, and another carrier, the *Dwight D. Eisenhower*—all nuclear-powered. Able to cruise for 13 years without refueling, the *Nimitz* exceeds the length of three football fields, including end zones. The largest ship that sailed to Jamestown in 1607 wouldn't have gained four first downs.

Miles from the shipyard's clang and clamor, the sandy fields of Southampton County were green with corn and peanuts, and the loudest noise I heard was the buzzing of insects. I drove the twisting back roads in search of a tragic footnote to history—another of those Virginia glimpses, and one that by rights should have begun at the homesite of Joseph



Dust of a day's toil cakes the face of a peanut picker (**opposite**) near Smithfield. Once field hands gathered the harvest; now combines (**above**) do most of the work. Peanuts found little favor until the Civil War, when hungry troops sang of the protein-rich legumes: "Goodness! how delicious, Eatin' goober peas." Today Virginia's peanuts rank second only to tobacco as a cash crop.

Travis. But no marker points out the location. Finally I asked directions from a black man I met along the way.

"You mean the place where Nat Turner started his cuttin'?" he responded impassively. "Right across the road there."

Nat Turner Blazes a Tragic Trail

Born a slave, Turner seems to have believed that God wished him to lead a revolt for freedom. Before dawn on August 22, 1831, Turner and a few companions crept into the Travis house. They killed Travis, his wife, and two others, then returned to slay an infant. The slaves went to the home of Salathiel Francis, whom they murdered; next to the home of Mrs. Piety Reese, where they killed two. Other slaves swelled the band to 60. By next day, 55 to 60 whites lay dead.

Joseph Travis's house no longer stands. But the white frame dwelling where the rebellion was smashed remains much as it was in 1831. I was greeted at its door by Mrs. Willie Marks, who has lived there for 32 years.

"Nat Turner got here about daylight on the second day, the way I heard the story," Mrs. Marks told me after offering iced tea. Desertions had reduced Turner's band to about twenty. Inside the house waited Dr. Simon Blunt, his teen-age son, and an overseer, perhaps neighbors too.

"Dr. Blunt's slaves were hiding in the cookhouse," Mrs. Marks continued. "He gave them the choice of joining Turner or defending the place. They chose to defend it."

Upstairs, Mrs. Marks showed me the window from which Dr. Blunt's son is believed to have shot one or more of Nat's men. Dr. Blunt's slaves captured several. "I've always heard that Nat hid out in a barn behind the house until dark, then got away."

Captured two months later, Turner was tried and hanged, as were about 17 other convicted conspirators. In the pandemonium that

"I love fox hunting, but I'm too old to jump," says Mrs. Katherine Toerge, lifting a glass of sherry at the season's opening meet (**above**). Hunts are held three times a week from November through March near Middleburg. At Richmond's Country Club of Virginia (**right**), debutantes shimmer at the annual Bal du Bois. The extravaganza raises money for Sheltering Arms Hospital.

followed, many other Negroes were killed.

In 1619 a ship had reached Hampton Roads with "20 and odd Negroes," which the captain bartered for victuals. Apparently these first blacks were indentured servants, not slaves. But slavery was legalized in 1661, and by 1790 more than one Virginian in three lived in bondage. Slavery's evils vexed Jefferson, Madison, Patrick Henry, and others, inspiring abolitionist proposals. Turner's bloody rampage triggered one more assault on the system. A bill requiring gradual emancipation was put before the Virginia Legislature—with wide support.

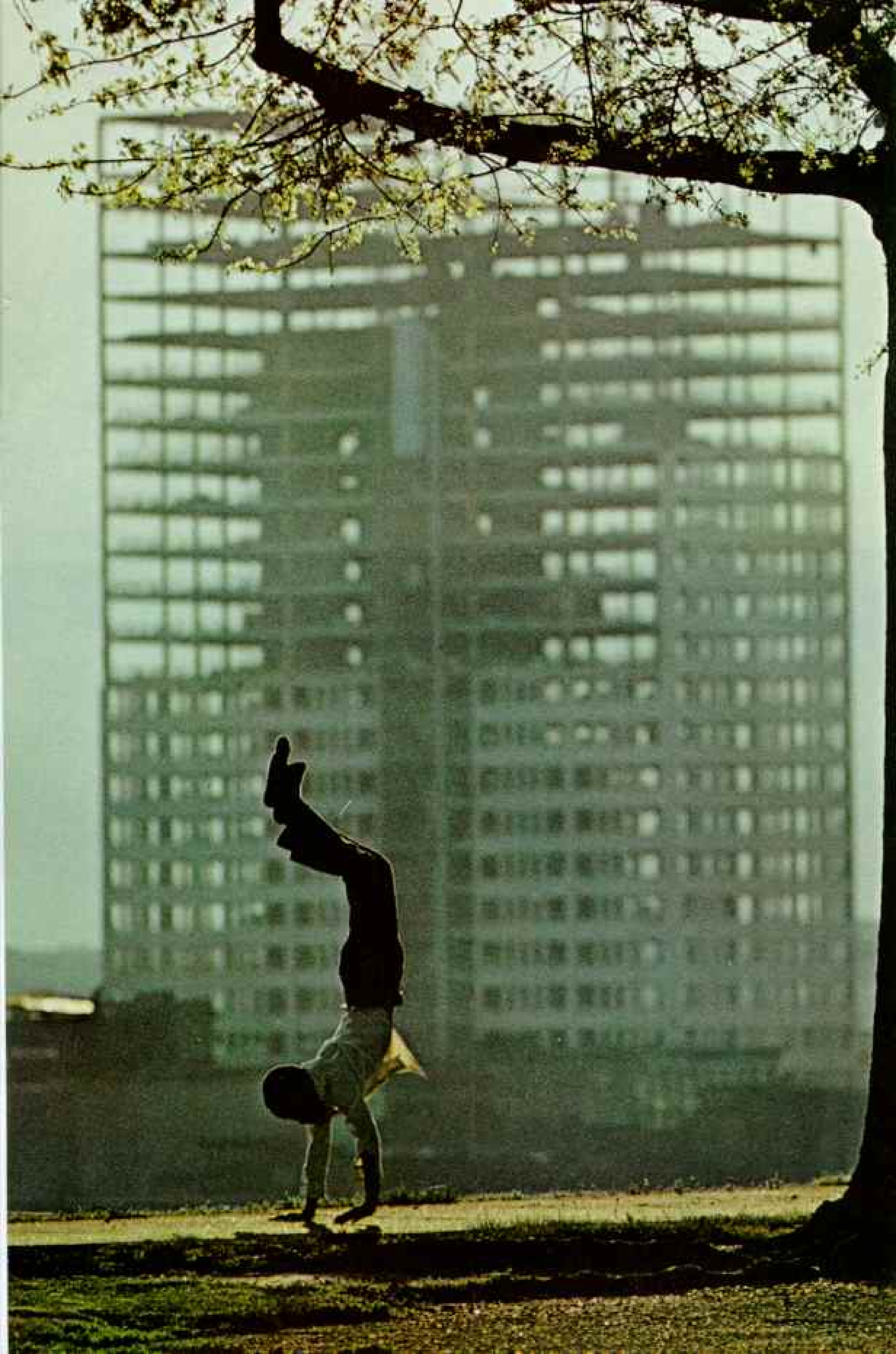
But slaves were property—worth cash. In the end the proponents of emancipation failed. Virginia had missed the opportunity to take a step of far-reaching impact upon other slave states.

At his Richmond home I discussed this with Virginius Dabney, retired Pulitzer Prize-winning editor of the *Richmond Times-Dispatch* and author of the excellent history, *Virginia, The New Dominion*. "Emancipation might have succeeded if a way could have been found for the Federal Government to compensate slave owners for their loss," he told me. "That was the big crunch right there."

Slaves were valuable even to an owner of worn-out tobacco land. "My great-grandfather had a plantation that was exhausted," Mr. Dabney said. "So he took all his people off to Mississippi in 1835. He bought land for cotton and put his slaves to work and cleared $50,000 in his best year. The whole thing was wiped out in the war, of course."

The South Needed the Old Dominion

The War: Many Virginians speak of it as if there had never been another. Seven states had left the Union by February 1861, but the Old Dominion hesitated. A state convention voted not to secede. But after President Lincoln called for state troops to put down the



rebellion, the convention voted again: 88 to 55 in favor of submitting an ordinance of secession to the people.

What if the Old Dominion had remained loyal? Near the banks of the James in Richmond, Roy Johnson implied one answer. "Down here," Roy said, "was the reason the Confederacy had to have Virginia."

During the war the Tredegar Iron Works was the South's major munitions factory. Much of the site has succumbed to weeds, but three war-era buildings remain. We watched masons restoring walls of a cannon factory.

Roy is a properties manager for the Ethyl Corporation, which owns the site. He told me a city building inspector examined the walls after a major flood in 1972 and found them seriously weakened. "He gave us 30 days to raze them. We decided instead to rebuild."

As the Confederate capital, Richmond was bloated with soldiers, bureaucrats, refugees. The population tripled. In 1862 and again in 1864 Union troops drew so close that they could hear the city's church bells.

Civil War Troops Wore Pathetic Tags

I went to the Cold Harbor trench lines—eight miles from downtown—to watch two Richmond National Battlefield Park employees fire a Civil War mortar for an audience of day campers. The children wore paper name tags. Many of the troops here on June 3, 1864, also pinned their names to their blouses—in hope that their bodies could thus be identified after the battle was over.

The first scattered shots from pickets were followed by a hideous barrage that cut down the advancing blue ranks like sickled grain. A Pennsylvanian said the outcome was decided in 15 minutes; a Union general, eight. Said a Confederate general, E. M. Law: "It was not war, it was murder."

Nine days later, when Ulysses S. Grant withdrew, Cold Harbor had cost him 12,700 men. But Robert E. Lee had won his last great battle for the Confederacy.

In Richmond, I paused inside St. Paul's Church. Jefferson Davis was worshiping there on Sunday, April 2, 1865, when a War Department messenger slipped through the doorway. Grim, the Confederate President left the service. In a few hours all Richmond knew that Lee's army was retreating.

The street filled with fleeing citizens. Government clerks opened a warehouse, distributing stores of flour, sugar, and coffee that astonished the inflation-ravaged populace. With cups and pans the thirsty dipped up whiskey emptied into the gutter. Other warehouses were ignited. Explosions reverberated. Flames consumed 20 blocks of buildings. Early on April 3, Mayor Joseph Mayo set out to find Union troops to restore order.

Richmond Does Not Forget *The* War

Modern Richmond, center of a metropolitan area of half a million people, has a long memory. In the 1940's, the late Douglas Southall Freeman, author of magnificent biographies of both Lee and Washington, habitually snapped off a salute when passing the statue of General Lee on Monument Avenue. Many thought such veneration not at all strange; many would not think it strange now.

But change has come. A new 15-story office tower crowds Lee's wartime home on Franklin Street. Blacks occupy an increasing number of positions in the city government—reflecting the eroding of old barriers and the rising proportion of black residents. I have heard white Richmonders prophesy that someday the government of the old Confederate capital will be dominated by blacks—in some minds, an ultimate irony.

Douglas Wilder scoffs at that prophecy. Grandson of a slave, his Afro beginning to show a bit of gray, Wilder in 1969 became the first black elected to the Virginia Senate since Reconstruction. In his law office in the ghetto he told me, "I'm not saying blacks can't run the city, but they're not going to. Let's face it: An all-black city would be an all-poor city. Leadership has to come from black and white." On a shelf behind his desk I saw a small bust that makes Wilder's own statement about The War. The face is Lincoln's.

A mile or so from the senator's office, I came upon the *Shanty*, the houseboat home of Lester and Frankie Blackiston. During the Hurricane Agnes flood in 1972, they tied to

Handstander grandstands before a skyscraper on Richmond's Church Hill. In nearby St. John's Church, Patrick Henry thundered "Give me liberty or give me death" in a speech that heralded the American Revolution. Capital of the Commonwealth of Virginia since 1779, Richmond was also the Confederate capital.

Search for a fallen son leads a mother through the bewildering tombstones of Arlington National Cemetery (**left**). After the remembrances of Memorial Day, a solemn soldier (**right**) gathers flags from the graves. More than 160,000 Americans—mostly veterans who died in times of conflict and times of peace—are crowded into the 570-acre tract by the Potomac.

Home of Robert E. Lee until it was confiscated by the Federal Government at the outbreak of the Civil War, Arlington was dedicated as a national cemetery by Secretary of War Edwin M. Stanton in 1864. Only two Presidents, William Howard Taft and John F. Kennedy, lie here.

treetops and rode out the rampage. In quieter times the *Shanty* rides in the Kanawha Canal, dug mainly in the 19th century to join Richmond with the west.

I found the 42-year-old skipper in cutoff jeans, a bandana at his neck, his beard trimmed into a neat spade. The radio was playing classics. Lester reached through a hatch into one of the *Shanty*'s pontoons—"my cooler"—and fetched up a jug. "Pardon the crock," he said as he poured homemade wine. "But notice the delicate color."

What followed was one of the most delightful afternoons I've spent in Virginia. Pacing and gesturing grandly, Lester recalled his days as a coffeehouse poet in the beatnik era in New York City. He read one of his own sonnets—quite a good one. He ticked off careers as writer, teacher, art dealer, diver, sailor. "I'll do anything I have to do to keep from working," he said. There's a fine double meaning there.

But mostly we talked of the canal, about which Lester confessed, "I am a hopeless romantic. I look out at the bank and I see men in tall hats and women in hoopskirts. I see black men loading and unloading the boats—manufactured goods for the west, coal and wheat for Richmond."

George Washington advocated canals to open commerce with the west, and later became honorary president of a company involved in building one along the James. It would skirt the rapids, pierce the Blue Ridge, and continue to the Ohio River country, the far-out fringe of settlement.

The canal inched westward slowly—too slowly. By the 1850's, 197 miles of waterway bore freight between Richmond and Buchanan on the other side of the Blue Ridge. But by then railroads had beaten the ditch to the west and captured most of the business.

Historic Site Marred by Pollution

Only fragments of granite-walled waterway remain near Richmond. Not much—but enough, Lester suggested, to bring history to life. "This is a place where fathers could bring their sons and explain how locks worked, how boats were raised and lowered." His voice

rose. "But this historic site is a garbage dump. I know some of the trash on these banks better than I know my aunts and uncles!" He described his efforts to compel the city and a nearby railroad to clean up their property. A passing freight punctuated the peroration with a loud, flat nasal toot.

"Knights" Go Exploring in Style

By the early 1700's, many Virginians yearned for a look at the land beyond the Tidewater. One of them was Governor Alexander Spotswood, and when he looked in 1716 he did it in style, accompanied by 60-odd men of high estate and low—planters, frontiersmen, slaves, Indians—and cheered by a heady assortment of refreshments.

Time has embroidered Governor Spotswood's journey across the Blue Ridge into a trailblazing epic of discovery. He and his companions have been endowed with an elegant name, Knights of the Golden Horseshoe, inspired by reports of jewel-studded miniatures that the governor supposedly bestowed upon each traveler.

I set out one weekend to retrace the governor's route. I began on Duke of Gloucester Street in Williamsburg with a lunch of Brunswick stew in Chowning's Tavern. I think Spotswood would applaud the meticulous restoration of Williamsburg, his capital for 12 years. Though it might unsettle his wig to see throngs of strangers trooping through the fine brick palace, I think he would be pleased that they admire it; after all, many features of the design are Spotswood's.*

To really discover Virginia on such a trip, it is best to go modestly prepared. Then you have to make inquiries in the crossroad stores. Fans are churning sultry air that smells of cardboard and candy as you remark on the weather and then state your business. Much of Virginia retains a fine antique flavor.

My business in a store 30 miles northeast of Richmond was to get directions to Beverley Park, the plantation of Robert Beverley,

*The restoration was described in "Williamsburg, City for All Seasons," by Joseph Judge, NATIONAL GEOGRAPHIC, December 1968. A more recent article on another aspect of Virginia featured the Shenandoah Valley in the April 1970 NATIONAL GEOGRAPHIC.

where according to the diary of John Fontaine, one of the travelers, the governor "left his chaise . . . and mounted his horse."

"Seems like I've heard o' that place," mused the man at the counter. "Nope, can't recall it. But I know somebody who can."

And that is how I met Gen. Edwin Cox, AUS (Ret.), who knows Colonial Virginia as few others. "He *lives* back there," I heard it said later by an acquaintance; the comment was made in admiration.

Commander of the First Virginia Regiment in World War II—the same First Virginia that lost 80 percent of its men in Pickett's Charge at Gettysburg—General Cox at 72 resides near the store where I inquired. He drives often to Richmond to officiate as president of the Virginia Historical Society.

As we plunged into the tale of the knights, the general puffed cigarettes, fetched books, and closed his eyes as if to recall detail glimpsed in person. He doubts that there were any golden horseshoes. "And they didn't really discover anything. Explorers had been in the Shenandoah Valley years before. It was just a wonderful party."

But, he added, one practical result was that several planters patented western lands, opening them for settlement.

Epic Route Debated by Scholars

With General Cox's directions, I went hunting Beverley's place. The house no longer stands. But winding along Highway 721, I could easily conjure up Beverley's century. Houses with dormers and tall chimneys meditated among their oaks and counted the corn rows that edged to the front yard. Plots of tobacco soaked up sun.

Scholars have long debated the route Spotswood took across the Blue Ridge. A writer in an 1896 issue of NATIONAL GEOGRAPHIC declared they crossed via Swift Run Gap, where Highway 33 now scales the crest. Others argue that they ascended the headwaters of the Rapidan River, about 12 miles north of Swift Run Gap, and crossed the mountain spine near what today is the Big Meadows Campground in Shenandoah National Park.

I favor the Rapidan route, not on fact but emotion; I am in love with that hemlock-shaded mountain stream.

Beyond the mountains the travelers came to a river—the Shenandoah. Beside it, Spotswood buried a bottle with a paper that claimed the land for George I. After dinner, Fontaine wrote, "we got the men together, and loaded all their arms, and we drank the King's Health in Champagne, and fired a volley. . . ." Other toasts to royalty followed, and other volleys. From saddlebags came, as Fontaine recorded, Burgundy, claret, Canary, other wines, Irish whiskey, brandy, shrub (a mixture of alcohol and fruit juice), two rums, punch, cider. It must have been quite a party.

Spotswood's Trip Triggers Settlement

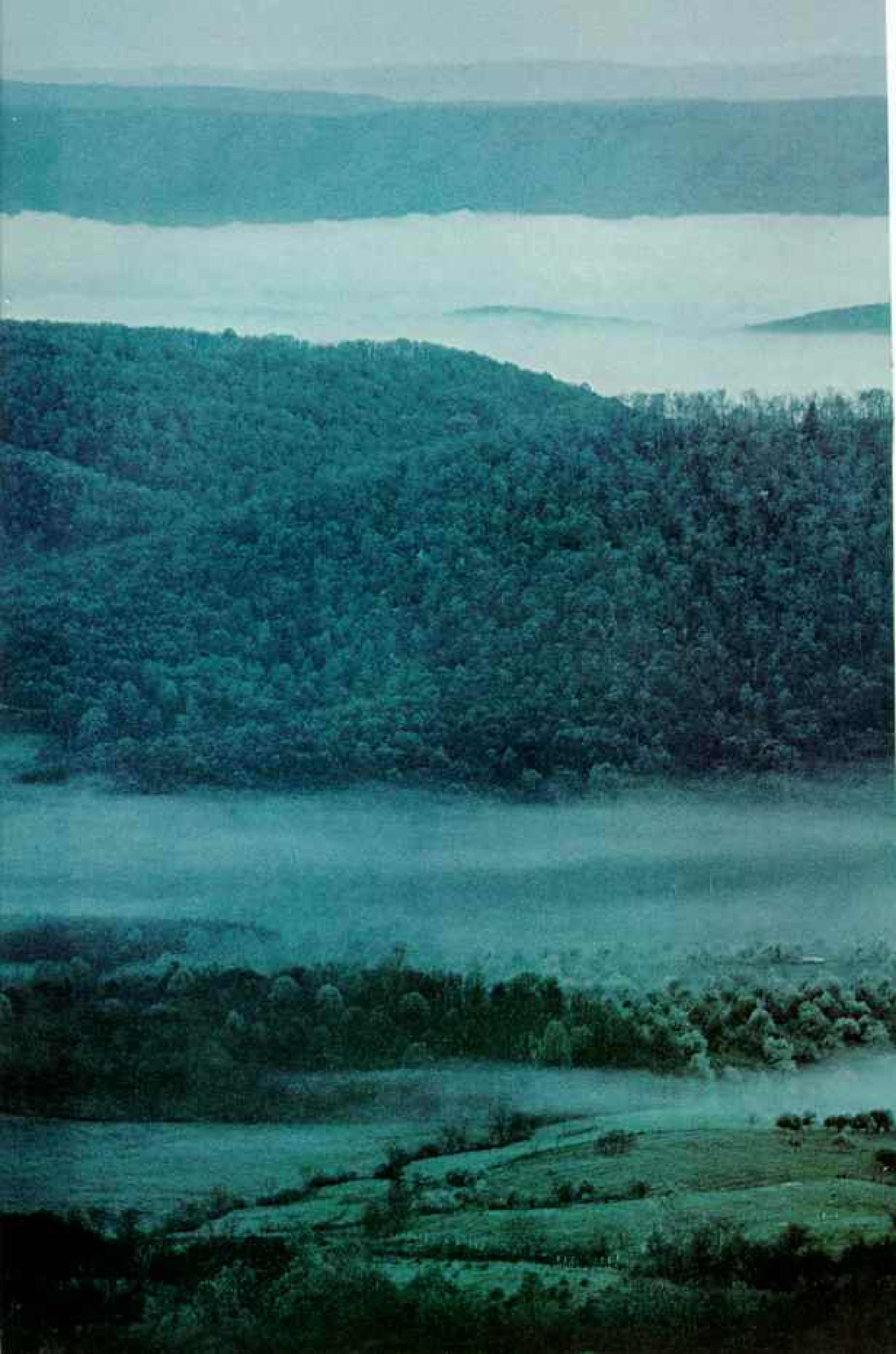
Ascending the Blue Ridge's eastern flank, I traced Spotswood's possible route along the Rapidan with Elvin Graves, known to everyone as "Mr. Jack," who has lived down-mountain from Big Meadows all his 72 years. When I first met him he was in overalls—I've never seen him in other attire—in the dining room of Graves' Mountain Lodge in the community of Syria. Not so much a resort as a collection of farm buildings open to guests, the lodge is rooted in generations of Graveses, having begun as an "ordinary," or inn, on a wagon road that went over the mountains. People were eating family style at long tables and Mr. Jack was urging on the timid. "Y'all sit down and get busy. If you can't reach what you want, ask somebody to pass it."

Settlers took up land east and west of the Blue Ridge soon after Spotswood's trip. Germans, Irish, and Scots came down the Shenandoah Valley from the north, and others crossed the Piedmont. Some trickled into the mountains and built rude log cabins, much like the four Mr. Jack built in his younger days.

Following old roads, Mr. Jack took me into the mountains one afternoon. We rode where we could, bouncing in his pickup, and where

Hometown roots run deep as the lines on his face. The only time John Menke ever left Sandston for long was during World War II, when he slogged up the boot of Italy as a GI. Affable, at ease with life, John muses, "Anybody's my friend."

Valley farms awaken to a misty morning in the Shenandoah *(following pages).* ▶



we couldn't ride we walked. At the junction of the two crystal creeks that form the Rapidan, we inspected a clapboard cottage. President Herbert Hoover confirmed my taste in scenic waters before I was born; he built this little hideaway in 1929 and spent many an hour angling the Rapidan for trout. Later he gave it to the National Park Service, which maintains it as a VIP retreat.

In Mr. Hoover's time, the cottage had many neighbors. "All these hollows had people in 'em," Mr. Jack recalled as we ambled on. A big lilac bush or an old apple tree would jog his memory of a cabin site. "A family would have maybe ten acres. They'd make potatoes and cabbage and corn. They'd have a few chickens, maybe a cow and some hogs. You could bury your potatoes and cabbage and they'd last nearly all winter. And you'd dry beans and peaches in the summer. You could catch fish and game. A fella didn't hardly have to have any cash a-tall."

Erosion Brings On a Mountain Exodus

But by 1936, when Shenandoah park was dedicated, much of the topsoil had washed away. "It was gettin' harder and harder for people to make a livin'," Mr. Jack said.

Four thousand mountaineers went elsewhere to live. Many of their cabins were torn down; some just fell in.

I spent an April night in one of the few that remain near the Blue Ridge, a century-old rectangle whose chinked timbers showed the bite of the broadax that hewed them square. Rain in sheets swept the shingled roof, trickling in here and there, but the fireplace threw cheering flares.

Next morning, going to the spring for water, I knew a loneliness of peace and space. Yet leafless, the sodden forest was a gray haze of oak and maple, but across the hollow a white patch identified an apple tree in flower. Nearer, a giant redbud verged upon an explosion of color. Such mountain cabins speak as eloquently to me of Virginia's past as the brick mansions beside the James.

In the Shenandoah, part of the longer Valley of Virginia (map, pages 596-7), industry hums in such cities as Winchester and Harrisonburg. But as I walk to a hilltop on a winter day, the slanting sun making the broom sedge shimmer like coppery tresses, and as I look out over mellowing brick farmhouses and their enormous bank barns—two stories on the uphill side, three stories on the down—as I see all this, I sense only an abiding, beneficent union of land and people.

Farther south, Lexington's Main Street throbbed with the sounds of hammers and saws. Royster Lyle, Jr., explained that a few years ago the residents realized they had a priceless heritage in the street's brick edifices, ranging in age up to 185 years. "So we organized a foundation and began to buy these places, hoping we could sell them to new owners who'd protect their character."

A few minutes' walk distant, on a gentle hill, I stood in the gray light of morning in front of the fortresslike barracks of the Virginia Military Institute. Heading to the day's first formation, uniformed cadets poured out, the "rats," or freshmen, being careful to walk exactly down the middle of the passageway—the "rat line"—and to salute Jackson's statue facing the parade ground.

The Stonewall of Manassas came to VMI in 1851 to teach Natural and Experimental Philosophy—physics, we'd call it—and artillery tactics. It was to Lexington that he was brought for burial after the Battle of Chancellorsville. After the war Lexington became the home of Jackson's commander, Lee, who spent his last years as president of Washington College, now Washington and Lee, which shares the hill with VMI. He is buried in the small Lee Memorial Chapel. Thus Lexington enfolds the bones of the Confederacy's most honored sons.

Army Chief a Man of Peace

Lexington has known other generals. George S. Patton studied a year at VMI before earning admission to West Point. And in 1897 came a man who would be not only a general but a man of peace. "I Send You My Youngest, And Last," wrote George C. Marshall, Sr., to VMI's commandant. "He Is Bright, Full Of Life, And I Believe Will Get Along Very Well." Following his older brother to the institute, George Catlett Marshall fulfilled his father's prophecy, becoming VMI's most distinguished graduate.

In the small museum that is a part of Lexington's Marshall library, established to care for the general's papers, are mementos of his role as Army Chief of Staff in World War II, the commander of eight million men, and his role in the postwar rebuilding of Europe. I stood for a long time in front of a glass case that held a medallion: the Nobel Peace Prize, awarded to him for the Marshall Plan.

"I've sawed on the fiddle since I was three years old," says Hubert Caldwell, 80, trading tunes with a pickin' partner at the 38th annual Old Fiddler's Convention in Galax. Thousands of back-porch musicians gather here each year to learn and share the magic of mountain music based on ballads, jigs, and reels of the British Isles.

Men of war, men of peace. The theme runs like a bright thread through the fabric of Virginia's history. It comes to mind, for example, in the birthplace at Staunton of Woodrow Wilson, leader of the nation in World War I and hapless architect of peace through the League of Nations. But the theme is nowhere stronger, I think, than on that richly historic tongue of land between the James and the York, the site of Jamestown, Williamsburg, and Yorktown.

By 1781 Yorktown had seen its best days. The surrounding tobacco lands were petering out, and commerce was shrinking on the wharves below the town's high marl bluffs. Charles, second Earl Cornwallis, moved his army to the little port in August. It seemed an excellent place to fortify as a secure base for the British fleet.

The Dawning of a Nation

A French fleet got there first. While it denied escape by water, Washington's army, bolstered by French units, bombarded Yorktown from the land, meanwhile pushing their trenches ever closer. Though he had suffered fewer than 600 casualties, Cornwallis could find no way out of his impasse.

At 2 p.m. on October 19 his beleaguered army marched from their defenses to a nearby field, making reality of the independence grandly proclaimed on a piece of paper in Philadelphia five years before.

I walked on the surrender field and tried to imagine the sight: the ragged Continentals drawn up along a road facing the resplendently uniformed French, the British marching between these ranks, flags furled.

Many of the British troops appeared, as a witness chronicled, "much in liquor." Some wept. British bands played a mournful tune that plausible legend identifies as "The World Turned Upside Down."

One part of the world indeed turned topsy-turvy near Yorktown that October afternoon. But another part, born in 1607 in the agony of Jamestown, just 15 miles away, turned toward a bright, promising dawn. □

Washing her sins away, a woman joins the mass baptism of the United House of Prayer for All People held each year in the James River at Newport News. Of the 15,000 who attended last year, say church elders, 2,000 waded into the river to be saved.

Last Harbor for the Oldest Ship

By SUSAN W. and MICHAEL L. KATZEV

MICHAEL L. KATZEV (ABOVE) AND BATES LITTLEHALES, NATIONAL GEOGRAPHIC PHOTOGRAPHER

Cairn of amphorae betrays the seaweed-shrouded tomb of a 23-century-old Greek merchant ship sunk only half a mile off the coast of Cyprus. Divers clear sand and silt from the wreck with air hoses (**right**) before making a detailed photographic survey. The remarkably preserved vessel was then raised piece by piece. Fitted back together, ribs and planks testify to the skill of ancient shipwrights.

HER VOYAGE IS FINISHED NOW. Back in the days of Alexander the Great, she had taken on cargo—almonds and long-necked jars of wine—and unfurled her square sail.

But what caused her to sink to the seabed off Kyrenia, Cyprus, so many years ago? Perhaps it was the sudden fury of an early autumn storm. Or was she simply tired? Indications are that she had been patched and repatched during her long life.

Whatever the cause, the merchantman settled 90 feet to the bottom, where sand and mud covered and protected her, leaving only a mound of amphorae to mark her grave.

For a month Michael and I had searched the Cyprus coasts for ancient shipwrecks. Andreas Cariolou, diving near his home port of Kyrenia, had seen amphorae on the bottom. We dived where he had found them, and our archeological detective work began.*

How old was the "Kyrenia ship," as we named her? Two summers of underwater excavation gave us the answer. Radiocarbon dating and bronze coins we found indicated she had sunk about 300 B.C.

By August 1969 we had raised all her cargo, but the most exciting treasure still lay before us. The hull, stretching like the skeleton of a giant undersea beast, was flattened but remarkably well preserved.

Still, the centuries had taken their toll; the

*Michael Katzev described the first two seasons of work on the Kyrenia ship in the June 1970 GEOGRAPHIC.

sunken timbers, riddled by shipworms, had the strength of wet cardboard. Clearly we could not lift this ship as a whole. So, before separating the timbers, we mapped and photographed and labeled every one.

As we dismantled the hull, we loaded the fragile parts onto metal trays and gently balloon-lifted them to the surface. Before October seas could rage, the dismembered ship was safe inside Kyrenia's medieval castle. Under the vaulting of a great crusader gallery, the ancient wood lay in the stillness of a big freshwater tank—for, should the timbers dry out now, they would shrink to a quarter of their original size.

Undersea explorer Andreas Cariolou dons a scuba tank for a search of waters off his native Cyprus (**map, below**). While diving for sponges in 1965, he discovered the ship later reassembled (**opposite**) in Kyrenia. "When I saw that pile of amphorae," he recalls, "the hair stood up on my neck like a hedgehog's."

A diver since childhood, Cariolou tested some of the first skin-diving equipment on Cyprus and in the process terrified a number of superstitious islanders. "When I surfaced near shore wearing my mask with twin snorkels," he says, "people mistook me for a sea monster with horns. I dodged a good many rocks in those days."

As this article went to press, Cariolou—with 480 others—was being held by Turkish forces in Kyrenia's Dome Hotel; most of the town's 4,300 Greek Cypriots had fled southward as war swept their island nation.

"I don't want to go," Cariolou told a reporter. "I am attached to my home.

"Are we prisoners of war, hostages, refugees? Every day begins with this agony."

JONATHAN BLAIR (OPPOSITE AND TOP)

Chief Requirement: Plenty of Time

Frances Talbot, our conservator, chose PEG—polyethylene glycol—as the medium with which to preserve our wood. She poured waxlike flakes into a water-filled tank containing samples, and heated the tank. Each day, the wood absorbed more PEG. After four months she removed some of the samples, but as they dried, the surfaces sagged and cracks appeared.

Frances shook her head. "Don't be discouraged; it's too soon. We should have a successful treatment worked out in a few more months."

Still, while the timbers of Aleppo pine stored in the freshwater holding tank awaited their PEG bath, there was enough work to keep us busy. Each piece was photographed from both sides—and as pictures piled up, so did full-size tracings, color-keyed to identify nail holes, mortises, and other details.

And there were emergencies. Robin Piercy, assistant project director, will long remember the night, many months later, when the electricity failed. The crew, already tired by a hard day's work, fished pieces of wood out of the rapidly cooling solution—driven by the thought of their ending up encased in a four-ton block of solid PEG.

Robin erected a temporary plank scaffold over the tank, and balanced precariously there while he groped in the dark liquid below. Suddenly he skidded on the plank, slick with the hot solution, and dipped a leg into the PEG. In the seconds he took to regain his balance and pull his leg out of the tank, which still simmered at 160 degrees F., he suffered a dangerous burn.

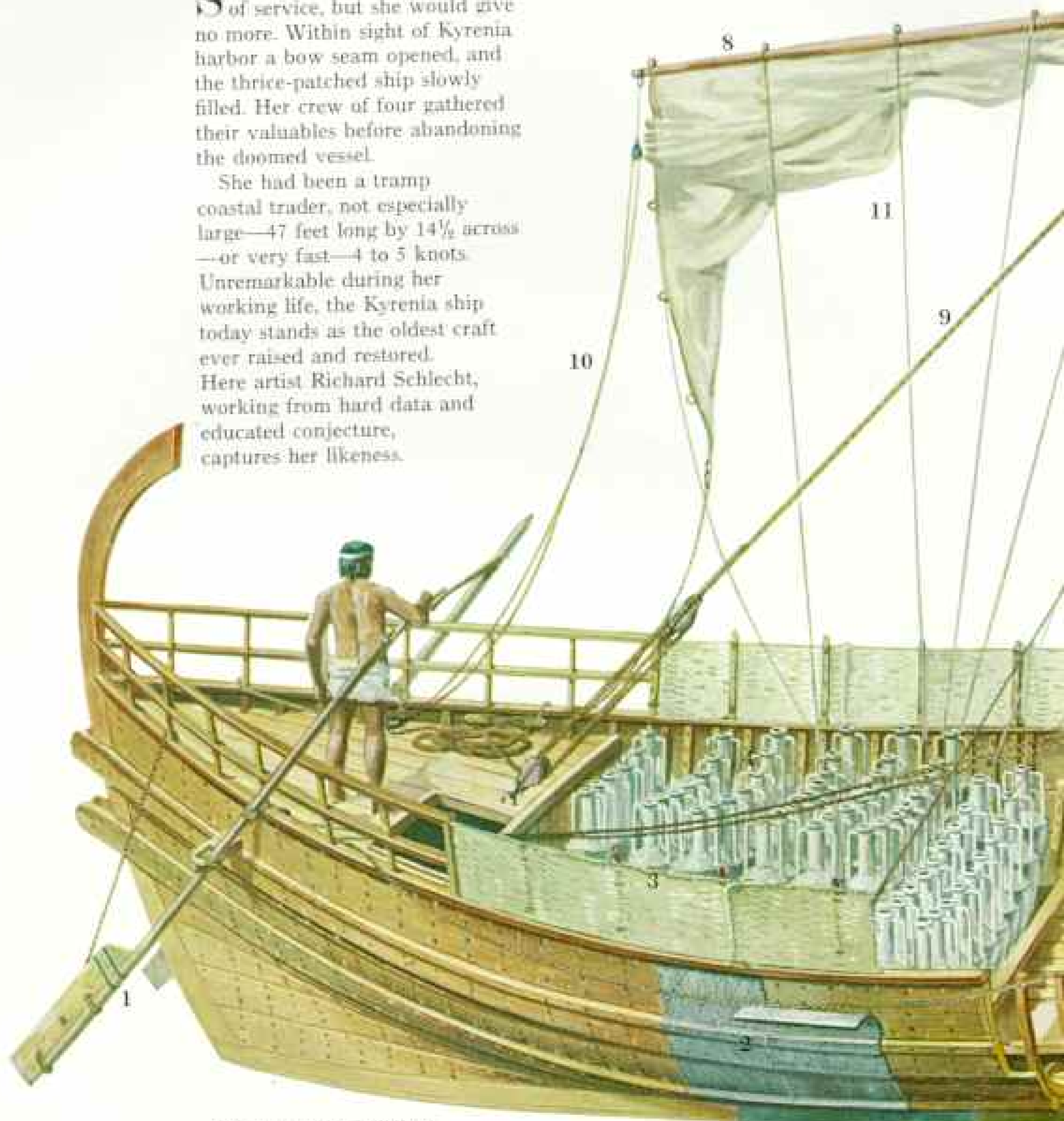
We rushed him to Kyrenia's hospital. A sleepy and bewildered staff—it was five in

Restored merchantman reveals the ancient shipwright's art

SHE HAD GIVEN perhaps a century of service, but she would give no more. Within sight of Kyrenia harbor a bow seam opened, and the thrice-patched ship slowly filled. Her crew of four gathered their valuables before abandoning the doomed vessel.

