VOL. 151, NO. 2 FEBRUARY 1977

NATIONAL GEOGRAPHIC

THE WORD "HARLEM" calls to mind images of crowded tenements, frigid in winter, stifling in summer, of teeming streets, drug trafficking, crime, and unemployment. Yet, as in all human communities, there are other realities present, those apparent to as gifted an author as Frank Hercules, a Harlem resident for more than 30 years and a man who sings in the purest tones about his home and its people.

His is a message of spiritual grit, of raising a shield of hope and humor against besetting odds. He obviously cares and sympathizes with the plight of those he knows so well. As he understands Harlem, so he understands that even in extremity a man or a woman might believe that "the sun's going to shine in my back door someday."

At a time when cynicism is the fashionable mode of much of journalism, when the subject of an inquiry is apt to become a target instead, it is easy to forget that the non-cynical is also a valid approach to an assignment. Writers, poets, and artists in the past have brought the good news of the human spirit out of the bad news of deplorable circumstance. I trust they will continue to do so despite the vagaries of journalistic fashion.

And that, it seems to me, serves only to increase our obligation to build a society that strives to eliminate poverty and blight from all our cities. Such hope as Mr. Hercules finds in Harlem should eventually lead to fulfillment, and that is one of the central challenges to modern democracy. Liberals and conservatives may argue whether economic management or the free market is the best device to realize this goal, but the voices of the artists on the scene are a constant reminder of the need to improve the quality of life throughout America.

LeRoy Woodson's photographs, in sympathy with Frank Hercules's narrative, show Harlem to be a community that holds many surprises for those accustomed to the stereotype. It is a distinctly American place with traditions all its own. Wearing the tattered garments of neglect, its buildings reflecting equally gutted lives, it also includes those who strive, who imagine, who dream and create—and sometimes, those who succeed.

Mr. Hercules himself is evidence of that.

Gilbert M. Grosvenor

NATIONAL GEOGRAPHIC

THE NATIONAL GEOGRAPHIC MAGAZINE, VOL. 151, NO. 2

February 1977

COVER: *Drifting bravely eastward above the Gulf of St. Lawrence,* Silver Fox *starts her transatlantic attempt (pages 208-217). Photograph by Otis Imboden.*

Audubon "On the Wing"

By DAVID JEFFERY

Photographs by BATES LITTLEHALES

BOTH NATIONAL GEOGRAPHIC STAFF

COSMOPOLITAN New Orleans took no notice of the ragged American woodsman with the French accent who stood on its levee one January day in 1821. Though an accomplished dancer, flute and violin player, fencer, marksman, and artist, for all the world he was a 35-year-old failure—recently jailed for debt, near despair.

"Nothing but the astonishing desire I have of Compleating my work Keeps My Spirits at par," he had jotted the day before. Brave words, but how could he realize his ambition of painting the birds of America in their natural surroundings, much less reproduce each at life-size, whether hummingbird or eagle? Who would engrave and publish such a work?

Destitute, he turned from the city and descended the levee to the only bed he could afford, the rough planking of the Mississippi riverboat he had arrived on.

PRIVATE COLLECTION

JOHN JAMES AUDUBON

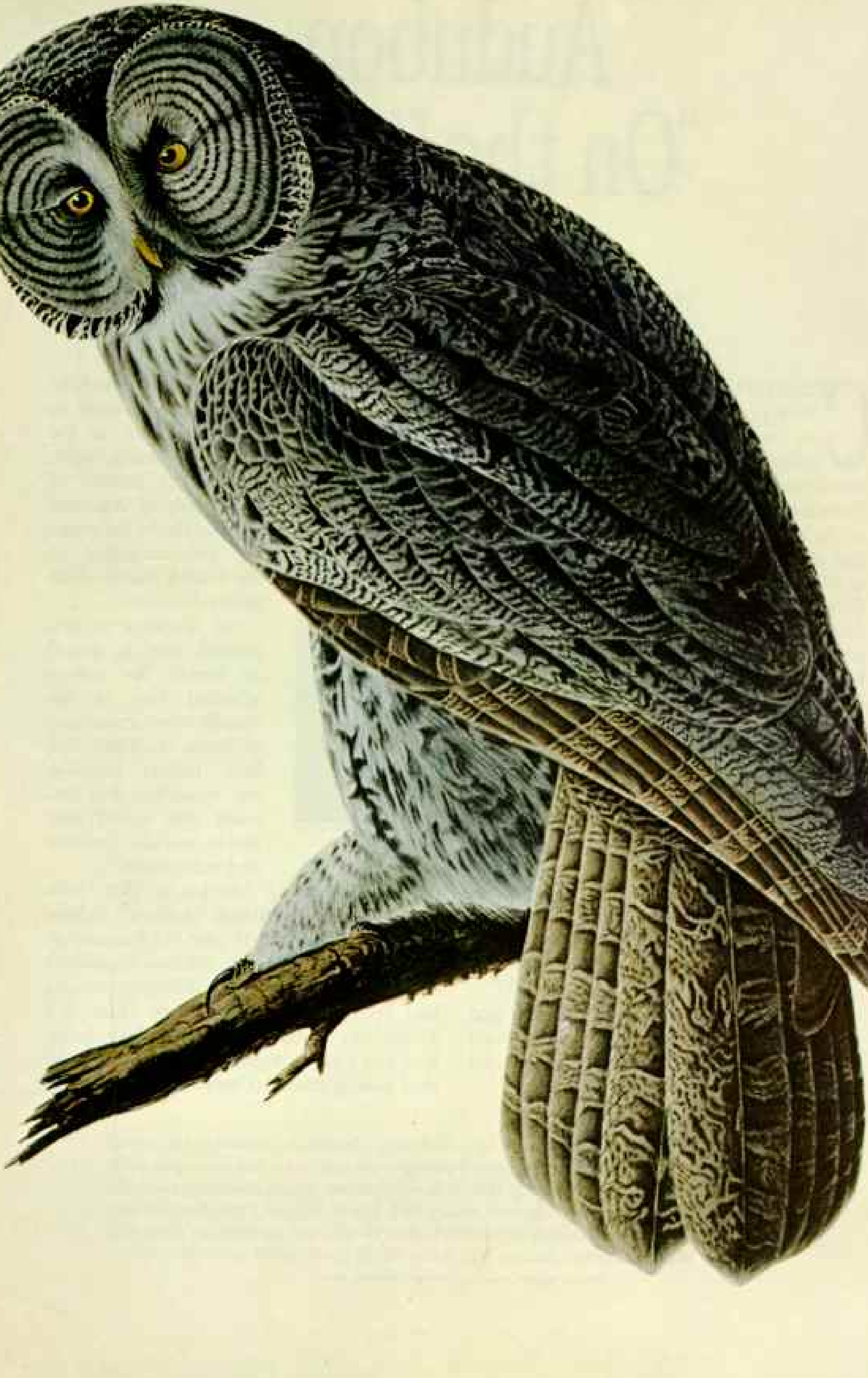
Yet in only 15 years he would be celebrated on two continents as the eminent ornithologist, the master painter of *The Birds of America*, without doubt the greatest artist-naturalist of the United States—John James Audubon.

No academy of arts trained him in pencil or brush. No college schooled him in the classification or anatomy of birds. Audubon had little formal learning, less discipline, but two traits that would help him to prevail—curiosity and enthusiasm.

He had come to America in 1803 "with intense and indescribable pleasure." Behind him in Brittany the 18-year-old Frenchman left the threat of conscription into Napoleon's armies and the stigma of his illegitimacy. He had been born in what is now Haiti to a French sea captain and planter, Jean Audubon, and a young woman, "Mlle. Rabin," who died shortly after. *(Continued on page 155)*

"My friends solemnly regarded me as a madman," Audubon confided to his journal in 1823, about the time he painted his self-portrait—an ambitious, unknown naturalist (**above**). Only he and his wife, Lucy, then believed that "my genius should prevail." His desire to publish *The Birds of America* finally took him to Britain. From there he sent long letters to Lucy, economizing by writing both vertically and horizontally (**left**), at a time when his meager income had yet to match his fledgling celebrity.

AUDUBON MEMORIAL MUSEUM, HENDERSON, KENTUCKY (LEFT)



"RAISE the bird about 4 inches . . . higher than in the Drawing, and put in a landscape below of Wild Mountains." Despite Audubon's instructions, Robert Havell, Jr., his chief engraver, merely added some sky and clouds when he copied Audubon's original (**left**) of the great gray owl. The collaboration of artist and engraver lasted 11 years through four volumes of 435 pages, each 39½ by 29½ inches—the total comprising the double elephant folio, *The Birds of America*.

"I saw these warriors descend like a streak of lightning," Audubon wrote of the gyrfalcon. He devoted two full plates to the northern raptor, here shown as two females in the white color phase. [Except as noted, reproductions in this article are of Audubon's original paintings.]

©2015 NEW-YORK HISTORICAL SOCIETY

SEVEN Carolina parakeets perched in a cocklebur (**left**) reveal the elegant design of Audubon's best works. In his *Ornithological Biography*, a five-volume companion to the folio, he wrote: "Parakeets are destroyed in great numbers. . . . ten, or even twenty, are killed at every discharge." Hunted for their plumage, all were dead by 1918.

Demonstrating another Audubon talent —the creation of a dramatic scene—peregrine falcons feast on ducks (**below**).

Drama and design come together in one of his most famous, and controversial, plates—mockingbirds defending a nest against a rattler (**right**). Claiming that rattlesnakes do not climb trees, Audubon's enemies attacked him. As it turns out, rattlesnakes can climb —but rarely do.

ALL NEW-YORK HISTORICAL SOCIETY

(Continued from page 149) What he could not leave behind were the ingrained habits of childhood and a character formed by the soft hands of indulgence.

He wrote in fond recollection of Madame Audubon, his father's wife, who treated him as her own son: "My stepmother . . . was devotedly attached to me, far too much so for my own good. . . . completely spoiled me, hid my faults, boasted to every one of my youthful merits, and, worse than all, said frequently in my presence that I was the handsomest boy in France."

Instead of going to school, he'd often make for the fields, returning with birds' eggs and nests, lichens, flowers, "even pebbles gathered along the shore of some rivulet."

Something must be done so that the undisciplined youth might grow, his father hoped, into responsible manhood. Jean Audubon had fought in the American Revolution, sailing in the French fleet of the Comte de Grasse that had bottled up Cornwallis at Yorktown. Obviously taken with the new nation, he had bought Mill Grove, a farm northwest of Philadelphia, and left Miers Fisher, a Quaker who lived nearby, to manage it for him.

Perhaps Fisher might find for the young Audubon "a good and healthy place where he might learn english" with a "good and decent familly." This proved to be Fisher's own, and Audubon was shipped off to America and duly installed in the Fisher home.

To the blithe young Frenchman with flowing locks, fine aquiline nose set between lightning eyes, and high good spirits, the plain Quaker domestic life had little appeal. Miers Fisher "was opposed to music of all descriptions, as well as to dancing, could not bear me to carry a gun, or fishing-rod, and, indeed condemned most of my amusements." Leaving the house of that "kindly, if somewhat strict Quaker," Audubon headed for the farm at Mill Grove and moved in with a tenant family, instructions from his father conveniently put aside. Pleasure before duty.

I MADE MY WAY there by following the swooping hills of Valley Forge to a tree-lined drive flecked by sunlight. Beyond an orchard and under the shoulder of a ridge, the house sits firm and solid. Its native fieldstone was laid in 1762. From the house, a lawn slopes down to a rough meadow. Beyond, a

THE ANNEFER GALLERIES, INC., NEW YORK (LEFT); AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK

AS "AMERICAN WOODSMAN," Audubon (**above**), here painted by his sons, captured the British fancy for romantic figures. His oil painting of game (**left**) suggests that his brush and gun were equal tools, and that he was at once artist, hunter, and ornithologist.

fringe of trees borders placid Perkiomen Creek. No wonder Audubon felt "Mill Grove was ever to me a blessed spot."

The house has been made into a museum. "We now have every major work published by Audubon, in Grade A condition," curator Edward Graham told me.

I walked through intimate, low-ceilinged rooms, but like Graham, who hopes someday his budget will let him establish a nature-study program, I was impatient for the woods where Audubon had spent his halcyon days. "Hunting, fishing, drawing, and music occupied my every moment; cares I knew not and cared naught about them."

A FEW STEPS from the back door I saw a turtle warming itself in bright sun. Farther down the trail, a wood thrush obliged with a virtuosity of song that bordered on vanity, then alighted in plain view to preen. I passed a ghostly hemlock grove and scrambled down a coppery bank to the creek. In a cave somewhere along here Audubon, with his avid curiosity, had tied silver threads to the legs of young phoebes and confirmed their return the following spring—the first birdbanding in the United States.

Carefree as he was, Audubon made two important discoveries while playing the squire at Mill Grove. He had begun to draw birds while still a child in France, "under the impression that it was a finished picture of a bird because it possessed some sort of a head and tail, and two sticks in lieu of legs." He progressed to drawing in the manner of the day that showed birds "*strictly ornithologically*, which means neither more nor less than in stiff, unmeaning profiles."

At Mill Grove he began sketching in the field, then tried to arrange the specimens he shot "in such attitudes as I had sketched. But, alas! they were *dead*."

He tried suspending them with threads. They were better, but not lifelike. He made a model from wood, cork, and wires, which made "a tolerable-looking Dodo. . . . I gave it a kick, broke it to atoms, walked off, and thought again."

One morning he rushed out before breakfast, first to a store to buy wire of various sizes, next to the creek to shoot "the first Kingfisher I met." He pierced and propped the bird's body, head, and tail with wires. And "there stood before me the *real* Kingfisher." He had hit on a method that might lead to great art, but it would come only slowly, painfully, haltingly.

At a nearby farm Audubon made a second important discovery—slim, serious-minded Lucy Bakewell—and he was smitten. Not only had he found a focus for his romantic nature, but he also found in Lucy's father and brothers companions who loved the outdoor life as much as he. There followed an idyll of hunting, collecting, drawing—and courting Lucy. But a quarrel with one of his father's partners in a lead-mine venture—Audubon thought the man was cheating—interrupted the idyll, and the artist returned to France to present his side of the matter. It was to be his last visit home.

Jean Audubon sent his son back to America contracted in a partnership with young Ferdinand Rozier. In temperament and zeal for business, he was everything Audubon was not. After a brief sojourn at Mill Grove and an interlude as clerks, the partners resolved to establish themselves "in the mercantile business" at Louisville, Kentucky.

WHEN THEY STARTED west on the rutted wagon roads of Pennsylvania in the late summer of 1807, less than a year had passed since Lewis and Clark's triumphant return from beyond the far reaches of the Louisiana Purchase, recently acquired by President Jefferson. The frontier began west of the Appalachians. Now, following the tracks of pioneers, settlers were sifting across the mountains. These, the partners hoped, would be their customers.

If Audubon was not yet a man of substance, he was at least a man of some prospects, able to return and convince the skeptical William Bakewell that he and Lucy should be married forthwith. The couple settled into domestic life at a Louisville tavern, the Indian Queen, and their first son, Victor, was born the following year.

Audubon, however, did not settle into the commercial life. "I seldom passed a day without drawing a bird, or noting something respecting its habits, Rozier meantime attending the counter." Yet he was diligent enough to be at the store one fine morning in March 1810. In walked a sharp-eyed man with two volumes under his arm. Alexander Wilson

explained in his Scots accent that he was soliciting subscriptions for his work, which he opened and laid before Audubon—colored plate after colored plate of American birds. Startled, Audubon, on the impulse of the moment, raised his pen to subscribe.

"My dear Audubon," Rozier whispered to the artist in French, "what induces you to subscribe to this work? Your drawings are certainly far better, and again you must know as much of the habits of American birds as this gentleman."

Partly out of vanity, Audubon confessed, he put his pen down, much to Wilson's dismay. For the next several days, Audubon relates, he treated Wilson kindly. "I presented him to my wife and friends. . . . We hunted together, and obtained birds which he had never before seen."

Wilson's account differed sharply. In Louisville "I . . . neither received one act of civility . . . nor one new bird. . . . Science or literature has not one friend in this place."

Whichever version was correct—and the discrepancy would help make Wilson's friends into Audubon's enemies—the meeting had made a lasting impression on Audubon. He now had some standard by which to judge his art—Wilson depicted birds *"strictly ornithologically."* Somewhere in the clock of Audubon's mind, faintly and irregularly, ambition began to tick.

WITH BUSINESS at best indifferent, the partners packed their goods for a 190-mile float to Henderson in western Kentucky. Flatboats, the mass transportation of the frontier, moved families, livestock, and cargo downriver. Price: $75. Guarantees: none. Knocked together from rough-sawn lumber, flatboats were little more than rafts with freeboard, huts serving for cabins.

This design, which Audubon disliked and Rozier detested, hasn't improved in a century and a half. Or so it seemed to me in the summer of 1975, given the example of the *Red Banks Queen*. True, she had gunwale-to-gunwale carpeting, but that polyester nicety served mainly to hide a leak near the stern.

The *Queen* was Henderson's entry in the annual Great Ohio River Flatboat Race. A baker's dozen of flatboats milled about in confusion, some of the craft floating downriver, some being towed up, when the starting flag was waved prematurely. The flotilla, in various states of authenticity and porosity, was off.

We hit our top speed, maybe two or three knots, early and held a loser's place toward the rear of the ramshackle convoy. I took a turn at the steering oar, which had all the grace and balance of a telephone pole with a shingle nailed to the end. To keep steerageway and put the *Queen* on any course at all, I had to scull now and then.

"This is supposed to be a drifting race," Bruce Farmer, a tree trunk of a man, commented in a tone of virtue-is-its-own-reward. But it was screaming back muscles, more than race rules, that kept us pure.

By the time the bloated sun squatted on the river horizon, the flatboats' essential cargo had long been broken out. Had all the beer from the 13 boats been pooled, it probably could have floated one of them. A welcoming committee of mosquitoes met us at French Island, where the boats tied up for an evening of singing and hollering.

DAWN CAME just after sleep, and the boats rafted together downriver in a freshening breeze that repeatedly blew us into willow thickets along the Indiana shore. Disentangled, we resumed, as in his day Rozier had put it, "our slow, tedious and seemingly never ending journey."

The flatboats having abandoned even the pretense of racing, I abandoned ship for Henderson, a river town as placid as the Ohio slipping by in slow summertime. There Audubon and Lucy had a home to themselves, "a log *cabin*, not a log *house;* but as better could not be had, we were pleased."

Then a rough-hewn settlement of fewer than 200, Henderson provided little business —"our profits were enormous, but our sales small." So Audubon "attended to the procuring of game and fish, while Rozier again stood behind the counter."

Rozier grew restive, and the partners took to the Ohio in a December 1810 snowstorm, bound for Ste. Genevieve, up the Mississippi, in what is now Missouri.

River ice slowed and sometimes stopped their progress. Rozier, "wrapped in a blanket, like a squirrel in winter quarters with his tail about his nose . . . slept and dreamed his time away." Dreaming of profits, no doubt, from

the "three hundred barrels of whisky, sundry dry-goods and powder" they were carrying aboard the craft.

For Audubon, delay meant a chance to explore new woods. He hunted swans with a Shawnee Indian party, which shot "more than fifty of these beautiful birds whose skins were intended for the ladies of Europe."

When the ice broke on the Mississippi, the pair gained their destination and the profit so dear to Rozier. The whiskey they had bought for 25 cents a gallon sold for two dollars per. Happy in French-speaking Ste. Genevieve, Rozier determined to stay there, and went on to success as a merchant. Audubon, now American in spirit if not accent, went back to Henderson.

No Rozier now stood behind the counter, but, very often, neither did Audubon. On trips he paid more attention to nature than to business. He experienced an earthquake and tornado; foiled an assault by frontier thugs; saw bear-baiting for sport; watched passenger pigeons being blasted out of the air to feed foraging hogs; witnessed the (probably exaggerated) wonders of Kentucky marksmanship. According to Audubon, he learned from the aged Daniel Boone the trick of "barking off squirrels"—killing them cleanly by the concussion of a deliberate near-miss.

THE YEARS DRIFTED BY, and Audubon became a citizen. He named an eagle the "Bird of Washington" out of a sense of gratitude, and insisted it was a new species rather than what it probably was, an immature bald eagle.

Since simple trade and shopkeeping could not support Audubon's nature study, perhaps something grander might. He entered into a partnership to build by the river in Henderson a novel steam-powered combination timber and grist mill.

"Well," he wrote, "up went the steam-mill at an enormous expense, in a country as unfit for such a thing as it would be now for me to attempt to settle in the moon." With too few customers, the balky mill ground the investors' capital into nothing.

Audubon wasted more time and money by going all the way to New Orleans in a futile attempt to repossess a small steamboat on which he held the unpaid note.

The English poet John Keats, outraged brother of an investor in that bad debt, wrote in astonished prose: "I cannot help thinking Mr. Audubon a dishonest man—Why did he make you believe he was a Man of Property? How is it his circumstances have altered so suddenly?" Keats's own Grecian urn advised, "Beauty is truth, truth beauty." Audubon's truth was not the failed mill or phantom steamboat but his growing portfolios of bird drawings, a beauty John Keats never saw.

George Keats lost some money; Audubon lost all his. Jailed briefly for debt, he was forced into bankruptcy and a new beginning. After a stint as taxidermist at a museum in Cincinnati, where Lucy took a teaching position to help support a family that now included another son, John, Audubon resolved to make his way by his art.

"Without any Money My Talents are to be My Support and My enthusiasm my Guide in My Dificulties," he wrote on October 12, 1820. Audubon had begun to keep a journal, as free in spelling and syntax as his spirits. With 13-year-old Joseph Mason for an apprentice, Audubon again boarded a flatboat, leaving Lucy and their boys in Cincinnati.

ALMOST ALONE, Lucy would need to be mother and father, teacher and breadwinner. She had the character for that and more—to remain his foremost supporter when others took him for an improvident dreamer and fool. Of Lucy, Audubon biographer Francis Hobart Herrick wrote: "Without her zeal and self-sacrificing devotion the world would never have heard of Audubon. His budding talents eventually would have been smothered in some backwoods of the Middle West or South."

And so it seemed as Audubon drifted away from Cincinnati. As usual he shot birds, dissected and drew them. And he used them further: "the Grebes were cooked and eat but extremely Fishy rancid and fat." His first hermit thrush "was very fat and delicate eating." On October 17, the fare was somewhat more substantial: "4 Turkeys I killed 2 at one shot."

By early November, Audubon had reached the site of his earlier misfortune. "We left our harbour at day Break and passed Henderson about sun raise, I Looked on the Mill perhaps for the Last Time, and with thoughts that made my *(Continued on page 165)*

"I have a rival in every bird," wrote Lucy Bakewell Audubon (**right**), a fair assessment of her life with the wandering naturalist. Twelve years after Audubon's death, when short of funds, she sold the more than 400 bird originals to the New-York Historical Society for $4,000—an amount some individual Audubon prints now command. Lucy resumed teaching at age 70 and died at 86.

AUDUBON MEMORIAL MUSEUM (ABOVE AND RIGHT)

QUARTER AND TYLER FAMILIES

As a novice in oils, Audubon painted his sons, John (**above**) and Victor (**right**), in 1822. He hoped mastering the technique would bring portrait commissions to help finance his grand project—the folio. Yet even as it was being engraved, he wrote: "I do anything for money now a days—I positively . . . made 22 Pounds 10 Shillings by drawing trifles in a Scotch Lady's album."

As young men, both sons joined what had become, in effect, the family firm—John as assistant artist, Victor as business agent. For all their labors, the Audubon family knew only brief periods of financial ease, and both brothers died long before their mother.

SHAMMING an attack, two chuck-will's-widows hiss at a coral snake (**facing page**). Thinking the snake to be "quite harmless," Audubon wrote that "Children are fond of catching it," an amusement that could have killed them; this snake's venom is highly toxic. Given the immensity of Audubon's work, it is remarkable that he made so few errors.

Rare giant, the California condor (**left**) was drawn from skins. The largest birds posed problems of composition, since Audubon drew each for reproduction at life-size.

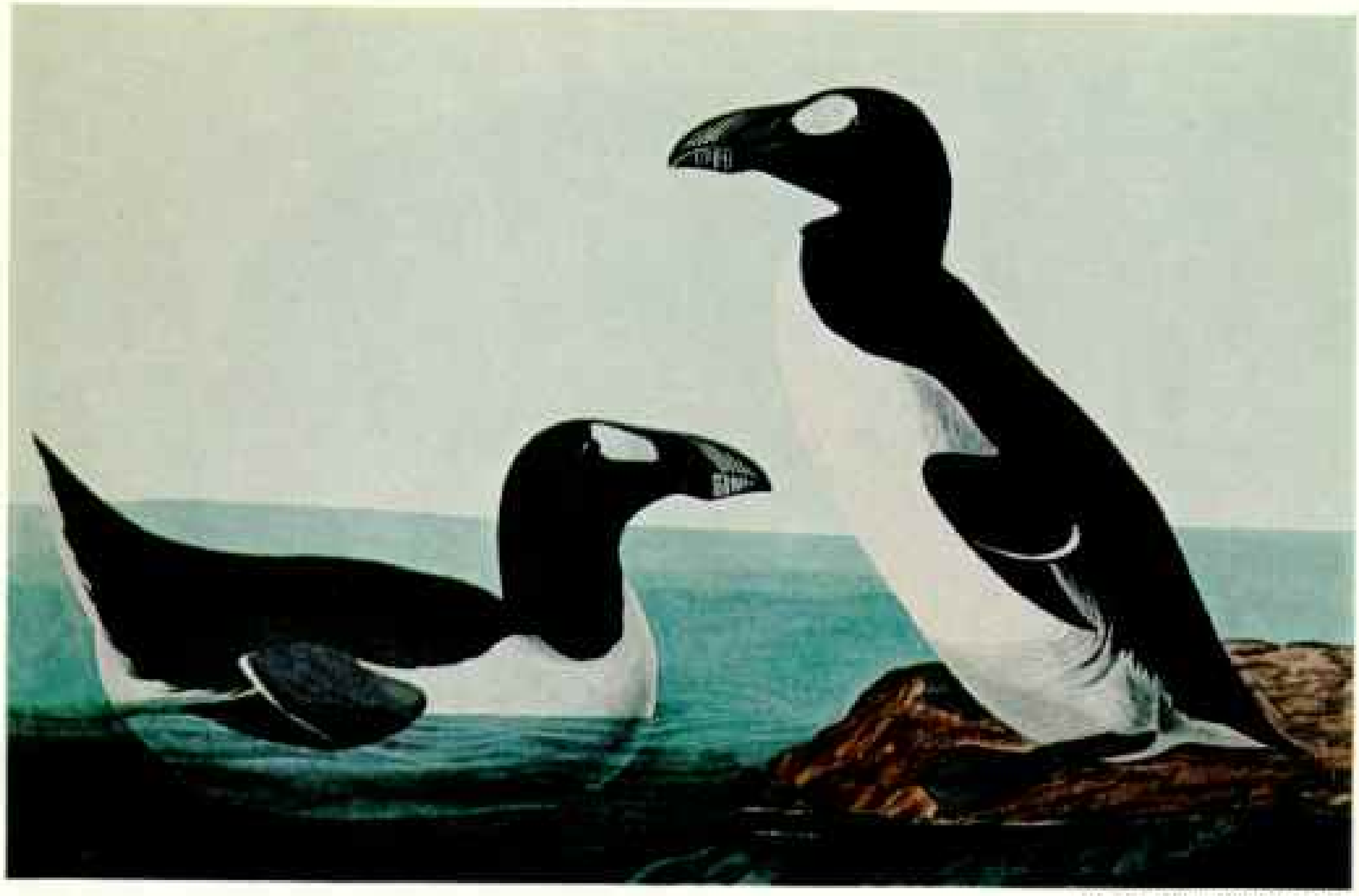
To the last whisker, every detail of a Canada lynx (**below**) conveys the coiled energy of a predator with prey in sight. On completion of his birds, Audubon undertook paintings of the quadrupeds of North America, a project completed by his sons.

NEW-YORK HISTORICAL SOCIETY (LEFT AND TOP); AMERICAN MUSEUM OF NATURAL HISTORY

"GREAT CHIEFTAIN of the Woodpecker tribe," the ivorybill (**left**) was a familiar sight in the early 1800's. Roaming virgin forests, it could not withstand the encroachment of man and may now be extinct. A stain like dried blood streaks from the head of a female. This accidental symbol agrees with the naturalist's account of the birds' being shot for their decorative bills and a market that paid "a quarter of a dollar for two or three heads."

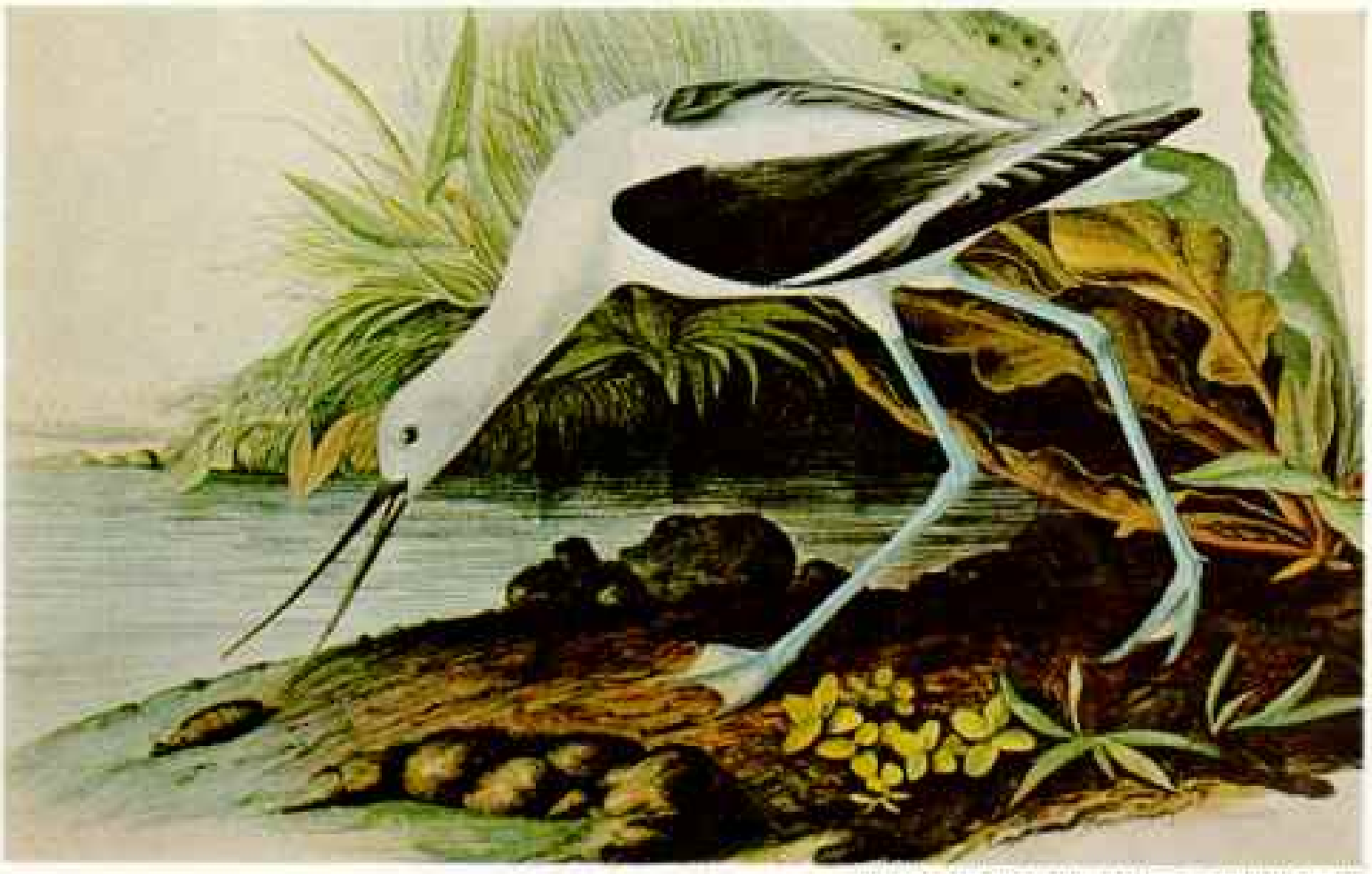
"The air was literally filled . . . the light of noon-day was obscured as by an eclipse," as passenger pigeons (**right**) passed overhead a billion strong in 1813. A century later, shot for market, they were extinct.

Already scarce by the time Audubon traveled to the Gulf of St. Lawrence, the great auk (**below**) became extinct in his lifetime. Of other far-northern birds he wrote in 1833: "In less than half a century these wonderful nurseries will be entirely destroyed, unless some kind government will interfere to stop the shameful destruction."



ALL NEW-YORK HISTORICAL SOCIETY

WHICH is the real Audubon? The artist's original of the American avocet in its habitat (**below**) and Robert Havell's hand-colored aquatint print (**above**) are both "real." With Audubon's consent, Havell made a few changes—rosy summer plumage, another avocet in the background, and a bug instead of a slug as the large avocet's prey. Yet, fidelity to the spirit of the original remains.



LIBRARY OF CONGRESS (TOP); NEW-YORK HISTORICAL SOCIETY

(Continued from page 158) Blood almost Cold bid it an eternal farewell."

Nor did nature and the constant collecting of birds always sustain Audubon's spirits. "Drawing nearly all day I finished the Carion Crow, it stunk so intolerably, and Looked so disgusting that I was very glad when I through it over Board."

WEEKS LATER they reached Natchez, where, "having Not one Cent when I Landed . . . I imediatly Looked for something to do . . . for our Support (unfortunately Naturalists are Obliged to eat and have some sort of Garb)." He sold a sketch for $5, "fine sauce for our empty stomacks."

Such a life as his and young Mason's, Audubon reflected, toughens the constitution "to Sleep with Wet Muddy Clothing on a Buffalo skin stretch on a Board—to hunt through Woods filled with fallen trees, Entengeled with Vines. . . . I Would advise . . . our Eastern Dandys to try the experiment."

Shortly after leaving Natchez, Audubon discovered that one portfolio of drawings had been left ashore. Despairing, he wrote in his journal: "no Hopes can I have of ever seeing it when Lost amongst 150 or 160 flat Boats and Houses filled with the Lowest of Caracters—No doubt My Drawings will serve to ornement their Parlours or will be Nailed on Some of The Steering Oars."

What then of his already stated intention to "Compleat a collection of drawings of the *Birds* of our Country, from *Nature*, all of Natural Size . . ."? When Audubon stood on that levee at New Orleans in January 1821, his future as both businessman and bird artist seemed behind him. Then his pocketbook was stolen. He lost no money, for he had none, but his letters of introduction, including one from Henry Clay, were gone. A few portrait commissions kept Audubon and Mason alive, eating ham chunks but drawing the line at maggoty cheese.

One morning shortly after his arrival in graceful, vain, and flourishing New Orleans, Audubon was approached on the street by a heavily veiled "femelle of a fine form." Was he, she asked, the one who drew remarkable likenesses in black chalk? Then he was to come to her apartment in 30 minutes.

Once there, she double-bolted the door behind him and threw back her veil, revealing an exquisite face. "Set down and be easy," she said. "I will not hurt you."

Blushing, Audubon accepted a cordial. "I drank it for I needed it."

What was his price for a portrait? Usually $25. Would he keep her name and address a secret? He would.

"Have you ever Drawn a full figure?" Yes, he had.

"Naked?"

Flustered, Audubon agreed to attempt it but found he "could not well reconcile all the feelings that were necessary to draw well, without mingling with them some of a very different Nature."

Nevertheless, through sittings conducted with awkward decorum, he completed the portrait of this enigmatic beauty—Madame André, as she called herself—and was paid with an engraved shotgun worth $125.

Less mysterious women sat as his subjects for portraits or engaged his services as their teacher of drawing or music. To keep such patronage, the handsome artist was often forced to appeal to vanity: "And here," he wrote in a journal entry intended for his sons, "I will give you a Lesson, should you ever be Employed as a Teacher to any ostantatious oppolent person—*flatter*, Keep flattering and end in flattery or else expect No pay."

But commissions and lessons slacked off—only the return of the lost portfolio, found in Natchez, relieved the gloom. Audubon was happy to take a position upriver near St. Francisville as tutor to Eliza Pirrie, daughter to the Pirries of Oakley plantation.

After the table-flat country around New Orleans, the rolling hills of West Feliciana Parish, veined with watercourses and spread with environments as varied as swamps and piney woods, were a paradise to Audubon.

AT OAKLEY he was obliged to spend only half of each day tutoring. From June to October 1821, he worked furiously, filling his journal with bird observations. Even the Louisiana summer did not slow his pace: "My Drawing I Hope Will give you a good Idea of a Rattle Snake although the Heat of the weather Would not permit me to Spend More than 16 hours at it."

Whatever his failings, lack of energy was not among them. I confirmed that by investigating some of Audubon's old haunts near

Oakley. Just before an August sunrise I trudged along the sandy shore of Thompson Creek. Opposite, a small herd of cattle bellowed its way through scrubwoods as the red sun cleared the treetops. By eight the heat and humidity suffocated like troubled dreams of a fitful sleep. To be was to sweat; to walk was to become a moving watershed, rivulets running into my eyes.

Tangled woods never looked so good. Shade! But apologies here to a warbler, there to a chickadee for rousting them from their perches. And breaking out to the edge of a swamp, I-beg-your-pardons to great blue herons for sending them lumbering into the hazy caldron of sky.

The best refuge, I found, lay tucked along the bottoms of waterless creeks. An overstory of trees gave shade where spiders the size of a baby's hand performed high-web acts across enormous spans.

Audubon apologized for working only sixteen hours in such heat. I make none for eight.

FOR A BETTER SENSE of this countryside where Audubon had been so prolific in both observing and drawing, I went to see Murrell Butler. On his place near St. Francisville wild turkeys roam free—the bird Audubon chose to decorate his motto: "America, my country." Butler himself is distantly related to the Bakewells, Lucy Audubon's family, and owns a cabinet of birds reportedly stuffed and mounted by Audubon's assistant Joseph Mason. Butler has even worked at Oakley. "Working there really stimulated my interest, as it would anybody's. It was something that would have to rub off on you." Rub off it did, for Butler has become a wildlife artist. When I arrived at his house, he was just finishing a canvas of great horned owls feeding on a rabbit.

Butler offered to take me to Bayou Sara, where Audubon had collected specimens. From a road bridge we half walked, half waded through water not tepid, not warm, but hot. Accompanied by a little blue heron that kept ahead of us, we talked of the country he has known since childhood, its plants and trees, its wildlife, "still almost as it was in Audubon's time."

As afternoon began to throw longer shadows, we headed back, sometimes barefoot along the banks, avoiding briers where we could, sometimes straight upstream. And Butler was right: Beneath the quicksand in the streambed there was solid ground. I went up to my hip, and I felt it.

During his few months at Oakley, Audubon drew and painted more and better than ever, while Mason created floral compositions for backgrounds that perfectly complemented the birds. Yet as Audubon's art progressed, his relations with the Pirries deteriorated. Despite his charm, a tactless, stubborn streak had a way of surfacing. A misunderstanding grew into a quarrel, with Audubon too proud to compromise or apologize.

"Day Light of Sunday Saw us Loading our Trunks and Drawing Table. Vaulted our Sadles and Left this abode of unfortunate Opulence without a single Sigh of regret."

Wandering, turmoil, and failure filled the next few years. A self-portrait (page 149) shows the face of a man who could scrawl a note to his old partner: "I am yet my Dear Rozier on the Wing & God only knows how Long I May yet remain so. . . . I am now rather Wearied of the World. I have I believe seen too much of it."

In the season of rebirth and migration of 1824, Audubon arrived in Philadelphia in hopes of finding a publisher or patron. He made a friend in Thomas Sully, a great portraitist of the age. But he made an important enemy as well. Alexander Wilson, whose bird plates had so excited the young Audubon years before in Louisville, was dead. Wilson's editor and biographer, George Ord, disliked Audubon from their first meeting. In Philadelphia, Ord led a campaign against Audubon that was to stretch far into the future.

NEW YORK CITY proved friendlier but, distracted by preparations for the triumphal return visit of Lafayette, no more helpful. Audubon wandered on to Niagara Falls, only to have his pocketbook stolen again, then across Lake Erie and south through Pennsylvania, to be mistaken for an itinerant preacher. Finally, he returned to Louisiana. There Lucy had taken a teaching position at Beech Woods, a plantation near Oakley. And there she determined to stay until Audubon succeeded.

One hope remained, however faint—publication in Britain. But how would he pay for his passage? Contrary to his usual habits,

Audubon began methodically to accumulate money by teaching dancing, fencing, and music. Shortly after his 41st birthday, with his savings and some of Lucy's, he boarded the *Delos*, bound for England. With him he took his best work, an impressive collection, yet far short of what was needed to publish all the birds of America.

Bad luck and poor judgment, as well as a quick temper, had frustrated Audubon again and again. Now increasingly able to control his personal feelings, he saw his luck change for the better in Liverpool, where he staged an exhibit at the Royal Institution. People came, people flocked—people paid!—to see his birds. He wrote to his son Victor: "I am in miniature in Liverpool what Lafayette was with us. . . . My exhibition attracts the *beau monde* altogether and the Lords of England look at them with wonder."

IN EDINBURGH Audubon showed his work to W. H. Lizars, an eminent engraver who exclaimed, "My God! I never saw anything like this before." Lizars agreed to undertake engraving, printing, and hand coloring *The Birds of America* on pages each measuring 39½ by 29½ inches—the double elephant folio.

Not that Audubon could merely turn the job over to Lizars and wait for money and fame to roll in. He had to correct, alter, and add to the paintings from which the aquatint engravings were to be made. He had to monitor the printing and tedious coloring for fidelity. And he had to cultivate contacts and solicit subscriptions to the work, which would be issued in 87 installments over a period of years—435 plates for about $1,000, in those days a small fortune.

"The great round of Company I am thrown in," he wrote Lucy, "has become fatiguing to me in the extreme and does not agree with my early habits. I go to dine out at 6, 7 or 8 o'clock in the evening and it is one or two in the morning when the party breaks up then painting all day with my Correspondence that increases daily my Head is like a hornets nest and my body wearied beyond calculation—yet it has to be done."

How different an Audubon from the spoiled young man, the gentleman of leisure at Mill Grove, the inattentive businessman, the itinerant portraitist!

"It was an extraordinary achievement," biographer Alexander B. Adams told me. "When Audubon found his niche, the work he put into it, the care, was astounding. That he could have been irresponsible, unstable, and then could do this—to me that's what is really intriguing about the man."

Sensible that he could merchandise himself as well as his works, in dress and manner Audubon played on the romantic English view of the American frontiersman. He wrote Lucy: "My hairs are now as beautifully long and curly as ever and I assure thee do as much for me as my Talent for Painting."

Audubon persisted in his work, but Lizars' colorists went out on strike. Since time lost was money lost, Audubon contracted with Robert Havell, Jr., a brilliant London engraver, to complete the enormous project.

As Audubon's fame grew wider, his enemies honed their barbs. George Ord, the old adversary from Philadelphia, supplied the eccentric English naturalist Charles Waterton with acid commentary by writing of "this impudent pretender, and his stupid book. His elephant folio plates, so far from deserving the encomiums which are daily lavished upon them, are so vile, that I wonder how anyone, possessing the least taste or knowledge in the fine arts, can endure them."

In another letter Ord complained: "Every page of Audubon's book shows his breeding; he is neither a scholar nor a philosopher."

Precisely. Audubon made no such claims. What his plates showed were not dead birds but wildlife, birds animated in their natural surroundings, not "stiff, unmeaning profiles." His works were not for the pedant.

PASSING YEARS did little to diminish Audubon's energies. He and Lucy were reunited in Louisiana in 1829. He collected and drew, solicited new subscribers and pacified old ones. His expeditions, ranging from Florida to the Labrador peninsula, brought new specimens. Settling in New York City in 1839, he launched a smaller edition of *The Birds of America* and began on the quadrupeds of North America, traveling the Missouri River to collect animals. This work was completed by his sons and the Reverend John Bachman of Charleston, South Carolina, who gave two daughters in marriage to Audubon's sons.

Early in 1845, around his 60th birthday, Audubon paid a call on a delinquent subscriber—the American Philosophical Society, in the person of George Ord. Somewhat mellowed, Ord wrote of that meeting:

"Mr. Audubon made known to me his intention of going on with his projected publication, the history of the Quadrupeds of America. . . . But you can do nothing with an enthusiast, to whom everything appears *couleur de rose*. The old gentleman . . . appears, from his robust frame and agile step, to be yet capable of enduring fatigue. The industry he displayed in prosecuting to completion his great work is certainly worthy of all praise . . . but what will be the decision of posterity on the merits of one who has wantonly violated the dignity of truth."

As for posterity—a set of the double elephant folio, one of fewer than 200 ever completed, was recently auctioned for more than $200,000. Kenneth Newman, president of The Old Print Shop in New York City, took me up a narrow staircase and through a fire door. There dazzled the whole flock of *The Birds of America*, a set he had acquired and broken up for sale. The art market being prone to violent fluctuations, Newman declined to quote exact prices. But for one Audubon print in fine condition, a buyer should be prepared to pay from several hundred to several thousand dollars.

A BRIGHT Connecticut afternoon: Two of us walked single file down a path leading from an elaborate two-story studio that overlooks a pond circled with wild flowers. Ahead of me, the man in his 60's with straw-white hair and light-blue eyes said, without breaking stride or looking up:

"Broad-winged hawk."

Then he pointed. I saw it against a white cloud in a rainwashed sky and heard the faint *kree, kree* by which my host had identified it.

Roger Tory Peterson told me: "Audubon was the great one who pulled birds out of the glass case; he showed living birds." Peterson's own accomplishments invite comparison. With a list of honorary degrees and awards longer than the list of birds I have seen in my lifetime, Peterson is perhaps best known for *A Field Guide to the Birds*, first published in 1934, which made on-the-spot identification possible for millions of amateur enthusiasts. They know his respected guide simply as "the bible," though they may not know his large and beautifully lifelike paintings.

"Many artists like myself have been called 'modern Audubons.' We tire of that comparison, although we may indeed be influenced by his work.

"Was he greater as an artist or an ornithologist? I think the contribution is equal."

THANKS TO the National Audubon Society and the many local societies, Audubon's name has become synonymous with protection of wildlife, especially birds. But, as Peterson points out:

"In those days Audubon wasn't concerned with conservation. In fact, he shot birds like mad. His contribution is not conservation. His contribution is awareness, which he more than anyone else seems to symbolize."

If awareness comes before all else, and Audubon's contribution is awareness, that in itself is enough.

