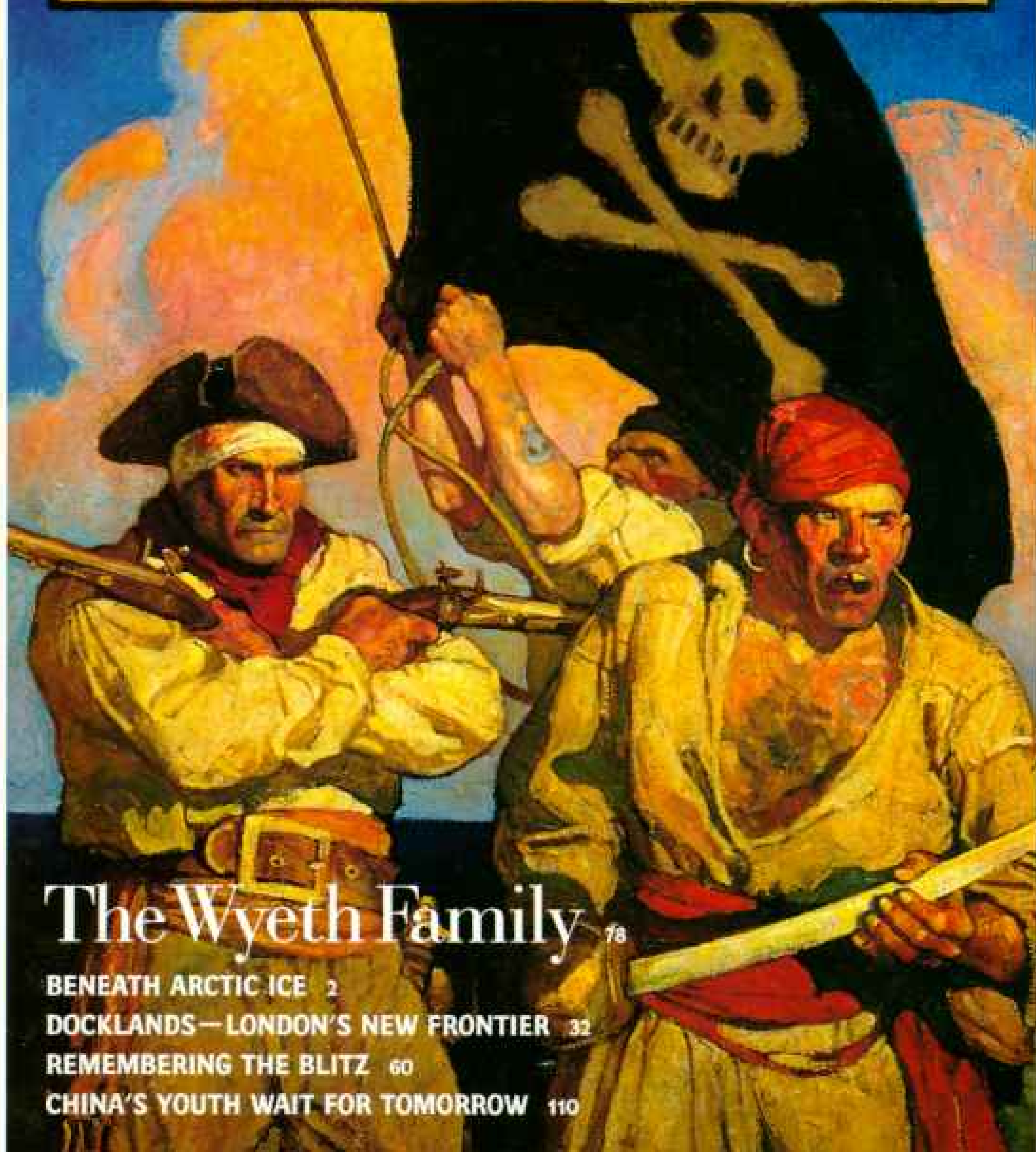


VOL. 180, NO. 1



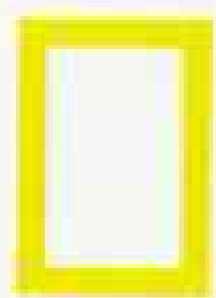
JULY 1991

NATIONAL GEOGRAPHIC



The Wyeth Family 78

- BENEATH ARCTIC ICE 2
- DOCKLANDS—LONDON'S NEW FRONTIER 32
- REMEMBERING THE BLITZ 60
- CHINA'S YOUTH WAIT FOR TOMORROW 110



NATIONAL GEOGRAPHIC

JULY 1991

Beneath Arctic Ice

*Text and photographs
by Flip Nicklin*



As the sun returns to the Canadian Arctic each spring, the sea ice breaks up, whales and birds return to breed, and seafloor life proliferates in an explosion of color.

2

Docklands— London's New Frontier

*By Erla Zwingle
Photographs by Joe McNally*



In the largest urban-renewal project in Europe, the transformation of a derelict waterfront on the Thames leaves longtime residents both hopeful and skeptical.

32

Remembering the Blitz

By Cameron Thomas



A Londoner looks back to the eight-month siege when, as a 16-year-old, he watched Hitler's bombers devastate his city in the early days of World War II.

60

The Wyeth Family: American Visions

*By Richard Meryman
Photographs by
David Alan Harvey*



Illustrator N. C. Wyeth turned a Pennsylvania farm into a private fantasy world for his children. With varied brushstrokes his gifted offspring honor his legacy.

78

China's Youth Wait for Tomorrow

*By Ross Terrill
Photographs by Leong Ka Tai*



Although intimidated by Tiananmen Square and its aftermath, the young people of China continue to dream of freedom and a better life. A supplement map explores 7,000 years of Chinese civilization.

110

COVER: Pirates come to life in a painting by N. C. Wyeth for the 1911 cover of Robert Louis Stevenson's Treasure Island. Private collection; courtesy Brandywine River Museum.



LIFE AT
BENEATH

Spring breakup in Canada's north gives a diver entry to Baffin Island's Admiralty

TEXT AND PHOTOGRAPHS BY



THE EDGE
ARCTIC ICE

Inlet—and the astonishing communities beyond the view of icebound onlookers.

FLIP NICKLIN



After months of darkness and temperatures as low as minus 56°F, Lancaster Sound begins to shed its frozen skin during the 24-hour sunlight of June. Large floes, mottled with snowmelt ponds, splinter off from thinning landfast



ice. As solid ice retreats, open stretches of water become travel corridors for migrating whales. Here belugas pause before feeding along the edge of floating ice, a boundary that has revealed itself as a popular oasis.



T

HE WORLD according to Andrew Taqtu changed suddenly one day. The first Inuk in his remote

Arctic village to learn how to scuba dive, Andrew was not expecting any dramatic revelations when on a May morning in 1990 he took his chain saw and chisel and noisily cut a hole in the six-foot-thick ice of Admiralty Inlet. After a slight hesitation he followed me into the frigid water below, leaving the brightness of the sea ice behind. It was his first dive below the ice.

This was true wilderness, an unexplored territory sealed off by ice. Would it be a barren, forbidding place?

Touching bottom at 40 feet, Andrew switched on his powerful light. Its beam worked like a sorcerer's wand. All around us Andrew saw things that he hadn't dreamed possible. Brilliantly colored sun stars—luscious lime green and brazen orange animals (left)—were plastered on rocks and surrounded by flower-like sea anemones. Pastel-tinged soft corals swayed in the current. Andrew lingered at a boulder splashed with pink algae and sprouting tentacle-waving anemones (right).

When we returned to the stark desert on the surface, Andrew turned to me and, in the awed tones of a new convert, said, "It's like a garden down there."

I shared Andrew's pleasure that day: For all my Arctic dives I have never quit being amazed at the variety of life-forms present in the polar sea. For five years I had been journeying to the northern end of Baffin Island, 500 miles above the Arctic Circle, coming to the frozen

shelf of Admiralty Inlet and Lancaster Sound to observe what happens when the sea ice breaks up in spring. Each year I have seen the polar sea reawaken. Underwater, on the ice, in the air, creatures again bring a sense of abundance to one of the planet's harshest environments.

How could I blink with disbelief at corals in a polar sea when I had seen tusked narwhals streaming through the broken ice, watched skeins of seabirds

None of my work would have been possible without the cooperation and generosity of the people in Arctic Bay, an Inuit village not far from Admiralty Inlet. Andrew and I later introduced a handful of the 600 townspeople to the marvelous secrets of underwater life, and the villagers more than repaid me by showing me the ways of living on the ice.