She had been a tramp coastal trader, not especially large—47 feet long by 14½ across—or very fast—4 to 5 knots. Unremarkable during her working life, the Kyrenia ship today stands as the oldest craft ever raised and restored. Here artist Richard Schlecht, working from hard data and educated conjecture, captures her likeness.

Forty feet of yard (8) held up to 700 square feet of linen sailcloth. Raised from the afterdeck by a halyard (**9**), the yard could be angled with braces (**10**) to catch the wind.

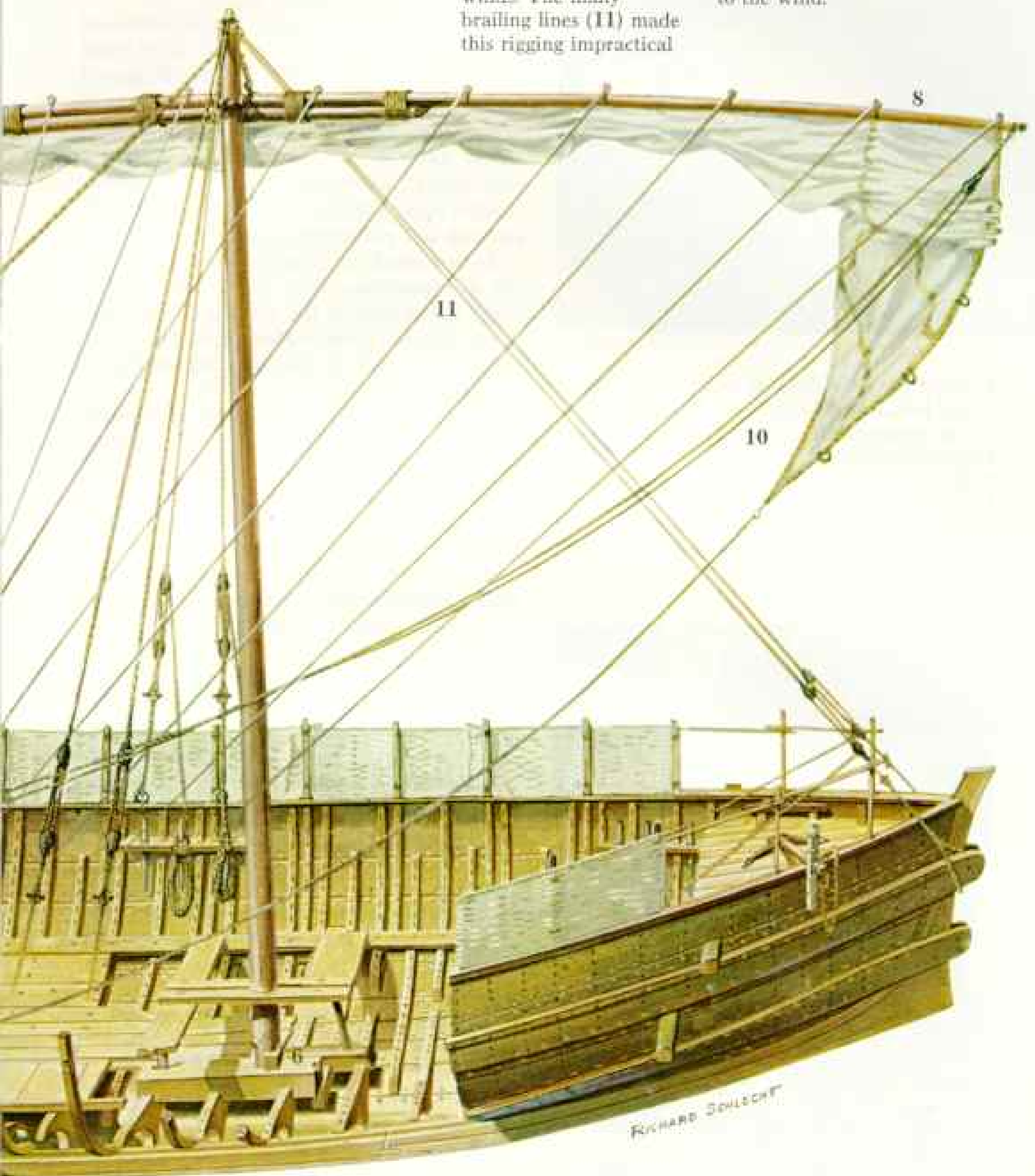


Dual steering oars (1) kept the ship on course. Though more efficient than a single rudder, the exposed oars were more vulnerable to damage.

Lead sheathing (2) was added, long after the ship was built, to protect the hull from worms. Fastened with thousands of copper nails, the watertight skin added years to the vessel's life.

Weather cloths (3), probably of woven matting, shielded wine-filled amphorae (**4**) from waves. The mats could be removed to facilitate loading and unloading of cargo.

Brailed sail allowed almost infinite adjustment for varying winds. The many brailing lines (**11**) made this rigging impractical for vessels carrying several sails, but let the Kyrenia ship point close to the wind.



Ribs (**5**) shown in this cutaway were added after outer planking was complete. This "shell-first" construction was a trademark of ancient naval architecture.

The mast step (**6**) allowed the mast to pivot backward for easy lowering. When upright, small wedges locked the mast's heel in position; fore-and-aft partners (**7**) gave added support.

SUSAN W. KATZEV AND (BELOW) JONATHAN BLAIR

Getting the wrinkles out, conservator Frances Talbot irons irregularities in the ship's keel caused by the preservation process. Before the timbers could be reassembled, each had to be flushed with freshwater, then saturated with a waxlike chemical to give the time-weakened wood new strength. Reconstructor Richard Steffy (**below**) lays out treated pieces of his jigsaw puzzle that will be added to the hull.

the morning—wondered aloud why he had been strolling in a thermal bath at such an odd hour. Robin grinned through his pain, and explained that underwater archeologists do not always dive in the sea.

We returned to our task. Liquid streamed from the planks like warm honey as we lifted them. And smiles of relief crossed Frances's face. The wood was solid. Success!

Now we knew that the largest timbers would have to be soaked for more than a year, though six months would be enough for smaller ones. But we could go ahead in earnest with our preservation project.

As our stacks of treated timbers grew, so did our questions. Why the double layer of wood in the bow of the old ship? Why those square-headed tenons? Most of all, how could we ever manage to put this jigsaw puzzle back together?

"Don't worry—we'll take care of Humpty Dumpty." Those reassuring words came from Richard Steffy, just arrived from the U. S.

Meeting Dick had been one of those happy accidents. Michael had lectured in Pennsylvania one evening, and afterward Dick had invited us to his home. Soon Michael was asking the questions, receiving an outpouring of nautical common sense and shipbuilding technology in return.

Dick, an electrical contractor, spent evenings building models of old ships. Not coffee-table models, but ones to test theories, solve problems. Clearly, Dick Steffy was the man to rebuild the Kyrenia ship, and he took a leave of absence from his business to do it.

Steel Takes the Place of Ancient Joints

In Cyprus Dick pored over every scrap of wood, trying to determine the merchantman's original lines. Those two thousand years of submersion had crushed the hull, spreading the ribs from their original curves.

Working from our notes and tracings, he rebuilt the hull on paper. We continued to treat the remaining wood with PEG.

There were thousands of mortises and tenons connecting the planks. We supplemented them with modern devices—stainless steel rods, which we inserted into the wood—since the watertight integrity of the old hull was no longer a concern.

At last the big freshwater holding tank was empty. In celebration, we donned swim suits and jumped into it to play a foaming game of aquatic hide-and-seek. Soon afterwards we

dismantled the pool to make room for the hull.

Each piece of wood was cleaned, catalogued, photographed, traced, and given a final sponging to bring out the color and grain. We recorded every meaningful detail. Much credit for that exacting work goes to our staff architect, Laina Wylde Swiny.

Dick, in turn, developed a rapport with the Greek builder of 2,300 years ago. "Susan, bring your camera," he would call, as he fitted timbers to their proper curves. "Look at that beautiful work! See what happened? A little sliver came off this one when it was being installed. A carpenter today would ignore it, but our shipwright took the trouble to put in a small patch where no one would ever see it. I really admire a craftsman like that!"

To learn better how the Greeks originally constructed the ship, Robin Piercy began to build a full-size replica of a section of it—shell first. He joined each plank to the next with a row of oak tenons set in mortises. Only after the last plank was set did he fit the frames inside the hull, securing them with long copper spikes.

For more than four years the Kyrenia ship was the focus of our lives.* Her length was 47 feet, her beam 14½—roughly the size of the *Godspeed*, which carried early colonists to Jamestown, Virginia. But she was not built to cross an ocean; when she was loaded, her rail cap stood only two feet above the water. Displacement? Net weight 14 tons, and she carried half again that in cargo.

Maneuvering a scale model outside Kyrenia's harbor, we discovered that she could point surprisingly close to the wind. But it was not easy to set the single square sail around—all those brail lines created a problem. The two steering oars made her amazingly responsive—but they were also more exposed and vulnerable than the single rudder that evolved later.

Dick found, during the restoration, that later shipwrights had patched the vessel at least three times. Built into her hull are signs of a very long working life. Still, even the fine crafting could not keep the water out forever. After years at sea, her bow joinery began to loosen, so a thin veneer of pine was nailed on, probably over thick resin caulking. Later, well below the waterline, four planks grew rotten with age, and were replaced. The patchwork, using square-headed tenons, is a marvel of ancient ingenuity.

More hard service, and then the ship began to leak again. This time her planks were weakened by shipworms, so she was hauled out and sheathed in lead. Then the old ship turned to battle the sea again.

Some time near the year 300 B.C., a captain and his three crewmen loaded their craft for what would turn out to be her final voyage. Samos may have been the starting point; a few amphorae from there were tucked into the back ranks of the cargo. Next, perhaps, was Kos, where millstones came aboard, then Rhodes, to pick up more than 300 amphorae.

And finally, off Kyrenia, she sank.

New Danger Besets the Vessel

It was pure good fortune that the Cyprus Department of Antiquities allowed us to reconstruct the ship within the massive walls of Kyrenia's crusader castle—for, shortly after the project was completed, Kyrenia became a battle zone. As we write this, the old ship still rests there, intact. We pray that the fortunes of war will continue to spare her, for scholars can reap a rich harvest from the oldest vessel ever brought up from the sea.

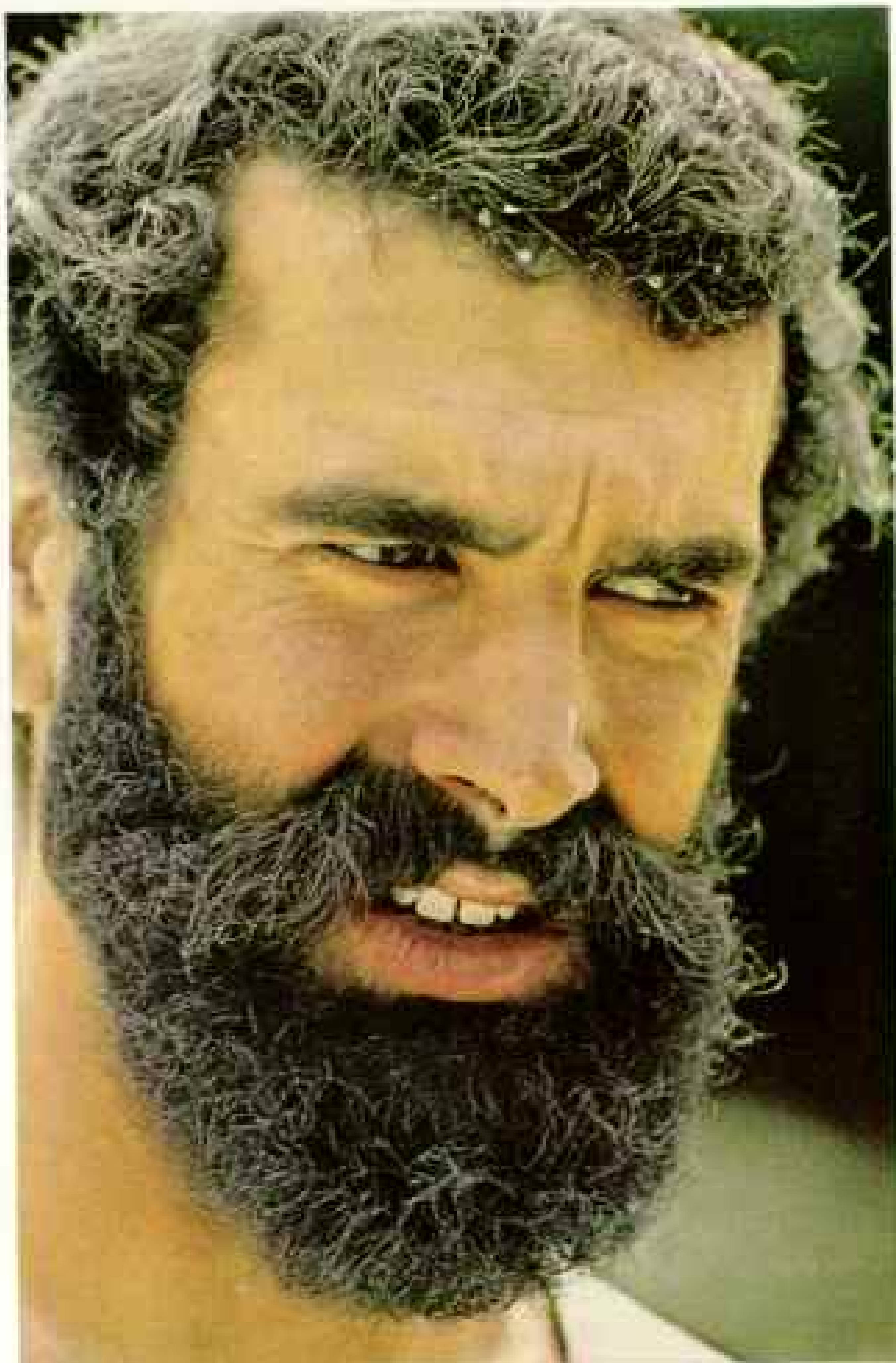
What kind of harvest? Knowledge of classical ship design, for example, and information about the little known "shell-first" building technique.

And knowledge of ancient implements. While Robin Piercy was building the cross section which duplicated a part of the original hull, we learned just how efficient the bronze tools of 23 centuries ago were. Surely, they must have held keen edges, or been sharpened frequently. Even our modern steel chisel blades dulled quickly as we worked with the tough Aleppo pine. And yet the ancients had cut an astounding 4,000 mortise-and-tenon joints into the plank edges of the ship to hold the hull together.

So to us, and to other scholars around the world, the Kyrenia ship is a "time capsule" that links our age with antiquity. If modern conflict spares her, she will continue to yield new understanding of man's early venturings upon the sea. □

*The Kyrenia ship reconstruction was originally sponsored by Oberlin College. The National Geographic Society provided funds, as did the National Endowment for the Humanities, the Cyprus Mines Corporation, the Cook Foundation, and UNESCO. Other contributors included Ocean Search, Inc., the American Council of Learned Societies, the Ford Foundation, the Dietrich Foundation, the Louis Taft Semple Foundation, and several generous personal donors. Since July 1973, the project has been under the sponsorship of the American Institute of Nautical Archaeology.

The Renaissance Lives On In Tuscany



IN THE CITY OF FLORENCE in Italy's region of Tuscany there stands a curious square building, half granary, half church. Life-size statues of saints in bronze and marble look out from niches in the massive walls. In one, St. Thomas is about to touch the wounds of Christ.

A faint smile plays round Doubting Thomas's lips; his expression reveals curiosity, skepticism, but not outright disbelief. He does not truly doubt, but he wants the evidence of his senses to verify his faith.

This Florentine Thomas is the quintessential Tuscan: ironic, slightly disdainful, supremely confident of his own powers. In short, a Renaissance man.

No one will ever know precisely why a volcano of genius should suddenly erupt in 15th-century Tuscany. For a thousand years Europe had slept its long medieval night. Here and there a few sleepwalkers paced the cells of their minds, but on the whole the learning of the ancient Greeks and Romans had been forgotten, and the mass of men lived in ignorance, fear, and superstition. Mystics spoke of another life and turned their backs on an earthly existence that was largely brutish and short.

And then, with the abruptness of a thunderclap, the cry *"La vita terrena merita d'esser vissuta*—Life on earth deserves to be lived" heralded a new kind of man, Man with a capital letter, who lived life so richly, fully, and brilliantly that the flame he kindled lighted all Italy, then Europe, and ultimately, the civilized world.

Perhaps there was another life; meanwhile, this one was to be lived, and live it they did, so resplendently that these humanists, as they termed themselves, almost single-handedly brought into being modern man with his art, science, and technology.

By LUIS MARDEN

CHIEF, FOREIGN EDITORIAL STAFF

Photographs by

ALBERT MOLDVAY

Eternal faces of Tuscany: Chips of marble that sequin the hair of sculptor Guglielmo Vecchietti Massacci (**far left**) come from the same Carrara quarries that gave glowing flesh to Michelangelo's sublime "David" (**near left**). Crucible of the Renaissance, Tuscany's marbled hills poured forth an incandescent flow of genius—Giotto and Galileo, Dante and Petrarch, Michelangelo and Leonardo da Vinci—men whose dazzling achievements put a Tuscan stamp on the mind of modern man.

That golden age has never really ended. The Renaissance man is alive and well and still living in Tuscany. Wherever I traveled, I found him: standing beside me in one of Florence's innumerable coffee bars, tending grapevines on a Chianti slope, scanning the skies from the hill where the first watcher, Galileo, turned his telescope heavenward.

Men like Galileo and Leonardo, when writing their names, proudly added "Florentine." Today every Florentine is still an artist, primarily in the art of living, but probably also a poet, painter, and engineer, certainly a gastronome and classicist. In Tuscany there is no division into intellectuals and Philistines. Here every man is an island, well rounded and complete, and even the plumbers quote Dante.

The region of Tuscany was originally part of Etruria, domain of the Etruscans, a people of unknown origin who occupied the area when Rome was only a cluster of villages. The Arno, flowing east to west where Florence now stands, barred travel north and south. There was a crossing at the point now marked by the Ponte Vecchio, but no bridge until the Romans, pushing their colonies northward, spanned the river and established the town of Florentia in 59 B.C.

At the time of the cultural explosion in the 15th century, Florence was a flourishing walled city of tall quadrangular towers, splendid churches, and rich palaces. The Palazzo Vecchio, that sober and elegant citadel, had already been a center of civic life for two hundred years, and Florence, grown rich in the wool trade, was one of the wealthiest of the Italian city-states.

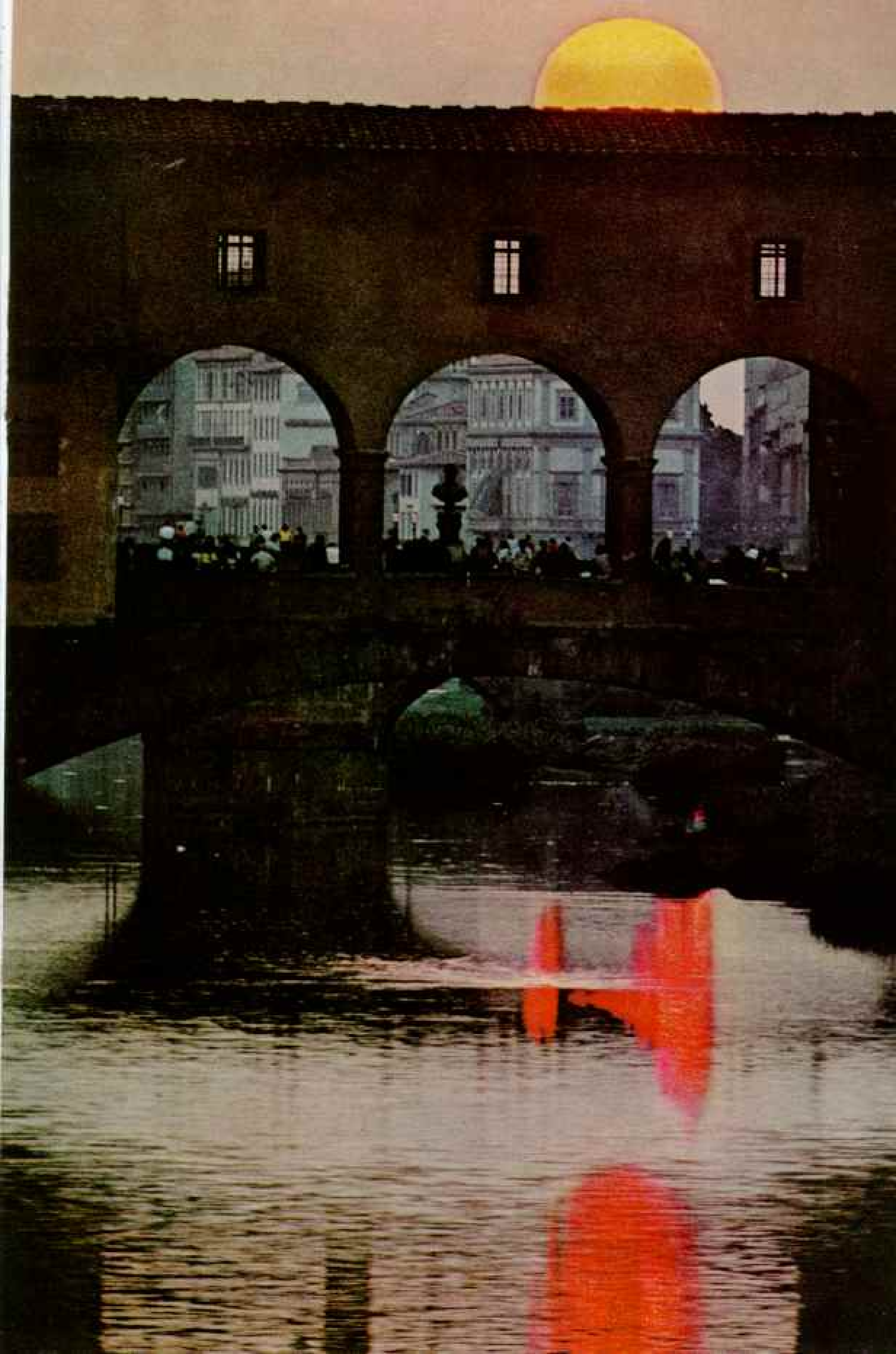
Florence, then as now, was a center of artisanship and crafts, and exquisite objects in gold, silver, glass, leather, and marble issued from its *(Continued on page 633)*

WHEREVER A SUNBEAM ALIGHTS IN FLORENCE *it ignites the glory of a Renaissance treasure. The famed cathedral and Giotto bell tower, right of center, dominate the heart of the Tuscan capital. The river Arno slides beneath a lattice of bridges that includes the shop-lined 14th-century Ponte Vecchio.*

PHOTOGRAPHED BY THE AUTHOR FROM THE GOODYEAR AIRSHIP "EUROPA"

Bridging the centuries, the Ponte Vecchio, or Old Bridge (**opposite**), has spanned the Arno since 1345. Its shops ran with butchers' gore until the mid-1500's, when the Medici—then rulers of Florence—moved their court to the Pitti Palace, on the left bank. Affronted by the smell, the Medici ousted the butchers in favor of goldsmiths and jewelers, who remain today. Visitors ogle dazzling shopwindows (**below**), whose assorted treasures spring from the skill of goldsmiths like Enzo Giachi (**right**).

Striking cameo by Enzo Quaglia, displayed in a local shop (**below**), reproduces a fresco by Raphael, a onetime resident of Florence.



dark *botteghe,* the workshops that lined the city's narrow streets.

The tradition of individual craftsmanship and enterprise persists. Italian cities have their supermarkets and department stores, but in Florence the small shopkeepers and artisans tend to go their separate ways. Whenever I walked from my apartment on the Lungarno delle Grazie to the Palazzo Vecchio, I would pass, within a single long block of the Via dei Neri, 30 shops, among them a furniture seller, bank, cookshop, cheese and sausage monger, two wineshops, fruiterer, greengrocer, butcher, dress shop, barber, paper and twine vendor, and dairy.

Italians love growing things. One day on the Via dei Neri I saw the barber squirting a stream of water on a small green plant, not two inches tall, that had sprouted between ancient paving blocks at his feet. To everyone who passed he said: *"Ha visto, cosa è nato—* See what has been born here," and the passersby would beam with approval.

ON THE LEFT BANK of the Arno, in an old ghetto quarter hard by the Ponte Vecchio, goldsmiths and their apprentices fashion beautiful jewels of gold, silver, and precious stones, wedding art and technique in the manner of the Renaissance. In one small workshop I watched the partners, Aliani and Perini, casting gold. Signor Perini played the flame of a blowpipe on a button of gold in a porcelain crucible.

"I let 'the flames gently unfold over the work,' as our master taught," said Perini.

"Who was your master?" I asked.

"The master of us all," replied Perini with a smile, "Benvenuto Cellini. It is all in his book; we do nothing different, nothing new."

I had read Cellini's famous life of himself, but I had not known that he had written a treatise on the art of the goldsmith, still valid after four hundred years.

The lump of gold melted. With tongs Master Perini lifted the crucible and poured the tawny stream into a plaster mold. Beside him an apprentice delicately chased and stippled the head of a golden octopus. Gold is a soft and ductile metal, and so skillfully had the master modeled the brooch that the eight arms seemed to writhe. When the worker inserted green emeralds into the eye-sockets, the octopus glared balefully.

Octopuses, fish, sea horses, and other "marine monsters" such as Cellini loved to fashion glitter in the windows of shops that crowd both sides of the medieval Ponte Vecchio (pages 630-31), but before the master's time the shops housed a more prosaic brotherhood, the butchers.

Alone in Italy, the Tuscans are hearty beef eaters. In a restaurant near the Ponte Vecchio I first tasted that Florentine specialty, *bistecca alla fiorentina,* steak grilled in herbs and olive oil. In Tuscany the cooking is simpler and lighter than most Italian cuisine. Tuscans cook superlative ingredients with great subtlety, doing, for example, wonderful things with white beans and the best olive oil in the world.

When Catherine de' Medici went to France to marry the future King Henry II, she was appalled by both the cooking and table manners of the French court. Sending for her cooks, she laid the foundation of the French *grande cuisine.* At the same time, she brought an Italian invention called the fork.

An Englishman traveling in Italy wrote in 1611, "The Italians ... use a little forke when they cut their meat. ... The reason of this their curiosity is, because the Italian cannot by any means indure to have his dish touched with fingers, seeing all men's fingers are not alike cleane."

WHENEVER I sat down in a Tuscan restaurant the waiter, even before handing me a menu, would ask, "White or red?" He referred, of course, to Italy's most celebrated product: wine.

The Greeks called Italy Oenotria, the Land of Wine. Man and the vine have grown up together in this millenary soil, and Italy today is the largest maker and consumer of wine in the world, producing 1.5 billion gallons of wine per year. One out of every fifteen acres of Italian land is planted to the vine.

Fusion of gold, smoke, and Tuscan tradition: Three-inch-high sculpture by modern Italian goldsmith Germano, photographed amid a puff of smoke in a Florence shop, portrays ruby-eyed Charon, boatman of Hades, ferrying protesting souls across the river Styx. Though borrowing his theme from classical mythology, Germano evokes the work of two famed Florentines: the *Inferno* of Dante and the magnificent golden sculptures of Benvenuto Cellini.

Birthplace of modernity, Tuscany—Toscana in Italian—owes its name to the ancient Etruscans, whose civilization glittered brightly before being eclipsed by Rome about 500 B.C. Two millenniums later, Florence-born navigator Amerigo Vespucci ranged far beyond these hills to give his Tuscan name to a New World. Today's artifact-strewn landscape, little marred by industry, nurtures farms whose produce—like that grasped by a modern Florentine (**right**)—sustains a people with an ever-vigorous appetite for life.

One of the best-known wines in the world comes from Chianti, a region between Florence and the city of Siena to the south. In 1924 Italians built the world's first *autostrada,* and today a network of superhighways runs the length of the Italian boot. But the best way to see Chianti is to take the old road, the Via Chiantigiana, that traverses this well-favored region of forested hills, castles, villas, and vineyards.

THE CITY-STATES of medieval and Renaissance Italy were broadly aligned in two camps: the Guelphs and the Ghibellines. The terms derived from two German factions, contenders for that relict of ancient Rome, the Holy Roman Empire, which cynics said was neither holy, nor Roman, nor an empire. The Guelphs claimed temporal—as well as spiritual—power for the Pope, while the Ghibellines supported the Holy Roman Emperor. To complicate matters, the Florentine Guelphs divided into Blacks and Whites. Chianti, lying between Guelph Florence and Ghibelline Siena, saw nearly constant bloody warfare.

In a castle on the banks of the Greve, a quiet stream that meanders through the Chianti hills, a powerful family, the Gherardini, had their seat. They mustered 300 "knights of the golden spur," but they were Whites, and in 1302 the Blacks razed the castle.

A remnant of the Gherardini resettled on the opposite bank of the Greve in a villa called Vignamaggio, a rose-red building set among dark cypresses. Its formal Italian garden of ranked cypresses, clipped severe hedges, and geometric walks expresses perfectly the humanists' insistence that everything, even nature, must bend to man's will. Here I talked with the owner, Count Bino Sanminiatelli, a slender man of great charm and vivacity. Like many of the Italian aristocracy, the count is a writer, and has published more than twenty volumes.

"The Gherardini," said the count, "were a strong and spirited strain. In the 12th century some of them emigrated to Ireland, where they anglicized their name to Fitzgerald, a literal translation, since both mean 'son of Gerald.' This was the beginning of the famous Irish Fitzgerald family. Your late President Kennedy had Tuscan blood, he being a Fitzgerald on his mother's side."

In his book-lined study the count showed me an advertisement for the superb wine he makes. The caption read: "Why Does the Lady Smile? You'd smile too, if the finest and

purest Chianti came from a vineyard bearing your name." Above was a reproduction of the world's most famous portrait.

"In 1479," said the count, "one Anton Maria di Noldo Gherardini, of the family that had remained in Tuscany, fathered a daughter whom he called Lisa. At 16 the girl married a merchant of Florence, Messer Francesco di Bartolommeo di Zanobi del Giocondo. When Lisa was 24, her beauty caught the eye of a painter named Leonardo."

Of her portrait a contemporary wrote, "Leonardo achieved a smile so pleasing that it was a thing more divine than human. . . ."

If you know Tuscany, the celebrated Gioconda smile of Monna (short for *madonna,* my lady) Lisa holds no mystery. It is a humanist smile, serene, self-confident, perfectly content with the best of all possible worlds. My Lady Lisa is, in the jargon of today, utterly "well adjusted." It must be hard, I think, for a psychoanalyst to make a living in Italy.

When, called by Francis I, Leonardo da Vinci went to France to end his days, he took Madonna Lisa's portrait with him. Today in the Louvre, the French have gallicized her title, Mona Lisa. But then they call Julius Caesar Jules César.

"So you see," said Count Sanminiatelli with his own slight smile, "your President Kennedy and Monna Lisa were related, distantly but definitely."

IN THE TUSCAN HILLS the vine antedates man. Some years ago paleontologists discovered a million-year-old fossil grape vine in Chianti, probably an ancestor of the same *Vitis vinifera* cultivated today.

The best-known wine of Chianti comes from Brolio, a thousand-year-old castle on the way from Siena to Florence. Any army marching north or south found this formidable defense squarely in its path. In the sanguinary fighting between Ghibelline Siena and the Florentine Guelphs, Brolio was razed every time the Florentines were defeated and rebuilt whenever they won.

In 1141 the Ricasoli, a family in Chianti since at least 770, acquired the castle. With the present Baron Bettino Ricasoli, a quiet-voiced, gray-eyed man, I visited Brolio one bright morning. The massive castle, surrounded by cyclopean walls of gray stone, stands on a terraced hillside (pages 640-41). From the ramparts we looked down the Arbia valley to Siena, barely visible on the horizon. We were at 2,000 feet, and a cool breeze brushed the ranks of olive trees below us with silver.

"Wine has been made here for at least a thousand years," said the baron, "but the vineyards down there were planted by my great-grandfather."

He spoke of an earlier Bettino Ricasoli known to Italian history as the Iron Baron. The old baron was Italy's second Prime Minister, after Cavour, who unified the country in 1861. Like many Tuscan aristocrats, he was an egalitarian.

"In 1848 the *liberali* of Florence gave a dinner for Richard Cobden, the British apostle of free trade," the baron told me. "My great-grandfather sent 24 bottles of his precious 1841 vintage, 'something,' he used to say, 'that I would not have done for any king on earth.'"

Italians, especially Tuscans, have always been strong individualists, ardently given to going their own way.

Doubtless this is one reason why socialism and Communism have so many followers in Tuscany, a prosperous, largely agricultural land, with few extremely rich or very poor, not the kind of soil normally propitious for the red banner. But Communists in Italy, like

everything else Italian, are a breed apart.

In the hills south of Siena I once heard a man who was staggering under a full-size cross in a religious procession say:

"If it weren't for the Communists, there'd be no one to carry the cross in Italy!"

And in a restaurant on the island of Elba the proprietor, a Communist with a handlebar moustache like Franz Josef's, displays portraits of his two idols, side by side: Palmiro Togliatti (former head of the Italian Communist Party) and—Pope John XXIII.

"Our Communists," Italians say, "have no use for the Church—except at three moments in their lives: birth, marriage, and death."

For such men it is much easier to talk Communist philosophy than to live under the authoritarianism of Communism. I suspect that the fiercely independent Tuscans would not last three months in Russia or China.

Resuming the conversation about his great-grandfather, the baron said, "He never stopped experimenting with his vines. After twenty years of work he established Chianti as we know it now. It was—and is—made of three grapes, two red and one white."

In the twilight of great wine cellars at the foot of the hill we walked between enormous elliptical casks twice as tall as a man.

The baron held up a bottle. "Most Chianti is *di pronta beva*, to be drunk young, but nearly every year we make a reserve that we age for at least five years. This always goes into a standard bottle, as the rush covering on the tear-shaped Chianti flask may mold in a cellar." The baron poured a glass of 1967 *riserva*. It glinted with garnet lights and I inhaled the scent of—violets?

"For me, it is the perfume of the Florentine iris, the fleur-de-lis that is the symbol of the city," said the baron. *"Salute!"*

SCARCELY ten miles as the raven flies from Brolio, her ancient enemy Siena dominates the land between the valleys of the Arbia and Elsa. Behind massive ramparts the slender Italianate tower of the town hall rises from a shuffle of red-tile roofs. I entered the city through a monumental gate surmounted by the six balls of the Medici and the motto *"Cor magis tibi Sena pandit*—Siena freely opens her heart to thee"—a phrase the Sienese must have regretted in 1555 when, after a long siege, the city fell to a Florentine army.

The 334-foot tower of the town hall rises from the rim of the Campo, an inclined piazza. Bareback riders race dangerously here twice each year in the Palio, a 700-year-old horse race (pages 638-9).

This piazza to me is the most beautiful in Italy. The Sienese, proud of their city's history, have barred motor traffic from the town's heart, and in the Campo children run and play while their elders sip *aperitivi* at tables set along the higher edge of the square.

On the second of July, I sat on a balcony at one corner of the Campo and looked down on a dense mass of humanity. At least fifty thousand persons had jammed into the enclosed area of the piazza. Between packed bleachers and the central enclosure an earthen track the color of raw sienna covered the paving blocks.

Sitting beside me was my good friend Dr. Federigo Sani, a handsome man who bears a startling resemblance to Albrecht Dürer. He commented on the scene.

"There are 17 *contrade*, or quarters of the city, each with a symbolic animal or heraldic device, but in each Palio only ten compete.

"If for any reason the jockey should be thrown, the riderless horse can still win.

"They race three times around, beginning just below us at the stretched rope."

The curiously shaped piazza has the form of a D, with two sharp turns at the angles, where the bareback riders are often thrown and sometimes injured.

I wore a black-white-and-orange kerchief in honor of the *Lupa*, the She-wolf, my friend's contrada.

"We have drawn the best horse," said Signor Sani, "but we have not won a Palio in 23 years."

"Perhaps I'll bring luck," I said.

Below us a black-suited dignitary raised his foot and stamped on a pedal. The taut

Discordant clamor of today fills Florence's venerable Piazza della Signoria as striking workers parade through the square. Tempers also flared here in 1498 when the volatile friar Savonarola was hanged and burned by Florentines, whose worldly ways he had vigorously denounced. Standing before the Medici family's Palazzo Vecchio, or Old Palace: Bandinelli's "Hercules and Cacus" and a copy of Michelangelo's "David."

PADRONI
SI AI CONTRATTI
SCIOPERO

Pride is the most important purse in the Palio, an emphatically disorderly horse race staged in Siena's Campo. Riding without saddles or stirrups, jockeys wear the medieval colors of city wards. With abandon they hurl around the course, often

careening into mattress-cushioned walls as they round this 90-degree turn. Tradition condones almost any ruse—whipping an opponent, tripping, even bribery—to achieve victory. The first horse to cross the finish line wins—with or without its rider.

starting rope dropped to the ground. The horses sprang forward, the crowd roared, and then a gun fired. False start.

As the silk-clad riders jockeyed for position, I noticed some speaking rapidly to others.