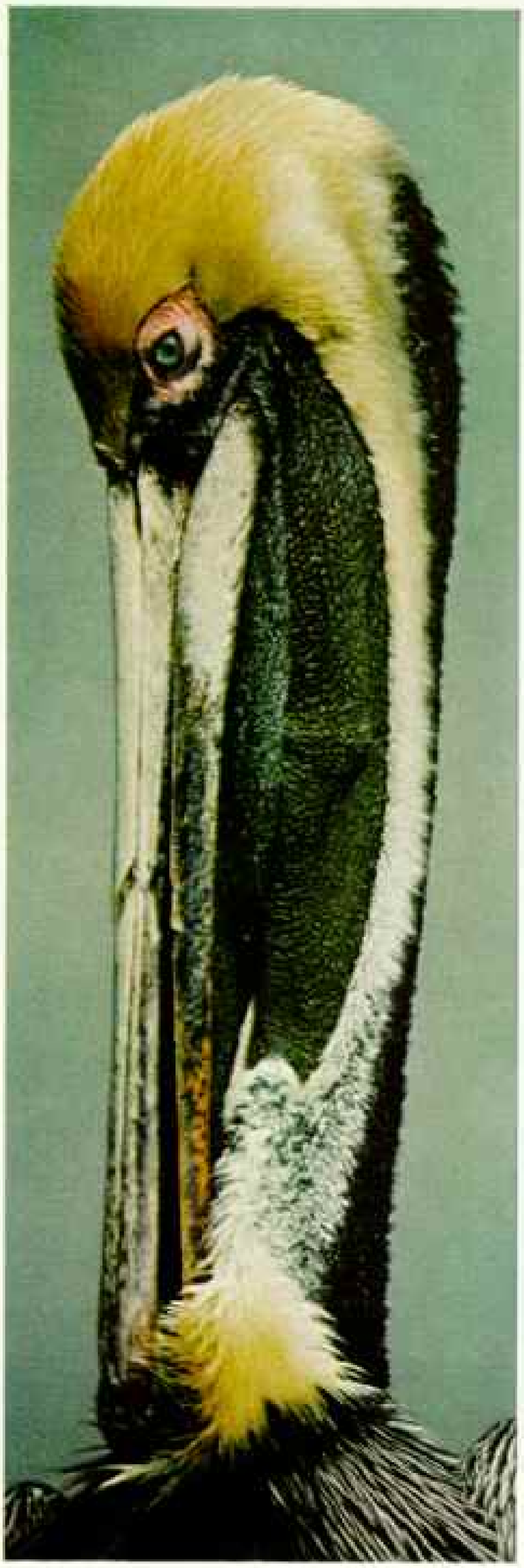
At 155th Street and the Hudson River, New York's barge traffic alone keeps the pace of Audubon's final days. Here, in a house he had built for Lucy, he at last declined, paying in mind and body for "*Marching* Thousands of Miles and *Sleeping* Years of Nights on the ground." Expressways and apartment buildings have overgrown the site. I walked up 155th Street, crossed Broadway, and entered the cemetery of Trinity Parish, canopied with trees and calm.

At the base of the tall runic cross, marigolds that someone had planted in old coffee cans were craning for the light. Atop a metal pole well off the vertical a bird feeder stood innocent of paint. Vandals had emptied it. Probably squirrels. The roof of the feeder rested on the base of the monument. Beneath, only what was mortal of Audubon remains.

Emblem for the naturalist—as Benjamin Franklin thought it should be for the nation—the wild turkey adorned Audubon's seal and became the first plate of *The Birds of America*. Wanton hunters decimated the species; responsible hunters helped revive it—to the health of this glowing gobbler from Audubon's favorite Louisiana countryside.

"**Redwings fall upon the fields** in such astonishing numbers as to seem capable of completely veiling them under the shade of their wings," Audubon wrote, noting the "havock

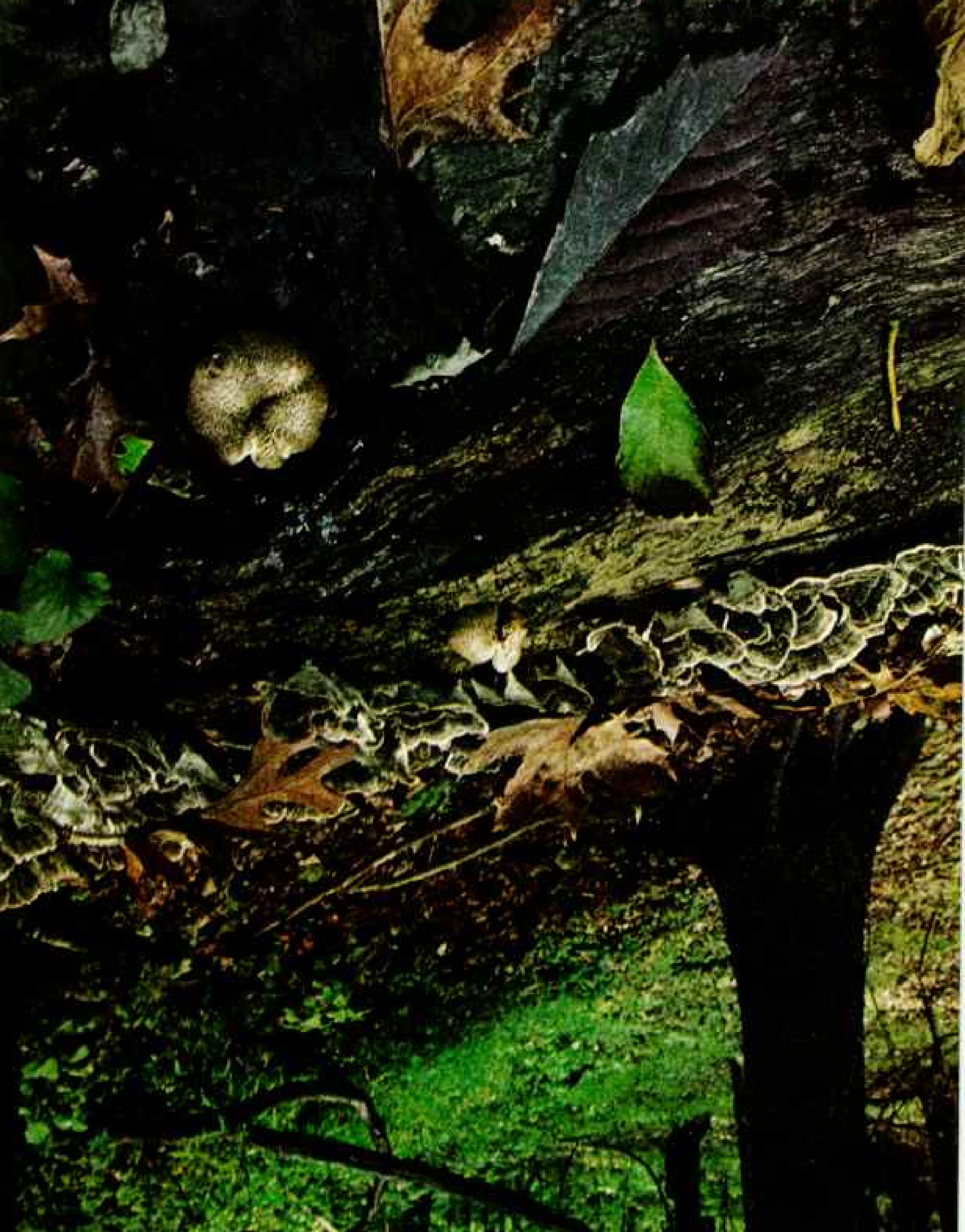
made amongst them . . . [when] upwards of fifty have been killed at a shot." Redwinged blackbirds still thrive; this Delaware flock is joined by a western yellow-headed stray.



"**How dexterously** do they wield that great bill of theirs, as they trim their plumage!" wrote Audubon of the now-endangered brown pelican (**left**). He predicted that they "will yet be hunted beyond the range of civilization."

Better known, and even closer to extinction, a whooping crane (**above**) tries its wings before migration. When Audubon wounded one on the banks of the Mississippi, it turned, chasing him to the river, "into which I plunged up to the neck"—one of the cranes' few victories over man.

Eventually, Audubon saw that man's slaughter and habitat destruction were taking heavy toll of the wilderness he had so long explored. He lamented: "Where can I go now, and visit nature undisturbed?"



The green invitation of Kentucky's woodlands (**left**) proved irresistible to the young Audubon. He read them like a primer, grounding later works on observations taken from such living texts. Never truly adjusted to his role as "*Publisher* of Works on Natural History," he wondered at the "*superfluity of refinement*" in Britain, but felt "the unbounded freedom of our Beloved America will be for ever preferred by me."

No armchair naturalist, Audubon did not live for the species tallying that consumed many ornithologists of his time. Even so, he discovered and described his share, some of which are shown clockwise from **below:** the rough-winged swallow; the freshwater king rail; and the great white heron (now regarded as a variant of the great blue heron).

Fixing a curious eye, a redhead duck (**below**) dabbles in his element. Audubon's painting was made from a pair given him by Daniel Webster.

To Audubon, "one of the most beautiful" of American birds was the tiny parula warbler (**right**), which goes about its business of looking for insects with "much activity and liveliness."

The unchanging habits of birds make Audubon's works timeless. A group of American avocets (**bottom**) stands just as Audubon remembered: "...they drew their heads close to their shoulders, and remained perfectly still, as if asleep." □

TO LIVE IN

I FIRST CAME TO HARLEM more than thirty years ago from Trinidad by way of London. I had been engaged in the study of law at the Middle Temple of the Inns of Court and was on my way back to the West Indies. The ship's itinerary obliged me to disembark in New York City. And so I came to Harlem.

From that moment, no matter where I have wandered, I have never in my heart been far away. I am often asked: "Why do you live in Harlem?"

My answer is invariably the same. I am in love with Harlem. It is a replica in miniature of the human condition. To live in Harlem is sometimes to hear the siren song of success, often to be denied by heaven and disdained by hell, yet always to hope anew each morning, whatever yesterday's despair.

The prosaic facts about Harlem are straightforward enough. Here are located some of New York's most elegant brownstones; middle-class blacks, having once abandoned them, are now returning to the old dwellings and refurbishing them. There are impressive high-rise apartment buildings. But there also are vast areas of deteriorated tenements. At least 50 percent of the community's available housing units are substandard.

Unemployment in Harlem ranges between 25 and 30 percent, and more than a fourth of all families are on welfare. Nearly half of all young people cannot find work; many of them are unemployable because they lack marketable skills or are addicted to drugs. Between 1950 and 1970 greater Harlem lost one in four of its inhabitants, a decline from 772,000 to 564,000. Still, if it were a separate municipality, it would rank as the nation's 21st largest, ahead of Pittsburgh, Denver, and Atlanta.

Outsiders may call it a ghetto, yet to half a million Harlemites it is home, the best-known black community in the Western world. In the heart of New York City, children play on West 138th Street, where traffic is banned for a Memorial Day block party.

HARLEM...

By FRANK HERCULES
Photographs by
LEROY WOODSON, JR.

The crime rate is high, and violence commonplace. On Friday and Saturday nights, Harlem Hospital can resemble a casualty station behind the front lines. It is also true that drug addicts buy their fixes under the very noses of the police. The numbers game flourishes more or less openly, as does prostitution.

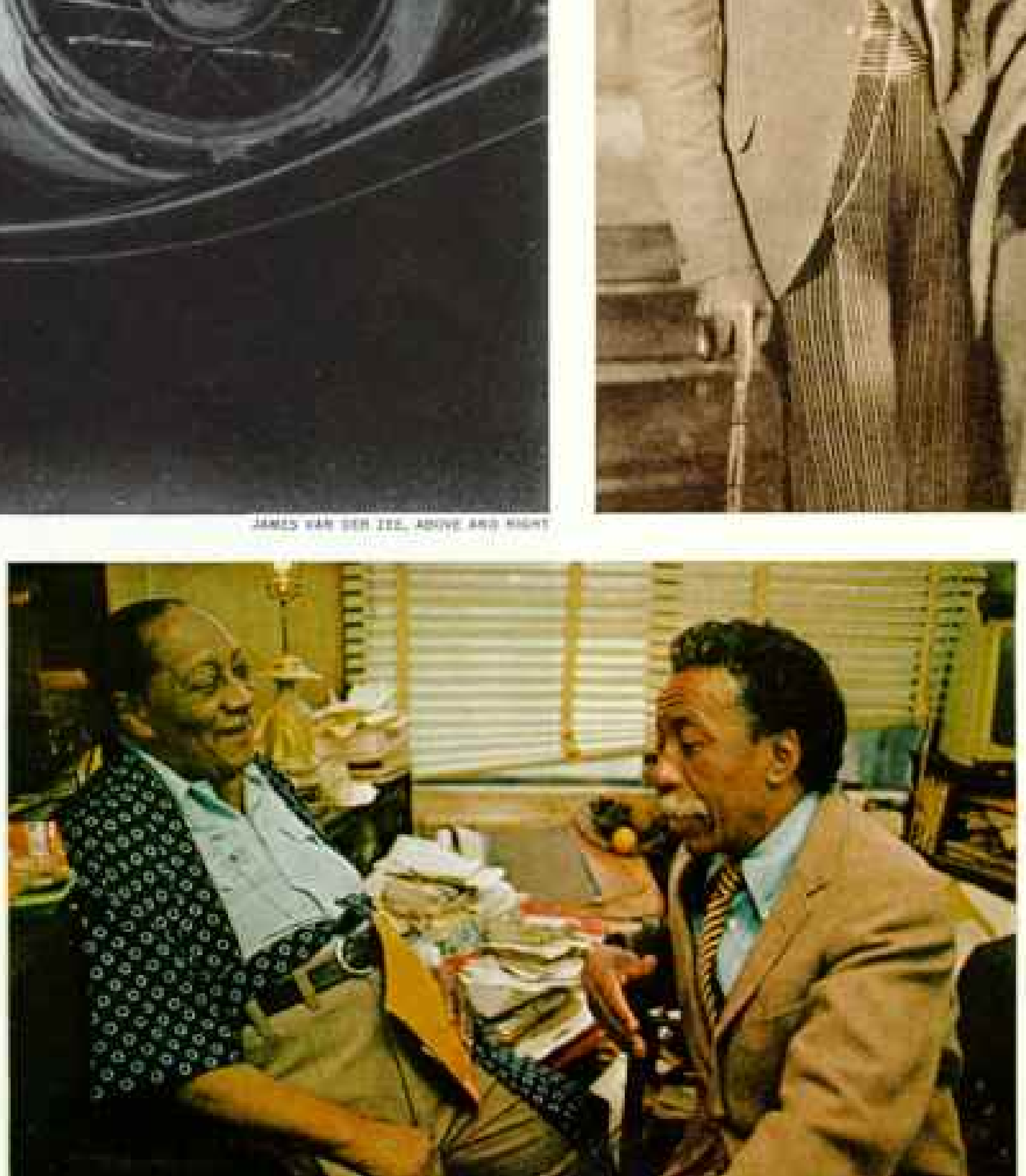
As for public education, Isaiah Robinson, President of New York City's Board of Education, is critical. "The quality of education in Harlem," says this Harlem resident, "has degenerated to the level of a custodial service."

Yet Harlem remains a key fortress for black people in the United States.

When I arrived, at the start of the forties, Harlem seemed to me like a painting by Monet, opaque on the surface but translucent in the depths of its luminous perspectives. Here, in the gray twilight of a winter day, I gleaned muted intimations of Turner's Venice. When spring came, the quarter I lived in was transformed into a corner of Paris: Montmartre in

JAMES VAN DER ZEE, ABOVE AND RIGHT

Harvest of a discerning eye, thousands of photographs by James Van Der Zee preserve half a century of Harlem history. To his studio flocked the unknown—graduates, brides, families in Easter finery—and the famous: back-to-Africa advocate Marcus Garvey, evangelist "Daddy" Grace, musician Hazel Scott. During the 1920's and early 1930's, when Harlem blossomed with writers and musicians, the photographer captured a pair of proud sophisticates with their new Cadillac roadster (**left**), and "one of the pretty boys" (**below**). Van Der Zee, now 90 (**bottom,** left), delights in his first meeting with Gordon Parks, film director and magazine photographer, composer and writer.



blackface with all the raffish stridency of a canvas by Toulouse-Lautrec.

There was a small middle class in Harlem, relatively successful, with mass poverty treading everywhere on its heels. Yet this widespread poverty was suffused with a massive resiliency of spirit. Humor irradiated the scene. Two superb black comedians, "Pigmeat" Markham and Jackie "Moms" Mabley, reigned at the Apollo Theatre.

Jazz Rewards a Subway Pilgrimage

God may have been in the heaven of the poet Robert Browning most of the week, but on Sunday mornings at eleven o'clock He came to Harlem and was omnipresent in the community's numerous and extremely diverse churches. The rest of the time He was represented here by Father Divine, His self-appointed surrogate.

Father Divine described himself as God. He dwelt in his own Heaven-on-the-Hudson, a palatial country estate within calling distance of the then Squire of Hyde Park, President Franklin Delano Roosevelt. Since Father Divine was careful to keep his followers well fed, they readily accepted him as God. They dined sumptuously at lavish feasts in his satellite heavens. They worshiped him with ecstatic devotion.

"I am God!"

"Ain't it the truth, Father!"

Outside the gates of heaven, there was stompin' nightly in the Savoy Ballroom at Lenox Avenue and 140th Street. The lindy hop was in vogue, and Harlem was its headquarters. People from everywhere took the A train of the Eighth Avenue subway uptown.

"Dusky sash across Manhattan," poet Langston Hughes called Harlem, symbol of elegance and distinction to blacks during the 1920's. Then gradually it slid downhill to become one of New York City's most depressed areas, a victim of discrimination, neglect, poverty, and crime. Turn-of-the-century brownstones spread from Lenox Avenue, a main thoroughfare in this one-time suburb of lower Manhattan. Now urban developers seek money and sponsors for new construction such as the 18-story State Office Building, center. It towers over the glistening Theresa, a landmark hotel turned office building.

Harlem was a Mecca, and not only for blacks. Whites also made the pilgrimage.

Few things would contribute so vitally to the restoration of Harlem as the return of whites in their former capacities as patrons of bars, restaurants, and nightclubs. When, in the aftermath of World War II, the whites stopped coming to Harlem, jazz was obliged to go downtown. Black musicians abandoned Harlem for 52d Street. Harlem has never been the same since.

It still is, in part, Catfish Row (the low-life slum area of Charleston, South Carolina, from which DuBose Heyward derived his classic play *Porgy*). Catfish Row is common to Charleston, New Orleans, London, Acapulco —and Harlem. Catfish Row exists wherever people live out the raw stuff of life in see-sawing transports of triumph and tragedy. So Harlem is a perennial masquerade. There is frenzied woe beneath the frenetic gaiety. The woe is real, but so is the gaiety.

Surrounded by comforts rare in her community, one of Harlem's few homeowners, silver-haired Mrs. Lenon Holder Hoyte, gives a dinner party in a brownstone that overflows with her antique collection. The cut-glass chandelier once hung in her parents' home on West 128th Street, torn down in 1949 to make way for a housing project.

"The razing of such neighborhoods was the start of the middle-class exodus," she believes. "But I never considered moving." The retired art teacher now encourages suburban friends to return. An avid doll collector, Mrs. Hoyte recently opened Aunt Len's Doll and Toy Museum. She hopes to make it and her unusual home a legacy to Harlem so that "children can understand how some of us lived."

the dying, and the survivors. I note the sentinel trees along the sculptured avenues and their side streets. I witness the gladness and grief, bluster and burlesque, delectation and despair. I observe how squalor and degradation exist side by side with elegance and exaltation.

And I here testify to the transmutation of all these diverse elements into hope.

Dutch Settlers Provide a Name

Harlem began as an Indian village on the banks of what is now the Harlem River between today's 110th and 125th Streets. In 1658 Dutch settlers named the community Nieuw Haarlem. A dozen or so years later, black slaves, whom the Dutch had begun to import in 1626, made the first road from lower Manhattan to Haarlem along the old Indian trail—today's Broadway.

Before the American Revolution, gentlemen farmers developed country estates here, and wealthy merchants built stately houses. As the 19th century arrived, the community was a tidy village whose residents enjoyed trotting races, cricket, and fishing. Gradually the surrounding farmland turned residential; in 1873 the Village of Harlem became part of the City of New York—and New York's first suburb.

The migration of blacks to New York City began soon after the 20th century opened. The failure of Reconstruction in the South obliged numbers of blacks to settle elsewhere.

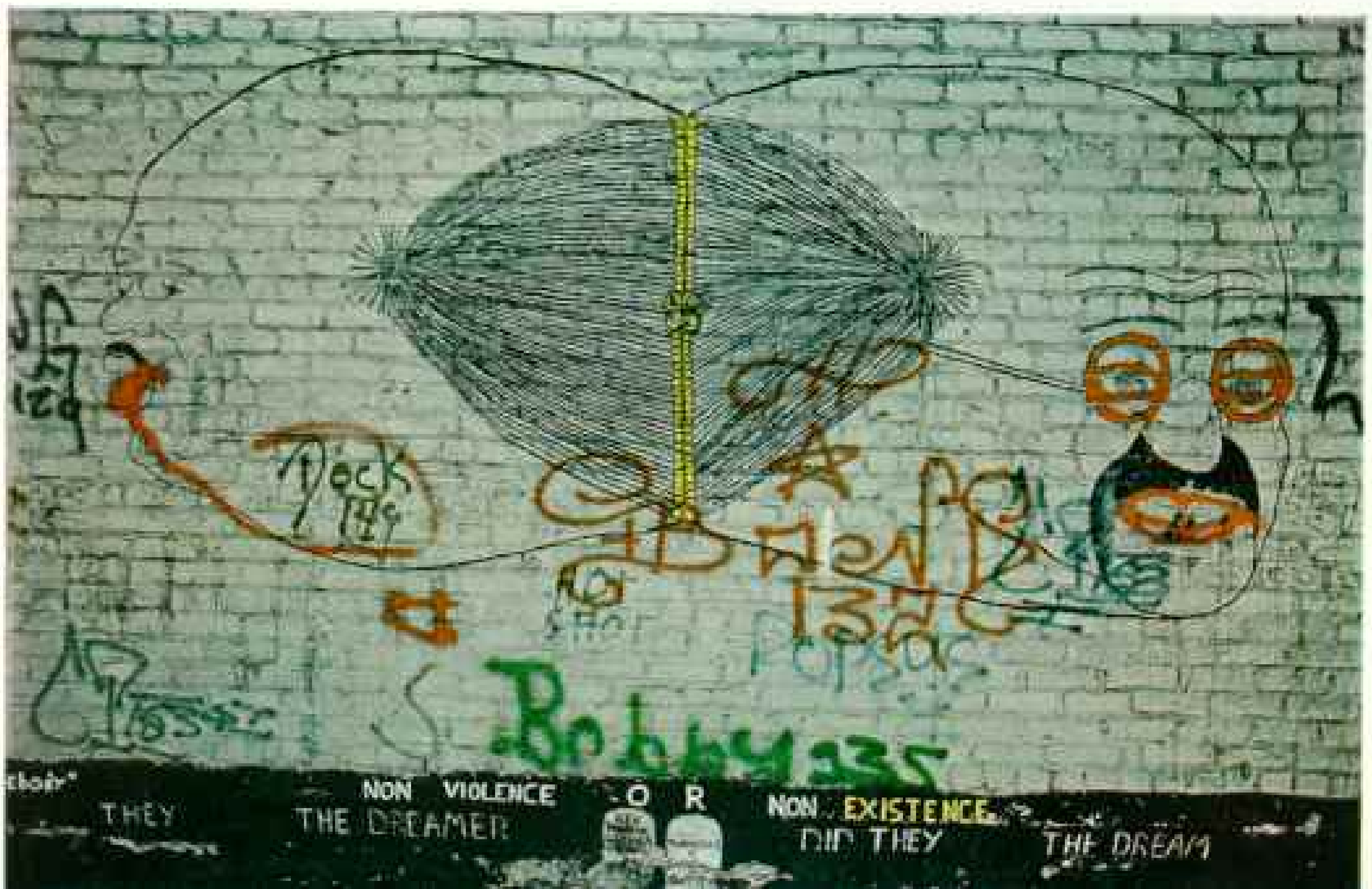
Strenuous efforts to keep Harlem white

And sometimes when the wind blows assertively from the southwest, ruffling the ornamental trees along 110th Street at the northern boundary of Central Park, it brings with it a nostalgic scent. I sniff again the salt tang of the sea I have journeyed across to Harlem.

For me, there has always been alchemy in these sights, scents, and sounds of Harlem. I remark the texture of its essential life, with its battlefield element of the dead, the wounded,

Ruled "unfit for human habitation" three-quarters of a century ago, brick walk-ups still comprise half of greater Harlem's 216,000 dwellings. These on East 115th Street attracted vagrants who lighted fires that finally gutted the buildings (**above**). When absentee owners stopped paying taxes, New York became the landlord. But the city's fiscal crisis has sidetracked reconstruction. Meanwhile, laundry flutters like an SOS signal, proving that life goes on. But for how long?

Like a cell dividing, the Reverend Martin Luther King, Jr., and India's Mahatma Gandhi emerge from a common center—the dream of freedom—in a graffiti-obscured street mural (**below**).



failed. By 1930 blacks were in substantial possession of central Harlem. As the Great Depression of the thirties advanced, the people of Harlem began to sink into dire poverty.

In this century several Harlems have existed, partitioned on ethnic lines: Negro (or, now, Black) Harlem; Spanish (that is, largely Puerto Rican) Harlem; and at varying periods within the past fifty years, Italian, Jewish, and Irish Harlem. A small colony of Finns once had a distinct quarter of its own.

Today the community may be regarded, geographically, as the area between 110th Street on the south, 155th Street on the north, the East and Harlem Rivers on the east, and Morningside and St. Nicholas Avenues on the west. Sociologically there is a greater Harlem that far exceeds its geographical boundaries. There are considerable pockets of blacks outside these limits.

High and Low Share Love of Harlem

For many men and women eminent in public life who reside in Harlem, their dedication to the community is a living vocation, religious in its intensity, all-encompassing in its devotion. A brilliant cluster of personalities comes to mind: U. S. Representative Charles Rangel; Percy Sutton, Borough President of Manhattan; Eleanor Holmes Norton, Commissioner of Human Rights for New York City; Basil Paterson, Vice-Chairman of the Democratic National Committee; New York State Senator Carl McCall; State Assemblyman George W. Miller; Presiding Justice Harold A. Stevens, Appellate Division, New York State Supreme Court; Judge James L. Watson of the U. S. Customs Court.

They reside in Harlem; so do many others no less outstanding. University professors, clergymen, lawyers, business executives—all reside in the community. Harlem is no mere dumping ground for social derelicts or an exclusive preserve of the lawless. Some of the most notable citizens of this country were born and raised here.

They are all, I believe, of a mind with Borough President Percy Sutton: "If I were offered a million dollars, I wouldn't leave Harlem." And with Mrs. Norton as she muses: "There is something magical about Harlem." And with former Sgt. Frederick Watts, who once headed the police homicide squad in a precinct in central Harlem and is also an attorney-at-law. No one knows the streets of Harlem better than he: the danger, the menace, the ubiquitous horror. At the same time, no one knows better than he the obverse side of that coin: the humor, the wry realism, the irrepressible love of life. "I don't feel right," he says, "away from Harlem."

Despite the formidable difficulties Harlem faces, it is a triumphant, not a defeated community. It celebrates the invincibility of the human spirit. In Harlem the source of that invincibility is humor, and often it is elemental. I cite this instance with a certain chagrin:

On an extremely cold winter morning, my wife is on her way to an appointment with her dentist. Snow lies several inches deep, and blasts of freezing air send flurries upward into the unprotected faces of passersby. An ancient black man, an authentic old Harlem cat, is sheltering in an inhospitable doorway. He sees my wife approaching, and as she goes by, he calls out to her: "Baby, ef Ah wuz yo' daddy, yo'd sho' be in bed dis mawnin'."

That man has given me a lesson in domestic gallantry. Somewhere in Harlem is an antique black gentleman who on a bitterly cold morning was more solicitous of my wife's comfort than I. That, however—that humor, that zest—is the spirit of Harlem, where humor and sorrow are contrapuntal effects in a great human fugue by some cosmic Bach.

Juggling the Possible Joys of a Single Day

My spirits are a sunburst some mornings. I juggle possibilities, throwing them into the air, catching and then tossing again this choice and that alternative.

If the soaring flight of the morning fulfills its early promise, I might breakfast at Adele's Kitchen and lunch at La Famille Restaurant. Between breakfast and lunch I might work on a research project at the Schomburg Collection, that treasure trove of black American literature in a branch of the New York Public Library at 135th Street and Lenox Avenue. After lunch I might return to the Schomburg for another two or three hours. Then I might go a few yards farther up toward Seventh Avenue (now Adam Clayton Powell, Jr., Boulevard) to the Harlem Young Men's Christian Association for some exercise.

Later I might dine at Jock's or the Red Rooster, then stroll up Seventh Avenue to Small's Paradise, looking in at Joe Wells's, or

the Club Baron before ending the evening at a theater or concert hall. I might go to a ballet rehearsal by the Dance Theatre of Harlem (pages 200-201), or attend a performance at the New Heritage Repertory Theatre or the National Black Theatre, or a concert or play at the Harlem School of the Arts, founded and directed by the world-famous singer Dorothy Maynor. I might also go to the Apollo Theatre, the epicenter of Harlem's folk life, squatting in the navel of the block between Seventh and Eighth Avenues on 125th Street.

My entire day, in all its diversity, would have been spent within a radius of a score of city blocks. Never at any point would I have set foot outside Harlem.

The prospect of the Apollo allures me. I find seductive the thought of Aretha Franklin, soul sister, on its stage in a nimbus of light, imploring her listeners in song: "Call me!" She will address herself directly to me—and to hundreds of others. But to me, anyway. And we shall all respond in unison to this bewitching, impassioned Circe: "I sure will, baby. Yes. I sure will."

Screams Give Voice to the Unsayable

And if James Brown was on the bill—James Brown, soul brother—he would adjure us, also in song: "Say it loud, 'I'm black and proud!' "

Thus admonishing and exhorting us, he would caper, invertebrate, strutting, slithering, pirouetting, improvising a febrile ballet of black pride in India rubber; and bawling, bawling, bawling, driven to a Cyprian frenzy under the hypnosis of drums in league with a choir of keening saxophones underscored by an immense and brooding bass fiddle.

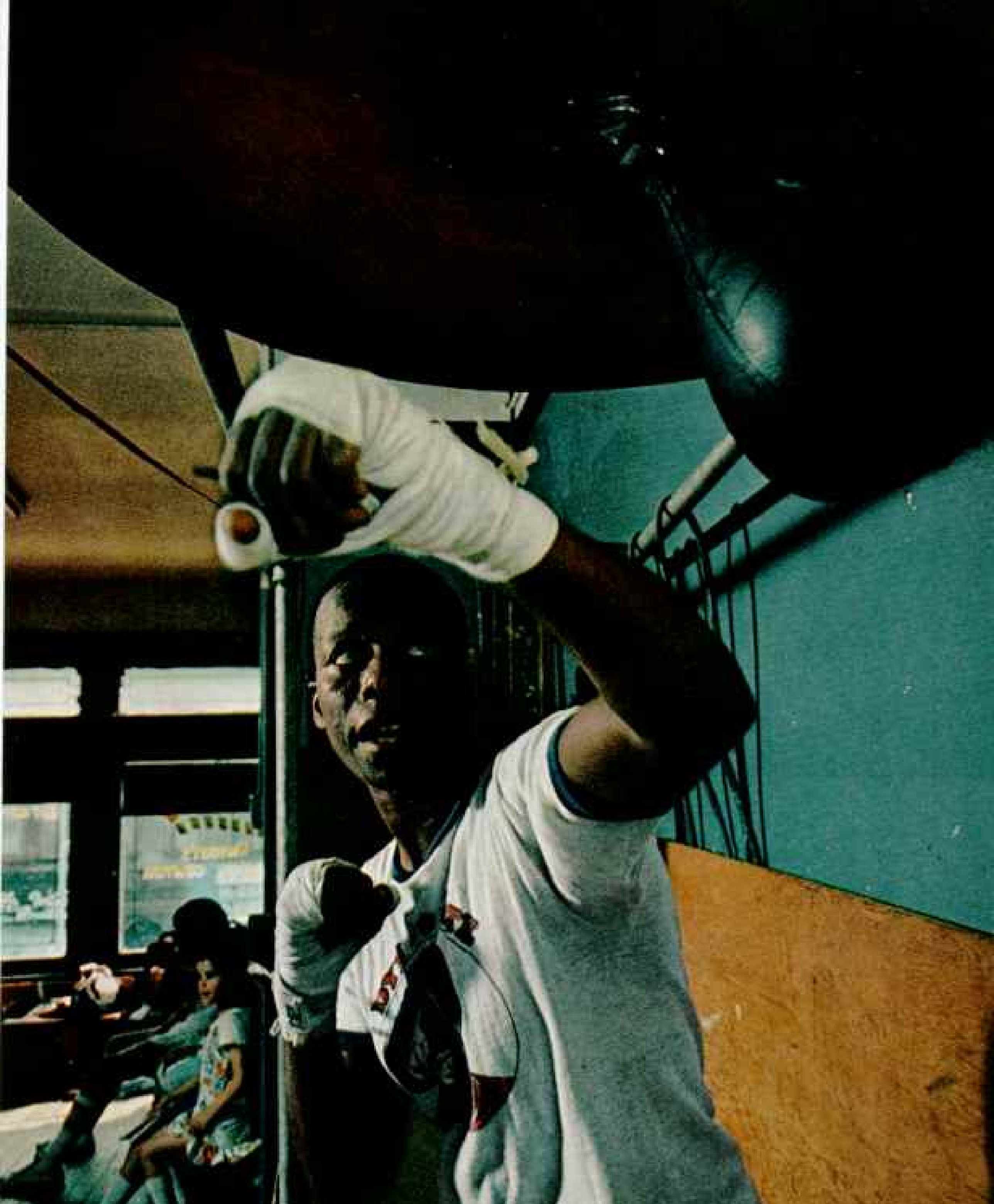
And now uncontrollable passion assails him. Lying on one side, he stretches full length on *(Continued on page 193)*

Oasis in an asphalt desert, water from a fire hydrant refreshes youngsters on a simmering day. Streets traditionally have served as playgrounds, while in recent years parks have become hangouts for drug pushers.

Going to an urban well, Charles Cook fills kitchen kettles on a winter day when neither water nor heat reaches his eighth-floor apartment. "It was a nice building when I moved in 25 years ago; Dinah Washington once lived here," the dance instructor recalls. Gradually it deteriorated, despite complaints to landlords and building inspectors. "The last straw came when I was held up at gunpoint in the hallway," reported Cook. He has since moved out.

For security and sanctity, members of the World Community of Islam in the West—Black Muslims—submit to a search for weapons, drugs, tobacco, and alcohol before their Savior's Day services, February 26. Men sit apart from the white-gowned women, whose modest attire reflects religious conviction. The 47-year-old American sect has changed dramatically since the 1960's, when leaders demanded separation from "the devil white man." Still preaching strict moral behavior, pride, and self-help, they now accept white members and seek ties to Islamic centers of the Middle East.

Malcolm X, 12 years after his assassination at a Black Muslim service, still seems to speak from a poster in a barred basement window. From street corners to universities, he denounced racist attitudes that "forced us not to aspire to greater things but to view everyday living as survival." A former burglar and dope peddler, Malcolm turned a prison sentence into self-education and conversion to Islam. The mosque on West 116th Street where he served now bears his name, and many Harlemites say that "Malcolm was a good brother."



(Continued from page 188) the floor, supporting his weight with one hand while the other engages in insupportable gropings. In simulated ecstasy he cries aloud: "Shall I scream?" We are all suffering with him. "Yes! Scream, soul, scream!" we respond, thereby releasing him, and freeing ourselves. His need was ours; ours, his. We have achieved communication and understood each other. James Brown. Soul brother.

Fantasy Makes Life Bearable

On the Apollo's ghost-haunted stage, dreams spun out of waking fantasy come true. Even when they don't, the dreaming and the fantasy will have bestowed, for a moment at least, a transforming illusion to keep some nightmare reality at bay.

In Harlem, dreams possess vast social utility whether or not they come true. Whatever else one may do here, it is necessary to dream. The numbers game, which is to Harlem what roulette is to Monte Carlo, is based on dreams. To "hit the number" is to rocket to the moon and walk there, spending your winnings if you "hit it big," like a billionaire gone crazy. So that when in the shortness of time you revert to your impoverished state, the people on your block will still remember that sudden wealth did not make you a skinflint. And some one person or another will always stand you a drink at the neighborhood bar in memory of the night when you stood there host to all comers.

Fame is a capricious redeemer of poverty. The winged chariot it sends for the chosen may be chauffeured by a numbers runner, an impresario at the Afro-American Singing Theatre, or the coach of a topflight football or basketball team. It whisks the elect away swift as a meteor to the fruition of dreams. When he, or she, comes home again, home to Harlem—home to the childhood block—it is to be surrounded by admiring bevies of old friends. Others stand on stoops or lean from windows, calling out greetings in celebration of the present and in remembrance of times past. In a brief hour of surcease from their torments, the heroin addicts and the otherwise lost and tormented also cry welcome.

But there was no welcome in the haunted eyes of the girl who sat in the police car drawn up alongside the curb. She was in the front seat, a police officer at the wheel beside her. He called out to me. "Here, come in." He threw open a door to the backseat.

I had earlier requested this interview, and now the police officer told me: "Ask her anything you wish. Except her real name. She knows your name, but you cannot know hers. That is the only ground rule."

Namelessness, I reflected, is a state not alien to blacks. "Please tell me about yourself," I said.

For some reason obscure to me, she threw her head back and laughed soundlessly.

"I ran away from home for the first time when I was twelve. . . ."

"Why?"

"All my friends were able to stay out until ten-eleven o'clock at night, but my father wanted me to come in at six. He was a very hard man."

"Do you mean stern?"

"Yes. Stern. But he loved me."

"How long were you away from home?"

"About two weeks."

"What did your parents do when you returned home?"

"My father beat me—with a broomstick. He broke my arm."

She indicated the affected arm by a slight movement of it.

"Did you stay home?"

"No. I ran away again as soon as my arm was healed."

The girl's eyes were aglow with the transport and torment of remembering. What warrant had I for rummaging through her past?

I said to her, "You have always been seeking love, haven't you?"

She was all at once a creature unspoiled.

"I am the best . . . as far as I'm concerned," boasts Yvonne Barkley, lightweight contender for a crown not yet created in the fledgling field of women's boxing. The 25-year-old mother of two got her start at 14 in afterschool tumbles with other girls "who wanted to be tough." Winner of six bouts against women and two against men, the unemployed factory worker trains daily with former fighter Connie Bryant in his East 125th Street gym. She views boxing as her passport out of poverty.

Sensitivity training helps police better understand their own attitudes at a seminar to improve race relations in the 32d Precinct. In this exercise black officers form a clique, and whites learn what it's like to be the outsiders trying to gain acceptance.

"Drugs are destroying our children," the Reverend Carlton Coleman testifies at a street rally against the scourge that spreads across New York City. Working with police and churches, a group called CASH—Citizen Action for Safer Harlems—advises on how to stop crime.

The smile of a winsome, willful child irradiated her beautiful African face. "Yes," she answered.

"You mustn't," I told her. "Let love seek you. No one who seeks love ever finds it."

She nodded, acceptingly. And as though released by my little homily, the closed door of some inner compartment of her life flew open, and she said: "I've been a dope addict, a burglar, a stickup woman—to support my habit—but I've never been a prostitute." Pride elevated her voice.

"How old are you now?" I asked.

"Twenty-six, going on twenty-seven. And I have four children."

"How would it be," the police officer inquired with dispassion, "if you were to find yourself up against it—maybe your children were hungry—would you get a gun and . . . ?"

She smiled, shaking her head. No.

"And how about the heroin?" he persisted. "Done with that too?"

"Yes," she answered. And summoning a remnant of a band of angels to do battle with a legion of devils, she said, "I've enrolled at college. My children are with my parents."

How to Leave the Ghetto Behind

Entering college is one way out of the ghetto. But there are, in the main, two triumphal paths to transfiguring success for the blacks of Harlem or any other black ghetto. They are relatively short and thus offer to those suitably endowed more or less speedy transit to popular acclaim. One is by way of athletic prowess; the other, talented entertainment. Out of the first emerges a Willie Mays or Wilt Chamberlain, a "Doctor" Julius Erving or Kareem Abdul-Jabbar. Out of the second comes a Harry Belafonte or Sidney Poitier, a Diahann Carroll or Diana Sands, a Lena Horne or Sammy Davis, Jr., a Nina Simone.

Sports and entertainment are legendary accreditations that entitle the bearer to leave the slums. The ghetto now is behind him. The rats, cockroaches, dope addicts, dope pushers, the filthy tenements and disease-ridden hovels, dilapidated houses that are colder in winter than the open streets, the decaying people whom death itself rejects, the dreary hours and the hopeless years, social scorn and self-contempt, are all behind him now. The cat's gone. The brother's made it. Man, he's too strong.

The ability to excel at some form of sport is the first ray of light for many black youths. It is impossible to overemphasize the power of the example furnished by baseball players like Willie Mays or the late Jackie Robinson, or prizefighters like Joe Louis or Sugar Ray Robinson, Muhammad Ali or Joe Frazier. You too, my man, can do it.

Increasingly nowadays, the great athletes return to help, encourage, prod, and stimulate others by their own dramatic example to go and do likewise. They hold basketball clinics, and some in their off-season participate in tournaments on ghetto courts.

A Feel for the Pulse of Life

The artists of entertainment influence the black youth of Harlem as strongly as the athletes. I go to lunch with Miss Nina Simone. The late Duke Ellington, the peerless master of jazz, reportedly described her as the greatest singer he had ever worked with.

It is easy to accept this description of Nina Simone. Her voice expresses in universal terms the whole emotional content of human experience. Someone has observed of her: "If a lioness could sing, she would sing like that." Besides which, Miss Simone is a superb performer on the piano.

Nina Simone receives me in the house where Duke Ellington lived, and where she has been residing. She wears a tailored black suit. Her hair is dark, crispate, and close cropped. She is somewhat above medium height, slender, and lissome. You notice her beautifully sculptured hands at once.

Miss Simone pours champagne into finely embossed silver cups. "Those are Duke's champagne glasses," she says. Her dark, intense eyes query my purpose in coming to see her before she formulates the question: "Well, what do you want me to tell you?"

"What does jazz mean to Harlem—to black people?" I ask.

She considers her reply with care. "Jazz lets black people know, every time they hear it, that they have their hands on the pulse of life. Jazz always has a pulse—a rhythmic pulse—like a heartbeat. It is the beginning of life." She sighs and for a second closes her eyes. "Here in Duke Ellington's house, I am at peace."

Duke Ellington's house is an imposing mansion on Riverside Drive. Miss Simone is occupying the suite where he worked. A portrait of him, and another of Nina Simone at the age of 17, hang on the wall of the passageway connecting the two rooms.

"Will you demonstrate for me," I say to Miss Simone, "the difference between what you choose to play and what you don't?"

She puts down her champagne cup and goes to the piano. "This," she tells me, "is 'stride' piano playing." She plays after the fashion made famous by great performers such as Willie "The Lion" Smith and Duke Ellington. "And this," she continues, "is blues in the style of Billie Holiday." As she plays, she sings one of Billie Holiday's celebrated laments, "Fine and Mellow":

My man, he don't love me,
Treats me, Oh! so mean . . .
He's the lowest man that I've ever seen.

Fascinated, I listen, absorbed, intent. "When I am at my peak," she says, "my music comes out of me in rhapsodies—like Brahms, or in romanticism, like Chopin. Sometimes my right hand will do a melody, my left hand will do a melody, there may be three melodies all going at the same time, and all antiphonal to each other."

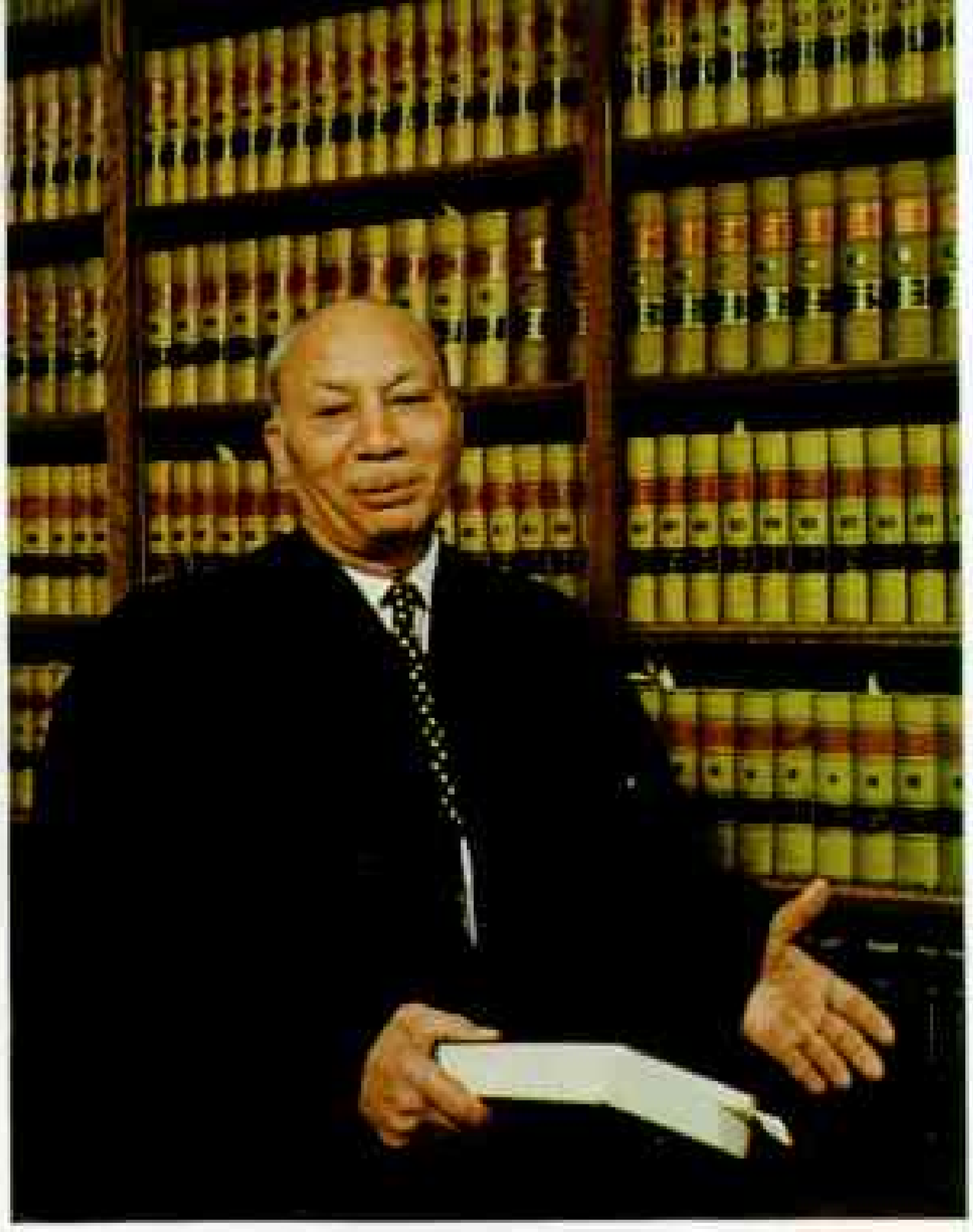
A silken carpet of sound unrolls. A low murmurous voice nestles at first against the carpet, then gathering volume rises from it, finally subsiding. "Those outward-spreading circles"—Miss Simone's hands, marvelously plastic, essay concentric motions—"of sound. You saw. . . ?" But I am still in the thrall of her performance.