The Inuit who accompanied me were experts at charting paths through featureless



crossing the enamel blue sky, found countless millions of small plants—phytoplankton—turning clear water into pea soup?

In the intense, light-filled days from May through July the Lancaster Sound region comes alive with wildlife, especially along the floe edge where ice meets open sea. The same icy, plankton-rich waters that support coral and starfish also sustain a food web that makes possible the spectacular processions of migrating birds and whales.

To document such gatherings of wildlife and to begin to understand the reasons behind this momentary richness, I enlisted the help of the Inuit.

frozen plains. They could "read" the ice in a dozen ways, gauging its thickness and solidity. Time after time their savvy kept me out of trouble. You don't want to lose your way in a place where polar bears range the ice, and you don't want to misstep and plunge into water where your chances of survival plummet after a single minute of exposure.

The Inuit also helped me keep things in perspective. Once when photographing narwhals in an ice crack, I grew excited and said grandly, "I bet no one has seen this before. . . ." Laughter stopped me when a villager said: "You mean no white guy with a camera has seen this before."

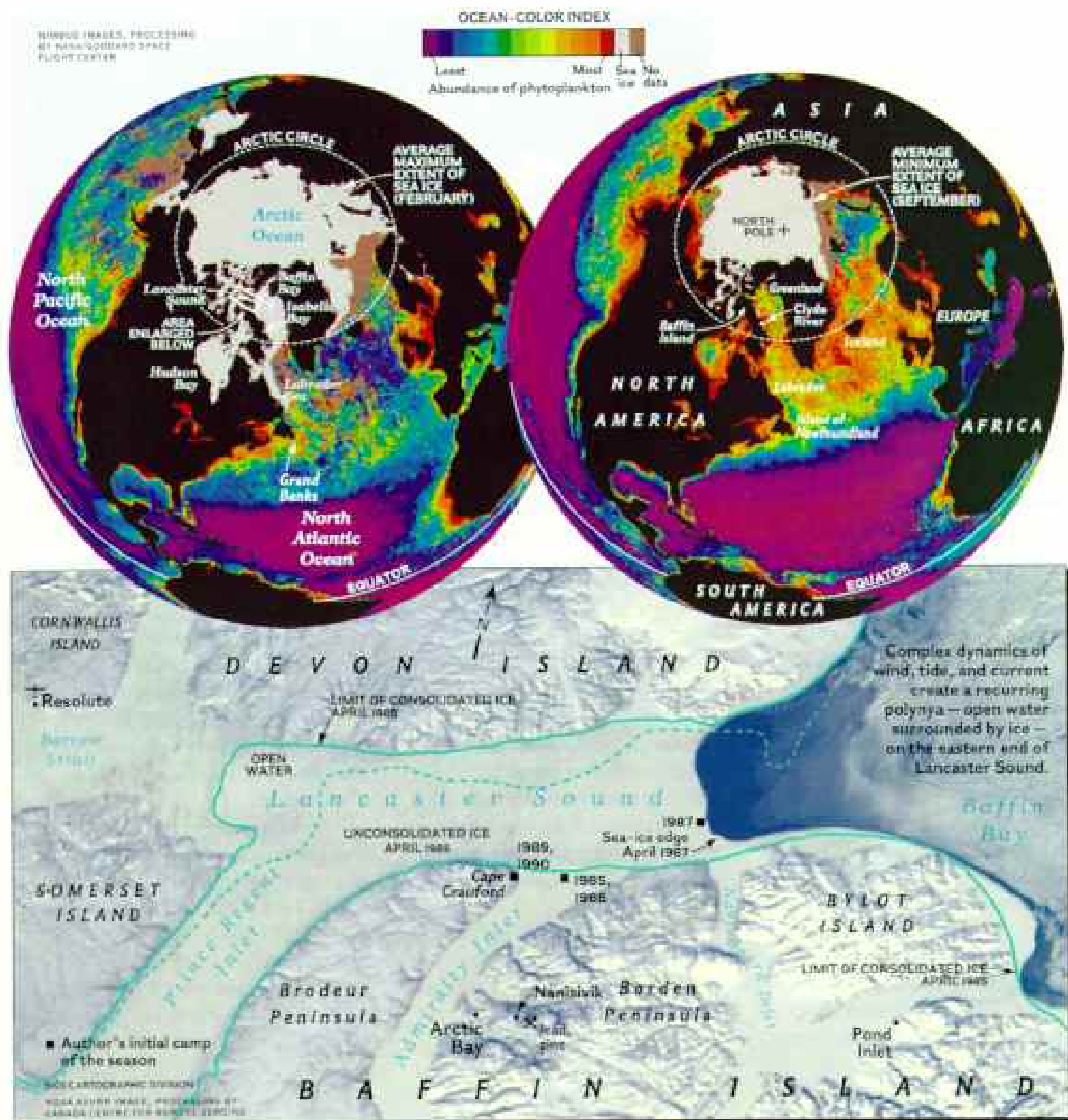
DURING THE DEPTHS of winter, sea ice in the Northern Hemisphere covers almost six million square miles, or approximately twice the size of the conterminous United States. A computer-generated image based on satellite data depicts the average maximum ice cover for February (below, at left). It shows the entire Arctic Ocean frozen over, with tentacles of ice extending as far south as Hudson Bay and the Labrador Sea.

I know from flying over the frozen seas that the winter ice cover is not a pure unbroken sheet anchored in place. Instead it looks like an immense broken pane of glass, its pieces—the ice floes—jostled continuously by wind, currents, and tides.

The image for September shows that by late summer the ice has melted to half its winter size. In the newly exposed waters and throughout the North Atlantic, plankton

growth is prodigious. Sunlight sets off a chain reaction of photosynthesis, and the northern seas bloom with pastures of algae and other phytoplankton, indicated below by the color bursts of red and orange. Some of the richest fishing grounds in the world—such as the Grand Banks off Newfoundland and the coastal waters of Iceland—flourish in these cold, fertile seas.

The unpredictable advances and retreats of winter sea ice



dictated where I could pitch camp when I came north in the spring. While the inlets of Baffin Island freeze solid each year, the amount of ice on Lancaster Sound varies widely with the severity of the winter. A high-resolution satellite image shows Lancaster Sound on April 30, 1987 (left, bottom). The 1986-87 winter was so severe that the floe edge reached almost to the eastern end of the sound, about as far as the ice cover has ever extended in historical times. The solid blue line indicates the limits of consolidated ice for an average winter (1984-85).

Spring is no time to drop your weather guard. Once in early June while I was camping on Cape Crauford at the tip of Brodeur Peninsula, a westerly gale struck so hard with 50-mile-an-hour winds that tents were torn from their moorings. My friend and advisor Glenn Williams, a polar veteran who has lived in Arctic Bay for years and serves as the renewable resource officer for the Northwest Territories, was compelled that day to wrestle with the wind, weighting down his tent

with the biggest rocks he could manage (below).

June can be counted on to usher in breakup—the long-awaited season the Inuit call *upinnguaq*. Leads open in the ice, drawing wildlife closer to the villages; temperatures creep toward the balmy 40s; and the sun never rests, pacing above the horizon all day long.

On warm, bright, windless days, nothing is as sublime as camping on the ice, which northern peoples have done

for the past 4,000 years since migrating bands from Asia first inhabited the Arctic. During breakup, the floe edge becomes a marvelous platform for observing the comings and goings of wildlife. One morning—or was it midnight?—I was the only person awake when a bowhead whale surfaced right in front of camp (bottom).





TRAVELING on a highway of ice calls for ingenious solutions to sudden problems.

Returning from the floe edge with an Inuit guide, Glenn Williams and a Japanese film crew faced a major obstacle: a hundred-foot-wide crack. Instinctively Glenn loaded the men onto an ice block, tossed a grappling hook across the gap, and towed men and equipment closer to camp (above).