"Last-minute offers," said my friend. "They're probably offering big sums of money to get the other rider to hold back his horse, or not to crowd at the turns.

"Millions of lire ride in this race; the jockeys, most of whom come from Sardinia or southern Italy, may make 10 million lire [$16,000] in one season. The contrade allow large sums for 'expenses,' which they use to make deals with others."

"An organized corruption," I said, "in the Renaissance manner."

"*Una corruzione lecita*—a licit corruption," said Signor Sani with a smile. "Everyone knows the unwritten rules and abides by them. The jockeys are poor men, and they may make a modest fortune."

Strangely, there is no betting on the Palio. Sienese are not betting people. "We are not interested in money, but in the honor a victory would bring. These rivalries have been going on for seven centuries."

A roar like that of a Roman mob at the circus erupted as the horses sprang forward, cleanly this time, and the field was away in a drumming of hoofs and a spray of yellow earth. The riders, stretched along the necks of their mounts, bunched at the first turn, then pulled apart in the long uphill stretch

BOTH BY CLIO MANDER

Nectar of Tuscany's hills, a Brunello, the world's most expensive wine, meets the test of taste from wine-grower Franco Biondi Santi (**above**) atop Montalcino Castle, south of Siena. The best years require at least half a century in the bottle to reach perfection. When new, Brunello has a bouquet of fresh chestnuts, like those on Dr. Biondi Santi's table with a priceless bottle of 1888 vintage.

A variety of the dark-purple Sangiovese grape used in Brunello also goes into Chianti—a blend of red and white grapes. Harvesters (**right**) pluck ripe clusters at the Brolio vineyards.

on the far side of the piazza. On the second circuit "my" horse, the She-wolf, took the rail at the bad turn and drew slightly ahead.

On the third round the Lupa pulled away. Women screamed, men shouted, and a heavy-set man—perhaps of the *Istrice*, the Porcupine contrada, deadly rivals of the She-wolf—bit a piece from the brim of his hat and swallowed it.

The Lupa had won and the dam of discipline burst. The crowd swarmed on to the track; a cheering mob pulled the winning jockey from his horse and fought to embrace him. Several fights broke out in the heaving sea of people. Just beneath us, screaming, weeping girls pleaded with outstretched hands for the Palio, the banner of victory.

Two men vaulted the balcony to clutch me to their bosoms. They kissed me on both cheeks. *"Lei ci ha portato fortuna*—you brought us good luck," they said. "You said we would win!"

On the 16th of August another Palio was run, but I was careful to stay away. I did not think my luck would hold for a second win, and I remembered the man with the hat.

BEFORE COMING to Tuscany, I had never heard of Brunello, Italy's finest red wine. In Montalcino, a fortified town on a hilltop south of Siena, I tasted this wine. At the Greppo winery, 2,000 feet above an undulating plain dotted with towers like the background of a medieval fresco, workers were

MANHATTAN OF TUSCANY, *San Gimignano lofts a cluster of late-medieval skyscrapers. A republic in its own right until annexed by Florence in 1353, San Gimignano was the home of wealthy merchant families who competed in erecting the towers—exclamation points to family pride as well as bastions of refuge in times of siege. Of some 70 towers in Dante's time, 13 remain today.*

pitchforking purple grapes into a crushing machine. Through a pulsing hose the juice flowed into fermenting vats. Placing my ear against one of the vats I could hear the subdued grumble of the "turbulent fermentation" that turns grape sugar into alcohol.

"Brunello was first made by my grandfather, toward the end of the last century," said Dr. Franco Biondi Santi. "It is a very simple wine made from a single grape, a subvariety of the Sangiovese."

Brunello matures extremely slowly. None is sold before aging four years in the wood, but the reserves of good years must have at least a dozen more years in the bottle to be ready for drinking. "The 1970, an extraordinary vintage, should be reaching its peak in 50 years," said the doctor. "Our wine is for people with patience."

And money. Brunello was unknown outside Italy until Italian President Saragat served it at a banquet for Queen Elizabeth in London in 1969. Now it is exported in small quantities—the oldest and most expensive wine in the world. In Italy a bottle of the youngest reserve, 1964, costs $101; the 1945, $338; the 1925, $560; and if you can find a bottle of the great 1891, it will cost $1,140.

In his cellars, not for sale, Dr. Biondi Santi has ten bottles of a miraculous year, 1888. Recently sampled, the vintage was still deep ruby red, full-bodied, and aromatic. I mentioned to him that 1888 was the year of the founding of the National Geographic Society.

"Come back next year on June 23, my silver wedding anniversary; we shall open a bottle of the 1888 and toast the Society."

SOUTHWARD from Siena the highroad runs, over rolling wheatlands, a heaving sea of gold; then it skirts an Etruscan site and passes through Grosseto, a city with polygonal Medicean walls encysted like a crystal in its heart.

Six miles off coastal Piombino lies the island of Elba, where the Etruscans, whose iron blades for a time outfought the Roman bronze short swords, obtained their metal. In a modest house overlooking the sea on Elba, Napoleon lived in exile for ten months, from May 1814 until his escape in February of 1815. On the wall of a villa outside Portoferraio I read three words the caged eagle had written: *"Ubicumque felix Napoleon*—Napoleon is happy everywhere." Before this pathetic attempt at self-deception I could pity, briefly, the man who brought sorrow to half the households of Europe.

Etruscan and Roman antiquities turn up all over Elba, but the richest finds come from the sea. At Portoferraio, chief port of Elba, Gino Brambilla, a barrel-chested man with the head of a Napoleon, told me of a Roman shipwreck found on the south coast.

"We brought up lamps, dishes, vases, and an ivory figurine of Bacchus and Pan, but the most astonishing finds were some small jars of clay. When we poured out the sand, they released a faint scent of musk. They were perfume jars, diffusing their fragrance after 2,000 years under the sea!

"On another wreck of the third century B.C., 175 feet down, we found a sealed amphora with this liquid in it." Gino handed me a plastic container. "We think it was originally white wine mixed with honey."

I took a cautious sip of the translucent yellow liquid. It was salty but not unpleasant.

"Era un buon secolo, Gino," I said. "That was a good century."

IN THE MIDDLE AGES Elba came under the dominion of Pisa, a powerful city-state astride the Arno, due west of Florence. In the Second Punic War, when Rome crushed Carthage, Etruscan seamen from this area had manned many of the Roman galleys.

In 1062 Pisa, now a powerful maritime republic, raided the Saracen stronghold of Palermo, in Sicily. With treasure taken from the sack of the city, Pisa began to build her magnificent cathedral in 1063.

Separate from the cathedral, in the Italian manner, the bell tower was begun in 1173. Almost at once it began to tilt. As each course was laid, stoneworkers tried to straighten the structure by cutting the marble blocks of one side slightly wedge-shaped.

The campanile was not completed until 1372, nearly 200 years after the first stone was laid. Today the eight-tiered tower curves slightly, like a banana, because of the builders' attempts to correct the lean. Engineers say the tower leans 5 degrees 19 minutes and 56 seconds from the vertical, which translates as an overhang of fifteen feet.

The Leaning Tower of Pisa leans because it was built on exceedingly shallow—ten-foot—foundations resting in sandy clay shot through with running water. For a long time the slant increased an eighth of an inch a year. Lately, the movement has slowed to only

Home cooking, Tuscan style: In the village of Firenzuola, Signora Ermelinda Salvini pours off liquid from homemade ricotta; this cheese is a protein-rich staple of the rural Tuscan's starch-heavy diet. Farm family (**below**) shares a main course of *pasta e fagioli* —macaroni and white beans with spices in olive oil. Such country-style fare is doted on by urban and rural Tuscans alike, although Florentines have also evolved a gourmet cuisine renowned for such treats as *bistecca* (beefsteak) *alla fiorentina*. France adopted Florence's cooking along with an Italian novelty called the fork.

Three faces of the Madonna, as if in a Picasso portrait (**left**), peer from a painting—yet to be fully restored—whose layers have been exposed for demonstration by art restorers in Florence. Oldest layer (large eye and mouth) was painted by an anonymous artist in the 1200's. Middle layer (light-skinned area at left) was overpainted some 400 years later. Most recent layer (darker face on right) probably dates from the 1700's. Modern restoration methods worked near-miracles in saving hundreds of masterworks damaged by the Arno's 1966 rampage.

Through a dark mask brightly: Blue-eyed photographer Albert Moldvay gives a haunting aspect to a bronze festival mask, found near Siena and dating from about A.D. 80. Says Moldvay: "I just wanted to see if the Romans who wore these things had heads as big as an average-size man's of today—so I tried it on. It fit perfectly."

The finishing touch never ends for students at the Institute for Marble in Carrara (**left**). Here fledgling aspirants to Michelangelo's artistry hone their talents by working on reproductions in the same kind of marble the master used. Michelangelo himself studied at a similar school established in Florence by Lorenzo the Magnificent—one of history's greatest art patrons.

a thirtieth of an inch a year, but engineers, who measure the tilt daily with clinometers and a pendulum hanging down the central well, fear it would take little more tilt to bring the whole architectural jewel crashing down.

The Leaning Tower recalls one of mankind's most illustrious names: Galileo Galilei, the genius who helped to found modern science. Galileo grew up in Florence, but went to study at the University of Pisa at the age of 17. Before his time, men of science tended to accept as unalterable truth everything that Aristotle and other classical writers had stated. Greek philosophers held the senses in contempt, relying on pure reason to arrive at their theories. Galileo, believing only what he could see, touch, and measure, built his theories on the basis of direct experiment, the modern method.

After Galileo's death in 1642, one of his disciples, Vincenzio Viviani, wrote a life of the master, in which he records that Galileo found "...that the velocity of like materials... is not in accord with their differing weights, as assigned to them by Aristotle; rather, they all move at the same speed, demonstrating this with repeated experiments performed from the summit of the bell tower of Pisa...."

One day at dusk I climbed the disorienting stairs of the Leaning Tower with the sexton. We carried two translucent balls the size of grapefruit. One was double the weight of the other and inside each was a colored, battery-powered electric lamp. On the top platform

we assembled the spheres and switched on the lights, then I ran down the stairs to my camera, set up a hundred yards away.

I opened the camera shutter and waved a handkerchief. Tracing two red and orange streaks against the violet night, the spheres dropped like falling stars and landed with a simultaneous thump (page 659).

Viviani also tells of Galileo's discovery of the principle of the pendulum, one of the fundamental physical discoveries of all time.

Galileo's name will be forever associated with the telescope, yet he did not invent the "tube of long vision." No one knows who made the first one, probably the Dutch, but it seems certain that the first telescopes were put together by makers of spectacle lenses. There is a tablet in the church of Santa Maria Maggiore in Florence that translates:

HERE LIES SALVINO D'ARMATO
DEGLI ARMATI OF FLORENCE
INVENTOR OF EYEGLASSES
MAY GOD FORGIVE HIS SINS
YEAR 1317

What is remarkable is that no one before Galileo seems to have turned the tube of long vision skyward: "But I, leaving things of the earth, turned my eyes upward to contemplation of the heavens.

"A most beautiful thing and beyond measure fascinating is to see the Moon's face.... It does not have a smooth and polished surface but rather it is scabrous and un-

As if Dante's inferno were boiling just beneath the ground, plumes of superheated steam jet from natural and man-made holes in and around the Larderello geothermal power station southwest of Siena. Cooling towers of the plant, upper right, rise above this Italian "valley of smokes"; the village of Montecerboli huddles at lower left.

Here, since 1913, electricity has been commercially generated from geothermal energy. Italy, pinched for power, has launched a full-steam-ahead project for further development of the nation's geothermal potential.

equal, like the face of the earth itself...."

Galileo also discovered four of the innermost satellites of the planet Jupiter and the true nature of the Milky Way.

On the banks of the Arno in Florence there stands one of the great science museums of the world. Here are displayed the elegant and beautiful scientific instruments of the past five centuries, but the most precious objects of the collection are two telescopes from Galileo's own hand.

With the director of the museum, a handsome and erudite lady, Professor Doctor Maria Luisa Righini Bonelli, I climbed the stairway to the top floor of the dark and silent museum one midnight. Throwing open the casement windows, we looked across the glistening Arno to the Florentine hills. Hanging like a steady lamp above the river shone a single bright planet.

Professor Bonelli gently laid a leather-covered tube in a wooden trough and sighted along it, muttering to herself as she moved the tube infinitesimally. At last she exclaimed: "*Ce l'ho!*—I've got it!" and motioned me to the instrument.

I applied my eye and saw only blackness. Shifting slightly I looked again. Suddenly a small bright disk swooped across the field and vanished, returned briefly to dance in my eye, and winked out.

Finally I got the knack and was able to hold the tremulous amber disk in view for several seconds. Some of the shaking came from emotion. I was looking at the planet Jupiter through Galileo's own instrument, reliving the supreme moment of the first man in the world to "search the ways of the heavens" with a telescope.

For an hour we peered at the dancing planet, but we never saw the Jovian satellites that had evoked the wonder and incredulity of the world three and a half centuries ago.

"We are struggling against something Galileo never encountered: smog," said the professor, pointing at the planet burning brightly above its wavering image in the Arno, "but we know the satellites are there."

Far upstream of the science museum and the nearby Ponte Vecchio, the Arno makes a great sweeping bend to the southeast, nearly touching the city of Arezzo. Here the Aretini have wedded modern mass production to the ancient goldsmith's art and turn out elegant objects by the hundredweight.

In a great factory that looks like something in Detroit, I saw 1,500 workers turning out gold and silver jewelry by the mile. In the foundry a casting machine extruded a continuous rod of gold, thicker than my thumb. The rod moved slowly downward through a hole in the floor; it was two stories long when I saw it.

Cavaliere Mellini, my companion, said: "If you keep melting metal at the top, the rod issuing from the machine will never end. Every day this plant turns out, by machine and hand finishing, about 500 pounds of gold and silver jewels. The trademark *Uno A Erre* [1-A-Rezzo] on 6,000 different models, takes our city's name all over the world."

FLORENCE was Arezzo's implacable enemy, as she was of virtually all the Tuscan city-states until her final conquest of them all. In a great battle at Campaldino in 1289, Florence vanquished the Aretini forces, but the defenders retired within the city walls and would not permit the victors to enter.

Tuscans are tenacious and have long memories. With the passage of time the two cities grew fairly friendly, but peace between Arezzo and Florence was not formally made until, at a public ceremony in October of 1971, the two mayors shook hands and signed a document—682 years after the battle!

Fighting on the Florentine side in the battle of Campaldino was a young horseman. Fortunately for the world, Durante (Dante) Alighieri survived the bloody battle and lived to write his *Commedia*, a long allegorical poem so sublime in its language and loftiness of concept that Italians and the world call it *The Divine Comedy*.

Before Dante's time few thought the vulgar tongue, as opposed to Latin, was elegant enough to express poetry and philosophy. Writing Italian in what was termed the *dolce stil novo*, the "sweet new style," Dante fixed

Pinocchio . . . and the real boy he wanted to be. In the tiny village of Collodi 5-year-old Andrea Bianchi hugs the toy puppet who yearned to be human. The universally loved children's character was created by Tuscan author Carlo Collodi, a Florentine who took the name of his mother's home village as his pen name.

The Renaissance takes the field again during an annual reenactment in Florence of the city's ostentatious gesture in 1530, while under siege by the forces of Charles V. Florentine citizens so scorned their attackers that they played a game of *calcio*—Florentine football—in clear view of the enemy, encamped on nearby hills.

Modern-day son of Florence (**above**) dons antique armor to take part in a parade preceding last year's celebration. Clad in Renaissance colors, players (**right**) compete furiously in an hour-long bout without time-outs or substitutions. Cries of foul—rarely heeded—are quickly swallowed up by the tumult of the crowd.

the Tuscan dialect of his native city, Florence, as the official tongue of Italy for all time. In other countries politics determined the national language; in Italy, it was letters.

Linguists generally acknowledge that Italian is the most mellifluous language in the world. Charles V, the Habsburg Holy Roman Emperor, is supposed to have said that he spoke Spanish to God, French to men, German to his horse—and Italian to women.

PROFESSOR GIACOMO DEVOTO, the eminent lexicographer, explained the purity of Tuscan for me. "The great Roman roads running the length of Italy were bifurcated by the geography of Tuscany," he said, "like a stream diverted by a granite boulder. The Via Aurelia, heading north from Rome toward Gaul, encountered the great swamps, the Maremma, in the southwest of Tuscany and had to hug the Tyrrhenian coast. The foothills of the Apennines deflected the Via Flaminia east along the Adriatic shore.

"In Rome itself, returning veterans and subject peoples debased the language, but the flow of war and migration bypassed Tuscany and left its Latin and, later, its Italian, limpid and pure."

As the rest of Italy says, "When a Tuscan speaks, he polishes the air around him."

The men of the Renaissance were protean. Galileo wrote poetry; Lorenzo the Magnificent was celebrated as a man of letters. Before them, Dante had proved himself a competent scientist in meteorology, astronomy, botany, and the observation of bird flight. But even in this glittering company one figure towered like a giant among pygmies.

". . . some times there is brought together in a single human being beauty, grace, and virtuosity to such a degree that wheresoever that person turns each of his actions is so divine that, leaving behind all other men, it is manifest that this is a thing granted by God and not acquired by human art."

So a contemporary describes Leonardo da Vinci, the greatest universal genius the world has ever known. Painter, sculptor, architect, engineer, scientist, poet, philosopher, musician—Leonardo was all these so astoundingly that "the terrible manifestations of his intellect" awed all who knew him.

Leonardo possessed great strength, so that "with his right hand he could twist a horseshoe as though it were made of lead," but he was gentle and soft of heart. He loved animals and ". . . when passing by a place where

Tipping the scale against a truck's front end, a heavyweight block of marble from quarries near Carrara is eased onto a flatbed. Precarious but practical roadway to the quarries (**right**) has wishbone curves too sharp for trucks to round; vehicles must back along one grade, then go forward on the next.

Mist-wreathed marble mountains of Carrara, part of the coast-flanking Apuan Alps, shoulder the northwest corner of Tuscany in this aerial view looking east across the mouth of the river Magra (**above**). Flowing from Tuscany into Liguria, the Magra marks the northern end of Tuscany's Versilian Riviera. Just to the northwest begins the Italian Riviera—more widely famed than Tuscany's holiday coast but no more beautiful or chic among local Italians and beach-thronging vacationists. This hauntingly lovely segment of the Tuscan littoral was beloved by the English Romantic poet Percy Bysshe Shelley. In 1822, he was drowned in a sailing accident off the sands of Viareggio (**right**), where bathers crouch beneath an almost solid canopy of beach umbrellas to escape the scorching sun. For the less gregarious, nearby beaches screened by thick pine woods and shrubbery offer scenic solitude. Farther south lie the off-coast islands of the Tuscan Archipelago, including storied Elba, to which Napoleon was exiled after his forced abdication in 1814. He escaped in 1815, and met his Waterloo a few months later.

they sold birds, he would take them out of the cages, and, paying the seller the price he asked, he would release them into the air, restoring to them their lost freedom."

IN A SMALL SQUARE behind the Palazzo Vecchio a bird seller displays stacked cages aflutter with birds of all colors, sizes, and voices. Each time I passed I would see two small brown birds in cages scarcely bigger than their bodies, silent amid the twittering, chirping, and raucous cries, ceaselessly and hopelessly hopping back and forth. Italians will shoot and eat anything that flies, and these sparrows were destined to lure their brothers within gunshot.

One day I could stand it no longer. "Paying the seller the price he asked," I took the small cages and drove across the Arno. At first I followed the river as it flows westward to the sea, then at Empoli turned north into the hills where the small town of Vinci clusters round its protecting castle.

Vinci—"Vinzhi" in the soft Tuscan pronunciation—cannot have changed much since Leonardo's time. The quadrangular umber tower of the castle rises from a silver-green sea of olives, grapevines rule green wales across the hills, and on the skyline sentinel rows of cypresses stand like vertical dark brushstrokes. Near here Leonardo was born and lived as a small boy. Now, with his eyes, I watched the swallows swoop and dart against a golden sky. He must have studied the flickering birds wistfully, because the desire to fly never left him.

I carried the cages to the top of the hill and gently lifted out the birds. For a moment I felt the beating of their hearts against my hands, then I tossed them into the air. They fluttered frantically and then fell to the ground where they staggered about drunkenly. They had been caged for months, and I remembered the Tuscan proverb:

"Chi di libertà è privo, ha in odio d'esser vivo—He who lacks liberty abhors life itself."

Now the birds hopped with more assurance among the fallen olive leaves that lay like silver lancets on the earth. Suddenly and together they launched themselves into the air and flew in a fluttering curve toward the tower on the hill.

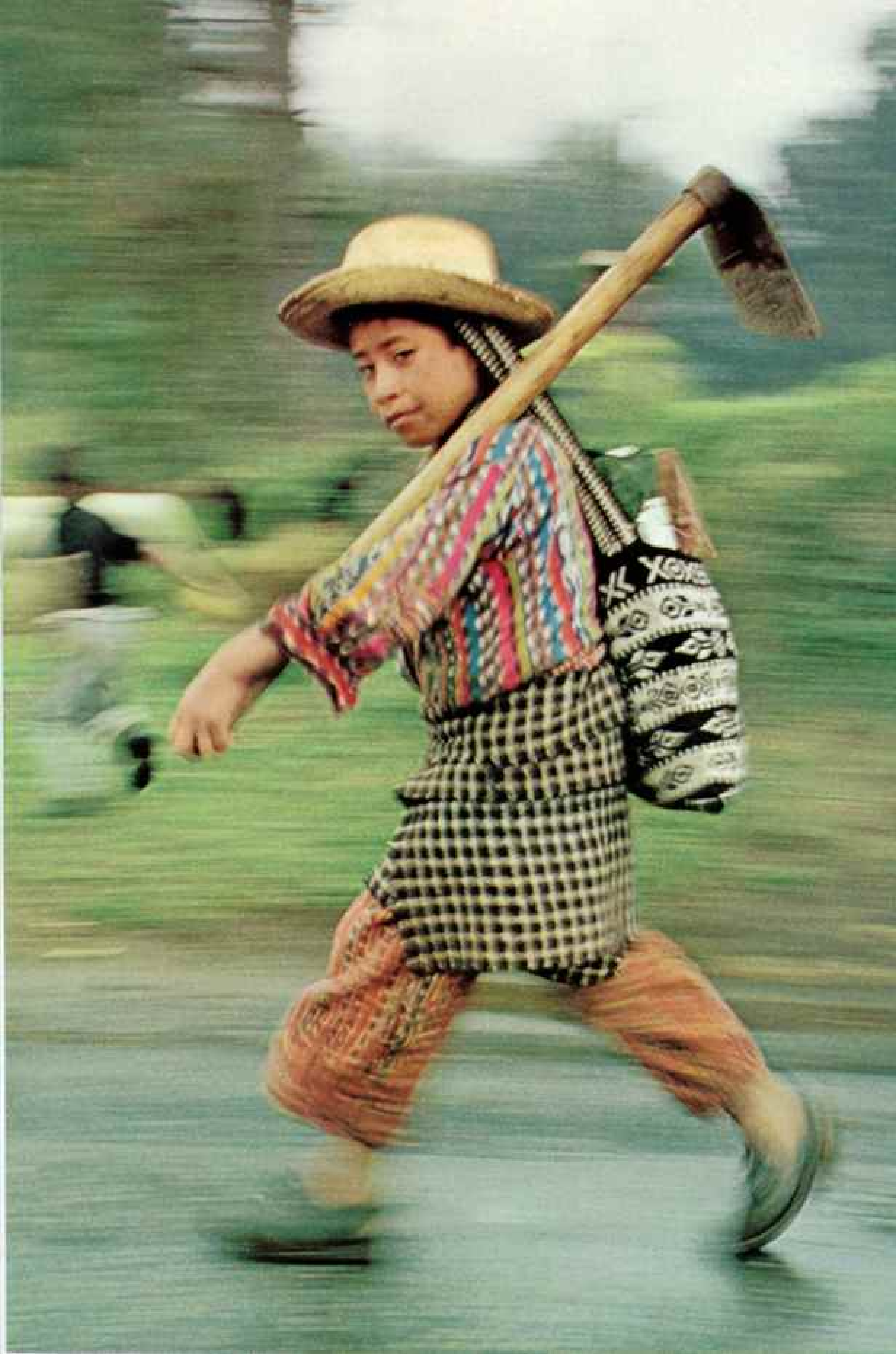
"Life is meant to be lived," said the Florentines. On my back I felt the approving glance of Leonardo, the greatest Tuscan of them all. □

Homeland of the questioning spirit, Tuscany produced some of history's most magnificent intellects. The transcendent Leonardo da Vinci, when not changing the course of art with his brush, conceived ideas for a whole technology of the future. At the museum in Vinci, a bust of Leonardo (**below**) peers above models of two of his flying machines.

Galileo Galilei, his pupil Viviani reported, put to the unfashionable test of experiment the Aristotelian theory that, when two bodies of unequal weight are dropped simultaneously, the heavier will hit the ground first. Author Luis Marden photographs a replay of Galileo's

experiment: Two lighted plastic balls, one heavier than the other, plummet from the Leaning Tower of Pisa (**right**). Both struck the ground at once—a result the scientific community of Galileo's day had refused to acknowledge.

LUIS MARDEN (RIGHT)



Guatemala, Maya and Modern

By LOUIS DE LA HABA

Photographs by
JOSEPH J. SCHERSCHEL
NATIONAL GEOGRAPHIC PHOTOGRAPHER

IN GUATEMALA'S lofty highlands, far from the hubbub of the modern capital, Maya Indians and their pantheon of spirits dwell amid the cloud-ripping hulks of dead and dormant volcanoes. To reach those high places one drives, as I have done, from the shadows of spanking new bank, office, and hotel buildings in Guatemala City until the broad, congested thoroughfare becomes a winding road that skirts precipitous mountainsides, descends into wooded gorges, and traverses high plateaus planted in corn or wheat. After a few hours a sight never to be forgotten may gleam through breaks in racing clouds, or it may glisten splendidly in the light of a clear blue sky: Lake Atitlán of the thousand-foot-deep waters.

Here live Maya-speaking Indians in villages that garland the lakeshore with a litany of saints' names—San Marcos, San Pablo, San Pedro, San Juan, and that most Spanish of patron saints, Santiago.

Santiago Atitlán's people live in steep-roofed houses within stone-walled compounds. They harvest some of the world's best coffee on high volcanic slopes, as well as *tul* reeds from the lake, and they fish from fragile high-prowed boats. Many an Atiteco has drowned when the frightful *chocomil* comes whistling down the mountains to churn the mirror lake into a raging sea.

Rugged country this, and rugged, conservative, inward-minded people live here. Guatemala's Indians—some twenty Maya-speaking groups that make up half the country's five and a half million people—have been Christianized, and to some extent modernized, since the conquistador Pedro de Alvarado first came thundering down from Mexico in 1524. But they keep to their old religious practices. The ancient spirits remain their allies and, at times, their foes.

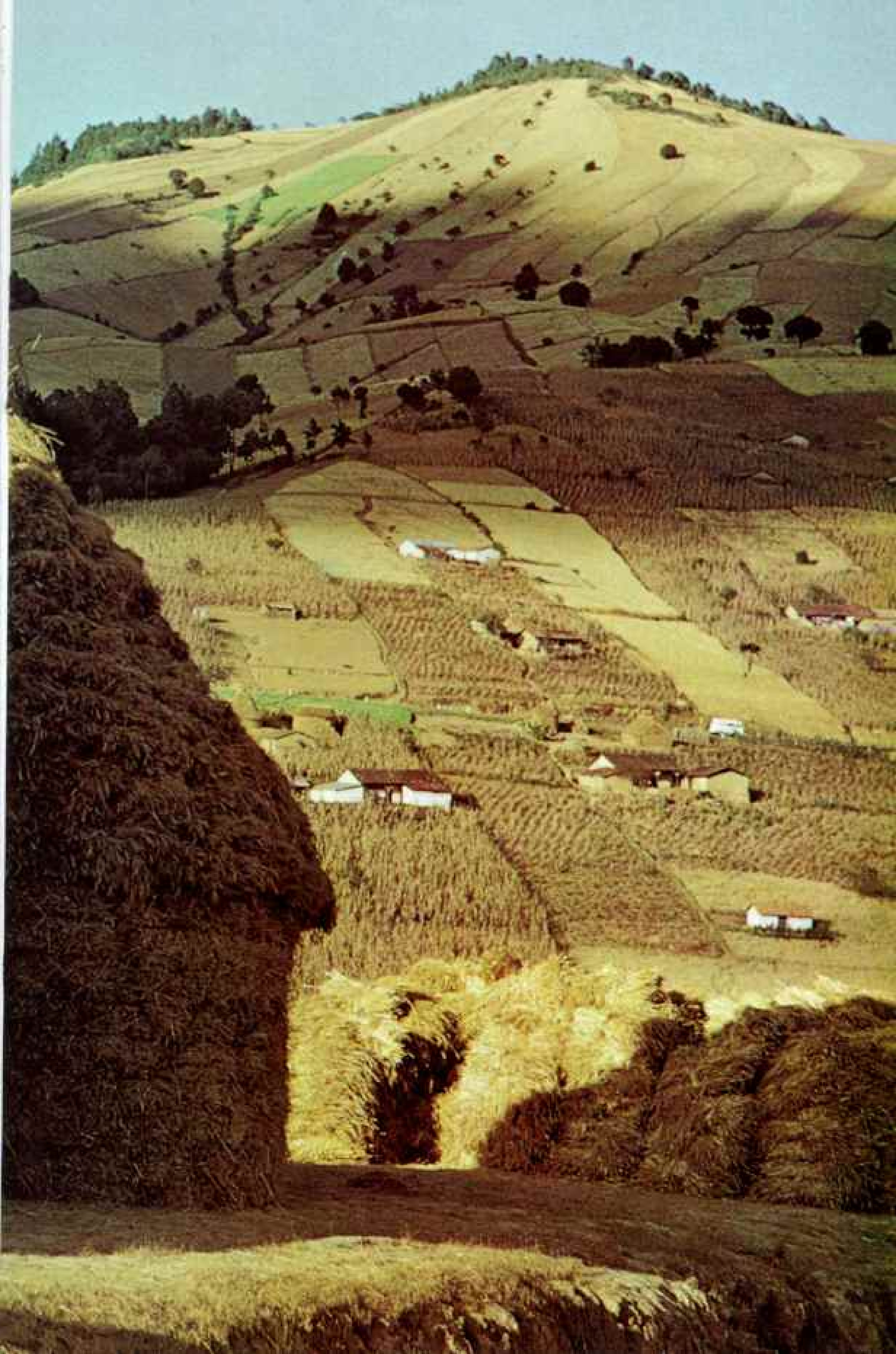
It has been said the Indians are Christians in the churches and pagans in the fields. What results is a complicated mixture of practices and beliefs. Nowhere is this more evident than in Santiago Atitlán during Holy Week, when many village Indians worship the Maximón, a mystery-wreathed idol made up of clothing bundled around a jealously guarded secret core.

Its face is a wooden mask, and invariably, when it appears in public, the Maximón has a long, fat, brown cigar protruding from its puckered lips. A village leader called the *telenél*, member of a brotherhood dedicated to

Using his head to carry his lunch, an Indian boy trots off to help his father on the family farm near Sololá. He represents one face of modern Guatemala—a proud heritage of Indian culture. The other was shaped by 300 years of Spanish colonialism. Now Guatemalans strive to unite the two as partners in a strong and stable nation.

Blessed by a wide range of climate, the Central American land can nurture virtually any crop grown in the Western Hemisphere. Golden cones of wheat straw tower above Indian farmers (**following two pages**) walking to their checkered fields.

DIEGO MOLINA (LEFT) AND JOSEPH J. SCHERSCHEL



the Maximón, keeps the idol hidden in the rafters of his house. Once a year, as one of the climactic moments of the Holy Week observance, the Maximón is taken down and dressed with great solemnity.

I attended this ceremony in the company of an old man, José Castro Zapeta. We smoked together and drank coffee spiced with chili (not recommended) as we sat on a bench against a wall of the telenél's crowded house. At a signal from the telenél, a powerfully built man in his thirties, the lights—but for one candle—were extinguished, and the idol was brought down from the rafters. The telenél dressed the 4½-foot-tall Maximón with layer upon layer of shirts, trousers, and coats. It took nearly an hour. When the candles flickered again, the Maximón, topped by two new five-gallon hats, stood in the center of the room, looking like a fat dwarf.

One by one the village elders came and knelt before the idol. They made the sign of the Cross and offered long and earnest prayers. Some left small gifts—cigars, cigarettes, half-pint bottles of rum. The smoke of incense filled the room.

Next day, in a tumult of music, the clacking of wooden noisemakers, and more clouds of incense, the telenél carried the idol on his shoulder to a small domed chapel outside the Roman Catholic church on the village square. The entire population watched. Inside the chapel the telenél placed the Maximón against a wooden pole, tied a rope around its neck, and—to my astonishment—hanged it. Then he stuck a fresh cigar in the idol's mouth.

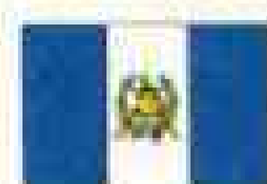
In many towns in Guatemala during Holy Week, people hang effigies of Judas Iscariot, Christ's betrayer, as objects of derision. Though the Maximón had also been hanged, it was not a figure of scorn but of devotion.

"What is inside the Maximón?" I asked

BOTH BY JOSEPH J. SCHERSCHEL

Who is the Maximón? Wreathed in elegance for Holy Week at Santiago Atitlán, the idol Maximón (**left**) combines Christian and pagan elements. A many-splendored wardrobe (**above**), here hung out to dry, covers the Maximón's secret core, perhaps a carving of a Maya deity. The *cofradía*, a brotherhood of believers, chooses one of its members to attend the idol in a joyous midweek procession to a small chapel, where it is hanged by the neck. An object of devotion despite such treatment, it remains there until Good Friday.

Rare quetzal, the bird on Guatemala's flag, represents a nation spreading the wings of independence. The country has long considered itself the head and heart of Central America, offering citizenship to any in the region. With developing resources in the Petén and modernized economic policies, Guatemalans have high hopes for continued political stability.



GOVERNMENT: Republic. AREA: 42,042 sq. miles. POPULATION: 5,600,000; 50 percent Indian, 45 percent *ladino* (part Indian). LANGUAGES: Spanish, Indian dialects. RELIGION: Roman Catholic. ECONOMY: Coffee, cotton, beef, sugar, vegetable oils, bananas, chicle. MAJOR CITIES: Guatemala City, pop. 750,000, capital; Quezaltenango, pop. 55,000. CLIMATE: Hot, humid coasts; cool highlands.

Pedro Damián, another village elder who had been a telenél himself.

"Clothes."

"But inside the clothes?"

"The small bundle you saw."

"And inside that?"

"Only the telenél knows. It cannot be told," Pedro Damián said testily.

I had heard that the Maximón's secret core might be an old Maya carving of wood, or perhaps of stone. No one would say. I tried one more tack.

"Who is the Maximón?"

"Maximón is San Simón. When Christ was born, *he* was born," Pedro Damián said. He peered at me, adding, "Maximón is Don Pedro de Alvarado." And the old man turned away, cackling with laughter.

Cataclysms Destroy Early Capitals

Pedro de Alvarado, one of the lieutenants of Hernán Cortés, battled his way into Guatemala with an army of 120 horsemen, 300 foot soldiers, and a few hundred Mexican allies. Several times the Indian inhabitants came close to defeating him, but the wily Spaniard prevailed.

Alvarado established his first headquarters in the Cakchiquel Indian stronghold of Iximché, 15 miles east of Santiago Atitlán. Indian hostility forced the Spaniards to move, and in 1527 they founded the city of Santiago de los Caballeros at the foot of Volcán de Agua. Torrential rains and earthquakes loosed a great flood and mud slide from the volcano in 1541, smothering this second capital city. In the centuries since, a town, today called Ciudad Vieja—Old City—has grown out of the ruins.

The Spaniards established their third capital two years later; they named it also for Santiago. The city flourished in its fertile valley, flanked by the volcanoes Agua, Fuego, and Acatenango; it became a shining cultural center, rivaling Mexico City to the north and Lima to the south. Splendid churches, convents, and government buildings vied for beauty and grandeur.

But there, too, disaster struck. In 1717 and again in 1773, horrendous earthquakes leveled the city.

This old capital is known today as Antigua Guatemala, and the city lives again, the bustle of daily business continually rubbing

"**Nothing now started . . .** will remain unfinished." So declared President Kjell Eugenio Laugerud García, center, pledging to continue programs begun by retiring President Carlos Arana Osorio, in dark glasses.

Upon taking office in July 1974, the newly elected president—handpicked by his predecessor—reasserted the Guatemalan claim to British Honduras, or Belize, Britain's colony at Guatemala's northeastern border. Although diplomatic relations between the two nations have been broken since 1963, Laugerud hopes to reopen negotiations concerning the fate of Belize.

JOHN M. KESHISHIAN, M.D.

elbows with the ruins of past glories. Antigua was declared a national monument in 1944, and some restoration has been done, but most of the battered old buildings have been left to stand as witnesses to old splendors and epic disasters.

Antigua is very Spanish, and its Indian population devoutly Christian. It was still Easter season when I arrived to find the streets decorated with intricate carpets of colored sawdust (following pages). To the sound of sacred music, elaborate processions trampled these as they wound through the city. It could have been medieval Seville but for the many Indian faces.

It is traditional in Antigua, on Good Friday, to release three inmates of the city's jail. The lucky ones are picked from eight candidates who confect their own less-than-artistic sawdust carpet on one side of the main plaza. I went there to witness the event, and found myself standing by one of the prisoners, a handsome young man of about 22.