Then her voice is suddenly overcast with a pall of somber testament to the agony of artistic creation: "I believe in minute attention to detail for the sake of perfection."

Gauging the True and the False

I hear the ring of truth, the chime of authenticity. And to speak of authenticity is to disclose the innermost secret of the formless welter, the elusive mystique, of the life of Harlem. The unforgivable sin in Harlem is to be a phony. You may be anything you please, provided only that you're "for real."

Authenticity guarantees you acceptance in Harlem as nothing else does. The bizarre, the grotesque, alien, exotic, squalid, monstrous, beautiful, sublime—each has its place in Harlem. *(Continued on page 201)*



Harlemites who lead

"POLITICS holds the key to Harlem's revival," says State Senator Carl McCall (**upper left**), who helped register 50,000 voters last year. Manhattan Borough President Percy Sutton (**below**) agrees, speaking for a constituency of more than 1.5 million. Former State Assemblyman Harold A. Stevens (**above**) is now a presiding justice in the State Supreme Court's Appellate Division. Retired Battalion Chief Wesley Williams, 80, became the city fire department's first black officer in 1927.


CHRIST TEMPLE
DELIVERANCE CHURCH
Pastor-Elder C.I. Mason

"**The Lord loves you.** Give your heart to Him." Evangelist Leemon Lawyer preaches to the people of Lenox Avenue on a Saturday afternoon. The tidy storefront church offers born-again religion to "down-home people who are not ashamed to shout their joy in the Christian life." The services, orchestrated with tambourines, washboards, drums, and organ, may last all day—"depending on the presence of the Lord."

The message of love also resounds through the Abyssinian Baptist Church on Easter Sunday (**left**). From this pulpit Adam Clayton Powell, Jr., rose to fame as an eloquent preacher, activist for job opportunities, and powerful Congressman. Harlem's churches have played a major role in the stability and development of the community.


THE RED

In a shimmering Eden, the snake lunges ominously as Adam and Eve cavort in a new ballet, *Manifestations*, choreographed by Arthur Mitchell of the Dance Theatre of Harlem. The first black premier dancer in a major American ballet company, Mitchell in 1969 founded the Harlem school and troupe "to prove black classical ballet artists can equal the best white companies."

Abode of jazz, chitterlings, and champagne, the Red Rooster restaurant-bar (**left**) remains the landmark it was in the '30's and '40's when it attracted Joe Louis, Duke Ellington, and Adam Clayton Powell, Jr. Here owner Gwendolyn Douglas visits with jazz guitarist Tiny Grimes.

(Continued from page 196) "Real" is a standard applied out of the searing, age-old experience of being black in a hostile culture, an instinctual response, a gut reaction, that assays in a lightning flash the true and the false.

The judgment, "Man, that cat ain't for real," implies its essential corollary, "Man, that cat ain't no good," and then, the ultimate verdict, "That cat's a phony." In Harlem, with its pervasive religious ethos, this is a sentence to hell, to be served in social contempt during the course of your unnatural life.

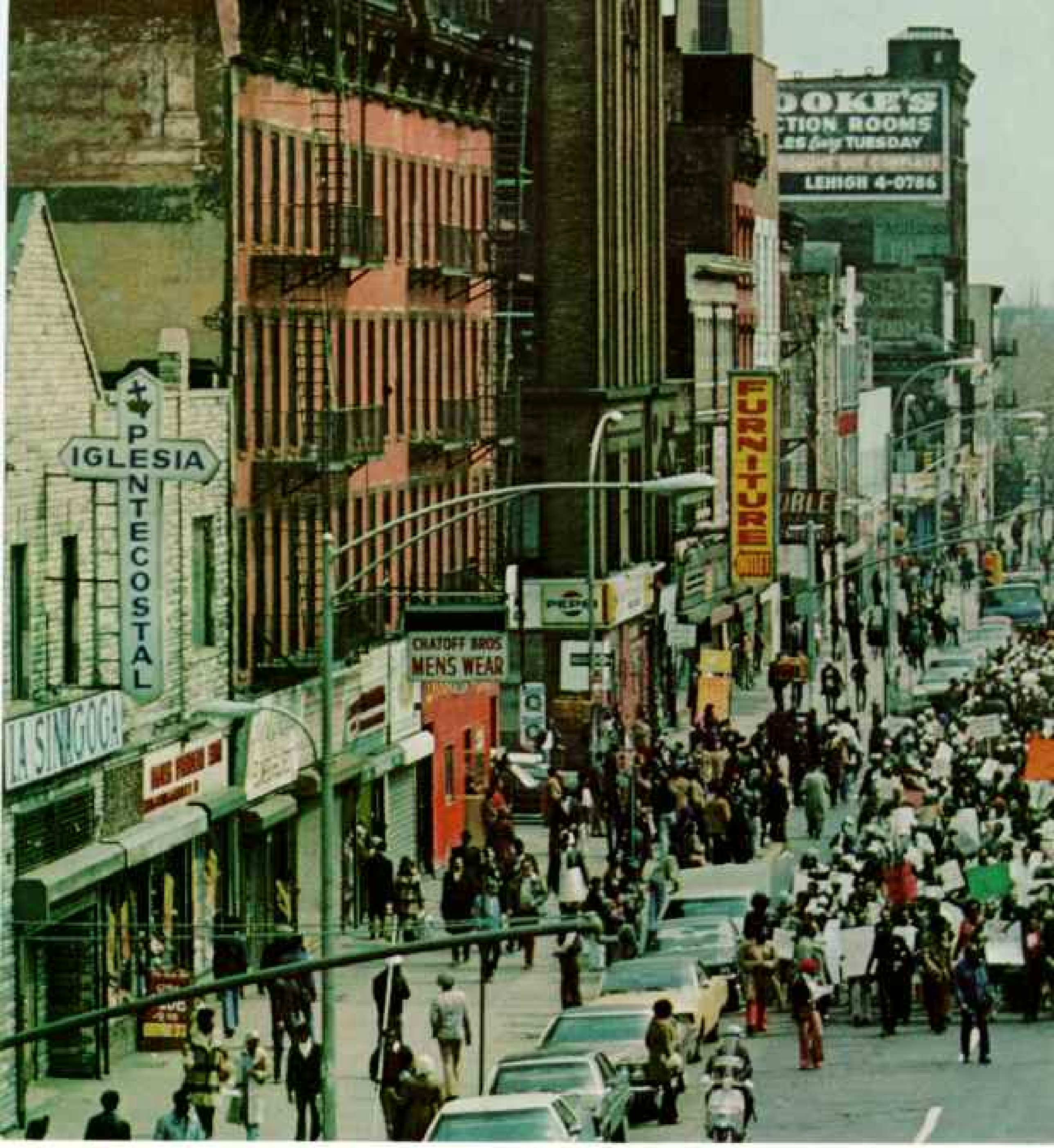
Crusader Bets His Hopes and His Life

Never during the passage of his twoscore years and more has Charles Kenyatta, who once was Malcolm X's bodyguard, hidden his reality behind anything. Few people on the Harlem scene are more readily identifiable. Whether orating on a street corner against the racially inspired ills of society or distributing Christmas gifts to dope addicts, whether symbolically brandishing a machete while surrounded by his similarly armed followers, or being interviewed about his social concerns and objectives, Charles Kenyatta seeks no refuge in dissimulation. His face beneath its canopy of abundant black hair is open, ingenuous even, and sensitive. This is, in the romantic sense, the face of a poet, on which uncongenial action has etched disillusionment.

"The clock is being turned back," he laments. "As a people, we have not learned to seize the time." He speaks of the overlordship of vice in the community. "Harlem," he says, "has been a haven for all the vice and corruption that are destroying this city." Yet he remains optimistic about Harlem. Honest and competent law enforcement and vigorous leadership would "turn the problem around," he thinks.

When Kenyatta speaks of the seduction of the community's children into using narcotics, his eyes kindle into a blaze of fury and disgust. He excoriates the "overseers of vice." The suffering on his ascetic face deepens. "Why don't they leave our children alone?"

Some time ago, an automobile in which Kenyatta was riding was ambushed. His body was honeycombed by bullets, and he was left for dead. But, as by a miracle, the crusading idealist recovered. Now on any



Saturday afternoon he may be seen and heard on the southwest corner of 125th Street and Seventh Avenue, inveighing against the evils of Harlem and denouncing the evildoers.

The Clear, True Perspective of Death

Life in Harlem is always a revelation, and never more than in death. Not long ago I attended a funeral service. The deceased, a woman, bore, derivatively from the slave system and its by-products, one of the great names of the South.

The church was Baptist, the pews were filled with mourners, and she lay at rest in a burnished blue-metal coffin that stood on wooden trestles in the transept. She was perhaps 60 years of age, a native of Alabama, a migrant to New York, the mother of several children. At the time of her death she was an aide at a community school in Harlem.

Ground swell that overrode City Hall: Harlemites 5,000 strong demonstrate on East 125th Street against closing desperately needed Sydenham Hospital, employer of 900 people and clinic for 100,000 patients a year. The march—and behind-the-scenes politicking—convinced the city to make budget cuts elsewhere.

A year or two before, she had obtained a high-school diploma and had been admitted to one of the city colleges. There she began a course of study leading to a degree of bachelor of arts. Her goal was a doctorate.

Her relatives occupied the first half-dozen pews, her friends and former colleagues the remainder of the seats. The early-afternoon sun filtered through stained-glass windows. At the end of the short and simple service

the husband of the deceased together with their children proceeded to the coffin to take their final leave.

One son, a splendidly handsome young man, whom she had striven with all her valiant soul to rescue from the demons of drug addiction, could not be persuaded to leave her coffin, nor would he permit it to be sealed. He stood there, gazing down at his mother, utterly abandoned to his grief.

I salute this departed lady because the spirit that she incarnated in her lifetime is the unconquerable spirit of Harlem: always, at best, indigent—yet, no matter how bad things are, resilient. In the midst of besetting poverty, and the holocaust of her children's, her husband's, and her own hopes, she fought, smiled, and danced. She was always eager to demonstrate the latest dance step: the monkey, the hustle, the bump.

Hers was a paradigm of the common life of Harlem, of the hope, indestructible as elemental matter, that springs insuppressibly in the black breast. Its living metaphor is the green shoots that regain life in resurrection from the garbage that often rises high in a noisome tide and engulfs the tenements of Harlem. But the odor of Harlem can also assert its own element of sanctity.

Churches Play a Major Role

If there is a single cohering organization in Harlem, it is the church. Though splintered into numerous denominations, sects, and factions, it cements the life of the community as the Church of Rome imposed coherence on the communal life of Europe during the Middle Ages.

The primary political centers of power in Harlem are located in the churches. For the members of a church are, from an earthly point of view, potential voters. Every minister of every church in Harlem confronts, in extraordinary degree, the delicate task of partitioning the world between God and Caesar.

It is to the church, above all, that the community looks for solutions to problems, private as well as public. Not seldom, indeed, does the Harlem church find itself called upon to supply social, economic, and political initiatives that would ordinarily emerge from secular sources.

It is a midwinter day in Harlem. I trace a labyrinthine path through the snow along 123d Street, and come to a minister's house. Bags of garbage are pyramided at the side of the basement entrance. At a rusty iron gate, the pressure of my finger on an electric button elicits a quavering, high-pitched alarm. The shuffle of slow footfalls grows steadily louder; an inner door groans and wheezes open. I am invited to enter by Dr. David Licorish, who was associate minister of the Abyssinian Baptist Church when the late

Living room with no walls, the street in Harlem serves as a social center during all

but the coldest weather. Summer's heat drives residents from stifling apartments to the small-town friendliness of curbside checker games and conversation.

Congressman Adam Clayton Powell, Jr., was the pastor.

Dr. Licorish seats me opposite himself at his desk. He is of medium height and powerful physique. An open, bespectacled brown face is framed in a squarish cast. The practiced pulpit voice rises and falls as he speaks.

I ask: "What did you think of Adam Clayton Powell?"

"Good and bad. Adam was genuinely interested in causes. But he was miserably selfish. He could not share anything and would not tolerate competitors. But we needed Powell. *At that time.*"

He leans back in his chair. A grudging smile, bitter as wormwood, dissolves the squarish lines of his face. "Raymond Jones —you remember him? Smart politician— warned me about Powell. Told me, 'Don't let him use you—*too much.*' I was Powell's deputy at the church. Whenever he was tied

up with his work in the Congress, or something else, he would say, 'Lick, take over for me.' For 28 years, 'Lick, take over for me.' And now . . . in the end. . . ." His hands, which have been restlessly arranging and rearranging papers on his desk, are still at last.

"Ray Jones wanted me to run for the City Council. But Powell wouldn't hear of it. 'No,' he said. 'I need somebody to look after the church.'" Suddenly he breaks into a ground swell of briny laughter. "'Lick, take over for me.'"

He observes a moment of silence as though for the dead. At last he declares in the manner of a clergyman pronouncing an elegy: "Adam Powell died of a broken heart. The people betrayed him. Harlem today is leaderless." Then, meditatively, "Looks like a bombed-out city."

Even now, here, in this Harlem basement on a wintry morning, Adam Clayton Powell's odd fascination remains potent.

"I sometimes think," says Dr. Licorish, "that Adam is somewhere around—for his work is not finished. Adam was able to lift people up through his People's Committee. But now we don't know where we're going. We need leaders of experience. Ideas just don't accomplish themselves. There's a mistaken emphasis on youth.

Harlem's Flaws Are Also the World's

"Our number-one problem is economics. And next, political awareness and organization. That's what Adam Powell tried to do for Harlem. To make people politically aware and to build a strong economic organization. But most of these politicians only give the people fantasy and euphoria.

"If the roots are rotten, how can the tree be healthy? We are back to the same old trick of getting some money out of the white man's pocket." His voice resonated into a thunder of contempt. "Are we always going to be parasites?"

Another distinguished clergyman thinks the problem is bigger than Harlem. Dr. M. Moran Weston is the pastor of St. Philip's Episcopal Church in Harlem, which has one of the largest congregations of its denomination in New York City. "Harlem," he says, "is going through far-reaching changes; a veritable microcosm of urban change, this community. What is wrong with Harlem is also wrong with New York City, and wrong with the whole country and, if you like, the world.

"Harlem," he asserts, "cannot be isolated as though its problems were somehow unique and unparalleled by any similar phenomena in the rest of the national and world society. Harlem is only an extreme instance, in a more visible context, of what is wrong with the larger society."

Looking for Strength Within

Dr. Weston will tell you—and so will other thoughtful people—where the solution to Harlem's agonies lies. It must stem from education and leadership. And there are in Harlem dedicated people who care, who have the ability to change things for the better.

This is a constantly recurring theme in Harlem, the confidence that the community possesses the resources of leadership to regenerate itself. The extraordinary abilities of these leaders—a Congressman, a borough president, a state senator, an assemblyman, a city commissioner of human rights, distinguished judges, and many more—these are the surest guarantee of Harlem's survival and future resplendence. They—and the people of Harlem themselves, with their insatiable appetite for life, their perennial resiliency, their unconquerable humor.

Harlem is courage and Harlem is love. Harlem is blood and Harlem is fire. Harlem is beauty and Harlem is squalor. Harlem is dreaming and Harlem is dust. Harlem is heaven and Harlem is hell. Harlem is the human condition.

To love the United States with all the troubled freight of its failures of idealism, to love humanity with all the tragic burden of its imperfections, to love life in all the complexity of its myriad menace and illimitable promise, is, for better, for worse, to love Harlem. □

"Life for me ain't been no crystal stair," a mother says to her son in a poem by Langston Hughes. But she counsels, "Don't you turn back." Keep going. Keep climbing. A woman's face in the crowd of hospital demonstrators evokes the strong-willed determination of Harlem.

The Longest Manned Balloon Flight

By ED YOST

NATIONAL GEOGRAPHIC PHOTOGRAPHER OTIS IMBODEN (ABOVE) AND BILL WEMS (FACING AND FOLLOWING PAGES)

Launch! The author issues the final command to a ground crewman as the balloon lifts off from Milbridge, on the northern coast of Maine. The goal—touchdown somewhere in Europe. A veteran aircraft pilot as well as balloonist, Ed Yost operates his own balloon-building company in Sioux Falls, South Dakota.

SLOWLY, SILENTLY, my balloon *Silver Fox* lifts free of earth, bound for wherever the winds will take it. Here along the New England coast, autumn winds generally blow toward the east. The pattern extends over much of the North Atlantic, and therein lies my hope. From the small coastal town of Milbridge, Maine, I plan to ride those winds some 3,000 miles in history's first transatlantic balloon flight.

For more than a century man has sought to conquer the Atlantic Ocean by balloon—and failed. In the past two decades alone, nearly a dozen attempts have been made, and five lives have been lost.

I have studied each attempt, convinced that success lies in a combination of experience, proper balloon design, advance weather forecasting, and that element familiar to all free balloonists—a measure of luck. After a quarter of a century of building and flying balloons, I am ready to test my theory.

Europe is the chief goal, but I have others in mind: new world records for both distance and duration of manned balloon flights, breaking those set by German balloonists more than sixty years ago.

Now as the earth slowly recedes, I wave a last time to family and friends below, then turn my attention to *Silver Fox*. Small in comparison to most transatlantic designs, it measures 80 feet in height and contains 60,000 cubic feet of helium in a neoprene-coated nylon bag. A snoutlike "appendix" allows for release of helium expanded by heat from the sun's rays, an effect lessened by a coat of reflective silver paint on the upper part of the bag.

Balloon and gondola combined weigh less than two tons, more than half of it ballast and expendable equipment. As a safety measure I have built the open gondola in the shape of a catamaran for a possible landing at sea. The balloon carries the Stars and Stripes and the flag of the National Geographic Society, which has furnished generous support for the venture.

Catching the first gust of wind, *Silver Fox* drifts slowly northward. On the following pages, framed in the immensity of sky and sea, the balloon floats northeastward 5,000 feet above Canada's Gulf of St. Lawrence during the first full day of flight.


Nuclear

Record flight dramatizes two centuries of ballooning history

IN HIS AGE-OLD LONGING for flight, man first triumphed by means of a hot-air balloon. From that primitive craft (**right**) balloons have evolved into valuable tools for high-altitude research.

An early attempt to cross the Atlantic Ocean was made in 1873, when the American balloon *Daily Graphic* with three aboard was forced down only 60 miles from launch. Following one other abortive venture in 1881, balloonists did not dare the Atlantic again until 1958, when four Britishers tried an east-west crossing. Since then there have been 11 attempts, including the author's.

Silver Fox demonstrated the capability of the low-altitude helium balloon. Airborne for 107 hours, 37 minutes, Ed Yost flew 2,740 miles to cover a great-circle distance of 2,475.03 miles, breaking the previous records of 87 hours and 1,896.85 miles for balloons of unlimited size.

Adverse winds in mid-ocean robbed Yost of his major goal, the first Atlantic balloon crossing. Borne north and then east during the initial three days, *Silver Fox* encountered an air mass known as the "Azores high," and was driven southward into a clockwise weather pattern that threatened to carry the balloon toward the Caribbean.

Through skillful use of ballast, Yost maneuvered for a day and a night between 5,000 and 14,600 feet in a vain search for favorable winds. Ballast and expendable gear nearly exhausted, he touched down 200 miles east of the Azores.

The schematic diagram at right reveals *Silver Fox*'s controlled flight pattern through cycles of warm days and cool nights. Contraction of the helium in the evening results in loss of buoyancy and in a gradual decline in altitude. The process is slowly offset by the jettisoning of ballast. Greater variations toward the end of the flight reflect Yost's attempts to escape the Azores high.

FIRST MANNED FLIGHT, November 21, 1783, occurred near Paris in a lavishly decorated hot-air balloon built by Etienne Montgolfier. The machine carried Pilâtre de Rosier and the Marquis d'Arlandes to a reported height of 3,000 feet in a flight lasting 20 minutes.

EXPLORER I, a joint project of the National Geographic Society and the U.S. Army Air Corps, attained an altitude of 60,613 feet on July 28, 1934. A tear in the bag forced the three-man crew to parachute.

EXPLORER II lofted man to 72,395 feet, or 13.71 miles — an official record that endured for 22 years. Launched November 11, 1935, the giant balloon proved that life could be sustained in the stratosphere.

STRATO-LAB HIGH 5, on May 4, 1961, carried Comdr. Malcolm D. Ross and Lt. Comdr. Victor A. Prather, Jr., of the U. S. Navy to 113,740 feet (21.5 miles). Prather drowned during recovery operations.

EXCELSIOR III, on August 16, 1960, lifted Capt. Joseph W. Kittinger, Jr., of the U.S. Air Force, to 102,800 feet. Kittinger made a free-fall descent to 17,500 feet, where his parachute opened.

CONQUEST of the English Channel by hot-air balloon was achieved by author Yost and Don Piccard on April 13, 1963.

October 7 — 6:10 p.m. EDT
Stronger winds, averaging 31 mph, have put another 741 miles behind Silver Fox.

October 8 — 6:10 p.m. EDT
In the third 24-hour period, wind average drops to 21 mph, and Yost makes only 514 miles, for a total since departure of 1,844 miles.

October 9 — 6:10 p.m. EDT
On a wind that averages 26 mph, Silver Fox logs another 627 miles.

14,000 feet

ENGLAND

FRANCE

45°

Atlantic Ocean

Azores

Santa Maria

PORTUGAL

TOUCHDOWN
October 10, 1976
5:47 a.m. Eastern daylight time (8:47 a.m. local standard time)
101 hours, 37 minutes
Winds averaged 23 mph for the last 269 miles. The total flight was 2,740 miles.

Vertical scale exaggerated

PAINTING BY WILLIAM N. JONES
NATIONAL GEOGRAPHIC ART DIVISION

30°

WITH HE ED VOET

Contrary winds hound "Silver Fox"

SILENCE AND THE SEA surround me midway across the Atlantic (**left**). On this third morning aloft *Silver Fox* drifts southeastward at an altitude of 9,660 feet. Two days earlier I had taken a self-portrait (**lower left**) over the Saumons River of Anticosti Island in the Gulf of St. Lawrence. Lashed to a handling line, the camera swung inboard, blurring the image.

Below me now small cumulus clouds dapple the seascape. Overhead a layer of cirrus creates problems: Screening the sun, it reduces warming of the helium, thus impairing buoyancy and forcing me to expend precious ballast in order to maintain altitude.

Thunderstorms, a major threat to all balloonists, have presented no problem. I have sighted several, but *Silver Fox* has slipped past them.

Despite an instrument panel crammed with sensitive navigation and radio equipment, I rely for safety on several commonsense rules laid down by old-time balloonists. At higher altitudes I inspect my fingernails regularly for the telltale blue shade that warns of insufficient oxygen.

To avoid touchdown at sea during hours of fitful sleep, I have equipped a barometer with a motorcycle horn that shrills a warning should the balloon dip below 3,000 feet. For proof of continuous flight beyond the eyes of witnesses I carry two sealed barographs that trace an unbroken record of *Silver Fox's* altitude and time aloft.

As morning wears on, I realize I am being driven irresistibly toward the Azores high with its clockwise weather pattern. Commercial airliners crossing far above me continue to relay weather advice and navigational fixes, and to a seasoned balloonist the message becomes increasingly clear: Europe is beyond reach.

With ballast running low, I survey the items I can afford to sacrifice: most of my canned food, all but a little water, my sleeping bag, a radio receiver, even the sextant. But their loss will bring a priceless bonus—one more day in the air.

RECOVERY AT SEA marks the end of my flight, 200 miles east of the island of Santa Maria in the Azores and 700 tantalizing miles from success —the coast of Portugal. Less than three hours after touchdown in a light swell, the West German freighter *Elisabeth Bolten* eases alongside the still partially filled balloon; a Soviet ship stands by and watches the proceedings, but does not identify herself.

During the final hours in the air a Lockheed HC-130 rescue plane from the U.S. Air Force's 67th Aerospace Rescue and Recovery Squadron based at Woodbridge, England, circled me endlessly to ensure my safety and to radio my position to all marine traffic in the area. Only when *Elisabeth Bolten* responded to the call and recovery was moments away did Air Force discipline finally give way to Air Force humor.

"We're going to drop you a book," the HC-130 commander radioed me abruptly as *Bolten* hove into sight. What kind of book, I inquired.

"Jaws!" came the cheerful reply. "Best of luck from the 67th," and the HC-130 turned for home.

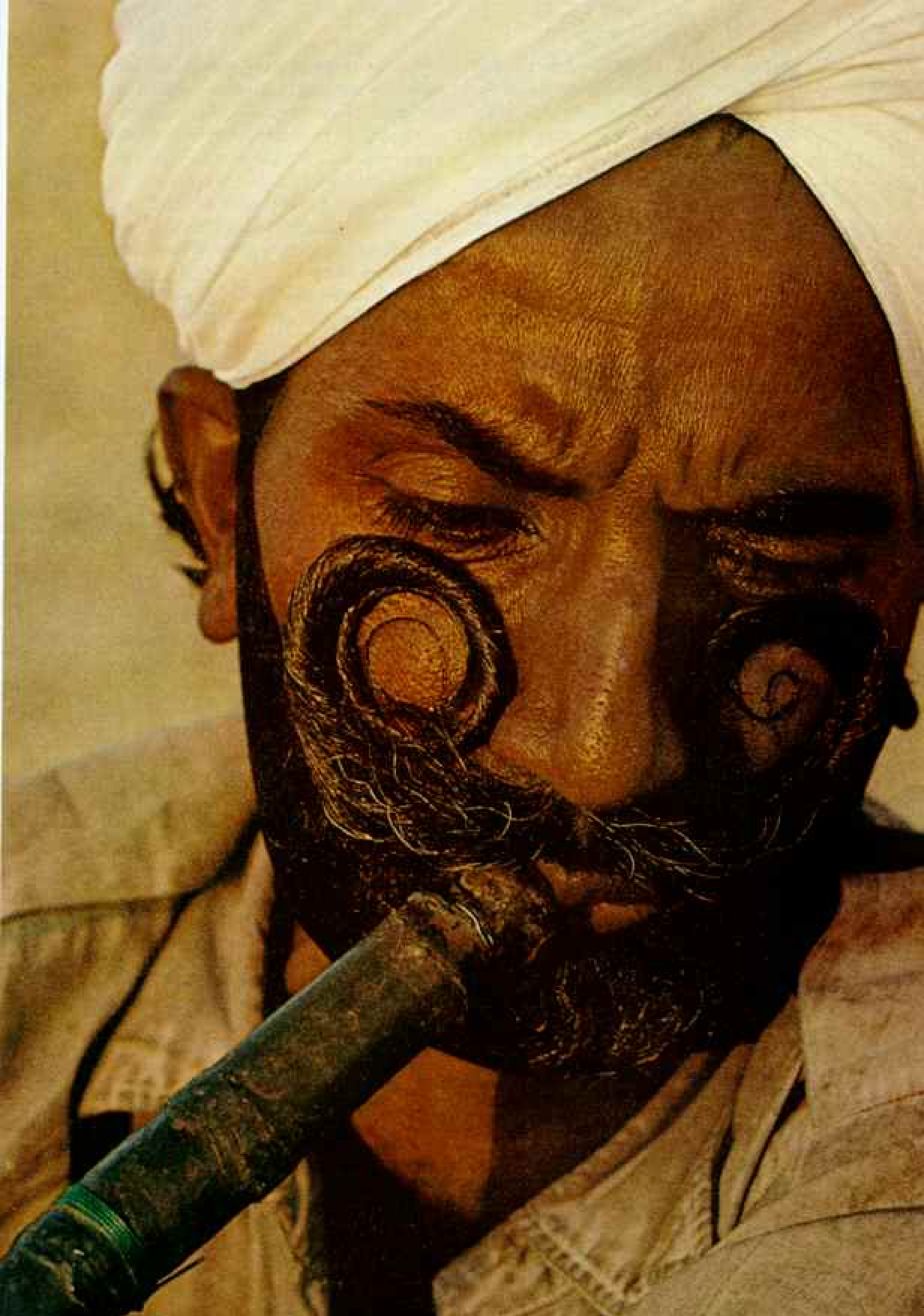
The ultimate boss of the 67th added his word upon my arrival at Gibraltar (**lower left**). The cable from Washington read in part: "You should take great pride in your truly outstanding achievement, and I extend my very best wishes to you, the members of your family, and to the people who helped make this feat possible." The message was signed simply, "Gerald R. Ford."

Will the Atlantic ever be crossed by a manned balloon? The possibility has long existed for a high-altitude balloon with a sealed gondola to ride the jet stream to Europe in two or three days. However, I prefer traditional ballooning in an open-air gondola and the challenge of direct conflict with the elements.

In either case, it is surely only a matter of time. □

CAPT. THEODORE SCHROEDER, USAF, AND CREW (ABOVE) (BELOW)

Ed Yost's "one man" attempt to span the Atlantic was, in fact, a team effort. The author's dedicated assistants, Richard Keuser, Jerry Melsha, and Bruce Hofer, helped build and launch the balloon. Two noted balloonists, Col. Joseph W. Kittinger, Jr., U.S. Air Force, of Excelsior III *fame (page 213), and Vera Simons, operated tracking stations near London and Washington, D.C. Support also came from the U.S. Coast Guard and the crews of Pan American World Airways, Inc., and Trans World Airlines, who volunteered weather data and radio plots en route. TWA first officer Harry Repak tracked and advised Yost all the way.*



The Pageant of Rajasthan

ARTICLE AND PHOTOGRAPHS BY
RAGHUBIR SINGH

THE HAUNTING SOUND of the bandit's flute floated through the village, mingling with the searing heat of the Great Indian Desert. When the music stopped, Karna Bhil (**left**), one of the most famous of Rajasthan's *dacoits*—a special breed of outlaws—drew the three-foot *narh* away from the grandiose coils of his oiled mustache. His eyes bored into mine. Under the stare of a man reputed to have killed dozens of people, it was I who blinked.

He spoke of the code of the dacoits, one of the many traditions of the Indian State of Rajasthan, my homeland. The true dacoits claim they are honorbound, as they have been for centuries, to rob only the rich and only in broad daylight. He boasted of a jailbreak, telling me how he had dug his way out of his cell "with my bare hands." For the moment he was free though, not charged with any crime, living as a small farmer. His lean fingers lovingly caressed his flute as he talked. "I play the narh camped out alone at night on the sand dunes," he said. "It helps to relieve the solitude." It has also made him one of Rajasthan's most renowned folk musicians. In late 1976 this living legend again lost his freedom; convicted of two murders, he is now serving a life sentence.

After years of living abroad, I recently returned to this harsh land of sun and sand, wind and rock where I was born and raised, to meet and photograph

its people: the musicians, the craftsmen, the nomads and other tribesmen.

Once this was the land of the Rajputs, Sons of the Kings, India's storied caste of warriors, rulers, and, later, landowners like my father. Thus, I was born a Rajput. In legend our ancestors sprang from the sun, the moon, or fire and emulated the heroes of such ancient Indian epics as the *Ramayana*.

From the early Middle Ages to the 18th century, the fiery, chivalrous Rajputs battled each other and ceaseless waves of invaders. One Rajput in particular remains a towering national figure: Maharana Pratap, the "one unconquerable mind" who successfully resisted the might of the Mogul Empire.

With the coming of the British, the Rajput princes were forced to make treaties with the Crown. After independence in 1947, they once again bowed to the times; the 22 princely states collectively called Rajputana were merged into the modern State of Rajasthan in the new Indian Union. In exchange the princes were granted many privileges and ample allowances, or "privy purses," from the government. And while I was growing up in the capital city of Jaipur, the final chapters in the passing of their age were being written.

HIGH ON A HILL facing my family's home stands the Nahargarh, Tiger Fort, whose fortifications are linked with Jaigarh, or Victory Fort. In the latter, according to legend, long ago was hidden the treasure of the Maharaja of Jaipur. Once in a lifetime each successive maharaja was led blindfolded into the vault. After being permitted to gaze at the incredible sea of jewels and gold, he was allowed to choose one piece, and only one, for his own.

In the 1930's Maharaja Man Singh II showed an English visitor a jewel of his father's: a golden bird 16 inches high, studded with rubies. Too young to lay claim to that or any other jewel for his own, he said, "What does it matter? There is no hurry." Little did the youth know what was to come.

In 1971 the members of this most exclusive club were stripped of their titles, privileges, and privy purses, turned into ordinary citizens, and delivered into the hands of the tax collector. But the government never found the fabled Golconda of Victory Fort.

BEYOND THE CITIES of Rajasthan, in the villages set in sand and shrub, the traditions of the Rajasthani peasant live on in countless fairs and festivals, songs and dances, with which they celebrate everything from the life-giving monsoon to the simple toils of daily life.

An unusual man named Komal Kothari is recording those fading traditions for future generations. One day he introduced me to one of his finds, a bearded man with a striking face and deep, gray-green eyes. Gold earrings dangled beneath his turban, and a silver pendant of a folk deity hung from a string around his neck.

"His name is Gulab Nath," Komal said. "He is from a group of camel breeders, but he married a snake charmer. Now he's become one of them. They travel with their snakes coiled in baskets and their few possessions bundled onto the backs of donkeys. Lean hunting dogs help them kill the wild animals they eat."

Rabindranath Tagore, the famed Bengali poet and mystic, knew the value of such people and the culture they have infused into India's marrow.

"Villages are like women," he wrote. "In their keeping is the cradle of the race. They are . . . in closer touch with the fountain of life. They . . . provide people with . . . food and joy, with the simple poetry of life, and with those inner ceremonies of beauty which the village spontaneously produces and in which she finds delight."

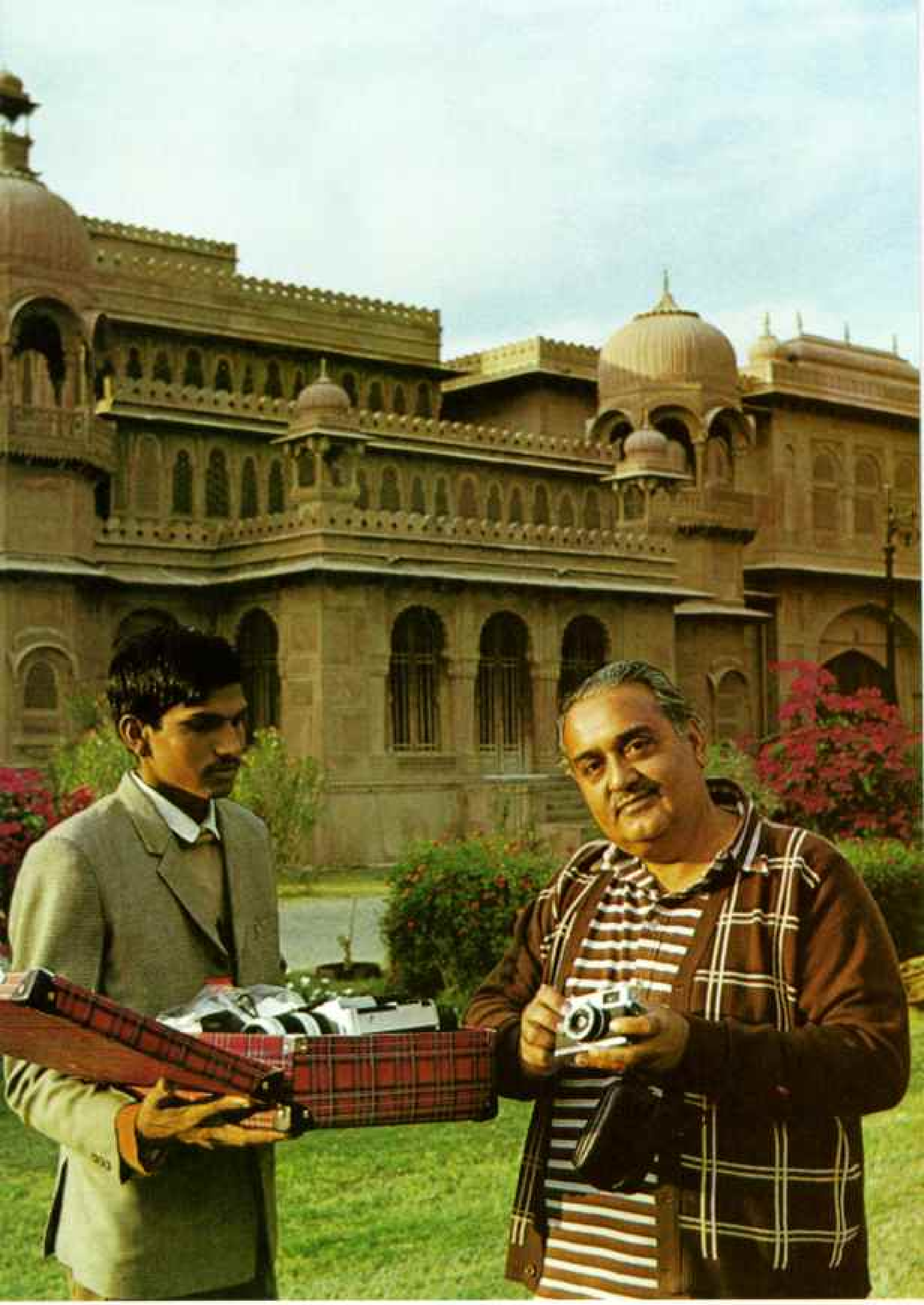
I feel that way about Rajasthan; its spirit travels with me, while something of myself remains behind.

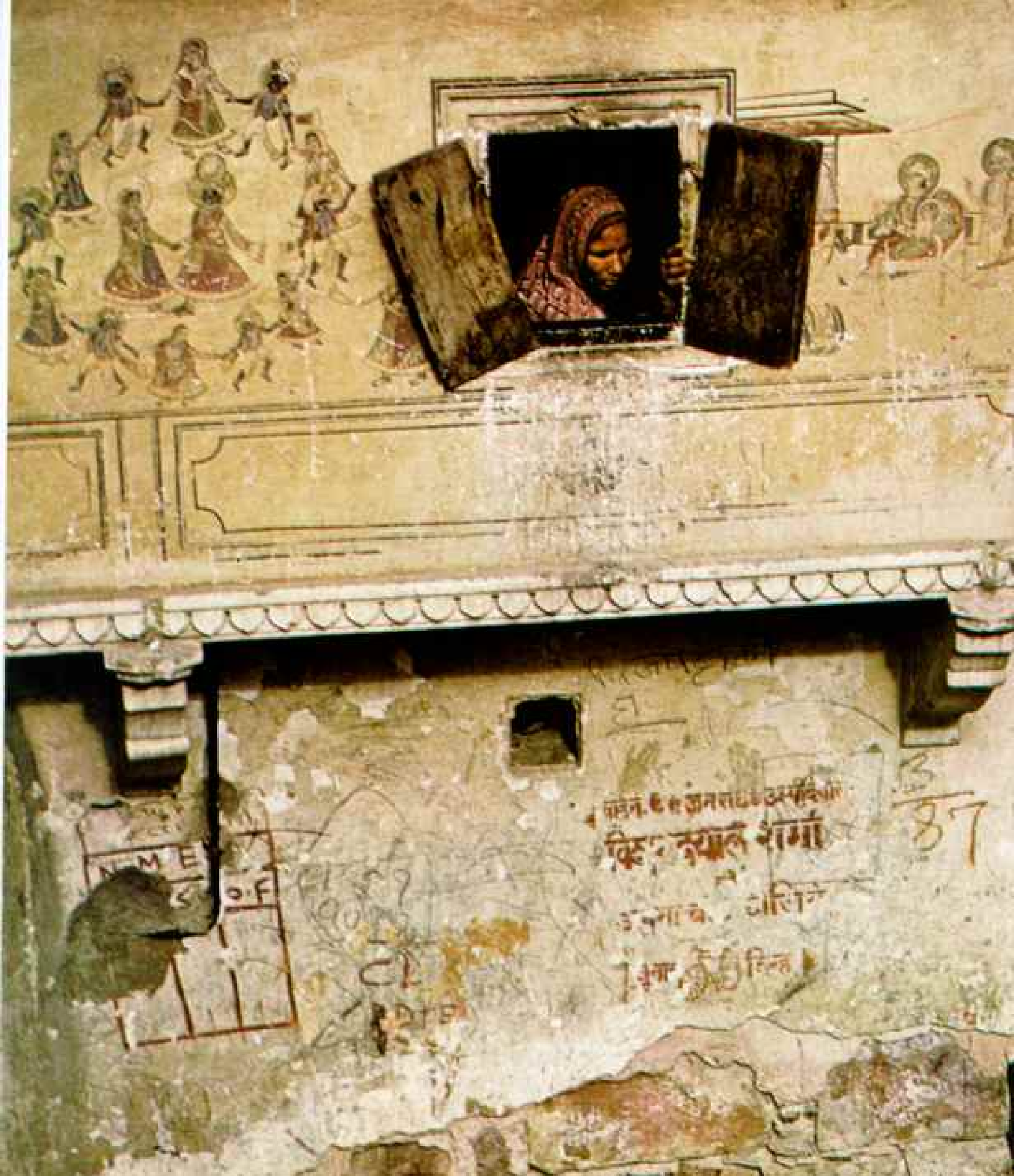
"Great Wall of India," built in the mid-1400's to thwart Moslem invaders, snakes 24 miles over the Aravalli Range. The bulwark was one of 32 erected by Rana Kumbha, one of India's greatest rulers. An outpost and a temple flank the fortifications, features common to many battlements that thread their way through the state. Bigger than England, Scotland, and Ireland combined, thinly populated Rajasthan sprawls over India's northwest corner along her sand-swept border with Pakistan. The Great Indian Desert covers almost half the region.

The bell tolls for the maharajas

LIKE A TOURIST in his own home, Dr. Karni Singh, once Maharaja of Bikaner and now a historian, makes photographs in front of his Lallgarh Palace. With the rest of India's princely rulers, Dr. Singh has been stripped of his regal perquisites. He has had to sell most of his assets to offset taxes of some $40,000 a year—nearly as much as his income—and has converted his fort into a museum and part of his palace into a hotel.

During British rule some of the princes, through extravagance and eccentricity, earned reputations as the playboys of the subcontinent. Others, like the Bikaner rulers, used their influence for the good of the people. As independence approached, Dr. Singh's father, the former Maharaja Sadul Singh, played a linchpin role in inducing most of Rajputana's princely states to become part of the Indian Union. A member of India's Parliament, Dr. Singh himself has long been concerned with winning water for Bikaner's thirsty soil through government irrigation projects.

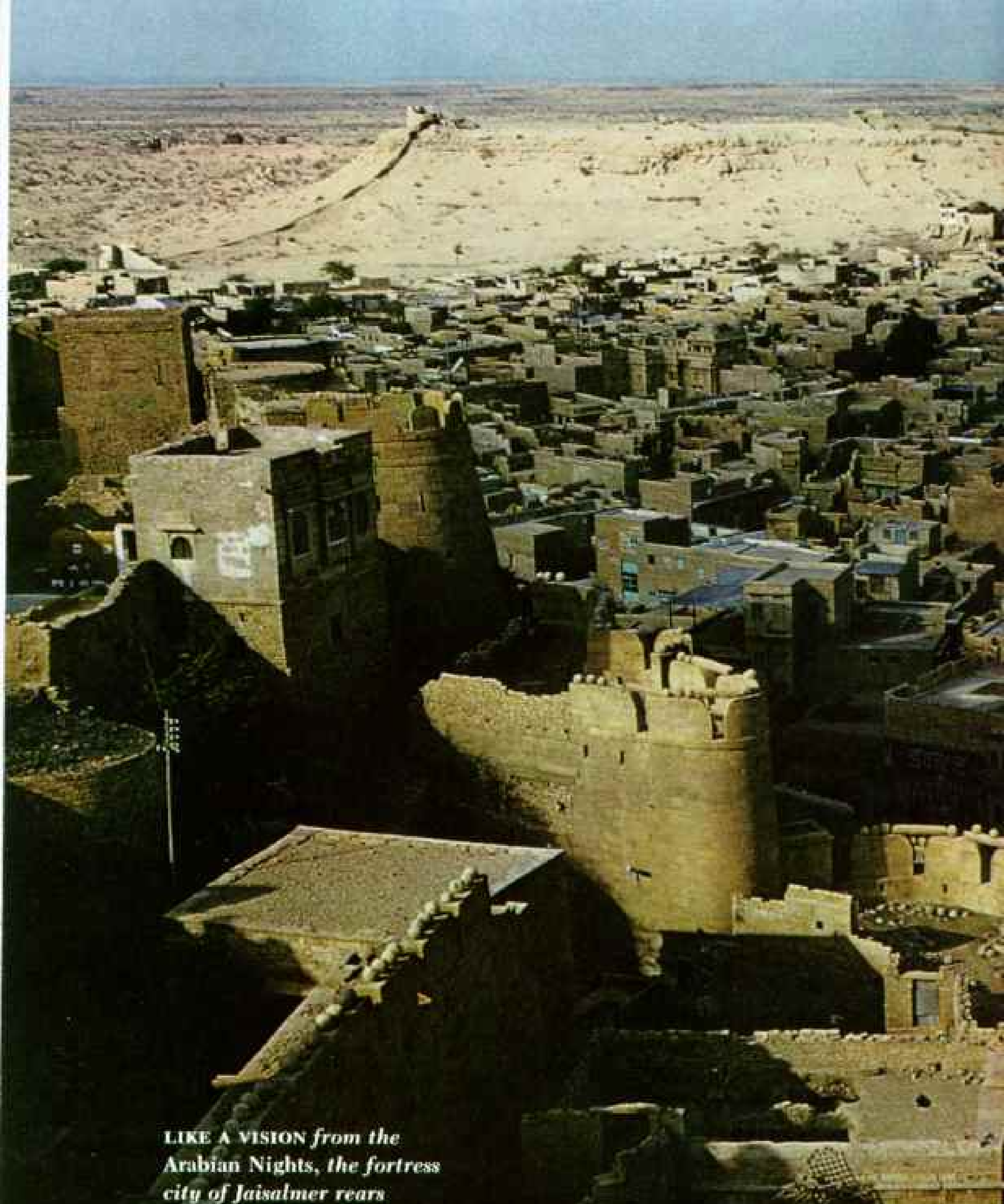




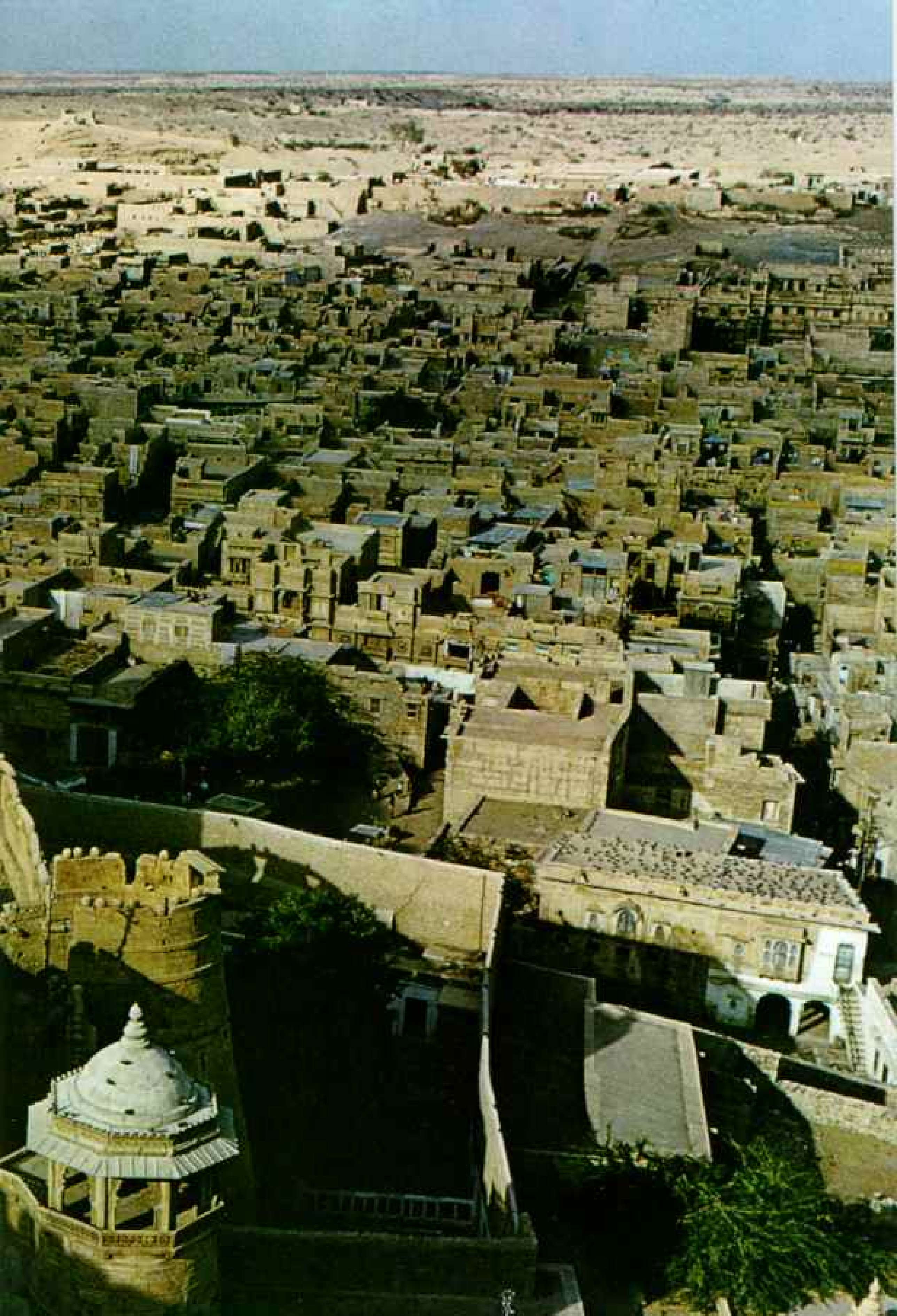
A place for people and gods

"FIX THY MIND on Me, be devoted to Me; sacrifice unto Me, bow down to Me," commanded Krishna, one of the most beloved of all Hindu deities. Scenes from his life flank a window in Jaipur, where a woman keeps a watchful eye on children playing below.