Inuit men travel the ice even in winter, hunting seals and polar bears. Come spring, they move to the floe edge to take narwhals. Families, meanwhile, load up sleds and head out

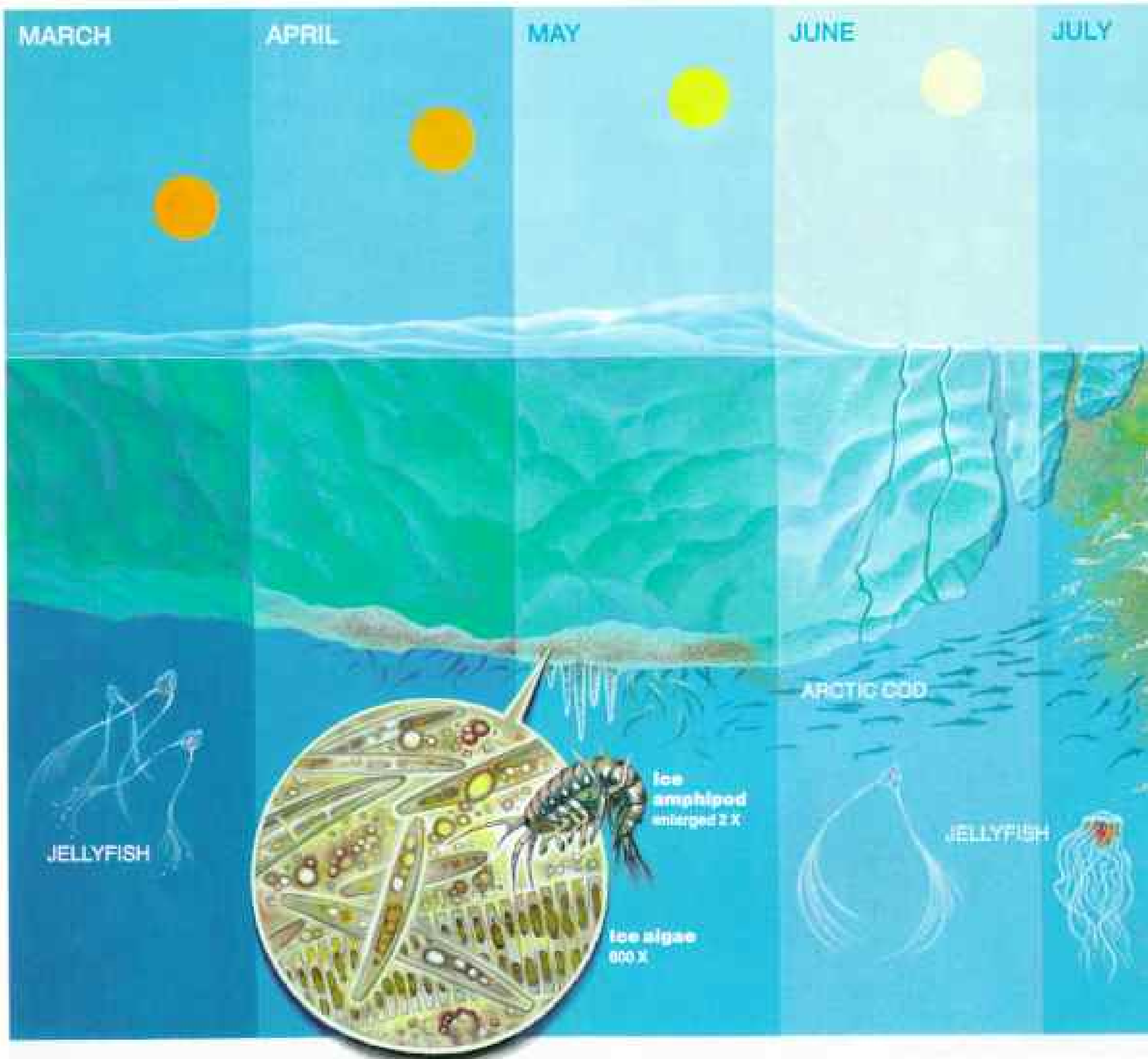
to make seasonal encampments.

All that movement made me realize that the Inuit are not far removed from their nomadic past. Until the 1960s when towns grew up where government services were introduced, the Inuit lived in camps, which they moved according to their hunting needs. That nomadic yearning survives today, I believe. And when the Inuit leave town and travel back to the ice, they don't think of themselves as leaving home. They are *coming* home.

Besides snowmobiles, schools, and satellite television, modern times bring the M.V. *Arctic* (right), a 700-foot-long

icebreaker that in spring clears a broad, straight path through Admiralty Inlet to pick up lead and zinc concentrates from the Nanisivik mine near Arctic Bay. The arrival of the ship may prove troublesome to hunters, since its passage breaks up the frozen traveling surface and the engine noise scares marine mammals. Sensitive to local issues, shipping officials are experimenting with a zigzag route, which prevents the broken ice from flowing straight out to sea, and lessens the chance of a premature breakup.





GROWTH OF A POLAR FOOD WEB

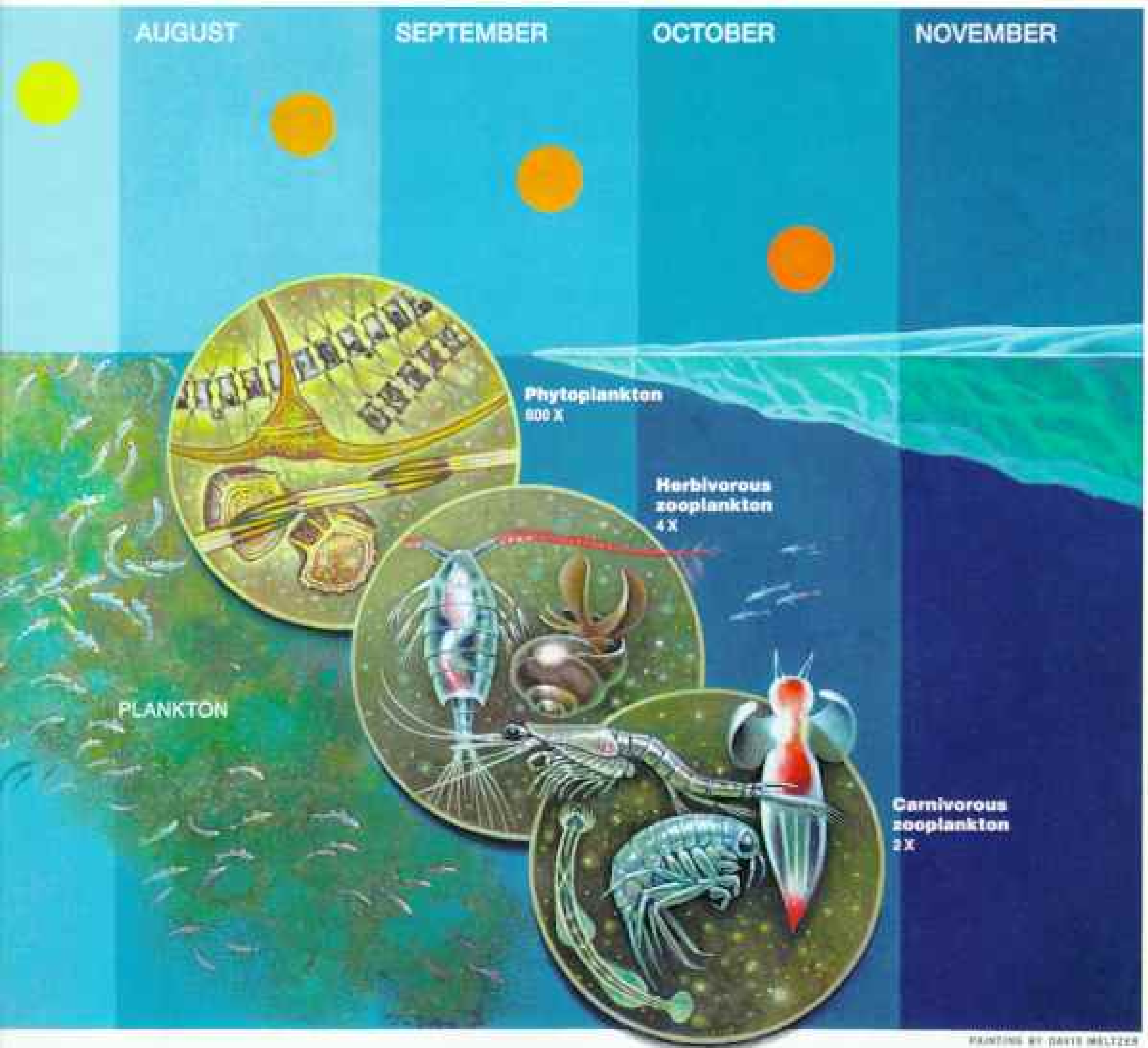
LIFE-GIVER of the Arctic, the sun, back from a three-month winter absence, ignites a string of events that by the end of summer will have filled the waters with swarms of tiny plants and animals. They are the first strands in a food web that extends from algae to whales, polar bears, and humans.