"What are you in for?" I asked him.

"Murder," he said, looking me in the eye.

A guard took him away, grasping him by his handcuffs. Soon the procession bearing the crucified Christ arrived and paused by the prisoners. The candidates for freedom were announced and—surprise—among them was the young man I had spoken to.

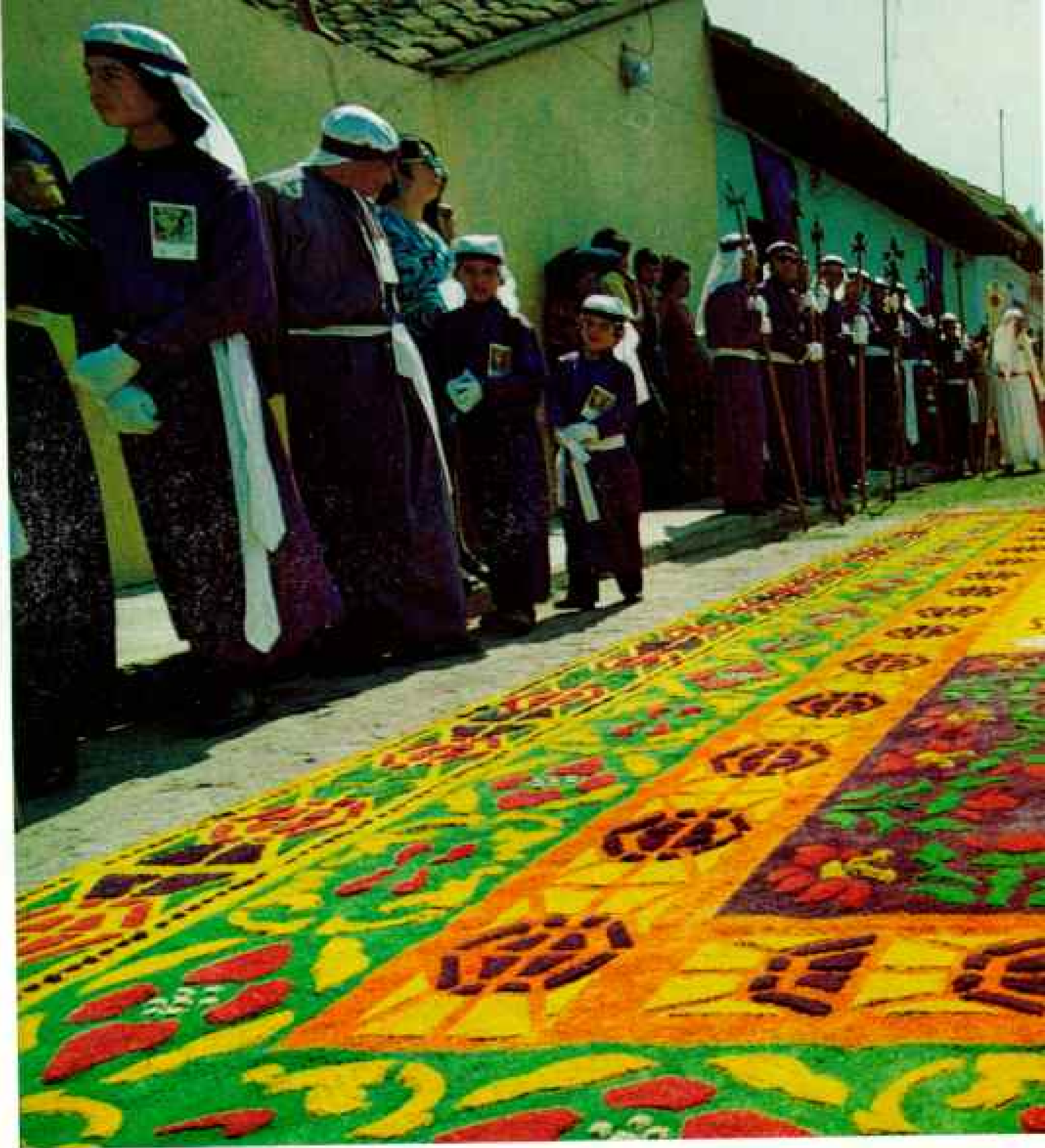
Nagged by doubts, I went to the police station and looked up the colonel in charge. When I finished my story, the colonel burst into laughter.

"A murderer! No, *señor*. Not a murderer at all. He was just a *bolito* [a drunk] we picked up a few days ago. He must have been trying to impress you. Let me assure you that we don't release murderers here in Antigua."

Modern Capital Dominates Nation's Life

After the 1773 earthquake, the Spaniards moved their capital once more, to a plateau nearly 5,000 feet above sea level, and there laid the foundations for Guatemala City, today a metropolis of 750,000 people. Nothing else in Guatemala compares to its capital, which is the center of everything—industry, commerce, finance, publishing, education (four universities), government, and a burgeoning tourism.

Tremors occasionally jolt the city, but some of them *(Continued on page 673)*

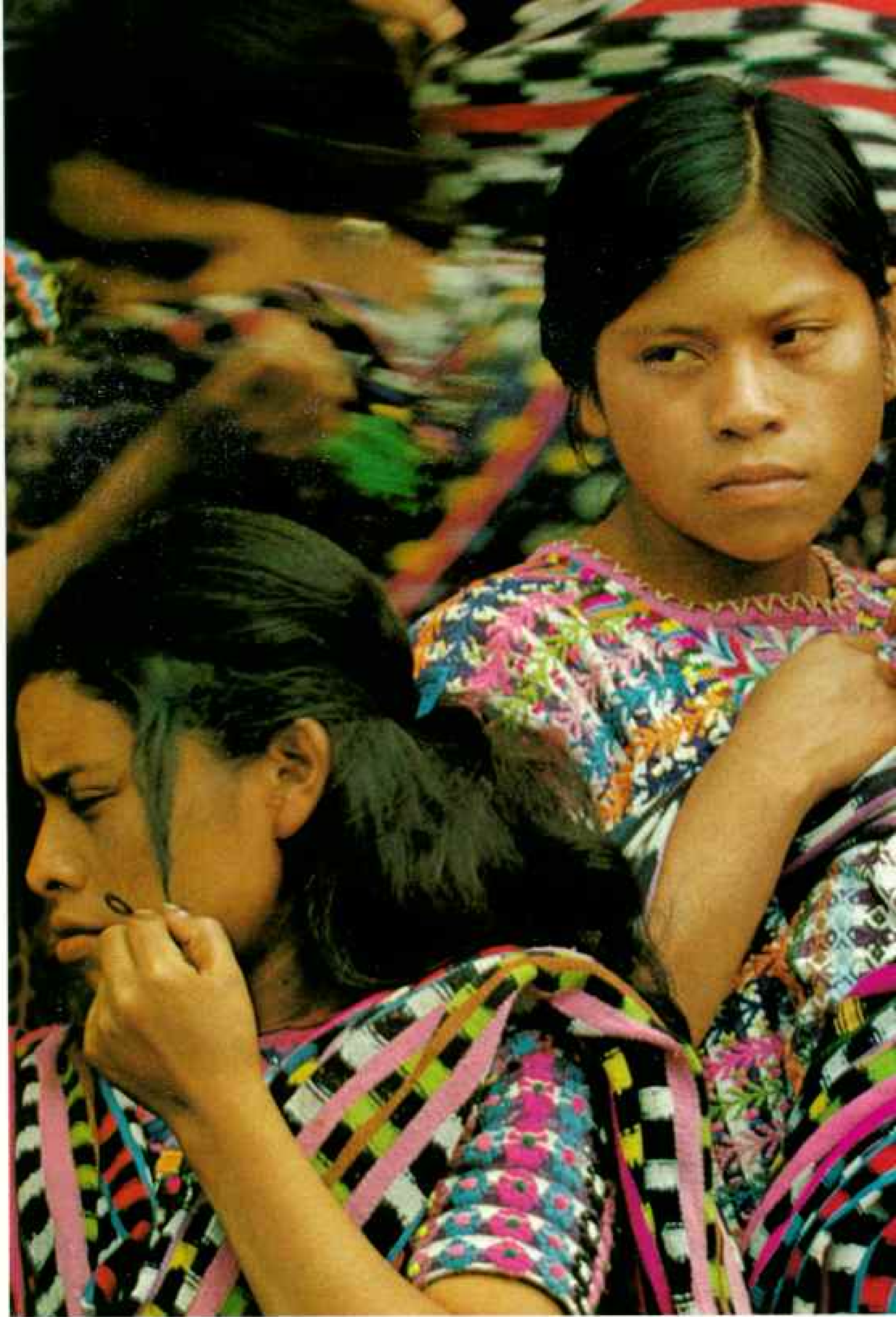


Triumph on the Way of Sorrows: Beauty blazes from a carpet of colored sawdust covering a street in Antigua during a Good Friday reenactment of Christ's Passion. Flanked by celebrants, an image of the cross-bearing Christ rides a mahogany platform on the shoulders of men whose shuffling feet destroy designs that required long hours of painstaking labor to create.

Onetime colonial capital of Guatemala, Antigua throbs with religious fervor during Holy Week. For the climactic procession recalling Christ's journey to Calvary, hundreds of men dress in purple, symbolic of the Passion, and march with lances in hand and pictures of saints over their hearts. Others appear as Roman centurions in golden armor and helmets.

Weaving through cobbled streets, the procession pauses before the City Hall. There, from among prisoners in the jail, three are selected for an act of penitence—then freedom. Shouldering logs heavy with chains, they join the procession (**right**).

BOTH BY JOSEPH J. SCHERSCHEL

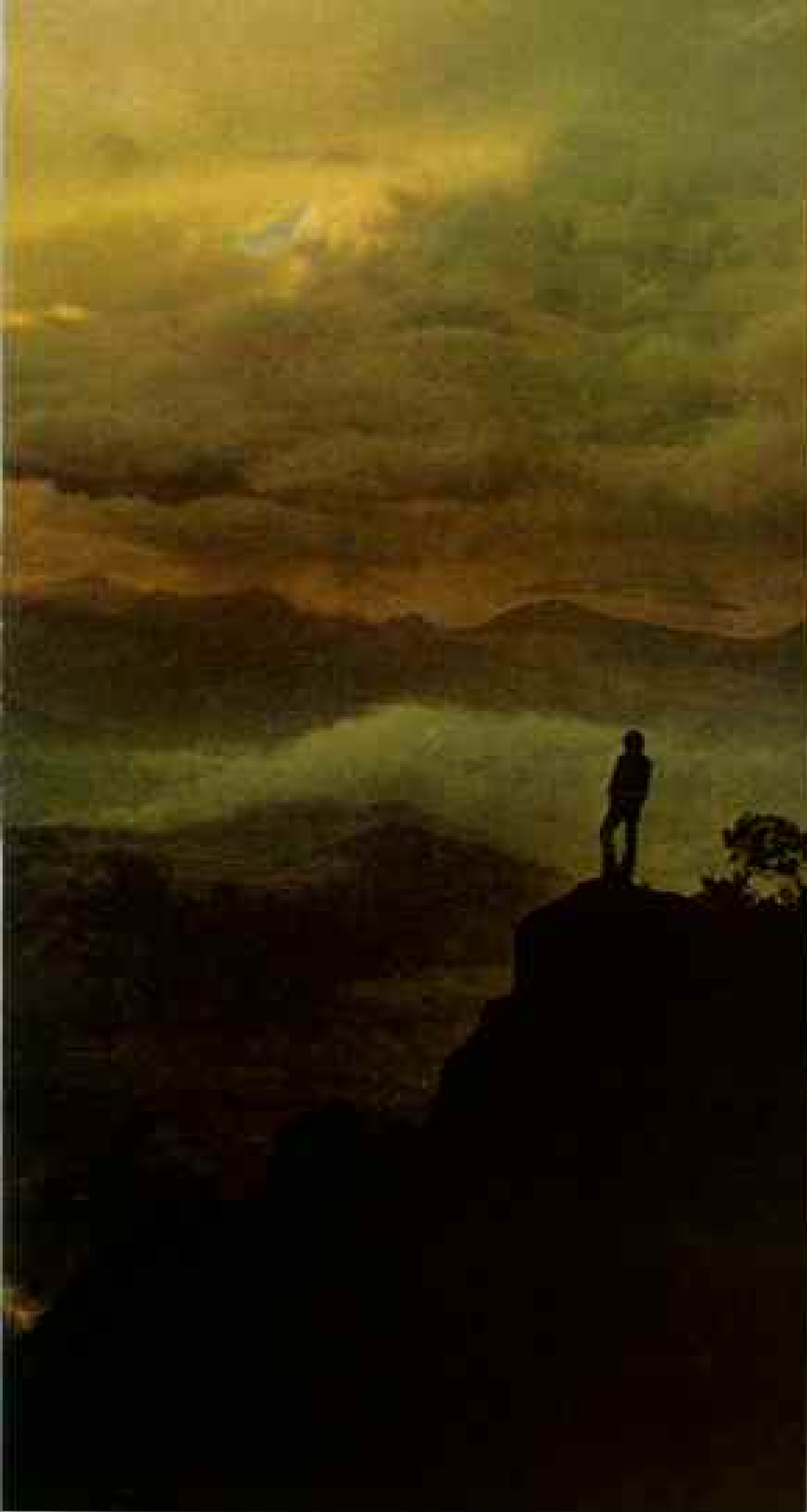


Villagers in Easter-egg colors celebrate Holy Week in Santiago Atitlán. But bright finery is worn year round in Indian Guatemala, where a village can be identified

JOSEPH J. SCHERSCHEL

by the design of its textiles. Even the volunteer militia recognizes the Indian's pride in his dress, allowing him to retain traditional garb in lieu of a uniform.

PATRICIA CAULFIELD (LOWER) AND JOSEPH J. SCHERSCHEL



Swathed in evening clouds, the perfect cone of Santa María (**above**) challenges the sunset. One of 33 volcanoes—a few still active—that march through Guatemala, Santa María has erupted twice in this century, in 1902 nearly eradicating Quezaltenango, the nation's second largest city.

Volcanic blasts shaped these placid peaks above the calm waters of Lake Atitlán, where Indians gather *tul* reeds which they will weave into mats. Bordered by villages, some accessible only by boat, the 16-mile-long lake often turns into a maelstrom in late afternoon, when a giant wind called *el chocomil* pours off the mountains, imperiling anyone foolish enough to venture out.

are predictable—when the big Boeing 747's come in from Los Angeles or Panama City, swoop low over Sexta Avenida, the main commercial thoroughfare, and head for the airport on the southern edge of town. Expected or not, at such moments all conversation stops, even in midword.

Tourists who come with their minds set on Maya ruins and primitive Indian villages are more than surprised to find a distinctly 20th-century city (following pages). They will find, for example, superb steak houses, a sign that along with the country's other major products—coffee, cotton, bananas, and sugar—beef is becoming increasingly important. For five quetzals (five dollars, U. S.) I savored a grilled filet mignon, a salad made from three firm, nut-flavored avocados, and for dessert a "drunken cake"—soaked in rum.

When I finished, the waiter brought me a steaming demitasse. "No thank you," I said, remembering the peppery brew I had drunk in Santiago Atitlán.

"But Señor, don't you know that Guatemala produces the best coffee in the world? You must try it," my waiter said.

Warily I tasted, and was rewarded by the strong, hot, aromatic brew. This is Guatemala's chief money earner—the product that is prized in the coffeehouses of Hamburg, Rotterdam, and Vienna.

Dictator Left an Ornate Legacy

After lunch I walked along Sexta Avenida; a crush of traffic filled the shop-lined street. Behind me, tasteful high-rise buildings defined the changing skyline over the low roofs of the old city. There are, of course, slums in this city as well, and overcrowding and unemployment and all the evils and discontent that go with modern urban culture, a situation fraught with problems for the Guatemalan Government.

Crossing the city's Central Park, I entered the heroically ornate National Palace, where the president has his offices. This building fulfilled the dream of strong man Jorge Ubico, who ruled Guatemala for 13 years until he was deposed in 1944. He enjoyed the fruit of his long planning for only a year before revolution ended his iron rule.

The occupant of the palace for four years prior to mid-1974 was the popularly elected President Carlos Arana Osorio (page 667). The successor he supported, mildly right-wing Gen. Kjell *(Continued on page 678)*

Blend of colonial and modern, cultural and commercial, Guatemala City sits atop a plateau almost a mile above sea level. The capital moved here after earthquakes devastated Antigua in 1773. Guatemala City itself had to be virtually rebuilt after major temblors in 1917-18. Today a population of 750,000 enjoys the altitude's gift of bright days and crisp nights.

The two-block patch of green in the city's northwest sector, right center, marks Central Park, bordered on the lower right, or east, by the cathedral and on the north by the National Palace, headquarters for the president and his ministers. The Civic Center (**right**) rises around the new supreme court building. When completed, the complex will house both national and municipal government agencies and the central bank.

JOHN M. KESHISHIAN, M.D. (LOWER) AND JOSEPH J. SCHERSCHEL

GRANT C. HALVORSON (LEFT); JOSEPH J. SCHERSCHEL

"Lluvia de oro—rain of gold," Guatemalans call their coffee harvest, leading source of commercial revenue. Here a plantation worker pours beans onto a concrete apron during the five-day drying process. Constantly turned during the day with wooden rakes, the beans must be collected and stored each evening before the dew falls. Of 4,000,000 acres under cultivation, a tenth are devoted to coffee.

Bananas, a lowland crop, declined as an agricultural product because of disease. With the introduction of a hardier strain, the fruit has now made a comeback among Guatemala's major exports. Plastic bags (**above**) protect stems of fruit from insects at a plantation near Bananera.

Eugenio Laugerud Garcia, was declared winner of the election earlier this year. There were some difficulties: Laugerud's left-leaning opponent, Gen. Efrain Rios Montt, accused President Arana and General Laugerud of rigging the ballot count. Laugerud denied this, stressing the legitimacy of the election. The Guatemalan congress ratified the balloting, and Laugerud took office peacefully. In his inaugural speech he called for national unity, promised basic social and economic reform, and pledged to continue and expand the programs launched by his predecessor.

Arana himself—only the third president since 1945 to serve out his elected term—had surprised outside observers four years earlier with his liberal social programs. A tough anti-Communist, he had kicked off his political career by putting down a guerrilla movement that threatened to disrupt the country in the 1960's. All shades of the left-wing spectrum, as well as disenchanted army officers, had been represented in the struggle against the existing government.

Last year I spent several days traveling through the countryside with President Arana. One night after dinner in a jungle retreat in the remote Petén, he reminisced about his guerrilla-fighting days.

Leader Met His Enemies by Night

He said it was difficult for him to talk about the campaigns because there had been so much violence and so many people killed. But it had also been hard for him as a commander to see his patrols returning to their bases bloodied and riddled with bullets, with many dead and wounded.

"Our army had been having little success in its operations when I was put in command of the Zacapa district, where the guerrillas were based. I brought in new officers and men I had trained myself, and I also established a strong civic-action program. The people in

these mountains had been living in absolute neglect; many had been aiding the guerrillas. I went from village to village, like a missionary, trying to convince them that we were on their side.

"One day someone told me he had received word that some of the guerrillas wanted to talk to me. I was to meet them at night near a highway bridge, and I had to come alone.

"I left my house, not knowing if I would ever return, and drove to the meeting place. It was quiet and dark; I could see nothing. Then I sensed movement by the roadside and smelled the smell of people who have been in the bush for a long time. In a flash of lightning I saw four men standing by my jeep."

The eyes of his guests were riveted on the President as he went on in his quiet voice.

"I thought they were going to kill me. They surprised me by saying they knew I would treat them fairly if they surrendered. We shook hands—theirs were cold and damp.

"Next day my men picked five of them up with helicopters. We used these people at roadblocks, because they knew all the guerrillas and sympathizers. They led us to guerrilla camps and to food and arms caches. We captured many people. We set up ambushes.

"That is how we eliminated the guerrillas. But it wasn't all done with bullets. We built schools and health centers, and conducted literacy campaigns. Soon the people stopped helping the guerrillas."

Town Blankets a Tiny Island

The vast lowland of the Petén encompasses about a third of Guatemala's 42,042 square miles (map, page 666). This green heartland stands as a last frontier—half jungle, half savanna, underpopulated, rich in timber, wildlife, and history. A government agency is making efforts to open portions of the territory to settlers, and to step up the exploitation of its resources.

Savory aroma of black beans steaming in a kettle fills a rustic farm home in Guatemala's highlands. The warmth of the fires takes the edge off the cool evening for one of the farmer's daughters, who nurses her youngest while an older child nestles against her back. Another of the farmer's 11 children stares pensively into the flames.

The farmer, like nearly half of all Guatemalans, is a *ladino,* a person of mixed Indian and European ancestry. He owns his land, but in order to support his large family he supplements farm income by operating a small roadside café from his home—selling beans, tortillas, and coffee to passing travelers. ALBERT MOLDVAY

BENT IN TIMELESS TOIL, *Indian farmers plant corn near Sololá—a tableau endlessly repeated across the breadth of the land. Except for the metal blades of their hoes, little has changed for such men of the soil since the days of their Maya ancestors.*

I am especially fond of the Petén's capital, the charming town of Flores. Its pastel-colored houses completely cover a little island in Lake Petén Itzá (facing page).

There is a story about the lake and conquistador Hernán Cortés, who came this way on a mission to what is now Honduras. One can only marvel at the Spaniards, hacking their way with heavy swords through the tangled, thorny jungle, sweating in their armor as they struggled with cannon and horses.

One of Cortés's horses was lame, the story goes, and he left it at Lake Petén Itzá, hoping that it would recover and that he could pick it up on the way back. After Cortés and his men left, the Indians did their best to care for the animal. But they had never seen a horse before, and could only guess what it ate; they offered it flowers and birds. The animal died, and the Indians, frightened of Cortés, made an image of stone, hoping thus to fool the conquistador when he returned.

He never did. In time the Indians came to worship the stone horse as a deity. Today, it is said, the image lies buried in the silt at the bottom of the lake, to which an iconoclastic Spanish missionary consigned it.

Backcountry Draws New Settlers

At Santa Elena I looked up Col. Oliverio Casasola, a portly, gracious man who has been working in the Petén for 20 years and is now in charge of its economic development. He helped build the only road that connects the region to the rest of Guatemala, as well as many miles of dusty limestone-paved tracks that link the few scattered communities.

"Now that the Petén has internal and external communications, it is beginning to grow—from a population of 15,000 in 1950 to today's 65,000," Colonel Casasola told me. "We are producing corn, beans, honey, and cattle. Our forests yield cedar, mahogany, and other hardwoods, and chicle—the base for chewing gum. And people who need land are coming from other parts of the nation under our colonization program."

I went to see some of the colonists who had settled on the banks of the Río de la Pasión. At Sayaxché I boarded a 27-foot outboard-powered dugout canoe; after two hours of threading the dark-green jungle on the river's jade waters, we came to the new settlement of La Palma. Its people had come from the Indian villages of Chimaltenango, in the central highlands, and Mazatenango, on the Pacific coastal plain.

La Palma at first seemed disappointing. Man leaves ugly scars when he cuts down living forest. Yet there was an air of purpose and hints of good things to come. Already there were accomplishments: a health center, school, community water tank, and—pride of the settlers—a soccer field.

Age-old Methods Endanger Soil

Night fell on our way back to Sayaxché, while towering thunderheads gathered and lightning pounded some distant point to the south. A short way in from the riverbank we saw many lights, like flitting fireflies. Men were setting a field aflame in the timeless ritual of slash-and-burn agriculture.

To clear the land for planting, trees and brush are cut and set afire. In the Petén, this has unfortunate effects. Deprived of forest cover, the thin topsoil is soon leached away. Within a year or two the farmer must seek new land for his corn plot. In the springtime the scent of Guatemala is the sweetly acrid smell of burning fields and forests; the smoke of a thousand fires darkens the sky. Even so, the exhausted land can support grass, and thus cattle—a promise for the future.

The Petén may be the key to Guatemala's future, as Colonel Casasola likes to think. There is no question that it is a doorway to the past—the glorious past of the ancient Maya civilization, and particularly its Classic Period, from A.D. 300 to the year 900.

Pre-eminent among Classic Maya centers stands the partly restored city of Tikal, an astonishing ruin some 25 miles northeast of Flores. The road to Tikal winds through the

Moored by its causeway, Flores lies like a ship in Lake Petén Itzá. Conquistador Hernán Cortés, en route from Mexico to the Gulf of Honduras to put down rebellious Spaniards, sighted the island in 1525. He met and exchanged gifts with the *canec*, or chief, and accepted an invitation to visit the village, "where I spent the . . . day in pleasure." Another Spanish invader, Don Martín de Ursua, 172 years later conquered the island, destroying its 21 idol houses. Today 4,000 people live in Flores, capital of the Department of the Petén.

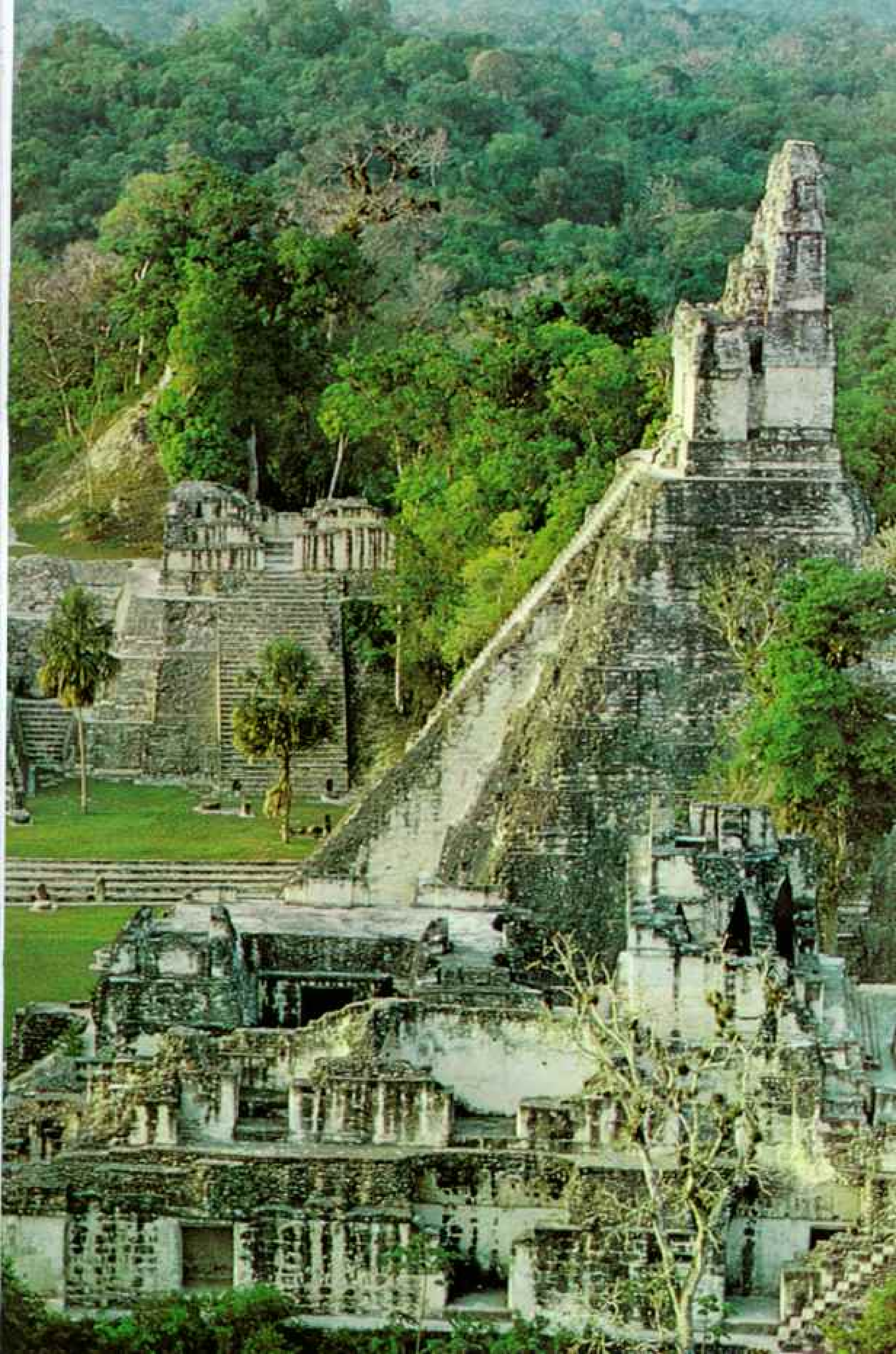
W. E. GARRETT, NATIONAL GEOGRAPHIC STAFF

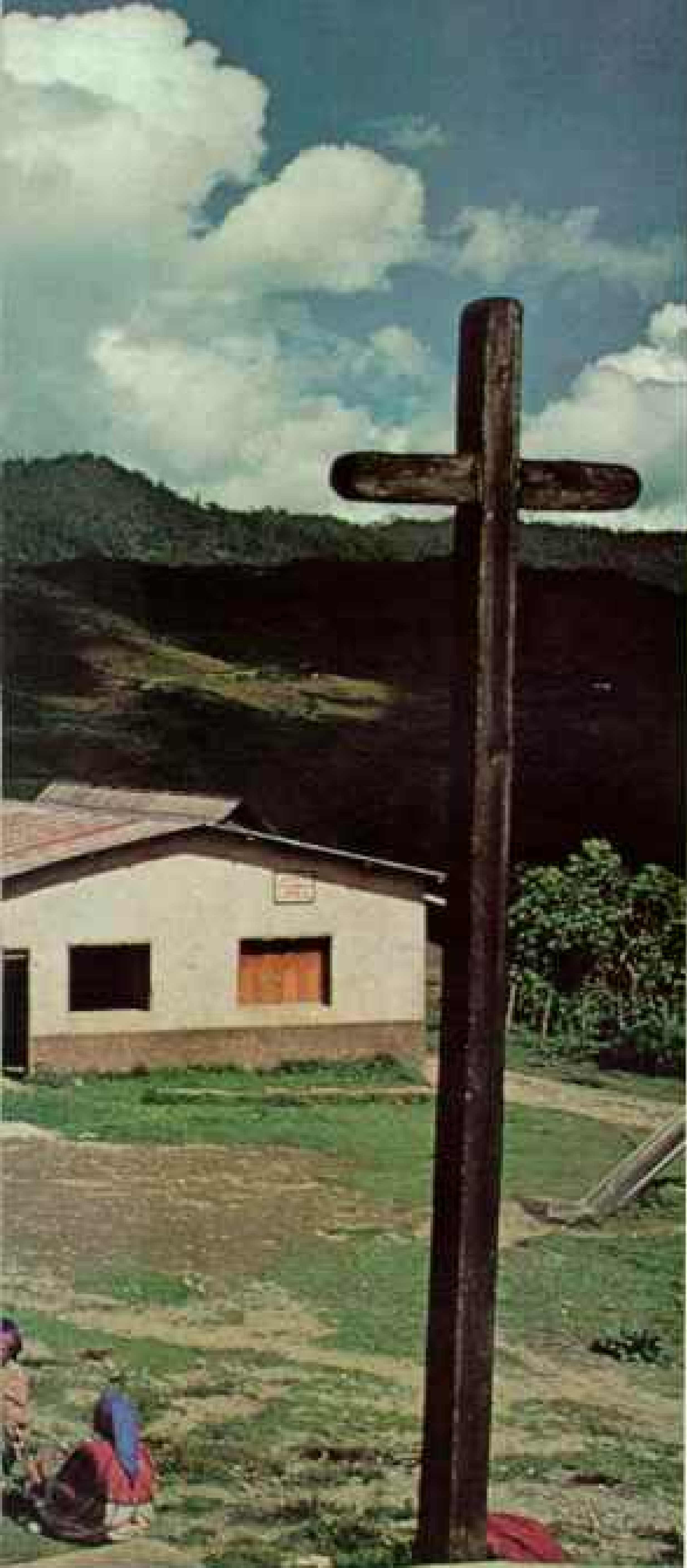
BOTH BY JOSEPH J. SCHERSCHEL

Even in ruin, grandeur. Rising amid the Petén's jungled mantle, stepped pyramids of Tikal recall the glory of the Classic Maya civilization that flourished here until about A.D. 900. Temples, palaces, and courtyards once knew the measured tread of priests and their attendants who intoned incantations to the gods of rain, sun, wind, and corn.

Archeologists have mapped only a quarter of the 25-square-mile ceremonial center. Tikal, though the grandest, is only one of more than a thousand archeological sites in Guatemala.

Near San Jerónimo, 160 miles to the south, an expedition sponsored by the National Geographic Society has uncovered evidence of settlement here perhaps as early as 1500 B.C. One exciting find: the largest carved jade object yet found in the Maya area—a 10½-inch-high figure (**above**) weighing 12½ pounds.





[illegible] (LOWER) AND JOSEPH J. SCHERSCHEL

While the padre was away, parishioners in San Mateo Ixtatán repainted the 17th-century church in eye-filling hues.

For most Guatemalan Indians, religion goes deeper than paint, and their faith still mixes Catholicism with pagan practices of the past. A chicken foot (**left**) is all that remains of a sacrifice offered by Indians to gods of their own in a cave near Lake Atitlán.

jungle like a dark-green tunnel; at its end lie treasures beyond imagination.

I arrived at the site early one May morning and startled a squadron of squawking parrots into the forest. Oriole-like oropendolas were building their hanging nests in nearby trees, and hummingbirds glinted like jewels amid the greenery. In the soft light the lofty limestone pyramids of the Great Plaza gleamed with ancient majesty (pages 684-85).

Tikal is, without doubt, Guatemala's most fascinating tourist attraction. Soon a herd of buses rumbled in, full of visitors—French, German, Japanese—who had come on the morning flight from Guatemala City. The Great Plaza, ceremonial heart of old Tikal, took on a polyglot air.

Looters Plunder the Ancient Past

As a national park, Tikal enjoys the protection of government guards. But most of the remainder of the country, with its 1,100 registered archeological sites, stands disarmed and vulnerable. In recent years looting and grave robbing have reached alarming proportions.

"It is an enormous problem," said Luis Luján Muñoz, director of Guatemala's Institute of Anthropology and History. "Sculptures smuggled out of here have turned up in places like Los Angeles, New York, and Paris. Some of them were being sold for as much as $350,000. In 1972 looters ambushed and murdered one of our archeological guards.

"But I'm afraid there's not much we can do. In the whole country we have only thirty guards. It is impossible to keep watch over all our monuments."

Edwin M. Shook, an American who directs an excavation at Monte Alto, agrees: "It's just not practical to guard all those sites. These blighters obviously know the bush. They take complete equipment with them—camping gear and motor-driven saws to slice off the sculptured faces of the monuments. They have even used helicopters to smuggle out the loot. They know what they're doing. And I'm certain that they are directed by people who know the archeological literature."

The oldest archeological sites in the Petén—at Seibal and Altar de Sacrificios, on the Río de la Pasión—date from 800 or 900 B.C. Until recently archeologists thought the first settlers of the Petén had come from Tabasco and Veracruz in Mexico, up the Río Usumacinta, and into the Río de la Pasión.

Research by Dr. Robert J. Sharer and David W. Sedat in the northern highlands of Alta and Baja Verapaz—a region previously considered an archeological vacuum—has raised new questions about the origins of Maya civilization. They have learned that people lived in this area as early as 1500 B.C.

I visited San Jerónimo, a National Geographic Society-sponsored excavation, where the two archeologists had uncovered an intriguing stela bearing glyphs and numerical inscriptions of an early type, possibly as old as 600 B.C. The 6½-foot-tall slab stood at the bottom of a pit, bathed in the burning sun of noon. The overhead light brought out details of the carving, though much of it was gone.

A Clue to the Origin of Maya Writing?

"The whole center scene has been deliberately defaced," Mr. Sedat explained. "It may be that the people who later buried the stela couldn't even understand what the inscription said, but it must have been something very sacred or very scary to them, so they battered it and buried it and built an adobe pyramid over it.

"In 1972 I excavated a site called Los Mangales, north of here, and found something that may be even older than this. In a tomb covered by a mound, I dug up two small stelae. The designs were not decorations, but symbols made to convey information.

"Considering that this tomb contained pottery from 700 to 900 B.C., we think these stones may be as old as that—the earliest examples of ideographic writing yet found in the Maya area. So we must now consider whether this area, far from being a vacuum, was not in fact one of the fountainheads of Maya civilization, perhaps even where Maya writing originated."

David Sedat and his wife, Rebecca, lived in San Jerónimo in a house that was half residence, half workshop. There I saw the two stelae, their mysterious markings eroded by the millenniums. A locked storeroom off the courtyard held enough material for a small museum—a 12½-pound jade figurine (page 684), two elaborate incense burners, polychrome pots, obsidian knives, various tools. Two military policemen, armed with machine guns, guarded the house day and night.

San Jerónimo lies in the Salamá Valley, flat and fertile amid rugged wooded mountains. This is tomato country as far as the eye can see, Guatemala's salad bowl. Mr. Sedat was born 30 miles north of here, in Cobán, Alta Verapaz, an area where German and English settlers established extensive coffee plantations in the 19th century.

"Hobbit country," Mr. Sedat calls it, and there *is* something here of J. R. R. Tolkien's fantastic landscapes. And like the novelist's imaginary hobbits, the Maya-Kekchi Indians who till the fields of Alta Verapaz are short, with big brown feet. Like hobbits, too, "they are nimble but don't like to hurry" and "wear bright colors but seldom wear shoes."