In times past many religious frescoes were repainted each year. Today, especially in the cities, the practice is dying out, though other traditions remain. Sculptors still ply their trade in this area, as do other artists and artisans in their own sections of the city. Meanwhile, the enduring charisma of the past lives side by side with social reality. The father of these children—like fathers of so many others of the middle class—is probably a clerk.

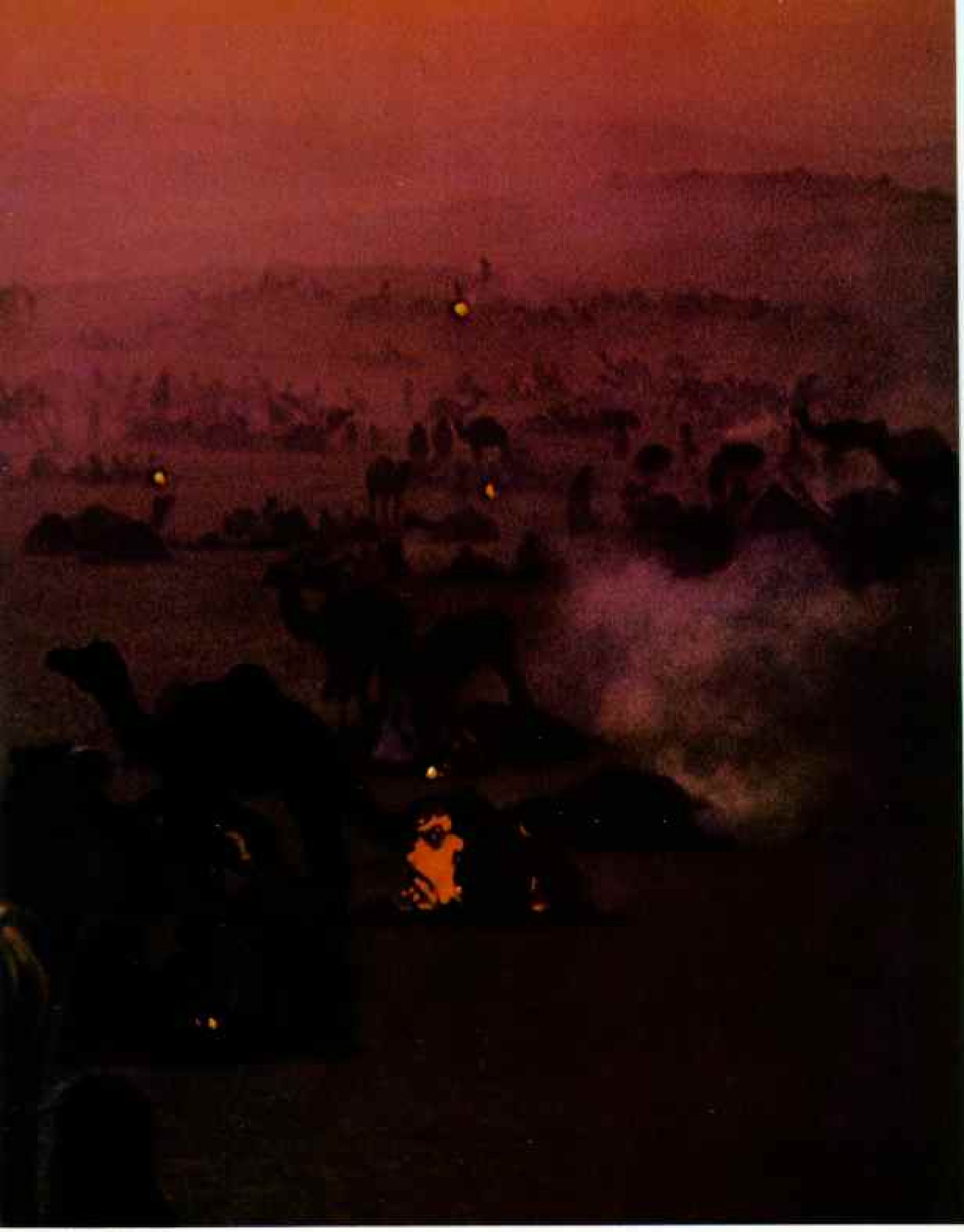


LIKE A VISION *from the* **Arabian Nights,** *the fortress city of Jaisalmer rears from Rajasthan's desolate western reaches. Founded in the 12th century* A.D., *it grew up along a caravan route to the Khyber Pass. The fort, in the foreground, now houses some 2,000 of the city's 20,000 inhabitants.*



A timeless twilight ...

CAMPFIRES FLICKER, weaving a smoky spell over camel traders bedding down for the night at the Pushkar Fair after a hard day of haggling. Each year tens of thousands



of Indians attend the week-long festival to buy and sell livestock, enjoy feats of strength and skill, and bathe in holy Pushkar Lake nearby. Here, according to a legend, Brahma, the Hindu lord of creation, performed a sacrifice by letting a lotus blossom fall from heaven. It struck the earth in three places, and water sprang forth, creating the lake.

...and a torrent of joy— the monsoon

"AT THE FIRST SWING, O my mother, the clouds appeared," sing the women in July, welcoming the end of the months-long dry season. In a village (**left**), up go the swings as down come the rains. A gentle monsoon shower nourishes smiles on the children's faces and laughter in the hearts of their parents. In another village (**below**), men celebrate the monsoon with traditional songs, thrusting their umbrellas at the heavens. "All the lakes are brimming," sings one paean. "The lovely season has come to my country, The good season has come to my country."

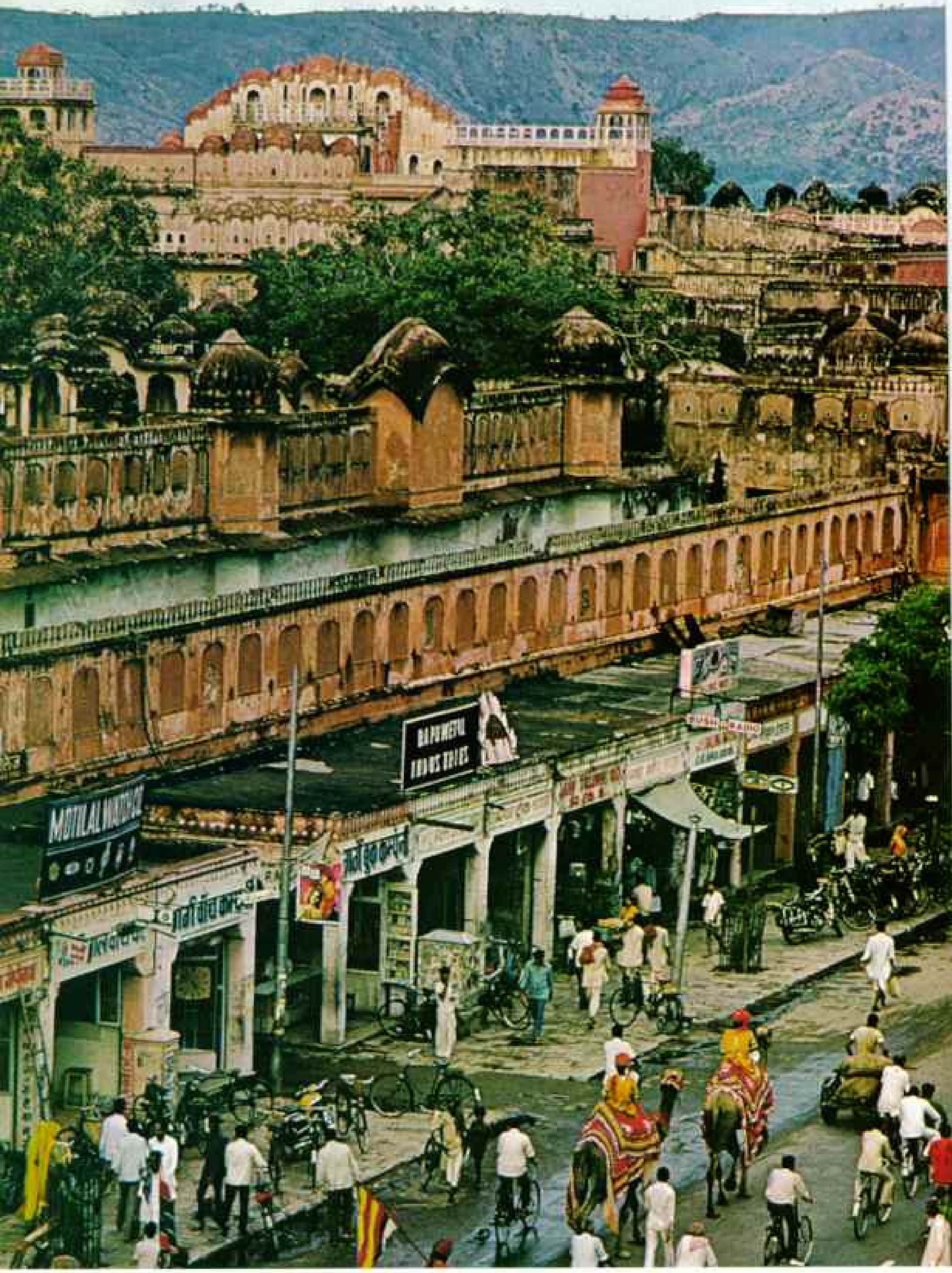
The first Rajasthanis

THE SOUND OF LAUGHTER rings through the mountains and surrounds a temple in Rakhabh Dev as tribal Bhils honor Kalaji, the god who protects their village. Abloom in her brightest finery, a girl dashes through the crowd with a friend in hot pursuit (**left**). Spontaneously two women embrace (**right**).

Long before the Rajputs arrived, the Bhils roamed over what is now Rajasthan, worshiping a vast pantheon of nature gods. In one legend Bhil twins were earth's only inhabitants. When the gods demanded the head of one and the eyes of the other, each unhesitatingly obeyed. Pleased, the gods restored them to life, and their race was born.

Gradually the Bhils yielded power to the Rajputs. Though most are now settled, some remain seminomadic and animistic. Polygamy, long regarded as a sign of wealth and prestige, is still practiced occasionally. "If a Bhil runs away, his neighbor gets his dwelling," says a proverb; "if he dies, the neighbor gets his wife."

East and West marry in Jaipur, Rajasthan's capital, where broad



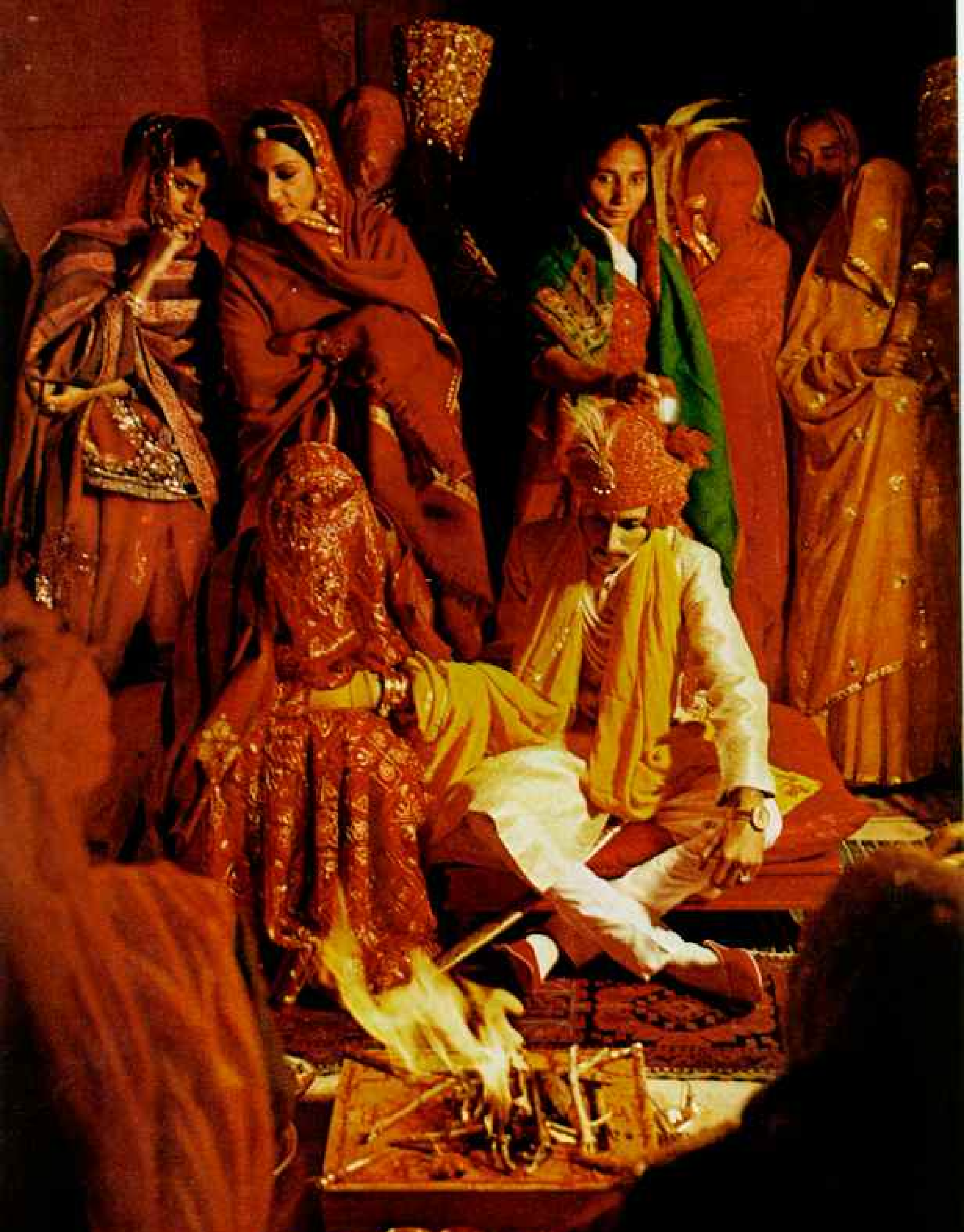
streets are embellished by a fairy work of domes and corbels.

Splendor lingers in royal weddings

WITH THE POMP AND PAGEANTRY of a Mogul court, two marriages—perhaps the last of their kind—mark changing Rajput society. In Jaisalmer Palace (**above**) dancing girls twirl as the groom, son of a onetime raja, waits on a silver throne for the ceremony joining him and the daughter of Jaisalmer's former ruler.

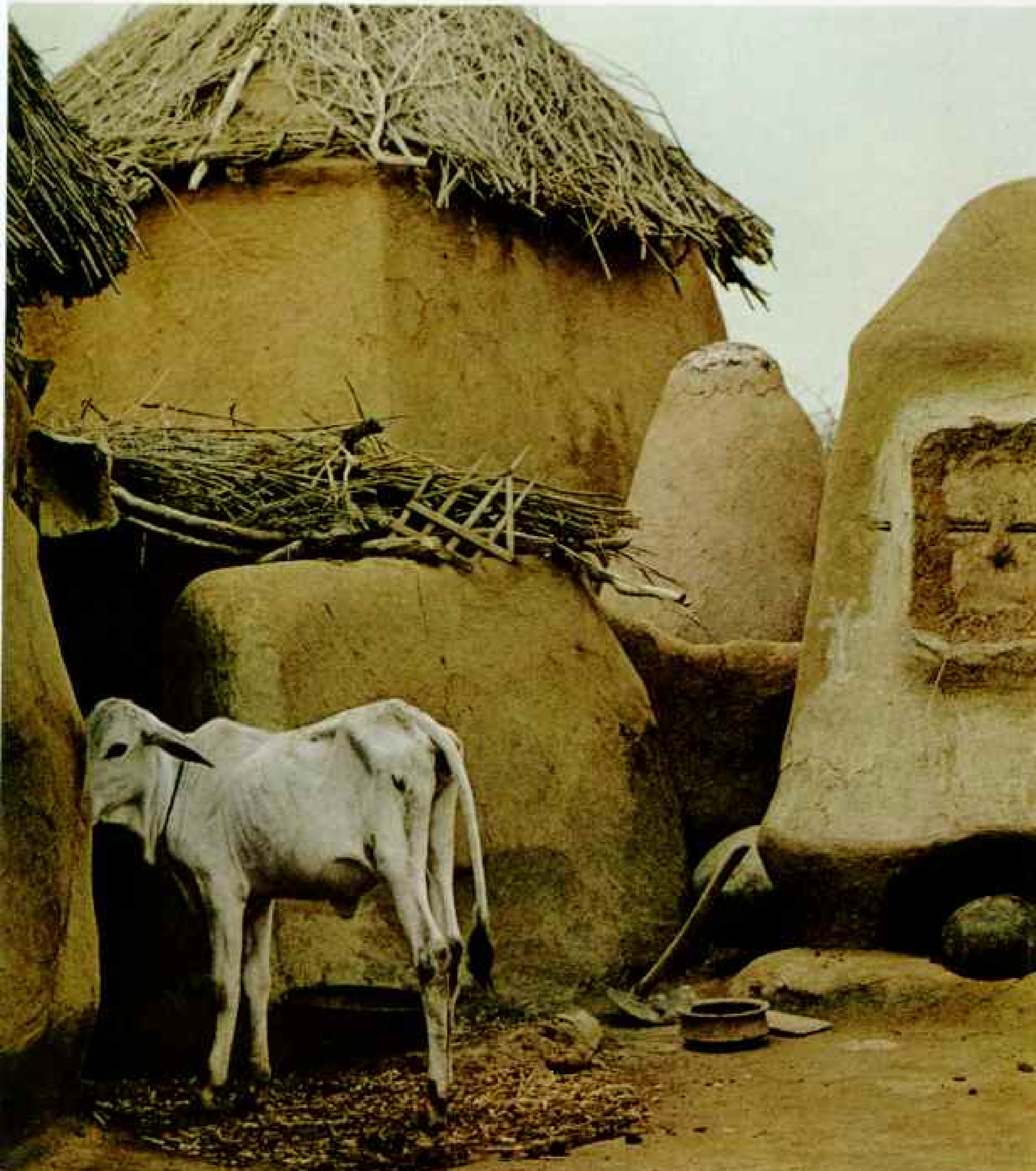
At Lallgarh Palace (**below**) musicians at the wedding of the youngest daughter of former Bikaner Maharaja Karni Singh (pages 222-3) entertain while vows are being exchanged near a temple outside. The bride and groom (**right**), sitting before a holy fire, listen to chanted hymns. Dr. Singh's oldest daughter was married—by choice—not into a princely family but to the son of a landowner.

In both cases the government restricted the amounts and kinds of food and drink served, thus eliminating the extravagances of the past.



Granaries of clay and dung...

HUMAN FACES, subtly suggested, adorn sealed silos near Bikaner—another bit of folklore woven into the everyday fabric of Rajasthani life. The earthen bins, called *kothis*, protect the villager's food for his table, seed for his fields, and grain for his



livestock. A gaunt calf, one of India's sacred cows, stands tethered in a corner. In Rajasthan, reverence for these animals that provide milk and the dung used for both building material and fuel remains undiminished.

Another fixture, "the Bird of Birds—the Indian Crow," as Mark Twain extolled the "hardest lot that wears feathers," flaps across the scene on its way to larceny. In the fields of Rajasthan, as in fields anywhere, the crow is a pest, but in the household it is tolerated as a drop-in pet.

...for harvests guarded by tireless vigil

"WE SHALL LIVE day and night in the fields. Praise God, praise!" To that refrain, a farmer named Surajmal moves his bed into his single precious stand of barley—a common sight throughout India—to guard it against fire, thieves, or wild animals.

The crop will provide the family's only grain until the next growing season; if bountiful, some of it will probably be sold in nearby Udaipur.

Enough rain usually falls here in southern Rajasthan to allow a second planting—hence, this March harvest after other crops were reaped in October. When the worst happens and the monsoon fails—and it often does—famines are less disastrous than elsewhere in India. The resilient Rajasthanis simply turn to their goats and sheep to tide them over until the rains come again. One way or another, they get by.

Promise for a parched land

A MIRAGE COMES TO LIFE as villagers lead their stock to drink from the Rajasthan Canal, the result of a relentless assault on the dry northwestern wasteland. Fed by the Beas and Sutlej Rivers in northern Punjab, half of the 290-mile-long project has been

painstakingly trenched and lined with tile and brick through the desert. Planning began in 1957, but progress was stalled by disputes over water rights with Pakistan, as well as by shortages of labor and material. The World Bank bolstered the 174-million-dollar scheme with an 83-million-dollar loan. When complete, the canal is expected to make three million acres of desert bloom with cotton, wheat, and other crops. Here, where a child can live for years before seeing rain, that will be nothing short of a miracle. □

The Ohio—River With a Job to Do

By PRIIT J. VESILIND
NATIONAL GEOGRAPHIC STAFF

Photographs by
MARTIN ROGERS

Tightening steel tendons that lash together thousand-ton barges, "Skip" Stewart readies a tow for a trip down the Ohio. From Pittsburgh's glittering Golden Triangle (**following pages**), where the Allegheny, right, and Monongahela Rivers merge, the Ohio drains one of the world's most productive industrial and agricultural basins. Although factory wastes and sewage still afflict the waterway, an interstate cleanup is now reviving the Ohio and encouraging its cities and towns to rejuvenate dilapidated riverfronts.

THE RIVER AIR IS MOIST, sweetly sulfuric in the heat of August. Our diesel-driven towboat leaves the Pittsburgh area at twilight, pushing a patchwork of eight barges through the industrial corridor of western Pennsylvania. Factories. Scrapyards. A run-on jumble of mill towns.

At Mile 17, Aliquippa, we struggle with chains and ratchets in the darkness, lashing on a barge carrying 700 tons of steel destined for Baton Rouge. When the night-shift deckhands relieve us, I climb up to the pilothouse of the boat, Union Mechling Corporation's *Northern*, where 52-year-old Capt. Louis Carroll Himes looks at me skeptically.

"The tow's a dangerous place," he warns, "on-account-a you can't make no mistakes out there. In a factory you lose maybe your hand, but out there on the tow you're liable to get killed. That's why I take special pains with the greenhorn."

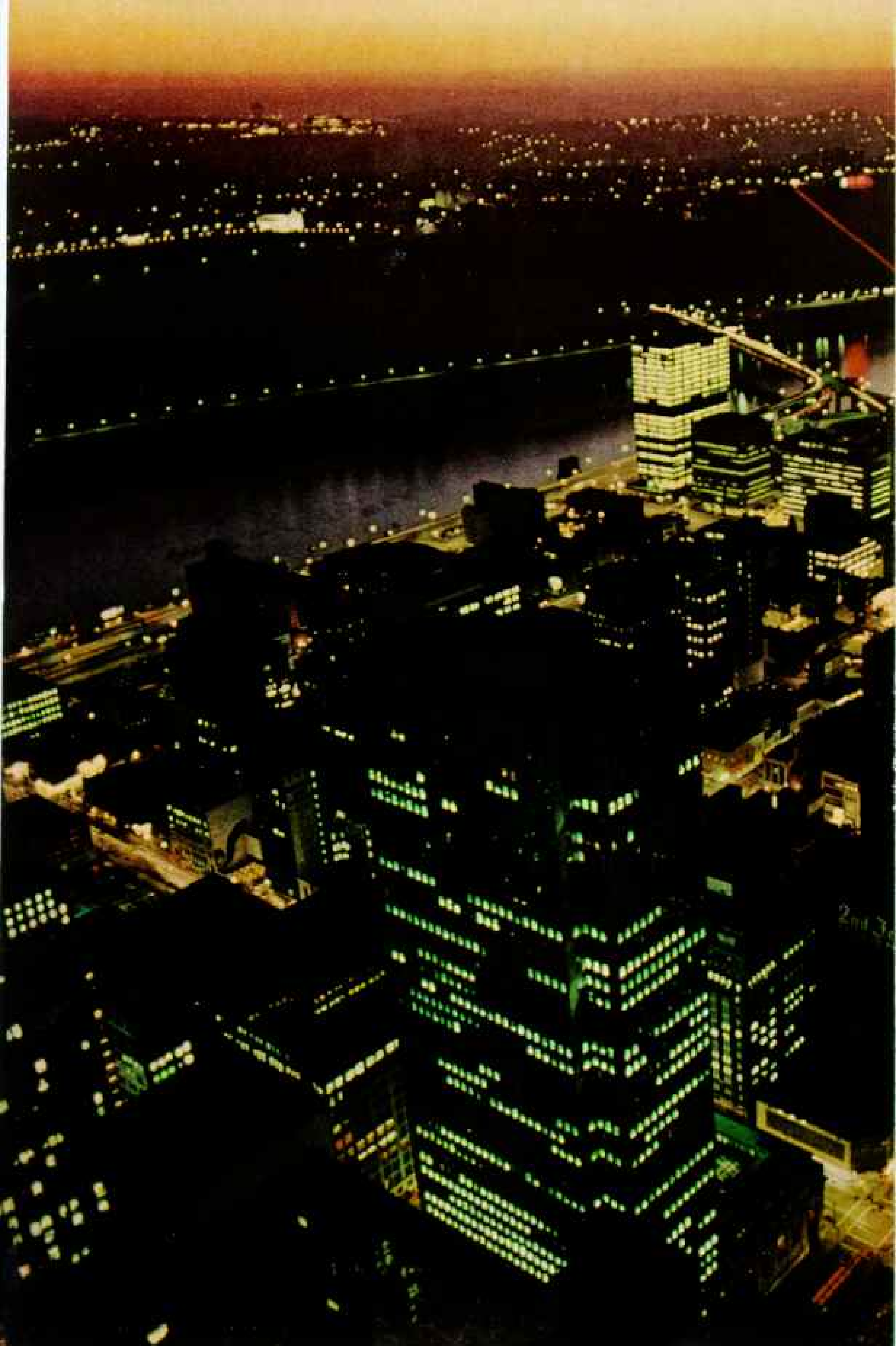
Greenhorn. He meant me. I was to be a novice deckhand for a week—the time it takes the *Northern* to work the 981-mile length of the Ohio River from Pittsburgh to the Mississippi at Cairo, Illinois. Captain Himes, a master pilot, had long since memorized every island, bend, and sandbar. But I, too, knew something about this section of river, for I grew up here in the coal-rich upper Ohio Valley.

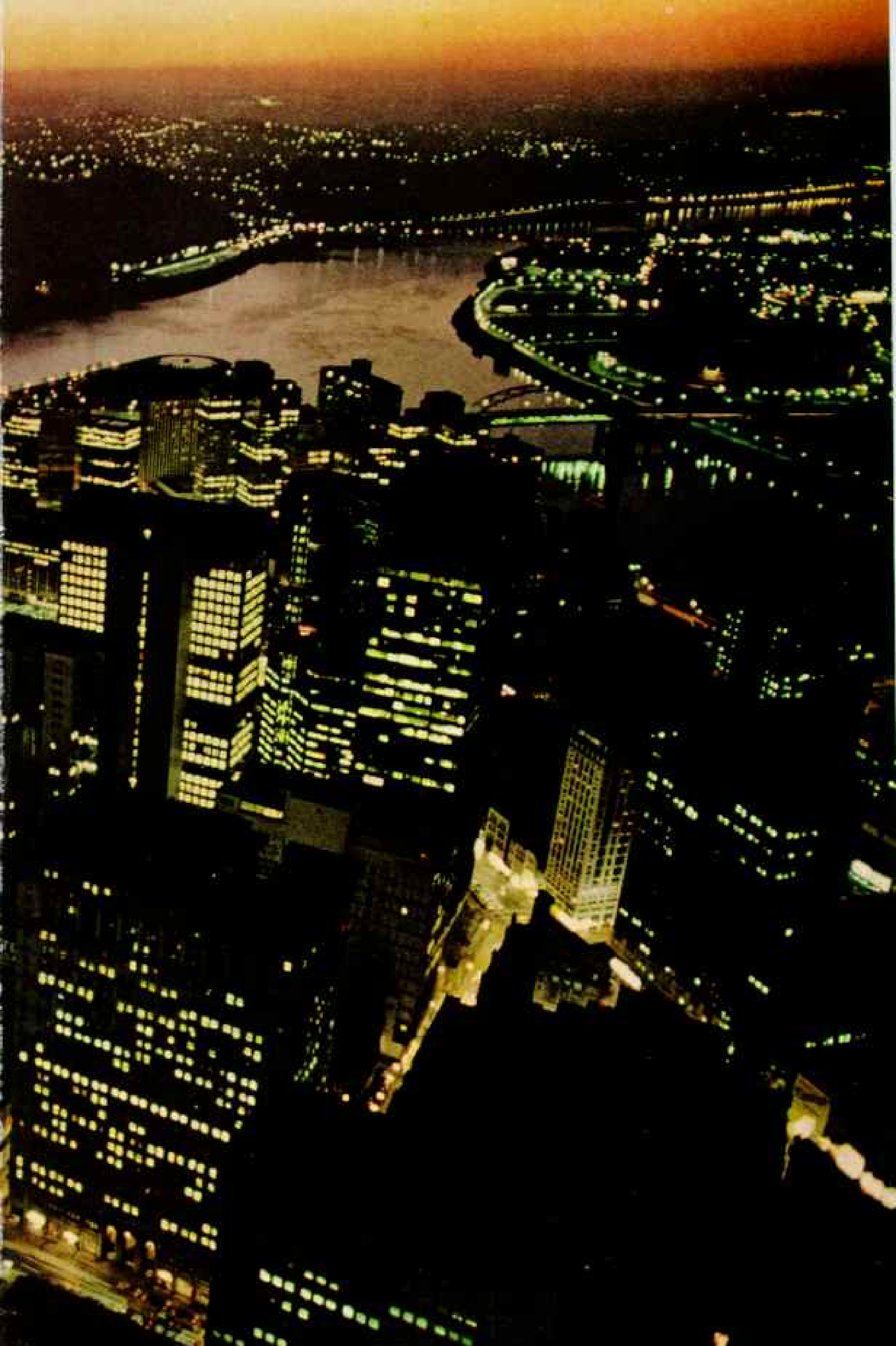
Mile 25

The sounds and smells are familiar: the clank and gnaw of railroad couplings, the rich musk of oil refineries. And as the *Northern* edges past the mouth of the Beaver River, I can see my hometown—Beaver, Pennsylvania, a prosperous county seat of 6,500.

As kids we often sat on the bluff overlooking the river and watched the powerful towboats. They seemed endless—the barges of oil and chemicals, coal and gravel that passed and disappeared into the river haze. Late at night we heard the shift whistles of the mills and the faraway rumbling of hopper cars. And we heard the towboat horns lamenting the fog—a sound that spoke of cold black water, immense weight, and loneliness.

Few of us were Huckleberry Finns in the early 1950's. The riverbanks were sullied by oil and scum, the water was murky and acidic, and "undesirables," mother warned, lurked beneath the railroad bridge. Swimming in the





river was considered unsavory at best, but we did fish for carp and catfish at the mouth of the free-flowing municipal sewer pipe.

French explorers of the 17th century found a much different river. It was then a free-flowing stream, a foaming torrent in the spring floods, a sluggish ribbon in the summer droughts. They marveled at the beauty of the Ohio, calling it La Belle Rivière. And during America's early expansion the Ohio was a great highway to the West—a river of destiny, romance, and folklore.

But with increased settlement came the abuses of cities and heavy industry. The river slipped into civilized degradation, choking its aquatic life, alienating its people.

Today, although pollution and economic lethargy still vex some areas, the Ohio Valley is enjoying a hard-earned revival. Industry and commerce, boosted by the completion of bigger locks and dams, are thriving and expanding despite stricter pollution standards; successful cities like Louisville and Cincinnati are finding renewed pride in their river heritage; and the water itself is healing through an ambitious interstate effort.

In Beaver, a sewage-treatment plant now squats near the waterworks, kids swim by the railroad bridge, and bass spawn along the willow banks.

Throughout the bittersweet history of the Ohio, its soul has been the robust energy of working people. The Ohio is, above all, a working river. It has no trickling childhood of mountain streams; it is born an adult, mature and strong, from the union of the Allegheny and the Monongahela at Pittsburgh.

Nearly 25 million people in parts of 14 states live in the 203,900-square-mile Ohio Basin, one of the world's most productive land areas. (See **"Close-Up: U.S.A."—Illinois, Indiana, Ohio, and Kentucky**, a supplement to this issue.) The Ohio hauls more freight than the Panama Canal and carries more water than the upper Mississippi where the two rivers meet (map, below). Some rivermen even insist it's the *Ohio* that flows into the Gulf of Mexico.

The tireless Ohio, harnessed for heavy labor

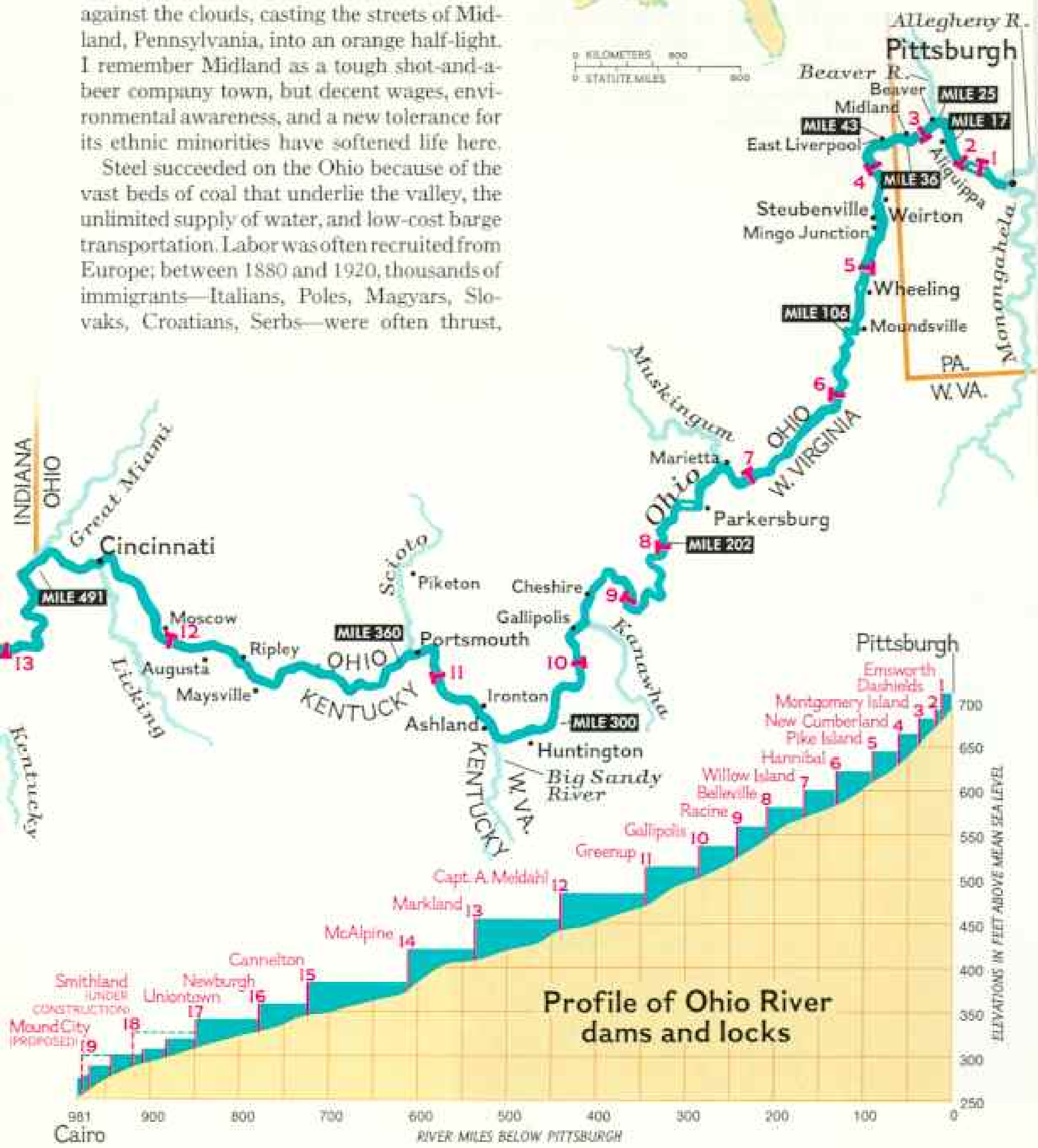
A WILD, CAPRICIOUS RIVER confronted French explorers who ventured down the Ohio in the 1600's. Sometimes swollen and powerful, often shallow and snag-ridden, the river played tricks with flatboating settlers, keelboat merchants, and steamboat captains into the 20th century. But by 1929, navigational dams and dredging had tamed "La Belle Rivière" into a series of lakelike pools with channels at least nine feet deep. Dependable for year-round commerce, the river carries more cargo than the Panama Canal. New locks accommodate 17-barge loads, pushed by powerful diesel towboats that can make the 981-mile trip from Pittsburgh to Cairo in less than a week.

In the months that followed my towboat job I saw many other faces of the Ohio. Twice again I journeyed up and down this tireless ox of a river—hauling, hammering, chopping, and peddling through other jobs, and sharing parts of other lives.

Mile 36

Shortly after midnight we glide past Crucible's steel mill on the north bank. It hisses and smokes like a petulant dragon. Molten metal glows against the clouds, casting the streets of Midland, Pennsylvania, into an orange half-light. I remember Midland as a tough shot-and-a-beer company town, but decent wages, environmental awareness, and a new tolerance for its ethnic minorities have softened life here.

Steel succeeded on the Ohio because of the vast beds of coal that underlie the valley, the unlimited supply of water, and low-cost barge transportation. Labor was often recruited from Europe; between 1880 and 1920, thousands of immigrants—Italians, Poles, Magyars, Slovaks, Croatians, Serbs—were often thrust,



wide-eyed, into the maw of the river mills.

"It used to be that 'mill Hunkies' like me didn't go past Sixth Street in Midland," remembered Sylvester "Sonny" Vranes, now a Crucible supervisor. "That was where the 'Americans' lived. But it's changed—a name doesn't mean a thing anymore."

Photographer Martin Rogers and I came to Midland for Serbian Christmas, celebrated on January 7. Snow covered the hillside where Stanley Holava, a retired millworker, barbecued two suckling pigs for the *pečenica*, the holiday roast. An old refrigerator motor turned the spit over wood coals (below).

"American ingenuity," chuckled Stanley, pleased with the operation. That morning he and his steelworker sons, Ted and "Skeets," had butchered the traditional Christmas dinner. On a stump sat a bottle of untraditional bourbon, for traditional toasting.

"I'll tell you what," said Ted, pointing to the pig, "this here's *our* soul food."

At the Serbian club on Christmas Eve, after religious ceremonies, an exuberant trio, home from college, plucked tamburitzas, and everybody sang Serbian folk songs of heartbreak, courtship, and village fun. Martin and I stumbled happily along, arms over shoulders, in the Serbian circle dances.

The revelers left shortly before midnight and reassembled solemnly in the choir loft of St. George Serbian Orthodox Church for Christmas vigil service. Outside, a light snowfall soothed the stained buildings of the little town as we sang an Austrian carol, "Silent Night," first in Serbian, then in English.

Next day we joined the Holavas for Christmas dinner. Straw to recall the manger was spread beneath the table where Stanley lit the Christmas candle. Between the sweet bread and the homemade noodle soup sat the head of the pečenica, an apple in its mouth. Stanley doused the candle with wine, and then, in a moving ritual, four generations of Holavas kissed one another, repeating the words: *"Hristos se rodi. Vaistinu se rodi*—Christ is born. Indeed He is born."

Mile 43

Five-thirty a.m. James Philpott, a deckhand on the other shift, barrels up the stairs grinning and clanging a bell. At breakfast we load up on biscuits, gravy, bacon, sausage, and eggs.

"Any cook that I have knows she's gotta feed the boys," Captain Himes boasts, "on-account-a I won't let 'em slouch on their work. When they come to that table, they want to eat just like *hogs*, on-account-a they worked hard, and, by golly, you can't make it on a bowl of cornflakes."

The riverbank smolders with glass factories, brickyards, and potteries as the Ohio

The backyard's a factory in small towns like Mingo Junction, Ohio (**right**), where steel mills line the river. Many such enclaves of industry sprouted in the 1800's, when mining of enormous coal seams boosted iron- and steelmaking, and supplies of clay and natural gas gave rise to pottery, glass, and brick industries. Later, deposits of salt and limestone led to chemical manufacturing.

By 1920 thousands of European immigrants had been recruited to work the Ohio River mills. Many came to Midland, Pennsylvania, a steel town, where retired millworker Stanley Holava (**left**) barbecues pigs for his family's traditional Serbian Christmas dinner.


TOOLS

funnels south between the steep and sooty hillsides of Ohio and West Virginia. Underlying deposits of clay, sand, limestone, and natural gas feed the industries.

We pass Steubenville, Ohio, notorious for its 1970 ranking by the National Air Pollution Control Administration as the city with the dirtiest air in the nation. Since 1969 the area has been suffering from a chemical pollutant that turns pastures an iridescent blue and causes cattle to lose their teeth and die.

Wheeling, in the northern West Virginia panhandle, is an industrial city of 48,000 and a hub of transportation—both river and highway. Driving there a few months later, I pulled into a complex of truck stops by Interstate 70, a beehive of droning semitrailers caked with highway dirt. Inside a coffee shop, country fiddles wailed from the jukebox, and the waitress, hair confected into a marvelous bouffant, sang lustily along.

All the comforts of home for the truckers—a motel, store, showers, even a burlesque house—open late into the night. Curious, I wandered in to see a self-assured blonde flip her tassels at bleary-eyed drivers.

I asked her later what it was like to dance at a "dirty old" truck stop. She blinked politely at me, half-offended.

"Truckers are the most gentle people I've ever worked in front of," Delphine Jenness informed me. "They never make you feel cheap or insult you. I met one trucker last year and really fell for him, but I lost out to a load of cabbage. That's the last time I mess around with anyone carrying perishables."

Mile 106

The river is bound in fog. From above, it must resemble a looping string of cotton. Squeezed by sandstone bluffs, it slides southwest out of the shadow of heavy industry. An occasional creek flows into the main stem, and there is a deep-set hollow where chimney smoke from coal fires curls in violet wisps.

We sit glumly in the darkened deckhouse in the bow of the *Northern*, surrounded by coiled ropes and cables, yellow rain slickers, and oily life jackets. A pale light bulb is our only comfort against the morning.

"This here's the doghouse," one deckhand laments, "where us dogs sit."

Topside, Captain Himes stares intently at the blipping of the radar screen. The end of the tow is invisible, and we push a sealed bargeload of toxic liquid chlorine. An accident, and we might seriously endanger the population for miles around with the escaping fumes. Before radar, we would surely have been tied to some old sycamore tree, playing poker in the doghouse.

Chemicals account for more and more river tonnage. The industry came to the Ohio mainly for the limitless water for processing and transportation. Since 1946 nearly 150 chemical plants, making plastics to panty hose, have located in the Ohio Basin, bringing renewed economic hope and prosperity.

Many Ohio River towns faded when commercial shipping shifted from the river to railroads and highways to the north. But in the halcyon days of steam, 19th-century packet boats crammed with passengers, hardware, and dry goods made regular stops at river ports like Marietta, Ohio, a postcard city of 17,000 at the mouth of the Muskingum River. Marietta still wears an air of expectancy as we pass, with its gingerbread storefronts, striped awnings, and widow's walks.

Mile 202

The majority of rivermen I meet are conservative Anglo-Saxons with strong opinions and little use for those who disagree.

On my crew there is Billy Ray "Wolfcreek Pete" Stephenson, reared in a cabin on the Ohio bank near Wolf Creek, Kentucky. The other deckhand is Bob Carr, an earnest, likable fellow of 43 who rolls his own cigarettes. The mate is Alfred "Skip" Stewart, an avuncular figure with a graying crew cut who claims, "I'm so tough I sleep with one eye open so's I won't slit my own throat."

The four of us sit on the front tip of the tow, easing slowly into the Belleville Lock. The river is still bathed in a warm fog, and the towboat, almost a quarter of a mile of barges behind us, is invisible, its engines muffled. It seems as if we're in a cloud, being gently pushed by the wind.