As early as February enough light penetrates the frozen waters to initiate growth of a brownish layer of algae on the underside of the ice. Consisting mostly of rod-shaped diatoms, this algae is a pasture for ravenous grazing by shrimplike crustaceans called amphipods. The

amphipods attract Arctic cod, small pelagic fish that haunt the floe edge.

Though icebound algae make up only 10 percent of the plant growth in Arctic waters, they constitute almost the entire food supply until the time of open water, when the phytoplankton erupt.

Relying on the energy of direct sunlight and on nutrients in the upper water layer, the phytoplankton multiply rapidly, forming greenish clouds near the surface. As the phytoplankton layer thickens, zooplankton—tiny marine animals—rise in the water to eat and to be eaten. Crustaceans called copepods,



ILLUSTRATIONS BY DAVID MELTZER



about the size of a grain of rice, and pteropods, or winged snails, both feed in the ocean. The fate of the copepods is to serve as the primary diet for bowhead whales, which will eat 3 percent of their body weight, or as much as a ton of plankton, in a day.

Also joining in the feeding frenzy are carnivorous zooplankton. Their legions include amphipods, arrowworms, jellyfish, inch-long mysids called opossum shrimp, and other winged snails, *Clione*. Ringed seals, cod, and seabirds feast on all these animals except the jellyfish.

The key link in the long polar food chain is the Arctic cod. In

its dual roles as predator and prey, it transfers energy from the lower level—the plankton biomass—to the higher level of marine mammals, the small toothed whales and seals. The top link belongs to the polar bears and the Inuit, such as an Arctic Bay man (left) who packs up the meat of a ringed seal in a pouch made of its skin.



THINKING SMALL, Andrew Taqtu searches the underside of the floe ice in hopes of finding dug-in members of the plankton community. Andrew, whom I teasingly refer to as the “Jacques Cousteau of Arctic Bay,” often directed me to an amphipod on the ice (right). These thumbnail-size crustaceans move along the bottom of the ice to feed on algae and to lay their eggs.

What Andrew and I can’t see with the naked eye are the



millions of nematode worms, other extremely small invertebrates, and planktonic larvae of larger invertebrates, such as polychaete worms, that also inhabit the ice. These hordes of microscopic grazers also feast on the algae.

Once the ceiling of ice melts or splits apart and direct sunlight comes streaming in, the water becomes charged with life and energy. One day the visibility close to the surface will be as much as 300 feet. Then the phytoplankton bloom, and I can



hardly see 40 feet in front of me.

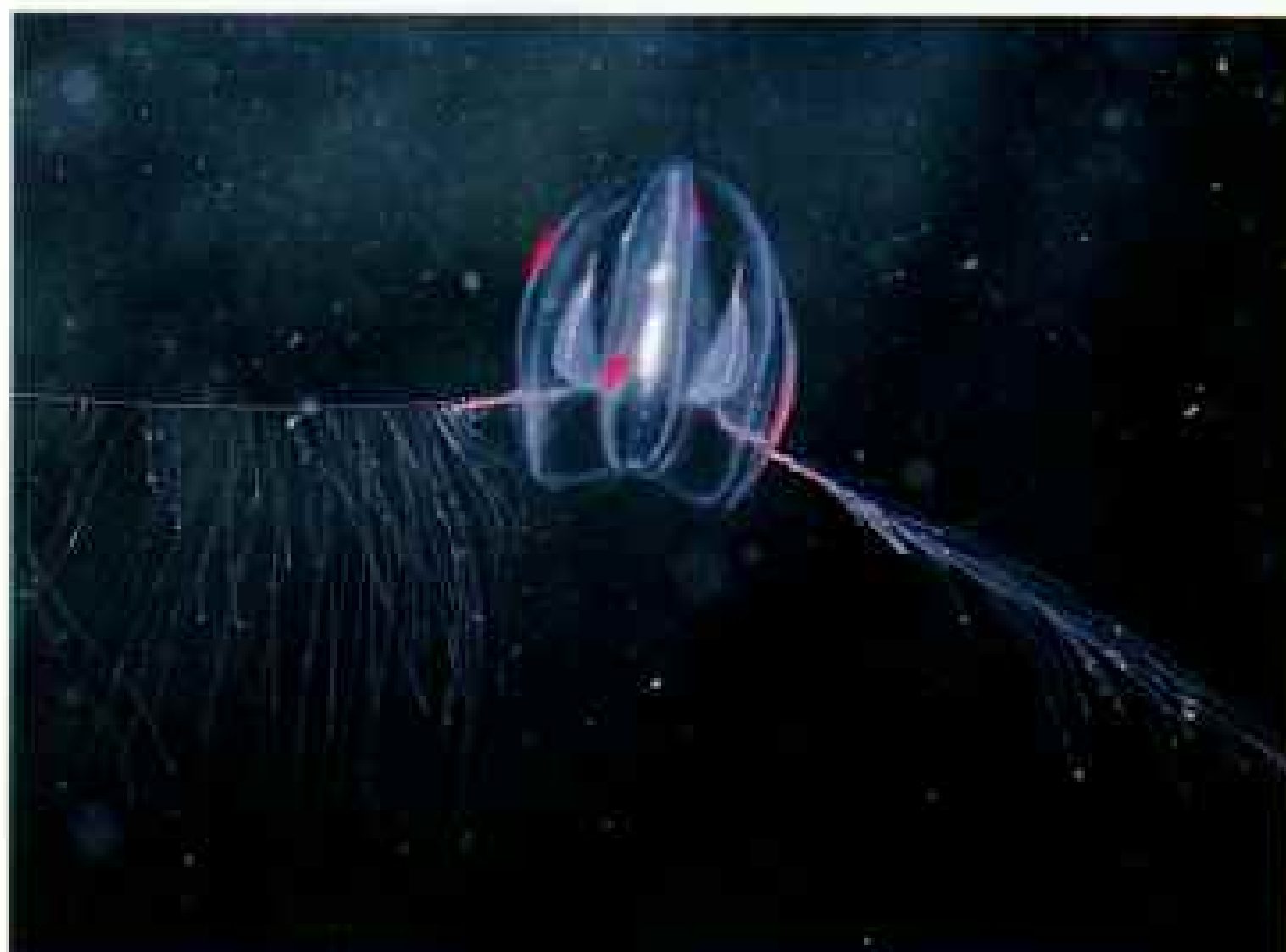


hardly see 40 feet in front of me.

Next comes the invasion of zooplankton. These tiny hunters migrate from the depths where they spent the winter in a near-dormant state. A transparent, inch-and-a-half-long horned *Clione* (top) comes sailing by, ready to snare a smaller snail.

A frilly nudibranch (above), an elegant half-inch-long mollusk with the inelegant common name of sea slug, forages among kelp for jellyfish-like hydroids.

The numerous jellyfish, which most other species seem to avoid, are voracious consumers of herbivorous zooplankton. One small jellyfish I saw (middle) appeared to push its tentacles before it rather than pull them behind it. I enjoyed observing the feeding technique of a ctenophore (left), which extends its tentacles like trawl lines to haul in the copepods.



HIDDEN GARDENS of color and movement opened for me when I dived beneath the ice to the shallow bottom near the shore of Admiralty Inlet. Forty feet beneath the surface at 29°F, barely above the freezing point of salt water, I was delighted to find such tropical sights as a soft coral growing next to sea urchins (right) and a cardinal red shrimp perched on a kelp frond (middle).

Water temperature, I know, is not a limiting factor in the growth of some corals. In fact, in the icy waters of both the Arctic and Antarctic an extensive group of corals manages to survive. As long as the polyps have zooplankton to feed on, corals will grow surely, if slowly.