These handsome Indians of Alta Verapaz use their tough, serviceable feet to trot under cumbersome loads over good terrain and bad. The men have incredible strength. The women jog gracefully along the roadsides balancing heavy water jugs on their heads.

They are a shy, self-contained people. The Sedats and I stopped off at one house in a little green valley and knocked on the door.

"*Inc'a'*—no," said a woman. "You may not come in. White people bring bad luck." And that, as far as she was concerned, was that.

Tradition Wrestles With Modernity

As I returned to Guatemala City and its rising skyline, I was troubled by a sense of double vision: Indian Guatemala, modern Guatemala. The images displaced each other as in an optical illusion.

"Well, there really are two different countries," a Guatemalan friend told me. "The Indians, even if they have transistor radios, are still living somewhere back in the 17th century. But those same transistor radios are slowly bringing changes.

"They are making the Indians more aware of the politics and economics of the other Guatemala. And of their own worth. Someday Guatemala will put it all together." □

Surveying the world from a piggyback perch, this young boy rides atop a load of firewood on his mother's back. Indian children never know loneliness, basking in the constant companionship of their family. Of their homeland, the distinguished Guatemalan editor and lawyer David Vela observes, "We walk on two legs, Indian and Occidental. Sometimes we stumble but, more and more, we march at a steadier pace."

JOSEPH J. SCHERSCHEL

Scotland's Inner Hebrides

Isles of the Western Sea

By KENNETH MacLEISH
SENIOR ASSISTANT EDITOR

Photographs by R. STEPHEN UZZELL III
NATIONAL GEOGRAPHIC STAFF

THEY LIE LIKE A SCATTER of rough-cut gems, these Isles of the Western Sea, arrayed between the Highland hills and the Outer Hebrides. They are, in their entirety, larger, more numerous, and vastly more varied than the starkly, darkly lovely Isles on the Edge of the Sea, as the outer group is called.* Too, the Inner Hebrides are more troubled by the soft relentless pressure of machine-age civilization, whose ways are not those of the Gaelic islandman. The sea-bred Gael holds in a loving but loosening grasp an age-old skein of folkways born of human nature rather than the mind-molding strictures of the industrial society.

"We belong to this place," a crofter said. "I'm a Gaelic-speaking man; we all had the Gaelic once. Och, but now we're growing few, and our tongue is being lost, and the language holds the tales, and the tales hold the knowledge of the old ways and the old days, of holy and unholy things. . . ."

I woke in the full darkness of a moonless night, dressed quickly, stepped out into silence and moist sweet air, sea-seasoned, moor-scented. I drove down across Islay, the southernmost isle of the Inner Hebrides, determined to see a wondrous thing both old and holy in the first light of a Scottish morning.

The car whispered through pretty Bowmore, whose neat slated houses slumbered behind darkened windows and whose round church (no corners, there, for the Devil to hide in) blessed the town from the top of the empty main street. Port Ellen, the island's chief harbor town, was as quiet as the inland moors. No wind disturbed the water, where swans slept in mirrored duplication, nor any early riser the silence of the street.

Eastward, then, past distilleries that supply Islay with industry fit for Gaels and the world with splendid whisky. Beyond these, on a rocky shore, stood the ruins of 13th-century Dunyveg Castle, fortress seat of the MacDonald Lords of the Isles who ruled under Norwegian and, later, Scottish kings until the strong sly Campbells of Argyll added Islay to their 17th-century empire.

My destination lay nearby in a wooded place. No proud castle brought me there, no crumbling walls standing as derisive memorials to murder, but a single stone set by a small roofless chapel: a heartbreakingly beautiful Celtic cross, carved eleven hundred years ago to the glory of Christ. Mist was on

*The author wrote of the outer islands in the May 1970 NATIONAL GEOGRAPHIC.

In faith renewed, a replica of the Cross of St. John rises from the mist-soaked earth of Iona, where ancient kings and holy men sleep their last. Like the Celtic Cross of Kildalton on nearby Islay, the stone relics of Iona mark settlements of early Gaelic Christians on the heathered isles of Scotland's Inner Hebrides.

THOMAS NEBBIA (LEFT)

Flecks of white against rock-torn turf, hardy blackface sheep spill across a hillside on Canna, heading for market on the mainland. Aboard the homeward ferry from Oban, a harmonica-playing islander (**above**) celebrates a canny deal with his buyers, who might have paid anything from $14 to $29 apiece for his lambs.

Colonized by Gaelic-speaking *Scotti* from Ireland, raided by dragon ships of the Norsemen, the Inner Hebrides lay beneath the rule of warlike clans for generations. In the mid-18th century the clans were disbanded by law, opening the way for the Clearances of the early 19th century. Money-hungry lairds found sheep more profitable than men, and evicted thousands of crofters from farms their families had worked for generations. Today only 15,000 islanders remain, hardly a third the population a hundred years ago.

the mountains now, and on the sea. The risen but still-veiled sun gave the eastern sky the cold glow of stone-ground iron. A doe, startled from her bracken bed, stood silhouetted, watching without fear as I walked to the foot of the High Cross of Kildalton.

As the muted morning brightened, details of the cross stood out: Irish twined vines, Pictish coiled snakes, Northumbrian figures —a blending of ancient designs within the simple sign of the Eastern religion that had blessed the West. Such art did not exist in Islay in the year 800, when the cross was made. The artist came from holy Iona, where other great crosses still stand. He would have been descended from those Celts called *Scotti* who had come out of Christian Ireland in the sixth century to spread the new faith into the pagan Highlands and islands.

The cross is a milestone in the early course of Hebridean history. There were cultures and peoples that predate it, but their story is blurred by time. Understanding begins here. And so, from this perfect point of departure, I set forth to explore the Inner Hebrides.

Descendant Defends the Lairds' Role

The mist melted as I left. These islands seem to make their own weather, and they make it capriciously; the sky changes between glances. Now the sun found jewels in the dew-drenched bracken and glittered green and gold in trees planted a century ago by the Ramsay lairds. Within that grove, in a fine old manse, I found a remaining Ramsay, widow of Iain. For this charming lady, the past is as real as the present, and she looks to it with love.

"Our estate was big, once," she told me. "The lairds of our family cared about the island, and the people on it. You'll have heard harsh words about the large landowners of the past, I suppose?"

I had indeed. Islanders recall often the days of the old clan system when the laird was chief as well as landlord, and often kin to the small tenants who pastured their flocks on clan lands. After the defeat of Bonnie Prince Charlie in 1746, the old society collapsed. The rush for money replaced clan feeling and gave rise to new-style lairds, among them many outsiders.

Some of these lairds drove crofters from their ancestral lands in the Clearances of the 19th century, when sheep were reckoned more profitable than peasants. I had seen the

Washed and warmed by offshoots of the Gulf Stream, the Inner Hebrides huddle close to Scotland's Highland shore. "If the Scotch knew enough to go in when it rained," wrote one visitor, "they would never get any outdoor exercise."

result in the Rinns of Islay, long a crofting region, now a dark moorland where ruined houses stand sighing in the sea wind.

"John Ramsay was laird here during the Clearances," Mrs. Ramsay continued, "and he did his best. But there were too many people on all the islands. Better hygiene, the kelp industry [they burned it for lye, to be used in soap-making], and the end of clan warfare, all kept the population growing.

"Crofters' holdings weren't big enough to be viable. They'd been subdivided since the old clan days. The crofters had to go, and John helped them find elsewhere the living they couldn't find here."

"Aye, there's truth in that," said Hamish MacTaggart, owner of a farm bought from the Ramsays in The Oa, Islay's south end. "Islay was crowded, and Ramsay was kind enough. What hurt the island folk most was that they were given little choice. The crofter had no protection then. He has now. The Crofter's Act gives him advantages over regular tenant farmers: hereditary rights, larger subsidies for land improved, a very low rent, and secure tenancy so long as he pays it.

"Now, I'm a small owner. I've 1,600 acres, freehold. Sounds a lot? Well, only 100 acres are arable. The rest is grazing for cattle and blackface sheep that winter out. Five hundred ewes and followers [lambs], 110 cows and their calves. I've got to work long days, hard days. But that's my choice, and Islay is a lovely place to be living."

Rinns Recall the Violent Times

It's all of that. "Green, grassy Islay," people call her, and so her middle section is. A more somber beauty marks the western Rinns, all but cut off from the rest of Islay by Loch Indaal and Loch Gruinart. The Rinns region has its own character, shaped by its bloody history. To the head of Gruinart sea-loch, on a great strand exposed at low tide, Sir Lachlan MacLean of Duart on Mull came in 1598 with 600 men to seize Islay from his own nephew, Sir James MacDonald.

"James, son of my own sister, avoid my path," shouted the MacLean, a moment before a bullet struck him dead. Sir James's slightly larger force killed all but 20 of the MacLeans before that awful day was done.

Near the ruins of the Rinns' Kilnave church is a beautiful but damaged High Cross. It had stood there when the Vikings came in the ninth century. It was old when the MacLeans came, when the MacDonalds of Islay fought each other, when the MacDonalds lost Islay to Argyll's Campbells—and that was in 1614. Now, timeworn, it offers its ancient benediction to the dead of 11 centuries, and to wayfarers along this lonely road.

Humans Outnumbered 27 to 1

From Islay I went on to Jura, an equally large island that is all but a continuation of Islay itself, yet differs from it in almost every particular. It is not green and grassy but dark and mountainous. The name, of Norse origin, means "deer island," and was never better deserved than now when 5,400 of the animals graze its hills. They are the only numerous creatures on the island, whose human population has slipped (unlike that of atypical Islay, which has held its own) from more than 1,000 to about 200.

Jura's three Paps rise in the south, imposing and challenging. I watched these hills from the little ferry that took me from Port Askaig in Islay to the Jura pier, then drove to a point a few miles from the northeastern Pap, Beinn Siantaidh, the "sacred mountain."

And it does look like a mountain, rising 2,477 feet from the sea. I climbed it, only to be driven down again by cloud and icy rain. Then I carried on up the road—the only one—to the end of its paved surface. Here was a sign indicating that a potter was at work nearby, and visitors would be welcome.

Now, I should explain that, as everyone in these islands knows, there are certain seals and swans who are able to shed their cloaks of fur or feathers and live for a time among mortals in the guise of lovely women. My potter had the look of just such a changeling. Hilda Brown was her name, and her face was young and gentle, with ivory skin and wide dark eyes. Her body was supple and slender. Her long hair was soft, shining, and perfectly gray (page 702).

The potter smiled sweetly and said, "Do you belong here? No? Then you'll be wanting the last ferry to Islay?" I nodded, bemused. "It's just that you won't get there in time," she added softly.

I snapped out of my enchanted dream. I *had* to catch that ferry, I explained, so as to catch another to the mainland in the morning, so as to. . . . Adrenalin flowed through me like an unwelcome antidote to magic, and I became the hurried, harassed human my world had made of me.

MOMENT FOR WISTFUL LOOKS *and glistening eyes comes as Mavis McKeurtan of Islay sets out for her wedding and a new life on the mainland. Guests with an island appetite for celebration danced till five the next morning.*

Quick to a challenge, sportsmen compete where brawn remains the key to country living. In Skye's green pastures, rivals battle in a game of "shinty" (**below**), a freewheeling and ferocious version of field hockey. On a dubious perch (**right**), a pair of hearty contestants in the Port Ellen Sports Day on Islay pummel each other with straw-filled sacks. A three-foot drop awaits the loser. At an agricultural show on the island, blue-jeaned farm workers (**lower right**) test their mettle in a tug-of-war. Though water abounds, swimming is one sport not especially popular; water temperatures rarely rise above a numbing 54° F.

THOMAS NEBBIA

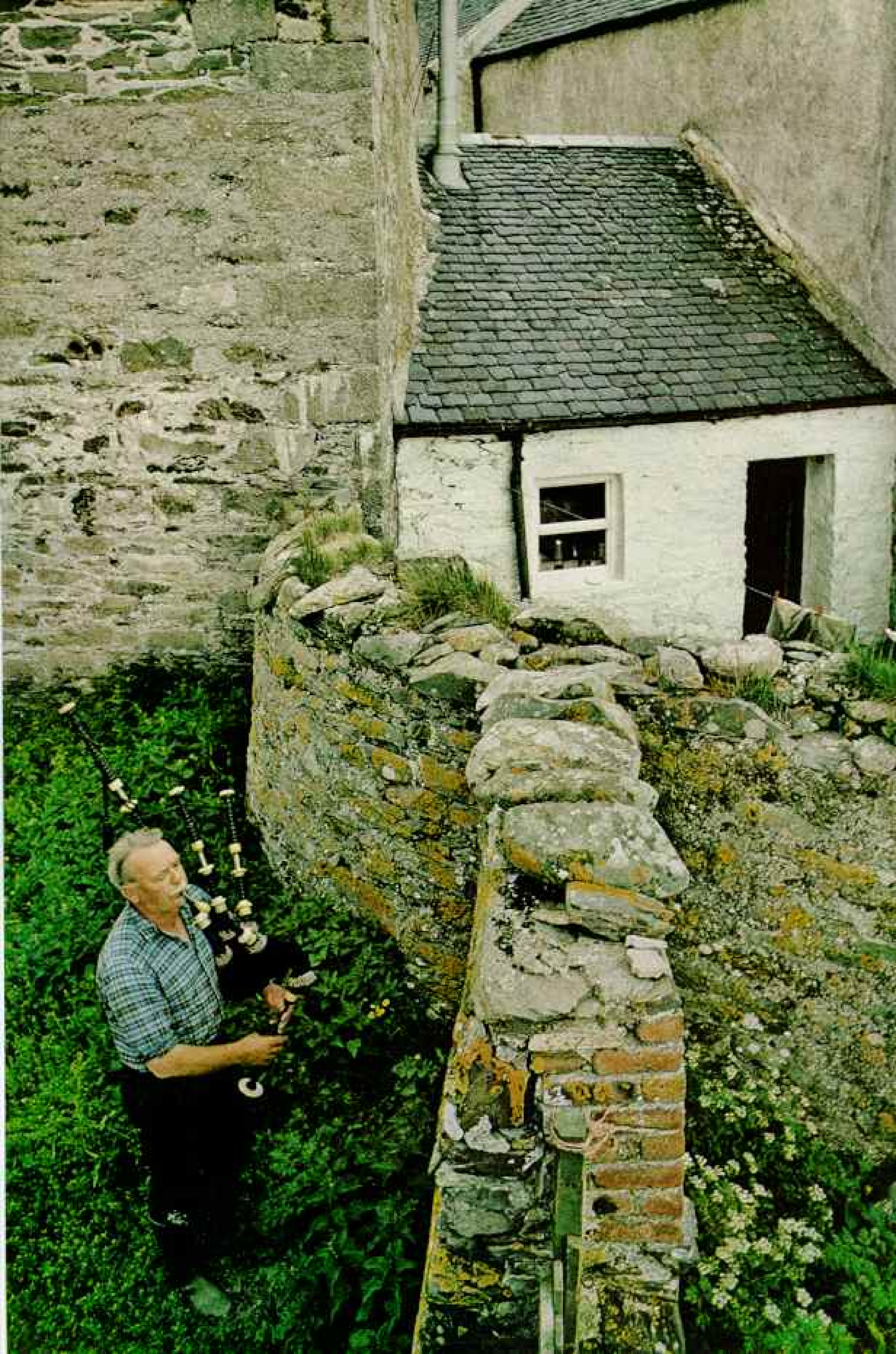
The bewitching potter looked at me in gentlest reproof. "But you mustn't be in such a hurry. It's not right. There's not a house on Jura won't put you up this night. There will be other ferries on other days. Besides, you'll not catch this one."

It is doubtful that there is a course record for the Jura road. No Gael worthy of the name would spoil the serenity of his day by setting one. I suppose mine—whatever it is—stands. But I was late: six minutes late. The ferry (God bless its island skipper) was also six minutes late.

So, having caught the ferry to Islay, I was able to take another one to the mainland the next morning, drive up to Oban and take a third to Colonsay-Oronsay (the two are connected at low tide). These little islands, far smaller and more remote than Islay and Jura, share their history. The only port is on Colonsay, the main island, behind whose unwelcoming eastern shore lies a delicious microcosm of all things Hebridean.

The main village, Scalasaig, sprawls back of the pier in pleasant disarray, its white-washed walls brightened by flowers. There is *the* hotel, *the* post, *the* pub (it has no name), *the* petrol, and not far away, *the* church. No more than one of each is required for a population of some 130.

The two small islands belong to Lord and Lady Strathcona, non-Gaelic despite their Gaelic name, and nonresident, but deeply interested in their Hebridean property, which they consider their home. I had a chat with Maj. John Quinn, the factor at the time, at



Colonsay House, the Strathcona residence.

"The whole situation here's an anachronism," John said. "The laird is expected to set up a welfare state within a welfare state—a feudal system with modern amenities—and it can't be done. He's asked to fire no one, even if he doesn't need all his employees, and has to pay for everyone's repairs. He still pays out more than he takes in in rents.

"But the estate—the island—needs more than rents. Tourism is our best hope. It could create jobs to hold the young. We've now 25 retirees and 26 schoolchildren. Where does that leave us?"

With problems, assuredly—and crofters claim the laird must share the blame. But you wouldn't sense the problems as you looked at the solid houses sitting snugly on the tractable land. Only bracken-bound old pastures spoke of grazing ground gone to ruin.

"Sheep do that," said crofter Ian MacKinnon of Kilchattan township. "Cattle take the bad with the good, and keep a grazing fine. Sheep leave what they don't like, say bracken, and it takes over. I myself run 60 sheep and followers and 16 cows with theirs." He glanced up quizzically from the ewe he was shearing. "Of course that's not the perfect balance. But cattle mean labor, and I've none to spare. A crofter's living is bare at best, and it won't be that if he doesn't favor sheep."

"Does the place support you?"

He stopped shearing and looked up again to see if I was having him on, and flashed a grin that said "Don't be daft, man."

Lone Farmer Tills Oronsay's Fields

Next morning, the tide being out, I went down to Oronsay to meet its only residents, Andrew Macneill and his wife.

I walked barefoot across a mile of tidal sands firm enough to support a car at dead low water. Oronsay was wind-scoured, sea-sculptured, most of it rough hill grazing. The farm was another mile along, set in the western bit of the island. I found Andrew on his tractor, spreading rain-soaked hay to dry—the age-old task called "tedding."

"And how are ye keeping?" he asked, as if he'd known me long. A sturdy man, kind and wise, graced by a trace of shyness.

"Well, come in, come in. We'll just be having a cup of tea, or would it be coffee you're wanting?"

He led me into the kitchen, the most used room in a Hebridean home, where the stove is warm all day and clothes are hoisted to dry on "the pulley," a hanging beam overhead. Kettles, cups, and cakes appeared.

I wondered how it was, being the only man on an island.

"Och, in the first place, I'm not alone at all in summer. I've got a visitor and two nephews to give me a hand. In the second place, I'm not alone ever. My Flora is here the whole time.

"Now, you see this in summer, and you think it's a bonny place. Aye, but in winter it's a wee bit of a different story. I tell you, I don't think there's a woman in the world could live here year round except Flora."

Skirling Relieves the Loneliness

I spotted a set of bagpipes on the wall, and mentioned that I'd played a bit, once. "Well, I played once too. Hardly touch them anymore. Would you care for a wee tune?"

I would. We went out. You don't play the pipes indoors unless it's raining. Within one minute I knew Andrew was a splendid piper. He played facing a wall, and I listened admiringly to the reflected sound of crisp grace notes that differentiate his kind of piping from mine (opposite).

In turn, I managed a recognizable tune. Andrew kept his gaze firmly fixed in the middle distance and froze his features so that no trace of the pain I caused him appeared. He did me the honor of offering no comment as I handed the pipes back, but launched into a fine, difficult piece.

I left when he had done—there could have been no finer send-off—and went to a ruined priory hard by his house. It may date from the days when the Irish saints came to the islands, but what still stands is medieval. Beneath the altar I found a pile of human bones. I picked up a skull and looked into the sightless

Tremble of grace notes reflects off a stone wall on the lonely isle of Oronsay as its sole farmer, Andrew Macneill, fingers the complicated melody of a piper's lament. With the final defeat of the Highland clans by the British Crown in 1746, playing of the pipes was made a crime. "The great Gaels . . . are the men that God made mad," wrote one English poet, "For all their wars are merry, and all their songs are sad."

sockets, wondering what those absent eyes saw before they closed. Viking raiders? Scottish kings? I replaced it gently. Surely Andrew would one day play a lament for his only neighbors, the ancient dead.

I beat the tide by minutes, and crossed to Colonsay with the long northern evening before me. I went down to the store, which is also the post office, in search of Angus McFadyan, who is also Angus the Post.

The sun was still up, it being no more than ten o'clock, so Angus was there and willing to voice an old Hebridean complaint to a sympathetic stranger.

Medieval castle grows beneath the gentle fingers of potter Hilda Brown, who will add spires and turrets later. An "incomer" from the mainland to Jura seven years ago, Hilda lives most of the year alone in her studio by the edge of the sea. Artist in her own right, daughter Carrie (**facing page**) attends school in Glasgow and spends the summers painting with her mother.

"The thing is, you see, the mainland cares nothing about the islands. The county seats are in the east. We are not a source of revenue. But we belong to Scotland, and the mainland should care about us.

"You can't blame people for leaving. They don't want to go. *I* don't ever want to go; I love this place. But suppose I'm told I'm not needed every day to care for the mail of so few people? Down goes the wage. And, maybe, away goes Angus the Post."

The sad sense of cultural extinction is always present in the islands, but often hidden by hearty good humor. I saw something of that in a *ceilidh* (pronounced kaylee) in Scalasaig. A ceilidh used to be a party in someone's house, where people entertained each other by singing a bit, and playing a bit, and drinking a bit more. Ceilidhs today, in the tourist season, are a little different. You pay to get in, and you sit in seats set in rows. You hear the same pure island voices, though, and good stories, and often fine piping.

Songs Have a Sobering Effect

Around midnight the chairs are taken away and the dancing begins. Eightsome Reels, the Gay Gordons, the Dashing White Sergeant, schmaltzy waltzes. People have a wonderful time; Gaels love parties and stories and music and dancing. Aye, and drinking.

An islander who had enjoyed this one to the point of near-paralysis began to drive home. Also to sing at the top of his voice.

"Are you sure you can make it, full as you are?" someone asked.

"I can do that," he said. "As long as I can sing I can find my way home."

He made it. We'd have heard if he hadn't. On Colonsay people not only know each other, they belong to each other.

Next day the ferry came and took me, circuitously, to Mull, one of the largest and most complex of the Hebrides. It may well be the place where island problems are most clearly seen and most closely examined. Not that there's unanimity of opinion as to their solutions. That wouldn't be in the Gaelic nature. But there is deep concern and much intelligent discussion.

One of those most concerned is an "incomer" and unflagging champion of the island's cause, Kim Finlay, Secretary of the Social Services Council.

"There were ten thousand people here 150 years ago. Now there are two thousand.

'Repopulate or perish!' say the criers of doom. They're wrong. If you go back a couple of hundred years, you find that the population was only twice what it is now. The kelp industry supported most of the ten thousand, and that bubble burst. Four thousand would be a good number now, and better still if most of the newcomers were in the 20-to-40 age group, where we're really short.

"The real problem is that land use here has been unbalanced and wasteful ever since the Crown gave clan lands to landlords. The ratio of sheep to cattle is 24 to 1. Should be one to one. But that kind of balance would require more labor, which isn't available, and a lot of pasture improvement. Our farmers and crofters can't improve land, pay the high freight costs that plague all the islands, and still make a living.

"Meanwhile the Forestry people plan to put a large part of the island in trees, which doesn't jibe with the Department of Agriculture's plan to establish good pastures; and neither would jibe with the plans of a local tourism commission—if we had one. Someone has to reconcile these seemingly irreconcilable interests."

Sculpture in Basalt and Granite

Physically, Mull is a wonderful, multifaceted sea-carved delight of an island. Loch na Keal almost cuts it in two, and sets apart the gentler and milder northern section. The center is shadowy and mountainous. There stand the eroded remnants of a great volcano, once perhaps 15,000 feet high, surrounded by vast flows of basalt that form the ridges and cliff-edged headlands seen all over

the island except in the Ross of Mull, the southern section. The Ross is a mass of red granite. Its handsome stone was used lavishly in Victorian London.

Iona, the Sacred Island where the Irish Saint Columba established his first church and monastery in Scotland (and where a fine medieval abbey church still stands), lies just off the tip of the Ross. It is doubtless the most intensely publicized three square miles in all Scotland, though no one could say of it that it must be seen to be appreciated. Seeing Iona is not, in fact, a memorable experience. Sensing it is.

A pair of open launches take day trippers and campers from the mainland out to the holy isle and back. I had the depressing conviction that most of them wanted to buy a souvenir, come back, eat at Mull's Clansman

Spearing forkfuls of harvest hay, Roddy Campbell and his sister Mary Anne build topknotted loaves of winter fodder at the family croft on Eigg (**lower left**). At a neighboring farm a pair of kittens get first licks at the day's milking (**below**). Partly subsidized and legally protected from eviction, crofters need pay only a few dollars' rent each year —yet with hardly one acre in fifty arable, not many manage to make ends meet with the proceeds from their crofts. Opportunities for alternative full-time work are slim. Public-service jobs, fishing, and distilleries employ some islanders, but for many it is a question of crofting or leaving.

BOTH BY THOMAS NEBBIA

Two-oared school bus fetches home a giggling foursome (**left**) after a day at Mull's Ulva Public School. Five of the one-room school's ten children cross the strait from Ulva to the larger island each day, prepared to master a bit of math or reading from teacher Meg Douglass (**above**). Special classes in bagpiping and Gaelic help keep alive the traditions of Hebridean life, despite incursions from television and English-tongued mainlanders.

Restaurant ("We love the day trippers; they spend money, and they go away") and return home to tell people they'd been to the isle.

But in the mind's eye the gaudy tents of the campers vanish, and only rough stone walls and the grassy graves of kings remain, reminding of ancient faith. The abbey, much and well repaired, is maintained by the Iona Community. Within its serene chambers, fresh flowers grace cut granite. Here Masses are said, and simple Protestant services held. It is a church for all Christendom.

Long before any part of the great abbey church existed, Columba and his monks lived on its site in huts of wattle and daub, and built for their worship a tiny chapel. Or rather, an old story goes, they tried to build it. But the walls would not stand until one of the brothers, the selfless Odhrain (later Saint Oran) let himself be buried alive in its foundations. Columba dug him up after three days to have a last look at him. Odhrain revived, declared to all that neither heaven nor hell were exactly as Christian teachings described them, and was promptly re-interred for his heresy.

The chapel and its graveyard, the Reilig Odhrain, were the most revered precincts in Scotland before 1200, when the Roman Church supplanted the outmoded Celtic Church. Duncan and Macbeth lie there with 46 other Scottish kings, 4 Irish, and 8 Norwegian. Chiefs rest in a mound alongside.

Coming back through the Ross, which is crofting country, I stopped off for a visit with George McRae, a crofter who admits cheerfully to his calling. "Some crofters like to say they're farmers. Not me. I *am* a crofter.

I like to say that and wait to be asked how much land I've got. Well, I've got 750 acres.

"I got it all when my landlord turned over to me the land of just-retired crofters. I've got enough now, 100 acres arable. For the first time I can give up my second job. I used to work as postman four hours a day. Had to. But no more. The land will take care of us."

At the other end of Mull's landholding spectrum is Col. Geoffrey Miller, one of Mull's few resident landlords. I found him mowing the lawn in the splendid gardens at Torosay Castle, his present home, and I asked him about the much-criticized absenteeism of big landowners.

"This ancient complaint about absentee landlords is simply not valid. Sentimental overreaction, I think. First place, most come several times a year, and even when they're not here, they're spending money here. What's the alternative? Government ownership? Worse by far. There's no incentive to landowning. We've got 12,000 acres, and in most years we lose money. Can't afford much labor. Have to do a lot of the gardening myself. Have to get into the fountains to pull out weeds, and my blasted boots leak."

Words Express an Islander's Love

The most eloquent and impassioned apologist for Mull is, oddly enough, Angus Macintyre, the island banker. He has the soul of a bard and the lilting, rhythmic voice of a sennachie—the storyteller of Gaeldom. His English is sonorous and precise, as learned languages are apt to be. The Gael does not mangle syntax or bury it beneath colloquialisms and ephemeral verbal fads as do native English speakers.

"This is the last bastion of quietude against the convulsive, frenzied life of the mainland," he said. "Ours is a simple culture, and its verities are eternal."

Mr. Macintyre did not sit down. White-haired, gentle of mien, he stood framed by the window of his office in Tobermory, with the sunlit harbor behind him, gesturing mildly in elegant emphasis.

"Incomers do not change us; no, it is they who are changed. Their pace slows, and they come to feel that there is no need for hurry. That is the philosophy of the Gael, and that is why industry will not succeed here.

"The islandman has no industrial tradition, except the making of whisky. It is a great thing for all of us that our old distillery, inactive for some fifty years, is starting up again."

He raised a finger and recited:

"A clever man, Old Hector,
And wise the words he said:
'Without the barley's nectar
A man is better dead.'

"People tell us we must expand, increase our population, create new jobs. They're wrong. No natural expansion is possible here. And any other kind would destroy the qualities that give Mull its appeal.

"There is an absentee-landlord problem. Absence makes the heart grow careless. Bracken grows thick on shooting estates where once grass grew. One imagines the infinite sadness of the pipes playing the 'Flowers of the Forest,' the death march, for old ways lost and irretrievable. But let us not destroy what we have left."

When the Land Denies, the Sea Provides

There is, in fact, one old way of life that is not irretrievable at all but making a heartening comeback. Fishing has become important once again, and will be more so. Four fishing vessels operate out of Tobermory, going to sea just after midnight on Sunday and coming home at about seven o'clock Friday evening, having unloaded their catch at Oban on the mainland.

It was at that hour that I left Mr. Macintyre's office, and there, at the pier, was Ian MacDonald's boat, and himself aboard her. "I've a good fifty-footer," he told me, "thanks to a grant from the White Fish Authority and a low-interest loan from the Highlands and Islands Development Board. Besides, the fishing's fine and the prices are high.

"So I've achieved my life's ambition—and how many men ever do that?"

He pointed up to a schoolhouse above the town. "When I was a wee lad up there, I'd look down to this harbor and think 'One day I'll be the skipper of my own boat.' And now I am, and I have a house and a good wife and a fine son—and I'm free! No laird owns my boat or tells me where I may fish."

A small neat man came up, holding a paper bag in his hand.

"Good evening to you, Ian, and how are you keeping?"

"Couldn't be better!"

"I was just wondering if you might have a fish left over?"

Ian made a great show of not knowing.

"Boys," he called down, "have we any fish at all saved for the pot?"

A box came up instantly, full of cod and sole and mackerel.

"I see we have. Take what you like."

"Ye're most kind, Ian. Most kind."

"Ach!"

The lairds have replaced the chiefs, but in the main they have relinquished the responsibilities and lost the loyalties that were part of the patrimony of the old leaders. A laird today could be almost a stranger to his lands and tenants. There are exceptions, though. I found one when I traveled on to Coll which, with neighboring Tiree, forms the outermost group of the Inner Hebrides. I will call him, as Coll men do (with vastly varying inflections) the "Dutchman."

Technology Promises Progress

"I am a man trained in the sciences," the Dutchman told me. "I know nothing of farming. But coming as I do from a small country where large tracts of land are not available, I was attracted by stories of big holdings to be had in the Highlands and islands. I looked at others, then came to Coll on a clear day and felt the world was far away. I bought it—the larger part of it—in two minutes. Since then—perpetual Coll-itis.

"It was my wish to improve things on the island and to spend money on it; but also to make it pay for itself, as far as possible. So I have invested in one special farm, now modernized, where grazing is improving. But a lot still has to be done.

"I've mechanized, and brought in trained outsiders. I had to. Most people here are elderly, and the young find more scope for their future on the mainland. The attitude of our local friends is delightful, though, especially in our hectic days. When I first came here I asked a man the time. 'August, sir,' he said."

Somehow it appeared that I was staying for lunch. Afterward I had a look at the Dutchman's special farm, 6,300 acres of land once run down but now being restored to profitable productivity by Arranman John Robert Johnston, its manager. I went on to explore the island and found that wonderful rarity, a thatched cottage a century old but in good-as-new condition.

The walls were thick, the roof held on by a net weighted with stones. A bit of a bay reached in to a little beach a few dozen

"As complete an islander as the mind can figure," an 18th-century visitor once wrote of a Coll man—and could have had in mind the prototype for Archie or Hector McKinnon (**above**). Identical twins, they have lived together in their thatched crofter's cottage on Coll most of their seventy-odd years. Inside, the orange glow from a peat-burning stove warms the small neat room, the stove's brightwork kept gleaming with constant polishing. "We've got to tend to that everyday," points out one with a chuckle. "It's an *aaful* job."

Lords on a seaweed throne, harbor seals guard the shore by Dunvegan Castle, hereditary home of Skye's Clan MacLeod for 700 years. Islanders hold that the soft-eyed sea creatures sometimes take on human form;

THOMAS NEBBIA

they also tell of a fairy who left at Dunvegan an enchanted silk banner with the power to thrice save the MacLeods from destruction. Unfurled only twice, it handed the family victory in clan wars of 1490 and 1580.

yards away. The place would have graced an exhibit of early Gaelic life-style. So would its inhabitants, Hector and Archibald McKinnon, a pair of winsome identical twins in their early seventies (page 709). They ushered me into a classic croft kitchen, then sat themselves on opposite ends of a sofa, smiling shyly and identically, legs crossed oppositely in perfect symmetry. Behind them were two identical China dogs.

Mirth Warms the Conversation

"Which of you is which?" I asked. They giggled hoarsely—in unison.

"I'm Eachann!" Hector declared, using the Gaelic form of his name.

"I'm Gilleasbuig!" said Archie, doing the same thing.

"How do people tell you apart?"

"Well," said Hector—or was it Archie—"people are asking us, 'are you Hector or Archie?' and we say, 'yes.'"

We talked farming and sipped a little whisky. There were once, they said, animal auctions on Coll. But no more. "Now you have to take the beasts to Oban by boat," said one.

"Unless you want to take them by airplane," said the other. They shook with silent laughter.

"Am I keeping you from anything you should be doing?" I asked.

"Ach, no. We should have cut our peats by now. Only we didn't."

"No, we didn't. Was it too wet or what? Well, you can't lose peats you haven't cut." More shaking.

Then silence. Easy, unembarrassed silence. After a while:

"We have a boat still, but we don't fish."

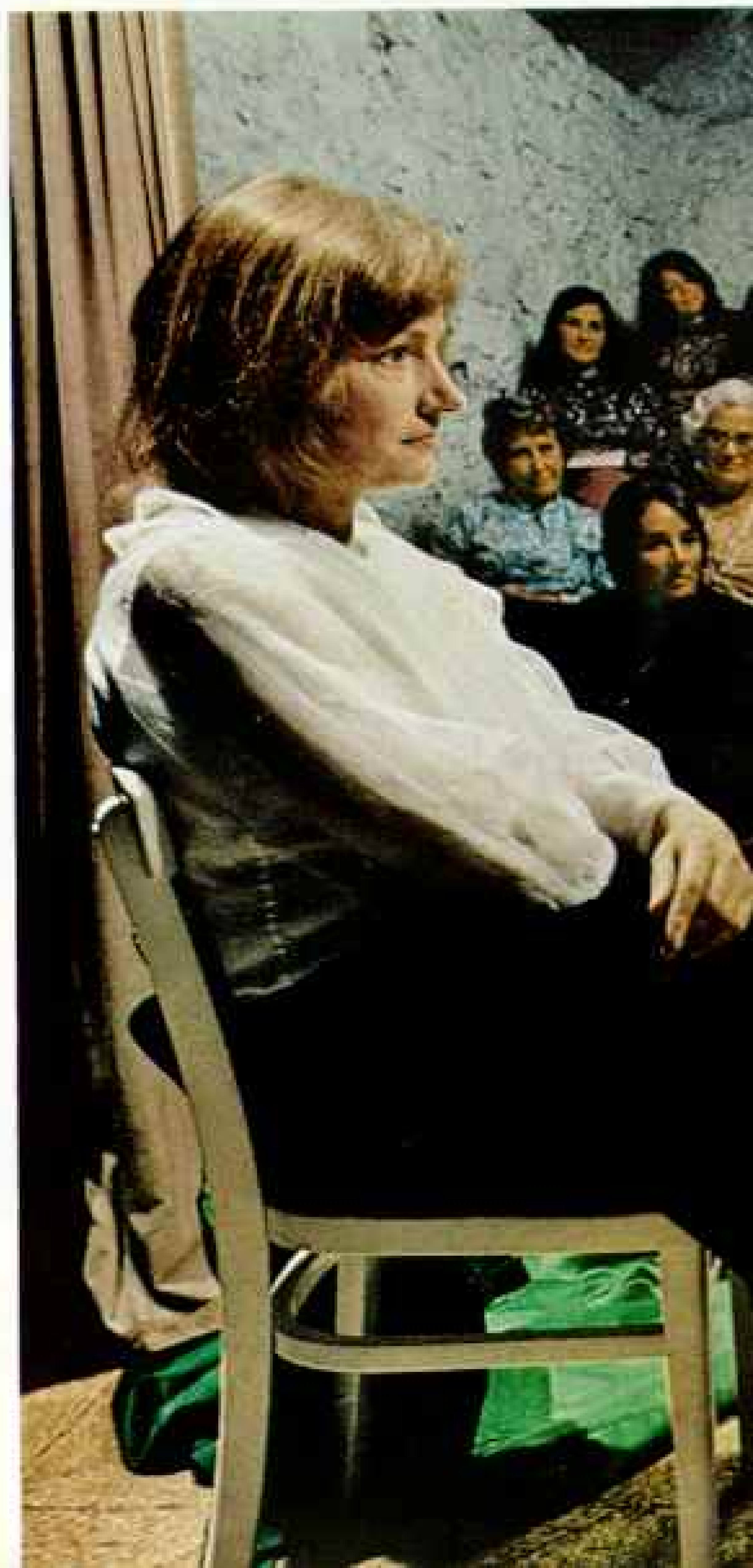
"No, we don't fish. But we collected a few things from a wreck that was near here."