An occasional flock of pigeons rustles by, and a mourning dove coos from the forest only 30 feet away. A hound dog bays in the distance. Skip cocks his head and says softly, "Dog got hisself a rabbit."

In such rustic landscapes the immense cooling towers and smokestacks of electric power plants rise like fanciful castles. A total of 33

coal-fired power plants line the Ohio, and more are planned or under construction. They are the biggest users of the water, drawing more than twice as much for cooling alone as all other users combined.

Kyger Creek power plant at Cheshire, Ohio, burns hundreds of tons of coal an hour to feed electricity to a government nuclear-fuel processing facility 50 miles away in Piketon, Ohio. In the mystical arithmetic of steam and atoms, a kilowatt generated by Kyger Creek can help manufacture enough uranium fuel to produce 40 kilowatts in a nuclear power plant.

Mile 300

Two crews work the shifts of the towboat for thirty days straight, six hours on, six hours off. They seldom climb the bank for a beer and a phone call to the wife, as in the past.

"The river's become big business," says Captain Himes, "and they've got to keep the boats running all the time. But my goodness, the fun we used to have on the river! Why, the boats would get into town, and both watches would go up the hill. Well, you only had one thing in mind to do—get drunk and then have a big fight. Everybody."

I nod, feigning enthusiasm, and the captain chuckles to himself as the river slides into the grind of heavy industry once again. Huntington, West Virginia, Ashland, Kentucky, and Ironton, Ohio, form a 20-mile gantlet of coal, petroleum, and metalworks.

Huntington, a well-endowed industrial city of 74,000, hosts both Marshall University and the Club Pompeii, a night spot that features a 30-foot papier-mâché Mount Vesuvius that erupts on the hour and nubile waitresses in mini-togas. I was sorry the guys from the *Northern* couldn't join me here.

In Huntington I spent a couple of days working at the coal terminal of the Ohio River Company, where coal is transferred from railroad cars to river barges. Loaded hopper cars passed through an archlike building where we stood with sledgehammers, our ears plugged with cotton, knocking the pins that allowed the hopper doors to swing open.

Heavy steel brackets, called shakers, were then lowered by hoist onto the tops of the cars and vibrated with mind-draining thunder as the coal tumbled into the bin below. From there a conveyor belt snaked toward

Working for peanuts, author Priit Vesilind tries his hand as a vendor during a baseball game at Cincinnati's Riverfront Stadium. To reestablish ties with the river he had known as a boy in Beaver, Pennsylvania, Vesilind embarked on a working journey down the Ohio, laboring also as a distillery vat tender, tobacco cutter, coal-terminal worker, and towboat deckhand.

the river and poured the coal from a spigot-like mouth into the waiting barges.

It was a gloomy, unrewarding task, but the kind of necessary labor that keeps the furnaces roaring in power plants, and the economy on an even keel.

About 33 percent of this nation's presently recoverable bituminous coal underlies the Ohio Basin, a reservoir expected to last for centuries and a fuel increasingly in demand as the United States strives for energy independence. And of the nearly 116 million tons of coal moved on American river systems in 1975, about 86 percent was carried on the Ohio and its tributaries.

"This job makes you feel pretty secure right now," reasoned Wilbert Rideout, Jr., a second-generation coalworker. "I'm 27 . . . I'll retire in 23 years. I don't think they'll come up with a good energy substitute by then."

Mile 360

Past Portsmouth, Ohio, the steel-coal economy of the upper river is essentially behind us. The southern bank is a land of quiet fields and white fences. In the river twilight Maysville, Kentucky, seems like an image frozen by a 19th-century photographer. It is a handsome town with stately white mansions and solid buildings of commerce—a town known for its burley tobacco.

Nothing grows in Kentucky like burley, the state's chief agricultural crop. From late November to early February, Kentucky's 219 warehouse auctions handle half a billion pounds, currently estimated as worth $1.15 a pound to the farmer.

We pass the Ohio village of Ripley, and on a hill a simple brick building looking toward the Kentucky hills: Rankin House. A lantern glowing from its upper window once signaled

Heralding autumn in Gallipolis, Ohio, the Gallia Academy band entertains in the city park. Away from the heavy industrial belts both upstream and downstream, Gallipolis depends on agriculture and two big medical centers for its prosperity.

Professionals and artisans fleeing revolutionary France founded the "City of the Gauls" in 1790, after discovering that the site swindlers had sold them nearby was mosquito-infested frontier, not the promised "semitropical" paradise.

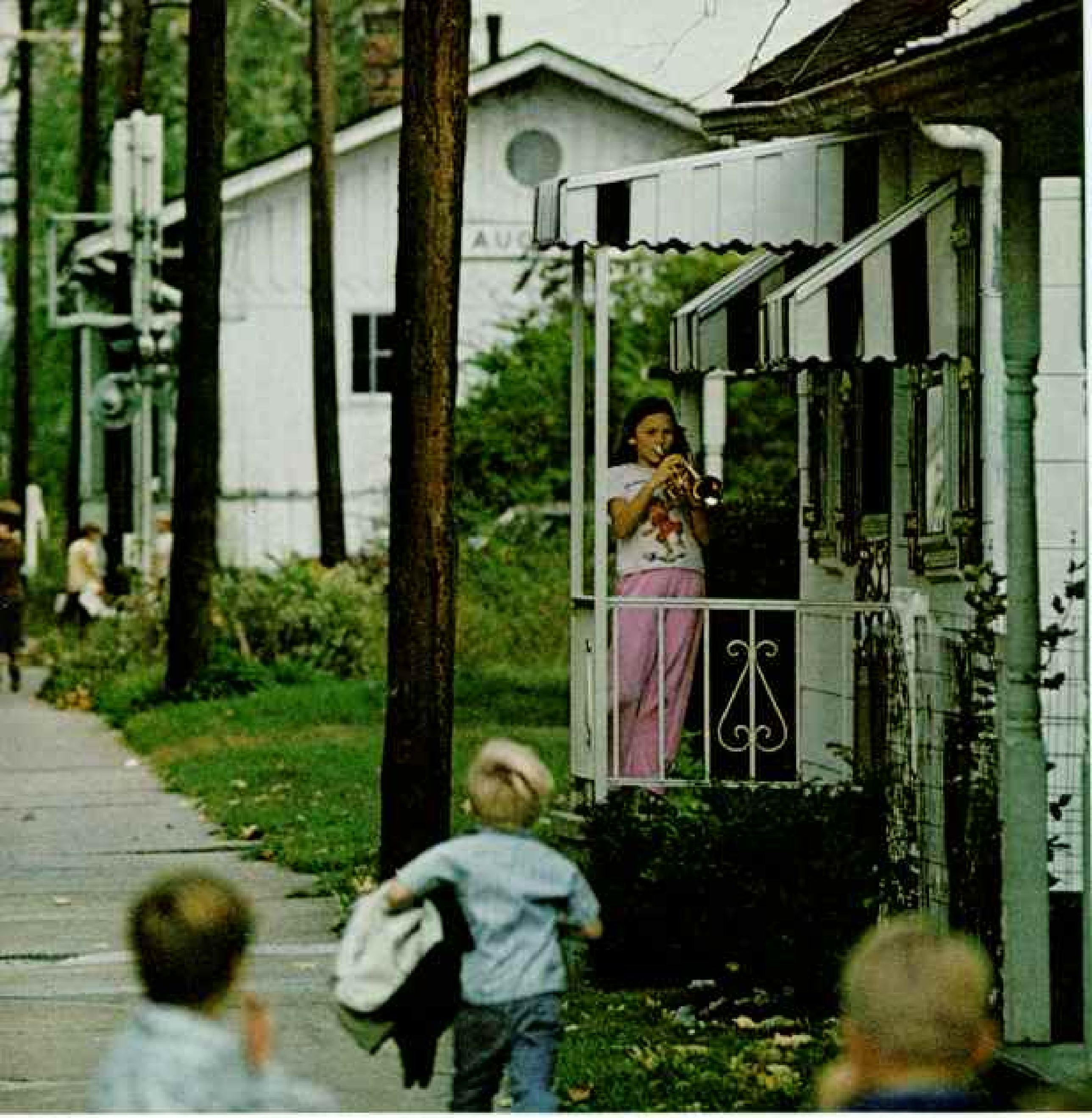
Rumble of a freight accompanies trumpeter Lisa Sue Groves in Augusta, Kentucky.

a station of the Underground Railroad. Through the kitchen of John Rankin, some 2,000 slaves found their way to freedom.

One evening in 1834 a young guest of Reverend Rankin heard her host tell a harrowing story of a slave woman, clutching an infant, who slipped and stumbled across an ice-choked Ohio toward the light. Seventeen years later, near the height of the abolitionist movement, Harriet Beecher Stowe wrote *Uncle Tom's Cabin*.

Laboring in the warm August evening, we unlash a barge loaded with steel pilings at Moscow, Ohio, and retire to the *Northern*'s small television lounge. The Cincinnati Reds are down, 2 to 1, seventh inning. Reception is marginal. Bob Carr cuffs the fluttering screen and mutters a threat.

That night we pass through the Queen City of the Ohio, a metropolis of 443,000. Yacht clubs, floating restaurants, and a showboat flank the river; splashes of music and laughter carry over the drone of our engines, strings of lights glitter across our wake.



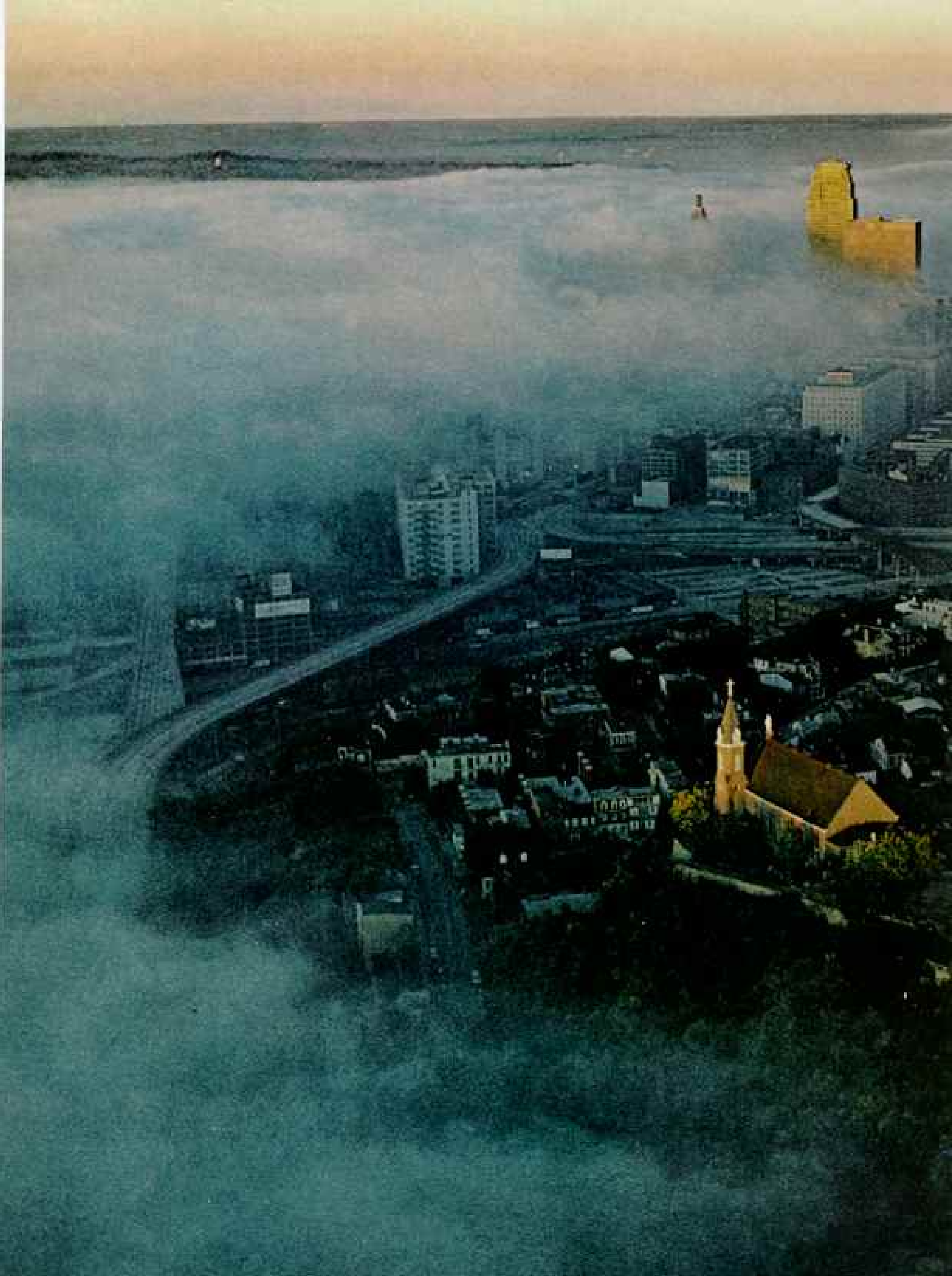
Six trains a day "shake things up a bit, but you get used to it," says a resident.

In 1790 Gen. Arthur St. Clair, governor of the Northwest Territory, stepped off a flatboat at the river community of Losantiville and said something like, "What an awful name, dammit, call it Cincinnati!"

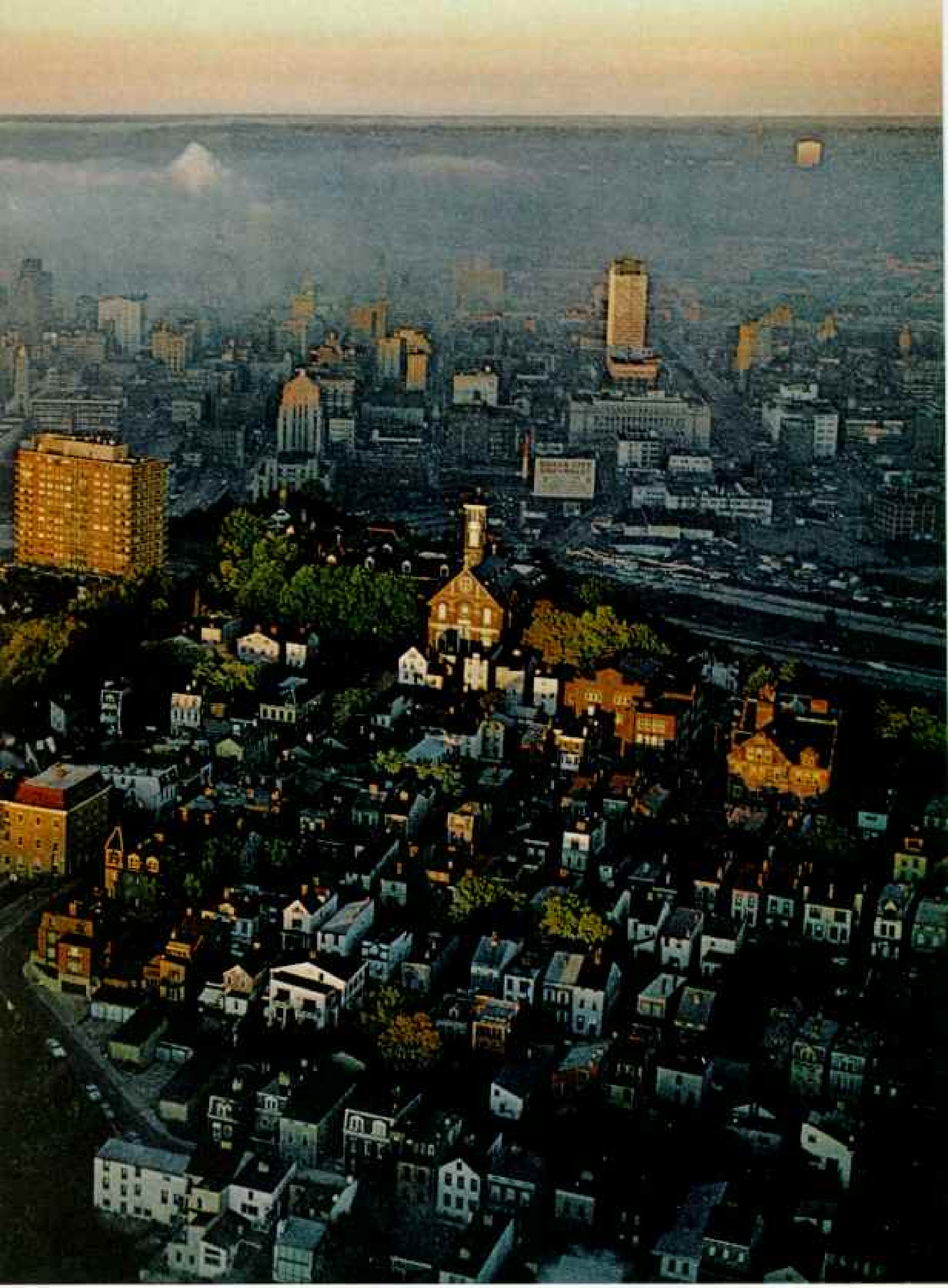
The city owes much of its character to the thousands of German immigrants who arrived by 19th-century steamboat, hoping to find a new Rhineland in the Ohio Valley. In the explosive decade of 1840-50, Cincinnati almost tripled in size. By 1880, some twenty breweries flourished, along with German bands, song festivals, gymnastic societies, and taverns advertising "a free wienerwurst with every drink."

Cincinnati still prospers with the German legacy of hard work and organization. Its industry—transportation equipment, printing, soaps, brewing, meat-packing—is solid and diversified.

Its people are proud enough of their city, but passionate about their baseball team—the world-champion Cincinnati Reds. The team plays at *(Continued on page 261)*



Swath of fog blankets the Ohio River and Cincinnati's once neglected downtown riverfront, where stadium, coliseum, and a new park now attract thousands



night and day for recreation and relaxation. Mount Adams, foreground, a popular bastion of boutiques and nightclubs, is one of the lively city's seven hills.

"On a forgotten bit of river shore," wrote artist Harlan Hubbard in his book *Payne Hollow*, he and his wife, Anna, reap "peace and inner rewards beyond measure." In the home they designed and built themselves 25 years ago near Milton, Kentucky, they lead a self-sufficient life without electricity, running water, or telephone. Oil lamps (**left**) provide light for Harlan, and a garden, goats, and catfish keep the larder full. But weekenders' boats and trailers encroach. "The Ohio is no longer the forsaken stream of the past," he wrote, "and the change is regretted by those who loved its forsakenness."

saucerlike Riverfront Stadium, showcase of an ambitious riverfront development project.

One evening I went there to work as a peanut vendor at a ball game (page 253). Deep inside the stadium, in a bare room with wooden benches and concrete floor, I sat with sixty others in red-and-white-striped shirts and two-pointed hats. Most of the vendors were young blacks—full of street talk and convoluted handshakes. We were getting final instructions from the black policeman:

"All you beer vendors—you all know how to read and write?" He looked searchingly over us. "Cause you gotta check every ID. All right. I'd like all you fellows to zipper up before you go out . . . and comb your hair. Hair combed? We want you to look neat."

Later, $8.23 richer for the evening's work, I talked with one of my co-workers, 17-year-old Derwin Phillips, a high-school student and commercial artist. I asked him who his favorite ballplayer was.

"I tell the people, Pete Rose," Derwin said. "That's my *man*. Shoot! They cut his pay this year. Made me *mad!*"

"You know how much money he makes?"

"Yeah, about 180,000 . . . but the way he work, he earns every dollar he make."

The Reds' all-star third baseman, Peter Edward Rose, is a rugged, plainspoken bundle of Irish braggadocio. Sportswriters call him "Charlie Hustle" for the intensity of his play. A son of the Ohio, he was born and reared in Cincinnati's working-class Riverside district.

Pete and I drove down to his old neighborhood one Sunday. At the railroad tracks by Anderson Ferry Road, below a hillside of simple frame houses and vegetable plots, Pete stopped his Rolls-Royce.

"There's the ferry right now, see?" he pointed, his face eager with memories. "I used to work on it. . . . Mr. Kottmyer would let me blow the whistle . . . And right here, on this corner, there was a place called Schulte's Garden, where they had the greatest fish in the world. I cleaned up their back lot on Sundays —picked up beer bottles and cashed them in, nickel a quart bottle—made some gravy."

Charlie Hustle looked rather sadly at the corner. "They tore that restaurant down in just one day—and put up a gas station."

Later, at his luxurious home in the Cincinnati suburb of Oak Hills, I asked Pete Rose

Floods leave a blessing of rich silt on Ronald Zimmerman's Slim Island farm, where a combine harvests corn (**above**). "I've got half the fertilizer bill and twice the headaches" of mainland farmers, says Zimmerman, who must ferry supplies to the 600-acre islet near the Illinois-Indiana border. Near Vevay, Indiana, a father and daughter spray tobacco (**below**).

what he thought of being a blue-collar hero.

"You've seen where I was raised," he said. "The average guy appreciates it. He knows I've worked hard for everything I've got."

In an office tower in downtown Cincinnati, the Ohio River Valley Water Sanitation Commission (ORSANCO) has worked hard for almost thirty years—to clean up the river.

For decades the Ohio absorbed a misery of sewage, industrial chemicals, and mine acids. In 1930 a severe drought created stagnant pools behind newly completed locks and dams. Disease spread through the lower valley.

Finally, in 1948, a compact was signed among eight states, and ORSANCO was born. Municipalities and states committed more than a billion dollars for construction of their waste treatment facilities.

Today a network of 37 monitoring stations, some completely automated, gather river samples and measure water quality for ORSANCO. On the main stem Ohio, 319 out of 324 communities with sewer systems treat their waste, many taking advantage of federal aid, and 70 percent of industry has effective treatment. Fish populations that had long been stunted by the pollution—largemouth bass, spotted bass, and crappie—are growing.

"We're constantly besieged by people from other countries," said ORSANCO staff geologist Russell Brant. "They want to know how we did it. We even had a delegation from the People's Republic of China."

Mile 491

Past the Ohio-Indiana border the river takes a dip to the south. Corn, soybeans, tobacco. Hoosiers who crack Kentucky hillbilly jokes. Kentuckians who crack Hoosier jokes.

I drove through this mellow wedge of rural Indiana in September, when the tobacco stood soft and golden, ready for cutting. In the lemon light of early morning, field hands waited hopefully on the street corners in the county seat of Vevay, and farmers who needed help loaded them into pickup trucks.

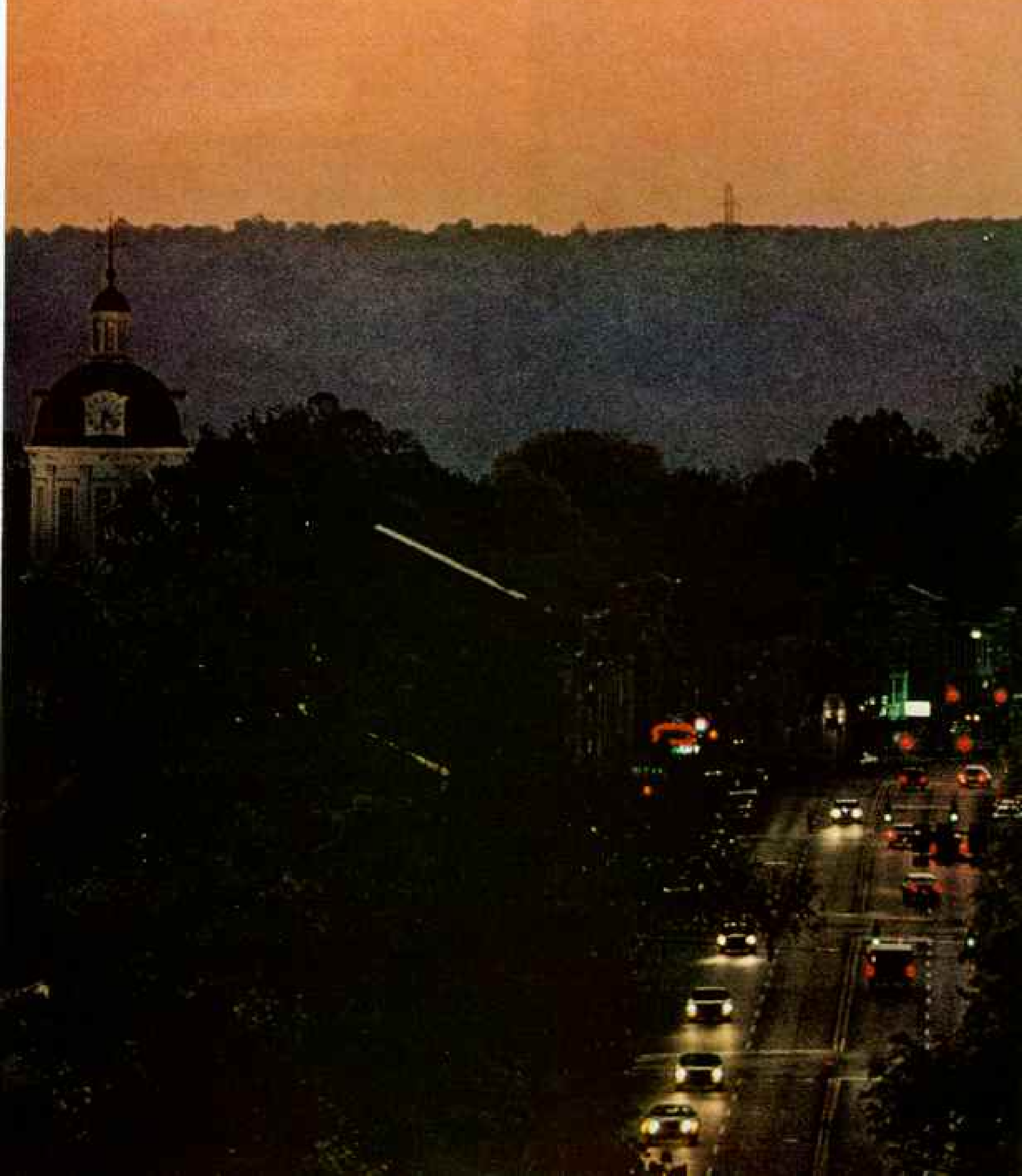
Five miles downriver were the tobacco and soybean fields of Joseph Lamson, whose family has been farming here more than 150 years. In 1818 Benjamin Lamson arrived in Pittsburgh from Beverly, Massachusetts, built a box-shaped flatboat, and set off down the Ohio. In Steubenville he took a wife. But the heavily loaded boat ran aground, so Benjamin and his bride were forced to drag it ashore. There, on the lush bottomland of Indiana, they built a cabin with timber from the forest, and stayed.

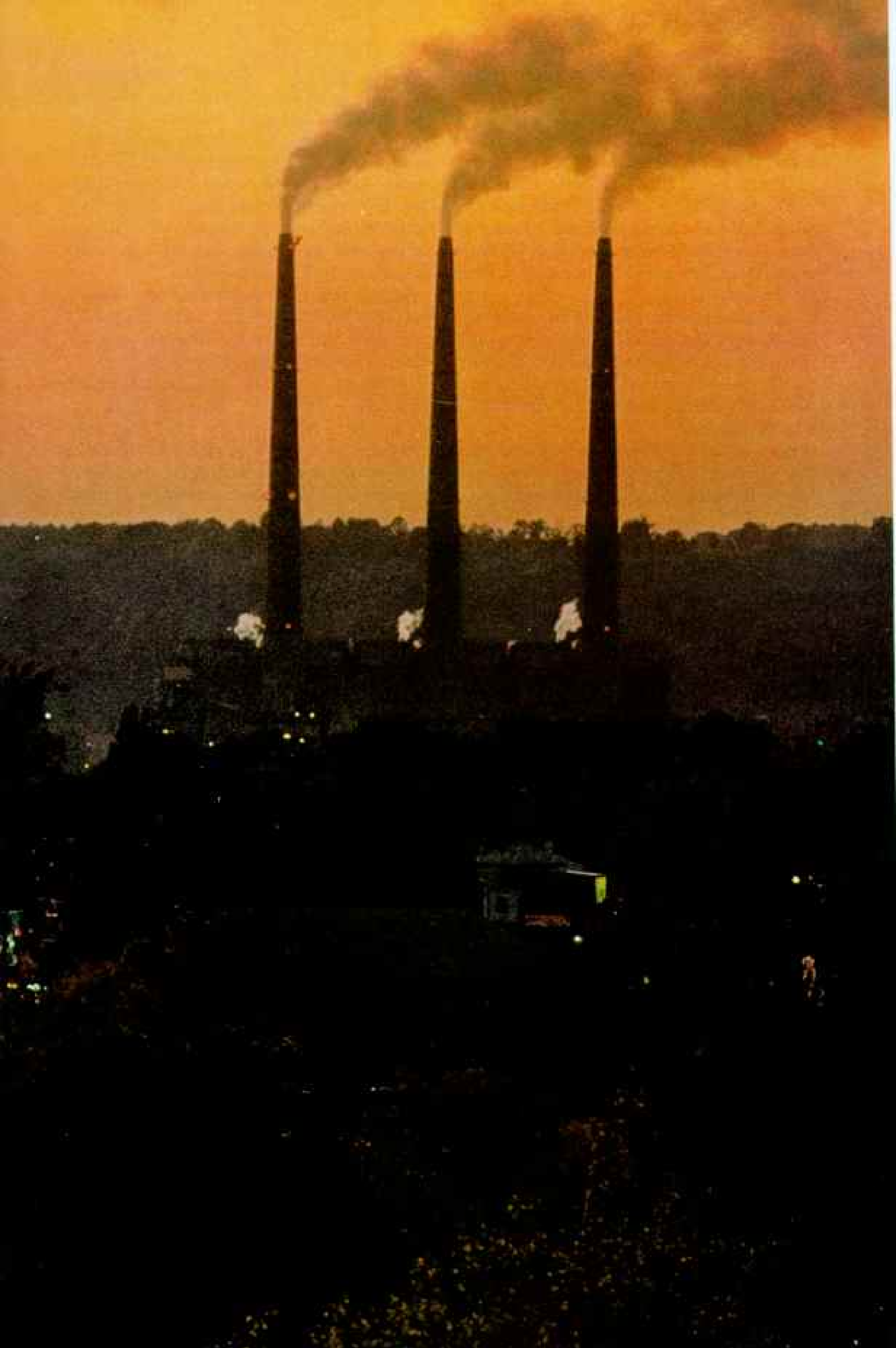
"Praise the Lord!" is a favorite expression of Joe Lamson, a deeply religious man. But the inflection changes to suit the circumstance. "Praise the Lord!" he says joyfully when a sow delivers a fine litter. "Praise the Lord!" he mutters when he cuts his finger.

One morning I joined Joe and his family of six for breakfast—biscuits, ham, and eggs—before a day in the fields. He praised the Lord as we held hands around the table.

With Joe's three teenage sons, Loren, Joey, and John, we labored among the damp rows of tobacco, cutting the heavy stalks and spearing them onto sticks to dry. The work was hard and I soon fell woefully behind the others. My hands ached and trembled, my sense of purpose soured. Tobacco, I was learning, takes more labor than any other major crop in the country. Corn needs only five man-hours an acre; tobacco, a hand-labor crop, requires about 320.

SKY-SMUDGING STACKS *at Clifty Creek power plant tower above Madison, Indiana. The 683-foot chimneys at the huge coal-burning facility, which generates electricity for processing nuclear fuel, were designed to discharge above breathing levels. But to comply with today's pollution laws, devices costing over 120 million dollars are being installed to clean smoke before release.*





Just before lunch we all stripped down to our skivvies and jumped, whooping and clowning, into the Ohio. In the evening we sat on the front porch and ate ice cream and talked about the future.

"There are a lot of absentee owners in Switzerland County," Joe said, "and some city people are just buying land and sticking A-frames on it, not even developing it. We don't resent them, but it's sad to see a good farm go downhill."

Joe gazed past the fields to the river that had brought Benjamin Lamson to his home. "I hope the boys will stay," he said wistfully. "We have to work hard, and we expect a lot from our children, and I guess they'd say I was a strict father. I am, I realize that. But that's the way my mother and father raised me—learning to work, learning to be dependable, learning to live up to your word."

Mile 604

We reach Louisville in late evening, following the channel's sweeping arc between bridge piers of blackened stone. In the urban haze a red sun filters through the girders and settles darkly behind the McAlpine Locks and Dam. We inch carefully into the chamber. The water drains beneath, and we drop 19 feet to the river level below the dam, smoothly bypassing the Falls of the Ohio.

Before a canal to circumvent it was finished in 1830, the Falls, actually a mile-long chute of rapids and bedrock limestone, was the greatest hazard to Ohio River navigation.

As early as 1824 the U. S. Army Corps of Engineers was directed to improve the nation's rivers. By 1929 the Ohio had been canalized to a depth of nine feet and fitted with 46 locks and dams. Congress appropriated money for a modernization program in

"Any fool knew the banks were gonna cave in—but not the slide-rule boys," griped a farmer when land began collapsing along a 240-mile stretch of river between Louisville and Uniontown, Kentucky. Landowners blame higher water levels behind new dams for the undermining of roads, houses, and croplands. The U. S. Army Corps of Engineers, which built the dams, disclaims full responsibility.

1954 that called for only 19 high-lift dams; 13 are now complete. The new 1,200-foot lock chambers can hold a tow of 17 jumbo barges and eliminate most of the congestion that once stalled shipments as long as ten hours.

Louisville, the frontier town that sprouted by the Falls, is a city of 330,000, a port of entry for international shipping from the Gulf of Mexico, and a major financial, industrial, and marketing center (following pages). Since 1968 Louisville has cleaned house, injecting vigor into a dishrag downtown with a bright pedestrian mall, clean-cut high-rise office buildings, and a seven-acre riverfront plaza and belvedere for concerts, moonlight dancing, festivals, and ice skating.

The city's industrial district is aromatic with toasting tobacco and cooking grain, as burley is squeezed into packs of twenty and corn parlayed into bourbon whiskey. Many Ohio Valley distilleries have closed production in the past twenty years due to changing public tastes and rising grain and barrel prices, but eight survive in Louisville.

The quality of Kentucky bourbon, claim the faithful, lies in the almost inexhaustible supply of cool limestone water that underlies Louisville and the Kentucky Bluegrass country. To Woodrow "Woody" Wilson, master distiller, it's an integral part of his secret sour-mash recipe for Old Fitzgerald bourbon.

"You gotta have good limestone water to make good whiskey," he says flatly.

I worked at Old Fitzgerald for a while as a vat tender—in the fermenting rooms where the mash of corn, wheat, and barley malt bubbled with yeast in deep tanks of cypress or stainless steel.

"Some mornings you walk in here and you can hardly breathe," said my supervisor, Clifford Roberts, an attentive man with short sandy hair and an ambiguous twang. "You've smelled dogs after you've run them all day? Smells just like that."

Through the day we drained the tanks, cleaned them with steam, and worried about maintaining proper temperature. Raw bourbon, still colorless, is collected at the rate of 200 fifty-gallon barrels a day at Old Fitz. Over the years the charred insides of new white-oak barrels mellow the whiskey into caramel-colored maturity. Some of the grain by-product is sold as slop to farmers, who queue up daily at the distillery.

"Every time we shut down," Woody exaggerated, "five farmers go broke. This is the cheapest and most potent feed they can get."

Mile 665

The hills are lost in distance, and ink spots of black Angus graze on gently rolling plains. Orchards, grainfields, tufts of forest, and weathered barns slip by in the haze. The muddy-dun Ohio water deepens into green, and broadens as it lowers into the midwestern heartland.

Past the horseshoe bend near Leavenworth, Indiana, Wolfcreek Pete stands on deck, his thumbs hooked in the pockets of his jeans, and gazes at the shore where Wolf Creek empties in from the Kentucky hills.

"That's my country," he says quietly. "I made only $1,700 farming last year. Couldn't find no other work on the bank, so I came to the tow. I warned my wife, I may be out here the rest of my life. She said that's all right with her, as long as I'm making a living. I wouldn't go back on the bank for a job."

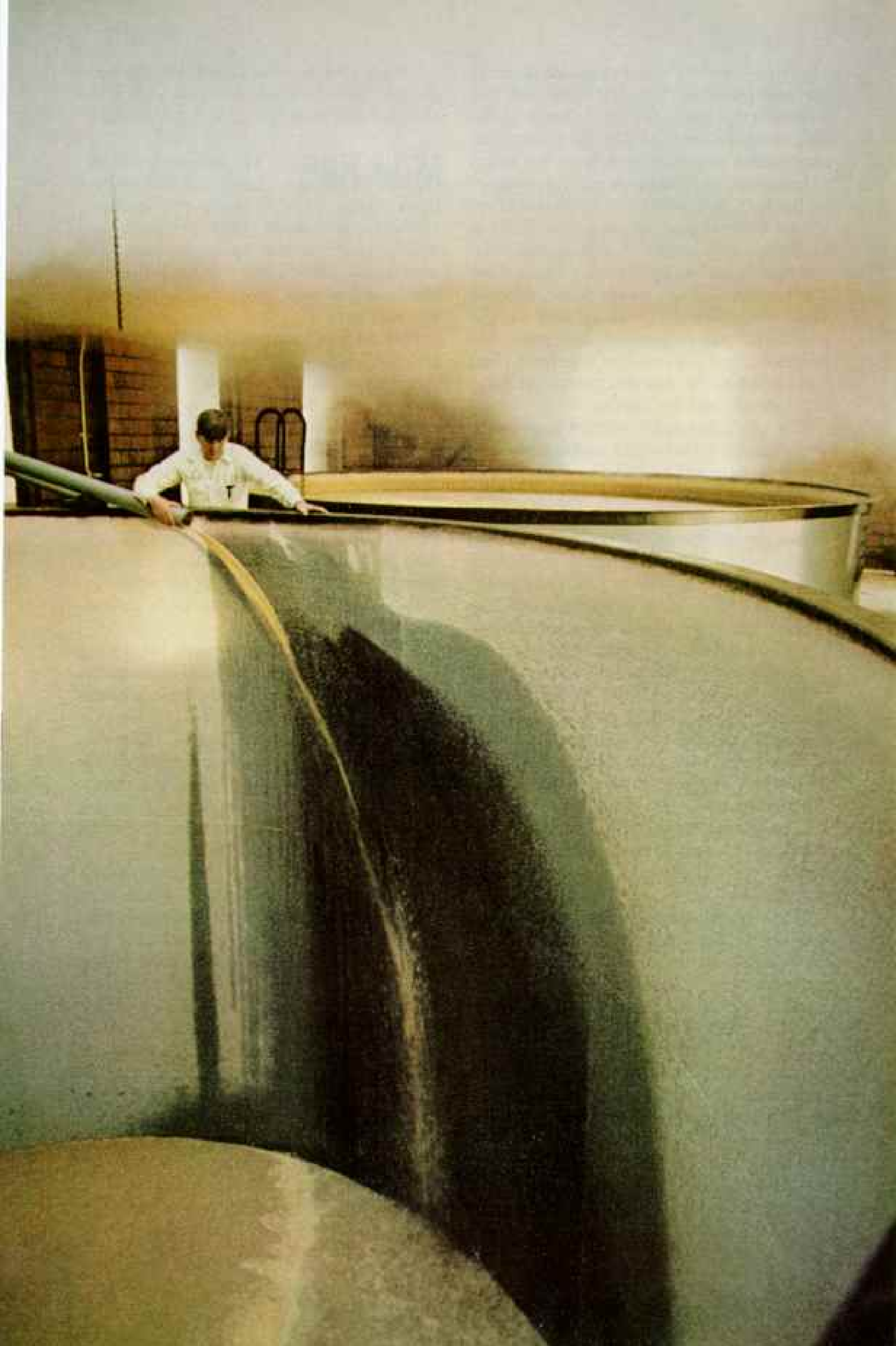
He gives me a crooked little smile and ambles back to the galley.

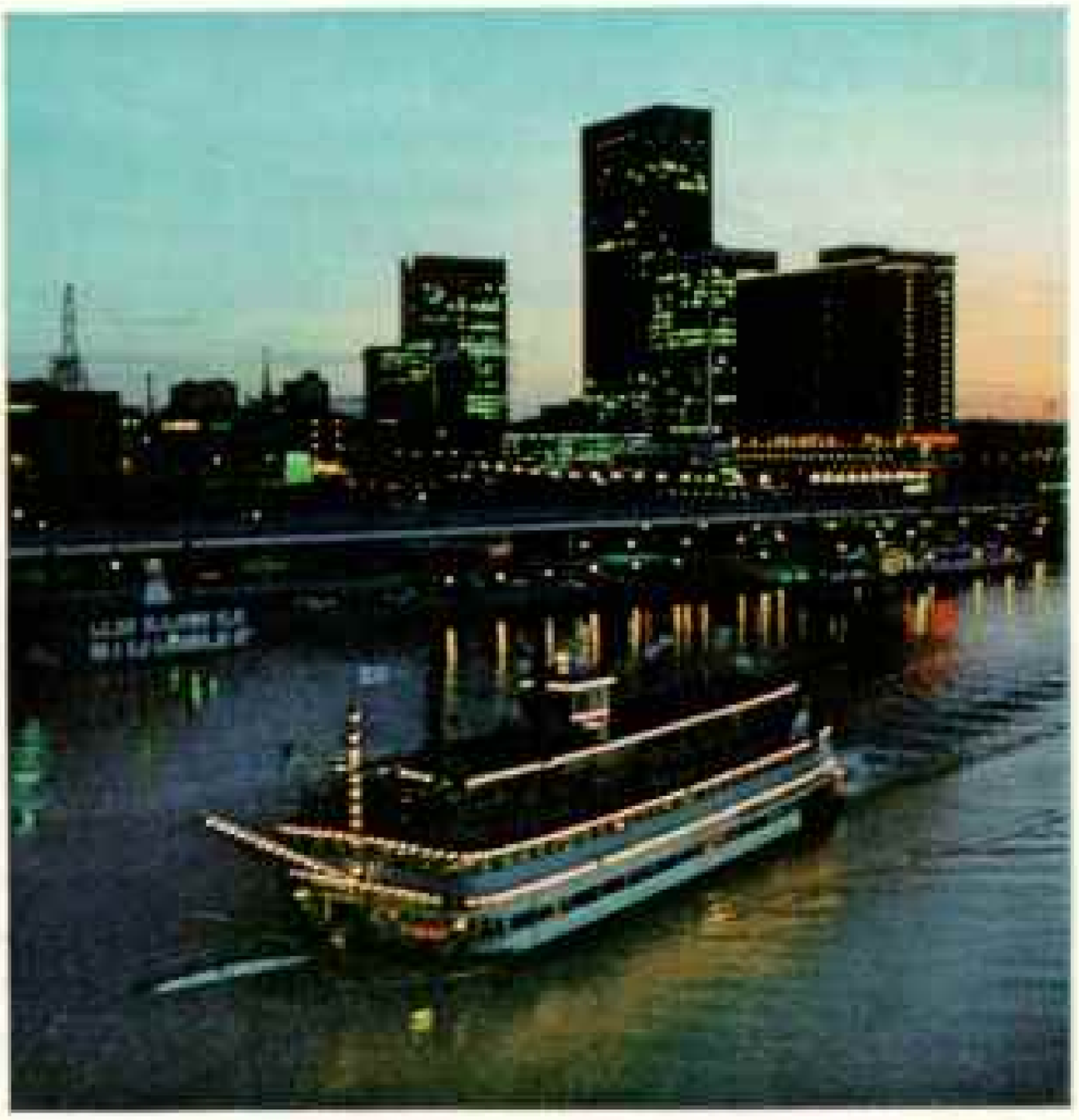
The *Northern* powers through the pool of Cannelton Dam, and Captain Himes points to a gash of bare bank where the land seems sliced away as if by some giant cleaver. Willows lean at awkward angles, their root snarls exposed to the wash (facing page). The captain shakes his head: "The Ohio's a beautiful river, but some people think the big dams have ruined the shoreline. I hear the Government's got a lot of lawsuits."

The problem is most serious along a 240-mile stretch from Louisville to Uniontown, Kentucky, where three new locks and dams have raised the water level as much as 25 feet.

Farmers are indeed suing the Government for loss of land whose value far exceeds the amount paid to them for flooding easements by the Army Corps of Engineers. Estel Sheldon, a 72-year-old farmer with 92 acres just upstream of the Cannelton Dam, has lost more than sixty feet of his shoreline since the dam was completed. The corps denies that its dams are causing all the trouble.

Estel Sheldon is one angry Hoosier. "If the people knew then what they know now," he told me, "the Army would have one heck of a time a-gittin' this land. To tell you the truth, mister, it's a damn mess!"





In Kentucky-size tubs, Louisville's Old Fitzgerald Distillery prepares the state's famous "sippin' stuff"—sour-mash bourbon. Cooked corn, wheat, and barley malt—mash—pouring into the 12,960-gallon stainless-steel vat (**left**) will ferment for about three days, then will be distilled and aged in charred white-oak barrels. Steam rises during sterilization of adjacent fermenting tubs.

Civic spirit soared in Louisville after a downtown face-lifting renovated old buildings and added a pedestrian mall and seven-acre plaza (**below**) to the riverfront.

Paddling past the city, the excursion boat *Belle of Louisville* recalls the mid-19th-century Ohio, when hundreds of steamboats annually carried some three million passengers. The yearly race between the *Belle*, Cincinnati's *Delta Queen*, and Peoria's *Julia Belle Swain* would have delighted Mark Twain: "... red-hot steamboats raging along ... straining every ... rivet in the boilers ... spouting white steam ... parting the river into long breaks of hissing foam—this is sport that makes a body's very liver curl with enjoyment."

Mile 792

We take on four barges of corn at Evansville, Indiana, a slick city of double-knit leisure suits and a sense of civic rebirth shared by 139,000 residents. About 15 years ago a group of creative citizens molded this apathetic town into an important convention center and a model of downtown redevelopment.

Along this quiet Ohio only names are left of a burly frontier past—Poker Point, Big Poison Creek, Scuffletown Bar, Shawneetown.

"I had a deckhand once," says Captain Himes, "who had a knife with a pearl handle and a seven-inch blade, sharp as a razor. He'd say, 'This here's what I take to Shawneetown on a Saturday night.'"

Old Shawneetown, Illinois, population 350, once the energetic gateway to the new state, and a town known as the toughest on the river, has faded to a shabby handful of buildings behind a levee that never did much good.

Defiant, obstinate, the people of Shawneetown clung to their piece of floodplain through long years of inevitable but tragic inundations. And in 1937, the year of the worst flood in the history of the lower Ohio, the river destroyed Shawneetown.

The disaster started on January 2 as a steady, brooding rain that shrouded the valley. By mid-month water was lapping into second-story windows in Cincinnati. After three more inches of wet snow the river poured into the streets of Louisville. Power and water plants failed; 500,000 people were driven from their homes. Many drowned.

The bloated, icy river hurtled westward, spreading twenty miles wide in the bottomlands. In Shawneetown the levee was systematically dynamited to prevent sudden collapse as the river inched upward. Once again the Ohio swirled deep down Main Street.

"I stayed down there till the very end," remembered Rudy Phillips, as we talked one morning in his barbecue restaurant near Old Shawneetown. "The last night, I slept up on the third floor. In the morning when I reached for my clothes, they was floatin' around the room. I knew then it was time to leave."