Splashy sea anemones also find a niche, in this case on a boulder splotted with colorful coralline algae (facing page). These algae secrete a hard, calcareous substance similar to that produced by coral. I once watched with fascination as a small sea spider, disturbed by the glare of my diving light,

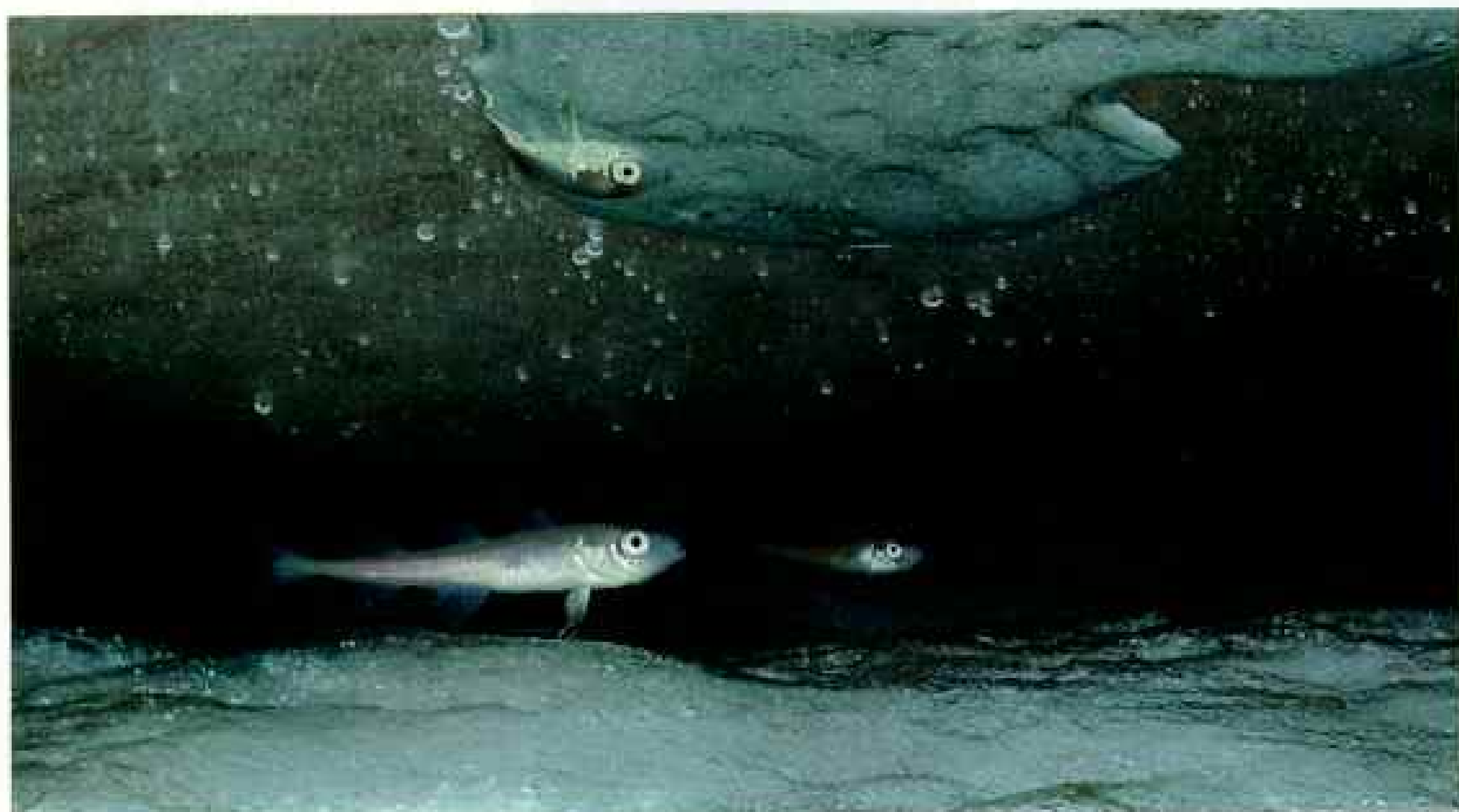


moved away from me in crab-like fashion only to be gobbled up by a sea anemone.

Because the ice was still blocking the rays of the sun, most creatures on the bottom were in their winter trance, hardly moving at all. Fish lay on rocks oblivious to my approach. Gunnels—eel-like fish—curled sleepily among soft corals. Shrimp, normally furtive and quick, remained motionless while I took their picture.

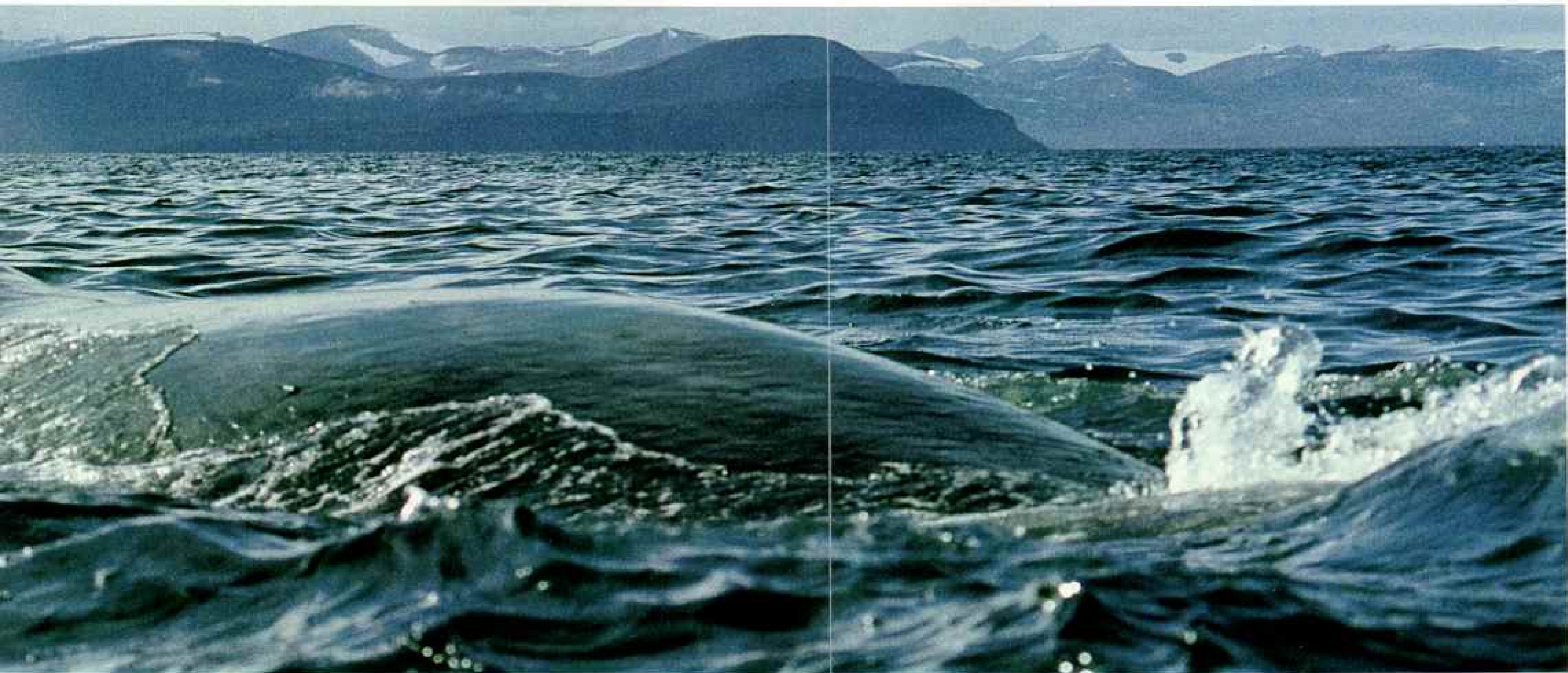
When the ice disappeared and the sun lit the sea, animals that had been so docile now darted beneath rocks and vanished into kelp beds. In broken ice near shore I discovered a few cod hiding out. I captured the image of one reflected in an air bubble (bottom).

During the season of open water, Arctic cod assemble in shallow-water schools half a mile long and so dense that the fish darken the seafloor beneath them. Why the fish mass in such numbers remains one of many mysteries in the life cycles of creatures that inhabit Arctic waters, a little understood ecosystem.









TAKING A BREATHER from tumultuous sexual activity underwater, a pair of rare, 50-foot-long bowhead whales surface in Isabella Bay on Baffin Island's east coast. This remote fjord is the only place left in the eastern Arctic where bowheads congregate in great numbers. Before two centuries of whaling began in the early 1700s, bowheads numbered an estimated 11,000 in the Baffin Bay region. Today fewer than 500 remain there.

After long marveling at solitary bowheads floating along the floe edge of Admiralty Inlet, I was eager to visit Isabella Bay. My guide was Kerry Finley, a marine mammal biologist who has

been studying the whales since 1983.

Kerry, observing the endangered bowhead with the help of Inuit from nearby Clyde River, has found that as many as 70 whales gather inside the bay when the ice goes out in August. For them it's a playground unfrequented by predatory killer whales. In groups of four or five, the whales engage in day-long rounds of copulation.