"And someone stole them when we went for a van. We'd a mind to call the polis."

It was hypnotizing. Absolute imperviousness to the passage of time. The pendulum of the clock ticked back and forth, signifying nothing. As I mused and nodded, I was recalling an old saying I had read somewhere:

What the Mull man sees he covets.
What the Mull man covets, the Coll man steals.
What the Coll man steals, the Tiree man hides.

Tiree was my next port of call. It is so near Coll that there's hardly two miles of unbroken water between them. The two islands were one once, when the sea level was lower. Yet Tiree, in true Hebridean style, differs not only from its sibling but also from all the other Hebridean islands. It commands quite a few superlatives: Tiree is the sunniest, the most fertile, the flattest. It once was called "the Kingdom whose summits are lower than the waves." Actually they're not, but the central section is. The land is not sodden and peaty,



One and one make many for Barrie Hesketh and his wife, Marianne, who converted an old stone cow shed on Mull into a theater—and there produce everything from Shakespeare to Strindberg, all with a cast of two. Changing costumes with characters, the Hesketh delight their audiences and bring the island needed tourists.

but grassy. The isle's sandy soil nourishes rich vegetation, ideal for stock raising.

And according to a 16th-century account, the cattle of Tiree "abundis sa of milk that thai are milkit four times in the day." An old saying adds: "Tiree would have two crops but for fear of two rents."

Under a full sun and a blue dome of sky, the island is said to be impressively fresh and sparkling. I did not see it so. But even in a gloom of rain and chill breeze it has a clean sea-and-sand quality that pleases the eye.

Bridge Could Alter Island Ways

The near-island formed by Coll and Tiree points like an eroded dagger northwest to the Small Isles, part of Skye's sea-girt hinterland, and the ocean-riven isle itself. Skye is the largest of the Inner Hebrides, and the closest to the mainland. Yet near as it is to the Highlands, and swamped as it is with visitors, it has its own character—one that epitomizes Gaeldom and Gaeldom's problems, as I had seen them in other islands. Today that character is threatened by a proposal to build a bridge between island and mainland.

But one aspect of the wonderful isle—its physical form—will never change: Skye is mountain and wind, cloud and sea, all in awesome abundance. South of the center are the steep, conical Red Hills. Beside them stand the fearsome black Cuillin Hills. On the northwestern peninsulas are outpourings of basalt which form high cliffs. Every peak is gale-ridden, and clothed often in cloud.

Only the center is dull and flattish, wet and

sour. It is a small part of Skye's nearly half million acres, and here, as in the southern area called Sleat and a few northern regions, crofters can eke out a partial living. Yet even in the dark central moorland there is no place more than five miles from some point on the island's thousand-mile coastline. Ocean is everywhere, intruding in long sea-lochs far into the realm of land.

Most of the 7,400 islanders (there were 23,000 in 1841) live in crofting "townships," usually a small group of houses arranged in a row between hill and sea. Almost everyone depends on wages, but works his croft a bit as well. Said Mrs. Euphemia Macdonald of Skinidin, "No one would think of not using the land. I have sheep, and my sons come from away to help when help's needed."

Said her daughter: "Here everyone has Gaelic. No one would think of cutting peats and speaking English at the same time. They don't go together. Yet Gaelic's going. Children are taught it in school, but at home they'll answer in English. The old culture passed down to us may vanish."

"Yes," said her mother, and the word was a sigh, "and the TV has replaced the ceilidh."

Despite the TV, Skye is devout and Sabbatarian, to the distress of the tourists on whom it depends. On Sunday there's many a smokeless chimney, and "Bed and Breakfast" signs with cloths over them. Most petrol stations are closed.

Yet tourism is *the* industry. Farming continues, but the only fine, productive farm I saw was Lawrence MacEwen's, on the little island of Muck. There are few others. Skye no longer fills even its own demand for potatoes, hay, and milk. Fishing is a bright prospect, and growing, but it has just begun to

THOMAS NEBBIA (RIGHT)

Gentle countenance of a pastel street reflects the quietness of a Friday morning in Islay's Bowmore (**above**). In a more boisterous mood, neighbors on Eigg gather in the kitchen of red-sweatered Donald Kirk (**right, center**) for a *ceilidh* of dancing and singing. Familiar through the centuries with poverty and the sting of winters on the Atlantic's edge, islanders retain a faith in their world—having, in the words of one modern Gaelic poet, "a sprinkling of pride in their hearts, keeping them sound."

Tended by the winds, Sanday's Roman Catholic church stands isolated

grow. Manufacturing employs only a handful of people.

Said County Councillor Roderick Budge of Dunvegan, where stands the old castle of the MacLeods, the only clan stronghold in continuous occupancy for 700 years: "Tourism is essential. The castle depends on it. So do I." He has rooms to let and a crafts shop as well. "Still, I'm against the bridge.

"Granted, we can't be as we were in my youth, eating potatoes, salt herring, and oatmeal, and having ceilidhs around the fire. Dunvegan was a self-sufficient community then, with its own wheelwright, miller, tailor, blacksmith, everything. No, we can't go back to that. Nowadays people want amenities, and that means money, and where will it come from if not from tourists?

"It's just that we're getting saturated. But for now there's peace and quiet here. Let it be so for a while."

Roderick's cousin, Jonathan MacDonald, a fine young Gael at heart and one who cares for Gaelic ways, has solved the problem to his own satisfaction. He runs a good croft, and worries about incomers. But since they're incoming, he caters to them with a crafts shop, a tearoom, a museum, and a hotel.

"Do you see any conflict in that?" I asked.

He sidestepped nimbly. "It's true that the tourists demand luxuries that are not part of the island life. But in a way tourism leads to a preservation of the old customs and manners. If there were nothing special about us, we'd be just like any other place in the north of Britain, and the mistiest one at that. We must keep our culture and retain our individuality to attract tourists."

Majestic Scenery Explains Allure

A third Gael contributed blunter views on this greatest, perhaps, of Gaeldom's dilemmas. Col. Jock Macdonald sat in the coolish interior of his great house, near Portree, the island's largest town, toasting the expanse of skin between kilt and hose before an electric heater set in the fireplace.

"Tourism's overdone. Hell on Skyemen.

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on its strip of soil. The cliffs of Rhum jut into the sea beyond.

Puts prices up, you know. We ought to limit the number of incomers. But that really can't be done, now, can it?"

His wife looked at him with fond exasperation and said, "We take in paying guests. We have to. He wants to die here. It's I who'll die here, mark my words. Oh! Here's the coach now. People from southern England."

I left him to welcome his own herd of incomers and drove up the great northward-pointing finger of Trotternish, there to park and hike across the brook-furrowed foothills to the base of The Storr, whose north end consists of a 540-foot cliff.

I went up the side, the easy way, and stood looking at the mainland mountains, and, across the Minches, the hills of the Outer Hebrides. In the south the black Cuillin stood dark and jagged. Here were all the elements that combine to make Skye: wind, clouds, mountains, white-streaked seas. And peace.

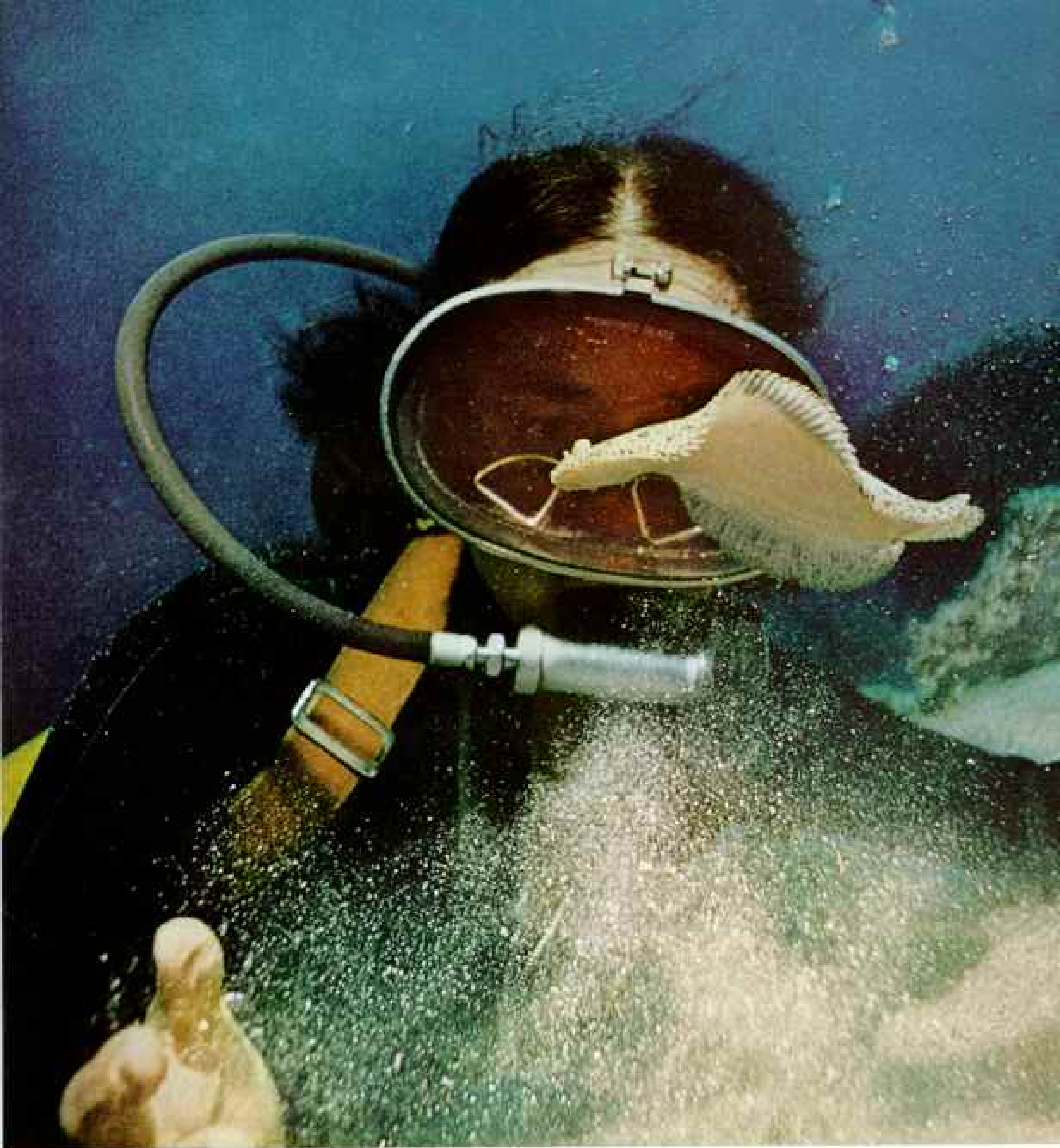
Suddenly the sun shone, bringing unearthly visibility and the luminous glow that only wild untainted lands can know. The dark brooding threat of the distant peaks melted away before the clean sea wind and the radiance from the ragged sky, whose tatters of cloud would soon again plunge Skye into shadowed melancholy. No matter. I'd seen it, savored that lustrous instant, sensed the soul of the island.

Gaelic Hearts Look Homeward

As to the island's people, perhaps they—natives of this last and most magnificent stone in the strand of Hebridean gems—epitomize best the half-tragic, half-triumphant lot of the island Gaels:

To take their native culture, their integrity, kindness, courage, and sense of wonder away over the oceans to the benefit of other lands, other peoples and themselves; yet retaining always the deep nostalgia that even the passage of generations cannot allay. An anonymous poem by a displaced Gael says it all:

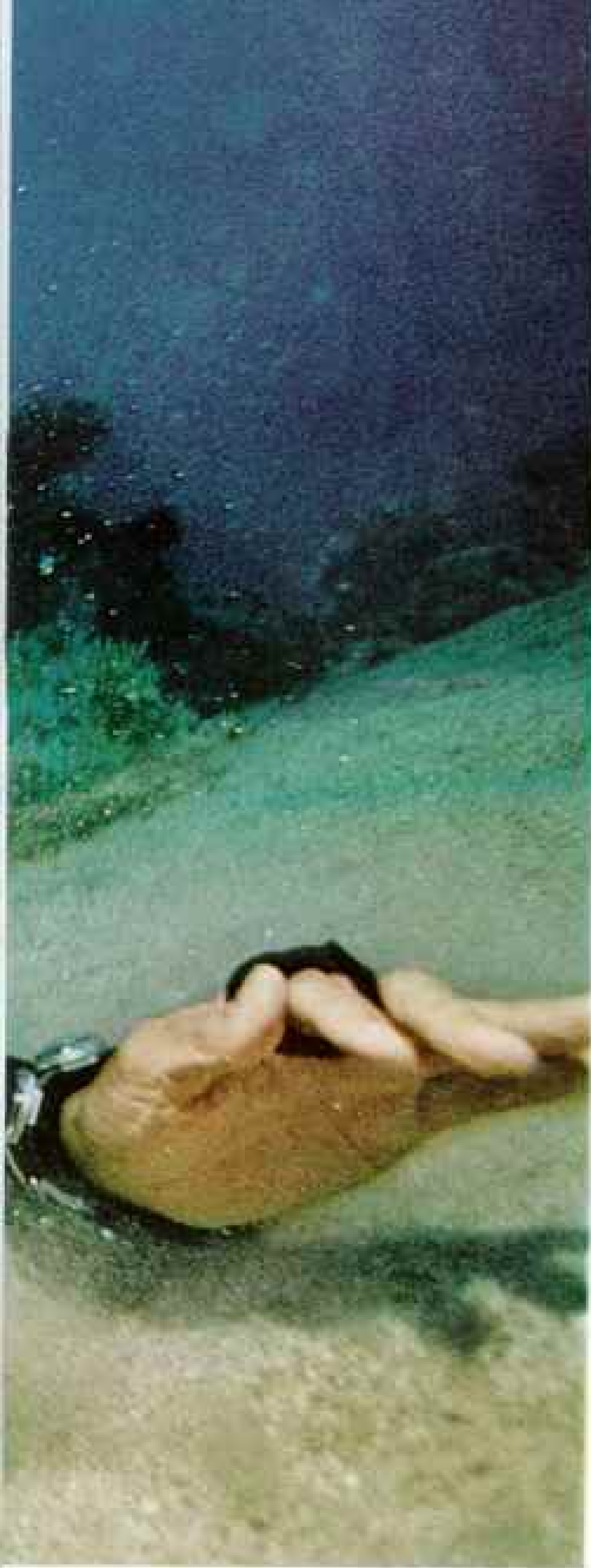
. . . still the blood is strong,
the heart is Highland,
And we in dreams behold the Hebrides. □



WE WATCHED IN DISBELIEF as the big shark swam toward the tethered baitfish, opened wide its saw-toothed mouth, half enveloped its prey, and then—instant retreat!

The deadly predator jerked away, its jaws "frozen" open. Vigorously shaking its head from side to side, the shark dashed around the pool in the marine laboratory at Elat, Israel, before at last succeeding in closing its mouth. The captive baitfish kept up its easy undulating motion as if nothing had happened.

Of ordinary appearance—it looks very like a flounder you might buy in a supermarket—the flatfish that repelled the shark is a species of sole known to scientists as *Pardachirus marmoratus*. What makes it remarkable is the lethally toxic, milky poison secreted by glands along its dorsal and anal fins. Nevertheless, local people along the Red Sea eat the fish—after they cook it, of course—and consider it quite tasty.



By what mysterious power does a common flatfish—delicate as a frill of chiffon—repel the sea's most rapacious predator? The author captured live specimens (**left**) to solve the riddle of how the little sole foils a hungry shark (**above**). Read on to learn the answer.

The Red Sea's Sharkproof Fish

By EUGENIE CLARK, Ph.D.

Photographs by DAVID DOUBILET

Pardachirus is a translucent white on the side facing downward as it swims about or lies in the sea-floor sand, but speckled on the top. Israelis call it the "Moses sole." When Moses parted the Red Sea, the story goes, a fish, caught in the middle, was split; the halves became our sole.

The Moses sole swims quite abundantly in the crystalline waters of the Gulf of Aqaba, the northeastern arm of the Red Sea (map, following page), where for many years I have been studying garden eels and other marine fish.* In small aquariums at Hebrew University's Heinz Steinitz Marine Biology Laboratory at Elat, I had been subjecting a variety of marine creatures to the toxic "milk" secreted by *Pardachirus*.

Echinoderms—sea urchins and starfish—had died from contact with the poison, even when it was highly diluted in seawater. Small

*The author described her earlier research in the November 1972 GEOGRAPHIC.

reef fish, too, had succumbed. Could the toxin also kill, or repel, larger marine animals?

Two reef whitetip sharks, *Triaenodon obesus*, caught three years earlier, were more pets than experimental animals at the laboratory. Everyone on the staff tossed fish into their aquarium to watch them be gobbled up.

"There's no fish those sharks won't eat," the laboratory people assured me.

But I consulted undersea naturalist David Fridman, the laboratory's aquarist and collector. The sharks were his special charge.

"Sure, go ahead and try *Pardachirus* on them," said David. "Can't believe such a little fish could hurt them; they're too tough."

Midget Morsel Holds Hunters at Bay

I had been winding up my summer work at the laboratory. Left over was one live eight-inch female *Pardachirus*, already partly milked during echinoderm experiments. I was sure, though, she had some poison left.

We tied her with a string through the gill openings and lowered her into the shark pool. As soon as the wriggling sole touched the water, the two sharks swept in toward her, with the surprising result I've described.

Both sharks kept circling back toward the sole, attracted by vibrations from her movements. But each time a shark attempted to take a bite, the outcome was the same: jaws agape, as if unable to close.

During a six-hour vigil, we never saw the fish release her paralyzing milk, though we were sure the sharks were reacting to invisible amounts of it.

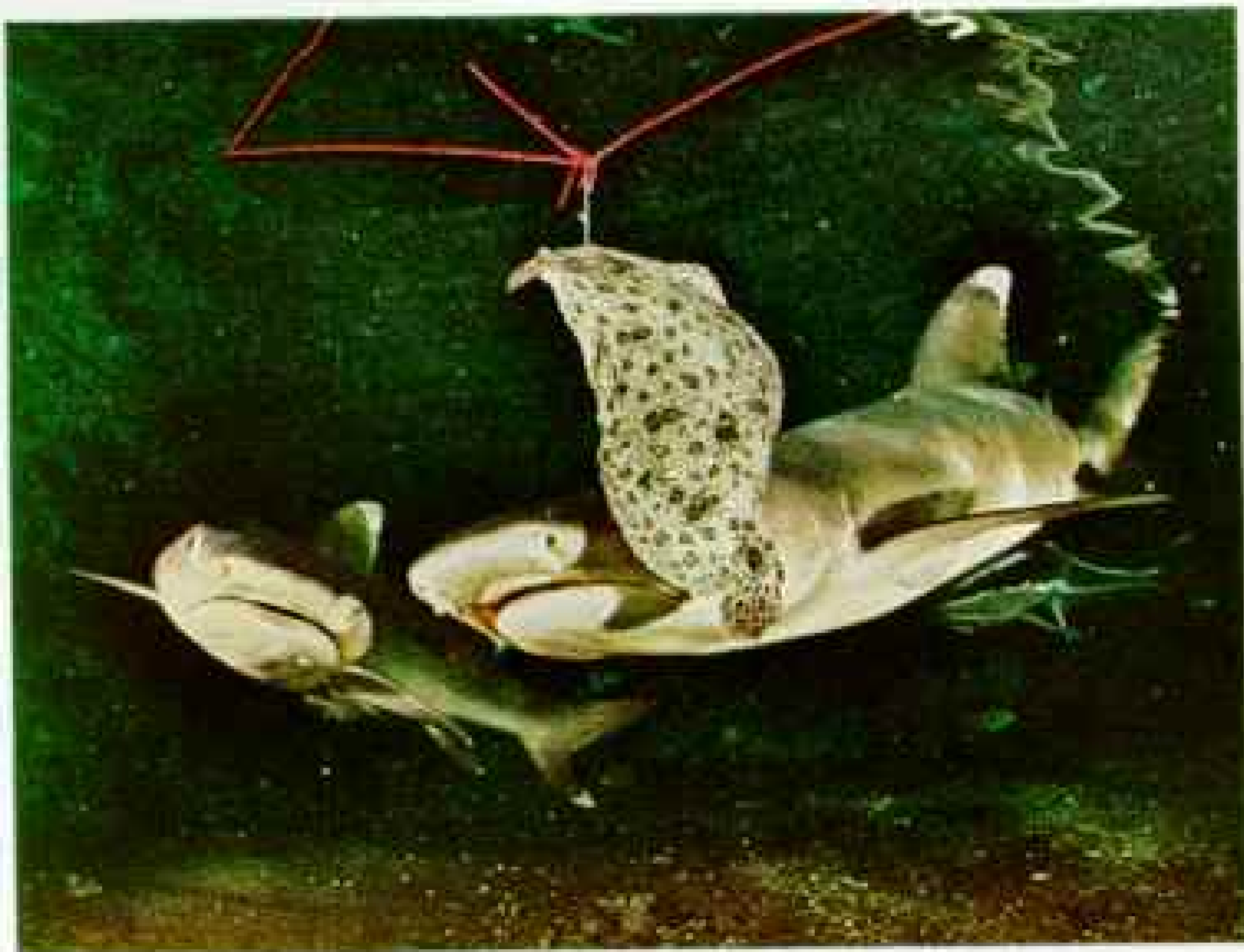
What kind of substance was this that could foil a shark in the process of taking a bite? David and I were dumbfounded. I almost missed my homeward plane.

"You better come back, Genie," was David's farewell injunction. "We have a lot more to learn about *Pardachirus*."

In the summer of 1973, sponsored by the National Geographic Society, I returned to the Red Sea to make further studies of the Moses sole. Photographer David Doubilet joined me, as did three volunteer assistants: Gail Weinmann, a medical student, Willard Cook, a husky blond high school senior, and my 14-year-old son, Niki.

The laboratory stands next to the gulf's edge. We dived there to study, photograph, and catch *Pardachirus*, usually in water 20 feet or less in depth. From the garden eel colony in front of Willy Halpert's Aqua Sport

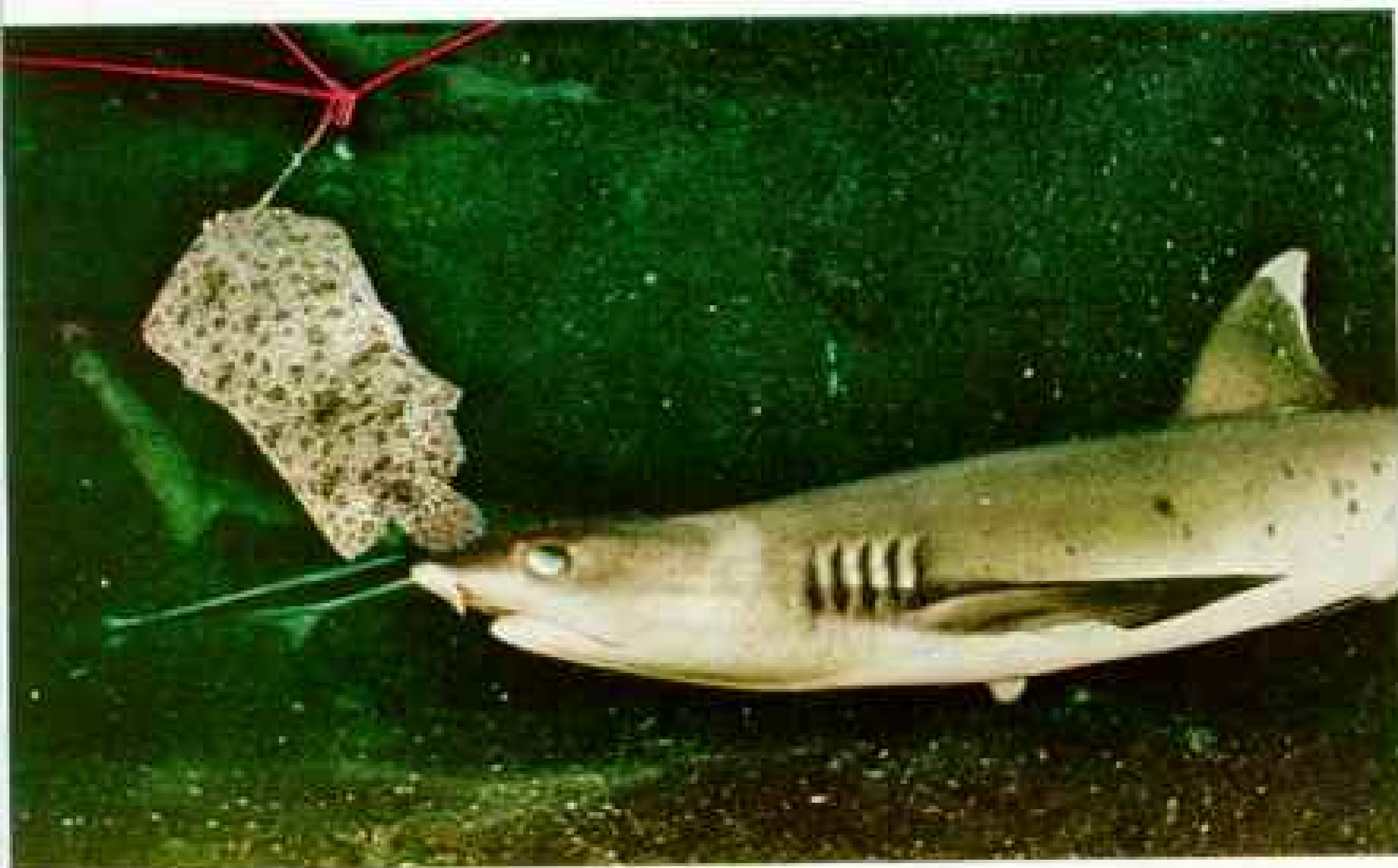
Dappled back of the shark-repelling sole *Pardachirus marmoratus* blends with the sandy bottom of the Red Sea (**left**). Dr. Clark, gliding beyond a large sea fan in the shark-infested waters off Ras Muhammad (**above**), discovered the fish's ability to ward off attackers. To demonstrate, she hung *Pardachirus* along with other types of fish on bait lines. During shark dining hours she watched the predators devour every one—except the potent sole.

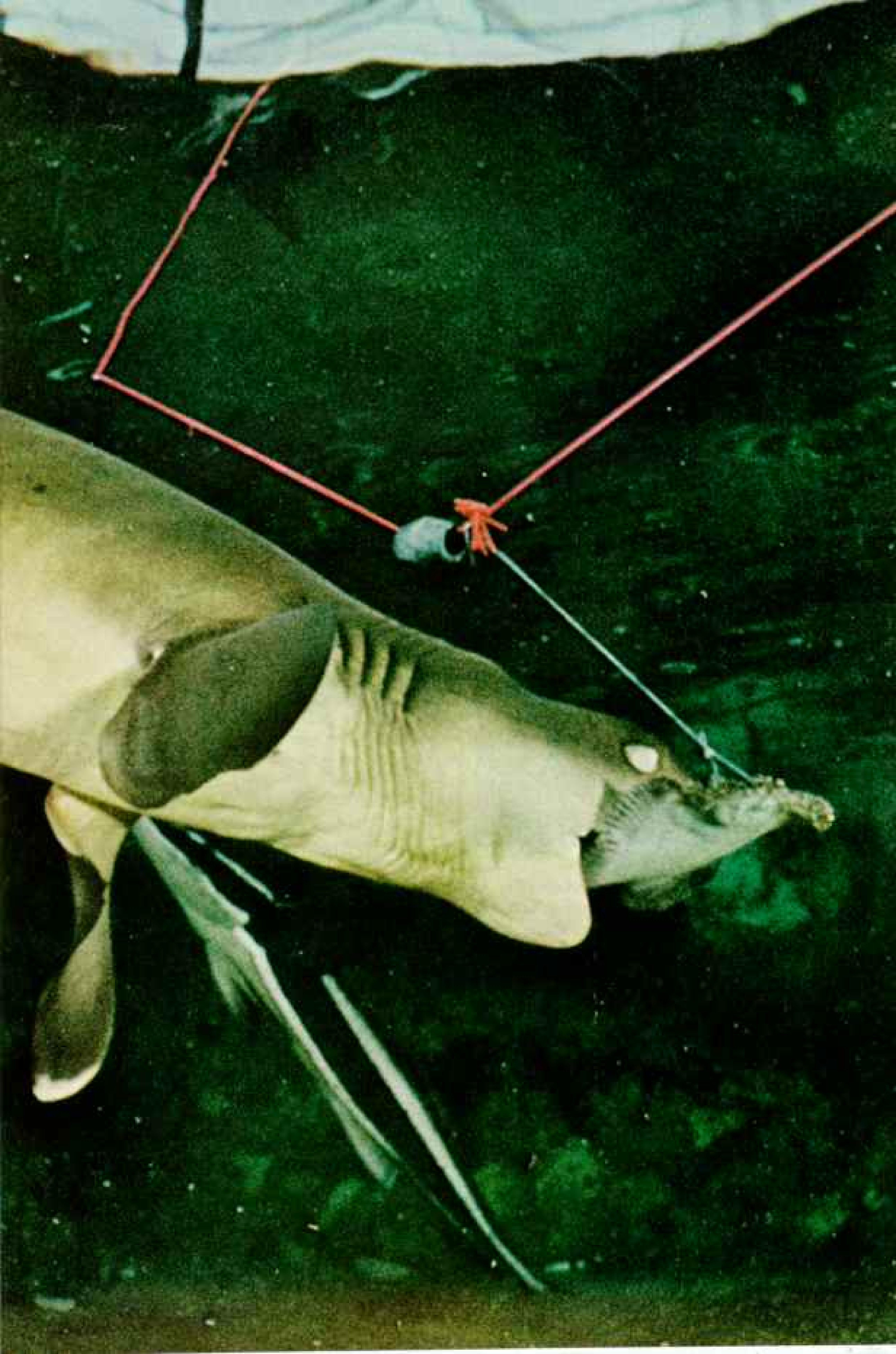


Incredible inedible: *Pardachirus* dangles from a plastic line (**above**), while two sharks circle in a tank at Elat, Israel. The sharks find vibrations caused by the wriggling fish almost irresistible; one speeds in for a feast. But sole food it isn't!

Bumping the fish (**below**), the shark encounters an invisible cloud of poison emitted by its intended meal. Thick white membranes close over the attacker's eyes as it enters the zone affected by the secretion.

Appetite overcoming repulsion, another would-be diner tries to take a bite (**right**), but seems unable to close its jaws. In convulsion the shark streaks away, frantically shaking its head and leaping and thrashing about the tank. The violence knocks loose a hitchhiking remora from the shark's underside. Seventeen hours later, after repeated attack attempts, the sole bears not a scratch.





"**First known chemical** that can prevent a shark from biting," says Dr. Clark of the toxin she squeezes from a dead *Pardachirus* (**left**). Assistant Gail Weinmann collects the poison (**bottom**) produced by some 240 glands along the sole's anal and dorsal fins.

A double-barreled defense weapon, the toxin not only produces extreme agitation, but also attacks red blood cells. Normally

DAVID DAROM (ABOVE)

plate-shaped, human red blood cells (**above**) here explode and distort as a diluted solution of the toxin touches them.

Chemical analysis of the mighty milk reveals a built-in inhibitor, a protein substance that in some circumstances neutralizes the effects of the poison. This inhibitor, Dr. Clark thinks, may contribute to the fish's immunity to its own toxin.

What do local Israelis do with this deadly fish? They eat it with gusto and no harm; cooking destroys the poison.

diving center, we ranged past a beautiful coral reef preserve called the "Japanese Gardens," and on south as far as Taba. There, after a long swim, we could eat hot kabob on the beach at Rafi Nelson's Village, a delightful hippie-run restaurant with Bedouin cooks.

"Milk" Makes Short Work of Smaller Fish

Pardachirus at rest often lies buried in sand, completely hidden except for its eyes and its large snorkel-like nostril (page 721). Locating such a fish was one thing, catching it another. After initial frustrations, my helpers found they could capture *Pardachirus* in nylon-mesh shopping bags.

We performed some of our experiments in the sea. Catching a *Pardachirus*, we placed it in a plastic bag, which we inverted over a small branched coral, the home of many hidden fish and invertebrates. Then we squeezed the poisonous milk from the *Pardachirus*, and timed what happened. Knowing the volume of the bag and the amount of milk that we could squeeze out (about a thimbleful), we could estimate our dilution.

One part milk in five thousand parts seawater killed every small fish tested in a matter of minutes, even hardy damselfish (page 726). We also verified the initial attraction and ultimate repellent effect of a *Pardachirus* on dangerous animals in the sea. I placed a wriggling Moses sole outside the den of a moray eel. Soon the moray eased out and tried to bite the fish. It came as no surprise

that the eel could not lay a tooth on *Pardachirus*, but instead writhed backward in a hurried escape.

David Doubilet's experience was more exciting. After photographing a large sole on the sea floor, he grabbed it to bring it up.

"Just then," David later recalled, "a barracuda appeared. I could have counted its teeth as it charged straight toward the *Pardachirus* in my hand. But at the last possible moment it stopped cold, shook its head, and shot away. Its teeth never touched us!"

I first came upon this mysterious sole in 1960 while diving near Elat collecting sea horses and pipefish. Netting the *Pardachirus*, I had been surprised to see milky fluid flowing out of pores along the fins. The milk felt slippery and caused a tightening sensation in my fingers. I suspected it might be poisonous.

I preserved the fish and later read about it in Professor Steinitz's library in Jerusalem. The milk from *Pardachirus* had first been reported by Dr. C. B. Klunzinger in 1871. My interest continued, and in 1971 one of my students, Stella Chao of the University of Maryland, ran tests that proved the milk, indeed, has toxic effects. But no chemical experimentation was undertaken until 1972, when I was a visiting professor at Hebrew University in Jerusalem. One of my graduate students, Naftali Primor, was working on the biochemistry of animal toxins.

After hearing me lecture about my early observations of the Red Sea sole, Naftali pleaded, "I want to study that *Pardachirus* toxin." He dropped almost everything else and devoted himself to this work.

Poison Ravages Blood Cells

In his laboratory Naftali injected a mouse with a fifth of a milliliter of the undiluted secretion. It was a massive dose, immediately sending the rodent into violent convulsions. Within two minutes it was dead. Naftali found that the organs in the mouse's body cavity had hemorrhaged. From his description of the creature's last moments, it seemed that the milk had attacked nerves as well as blood, indicating both neurotoxic and hemotoxic effects.

More research is needed to find out if the sole's milk really does affect the nervous system. But, thanks to Naftali's later experiments, we now know for certain that the poison destroys red blood cells.

Dr. Eliahu Zlotkin, toxicologist at Hebrew University, assured me that Naftali's results were reliable. The graduate-student researcher probed deeper. He separated the milk into three protein components, and found he could isolate an inhibitor of the hemotoxin—a substance mixed into the poison that can prevent it from taking effect! I think this inhibitor could eventually prove to be the explanation for the sole's seeming imperviousness to its own deadly poison.

Naftali's work went even further. He discovered that *Pardachirus*'s toxin inhibitor also counteracts the hemotoxic effects of venom from scorpions, bees, and elapid snakes such as corals, cobras, and mambas.

"Because of these findings," Dr. Zlotkin said, "your Moses sole has promising and exciting medical possibilities."

Research even now is continuing in Israel and the U. S. toward utilizing this inhibitor ingredient. And *Pardachirus* toxin itself is being evaluated as a possible shark repellent for use by swimmers and divers. None of four species of sharks exposed to the Moses sole have attacked it. Flies, too, seem to be repelled by its poison.

Humans Try a Taste Test

What about the sole's poison as a hazard to humans? From our experiments with rats —most of them recovered from moderate injections of the poison—I was confident that it would take a strong dose of *Pardachirus* poison placed directly into a person's bloodstream to do any damage. As with snake venom, you probably could drink *Pardachirus*'s potent milk without any ill effect if you have no cut in your mouth or ulcer in your stomach.

We didn't go that far, but we tasted the milk from a live *Pardachirus*. I dipped a finger in the poison and touched it to my tongue. Then Gail and, finally, reluctantly, the boys followed suit. We all experienced not only the highly unpleasant bitterness and the strong taste, but also the fast-acting astringent action caused by the tiniest drop. We wiggled our tongues uncomfortably for 20 minutes before the sensation went away.

Now we could better understand the violent reactions of our marine test animals: Why sea anemones contracted and everted their stomachs; why the pulsating soft coral, *Xenia*, became discombobulated and distorted; why the feet of mollusks fragmented into shrunken pieces; and why fish shuddered

Bouquet of death: Lethal sole and several damselfish share a plastic sack placed over a coral clump in the Gulf of Aqaba. Within 30 seconds the little fish took the diluted milk in through their gills and went into convulsions. Minutes later they floated lifeless, while *Pardachirus* swam about unaffected (**right**). Far more effective than any other chemical shark repellent, the toxin is now under study as a future lifesaver.

and turned belly up when put in water to which the milk had been added. Brittle stars would either coil up in a ball and die, or suddenly stiffen straight out, their slender arms like five radiating exclamation points expressing their horror.