The Government stepped in, providing funds to relocate the tired, beaten town. In June 1938, a bizarre cavalcade of about 240 houses and an upright 100-foot-high water tower moved slowly up Route 13. Three miles inland they built a new Shawneetown, a skeleton of a place whose soul remains on the banks of the powerful river.

There are signs of new life in the old village, but veterans like Rudy have given up on going back. "These strangers coming in," he said, "they don't know what it's all about. They will someday . . . there's going to be another flood. Always has been, always will be."

Always. Engineers can only manipulate the flow of such a mighty river, not truly control it. Through 1974 more than 1.4 billion dollars has been spent for flood-control structures such as dams, reservoirs, and floodwalls.

Weekend pioneers float back to the old days during the annual Great Ohio River Flatboat Race from Owensboro, Kentucky, to Henderson. Settlers piloted such unwieldy craft on their way west, family members crowded in the cabin and livestock milling in the hull. High sides offered protection from Indian arrows. On arrival, boat timbers were used to build houses.

In return, an estimated 3.5 billion dollars in damages has been prevented. But more money will be needed as more people insist on building and living on the river's floodplain.

Mile 930

The Ohio sweeps on smoothly beneath us, broad and strong to Paducah, Kentucky, a healthy city of 35,000 where the poolrooms close on Sundays. Nearby, an atomic-energy plant enriches uranium, and a chemical complex in Calvert City turns out products ranging from chlorine to photographic film.

We press on through a channel cramped by wide sandbars, and finally reach the mouth of the Ohio, and the Mississippi.

It is often said that there should have been a great city here at the confluence of two mighty rivers (following pages), but there is only a misunderstood town of 6,500—Cairo (pronounced CARE-o), Illinois. Lower than Richmond, Virginia, in latitude, Cairo is a southern town, really, with catfish dinners, mansions, and quiet streets lined with magnolia and sycamore trees.

In the 1920's, when Cairo's population peaked at 15,000, it was a busy barge terminal, and dozens of small industries—lumber mills, flooring plants, box factories—rattled and steamed inside the levee walls. Much of the industry was based on the abundant forests, now stripped.

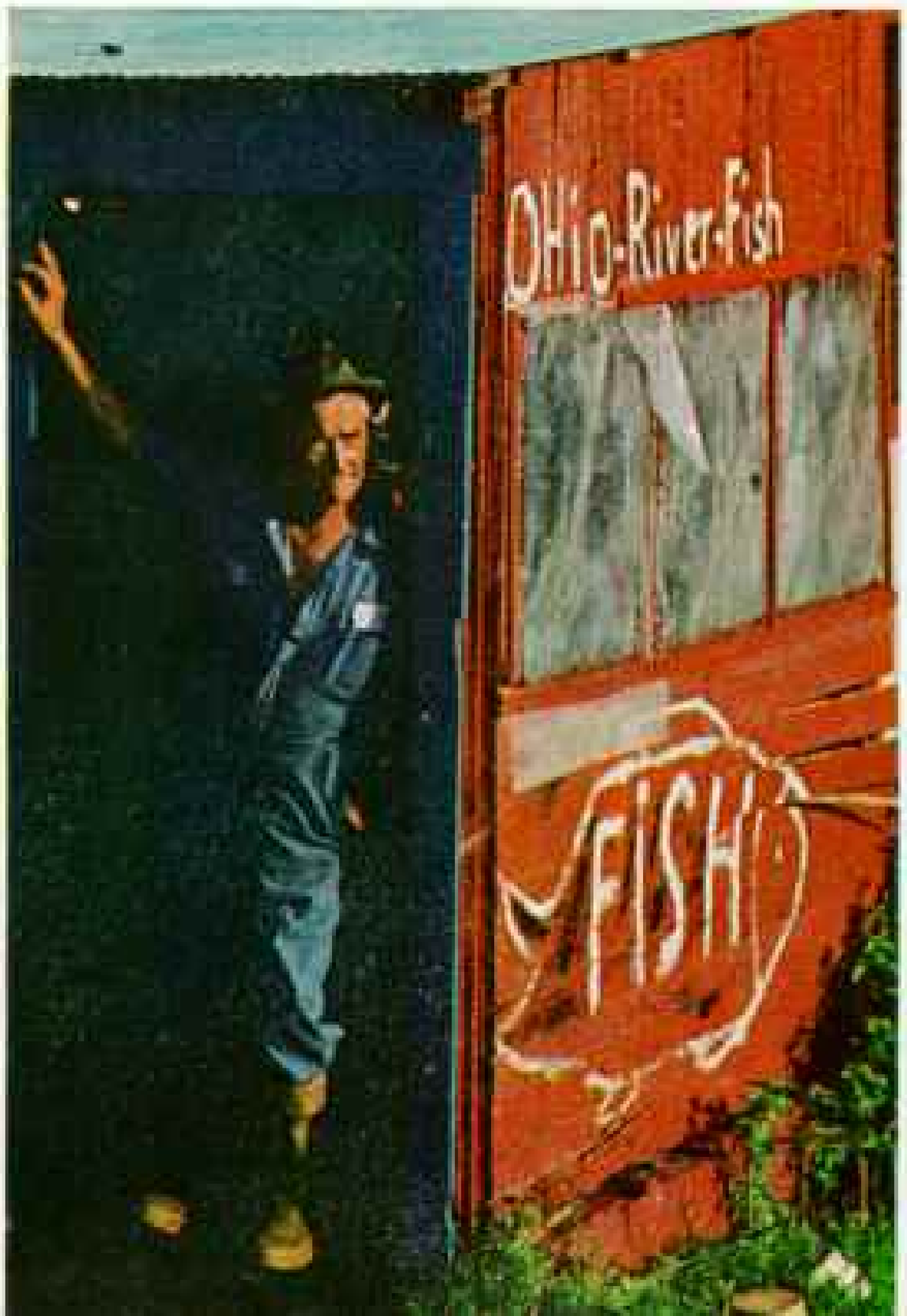
Today there is a missing-tooth look to downtown Cairo, and a bitter residue of unemployment and economic depression shared by much of southern Illinois. But the people of Cairo are tired of hearing about their shortcomings. They believe prosperity is at hand and the future of their town is with the rivers. Already, local plants are modernizing, a dry-dock facility has been expanded to meet growing river traffic, and several outside industries have sent feelers to Cairo about plant locations.

"In the past 36 months," said town historian Mrs. Guyla Moreland, "more really

Meeting of the mighty: Its journey ended, the Ohio, right, sweeps into the growing Mississippi River. There is no great metropolis here, only Cairo, Illinois, a small southern town of 6,500. Fields of soybeans cover the floodplain outside the town levees, and bridges link Illinois to Missouri, left, and Kentucky—a triangle far from the "golden" heart of Pittsburgh.

Fast emerging from an era of economic and social problems, Cairo looks to heavier river traffic and new barge facilities for future growth as a freight-transfer center.

Since Depression days, Cairo commercial fisherman Roy Walls (**right**) has harvested serenity as well as carp and catfish from the river. "There ain't much here in Cairo right now," he says, "and a lot of our young people have gone. But I love it here. If they moved the Ohio River, I'd probably go too, but that's one thing they won't move."



progressive things have happened here than I had seen in the previous 36 years."

One area resident who learned early to live with instability is 57-year-old Roy Walls (left). A carpenter turned commercial fisherman, he sells Ohio River carp, catfish, white perch, buffalo fish, and an occasional sturgeon from a ramshackle hut by the Kentucky bridge.

Early one autumn morning we launched his 17-foot fishing boat into the lakelike expanse of the Ohio. Over a Kentucky sandbar Roy unraveled a 100-yard-long trammel net into the channel, leaned back, and lit his pipe.

"I've been fishing forty years," he said, "and at times the river has made a living for nine of us. I only went through the fourth grade myself, but I've got a son who's in college—wants to become a lawyer, wants to change things."

Roy's eyes crinkled into a smile: "Oh, it ain't all been honey. We've had some rough times." He reached into the water with an old tin cup and drank deeply of the river.

"Drunk this water all my life," he said at my astonished expression. "Ain't been sick yet, so I guess it's all right."

The floats of the net dipped and jerked with the wake of a passing coal tow. In the midwestern sky the rain clouds curdled and the wind swept the river into whitecaps. Together we dragged the dripping net into the boat and headed for the levee.

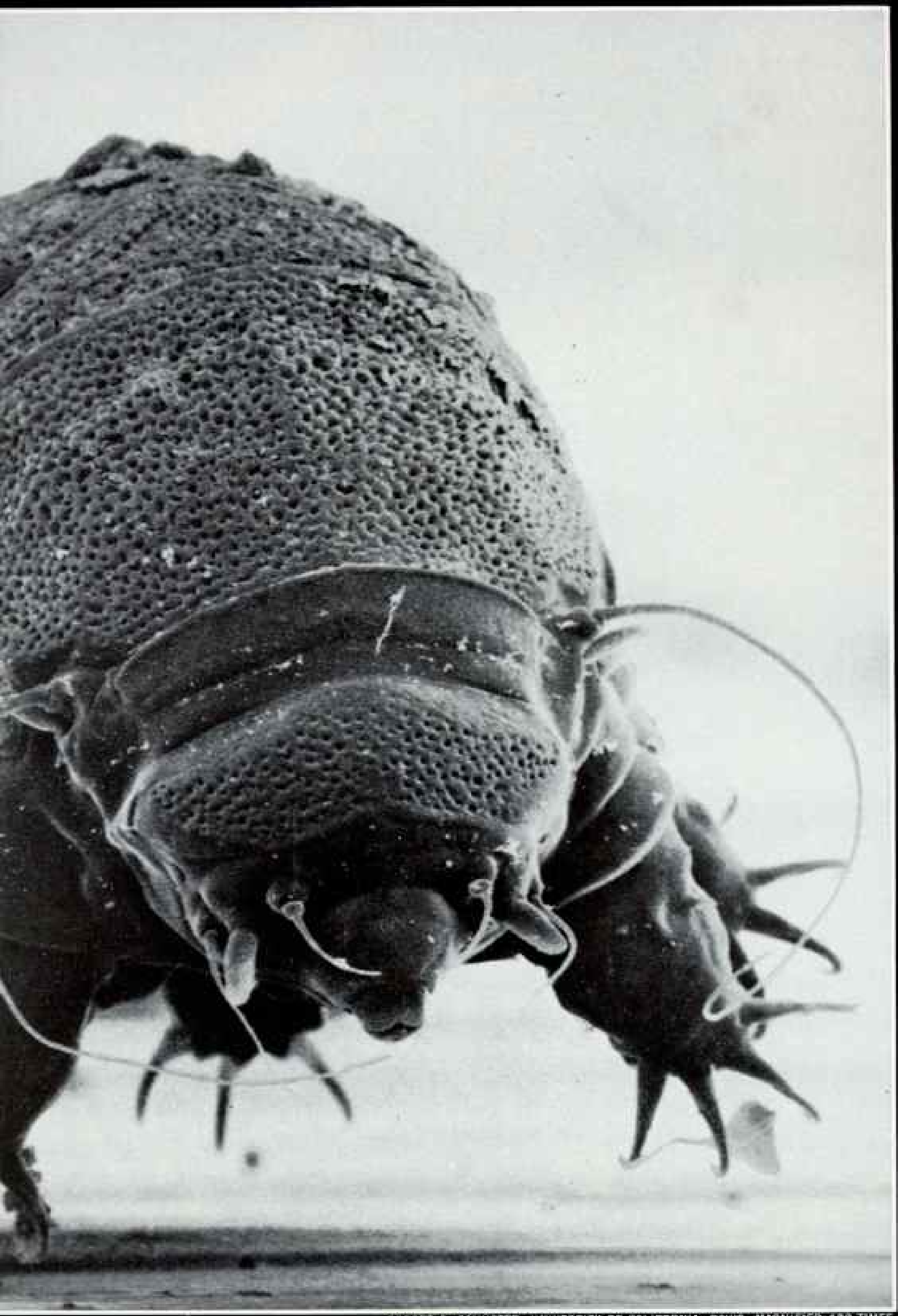
Mile 981

The *Northern* turned around at Cairo, leaving her barges with a bigger, stronger towboat for delivery down the free-flowing lower Mississippi. Then, after picking up eight others for the upstream run, she disappeared past the bend for Paducah and above, laboring heavily against the current, minus one greenhorn deckhand. □

Electronic Voyage Through an Invisible World

LOOMING INTO VIEW from the minuscule world of micro-organisms, a tardigrade—commonly known as a water bear—appears 480 times normal size through a scanning electron microscope. A resident of water-drops on plants, this speck-size rhinoceros has the puzzling ability to adapt to loss of body water and go dormant for decades.

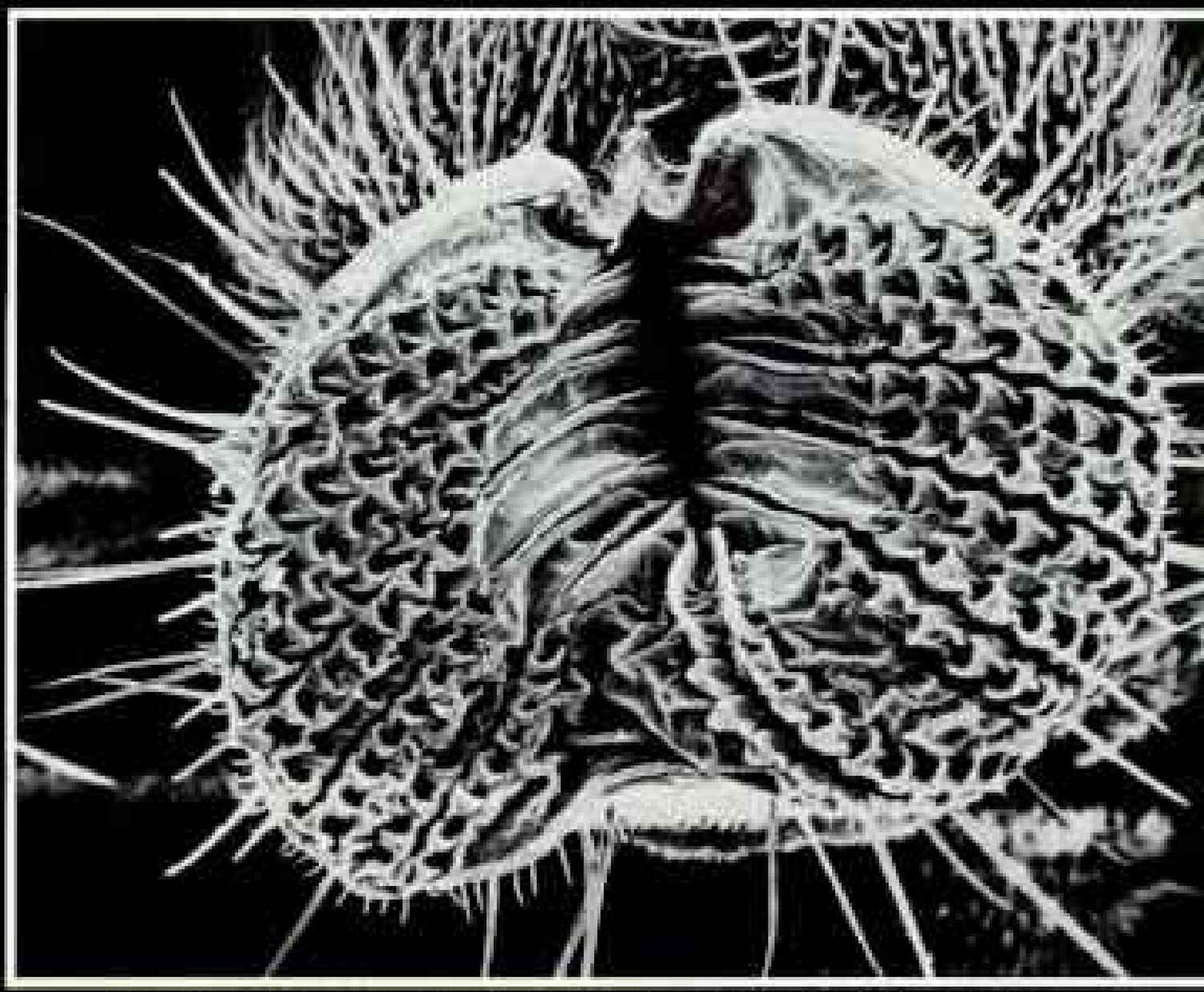
One of a new generation of instruments that enlarges images with electrons instead of light rays, the SEM is providing our first close-up look at such remarkable creatures. With the new microscopes, some of which are capable of magnifications of 20 millionfold, scientists of many disciplines are becoming wonder-struck voyagers into the reaches of inner space.



ROBERT O. SCHUSTER, UNIVERSITY OF CALIFORNIA, DAVIS: MAGNIFIED 480 TIMES

CAUGHT IN THE ACT by the SEM's probing electron beam, two aphids suck nutrients from a lemon leaf, causing it to curl into a cavernous shelter (left). The frightful countenance of a fruit fly (below) is enlarged 100 times; even closer scrutiny reveals details of a fly's labellum (bottom)—the feeding organ located at the bottom center of the "face."

Unlike light rays, electrons cannot convey colors. The SEM images, however, are of particular value to scientists because of their great detail and depth of field—qualities unachievable with optical microscopes.



DAVID SCHARF, 95 X (LEFT); JOHN MAIS, UNIVERSITY OF CALIFORNIA, DAVIS, 100 X (TOP) AND 465 X (ABOVE)

Where the telescope ends, the microscope begins. Which of the two has the grander view?

VICTOR HUGO, "LES MISERABLES"

THE SIGN ON THE DOOR, in Japanese calligraphy, read *Denshi Yama*. That means "Mount Electron," and what I saw beyond the door amply justified the name. It was one of the world's largest electron microscopes, installed in Colorado by a group of Japanese technicians in 1972.

A bulbous metal cylinder, studded with rings, projections, electrical cables, and hoses for cooling water, it rose two stories from the laboratory floor. It looked totally unlike any optical microscope I had ever seen.

And, unlike an optical microscope, this million-dollar Japanese instrument, at the University of Colorado at Boulder, used no beams of light and no glass lenses. Instead, it was bombarding an ultrathin biological specimen with a million-volt beam of electrons, focused and manipulated by magnetic lenses. The resulting image of a single cell nucleolus appeared on a green fluorescent screen in the base of the instrument. I could see the image by looking through an eight-inch-thick window of lead glass that shielded me from deadly X rays created by the barrage of electrons.

With instruments of this type, scientists have opened up a whole new realm of atoms and molecules, a world man has never seen before. Just as today's largest telescopes take us into the bizarre universe of quasars and black holes, so the electron microscope takes us into the Alice-in-Wonderland world of inner space. What we see there is sometimes hauntingly beautiful, sometimes awesome, and frequently of supreme significance.

The best of optical microscopes, limited by the wavelengths of light, magnify no more than 2,000 times. They resolve, or discriminate, objects no closer than about 2,000 angstroms, or 1/125,000 of an inch. Optical microscopes easily enable us to see bacteria, as Dutch microscopist Anton van Leeuwenhoek did even with the crude lenses of the 17th century. But they cannot distinguish the tiny viruses that plague mankind.

By contrast, the best electron microscope can magnify an incredible twenty million times, with a resolution on the order of two angstroms. And even the individual atom, which has a diameter of only about one angstrom (about four-billionths of an inch), can be photographed in the same way that an invisible mote of dust can be "seen" by the light scattered when the mote floats through a bright beam of sunlight. These angstrom-wide atoms are so small that nearly a million of them, lined up side by side, would fit into the thickness of this sheet of paper.

Dr. Albert V. Crewe and Dr. Michael S. Isaacson, of the Enrico Fermi Institute at the University of Chicago, recently developed the electron microscope to such a point that they were able to make a movie of uranium atoms in motion.

The earliest and most common electron microscope—a transmission microscope—shoots its illuminating electron beam *through* the sample, which must therefore be extremely thin. Biological samples are frozen, then sectioned with a diamond knife into slices far thinner than a wavelength of light. They are so delicate that they can be handled only by floating them off the knife onto water. They are picked up on an exquisitely thin gold or platinum grid that is inserted through an air lock into the microscope's vacuum chamber.

This extraordinary grid, only three millimeters in diameter, has as many as a thousand wires to the inch; yet, under the instrument's maximum magnification, an image of the entire grid would fill a viewing screen as large as Rhode Island. The minuscule becomes monumental.

A newer form of the microscope, the scanning electron microscope, offers exciting possibilities that supplement the transmission instrument. Instead of penetrating an object, its electron beam reveals the magnified exterior with an unbelievable clarity and depth of field. As the amazing photographs with this article attest, the scanning electron microscope produces realistic images as though it were a TV set that magnifies.

Since this instrument does not require thin sections, it can magnify a living organism. Most samples, however, are placed inside a vacuum chamber where gold is heated until

Probing the microcosm with the ease of TV viewing, Dr. Albert V. Crewe of the University of Chicago's Enrico Fermi Institute focuses a color-enhanced image of human antibodies magnified a million times. A technological "hybrid," capable of viewing single atoms, the microscope shown here was designed by Dr. Crewe and his associates with features of both transmission and scanning electron instruments (**following pages**).

FRED WARD, BLACK STAR

it evaporates and covers the specimen with a thin coating of metal. This process is used so the specimen will be electrically conducting and the image less blurred.

Once the sample has been fixed in the viewing chamber, the scanning microscope focuses its beam of electrons to a fine point that sweeps rapidly across the object, building an image line by line, just as does a TV camera. As the electrons strike, they knock loose showers of electrons from the object itself. These secondary electrons are captured by a detector and form the image on a cathode-ray tube.

If there are many secondary electrons from a direct impact, they form a bright spot on the imaging tube. If, on the other hand, the scanning beam strikes a sloping surface, the glancing blow does not produce as many electrons; a darker area forms in the image.

Thus does the scanning microscope reproduce faithfully the lights and shadows of an irregular three-dimensional surface—whether it be the hypodermic proboscis of a mosquito, minute spheres of moon dust, rods and cones in the retina, or neurons of the brain.

"WITHIN THIS INVISIBLE WORLD lie the keys to every life process and many diseases," writes the pioneering microscopist Humberto Fernández-Morán, inventor of the diamond knife. Indeed, the electron microscope has revolutionized research. It is now easily possible to see viruses that are sometimes as small as 60 angstroms in diameter. Biologists can even see normal cells changing into cancerous cells and identify genes that cause hereditary diseases.

Other scientists, too, use this remarkable tool. The metallurgist, gaining new insight into crystal structure, learns how metals corrode and fracture. The materials expert looks into the heart of a rubber molecule and predicts a tire's performance. The ecologist, tracking down pollution, identifies fine droplets of sulfuric acid even in the pristine air of Antarctica.

But perhaps the most unexpected benefit of the electron microscope is in "demagnifying." Today's high-speed computers, for example, depend on tiny silicon wafers containing intricate circuits and thousands of transistors. They can be produced with photographic masks that have been made at large scale, then ultraminiaturized by photography through the microscope-in-reverse.

Someday, scientists hope, these techniques will make possible a miniature computer rivaling the human brain with its billions of connections. Already, with grainless films, we can reduce printing until each letter is only 100 angstroms high. At that size, all the millions of books in the Library of Congress could be stored on a single sheet of paper.

Incredible? Yes, the electron microscope is taking us into an unbelievable realm, the domain of the atom, the invisible world.

"It is a strange world in which new laws apply," says California Institute of Technology's Nobel laureate Richard Feynman. "Up to now man has been blind." □

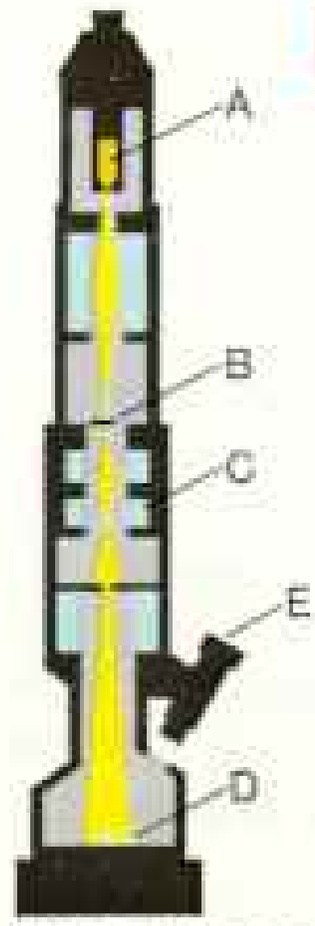
By KENNETH F. WEAVER ASSISTANT EDITOR

New microscopes break the light barrier

ONCE LIMITED by the wavelengths of light, scientists now turn to the electron, with wavelengths thousands of times shorter. Instruments can now "see" into a realm where objects are measured in angstroms—units equivalent to a hundred-millionth of a centimeter.

Optical microscope

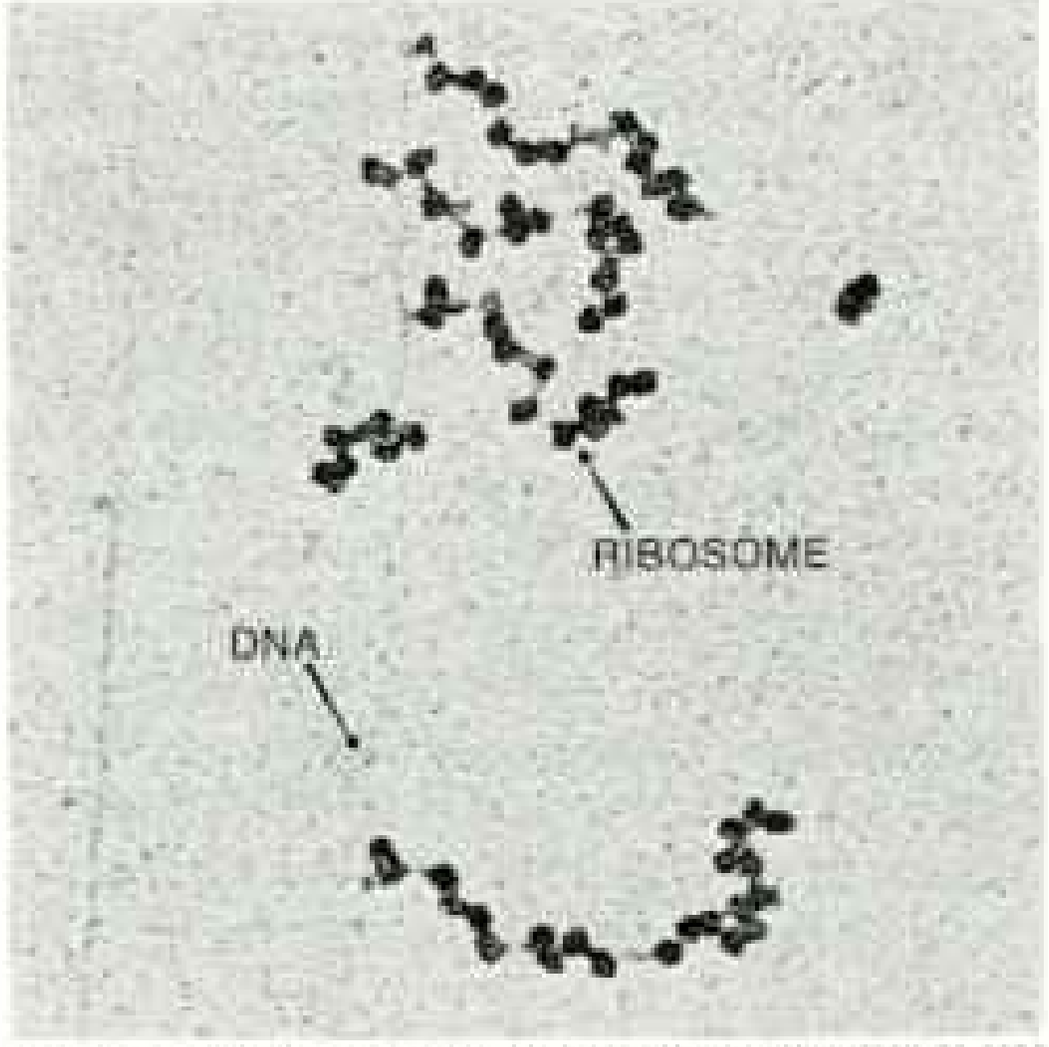
Workhorse of scientists for more than three centuries, the optical microscope magnifies images with a beam of light reflected off a mirror (A), through condensing lenses, and then through the specimen (B). From there the image undergoes magnification through additional sets of lenses, finally focusing at the eyepiece (C). From a highly specialized optical microscope comes this image of a "plantimal"—a fusion of a tobacco cell and human tumor cells—a historic breakthrough in biological research.



Transmission electron microscope

First microscope to replace light rays with electron beams, this instrument brought about a quantum leap in the life and physical sciences. Similar in principle to the optical microscope, its lenses are formed by magnetic coils that affect an electron beam in much the same manner as glass lenses affect light. A filament (A) generates a high-voltage electron beam which passes through a series of condensing lenses and then through the specimen (B). From there the electrons are scattered, creating an invisible image that is made visual by a system of magnetic lenses (C) that focus the image onto a fluorescent screen (D), viewed through an eyepiece (E). The TEM shares one property with the optical microscope: The illuminating beam must shine *through* a thin specimen, and the resultant image bears little resemblance to the object's overall appearance. Nonetheless, the TEM is invaluable for studies such as genetics, showing in graphic detail (**below**) an active bacterial chromosome.

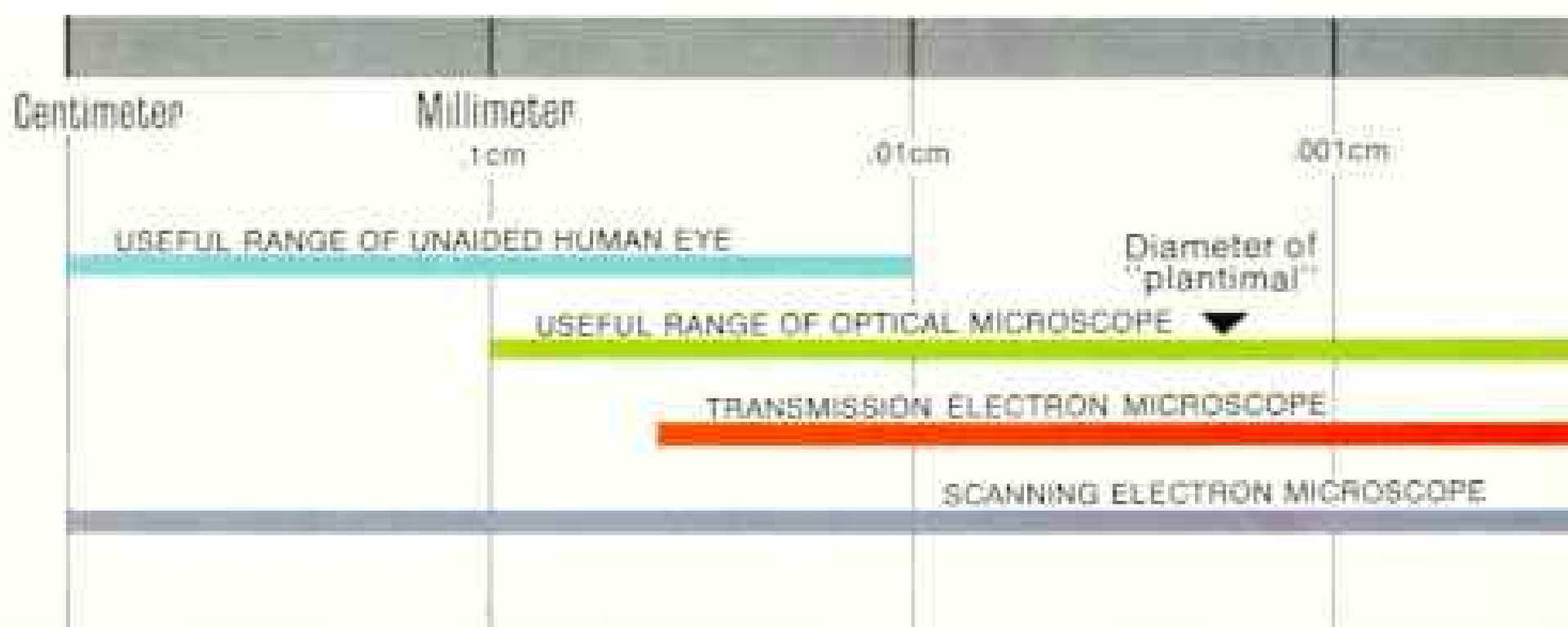
"PLANTIMAL"
.0028 cm

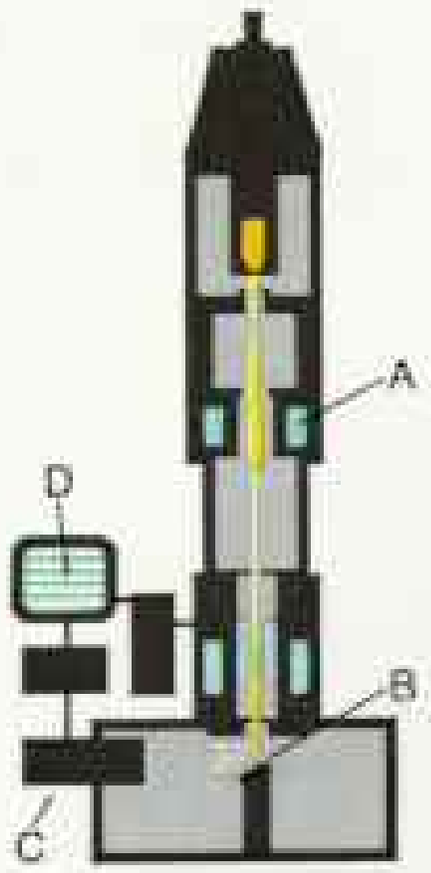


BACTERIUM
DNA—.000000207 cm Ribosome—.000002 cm

In eight steps, the gray bar at right moves from the familiar centimeter to the submicroscopic angstrom, a hundred-millionth of a centimeter. Each unit of measurement is one-tenth the size of the preceding one. Continuing to divide by ten for five more steps would take us to a fermi—a ten-trillionth of a centimeter.

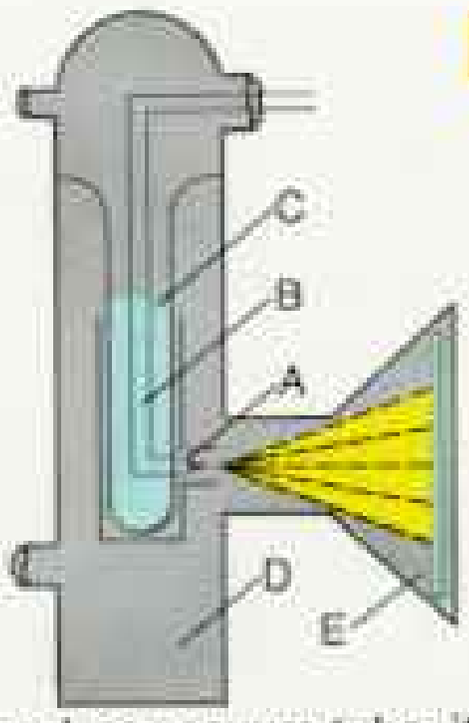
ACTUAL LENGTH OF ONE CENTIMETER (.39 INCH)





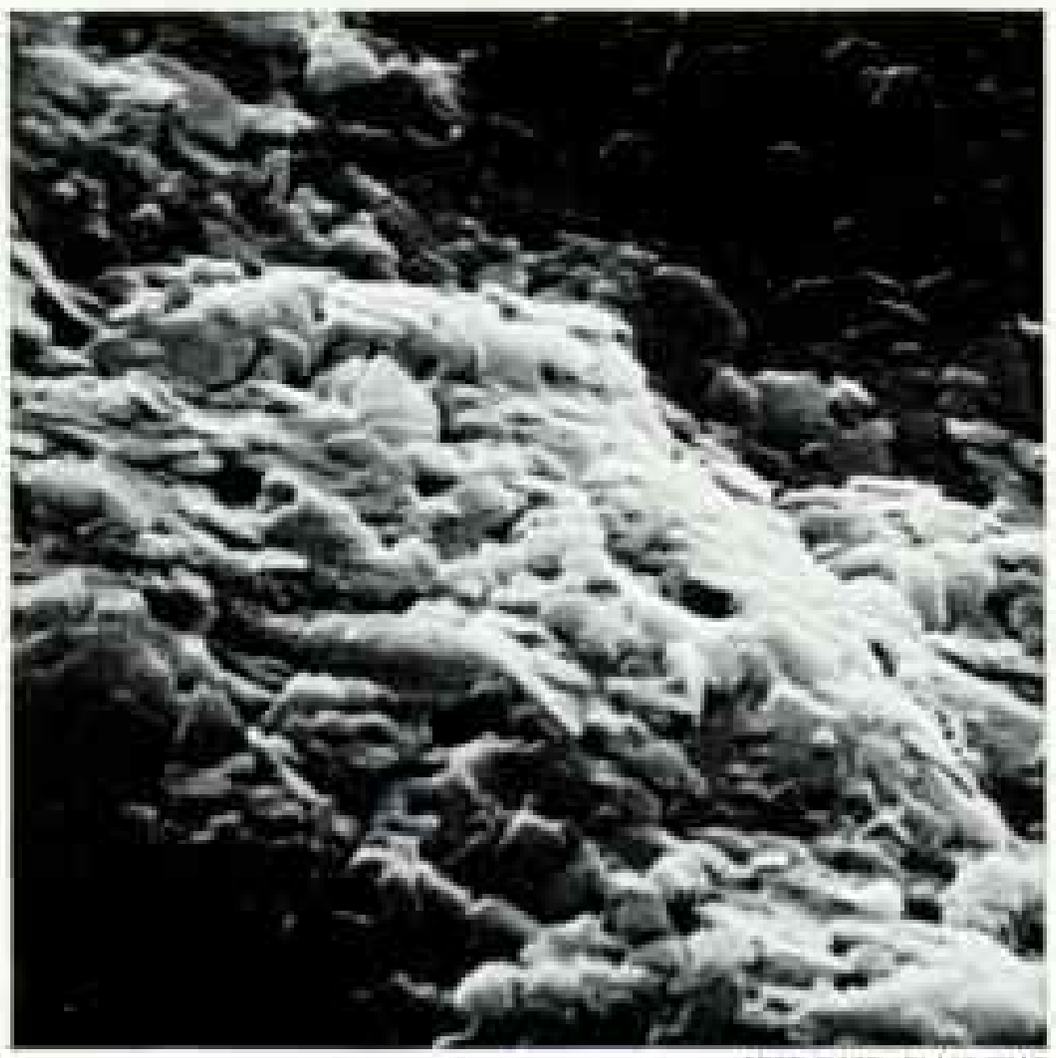
Scanning electron microscope

With the advent of the SEM in the late 1960's, scientists were finally able to view the three-dimensional surface structure of infinitesimal objects. Instead of shining a beam through the specimen, the SEM's condensing lenses (A) form the electrons into an exceedingly fine beam that sweeps across the specimen (B), causing it to release a shower of its own electrons. These in turn are picked up by a signal detector (C) and transmitted onto a cathode-ray viewing screen (D). In this manner the SEM works in principle much the same way as a closed-circuit television system. Though this concept has revolutionized microscopy, it will serve as a complement to, and not a replacement for, conventional transmission instruments. The rugged terrain below is no more than an SEM micrograph of the clay coating on a page of NATIONAL GEOGRAPHIC.

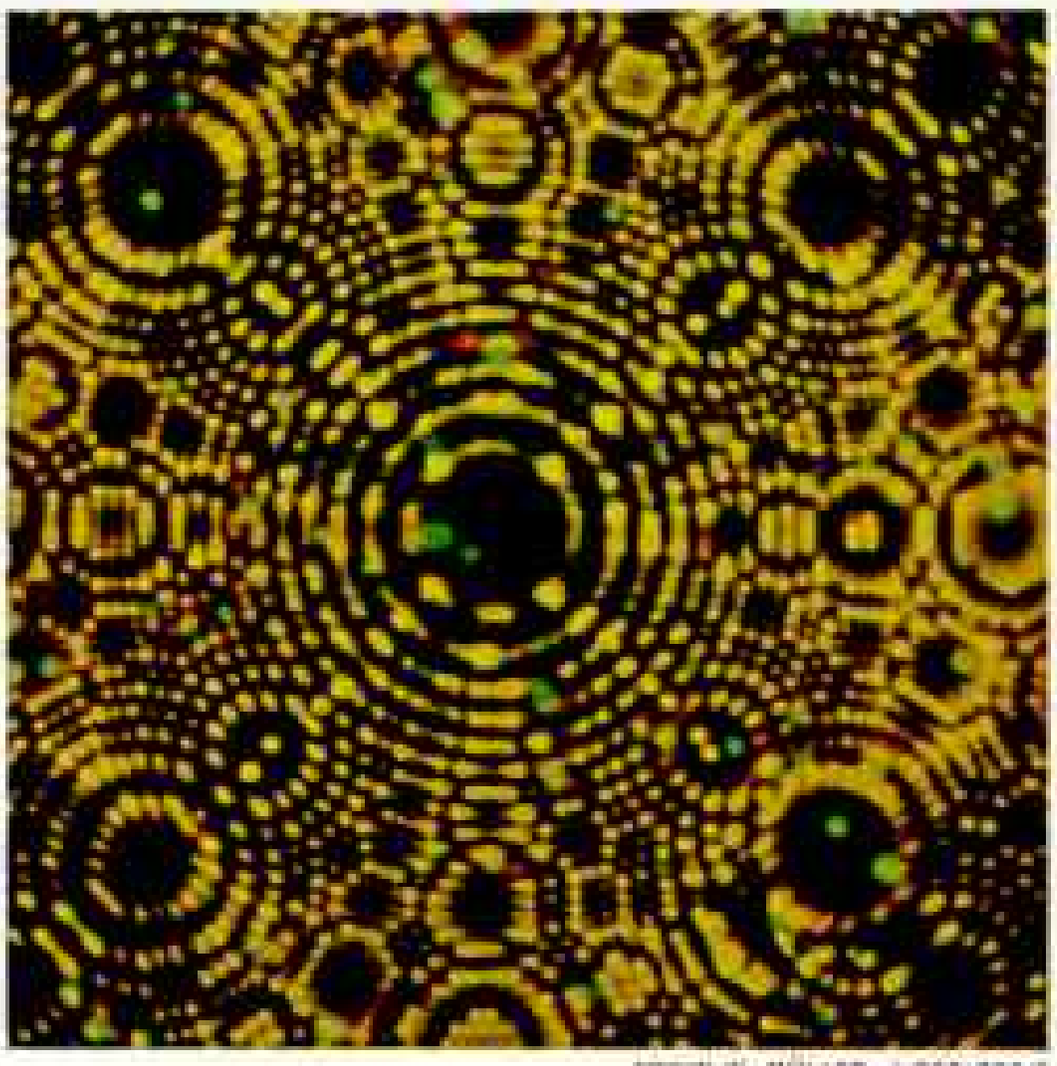


Field ion microscope

Used primarily to study the atomic structure of metals, the field ion microscope, invented by Dr. Erwin W. Müller, created a sensation in 1951 when it provided man's first views of the atom. Essentially only a glass vacuum tube, its most surprising feature is that it contains no lens. A specimen of metal is etched to a point a thousandth the size of the tip of a fine sewing needle (A). A high-voltage wire (B) is connected, and a refrigerant to reduce thermal energy is introduced into an inner chamber (C); helium—an "imaging gas"—is introduced into the vacuum chamber (D). Ionized helium atoms shooting out from the specimen tip hit the fluorescent screen (E), causing it to light up and reveal the atomic structure of the specimen magnified a million or more times. In the color-enhanced image of an iridium crystal below, each dot represents a single atom. The latticelike arrangement of these radiant strings of lights reflects the order and symmetry of crystalline atomic structure.