With Kerry on hand in a kayak, a female lifts a six-foot-long flipper and lazily slaps the water (left). As a possible gesture of prowess, a male indulges in violent tail lashing (right). A lowered hydrophone picks up screams, roars, and wild trumpeting. "The sounds were so loud,

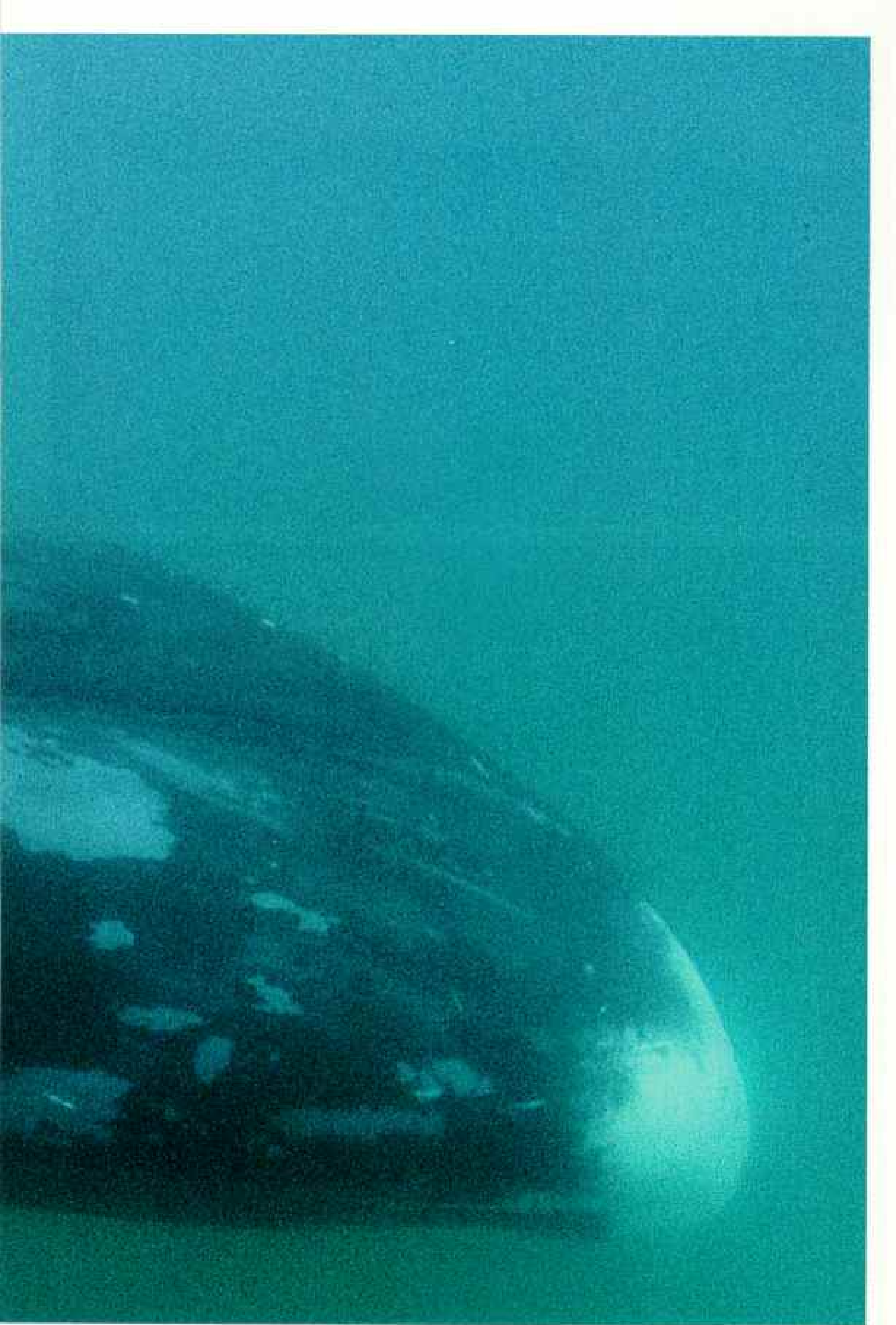
they vibrated my kayak," Kerry said.

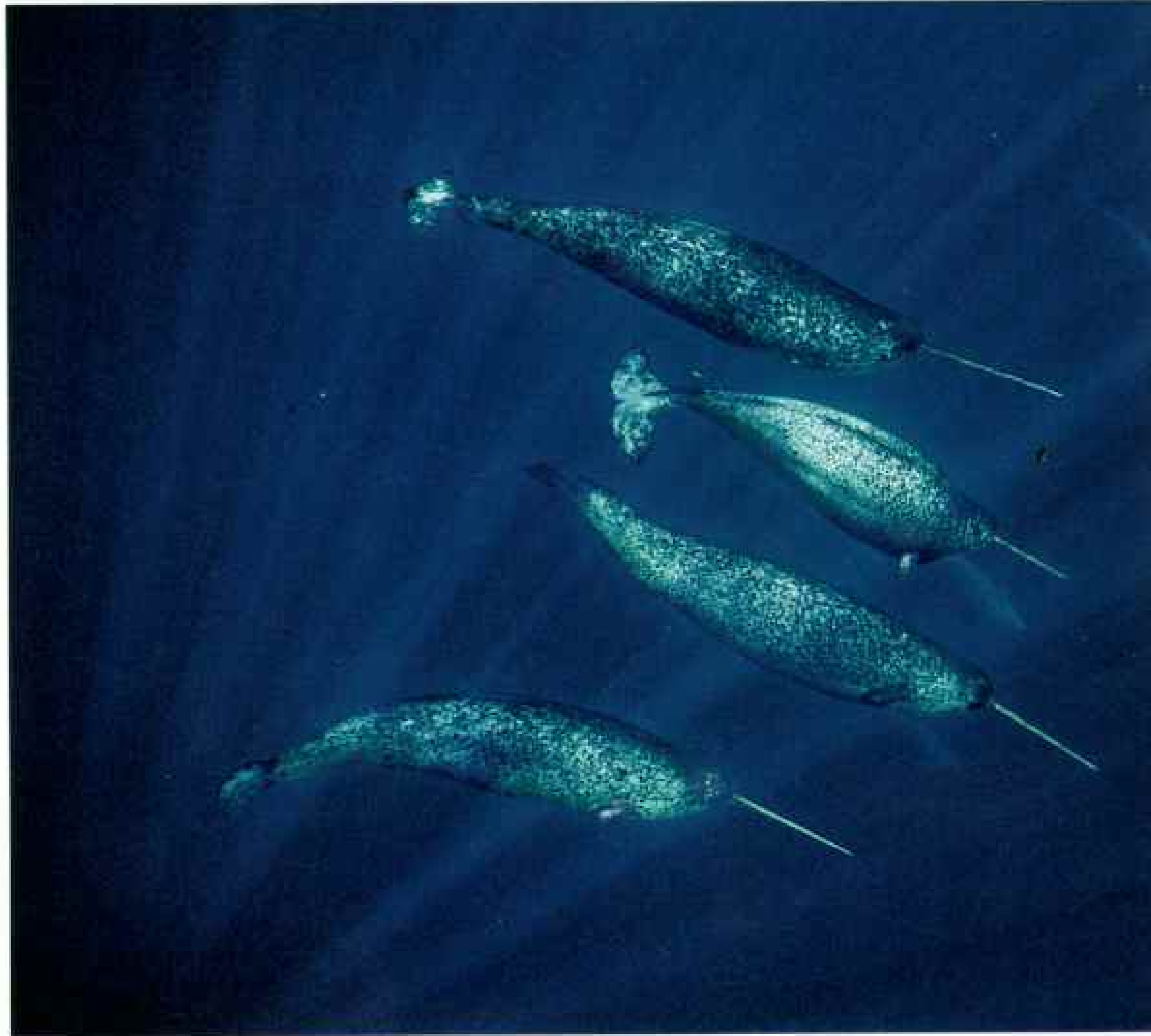
The confines of Isabella Bay also serve the whales as a grooming area where they can rub off molting skin on the shallow bottom. Most exciting for Kerry: He discovered that bowheads dive more than 700 feet into glacial troughs to gorge on descending copepods.

Cautiously entering the water with these giants, I managed to make the first-ever underwater photograph of a bowhead (following pages). For all its scars and scaly skin, it's one of the most impressive creatures I've seen.











MY FELLOW DIVERS, belugas captivated me with their grace and forwardness.