Dissecting *Pardachirus*, we found that the poison glands, an average of 240 per sole, are located in pairs at the base of all dorsal and anal fin rays except the first and last. Each gland opens through a tiny pore, and from the pores the milk runs out into the membranous grooves between the stiff, gristly rays that give rigidity to the fins.

During our experiments with the sharks in the Steinitz laboratory tank, only in two instances did *Pardachirus* release a visible amount of milk; the poison came out as two or three white threadlike wisps that dissolved within a few moments. I believe *Pardachirus* constantly exudes very minute amounts. Our experiments showed that a halo of protection several inches in radius surrounds the sole.

Ordinary fish suspended in the pool immediately adjacent to *Pardachirus* were shunned by the sharks. If we let a dead fish dangle from the tail of *Pardachirus*, so part of it was three inches away, the sharks would eventually bite the end farthest from *Pardachirus*, but only after many minutes.

When we wiped the skin of a live *Pardachirus* with alcohol, removing the mucus-poison mix, and at once dropped the fish in the tank, it was inside a shark's stomach in a flash.

Back to the Sea for a Final Test

For our concluding fieldwork, we wanted to see how free-swimming sharks react to live, tethered *Pardachirus*. On the southern tip of the Sinai Peninsula, at Ras Muhammad, we found a magnificent spot to set shark test lines. We couldn't find any Moses soles there, however, so we had to carry them with us in plastic jugs from Elat.

At Ras Muhammad we set out an 80-foot shark line with ten dropper lines, each a yard long. We stretched the rig across a ledge three feet underwater and close to the rocky coastline, where just offshore the water plunges to a depth of more than 1,000 feet.

We tied bait to each line: parrot fish, wrasse, lizard fish, grouper, and non-poisonous flatfish. Along the line, we interspersed *Pardachirus*, alive or freshly dead.

Set during daytime, the line at first attracted no sharks. But as the sun slipped down near the horizon, and as it rose in the morning, sharks came up from the deep. The activity at our shark line was at its height from 5 to 8 p.m. and 4:30 to 6:30 a.m. We dived with scuba gear to observe the sleek sharks swimming up from below, or we snorkeled quietly along the underwater ledge near the line of captive fish.

Whenever we set a line, the fish—alive and kicking, weak and dying, or already dead—were eaten one by one. All except *Pardachirus*. The predators included groupers, jacks, and surgeonfish, as well as sharks.

Shark in the Dark Dines in Peace

Perched one evening on a ledge six feet above the water, I held my thumb on the trigger that controlled our remote underwater camera and strobe-light setup.

A slight ripple on the sea broke the moonlight into a band of silver sequins right over the shark line. A large dark object drifted up from the depths. Avi Barnes, a graduate student who had joined us, was snorkeling at the coral drop-off.

At his signal, I pressed the button to trip the camera shutter and fire the strobe. A spectacular scene! The strobe lights flashed as a large requiem shark came to the line near Avi's head. I saw Avi's hair standing straight out and the shark's eyes gleaming, and I felt goose bumps on my arms. But the shark was too far from the camera for an effective picture.

Then I saw the shark approach the ideal spot, and I pressed the button again, and again, and again. What a moment of frustration, as the shark, gobbling other fish but repelled by *Pardachirus*, completed its performance before the strobe lights could recycle and fire!

Our experience at Ras Muhammad confirmed the observations at the tank in Elat: *Pardachirus* could hang for hours in the sea and repel all comers among the finny predators of dawn and dusk.

I look forward to the day when research on *Pardachirus* and its potent toxin has advanced to allow this scenario: I get into my wet suit and spray it with the synthesized poison of the Moses sole. Then I dive in and swim at ease among the sharks, exempt from concern that these old friends may make me an item in their diet. □

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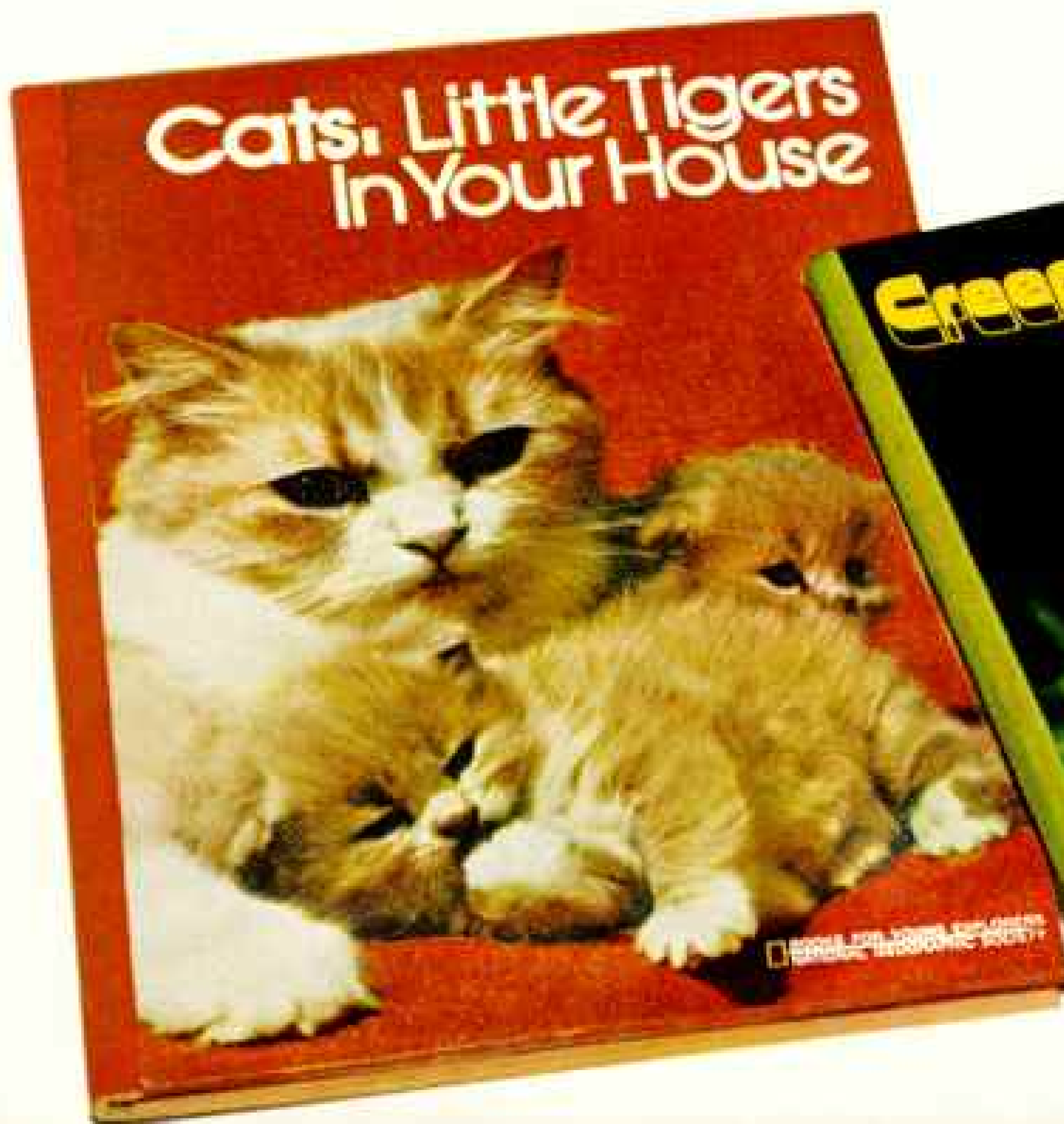

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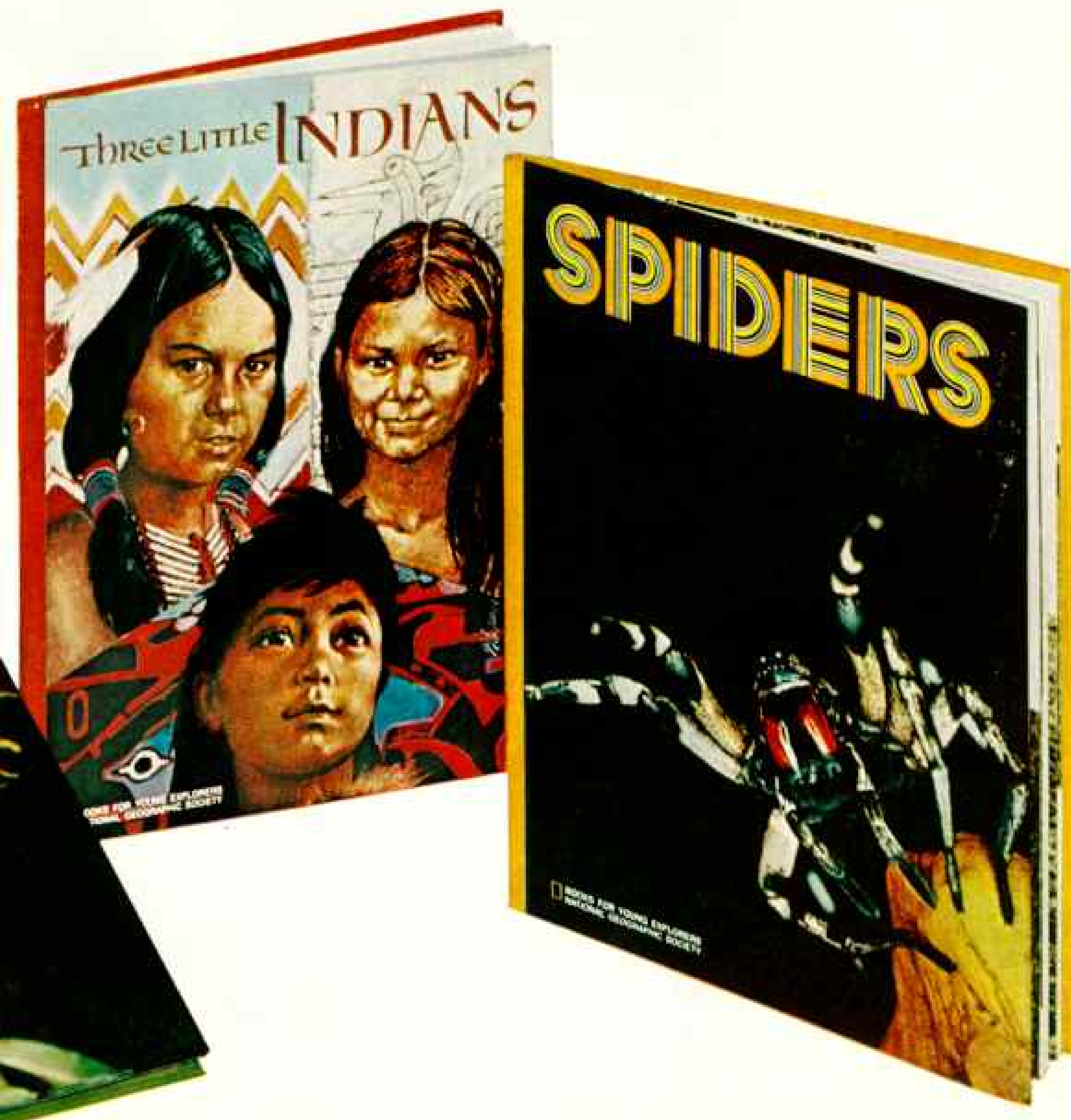

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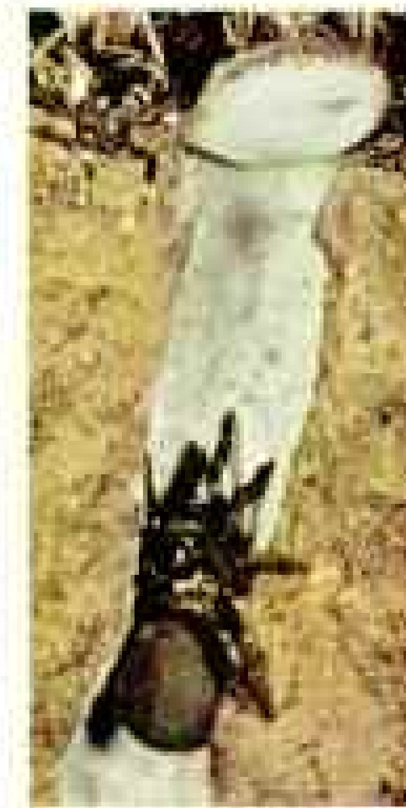

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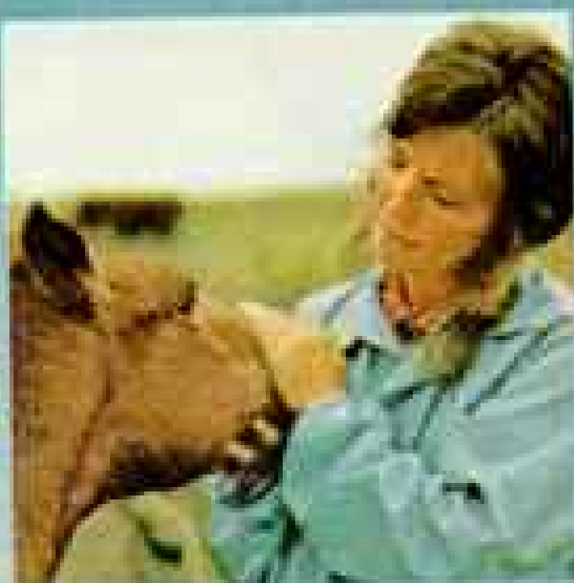

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PARKER 75

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The point of a Parker 75 Classic Ball Pen is not large. Fifty points, side by side, measure one inch.

For this pen to write the way we want it to—clean, crisp, without skip or blob—the point must be as near a perfect sphere as we can make it.

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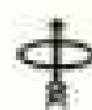
The slender Parker 75 Classic Ball Pen. Though it's made up of approximations, it does make a very nice gift.

 PARKER

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The National Governors' Conference
announces its official series of
solid sterling silver ingots honoring
the State Birds and State Flowers
of the United States....

THE OFFICIAL STATE INGOTS OF THE NATIONAL GOVERNORS' CONFERENCE

IN SOLID STERLING SILVER

...depicting the State Birds and State Flowers of the 50 States.

In tribute to the natural beauty of each of the 50 States of the Union, the Executive Committee of the National Governors' Conference, representing the Governors of all 50 States, has authorized the minting and issuance of sterling silver ingots portraying the State Birds and State Flowers of the United States.

The Official State Ingots of the National Governors' Conference will be the first complete collection of silver ingots ever to officially honor the State Birds and State Flowers of all the States. Minted in solid sterling silver and issued in a strictly limited edition it will, unquestionably, be one of the most beautiful and most important collections ever issued. Each ingot, moreover, will be exceptionally large—1.5" x 2.1"—so that the full beauty of both the bird and the flower can be captured in richly sculptured detail.

The collection reflects the beauty and diversity of America

In issuing this important collection, the National Governors' Conference pays enduring tribute to the great natural beauty and rich diversity of America. On each ingot, both the State Bird and State Flower are portrayed in exquisite sculptured detail—from the Bluebird and Rose of New York to the Valley Quail and Golden Poppy of California . . . the Mockingbird and Orange Blossom of Florida to the Willow Ptarmigan and Forget-me-not of Alaska.

In honoring these lovely birds and flowers, the National Governors' Conference is also mindful of America's ever-increasing determination to protect and preserve our magnificent natural heritage throughout the years to come.

Ingots shown actual size.

The opportunity to acquire a First Edition Proof Set

The National Governors' Conference has appointed The Franklin Mint, America's foremost private mint, to sculpture and strike these beautiful ingots. The First Edition will be a *hallmarked Proof Edition*—with the sculptured design in frosted relief against a mirror-like background. To achieve this two-tone, gem Proof finish, the master dies must be specially finished by hand, and each ingot must be individually double-struck under rigorously controlled conditions. Flawless Proofs are universally recognized as the ultimate achievement of the minter's art, and The Franklin Mint is world-famous for its proof-quality minting.

First Edition Proof Sets of these superbly crafted ingots are available by advance subscription only, and will be issued to subscribers at the rate of one Proof ingot per month.

You may become an advance subscriber by submitting the subscription application on this page by November 30, 1974.

The edition will be strictly limited

There is an absolute limit of one set per subscriber. The total number of First Edition Proof Sets issued will thus be limited to the exact number of advance subscriptions entered by the closing date of November 30, 1974 (plus one complete Proof Set for the Archives of each State, to be presented by the National Governors' Conference).

The complete collection will contain no less than 30,000 grains of sterling silver. The original issue price of each First Edition Proof ingot is $30., and The Franklin Mint has agreed to guarantee this price for the entire fifty-month issue period, thus protecting subscribers against the possibility of increases in the price of silver during the next four years. Given the persistent nature of world-wide inflationary pressures, this is a most significant guarantee.

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The complete First Edition Proof Set of The Official State Ingots of the National Governors' Conference is clearly destined to become an important American heirloom. One that will be prized and treasured now and for generations to come. Combining great beauty, educational interest and the intrinsic value of solid sterling silver, it also has the important added value of assured rarity. For the First Edition is the *only* Proof Edition that will ever be minted.

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THE OFFICIAL STATE INGOTS OF THE NATIONAL GOVERNORS' CONFERENCE

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Among the Conference's purposes are:

- Providing a medium for the exchange of views and experiences on subjects of general importance to the people of the States.
- Fostering interstate cooperation.
- Promoting greater uniformity of state laws.
- Attaining greater efficiency in state administration.
- Facilitating and improving state-local and state-federal relationships.
- Representing the interests of the States in the federal system.

For more than six decades, since its founding in 1908, the Conference has been a significant and constructive force in the progress of our nation's federal system, the improvement of state government, and the development of effective cooperation between the States.

As an appropriate tribute to the natural beauty of the fifty States, the National Governors' Conference has authorized the minting of its Official State Ingots honoring the State Bird and State Flower of each State. The conference has appointed The Franklin Mint, America's largest private mint, as official minter for this series of fifty sterling silver ingots.

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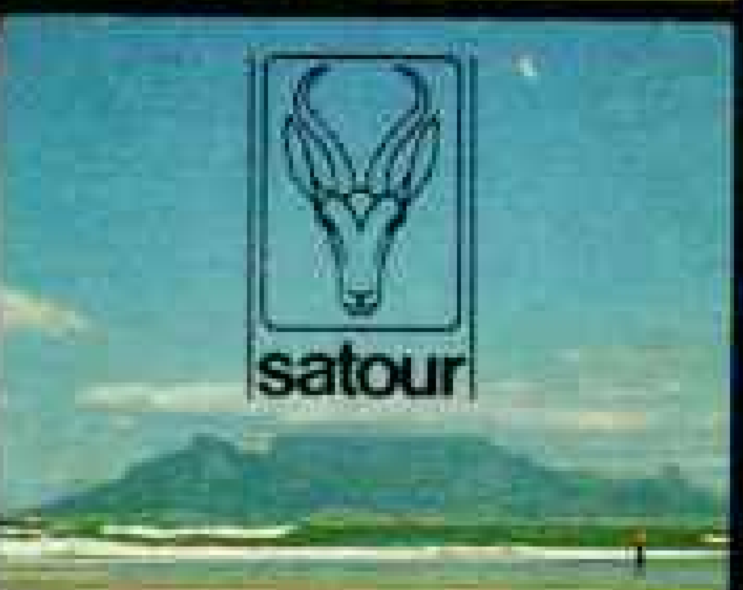

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More oil from

How Exxon is squeezing additional oil out of a 55-year-old field.

A popular myth has it that oil is found in large underground lakes or pools. Actually, when oil and natural gas are discovered they are inside sedimentary rock. They are trapped in the tiny pores of limestone or sandstone as far as five miles underground.

Usually, when a well is drilled into oil-saturated rock, natural underground pressures force the oil to *flow through the rock* to the well and then to the surface.

However, in many oil fields these natural pressures are not strong enough to move the oil to the well. Or, over time, they may have diminished to the point where they must be supplemented by additional pressure. This additional pressure is provided by "secondary recovery" methods.

Sample drilling cores taken from oil-saturated rock formations in Alaska, Texas and Saudi Arabia. Oil and gas must come from and flow through rock like this before they reach the well bore.

Forcing water deep into the oil-bearing rock.

The most widespread secondary recovery method in use throughout the oil industry is *waterflooding,* which was introduced over 30 years ago. Water is pumped into the oil-bearing rock to flush out more of the oil than would be produced by natural, or primary forces.

On the average, natural pressures move only about 15-20% of a field's oil from the underground rock up to the surface. By using secondary recovery technology, the final yield can be increased to an average of about 35%.

The Hewitt Field—a case in point.

The Hewitt oil field, discovered in 1919, near Ardmore, Oklahoma, is operated by Exxon and several other companies. Originally, this field produced nearly 30 thousand barrels of oil a day. However, the depletion of natural underground pressures gradually reduced Hewitt's production to the point where the field needed waterflooding.

In 1969, Exxon and other owners began a cooperative secondary recovery waterflood project, which has since cost about $20 million.

Engineers now estimate that the Hewitt field ultimately will produce 35% of the original oil in place. Without the use of waterflooding, total recovery had been estimated at only 20%.

Sometimes, but not at Hewitt, natural gas is injected instead of water. However, the efficiency of waterflooding usually makes it more attractive.

An experiment using heat and subterranean "detergents".

Even after an oil field is subjected to secondary recovery techniques, such as water and gas injection, a large percentage of the oil still remains locked in the pores of the rock. So for many years, Exxon has been experimenting with tertiary recovery methods designed to recover more of this oil.

In one experimental process, a "detergent" or surfactant is pumped into the rock. This agent works like a laundry detergent that removes oil from a shirt—it flushes out the droplets of oil

old wells.

Artist's conception of the Hewitt oil field located near Ardmore, Oklahoma. Large quantities of water are being injected into the oil-saturated rock to significantly increase the oil production.

which still remain in the pores of the rock. In some cases, particularly where the oil is thicker, sometimes nearly the consistency of molasses, steam injection also is being tested. The hot steam heats the oil, making it flow more freely.

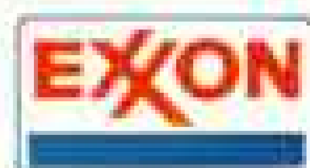
In perhaps the most dramatic oil-recovery technique, air is injected into the rock formation holding the oil. This injected air supports controlled underground combustion, which heats the oil, causes it to flow more readily and drives it to the well.

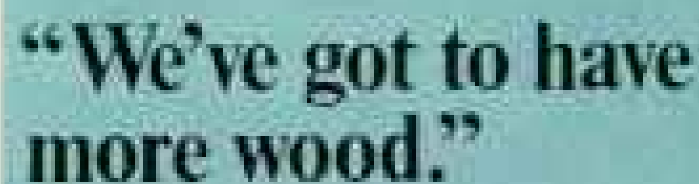
In addition, Exxon is testing and evaluating several other tertiary techniques.

A realistic look at the future.

To date, about 450 billion barrels of oil have been found and documented in the United States. Even after additional recovery efforts, like the waterflooding at Hewitt, are applied, some 300 billion barrels of this oil will still remain locked in the pores of rock. Today, there is no way to recover all of this oil.

But scientists believe that experimental "tertiary" techniques like "detergents" and combustion could someday produce a significant amount of additional oil which America will need in the years ahead.





Disagreement? Not necessarily. Both viewpoints make sense. We must save our forests and we must have more lumber. Trees are a natural resource essential to both our environment and our economy.

Trees hold the soil, stop erosion. They provide food and cover for wildlife. Their beauty and tranquility offer a welcome change from our hurry-up lives.

At the same time, we must have wood. For more than two million new homes each year. For books and newspapers. Furniture. For countless uses, some 15 billion dollars worth, annually.

We can have forests and paper and wood products. With complete, responsible forest management.

But it's not necessarily good management to leave the forests alone. When millions of trees are allowed to die of "natural" causes —old age, fire, insects, disease— that's waste.

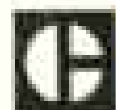
Modern forestry harvests trees at the proper time and gets new trees growing immediately. So regrowth is faster and surer than nature can provide.

A U.S. Forest Service study shows that we grow 62% more wood per acre on forest industry lands than on public lands. That capability is significant.

Intensive forest management can give us the wood products we need without lasting damage to our ecology. As long as we recognize the importance of each.

We think that's important because machines made by Caterpillar are used in the woods. And because forests are important to the beauty and health of our nation.

There are no simple solutions. Only intelligent choices.



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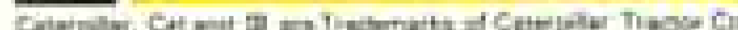

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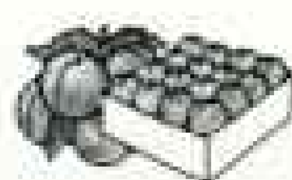
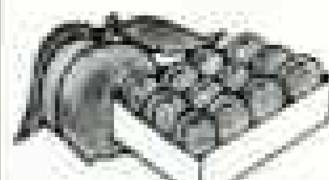
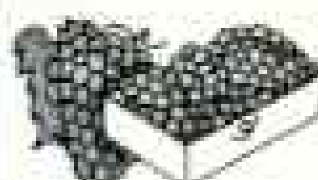
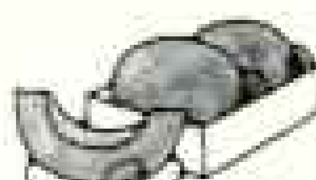
HAWAIIAN PINEAPPLES	WILD 'N RARE® PRESERVES	HOME-CANNED FRUIT	GIANT KIWI-BERRIES
August	**September**	**October**	**November**
			
EXOTIC NECTARINES	OREGOLD® PEACHES	ALPHONSE LAVALLE GRAPES	SPANISH MELONS

We guarantee your satisfaction in every respect . . . or your money back!

Month after month, a parade of handsome gift boxes, each with your greetings and all announced by a gold-embossed Certificate of Membership inscribed as you direct. These famous Clubs keep you in warm, friendly contact with people important to you or your business. The proved perfect family gift for over 30 years.

3-BOX CLUB: Surprise them with gorgeous gift boxes for Christmas, January and February!
Gift No. 111 . . . $21.95 delv'd

5-BOX CLUB: Keeps coming and coming! Christmas, January, February, May and September.
Gift No. 141 . . . $34.95 delv'd

8-BOX CLUB: Delight them to pieces again and again! Christmas, January, February, May, August, September, October and November.
Gift No. 151 . . . $59.95 delv'd

12-BOX CLUB: Flabbergasting! A gorgeous gift every single month of the year.
Gift No. 201 . . . $86.95 delv'd

Perfect Delivery Guaranteed

Royal Riviera® Pears

America's rarest and finest fruit

So big and juicy you eat 'em with a spoon! Royal Rivieras are the rarest and finest of over 800 known varieties — so rare in fact, that not 1 person in 1000 has ever tasted them. Beautifully gift packed — sent with your personal greetings. Available Nov. 10 to Jan. 25.

Gift No. 1 — shown
Net wt. 6¾ lbs. . . . $7.95 delv'd

Gift No. 3 — family size box of smaller pears
Net wt. 9 lbs. . . . $9.45 delv'd

Gift No. 5 — 8 to 9 gigantic pears Net wt. 8 lbs.
. . . $9.95 delv'd

EASY TO ORDER: Just send us your list. Enclose check or money order (no COD's please). Tell us how to sign your greetings for each gift. All prices include delivery.

Send your orders to:

Harry and David®
Box 628-A Medford, Oregon 97501

© 1974, Harry and David

WANT OUR FREE CATALOG? IT'S DELICIOUS. See more of our farm fresh Christmas Gifts and Fruit-of-the-Month Clubs in honest-to-gosh full color. Just send off the coupon right away.

Mail to *Harry and David* Box 628-A, Medford, Oregon 97501

PLEASE SEND FREE CATALOG TO

Name ______

Street ______

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State ______

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Honeywell Pentax ESII -- a camera for the busy, demanding man on the move.

You've always admired the work of good photographers. But you've been too busy to invest the time necessary to master complex cameras, lenses and lights — the complicated tools you knew would have to become second nature to you before you could hope to achieve truly outstanding photographs.

Well, this is simply no longer true.

Because now, with our 35mm Honeywell Pentax ESII, there are no complicated dials for you to master. No difficult readings to take. And no needles to match.

Instead, the ESII has a built-in meter and an electronic shutter that take care of these calculations for you. And assure you of pleasing exposures, even if lighting conditions change or your subject moves. Which means you can forget about the mechanics and spend your time concentrating on creativity and composition.

With the ESII camera, all you have to do is focus and shoot. Period. It does all the rest. And gives you just the exposure you need. Or if you wish to control your own exposure, you can take the ESII off automatic and choose from among six shutter speeds, B to 1/1000 seconds.

The Pentax ESII is no glorified automatic snapshot camera, either. It's an incredibly sophisticated machine with precision-tooled parts nestled in a body that weighs just two pounds, one ounce.

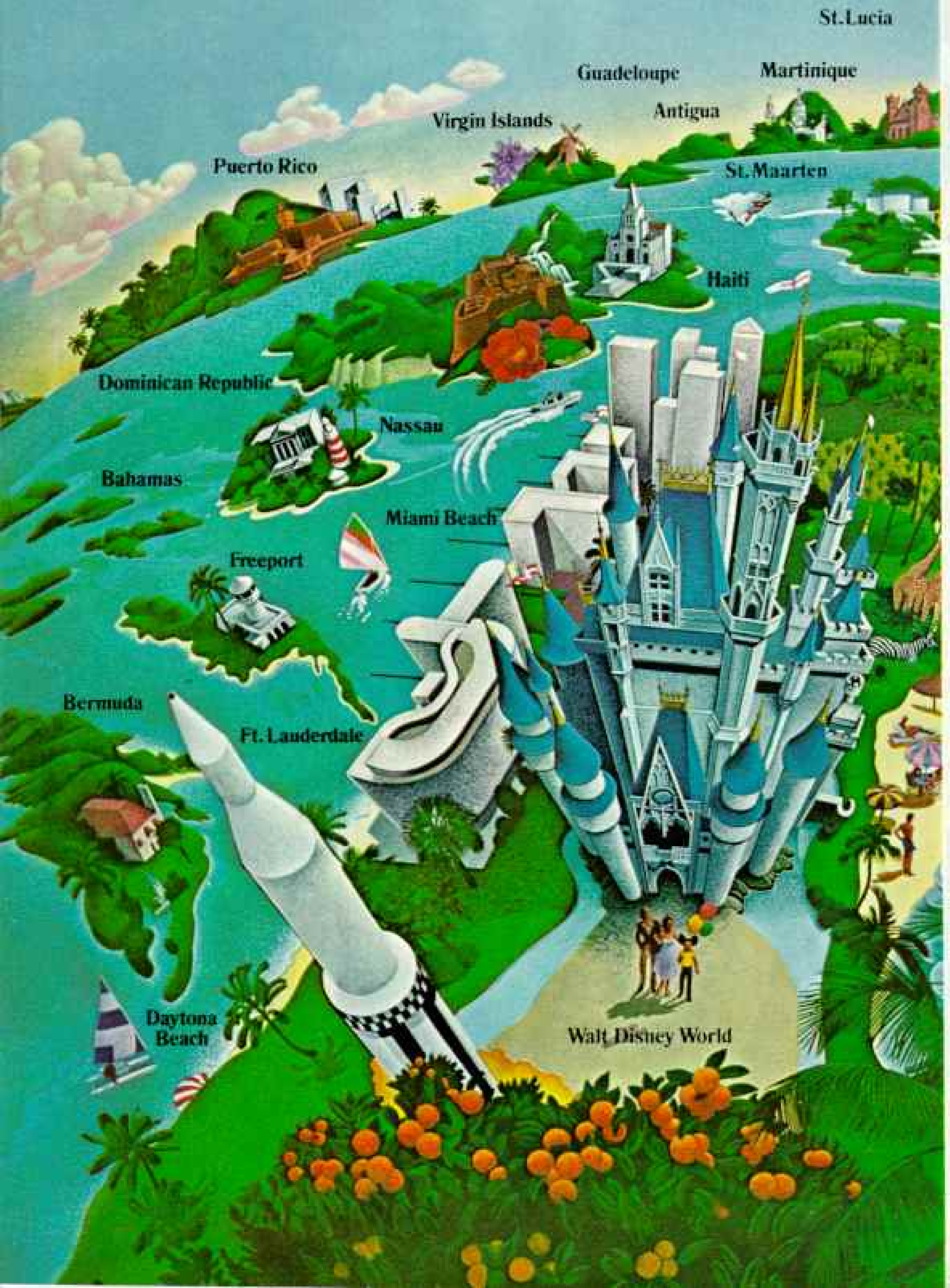
It comes with an optically superb 50mm f/1.4 or 55mm f/1.8 lens and can be used with any of our 23 other flare-taming Super-Multi-Coated-Takumars from extreme wide-angle to telephoto.

If you're too busy to learn photography but too demanding to settle for less than outstanding results, see your Honeywell Photo dealer for a demonstration of the Pentax ESII or write us for FREE literature: Honeywell Photographic, Dept. 101-462, P.O. Box 22083, Denver, Colorado 80222. In Canada, McQueen Sales Ltd., a subsidiary of Honeywell.

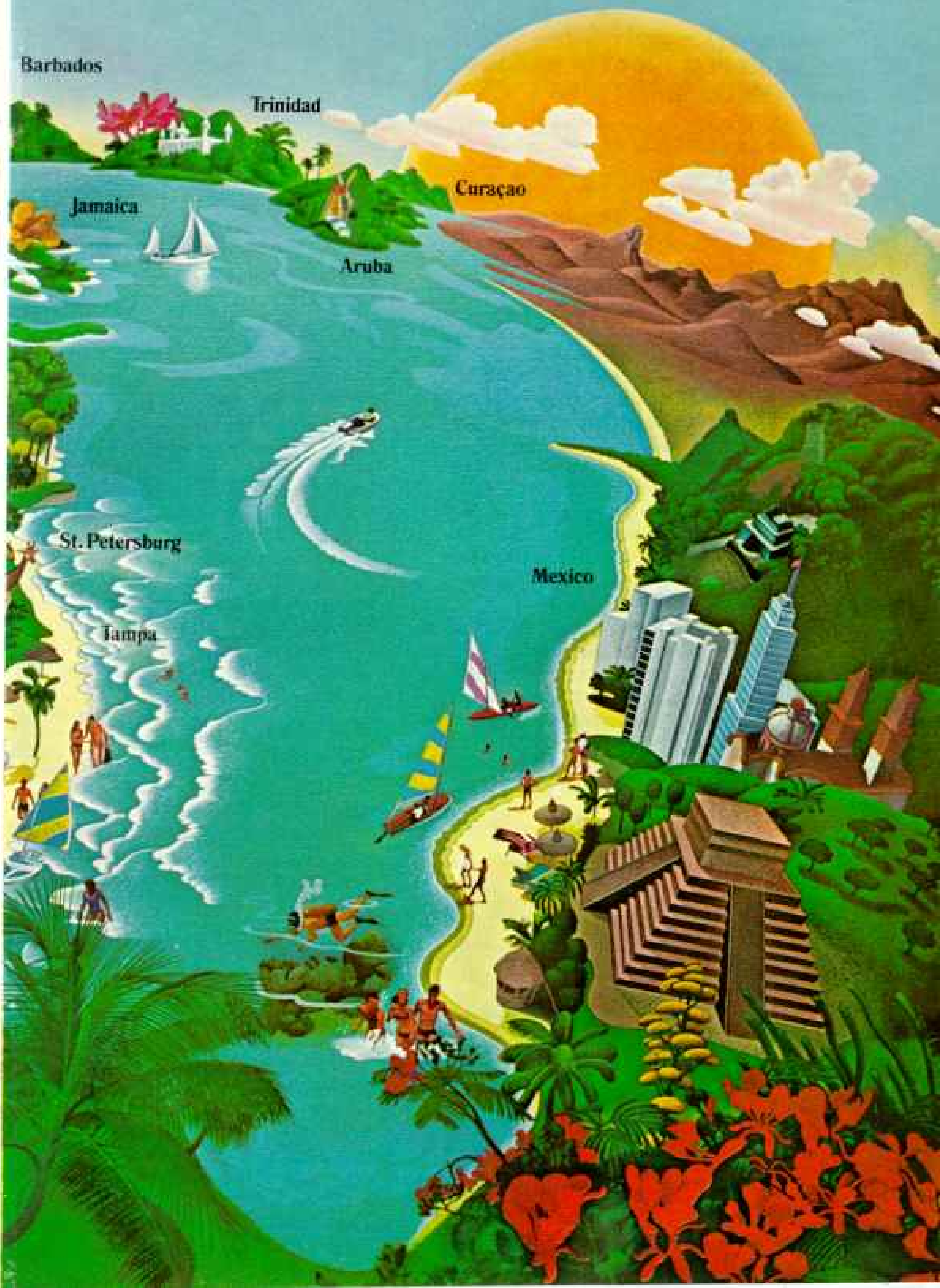
Honeywell Pentax in the U.S. and Mexico. Asahi Pentax elsewhere.