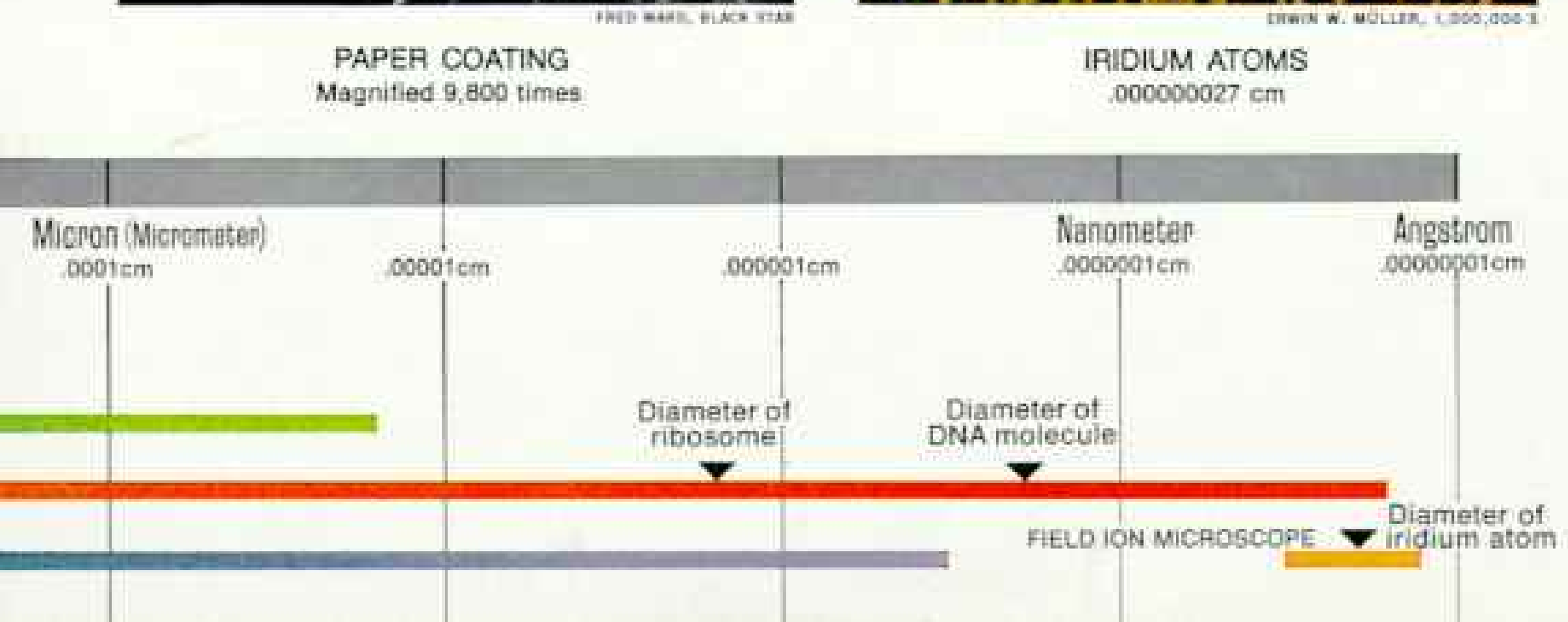
FRED MARL, BLACK STAR

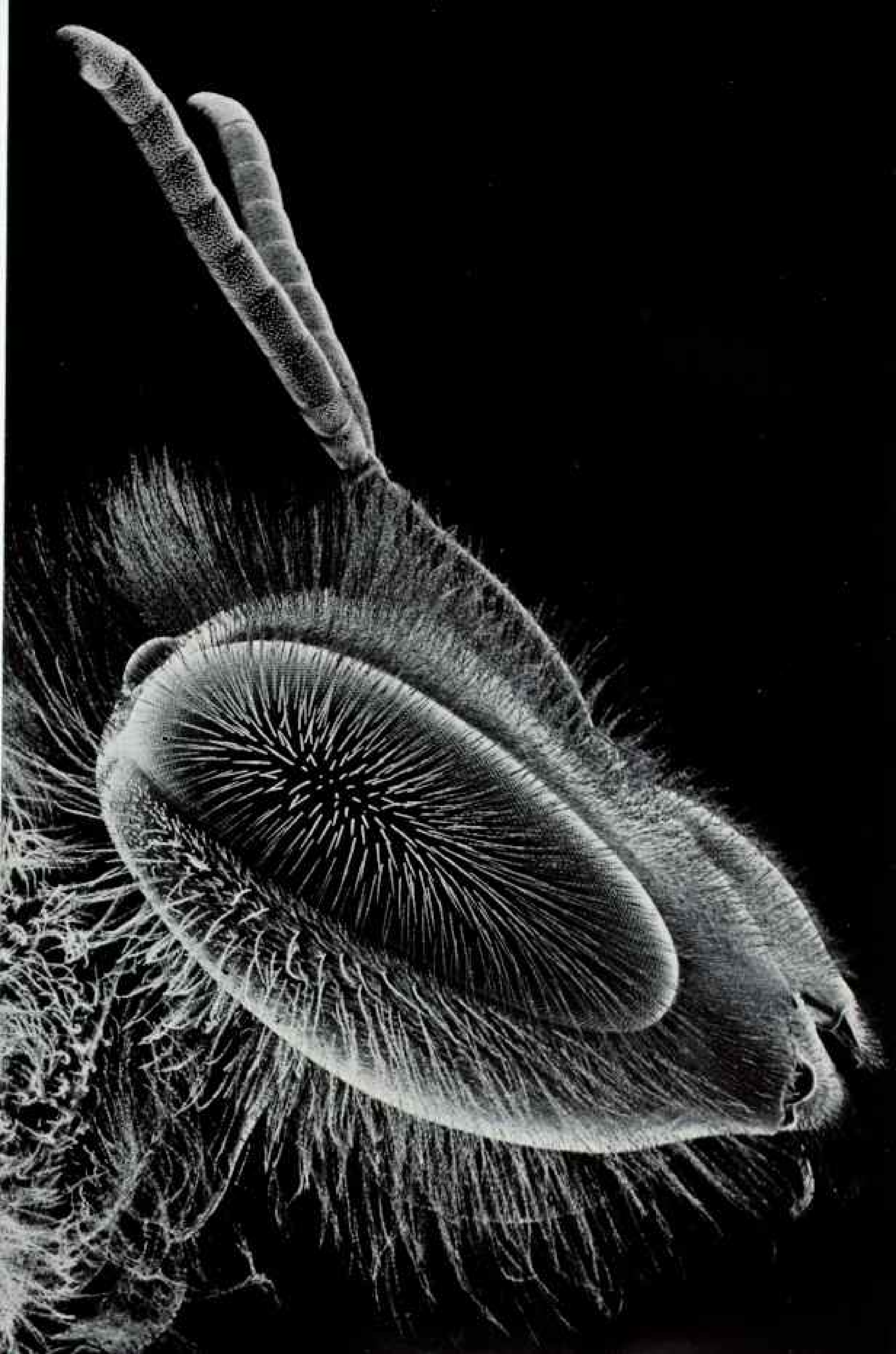


ERWIN W. MÜLLER, U.S. PAT. 3,000,000

PAPER COATING
Magnified 9,800 times

IRIDIUM ATOMS
.000000027 cm

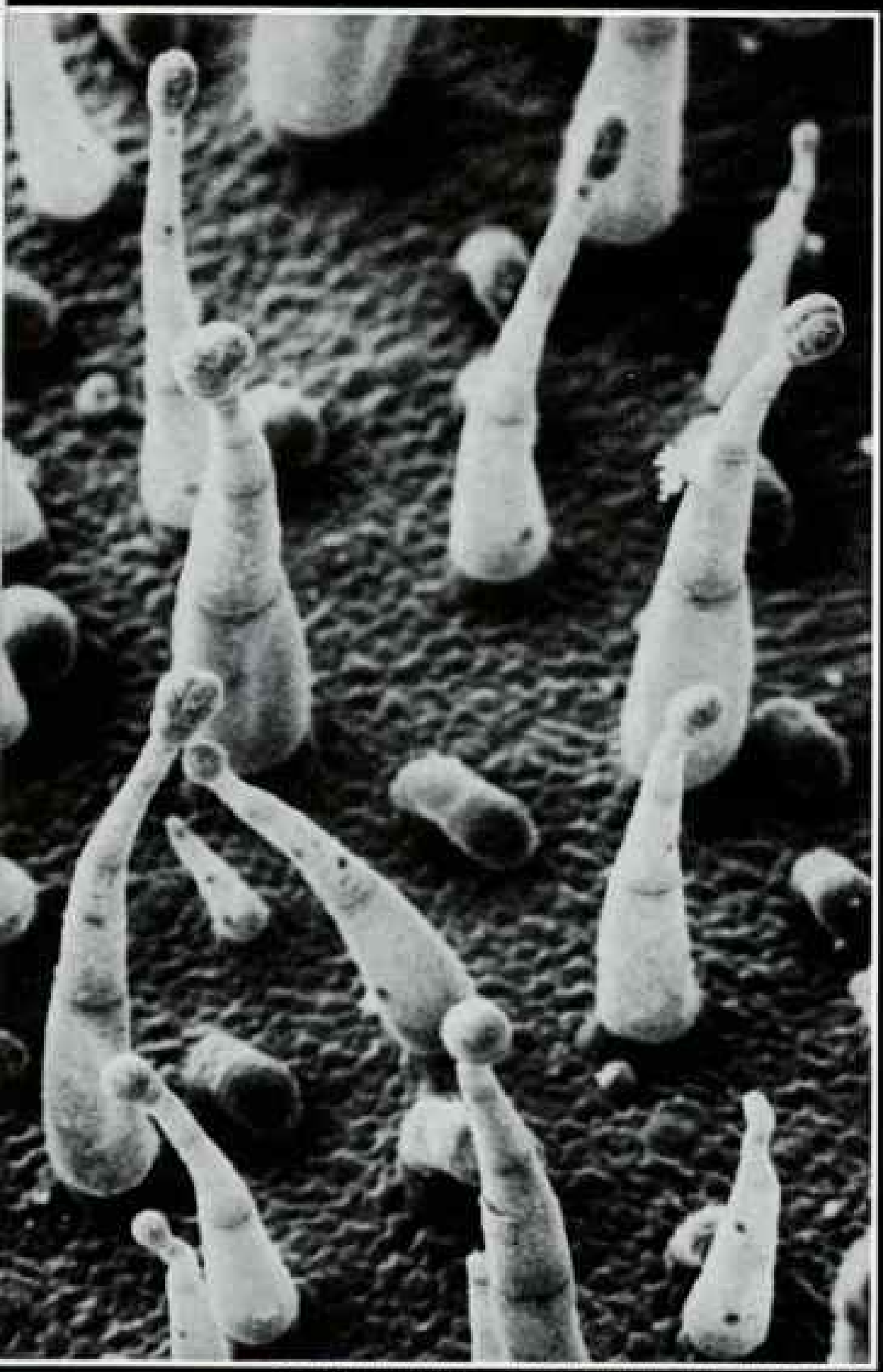




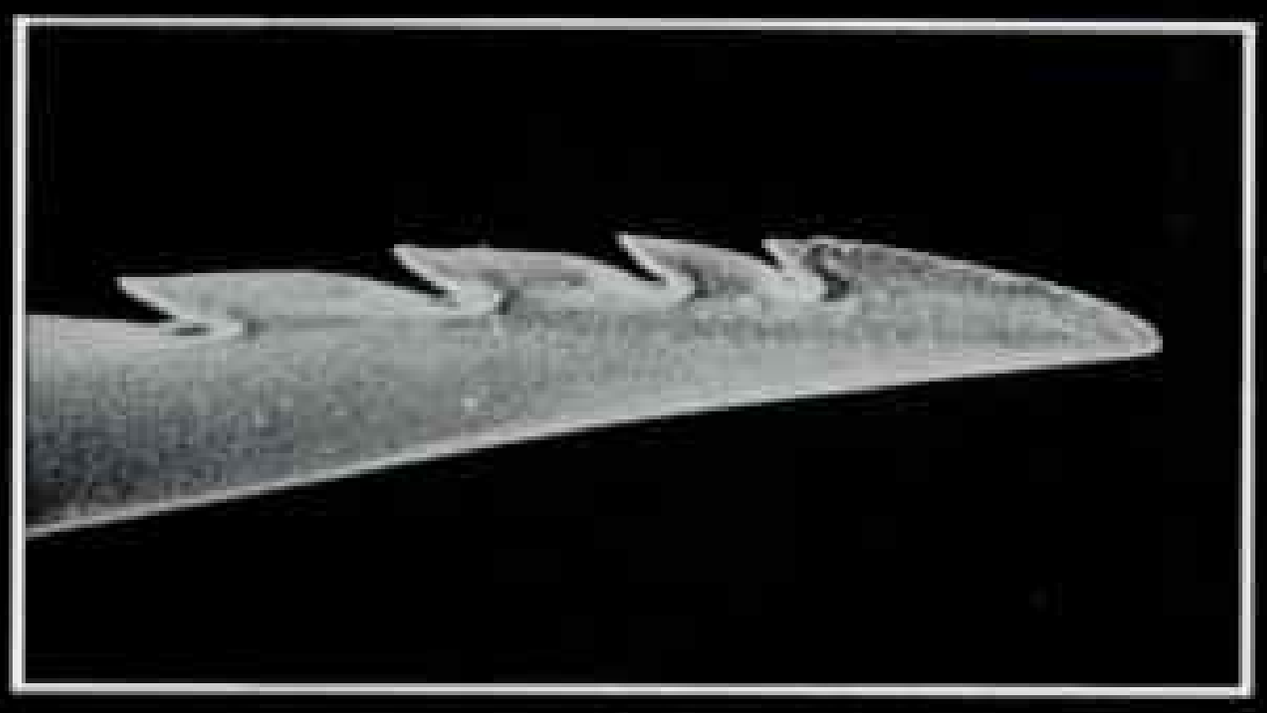
ALL BY DAVID SCHARF. 40 X (FACING PAGE), 80 X (ABOVE), 130 X (LOWER LEFT), AND 25 X (LOWER RIGHT)

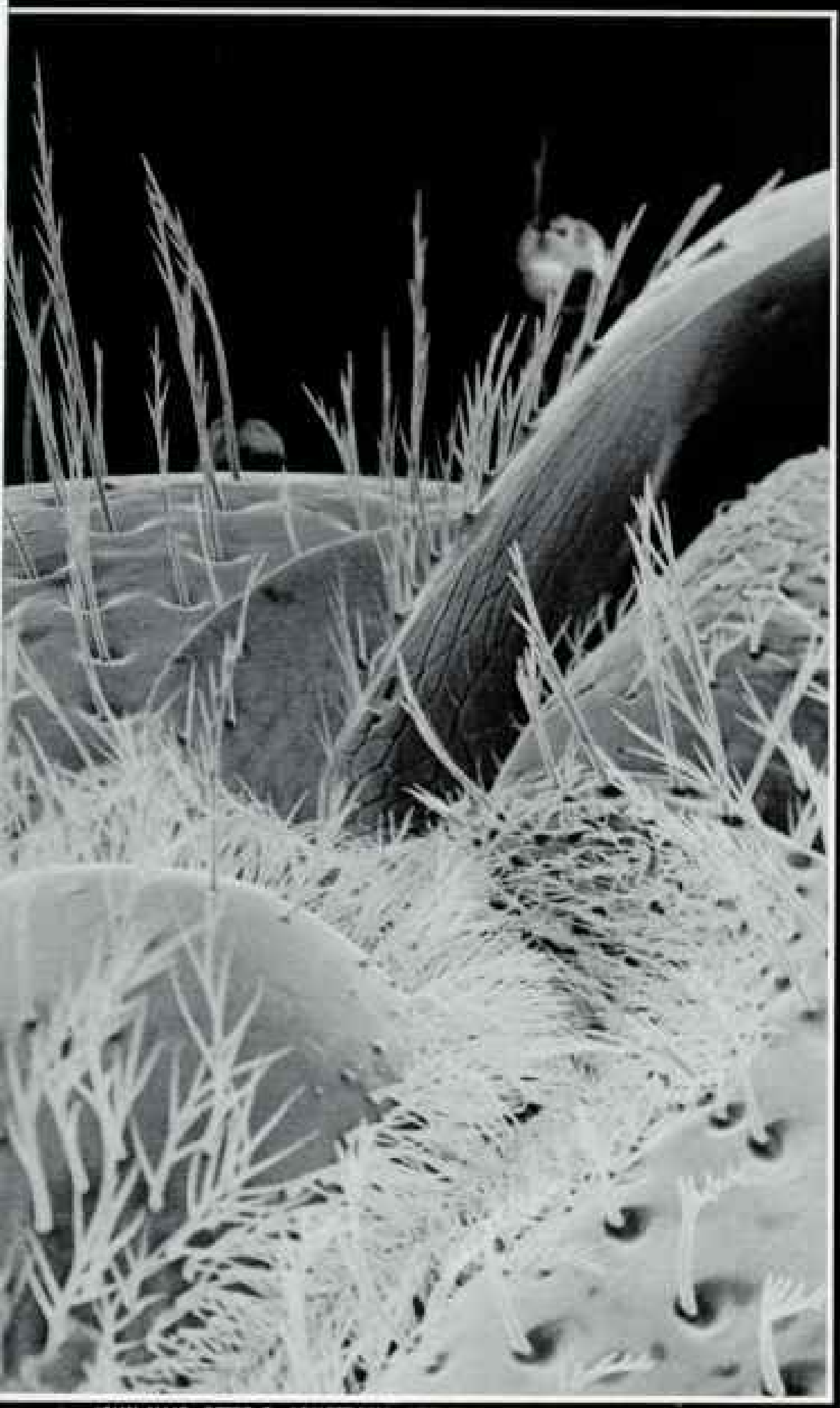
ROGUE'S GALLERY of familiar backyard denizens: The probe of a scanning electron microscope turns the commonplace into the bizarre with portraits of three ants—velvety tree ant (top), black ant (above), and red harvester ant (right)—revealing visages with eyes where ears might be and noses in their antennae. Equally disconcerting, the honeybee (left) views the world through oversize eyes composed of thousands of tiny facets. Each transmits image fragments to the brain, where they are received in mosaic patterns.

PSYCHEDELIC in appearance, a marijuana leaf close up resembles a giant cresting wave of thorns (right). The hairs and resin nodules on a *Cannabis sativa* leaf are magnified 345 times. Ghostlike figures (below) are, in fact, the four-celled leaf hairs of burley 21, a type of tobacco currently valuable to biological researchers using it to cultivate a potato virus to which the tobacco plant is host.



T. A. SHALLA AND L. J. PETERSEN, UNIVERSITY OF CALIFORNIA, DAVIS, 280 X (ABOVE); DAVID SCHARF, 345 X (RIGHT)

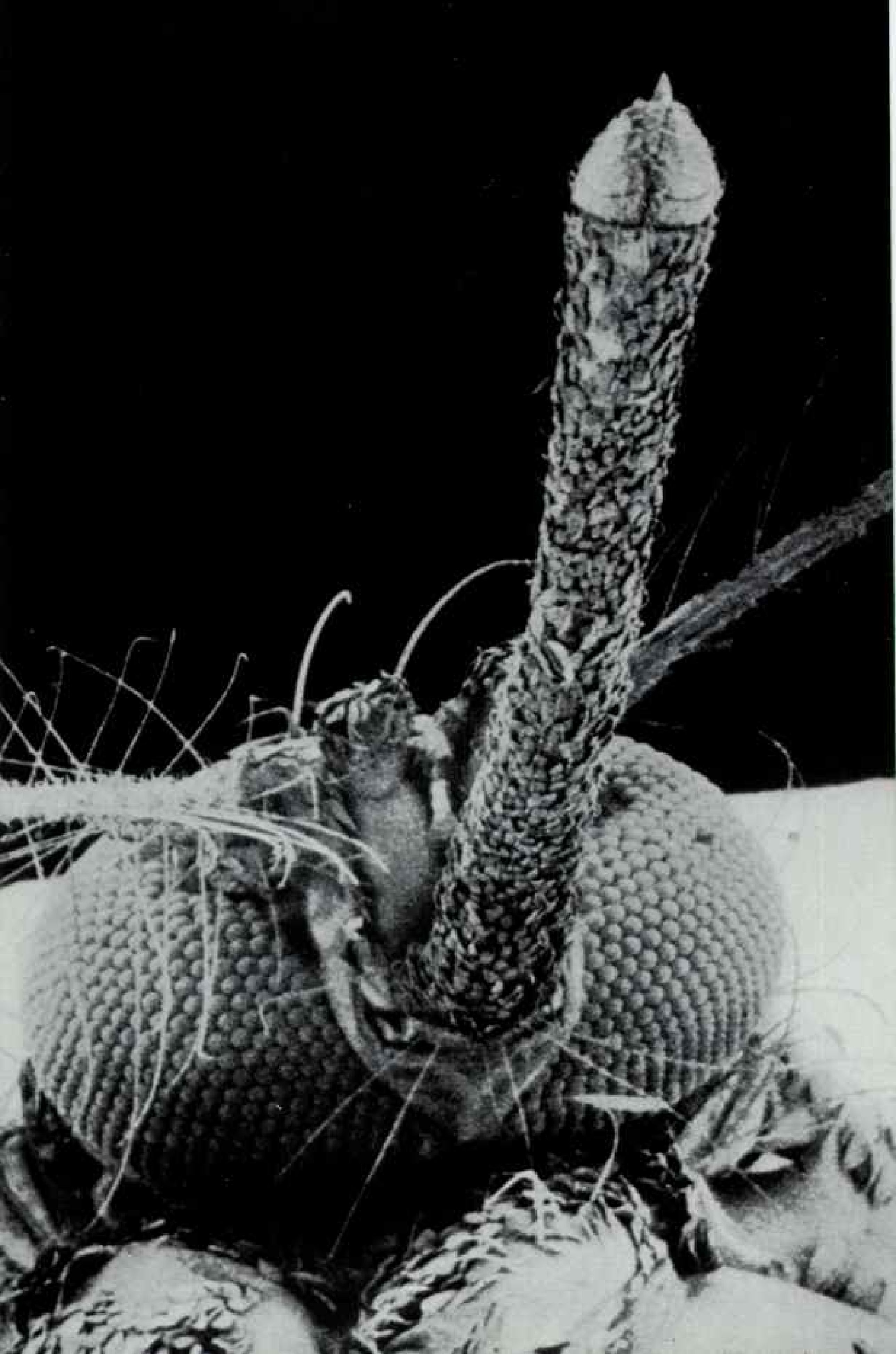


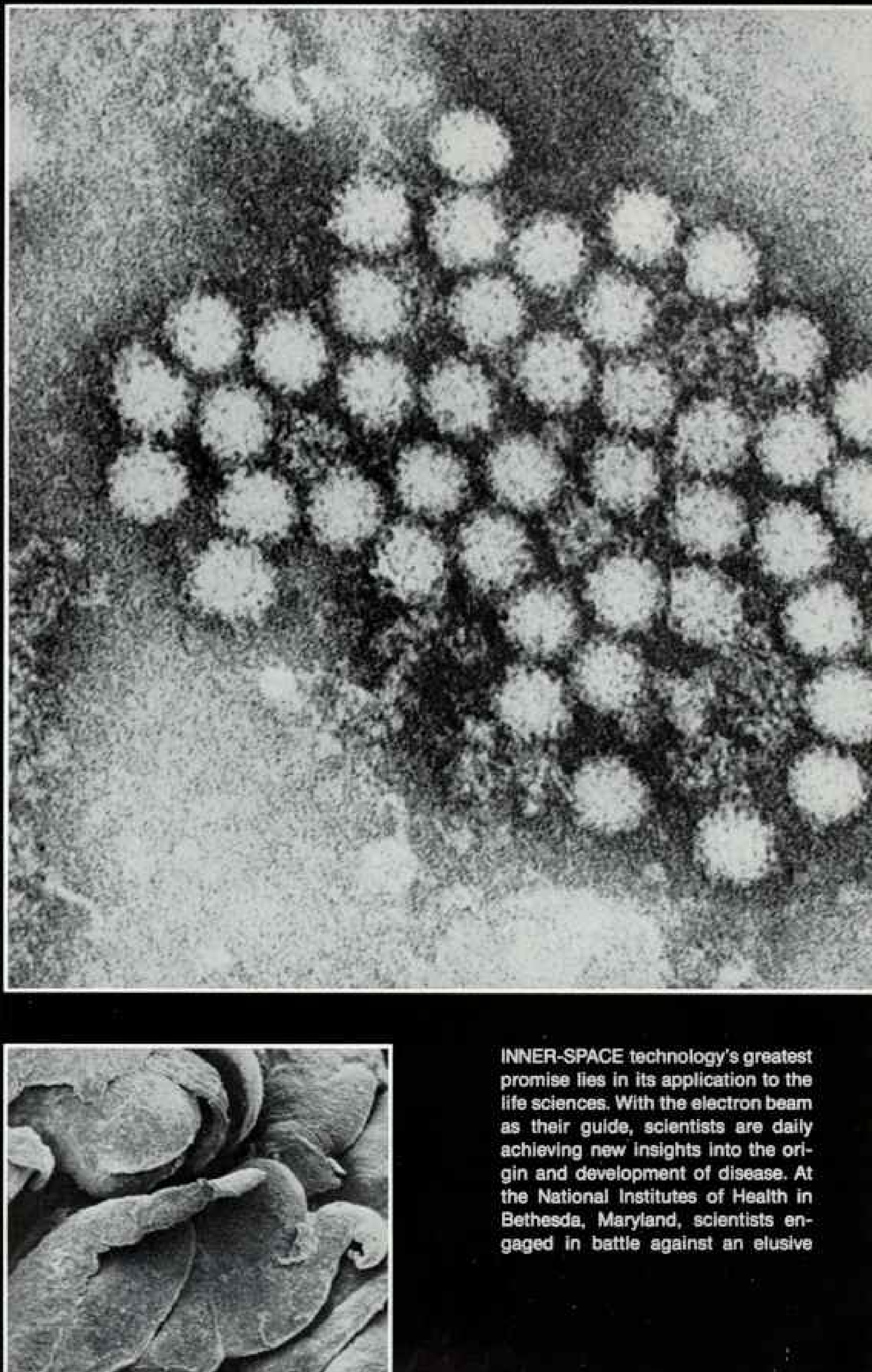


DREAD CARRIER of the yellow-fever virus, the female *Aedes aegypti* mosquito (facing page) has no trouble jabbing the needlelike central shaft concealed in its scaly proboscis in and out of human skin to obtain the blood it needs to survive. Not so with the worker bee, whose stinger (above left) is a once-in-a-lifetime defense. Since the barbed harpoon cannot be withdrawn, the bee's entire abdomen is torn out when it attempts to pull away.

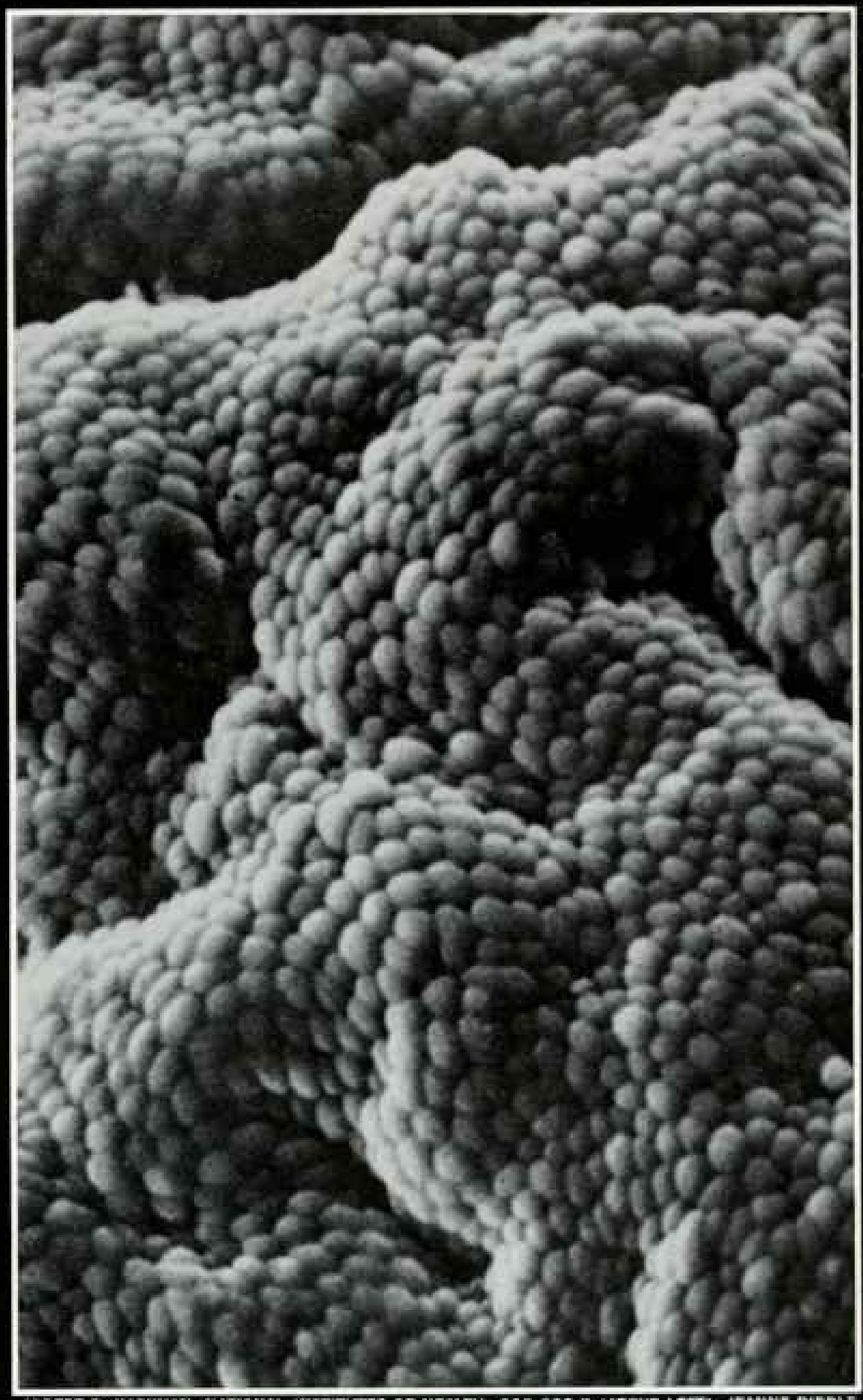
The surrealist landscape of a bee's back (left) was contributed, along with several other photographs for this article, by research photographer and artist David Scharf of California. Though many researchers working with the SEM must kill their specimens through preparation techniques, Scharf has perfected methods enabling him to examine live insects. By lowering the energy of the electron beam and adjusting the system for maximum sensitivity, he is able to produce images remarkable in their resolution of detail and three-dimensionality. Some specimens are returned to his garden—stunned, but alive.

JOHN MAIS, PETER B. ARMSTRONG, AND D. W. DEAMER, UNIVERSITY OF CALIFORNIA, DAVIS, 410 X (TOP), 220 X (FACING PAGE); DAVID SCHARF, 390 X (ABOVE)





INNER-SPACE technology's greatest promise lies in its application to the life sciences. With the electron beam as their guide, scientists are daily achieving new insights into the origin and development of disease. At the National Institutes of Health in Bethesda, Maryland, scientists engaged in battle against an elusive

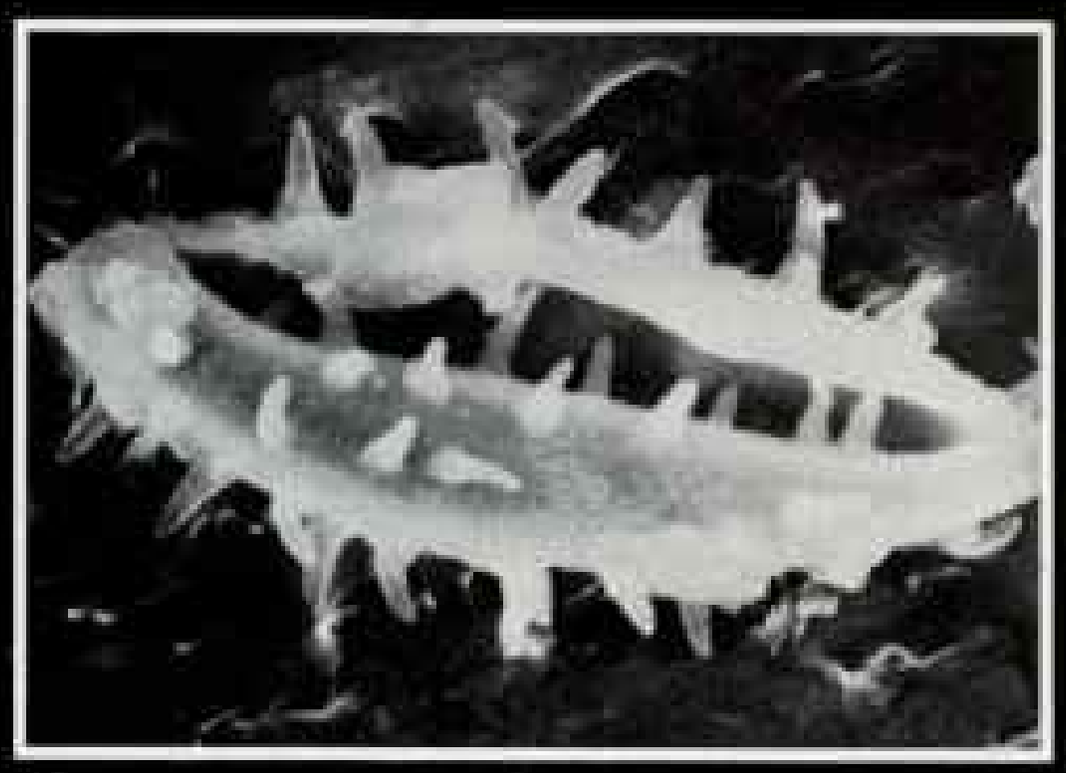


ALBERT Z. KAPIKIAN, NATIONAL INSTITUTES OF HEALTH, 390,000 X (ABOVE LEFT); JEANNE RIDDLE, WAYNE STATE UNIVERSITY, 70 X (FACING PAGE) AND 560 X (ABOVE)

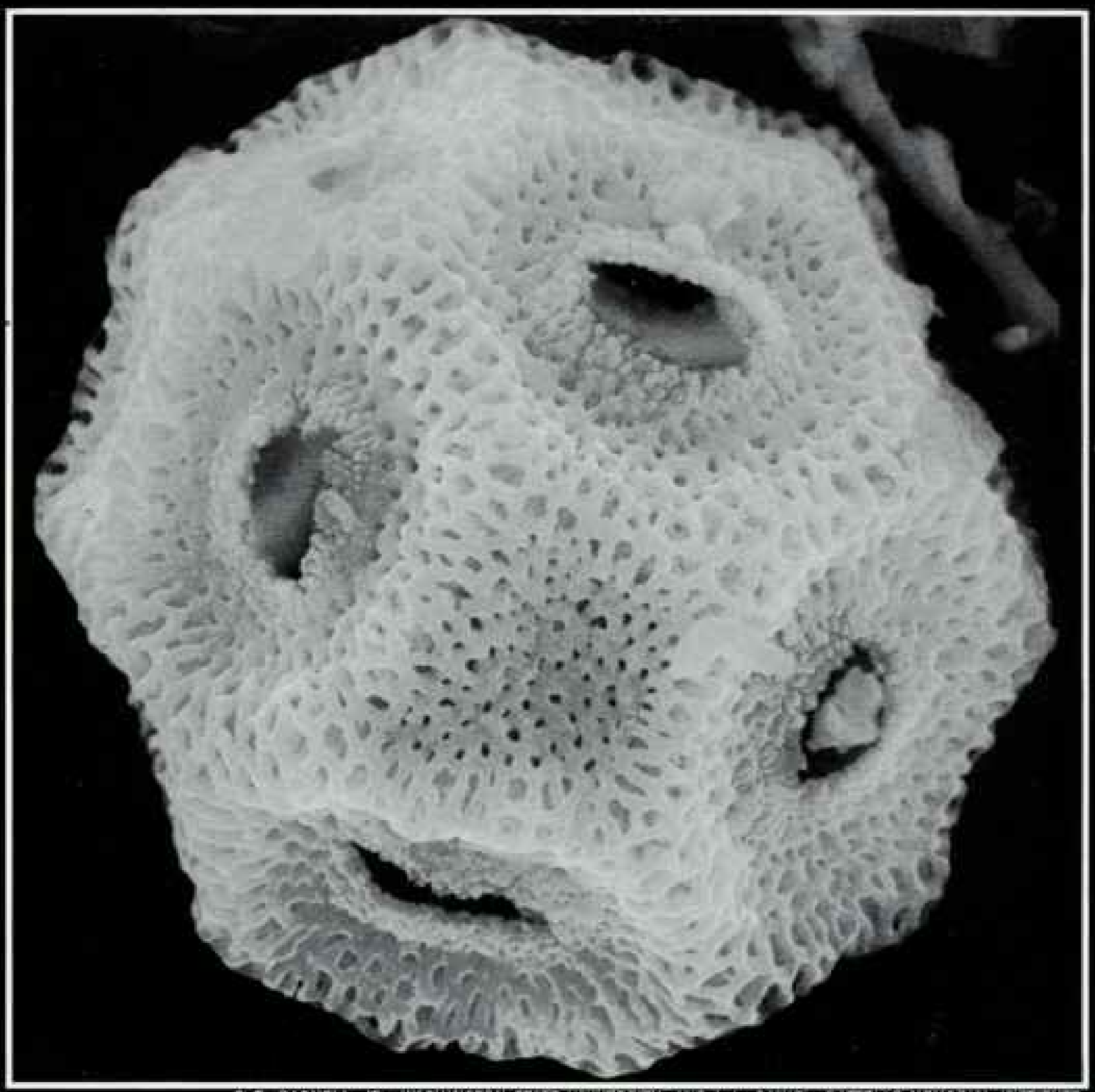
intestinal virus use the middle range of a transmission electron microscope to study the virus particles (above left).

Tissue removed from the knee joint of a rheumatoid arthritis patient (left) illustrates the characteristics of an overgrown membrane, crowding out and degenerating the surrounding cartilage. Though able to curb the physical damage of arthritis and lessen its pain, doctors are still a long way from finding a cure for this crippler.

The surface lining of a human stomach (above) normally sheds about half a million cells a minute, thereby renewing itself completely every five days or so.



DAVID J. LIM, OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, 1,850 X



C. R. BAGNELL, JR., WASHINGTON STATE UNIVERSITY, AND J. L. DANIEL, BATTELLE MEMORIAL INSTITUTE, 1,400 X (TOP RIGHT) AND 1,400 X (ABOVE)

BEARERS OF MALE PLANT GENES, pollen grains embody a startling range of distinctive forms. Cactus pollen (above) resembles the fragile structuring of a coral formation. The vicious barbs on ragweed pollen (top left) seem an appropriate mantle for this scourge of millions of hay-fever victims. Fossilized pollen such as the Ice Age water-lily specimen (top right) adds to our knowledge of ancient environments. □

NATIONAL GEOGRAPHIC SOCIETY

WASHINGTON, D. C.

Organized "for the increase and diffusion of geographic knowledge"

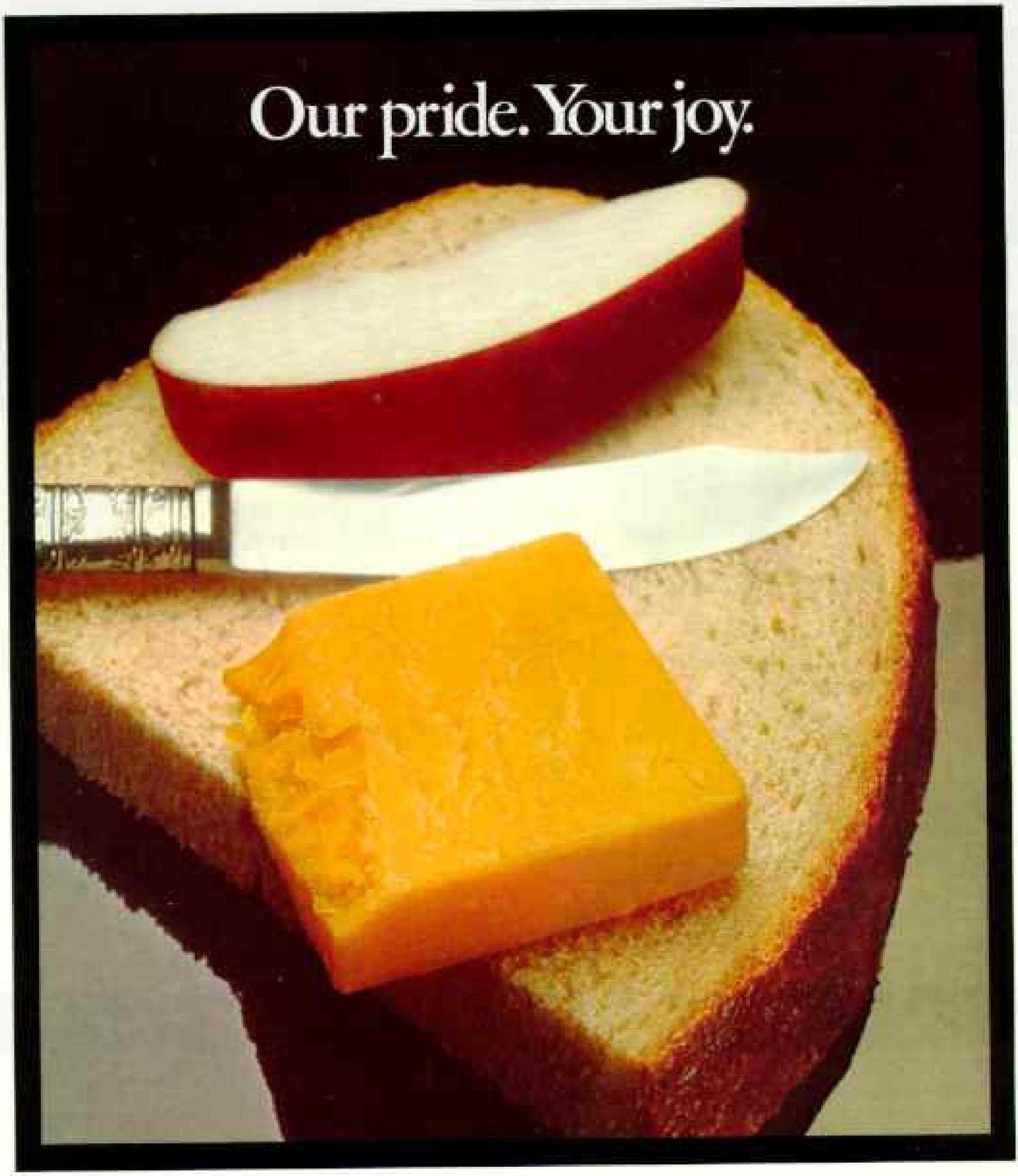
GILBERT HOVEY GROSVENOR
Editor, 1899-1954; President, 1920-1954
Chairman of the Board, 1954-1966

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., in accordance with the laws of the United States, as a nonprofit scientific and educational organization for increasing and diffusing geographic knowledge and promoting research and exploration. Since 1890 the Society has supported 1,352 explorations and research projects, adding immeasurably to man's knowledge of earth, sea, and sky. It diffuses this knowledge through its monthly journal, NATIONAL GEOGRAPHIC; supplement maps distributed to members; its books, globes, atlases, filmstrips, and educational films; *National Geographic WORLD*, a magazine for children age 8 and older; information services to press, radio, and television; technical reports; exhibits from around the world in Explorers Hall; and a nationwide series of programs on television.

Articles and photographs of travel, natural history, and expeditions to far places are desired. For material used, generous remuneration is made.

NATIONAL GEOGRAPHIC MAGAZINE

POSTMASTER: Send change of address form 3579 to National Geographic, 17th and M Sts. N.W., Washington, D. C. 20036.



We wanted to make the finest, most admired cheddar in our power and we gave it our all. The result fulfills our fondest hopes.

Long before Cracker Barrel takes its place on your cheese board, we've been nurturing it—from the finest ingredients, to the most patient aging and curing. When the day comes that we can say, "this is our best," only then is it named Cracker Barrel. And we stand behind it from then on. We have our pride, we want you to enjoy it. It's another reason America spells cheese KRAFT.

KRAFT

The Conseil International des Monuments et des Sites announces

The World's 100 Greatest Landmarks

Illustrated smaller than actual size is the medallic cachet honoring the Trevi Fountain, one of Italy's most beautiful landmarks. Officially postmarked in Rome, Italy, site of this world-famous fountain.

100 finely engraved cachets...
carrying 100
solid sterling silver medals...
and bearing 100 intriguing postmarks
from the far corners of the world.

The Tower of London. The Palace of Versailles. The summit of the Matterhorn. The Great Wall of China. The Alhambra. The Parthenon. Mount Rushmore. The Acropolis. Victoria Falls. The Basilica of St. Peter's...

These are among the greatest landmarks of the world. Breathtaking, exotic sites. Created by the magic of nature and the genius of man. So splendid and awe-inspiring that people from all over the world travel thousands of miles just to see them.

Now, the Conseil International des Monuments et des Sites—the Paris-based international body dedicated to the conservation and preservation of the world's landmarks—has chosen 100 of the most significant of all the world's landmarks for permanent

commemoration. And a unique collection of *medallic cachets* will be created to honor these world-renowned sites. Appropriately, there will be 100 cachets in the collection, each containing a finely sculptured sterling silver Proof medal portraying one of the world's greatest landmarks.

Each cachet will bear an official stamp of the nation where the landmark is located—and will be *postmarked at the site* of that great landmark. Thus, the Arch of Triumph cachet will be postmarked in Paris, France. The Mount Everest cachet in Kathmandu, Nepal. The Christ of the Andes cachet in Mendoza, Argentina. The Mosque of Sultan Ahmed cachet in Istanbul, Turkey. The Victoria Falls cachet in Livingstone, Zambia. The Mount Fuji cachet in Tokyo, Japan.

100 individual cachets...carrying 100 magnificent sterling silver Proof medals...postmarked at the sites of 100 of the greatest landmarks of the world.

Authentic commemoratives of the world's great sites

Subscribers and their families will thus have the pleasure of systematically building a collection of distinctive commemorative cachets that *have actually come from 100 of the most beautiful, most historic places on the face of the earth.* A collection as unusual as it is important. A true family heirloom that provides a lasting tribute to the great landmarks that have captured the imagination of the world.

To further enhance the desirability of the collection, each cachet will be personalized with the name and address of the individual owner, or anyone he designates. And each cachet will be accompanied by a special certificate attesting to the authenticity of the foreign postmarking and the sterling silver content of the Proof medal it contains.

In addition, a deluxe collector's chest will be provided to each subscriber, as part of the collection. This handsome chest will be custom-designed for easy reference and display of all 100 cachets.

Issued in strictly limited edition

The Conseil International des Monuments et des Sites (ICOMOS) has appointed The Franklin Mint, the world's largest private mint, to strike the medals and produce the cachets for The World's 100 Greatest Landmarks. And the collection will be issued in strictly limited edition. The total edition in the United States and Canada will be permanently limited to the number of subscribers whose applications are postmarked by February 28, 1977. The collection will be offered later in other countries by The Franklin Mint's international affiliates—but it will never again be made available in this country.

Subscribers will receive their specially-postmarked cachets at the rate of two per month, beginning in April 1977. The official issue price for each engraved cachet, including the sterling silver (32mm) Proof medal, is just $14.50—and this price will be guaranteed to each subscriber for the entire series.

Subscription deadline: February 28, 1977

This is the only time that you and your family will be able to take part in a unique *medallic tour* of the world. To "visit" some of the most exotic places on the face of the earth, and to take back with you a distinctive and lasting commemoration of each place. This fascinating tour will begin soon after you send your application to The Franklin Mint, Franklin Center, Pennsylvania. But please be sure to mail the application at right by February 28, 1977.

CONSEIL INTERNATIONAL
DES MONUMENTS ET DES SITES

Headquartered in Paris, the Conseil International des Monuments et des Sites (ICOMOS) operates through a world-wide network of National Committees in 55 countries. ICOMOS promotes programs of professional and technical education, sponsors national and international conferences and publishes professional journals dedicated to the conservation, preservation and protection of the landmarks, historical sites and national monuments of the world.

A strictly limited edition.

Subscription deadline: February 28, 1977.

A deluxe collector's chest will be provided to each subscriber to The World's 100 Greatest Landmarks. This chest will be custom-designed for easy reference and display of the 100 specially-postmarked medallic cachets that make up this distinguished commemorative collection.

SUBSCRIPTION APPLICATION

The World's 100 Greatest Landmarks

Valid only if postmarked by February 28, 1977

Limit: One subscription per person

The Franklin Mint
Franklin Center, Pennsylvania 19091

Enter my subscription for The World's 100 Greatest Landmarks consisting of 100 specially-postmarked cachets, each bearing a sterling silver (32mm) Proof medal. The price for each cachet is $14.50*, and the cachets will be sent at the rate of two per month beginning in April.

I agree to pay $29* for each shipment of two medallic cachets, promptly upon being billed at the time of its shipment. A custom-designed collector's chest will be provided to me at no additional charge. *Plus my state sales tax.

Signature _____

All applications are subject to acceptance.

Mr.
Mrs.
Miss _____

PLEASE PRINT CLEARLY

Address _____

City _____

State, Zip _____

Your cachets will be personalized exactly as shown above. If you wish your cachets personalized *differently*, please print the personalization you wish on a separate piece of paper and enclose it with this form.

☐ Check here if you wish no personalization at all.

Canadian price: $14.75 per cover, plus provincial sales tax, if any. Mail application to The Franklin Mint Canada Ltd., 70 Galaxy Blvd., Rexdale, Ontario M9W 4Y7.

The Franklin Mint is the world's largest private mint. It is not affiliated with the U.S. Mint or any other government agency.

NATIONAL GEOGRAPHIC

Medals in above caches shown actual size.

Cargo from 1600 B.C.

"AN EXTRAORDINARY STROKE OF LUCK"—a tip from a sponge diver—led Dr. George F. Bass to the terra-cotta jar above, which had lain for 3,600 years in the Mediterranean off Şeytan Deresi, or Devil Creek, on Turkey's southwest coast.