Called sea canaries by whalers, the gregarious belugas announced themselves with trills and chirps and established my position by echolocation. So curious were these gentle white whales that I could almost guarantee myself a group shot. All I had to do was start swimming back toward the floe edge and then turn around. Usually I would find behind me a gang of belugas (far left), twisting and twirling like modern dancers.

Narwhals, the fabulous tusked whales, arrive in great numbers in July, shortly after the belugas, having migrated from wintering grounds in the pack ice along Baffin Island. By midsummer the water is usually murky with plankton. Once, however, I chanced upon a rare unobstructed view of four male narwhals swimming in formation (left). Their tusks, which are living teeth, were six to seven feet long.

The Inuit's spring hunt in Admiralty Inlet has for centuries centered around the narwhal, which they now harvest according to a quota system. Hunted from the ice, the narwhal satisfies a variety of needs: meat for humans and dogs; a favorite food called muktuk, the whale's skin; and, for the cash-starved local economy, spiraled ivory tusks, which the hunters legally sell by the foot to Asian buyers.

One marine mammal I avoided was the Atlantic walrus (top). Clunky on land, walrus are fast and powerful in water, and they can be aggressive. I contented myself with photographing a pair sunning on an ice floe.



ANSWERING THE CALL of spring, migratory birds angle across the skies over Lancaster Sound, a prime destination for feeding and breeding. Snow still streaks the walls of Admiralty Inlet in June when a flock of king and common eiders wings by. These

large diving ducks, which winter in southwestern Greenland and on the Labrador coast, home in on shallow-water leads, plunging to the seafloor for clams and other mollusks. King eiders will nest singly on the banks of freshwater ponds, while the commons nest in



colonies on stony shorelines.

Seabirds arrive in waves on the floe edge. Millions of murrelets, northern fulmars, guillemots, kittiwakes, and dovekies flock to the area during breakup. They all feast on a stew of zooplankton and Arctic cod.

From my campsite I saw mobs of thick-billed murrelets bobbing on the water. When this stocky black-and-white bird dives, it seems to fly through the water, using short powerful wingbeats to jet after prey.

When finished eating, the seabirds return to teeming

rookeries they have established on nearby sea cliffs. As many as 140,000 breeding pairs of murrelets have been counted in a single colony on rocky ledges.

NO ONE SLEEPS when a polar bear is known to lurk in the neighborhood of camp. Fearless, wide-ranging hunters, polar bears will seldom pass up the chance to investigate a possible source of food. Fortunately, the time a bear did boldly approach my camp one sunlit night, I was accompanied by a team of dogs. The dogs rushed out to confront the intruder and, by means of feigned charges and loud barking, managed to drive the bear away. To my amazement, not a single dog was injured.

One of the world's largest land carnivores, the polar bear pursues its quarry on ice and in water as well. After checking out our camp, the bear escaped across a lead, its wet fur plastered against 500 pounds of hungry intent (bottom, left). A layer of fat as thick as four and a half inches helps keep a polar bear buoyant, an especially useful trait when it swims under ice stalking seals, its preferred prey, or when it attacks the occasional small whale or walrus.

Ursus maritimus—the maritime bear—spends most of its time on sea ice. The bears may hunt straight through the winter, but pregnant females retreat to snow dens. In spring they emerge with their cubs, usually twins, already several months old. One day I saw a pair of cubs learning from their mother how to ambush seals on the ice. As my armed Inuit companions and I came closer, the protective mother took off with her cubs (far right). The trio dived into the water, shortly to regain the safety of an ice floe.

"When you come upon a polar bear, there's a feeling of mutual respect," Glenn Williams told me. "You really don't want to test each other." Amen to that.







A WHIFF of Arctic air is all an adult ringed seal seems to take at a breathing hole, or *uglo*, before slipping back to

safety beneath the ice. The most abundant large mammal in the far north, the ringed seal lives in the area year-round, maintaining a vital network of breathing

holes in winter's ice-covered waters. Its major predators, Inuit hunters and polar bears, will hold long vigils at the holes in hopes of catching a meal.



For parts of five years I too waited patiently for the wildlife of the sea ice to reveal itself. No barren wasteland here. Come the springtime season of

light and its life-giving energy, the Arctic thaws into a true land of plenty. □

DOCKLANDS

London's backyard, the East End waterfront is being reborn as a high-rise jungle,

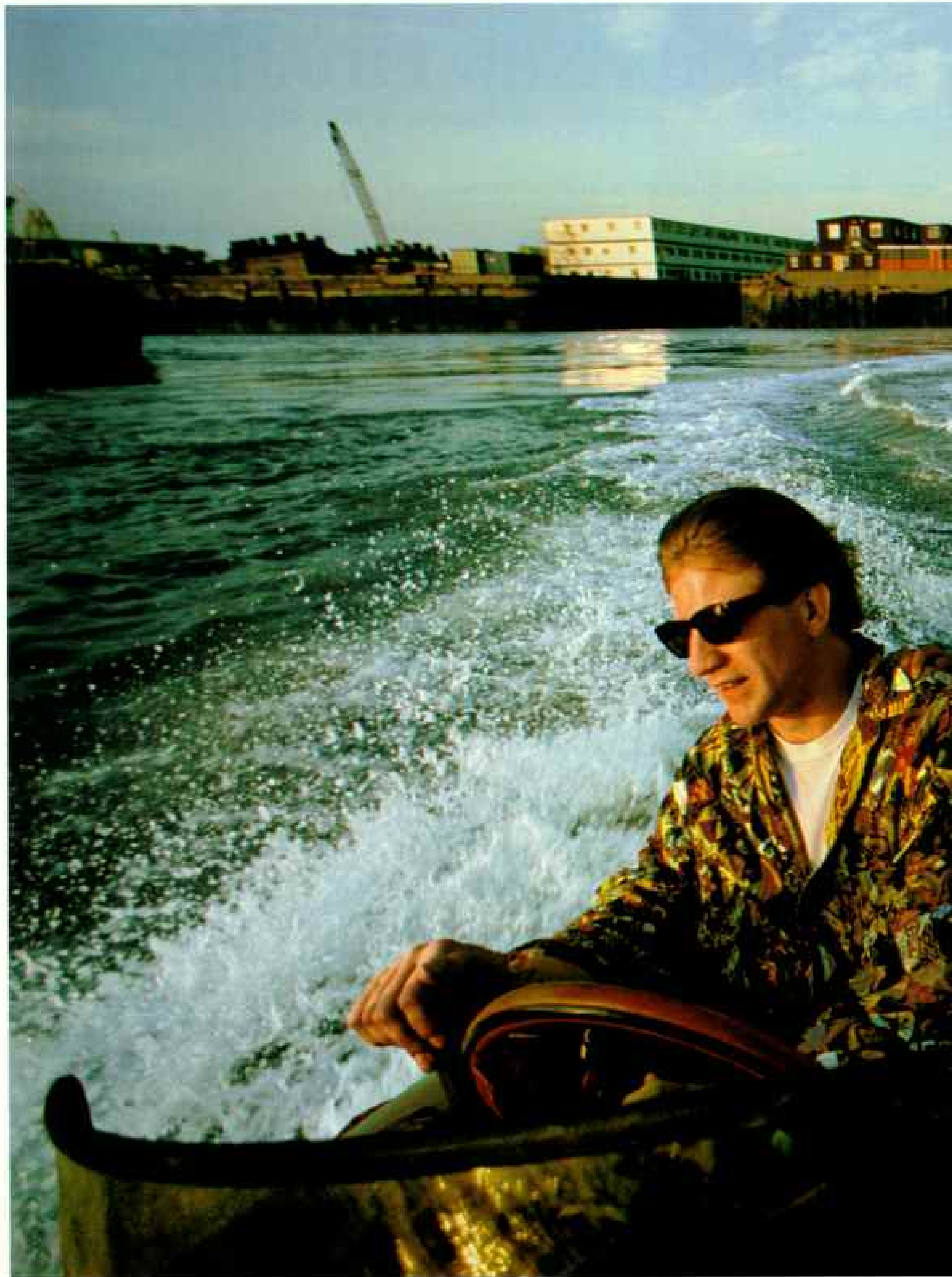


London's New Frontier

By ERLA ZWINGLE ASSISTANT EDITOR Photographs by JOE McNALLY SYGMA

overshadowing the cockney neighborhood of Patrick Gaynor and his dog Prince.