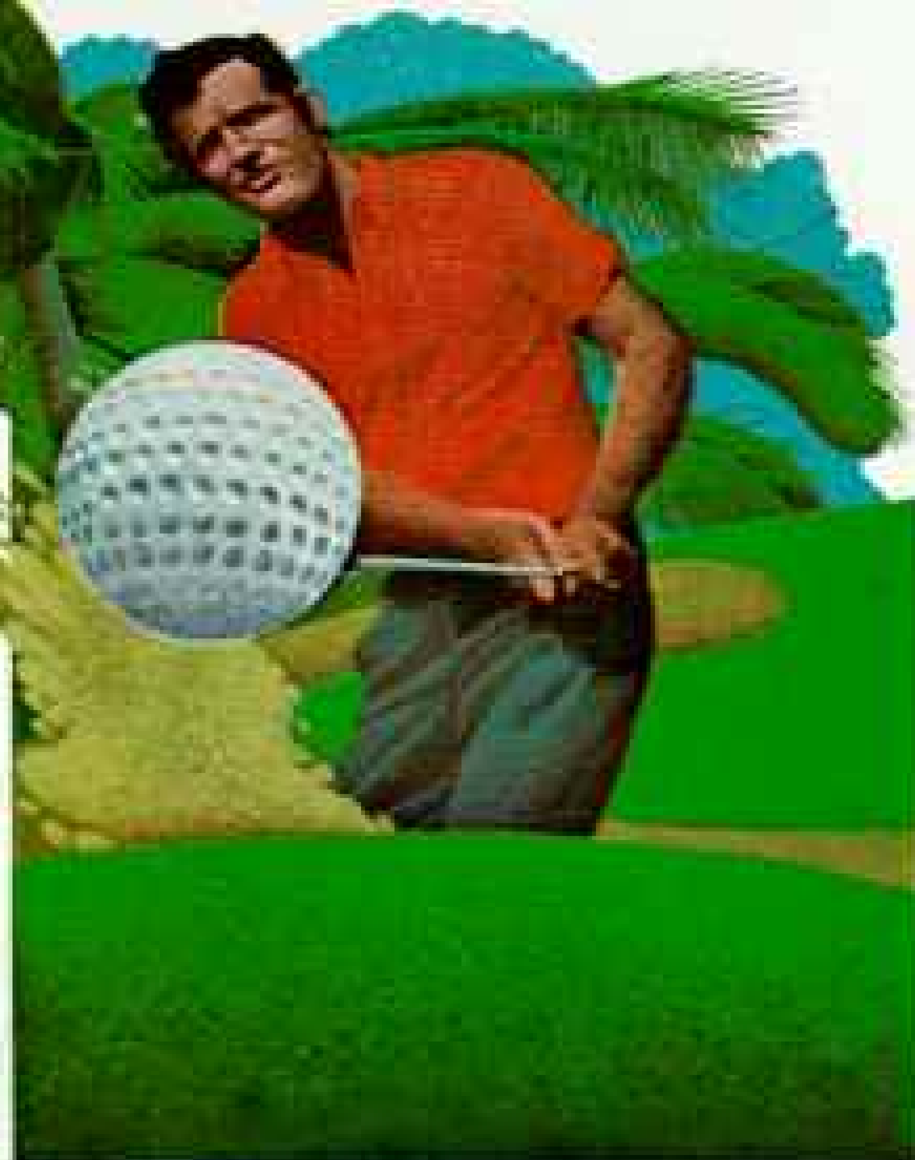
WE HAVE A PLACE FOR YOU THIS WINTER.

EASTERN'S WINT



ER WONDERLAND





YOU GOTTA BELIEVE WE'LL HELP YOU FIND THE RIGHT PLACE FOR THE RIGHT PRICE IN EASTERN'S WINTER WONDERLAND.

Eastern's winter wonderland is a land filled with warm, wondrous places, where trade winds blow and caress and icy winds never go.

It begins in the Sunshine State, Florida, and includes the magic kingdom of Walt Disney World. From there it follows the sun to the Bahamas, Bermuda, Mexico, Puerto Rico, and our other Vacation Islands of the Caribbean.

Of course, everybody would like to spend all winter long in a fantastic wonderland such as ours. For most people, though, that's impossible.

But Eastern or your travel agent can help you make the most out of the vacation time you do have. And the money you've set aside for it.

So when you go home you'll have lots of fond memories to keep you warm all winter long.

Eastern Airlines.
Number one to the sun.

Eastern flies to more places in this sun-drenched part of the world than anyone, and we know more about it than anyone. We'll be happy to share our knowledge with you to find the vacation you're looking for.

For example...

Key Biscayne.
$262.*

Stay 8 days/7 nights right on the beach at the renowned Sonesta Beach Hotel, only 18 minutes from Miami International Airport.

A welcome drink comes with the vacation. And for tennis lovers the most welcomed part of this vacation is the daily one-half hour tennis lesson plus another daily one-half hour of supervised tennis play. Also included is complimentary use of the hotel's bicycles. Round-trip transportation between the airport and hotel is provided.

Eastern also has many other tennis and golf packages available throughout Florida.

Walt Disney World.
$92 to $151.*

Something special from the official airline of Walt Disney World. Pick any one of 16 selected hotels. If you stay 5 nights, you get the 6th night free. Along with 2 days transportation to Walt Disney World. And admission and transportation within the Magic Kingdom. And exclusive Eastern ticket books for 18 attractions.

You also receive sightseeing tours of Kennedy Space Center, Tampa's Busch Gardens, Sea World and Cypress Gardens. Price includes round-trip transportation between hotel and airport. Two children under 12, sharing rooms with parents, only $42 each child.

Eastern offers many other Walt Disney World vacations at a wide range of prices.

Tampa/St. Petersburg.
$108 to $177.*

Begin your Florida vacation on Florida's exciting Gulf Coast. Stay 6 nights at one of 8 selected hotels and get the 7th night free. And there's good reason to stay. There's plenty to see and do.

You'll receive admission to the following attractions: a day at Walt Disney World, and an exclusive Eastern nine-ride ticket book to help you enjoy the day. Then, at your leisure see Busch Gardens, the St. Petersburg Aquatarium, Sunken Gardens and the *H.M.S. Bounty.* You also have a choice of either a 1½ hour cruise of Tarpon Springs, or a two-hour cruise aboard a riverboat, relaxing on Tampa Bay.

To help you, a subcompact car with unlimited mileage is included for 7 days (gas, oil and collision damage waiver not included). One evening's dinner and cocktail is also included at a choice of 4 hotels.

Eastern has many other exciting Gulf Coast vacations including Long Boat Key, Lido Beach and Indian Shores at a wide range of prices.

Florida Keys Island Hopper.
$38 to $71 (2 nights).*

Take a series of two night vacations at selected resorts up and down the Florida keys. You can stay two or more nights at one resort or you can mix and match. Each resort offers a special feature or sightseeing tour.

At Key Largo, enjoy free tennis and the John Pennekamp Coral Reef State Park, the only living coral formation in North America (admission not included). At Islamorada, a welcome cocktail and saunas. At Duck Key, free tennis plus one day of fishing on a party boat. At Key West, admission to Flipper's Sea School.

A subcompact rental car is included in the above price. Gas and insurance extra.

Florida/Bahamas Cruise.
$138 to $168.*

Here's a vacation that's really two vacations in one. First, spend 4 days/4 nights on Florida's Gold Coast. You have a choice of nine selected hotels in either Miami Beach or Ft. Lauderdale.

The second half of your vacation, you spend 4 days/3 nights cruising to Nassau and Freeport in the Bahamas on the *New S.S. Freeport*.† All meals aboard ship are included.

Or start your vacation in the Bahamas. Spend 4 nights in selected hotels in either Nassau or Freeport and cruise to Miami.

Add $20 per person to above prices from 2/1/75 to 3/5/75. The above prices may be subject to a cruise fuel surcharge.

Bahamas/Out Islands Cruise.
$239 to $339.*

Discover some of the undiscovered 700 out islands of the Bahamas with this 5 day/4 night cruise. Fly to Nassau and board the *New Shoreham*‡ and cruise to some of the most beautiful islands in the Bahamas: Meeks Patch, North Eleuthera, Spanish Wells, Cape Eleuthera, Elbow Cay, Shroud Cay, Highborne Cay, and Allan's Cay. All the meals during cruise are included.

†Registered in Panama.
‡Registered in the U.S.A.
*Prices are per person, double occupancy, 12/15/74 through 4/15/75 unless otherwise indicated and do not include airfare.

Your ship leaves Nassau on Monday morning, but it's a good idea to arrive on Saturday. This way you can use the *New Shoreham* as your hotel Saturday and Sunday at no extra cost, and spend the extra time getting to know Nassau and her duty-free shops.

San Juan/St.Thomas. $122 to $149.*

Lavish night life and casinos. You're in the Las Vegas of the Caribbean—San Juan. But, Puerto Rico is also palm-studded beaches. Sixteenth Century fortresses and cathedrals. And dense, secretive rain forests.

It's all yours to enjoy on this 8 day/7 night vacation. Take your choice of 2 selected air-conditioned hotels. Plus a day in the duty-free shopping paradise of St. Thomas at no extra cost.

We can also plan vacations that allow you to spend 3 or 4 nights in San Juan and the rest of your vacation in one of our twelve other Vacation Islands.

Puerto Rico Sports Spectacular. $378 to $393.*

If you're big on sports, this 7 day/6 night Puerto Rico vacation is what you're looking for. Stay at the Cerromar Beach Hotel and enjoy all the extras that this hotel offers as part of the price.

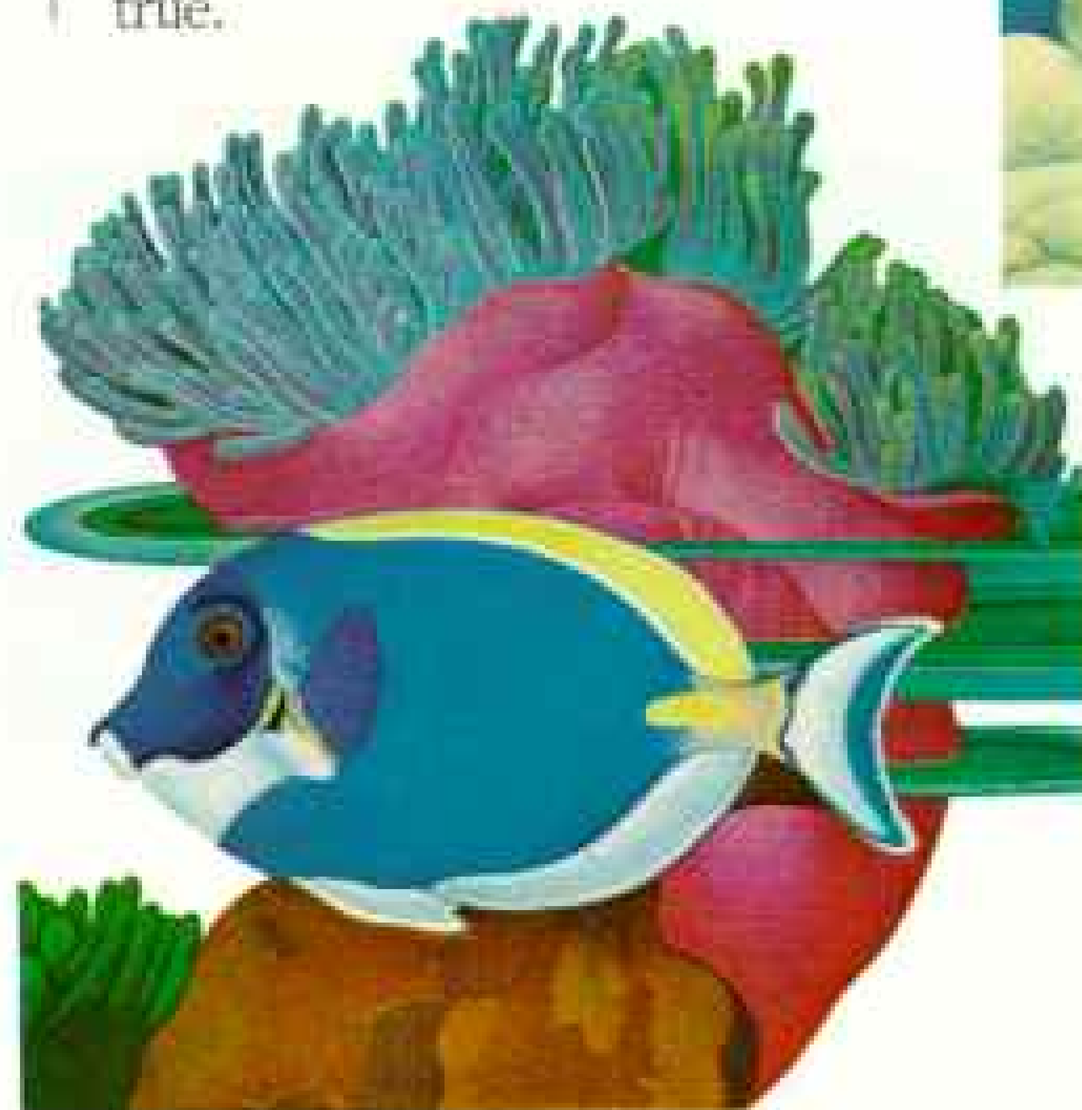
You'll receive unlimited greens fees, and one group golf lesson, or unlimited tennis and one group lesson, free use of sauna and health club facilities. To keep your strength up, two meals a day come with this sports package. Round-trip air transportation between San Juan's airport and your hotel are included in the above price.

Eastern also offers a wide variety of sports programs throughout the Caribbean including golf, tennis, sailing and scuba diving.

Virgin Islands. $168 to $177.*

St.Thomas is the bargain center of the Caribbean. So leave plenty of room in your suitcase for all the things you'll want to cart back. St.Thomas is also noted for its cays, reefs and bays. Its turquoise waters are a pleasure to swim in. You have a choice of two selected hotels on this 7 day/6 night vacation.

Whichever hotel you pick, you'll start off attending a cocktail party to make you feel welcome. Also included are complimentary chaise lounges and a sailing excursion to nearby St. John and Trump Bay National Park. This underwater park is a snorkeler's dream come true.



Jamaica. $126 to $319.*

In Jamaica, you can thrill to a jungle river rafting adventure and explore waterfalls you've seen only in your dreams. Or go the other route, and enjoy native night life you'll remember for the rest of your life. And anytime you please, there's sun and snorkeling off cloud-white beaches.

These are just some of the things you can do on this 8 day/7 night

*Prices are per person, double occupancy, 12/15/74 through 4/15/75 unless otherwise indicated and do not include airfare.

Montego Bay vacation. Pick any of six selected hotels. You'll receive round-trip transportation between airport and hotel as well as transportation and admission to the many attractions offered. Like Dunns River Falls, Swamp Safari, Rose Hall Great House, Tropic Gardens, Paradise Park, and Sign Great House. Or if you prefer, you can rent an air-conditioned compact and drive to Jamaica's many sites on your own. The cost is only $33 extra for 7 days with unlimited mileage. Gas, oil, and collision waiver not included.

Vacation Islands of the Caribbean. $65 to $359.*

Take your choice of any 12 lush Vacation Islands in the Caribbean. If you decide to stay 6 nights at selected hotels, you'll get the 7th night free. Islands included are Curaçao ($114–$141), Martinique ($202–$232), Barbados ($123–$333), Jamaica ($94–$355), Trinidad ($65–$283), St. Lucia ($168–$289), Tobago ($233–$275), Haiti ($82–$94), St. Maarten ($123–$291), Antigua ($90–$187), St. Croix ($120–$231), and San Juan ($82–$184).

From many of these islands, Eastern can arrange exciting one-day trips to out of the way, untouched islands such as Anguilla, Montserrat, St. Eustatius, and St. Barthelemy.

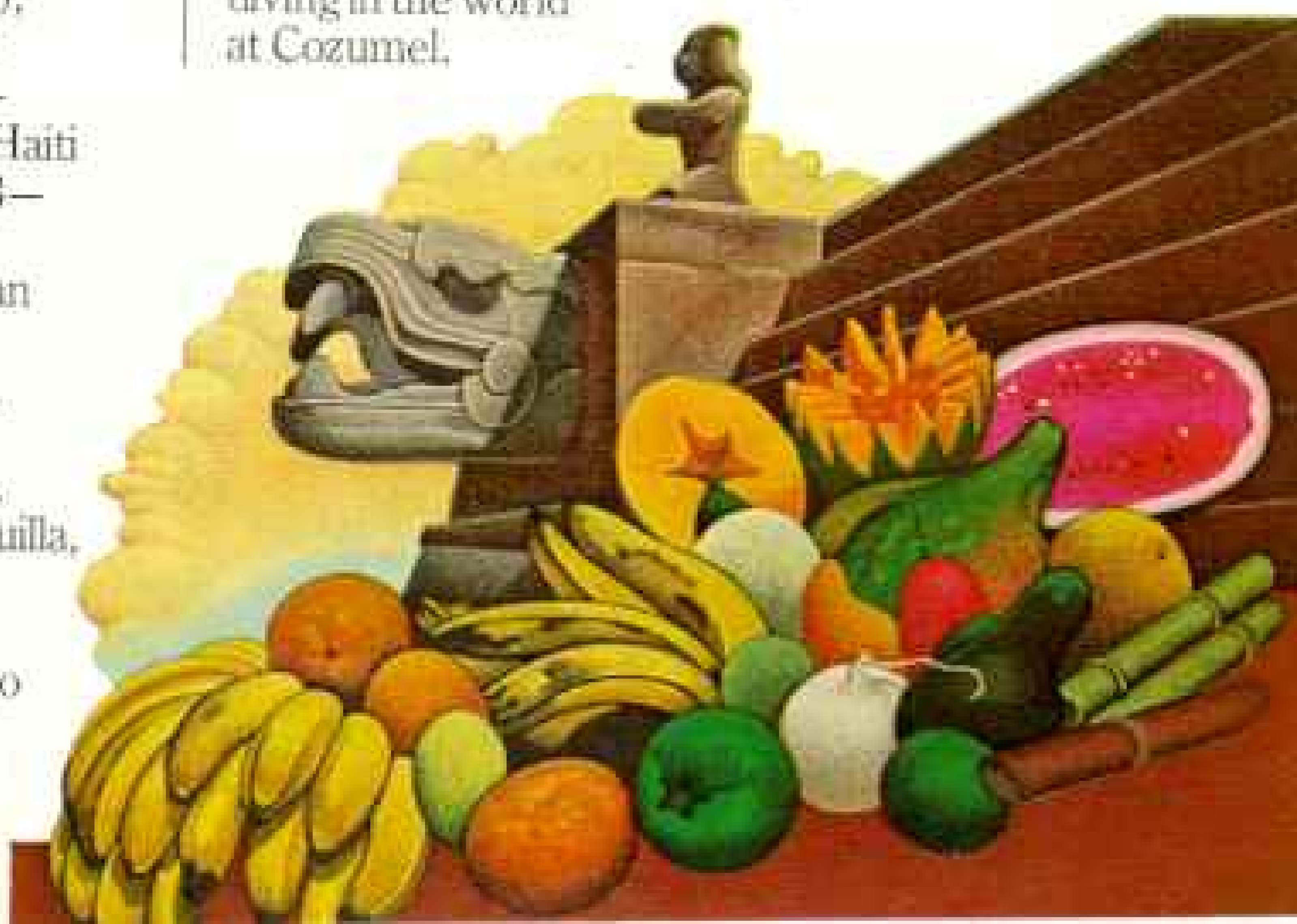
And if you would really like to escape to pure nature, try the Cayman Islands, Guadeloupe, Grenada or St. Kitts.

Mexico.
$129 to $229.*

On this unique 8 day/7 night vacation, you'll get acquainted with Mexico City, ancient capital of the Aztec empire and lively capital of modern Mexico. Then, after travelling by motor coach to Cuernavaca and Taxco, you'll relax at the famous seaside resort of Acapulco.

Your vacation includes accommodations at selected hotels for 3 nights in Mexico City, 1 night in Taxco and 3 nights in Acapulco. It also includes transportation from the airport to your Mexico City hotel, a welcome cocktail, 4 hours of sightseeing of old and new Mexico City, and a motor tour of Cuernavaca and Taxco on the way to Acapulco. While in Acapulco enjoy a cruise of Acapulco's romantic harbor.

Eastern can also arrange many other exciting Mexican adventures for you. For example, if you're an archeological buff, there are the Mayan ruins in the Yucatan and the Zapotec ruins in Monte Alban. Or enjoy some of the greatest scuba diving in the world at Cozumel.



MANY OTHER VACATION POSSIBILITIES WITH EASTERN'S EXCLUSIVE PERSONALIZED VACATION.

The people of Eastern know that everyone has a personality uniquely his own. And each place in Eastern's winter wonderland is endowed with its own personality, too. So one place, more than any other, is likely to suit you best. That's why Eastern created the Personalized Vacation.

If you know where you want to go, we can tell you all the things to do and see there. If you know what you like to do, we can tell you the best place to find it.

Just call us for our Vacation Planning Kit. Inside you'll find a large display map of Eastern's winter wonderland with all the vacation places we fly to and all the activities available to you there. And many other vacation ideas we haven't had room for here.

If that's not enough, we can still help you. Our vacation planning experts and a team of psychologists have designed a special Personalized Vacation Questionnaire. Your answers help us understand the kind of vacation that fits your personality. Then we ask our computer, filled with thousands of vacation experiences, to find the place and price that are right for you.

Our vacation recommendation will come back to you in a detailed 6-12 page letter.

So give us a call. We'll send you our Vacation Planning Kit including our Personalized Vacation Questionnaire.

This winter, let our winter make you warm again.

Eastern's winter wonderland is waiting.

Aruba and Curaçao. $161 to $168.*

Choose either Aruba or Curaçao. In either one you'll find a little bit of the Netherlands. That's because you're in the Dutch Caribbean. And at the Aruba or Curaçao Holiday Inn you'll find a welcome cocktail and a one-hour open bar cocktail party with hors d'oeuvres, to make you feel at home on your 8 day/7 night stay.

Also included is a glass bottom boat trip, a wine discount voucher, tennis, and pool and beach chaise lounges. And, for the kids, there's a playground full of activities and friends.

*Prices are per person, double occupancy, 12/15/74 through 4/15/75 unless otherwise indicated and do not include airfare.

All prices quoted in this brochure do not include meals, taxes or hotel service charges, unless otherwise specified. Applicable security charges additional.

SEE THE TRAVEL SPECIALIST, YOUR TRAVEL AGENT.

If any of these vacation ideas whet your appetite call us or see your travel agent, the travel specialist.

He's an expert in all phases of vacation planning and his advice is not only priceless, it's usually free.

Sample Individual Air Fares: (ROUND TRIP)

FROM / TO:	ATL.	WASH./BALT.	BOST.	CHIC.	PITT.	DETR.	HART.	NYC	PHIL.
Miami/Ft. L.	$116	$168	$212	$204	$180	$196	$204	$188	$180
Orlando/Tampa	86	150	204	176	158	174	190	176	168
Puerto Rico	231	172	194*	242†	194†	267†	194*	172*	172
Nassau	158	150#	184#	202#	184#	197#	184#	202#	202#

FROM / TO:	ATL.	WASH./BALT.	BOST.	CHIC.	PITT.	DETR.	HART.	NYC	PHIL.
Antigua#	$246	$215	$246	$324	$246	$290	$246	$215	$215
Jamaica#	166	202	234	260	224	234	234	202	202
Mexico City	199	261	310		250		310	239	229
Curaçao	287	239	289	341	287	313	275	239	239

*Mon.-Thurs.

Above air fares are per person round trip and are subject to change. They are regular day coach fares and are presently effective unless otherwise indicated. Domestic fares include taxes but not security charges. International fares don't include departure taxes and security charges. You can charge all airfares on "Wings," Eastern's new personal credit card.

†Tourist excursion fare to San Juan, 30 day maximum

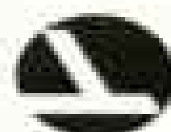
#ITX fares to Nassau, Antigua and Jamaica effective 1/7/75-3/21/75
Travel—Tues-Fri. 7 day minimum, 10 day maximum

Tourist excursion fares to Mexico City
Travel—Mon-Thurs. 7 day minimum, 30 day maximum

ITX fares to Mexico City
Travel—Mon-Thurs. to Mex., return Tues-Fri. from Mex. 5 day minimum, 21 day maximum Not avail. 12/15/74-1/10/75

Tourist excursion fare to Mex. City 7 day minimum, 21 day maximum

Tourist excursion fares to Curaçao
Travel—Tues-Fri. 3 day minimum, 21 day maximum



EASTERN THE WINGS OF MAN

"THE WINGS OF MAN" IS A REGISTERED SERVICE MARK OF EASTERN AIR LINES, INC.

Vacation in Georgia's Golden Isles. Where you can do nothing. Or everything.

Georgia's coastline has moss-draped resorts, campgrounds, state parks, and some of the cleanest beaches on the Atlantic. It's the perfect place to disappear for a week or two. And do nothing.

But if you're ready for a challenge, you'll meet it here. Fresh and salt water fishing. Great oceanside golfing. Swimming, tennis, and boating.

You'll discover unique attractions, like Millionaire's Village, once the exclusive playground of the elite. Drop in for the day. Visit Christ Church, founded in 1736 by John and Charles Wesley. Inspect an eighteenth century British fort. Photograph marine and wildlife in their natural surroundings, Georgia's unspoiled marshlands.

The Golden Isles—Sea Island, St. Simons, and Jekyll Island, near Brunswick—have something special to offer every visitor. Year 'round golfing under majestic live oaks. Quiet hours on uncrowded beaches. Family fun. So even if you come to Georgia to do nothing, you'll be tempted to do everything.

Georgia

FOR A GOOD TIME. OR A LIFETIME.

Georgia Department of Community Development
Tourist Division, Dept. NG-51, Box [illegible]
Atlanta, Georgia 30334

Please send me more information on family vacations in Georgia and the Golden Isles.

Name

Address

City State Zip

How to conserve gasoline

Gasoline and petroleum products are more expensive today than they used to be. So it may be helpful for you to review how to use gasoline more efficiently and more economically.

A check list of gasoline and money saving tips for you.

Engine Maintenance

- ☐ Engine tuned*
- ☐ PCV valve checked*
- ☐ Change motor oil and oil filter regularly*
- ☐ Replace air filter regularly*
- ☐ Check battery water level
- ☐ Check ignition wiring—clean it, apply moisture-proofing spray

*(See recommendations in your Owner's Manual)

Tires & Brakes

- ☐ Check for proper inflation. Do regularly
- ☐ Check wheel alignment
- ☐ If new tires needed, buy radials
- ☐ Check brake system

Driving Procedures

- ☐ Accelerate slowly . . . no fast starts
- ☐ Drive with steady gas feed to the engine. Minimize "speed up - slow down"
- ☐ Drive at 35-40 mph where permissible for maximum mileage and economy
- ☐ "Drive ahead" — anticipate traffic lights and traffic. Minimize braking and then accelerating
- ☐ Shift to high gear as soon as possible
- ☐ Avoid prolonged engine warm-up at idle . . . it isn't necessary

Car Usage

- ☐ Is this trip really necessary?
- ☐ Can you combine with someone else?
- ☐ Carpool?
- ☐ Can you use the bus or train instead?

Other

- ☐ Empty the car trunk of weighty items
- ☐ Use the proper octane gasoline for your car. Higher than needed octane is just a money waste
- ☐ Avoid using the air conditioner

For more information, write us!

Booklet

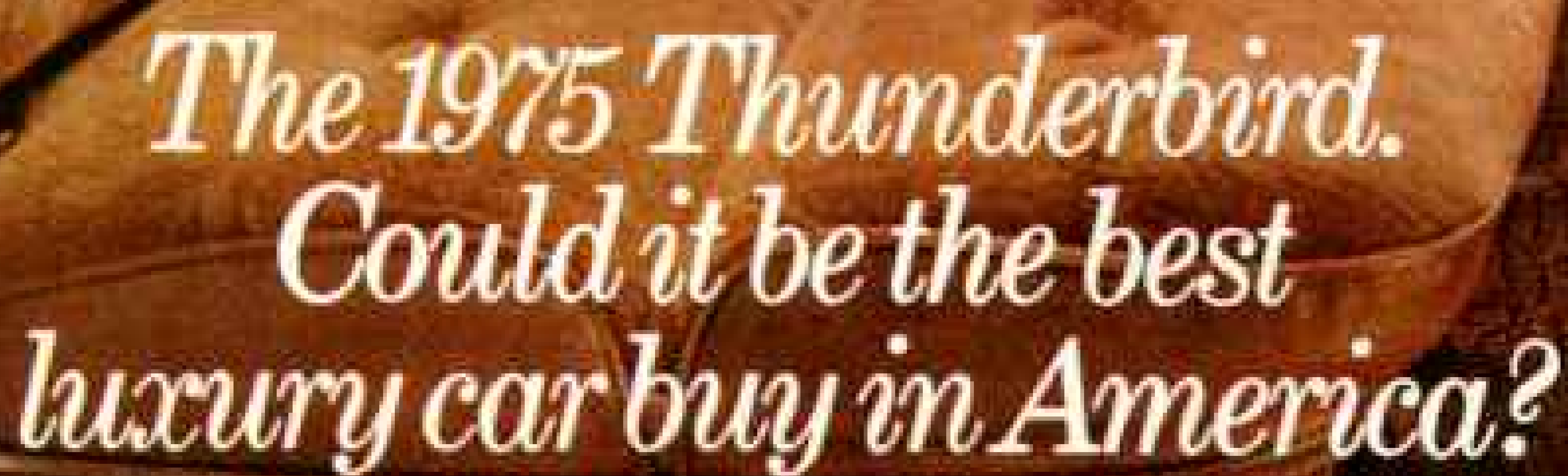
To help you in both the use of your car and in its maintenance, we have prepared a convenient 12 page booklet "Car Care Today — Driving for Economy."

Mileage Calculator

To help you calculate your gas mileage, we will send you a simple-to-use calculator. It will help you divide the miles driven by the gallons used and give you your miles per gallon. For your free copy of either the booklet or the mileage calculator, write to:

Gulf Consumer Information
P.O. Box 1403-S
Houston, Texas
77001

GULF OIL CORPORATION



Decide for yourself. Besides the very specialness of Thunderbird itself, and the superb feel of Thunderbird's ride, there's more to consider. All those lavish extras that come standard: Air conditioning. An AM/FM multiplex radio. Opera windows. Steel-belted whitewall radial ply tires. Deluxe bumper group and cornering lights. Choose the optional Moonroof, and you can have it in silver or gold color. Be sure to see the two new 20th Anniversary Thunderbird Editions for 1975. They're in Silver and Copper.

The closer you look, the better we look.

Shown: 1975 Thunderbird with optional Copper Luxury Group, and convenience group.

THUNDERBIRD

FORD DIVISION

Every few weeks, there's a little something new at your Post Office.

Bicentennial

Chautauqua Centennial

At least sixteen times this year, something special will happen at your Post Office. A special stamp.

A recent one celebrated Kentucky's First Settlement.

In 1774, Kentucky was no-man's-land. King George III forbade anyone to settle there. And the Indians not only fought and forced each other off the land, they forced everyone else off too. Including Daniel Boone. But a group led by James Harrod formed Kentucky's First Settlement in what is now called Harrodsburg.

This stamp gives you a small picture of the exciting story that lies behind every stamp. And there are more terrific stamps: one on The Legend of Sleepy Hollow, and a beautiful Currier & Ives Christmas Masterpiece.

At the Post Office we issue special commemoratives like these every few weeks. And they make a great American collection. But since each stamp is a limited edition, none will be available for very long.

So stop by your Post Office often. It's the place to discover the fun of stamp collecting.

Stamp Collecting. For the fun of it.

Your Postal Service®

Copyright 1974, U.S. Postal Service

D. W. Griffith

If this seems like only yesterday, imagine how soon tomorrow will be here.

If you're wondering where the years went since the '58 Prom, we can't help you. But if you're wondering where they're likely to go from here, we can.

Sometime very soon—probably while you're busy trying to cope with the present—your children will grow up.

They won't give notice; you'll simply wake up and find yourself the parent of undergraduates, instead of grade schoolers.

Which is why we'd like to remind you that the future is no time to plan for the future. You have to do it while you're young. And that's the best reason for seeing a Metropolitan Life representative now.

At Metropolitan, we're helping over 40 million people secure their financial future. And what we do for them, we can do for you.

Of course, nobody can tell you exactly what will happen in the future. But whatever does, it's nice to know you and your family will be ready for it.

You can look at the old country with a fresh point of view. All you need is a camera that responds to the mood of the moment.

You're comfortable with a Minolta SR-T from the moment you pick it up.

This is the 35mm reflex camera that lets you concentrate on the picture, because the viewfinder shows all the information needed for correct exposure and focusing. You never have to look away from the finder to adjust a Minolta SR-T, so you're ready to catch the one photograph that could never be taken again.

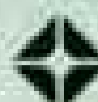
And when subjects call for a different perspective, Minolta SR-T cameras accept a complete system of interchangeable lenses, from "fisheye" wide angle to super-telephoto.

Try putting tradition on film with a Minolta SR-T 35mm reflex camera. For more information, see your photo dealer or write Minolta Corporation, 101 Williams Dr., Ramsey, N.J. 07446. In Canada: Anglophoto Ltd., P.Q.

Minolta SR-T 100/Minolta SR-T 101/Minolta SR-T 102

Minolta helps you visit the old country.

Is your camera a means of self-expression? If so, enter the Minolta Creative Photography Contest. Grand Prize: two weeks in the south Pacific islands for two, $1000 cash, and a Minolta SR-T 102. 1428 other valuable prizes will be awarded. Nothing to buy. Minolta equipment not required. See your Minolta dealer for details and registration. Or write: Minolta Creative Photography Contest, Box 1831, Blair, Neb. 68009.



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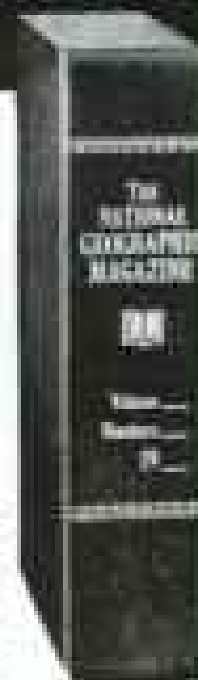

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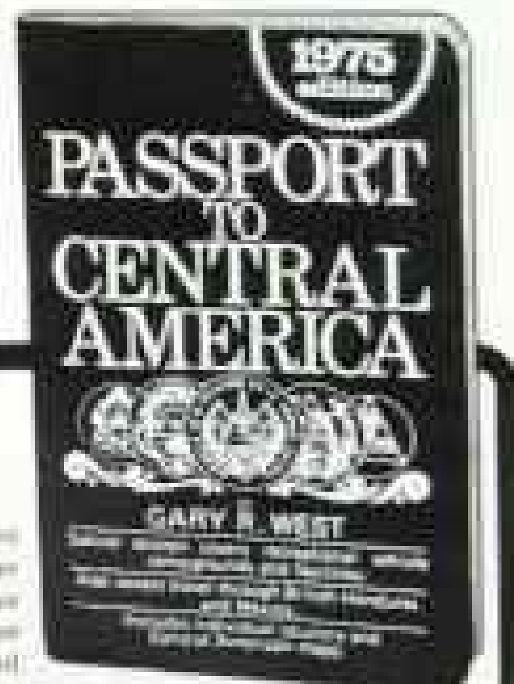

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"Pandamonium" reigns in the Nation's Capital. Hsing-Hsing, shown nibbling a stalk of bamboo, and his look-alike, Ling-Ling, are packing them in at the Washington Zoo. First giant pandas seen in America in 20 years, they came as ambassadors of goodwill from the People's Republic of China. In return, the United States sent two musk-oxen—Milton and Matilda—to Peking. Rare as moon rocks, pandas in captivity number fewer than 20, most of them in China. It is hoped that the Washington pair will increase the number when they reach maturity in 1976. Now two-year-plus juveniles, they frolic and fatten in separate quarters, eyeing each other through mesh fencing. To meet these and other exotic creatures, readers regularly turn to the pages of NATIONAL GEOGRAPHIC.

There's a new kind of Arizona prospector, searching for a new kind of gold...aluminum.

The people in Arizona have discovered that if all that glitters isn't gold, what's left can still be pretty valuable. Like aluminum. In 1973, over 94 million cans, or about 36 percent of those used, were collected and recycled in Arizona.

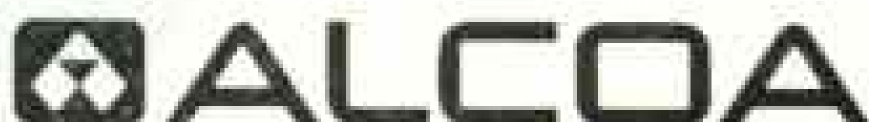
That comes out to 47 beer or soft drink cans for every man, woman and child in the state. Which means that Arizona's aluminum can prospectors have received a nice chunk of the estimated 15 million dollars paid to the nation's collectors since 1970.

There's not another beverage packaging material quite like aluminum. It's lightweight, chills quickly, keeps things fresh, opens easily, has high scrap value and can be recycled repeatedly.

The collection and recycling of aluminum cans is working. More than 1.6 billion were collected last year and the number is growing. Soon, new methods now under development will make possible the collection of even greater numbers. Ultimately, we can expect that improved technology will make it possible to recycle most municipal solid waste, and the high value of aluminum scrap will help make it economically attractive to do so.

For more information on Alcoa's "Yes We Can" recycling program and a list of collection centers, write to us—
Aluminum Company of America,
343-L Alcoa Building,
Pittsburgh, PA 15219.

The reasons for using aluminum are found in aluminum itself.



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Right: Opal Locket $27.50 Opal Necklace $80 and matched Earrings $45 Forget-me-not Earrings $30 and $25* Necklace $25 Racquet Brooch $22.50
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