Dr. Bass, far right, head of the American Institute of Nautical Archaeology at College Station, Texas, and his colleague Dr. John Cassils reassemble an amphora from the sea trove. The ancient cargo predates by 400 years another discovery off Turkey, reported in the May 1960 and May 1962 GEOGRAPHICS, the oldest shipwreck then known.

Twelve Society research grants have aided Dr. Bass's underwater explorations. Your friends can help too; nominate them for membership below.

BOTH BY ROBIN C. M. FRENCH

NATIONAL GEOGRAPHIC SOCIETY MEMBERSHIP

$8.50 **CALENDAR YEAR 1977 MEMBERSHIP DUES INCLUDE SUBSCRIPTION TO THE NATIONAL GEOGRAPHIC**

ANNUAL DUES in the United States and throughout the world are $8.50 U. S. funds or equivalent. To compensate for additional postage and handling for mailing magazine outside the U.S.A. and its outlying areas, please remit: for Canada, $10.45 Canadian or U. S. funds; for British Isles, Australia, and New Zealand, $12.80; for all other countries, $12.35 by U. S. bank draft or international money order. Eighty percent of dues is designated for subscription to the magazine. Annual membership starts with the January issue.

LIFE MEMBERSHIP is available to persons 10 years of age or older. The fee for U.S. (including its outlying areas) and Canada is $200 U. S. or Canadian funds; for all other countries, $250 by U. S. bank draft or international money order.

Mail to: The Secretary
National Geographic Society
Post Office Box 2895
Washington, D. C. 20013

CHECK ONE

☐ **I WISH TO JOIN** the NATIONAL GEOGRAPHIC SOCIETY and enclose my dues $_____
(FILL IN NAME AT LEFT.)

☐ **(GIFT MEMBERSHIP)** I nominate and enclose $_____ for dues of the person named at left.
Send gift card signed: _____

☐ **I NOMINATE** for Society membership the person named at left. (Use separate sheet for additional nominations.)

NEW MEMBER _____
PRINT NAME OF AN INDIVIDUAL ONLY (MR., MRS., MISS, MS.)
STREET
CITY, STATE, ZIP CODE

MY NAME _____
PLEASE PRINT (MR., MRS., MISS, MS.)
STREET
CITY, STATE, ZIP CODE 30217

Let Jack Frost nip somebody else's nose.

This winter, let Eastern take you and your family to the warmest place in the world, Walt Disney World.

When you stay 8 days/7 nights at selected Orlando hotels, you get the 7th night at no extra charge. Plus you get Eastern's exclusive Walt Disney World ticket book good for one day's admission to and transportation within the Magic Kingdom and nine attractions. $68-$183.*

Or see more of Florida. Spend 3 nights at selected hotels in Orlando. Then enjoy 4 nights in Daytona Beach, Tampa, St. Petersburg, Clearwater or the Sarasota area. $116-$208* depending upon choice of destination.

Whichever combination you choose, you get Eastern's exclusive Walt Disney World ticket book and a subcompact car for seven 24-hour periods with unlimited mileage (gas and insurance extra). Children's rates available at most hotels. See your travel agent. Or call Eastern. We've got the right time and the right place for you.

*Prices are per person, double occupancy and do not include airfare, taxes, meals or transfers unless indicated. Prices effective 12/16/76-4/21/77, and subject to change. "The Wings of Man" is a registered service mark of Eastern Air Lines, Inc.

Walt Disney World only $68-$208*
PLUS AIRFARE.

EASTERN
THE WINGS OF MAN

EXPLORE AFRICA HEART OF

A century ago, it took Sir Henry Morton Stanley almost four years to explore the most treacherous regions of Africa.

Today you and your family can explore them in a day at The Dark Continent® — Busch Gardens,® Tampa.

UNVEIL THE SECRETS OF AFRICA. Like early adventurers, you enter through 19th-century Marrakesh.

Beneath its classic arches and winding streets, you're greeted by the exotic sights and sounds of the Casbah.

You'll eye castanet-clicking belly dancers. Death-defying snake charmers. Mind-boggling magicians. And long-robed, bearded merchants peddling their baubles, bangles and beads.

DEEPEST IN THE FLORIDA.

COME FACE TO FACE WITH WILD BEASTS.

Pass over the "bridge of no return" and say good-bye to civilization.

Welcome to Nairobi. Where your kids can ride an elephant. Pet a true blue wildebeest. And hop a steam train to the famed Serengeti Plain—home of hundreds of free-roaming, wild animals.

PLUNGE OVER STANLEY FALLS.

Perhaps you prefer even wilder adventures? Then follow the screams to Stanleyville.

Here, you can take a treacherous dive down Stanley Falls in precarious flume log. Go a few rounds with the Monstrous Mamba. And fall head over heels for a 1200-foot Python—the roller coaster that turns you upside down and nearly inside out.

FOLLOW THE SUN TO THE FLORIDA COAST.

See Africa in a day? Why not? All it takes is $6.50. (Children three and under are free.) Each admission covers all rides, shows and attractions for a full day. Plus a free tour of the world-famous Anheuser-Busch Brewery.

What's more, you're just minutes from the sunny Gulf Coast and a short drive to Walt Disney World.

So become an African explorer in Florida. Take I-75 north of I-4 in Tampa. When you hear the pounding of drums, you'll know you're getting close.

The Dark Continent

Busch Gardens, Tampa, Fla.

Send this coupon for a free color brochure describing The Dark Continent. C-1

Name _____

Address _____

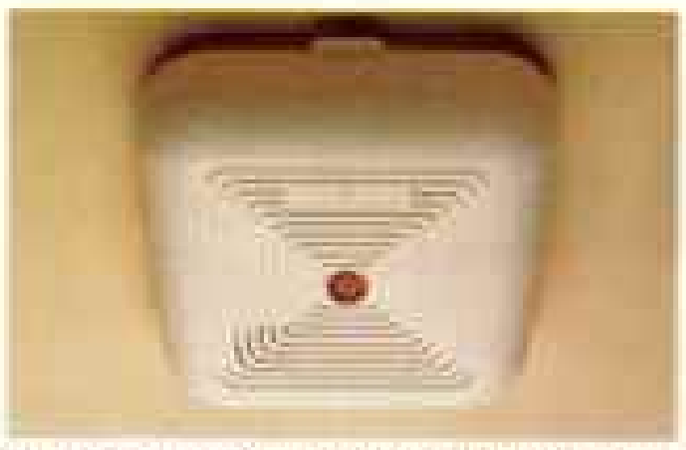
City/State/Zip _____

The Dark Continent, Busch Gardens,
P.O. Box 9337, Tampa, Florida 33674

Prices and hours subject to change without notice.

Deciding which smoke alarm to buy could be one of your most important decisions.

Here's why more families are choosing the Home Sentry® Smoke Alarm from GE than any other.



The Home Sentry Smoke Alarm from GE is an early-warning system that "sniffs" the air for the presence of smoke and sounds an alarm when smoke reaches it.

The battery-operated Home Sentry Smoke Alarm is the *only* smoke alarm with a 3-point checking system to assure you the alarm and the entire system are in working order. It features a 12.6-volt Duracell® battery made especially for smoke alarms by P.R. Mallory & Co. Inc. And because it's battery-operated, the Home Sentry Smoke Alarm can continue to function even if household power fails.

Of course, no one can guarantee against injury or loss of life in a fire; however, the Home Sentry Smoke Alarm from GE is intended to help reduce the risk of tragedy. Every Home Sentry Smoke Alarm is backed by the General Electric name and the quality and reliability it stands for. Now's the time to buy one—or as many as your home may need.

The Home Sentry Smoke Alarm could help you save your home and your family's lives.

Home Sentry Smoke Alarm

GENERAL ELECTRIC

SITMAR TO LIMA

NEW CRUISES TO AN ANCIENT WORLD.

Sitmar offers a rare opportunity to sail to colorful Caribbean ports, the Panama Canal, and on to another world—Lima, Peru, famed "City of Kings." You can see Machu Picchu, the incredible Amazon River, and much, much more.

The luxurious world of Sitmar.

Sitmar's T.S.S. Fairwind is one of the most spacious luxury ships sailing through the Canal. The crew is friendly, Italian and 500 strong. The dining superb. The entertainment non-stop.

Fly free from 114 cities.

Only Sitmar flies you free roundtrip on regularly scheduled airlines from any of 114 cities to board ship. And you enjoy stopover privileges, too.

On May 14, join the Fairwind on its 24-day inaugural voyage from New York City. Or board in Port Everglades, Florida on May 17. By boarding in New York City you get three days of cruising free.

On September 10, the Fairwind sails on a 21-day voyage from Port Everglades. See your travel agent now.

Sitmar Cruises

The Caribbean and South America, Mexico, Canada and Alaska

"That mine sure messed up that hillside."

Which best serves our society's needs, a mountain or the metal it holds? Both are important.

Whether deep or shallow, mining scars the land. Surface mining removes vegetation. Sometimes diverts and contaminates streams. Bares the earth to wind and water erosion. Deep mining, too, has its impacts in unsightly tailings, subsidence, abandoned structures.

Inevitably, as ore deposits diminish, our metals search must widen. Concerned people fear the search may lead to public lands or scenic wilderness areas.

Yet, we must have metals. Each year we require 40,000 pounds of new mineral supplies per person for our power plants, transportation, schools, machine tools, homes, bridges, medical uses, heavy equipment.

We should take advantage of our mineral wealth by mining it. But we must not do it at the expense of everything else.

Mining doesn't need to be totally disruptive. We can hold air and water pollution to a reasonable minimum. We can bring surface mined lands back to a useful purpose. We can sculpt tailing slopes and landscape mine areas to reduce the eyesore.

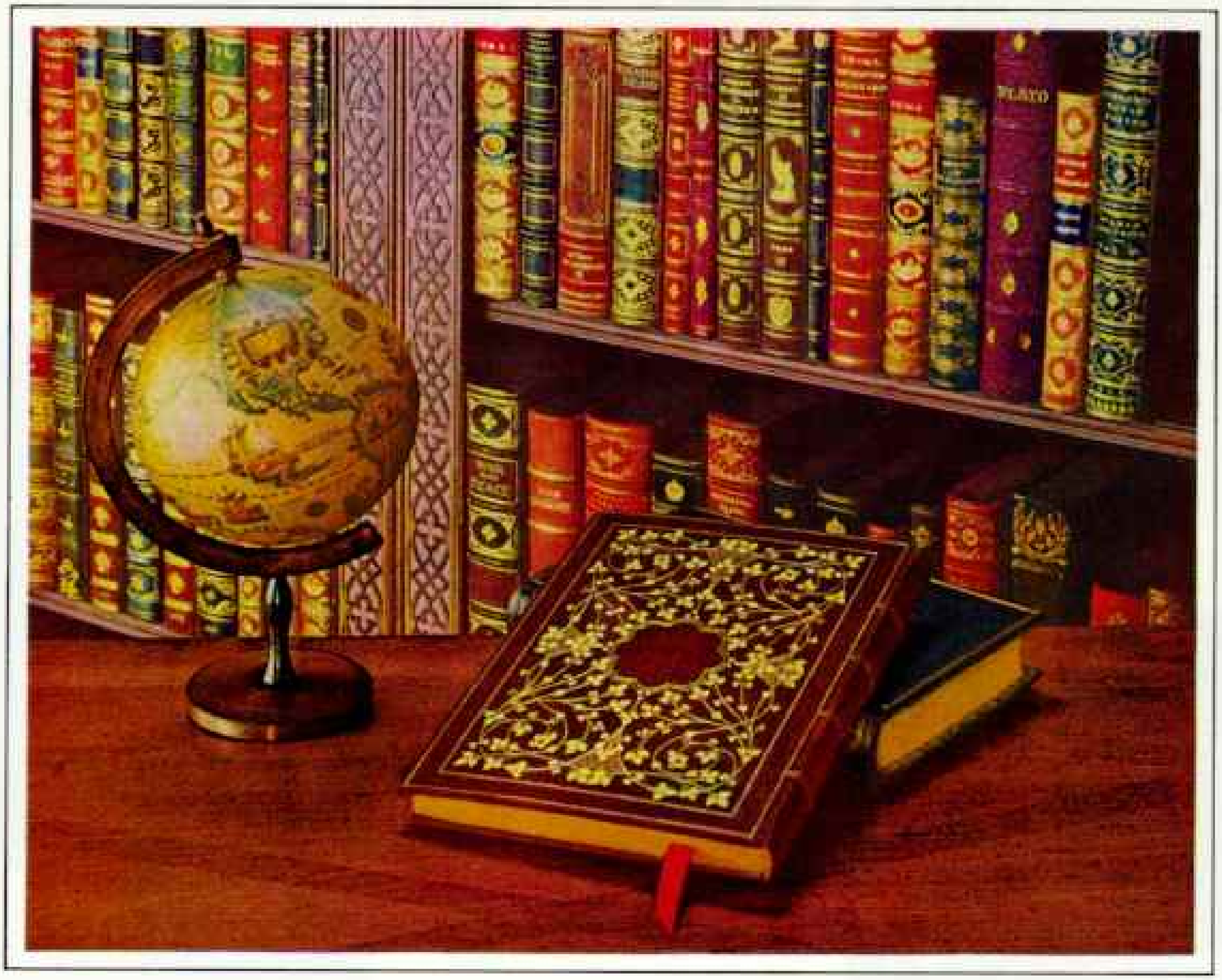
We should explore public as well as private lands—to take inventory of our mineral resources. In every case we must weigh the economic and environmental priorities for the greatest good. And then decide to deep mine, surface mine or not mine at all. Wise choices require a public attitude that recognizes both essentiality of metals and the need for environmental responsibility.

Caterpillar makes machines to prepare mining and smelting sites, to mine and reclaim land. And we consider a healthy, responsible mining industry vital to our nation's well being.

There are no simple solutions. Only intelligent choices.

CATERPILLAR

"That mine yielded gold for 50 years!"



You Can Now Acquire a Private Library of Distinction

THE GREATEST BOOKS EVER WRITTEN

Beautifully Illustrated • Bound in Genuine Leather • Decorated With Real Gold

The World's Greatest Books

It isn't difficult to list the world's greatest books. Their titles spring instantly to everyone's mind, because a book becomes great only when it is recognized as being great — generation after generation.

Melville's "Moby Dick", Dickens' "A Tale of Two Cities", Thackeray's "Vanity Fair", Fielding's "Tom Jones", Hawthorne's "Scarlet Letter", Brontë's "Wuthering Heights", Homer's "Iliad", Swift's "Gulliver's Travels", Mark Twain's "Huckleberry Finn" and Dostoevsky's "Crime and Punishment."

Books like these are the books of *lasting value* that each family wants on its bookshelves. It is these books that you can now acquire from The Easton Press.

As Beautiful As They Are Meaningful

The significance of each of these literary masterpieces is complemented by the sheer beauty of each book. Every volume in this private library will exemplify the ultimate in the art of printing, illustrating and binding.

Genuine Leather Bindings

Today, the cost of genuine leather bound books and the time required to create them has made the crafting of such bindings a vanishing art.

But each book in this collection will be bound in genuine leather!

Unique Cover Designs of Real Gold

To further enhance the beauty of your books, each binding will be decorated with real gold. Each cover design will be deeply inlaid with this pre-

cious metal. The back cover and the spine of each book will be similarly decorated.

Gilt-Edged Pages

Complementing the gold of the leather cover's design is the gilt edging of every side of every page.

Beautifully Illustrated Books

Each volume of "The Greatest Books Ever Written" will be beautifully illustrated, often with specially commissioned art from noted illustrators. Illustrations from the period of the literary masterpiece will also be used, and each will be carefully selected to match the mood and meaning of the author's work.

Elegant In Every Way

As final touches of elegance, each book will have beautiful endsheets of the highest quality, contain a bound-in ribbon page marker and be bound with a "hubbed" spine that is used in only the finest books.

The result is a collection of books that brings back memories of the great private libraries of the most discriminating families in days gone by.

Distinctly Different Volumes

Distinctiveness is the watchword of this private library. No two volumes are the same. The leather bindings will be of many colors and grains. The styles of type and illustration will vary. The design on each volume's cover will be different. Even the sizes of the books will vary.

A Most Important Family Heirloom

To acquire this edition of "The Greatest Books Ever Written" is to establish a family treasure that will be enjoyed now and passed on from generation to generation.

A Truly Personal Library

To beautifully identify each book as part of your own private collection, a unique personalized nameplate will accompany every volume.

This plate is our certification, as the publisher of this edition, that each volume was issued expressly *in your name.*

The Acquisition Plan

The Easton Press edition of "The Greatest Books Ever Written" will be made available only by advance subscription. The books will not be available in bookstores, nor will they be offered through dealers.

Comparable books in genuine leather sell for as much as $50 to $75 per volume. However, you will be pleased to learn the volumes in this collection will be priced at only $28.50 for the first two full years. Future volumes will be similarly priced subject only to minor periodic adjustment to reflect varying material costs.

If you desire, you may return any volume within 30 days for a full refund. Moreover, you may cancel your subscription at any time.

R.S.V.P.

To accept this invitation, you need only complete the Subscription Reservation below and return it to us. (It is not necessary to send any payment at this time.) This simple step is all that is necessary for you to begin building a private library of your own that is sure to be envied by all who see it, and treasured by all who use it.

SUBSCRIPTION RESERVATION

The Easton Press
47 Richards Ave.
Norwalk, Conn. 06857

No payment required.
Simply mail this reservation.

Please send me the first volume of "The Greatest Books Ever Written" and reserve a subscription in my name. Further volumes will be sent at the rate of one book per month. I will be billed $28.50 for the first book prior to shipment and invoiced on a pre-shipment basis for each volume thereafter.

I understand that you will send me a list of books scheduled for future monthly shipment. I may then indicate which titles on this list, if any, I do not want to receive, thereby insuring that I never receive any books I do not want.

I may return any book within 30 days for a full refund, and I may cancel my subscription at any time.

AN OPTION TO CHARGE BOOKS TO MASTER CHARGE OR BANKAMERICARD WILL BE MADE AVAILABLE WHEN YOU ARE INVOICED FOR YOUR FIRST VOLUME.

Name _____

Address _____

City _____

State _____ Zip _____

☐ As a convenience, I prefer to pay for my first volume now at $28.50 plus $1.25 shipping and handling (total payment $29.75*). Enclosed is my check payable to The Easton Press. *Conn. residents please pay $31.81 to include sales tax.

Readers of the National Geographic are invited to

Enjoy collecting a stirring panorama of U.S. history

to be treasured now and preserved for future generations.

Handsome "cachet" designed for each new issue, strikingly executed by steel engravings on the envelope.

Postmark of the officially designated post office issuing the new stamp.

Your own name and address is on every First Day Cover, and each is mailed directly to your own home.

The official "First Day of Issue" cancellation.

Official U.S. commemorative postage stamp.

At a surprisingly modest cost, you can receive beautiful First Day Covers for each new commemorative stamp issue of the United States.

Postal Commemorative Society members receive everything they need to build and maintain a personalized "perfect condition" collection of U.S. First Day Covers. For each cover issued, the Society provides an exclusive custom designed display page, especially made for the member's personalized album.

The United States regularly honors the important men, events and places in its history through the issuance of official U.S. commemorative postage stamps. When a new stamp is to be issued, one, and only one, post office is designated to provide the official "First Day" cancellation. The specially designed envelope bearing the new stamp, cancelled with the exact date of first issue of the officially designated post office, is a First Day Cover.

First Day Covers are fascinating collectors' items. As you can well imagine, the combination of an historic stamp, cancelled with the "First Day of Issue" postmark of the officially designated post office on a specially designed envelope, results in a collector's item of the first order. One that has been prized by collectors like Dwight D. Eisenhower, George C. Marshall and Franklin D. Roosevelt, plus others with the foresight to preserve yesterday and today for tomorrow.

The best time to obtain these prized collectors' items is when they are issued. This is now made easier than ever by the Postal Commemorative Society.

First Day Covers combine art and history in a tribute to our American heritage. Eisenhower . . . the Battle of Bunker Hill . . . the writing of the Star-Spangled Banner . . . the landing of astronauts on the moon . . . such are the subjects chosen by the United States for national honor on commemorative postage stamps.

The post office chosen for a first day of issue usually bears particular significance to the subject commemorated. For example, a first day cover of the 1976 Benjamin Franklin stamp bears the "First Day of Issue" postmark of Philadelphia, Pa.

The nation's leading artists and designers are called upon to portray the subjects chosen. Such commissions naturally are highly prized, and bring forth the best efforts of the artists involved.

Membership in the Postal Commemorative Society makes it possible to easily collect First Day Covers as they are issued. The Society will guarantee your receiving a personally addressed First Day Cover for each new U.S. commemorative stamp issue. All details of arranging for your First Day Covers to be sent to you will be handled by the Society.

Commemorative stamps normally are issued by the United States at the rate of one every three to four weeks. You will receive a beautiful First Day Cover for every United States commemorative stamp issue during the term of your membership at a total cost of just **$1.75** per issue.

As a member, at no additional cost, you will also receive the Society's exclusive display page for each new issue. Each beautiful, specially designed page is diecut to hold the First Day Cover, and contains a full description with all important historical information about the subject of the commemorative issue. *These pages are available only to members of the Society.*

At the surprisingly low cost of $1.75 per issue, you will be building a truly worthwhile First Day Cover collection to be enjoyed now and preserved for future generations of your family. Shouldn't you really give it a try?

Becoming a member now brings you an important collector's bonus at no additional cost. The Postal Commemorative Society makes available to each new member a handsome collector's album with the member's name hand-embossed on the cover. This album, specially designed to hold the Society's display pages, makes it possible for members to keep each new First Day Cover in perfect condition. *It is yours free, if you join now!*

MEMBERSHIP APPLICATION

Postal Commemorative Society
47 Richards Ave.
Norwalk, Conn. 06857

NO PAYMENT REQUIRED.
SIMPLY MAIL THIS
MEMBERSHIP APPLICATION.

Please enter a membership as indicated below. Send me a U.S. First Day Cover and display page for each new U.S. commemorative stamp issue (normally 15 to 18 per year) at a total cost of just $1.75 per issue. Bill me $14.00 to cover the total cost of the next eight issues.

As a new member, I will also receive a personalized collector's album at no additional charge. I may cancel my membership at any time upon 30 days notice.

Mr., Mrs., Miss _____

Address _____

City _____ State _____ Zip _____

Personalize my album as follows: _____
(Print name to be shown on album)

☐ As a convenience I prefer to pay $14.00* now for my membership. [Simply mail your completed application with your check payable to P.C.S. to the address above.]

☐ The above is a gift membership. Please bill me at the name and address given on a separate sheet of paper. [Also list any additional gift memberships you wish to give.]

*Conn residents pay $14.98 for each membership to include tax. N27

Chevrolet introduces the long-legged Coupe

Rest assured. The New Chevrolet is not one of those Coupes where comfort takes a back seat to styling.

As a matter of fact, this year's crisp new Coupe has nearly two inches more leg room in the rear than last year's full-size Chevy Coupe, making it almost as easy on the knees as it is on the eyes.

Sit in one soon and see.

And while you're there, notice the head room. There's more of that, too.

Our new Coupe is also easier to get into and out of, thanks to the increased height and the straight-up styling of the sides. (Plus the fact that you no longer have to trigger a release to fold the front seats forward.)

There is more trunk room than last year.

There is more corrosion protection.

More sound isolation.

An exceptionally attractive package, all in all. A real pleasure to look at, to ride in, and to drive.

The New Chevrolet is on display in Chevrolet showrooms all over America.

We hope you'll go down soon and try one on.

For sighs.

THE NEW CHEVROLET

WHY MAZOLA? ASK YOUR DOCTOR.

More and more doctors these days are becoming concerned about the high-cholesterol food habits of Americans. So as part of a total meal program for your family, ask your doctor about Mazola® Corn Oil. It contains no cholesterol.

Recently, such a program was tested to reduce blood cholesterol. It included skim milk, lean meats, plenty of fruits and vegetables, and Mazola pure corn oil.

Result: blood cholesterol was reduced an average of 17 percent. Couldn't your family benefit from such a meal program? Mazola suggests you ask your doctor.

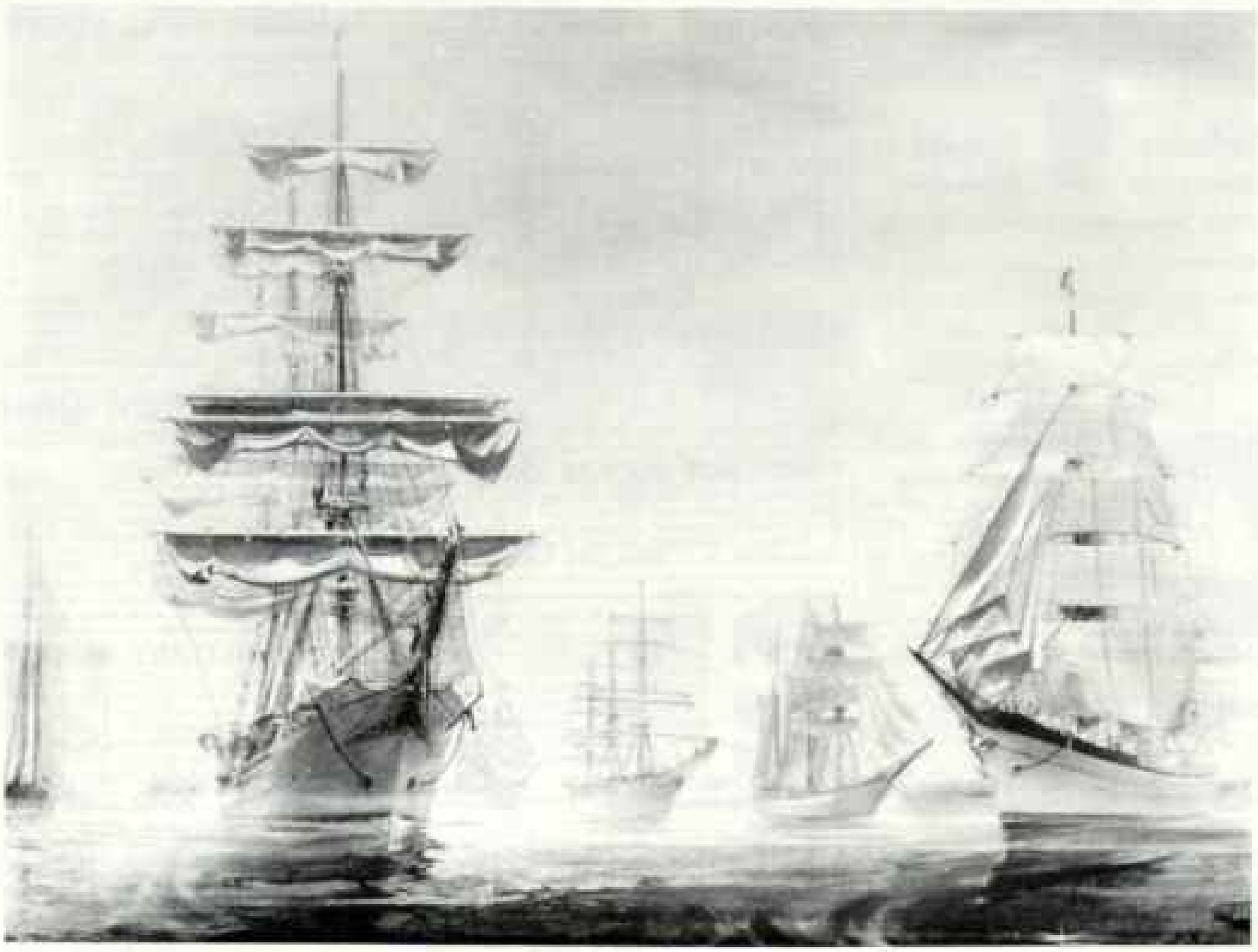
MAZOLA: THE ONLY LEADING BRAND THAT'S PURE CORN OIL

NOTE TO PHYSICIANS:
The complete report mentioned above was published in the "Journal of The American Dietetic Association" Volume 60, February 1973.

Mazola Foods, a Division of CPC International Inc.

CPC INTERNATIONAL

THE TALL SHIPS®



The Official Commemorative Print of the Historic 1976 Gathering of Tall Ships

Two years in the painting and meticulously accurate in nautical detail, this high fidelity lithograph will delight all those who admire fine art. Painted by the renowned marine artist, Kipp Soldwedel (Tall Ships Artist of Record), this official commemorative print is reproduced in magnificent color, 21 x 28 inches.

Depicted here in misty nautical splendor are the Blue Nose (Canada), Dunmark (Denmark), Segres (Portugal), Christian Radich (Norway) and the Gorch Foch II (Germany), winner of the International Trans Atlantic race.

Good art that is bound to accrue in value, handsome decoration for office or home, nostalgic memorabilia for sea lovers and sailors alike.

Handsomely framed in silvery metal, ready to hang.
$25.00. add $2 shipping and handling

Signed by the artist and framed.
$55.00. add $2 shipping and handling

Unframed in protective shipping tube.
$10.00. add $1 shipping and handling

OUR GUARANTEE:
You must be completely satisfied or we will refund your money.

American Ajax, Inc., Dept. NG 2
P.O. Box 256, Norwood, N.J. 07648

Gentlemen:

Please send_____framed "Tall Ships" print(s) @ $25.00 each plus $2 handling and shipping.

Please send_____framed and signed "Tall Ships" print(s) @ $55.00 each plus $2 handling and shipping.

Please send_____unframed "Tall Ships" print(s) @ $10.00 each plus $1 handling and shipping. No C.O.D.'s

New Jersey residents add sales tax.

Okay to charge it. Fill in credit information.

☐ American Express ☐ Diners Club
☐ Bank Americard ☐ Carte Blanche
☐ Master Charge interbank #_____

My credit card #_____

Expiration date_____

Signature_____

Name_____

Address_____

City_____ State_____ Zip_____

"Received your very lovely lithograph and it now has a place of predominance in my office. This is truly a magnificent work and is a conversation piece for all who come into my office."

Gerald E. Bauer, Dallas, Tx.

"I have just received a print of the "Tall Ships" by Kipp Soldwedel from my niece. It is truly a lovely work of art. It is in my foyer and has added much charm to that area. I am sure that other people will enjoy these beautiful ships in their homes."

Mrs. M. B. Flournoy, New York, N.Y.

"Those who thrilled at the sight of the soaring masts and graceful hulls in July will recapture that thrill when they see the clean lines of Kipp Soldwedel's paintings. His works ... carry the fresh, salty tang of ocean air wherever they go."

Genesis Galleries Ltd., New York, N.Y.

Home Study

CALVERT

Kindergarten through 8th grade. Educate your child at home with approved home study courses, or use as enrichment. Home is the classroom, you are the teacher with the help of step-by-step instructions. Start anytime, transfer to other schools. Used by over 300,000 students. Non-profit. Write for catalog.

NEW INDIVIDUAL SUBJECT COURSES

for 8th grade math, history, English (including grammar, vocabulary development, writing), science, reading (skill work, literature). Excellent for make-up, brush-up, enrichment. All texts, teacher's manuals included. Admits students of any race, color, national or ethnic origin.

Calvert School

Established 1897 — 301-243-6030

Box GX2-7, Tuscany Road, Baltimore, MD 21210

Parent's Name_____

Address_____

City_____ State_____ Zip_____

Child's Age_____ Grade_____

Coed Schools

FLINT SCHOOL aboard Te Vega and te Quest

CoEds 16-18. Aboard 156' Te Vega and 170' teQuest (sailing and anchoring together in foreign ports) your student will journey into educational sanity with the 48'e method providing students of ability with motivational incentive to academic excellence. Grades 9-12.

Drawer N, P. O. Box 5809, Sarasota, Florida 33579

FLORIDA CENTRAL ACADEMY Coed Educational College Prep. 45 acre campus 20 mi. N. of Orlando near Disney World. Grades 6-12. Fully accred. Development of effective study habits. Air-cond. dorms. Pool. Athletics. Racially non-discriminatory admissions. Catalog: **Dean, Box 38, Sorrento, Fla. 32776**

A "Unique" School For The Arts

Interlochen is: special study in art, drama, dance, writing and music with complete academics. An accredited co-ed school, grades 9-12 with a distinguished faculty and a 7-1 student-teacher ratio. Situated in a forested-lake setting with many chances to travel on tour. Apply anytime—2 terms. (616) 276-9221. Write Dept.NG Interlochen Arts Academy, Interlochen, Michigan 49643. "Admits students of any race, color and national ethnic origin."

INTERLOCHEN CENTER FOR THE ARTS

JUDSON-ARIZONA
BOARDING-COLLEGE PREP-COED

Accredited. Prep & General courses. Gr. 7-12. Small classes. Dev. Reading. Remedial Math. Art. Daily activities. Weekend travel. All Sports. Riding. Tennis. Rifery. Summer Study abroad. Healthful climate. Informal Southwestern life. Brochure.

Henry N. Wick, Director, Judson School
Box 1989, Scottsdale, AZ 85252 602-948-7733

KEMPER MILITARY SCHOOL AND COLLEGE Since 1844

Coed. Accred. Gr. 7-12; Jr. Coll. Sml. classes. Individual instruction. How-To-Study Prog. Jr. Sr. ROTC. Earn Army Commission. Sports. Riding. FAA Flying. Wilderness canoe camping. Non-discriminatory. **799 Third St., Boonville, Mo. 65233**

SHATTUCK/ST. MARY'S BOYS & GIRLS

Grades 7-12. 45 mi. S. Twin Cities. 2 campuses. College prep. Full sports program incld. indoor hockey, golf course. **Summer Schl./ Camp. Est. 1858. 57 Shumway Box 219, Faribault, MN 55021 507/334-6466**

TMI Coed. Non-military. College Prep. Gr. 7-12. Fully accredited, small classes. Excellent faculty. Full sports program including horsemanship. Mid-term enrollments accepted. Beautiful 141 acre campus. Catalog: **Sanford Gray, President, TMI ACADEMY, Box 147, Sweetwater, Tennessee 37874**

VILLA SCHOOL-ARIZONA

Ranch, Co-Ed ages 12-18; Fully accredited; Prep and Remedial; Specializing in the Underachiever. Healthful desert climate. Art, Bullfights, Sailing, Horses, Pool, Catalog: **Director, P.O. Box 1211, Casa Grande, Ariz. 85222. Tel. 602-466-7557**

WASATCH ACADEMY Coed. Gr. 9-12 Since 1875

College Prep in a Western Setting. Outdoor activities, camping, skiing. General course, advanced placement. Accredited. Art & music. Summer School. 801-462-2411. **Write: Box A, Wasatch Academy, Mt. Pleasant, Utah 84647**

WAYLAND A great prep school since 1855 emphasizes academic excellence, worthwhile values. Accelerated progs., fine alumni list. Athletic facilities incl. Mid-west Tennis Cts. Coed. Grades 8-12 Non-disc. **Write D. L. Redmond, WAYLAND, Box 35, Beaver Dam, Wis. 53916. 414-885-3373**

WEST NOTTINGHAM ACADEMY Coed. Grades 9-12

Exciting learning program, 4-day class wk., 5th day free to pursue individual interests. Fully accred. college prep. Est. 1744. 90 mi. NE of Wash., D.C. Non-Dist. admiss. Hdm., Box 21, West Nottingham Academy, Colora, Md. 21917

Camps

BRUSH RANCH Girls & Boys separate camps. On Pecos River nr. Santa Fe. Boys: Riflery, skeet, ride, swim, fish, tennis, backpack, art. Girls: Riding, fencing, swimming, tennis, dance, art, music, drama, nature, backpacking. Phone: (505) 753-2721. **Newcomb G. Rice, Box 2450, Santa Fe, N.M. 87501**

FARRAGUT NAVAL CAMPS

For boys 8-16. Boating, sailing trips, 50-boat fleet incl. 24 sailboats. All sports, 2 gyms, athletic fields, Pool. Approved summer school. Opens July 3. Catalog. **Farragut Naval Camps, Box LC, Toms River, N. J. 08753. (201) 349-1121**

LOST BOOO LBS (Or Thereabouts)

Boys 8-18 lose 20-50 lbs. & have the time of your life! Increased activity. Balanced diet & understanding staff instill self-respect & new confidence. Enjoy and succeed at all land and water activities. Year round counseling maintains weight loss. It was. Permanent facilities. Accred. ACA. Dr. Lloyd O. Appleton Box 132 **KINGSMONT** Camp W. Stockbridge, Mass. 01266 413-232-8518 Also **Camp Kingsmont for overweight Girls**

QUARTER CIRCLE V-BAR Ranch Camp Coed 7-16

40,000 acres. 4, 6 or 8 wks. Horsemanship, pool, sports, creative arts, ecology, survival training. Caravan thru SW. Credit courses. Non-discrim. ACA accred. Est. 1939. **Winter prep school. QCVBR, Box C, Mayer, AZ 86333**

TELLICO MTN. CAMP Boys and Girls 8-13

Summer adventure in Smoky Mtns. Horseback riding everyday. Golf, Tennis. Canoe trips, swimming. Crafts, Reading, math. 4 wks. $385. 4 wks. $460. 2 wks. $250. Catalog. **Write Sanford Gray, Dir. Box N, Sweetwater, Tennessee 37874**

Boys' Schools

AUGUSTA MILITARY ACADEMY

A FACULTY Advisor for each student. Individual attention develops the student's potential for academic self-reliance & leadership. Gr. 7-12 & P. G. Lower School Gr. 4-7. Write **Col. N. Livick, Box 100-N Fort Defiance, VA. 24437** Non-Disc. Adm.

Brandon Hall

EXCLUSIVELY INDIVIDUAL CLASSE FOR THE UNDERACHIEVER

Preparation for all schools and levels. Structured, challenging flexible prog. & acceleration for the academically talented. Since 1930 individual attention to students with language disability. Year-round enrollment. Racially non-discriminatory admissions.

2503 Spalding Drive Grades 6-12
Dunwoody, Georgia 30338 404/394-6176

CAMDEN MILITARY ACADEMY

A FULLY accredited college preparatory school, grades 7-12, in Carolina's winter resort section. Jr. Honor ROTC. Low rate. Students admitted of any race, color, national or ethnic origin. Write: **Col. L. P. Risher, Box N, Camden, S.C. 29020**

CARLISLE MILITARY SCHOOL

"DEVELOPS Manly Men." Prepares your son for life—give him a chance to develop his true potential. Gr. 7-12. All sports. Honor ROTC. Non-discriminatory. Mod. rates.
Col. Wm. N. Risher, Bamberg, S.C. 29003

CARSON LONG MILITARY SCHOOL

Accredited. Educates the whole boy—physically, mentally, spiritually. How to learn, how to labor, how to live. Prepares for college, life. Grades 8-12. 161st. yr. of character building. Overall charges $2600. **Box 98D, New Bloomfield, Pa. 17068**

CASTLE HEIGHTS MIL. ACADEMY

76th yr. Fully accredited. ROTC Honor School. 19 varsity sports. Chasm. drill, rifle teams. Excellent food. Coed. gr. 9-12. Sep. Jr. School, gr. 4-8. Summer School. Non-discriminatory. **Box 177N, Lebanon, Tenn. 37087.**

FARRAGUT NAVAL ACADEMIES

A complete academic program: Oceanography, Naval Science, extracurricular activities, sports. Grades 5-12. Separate lower school. Small classes. Honor Naval School. Fully Accredited. Band. Rifery. Sailing. NJROTC. College guidance program. 2 waterfront locations. Write for catalog. *Admits students of any race, color, national or ethnic origin.*

NORTH: **Box L, Toms River, NJ 08753—201 • 349-1121**
SOUTH: **Box L, St. Petersburg, FL 33710—813 • 381-1851**

FISHBURNE MILITARY SCHOOL Gr. 7-12 & P. G.

Small school. Broad prgm., full participation for each boy. How-to-study. Honors courses. Reading dept. Sports. Jr. ROTC. Clubs. Band. Summer School. Est. 1879. In the Shenandoah Valley. **Adm., Box 36B-N, Waynesboro, VA 22980**

FORK UNION MILITARY ACADEMY

One ONE SUBJECT PLAN for grades 9-12 increases honor roll. Fully accred. Training toward successful manhood and sound character. Separate Junior School gr. 5-8; housemothers. 18 modern bldgs. 2 pools, 2 gyms. Bands, glee cl. Boat. riding. 75th yr. Non-discriminatory. *Non-MIL Summer School gr. 7-12*
PH. 804-842-3215 or write admissions, Box 302, Fork Union, Virginia 23055

HOWE MILITARY SCHOOL

Jr. & Sr. Schls. Gr. 5-12. Thorough acad. training. Accred. College prep. Developmental Reading. ROTC. Sports. Jr. swit. shrm. Est. 1884. Sum. Camp. 2 mi. from turnpike. Cath. **Col. H. H. Kelly, Supt. 327 Academy Pl., Howe, Ind. 46746**

MILLER SCHOOL TRADITIONAL and Career Education.

Auto shop, wood shop, electrical shop, photo lab, radio room, drafting room. 5:1 student-teacher ratio. Our 90th yr. CAP/USAF. Gr. 7-12. Catalog: **Miller School, Box N, Charlottesville, Virginia 22901. Or call (804) 823-4805**

MISSOURI MILITARY ACADEMY

& Separate Jr. Schl. 88th Yr. Gr. 4-12. Makes college easier. New bldgs. Famous band & drill team. ROTC. All sports. Fine arts. Driver Ed. Golf. Riding. Non-Discrim. Write: **Col. Charles Stribling III, 927 Main, Mexico, Mo. 65265**

NORTHWESTERN MILITARY ACADEMY

Personal attention key to individ. college prep curriculum. Gr. 7-12. Excellent faculty promotes achievement. All sports. Recreation activities incld. sailing, tennis, skiing. **Box N-27, 550 S. Lk. Shore Dr., Lake Geneva, WI 53147**

THE ONE STUDENT/ONE MASTER

concept for boys 12-20 of average & superior intelligence. Wishing to accelerate or make up lost time • With academic deficiencies • Foreign students wishing to enter American Univs. Enter any time. **Oxford Academy,** Est. 1906. Westbrook, Ct.

RIVERSIDE MILITARY ACADEMY

Tradition of excellence. Accredited, College Prep & General. Grades 7-12 & PG. Honor ROTC. Year-round outdoor sports. Ga. Summ. Sch. Racially non-discriminatory admissions. Write Supt., Riverside, Box R302, Gainesville, Ga. 30501.

Winter in Southeast Florida
Fall & Spring in N. Georgia Mtns.

ST. JOHN'S MILITARY SCHOOL GR. 3-12 SINCE 1887

Accredited. Friendly individual attention. College prep. ROTC. All sports. Driver Ed. Art, Music. Good food. Admits, thruout year. Episcopal. Non-discrim. Write Col. R. G. Duckers, **Box NG-767, St. John's, Salina, Kan. 67401**

WENTWORTH Military Academy Grs. 7-12 & Jr. College

Accred. 97th Yr. Sr. ROTC. Million dollar field hse. Golf, Tennis. FAA Flying. Top marching band/Drill Team. Camera Club. Summer Schl. younger boys' camp. Non-discrim. **Col. Sellers 827 Washington, Lex., Mo. 64067**

The Age of Chivalry Relive the epic events of the Western World from Constantine to Joan of Arc: the fall of Rome, Viking invasions, the building of medieval castles and cathedrals, the Norman Conquest, the Crusades. 378 pages, including the complete Bayeux Tapestry. 401 color illustrations. **$11.95**

Wilderness U.S.A. Brilliant color photographs reveal the natural splendor of our country's wild lands. Expertly written text and many detailed maps provide both descriptive and practical information. Includes important safety and survival tips. 344 pages, 362 illustrations. **$9.95**

The World of the American Indian Meet the original Americans and follow their footsteps from 25,000 B.C. to the mid-1970's. Savor the richly varied cultures and contributions of Arctic nomads, fishermen, foragers, woodsmen, pueblo dwellers, and horsemen. 400 pages, 362 color illustrations. Large map. **$9.95**

Great Religions of The World The origins, customs, and beliefs of Hinduism, Buddhism, Judaism, Islam, and Christianity. Compare their similarities and differences. Sacred writings from the *Bhagavad-Gita*, the *Tripitaka*, the *Torah*, the *New Testament*, the *Koran*. 420 pages, 350 color illustrations. **$11.95**

We Americans A big, lavishly illustrated book that will make you feel like a participant in the entire American experience. Relive the lives of the "ordinary" people who shaped our nation. 456 pages, 659 illustrations. **$14.95**

Our Continent Find out how our continent was formed . . . how life evolved . . . what North America is like today. Trace 4.6 billion years of natural history. 398 pages, 342 color illustrations. **$11.95**

Six of the best from National Geographic

A wealth of pleasure and knowledge awaits your family in these fascinating books. Discover the vast unspoiled beauty of our country, meet its first inhabitants, relive the American experience since Columbus, see how our continent came into being. Step back in time to the Middle Ages, explore today's living religions. Priced as low as $9.95, containing up to 456 pages and 659 colorful illustrations, these volumes also make ideal gifts. Simply clip and mail the form at right. Send no money now; we'll bill you later. If not completely satisfied, you may return the book(s) without payment.

NATIONAL GEOGRAPHIC SOCIETY
Dept. 1110, Washington, D. C. 20036

Please send me, on approval, the books checked below. Bill me at time of shipment, plus postage and handling.

- ☐ 00075 Age of Chivalry $11.95
- ☐ 00151 The American Indian $9.95
- ☐ 00134 We Americans $14.95
- ☐ 00116 Wilderness U.S.A. $9.95
- ☐ 00103 Great Religions $11.95
- ☐ 00153 Our Continent $11.95

NAME

STREET

CITY, STATE, ZIP

Maryland residents please add sales tax.

You can expand your holiday horizons. Our free adventure kit shows you how.

Out of town for the holidays. The very idea rings with promise. Until you think of all the travel hassles.

There are those of us, however, who know that getting there is half the fun.

Beechcraft's high-flying Duke gives a full measure of pleasure to any holiday trip. Beginning the moment you step on board.

You'll have more hours to schuss a secret slope. To really explore your favorite city. To spend in the warm company of far-off family or friends. To get right down to the serious business of getting away from it all.

The Duke will take you to every major metropolitan airport and thousands more that the airlines don't serve. Chances are, you'll land very near your holiday destination.

The Beechcraft Duke is a limited-production aircraft. Its pressurized, air-conditioned cabin lets you fly over the highest mountain ranges in a comfortable, living room environment. Custom furnishings reflect your own good taste.

Beechcraft Duke. The best excuse anyone ever had to go out of town for the holidays.

Just to get you started, we've put together an updated and expanded version of our popular Beechcraft Adventure Kit. You'll find it an informative, entertaining guide to out-of-the ordinary places and events in the U.S. We'd like to send you one free of charge.

THIS IS NOT A COUPON

But we do urge you to write to us on your letterhead instead.

We'll send your Beechcraft Adventure Kit by return mail, absolutely free. And we know you'll like it.

Write to Beech Aircraft Corporation, Department A, Wichita, Kansas 67201.

Please include name, address, occupation, and title. Also, please let us know if you're already a pilot.

Beechcraft Duke