Breezing up the Thames, interior designer Mark Williams-Ellis and physician Fiona

“The locals have been hit over the



Butler represent a new breed of Docklander, at home with the area's trendy new flavor.

head by all this.” —BOB ASPINALL, LIBRARIAN

Magnet for investment is the Isle of Dogs, where businessmen have been laying down heavy bets for centuries. Speculators in the lucrative Caribbean sugar trade opened the lakelike West India Docks, center background, in 1802. Canary Wharf gambled on goods from the Canary Islands. The docks had closed by 1981, and



EAST OF THE TOWER OF LONDON, another London begins. Seen from the air, it appears to be more water than land, a Thames-side archipelago formed by a series of huge man-made lakes: the docks. Scarcely four miles from Buckingham Palace, it has echoed through the ages with the greatest names of maritime and commercial history, from Nelson to Cook to Captain Kidd, the *Mayflower* crew, Frobisher, and Drake. It has always been a world apart, and happy—no, proud—to remain so. But with a tidal wave of money and promises, all that is changing.

Between 1967 and 1981 commercial pressures forced the docks to close, and shipping moved downstream to Tilbury, where it could

be more competitive. In the ten years since, new commercial forces have been at work in a redevelopment effort of stupendous proportions (8.5 square miles, 9 billion pounds—some 18 billion dollars U. S.—invested) under one resounding name: Docklands.

New housing, new offices, new people have sprung up virtually overnight; real estate speculators and foreign investors have plunged in (some not to surface again); new roads are being gouged out, old roads redrawn or renamed, and whole blocks of longtime residents uprooted, with crowds of newcomers—so-called yuppies with phones in their BMWs—moving in.

Not surprisingly, nobody is neutral. Everyone from reporters to real estate analysts to

all bets were off: Only mass unemployment and dereliction remained. From those ruins rises a second Canary Wharf—this one a 71-acre high-rise development that boasts 12 million square feet of office space, as much as downtown Kansas City. Said one resident, "It's a piece of America that's fallen out of the sky."



the average bloke in the pub has an opinion, usually several. One thing is clear: The old riverside communities that struggled to stick together through the Blitz, rising unemployment, and floods of immigrants are now receiving the final blow. To hear the old working-class families talk, you'd think somebody had died. I hadn't been in town a week before I knew the dirge by heart.

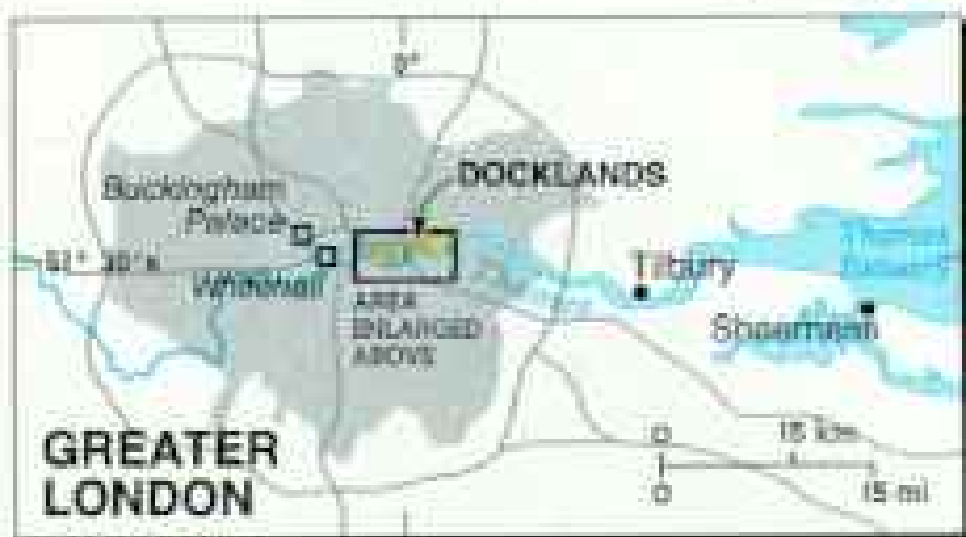
"It's all changed," says cab driver Billy Collins. "It's changed so much it's unbelievable. The people were close, and they're not close now."

"It used to be nice, didn't it?" says Lil Bannister, as she pulls on her pint of stout during a break in the Monday night meet of the Mile End and District Ladies Dart Leagues. "But

today people are greedy and they're nasty. We worked hard, but anybody would say they'd rather have the old days back. We had more life then than we do now. We was united."

"Maybe their intentions were right, but they've gone over the top," says Renee Hames, the fourth generation of her docker family. "They've ripped the guts out of the place, they've taken its soul."

THEY are commonly understood to be the London Docklands Development Corporation. Approved by then Prime Minister Margaret Thatcher in 1981, LDDC's primary function was to attract an unorthodox mix of public and private money to revitalize the area. "We think we're building a new



- | | | |
|----------------------|-------------------------|--------------------|
| Docklands | Existing | Proposed |
| Redevelopment area | Docklands Light Railway | London Underground |
| Open space | British Rail | Riverbus service |
| Enterprise zone | Riverbus service | |
| Archaeological site | | |
| Point of interest | | |
| NEWHAM Borough | | |
| STEPNEY Neighborhood | | |

Gateway to empire

Largest urban-renewal project in Europe, Docklands is 8.5 square miles of office towers and condominiums going up on the riverbanks east of Tower Bridge (right). Newcomers Myron and Rachel Belkind, at left, chat with their children on historic ground: Shipping dates back to Roman times. In the 1960s trade began shifting to the container-port downstream at Tilbury, and London's docks, once the world's busiest, withered.

To revitalize the area, the government created a tax-free "enterprise zone" in Docklands a decade ago to woo investors. Like the maritime traders of old, they have reshaped the gates of an empire.





center for London that will allow it to remain the capital of Europe," declared former chief executive Michael Honey. "We'll enable London to expand while preserving the historic area."

The expansion, in their view, needed to be both in housing (public and private) and in offices, especially those with large trading floors and other facilities for major financial institutions. "Very many cities have faced the problem of what to do with land that was previously used for waterfront activities," says Derek Diamond, a professor of urban and regional planning at the London School of Economics. "Something was going to happen here. Thatcher got it off the ground more quickly, and at a larger scale, than it might have done otherwise." So the Local Government Planning and Land Act gave the secretary of state for the environment the power to set up an "enterprise zone" on the Isle of Dogs, with plenty of tax abatements, looser planning controls, and other incentives.

Yet the intense emotions the Docklands transformation has evoked have less to do with square footage and interest rates than with a stab to the heart of London's sense of itself. Brenda Johnson, who taught school in Bermondsey during the dock closures of the seventies, explains it this way. "The docks, that's where life was," she says. "It was there you found your typical lower-class, hardworking family system. Front doors were never closed.

There was the old mentality of the English village: As long as you had your friends around, as long as you stuck together, it didn't matter what happened.

"Then the government put in these apartment tower blocks, where doors were locked, and while people were glad to have better living conditions, they really lacked the essence of their lives. You didn't know anyone.

"What's happened in Docklands is happening everywhere," she continues, "the impersonalization of society. It's all fragmented, and people don't feel safe."

"The cockneys are being driven from their homeland," Sister Christine, a feisty Irish nun, bluntly puts it.

But the newcomers, understandably, tend to look forward rather than back.

"We didn't come to speculate. Docklands had some element of excitement," says newspaperman Ken Bennett. "It was the land of milk and honey."

WANTING TO BE at the center of things, I moved into an apartment (there were no hotels yet) on the Isle of Dogs, that thumb of land poking into the eye of Greenwich. People tend to equate Docklands with the Isle of Dogs, because it has gotten most of the publicity. But in fact the area overlaps three municipal boroughs containing a congeries of ancient and distinct villages.

Traveling eastward along the north bank of the river, first comes Wapping, then Limehouse, Poplar, the Isle of Dogs (no one knows exactly how it came by that name), and finally the districts around the farthest east Royal Docks, crowned by the small, struggling new London City Airport. These share some history with the larger industrial East End of which they are a part. On the south bank, from Southwark to Rotherhithe, the villages have a more suburban personality.

Virtually every event and personage that made England great was connected with these shores. After all, "London is one of those rare capitals that is also a port," explains librarian Bob Aspinall at the Museum in Docklands. "It's impossible to separate the history and capital from the docks; the city was built on trade. This was a sort of Cape Canaveral: Everything shot out from here. London became a center of the tremendous shooting star of exploration and discovery."

The Romans made London an important

"Everything was muscle," recalls a docker of work in the 1940s and '50s. That tradition lingers downriver at Medway Dry Dock in Sheerness, where every available worker strains to open the ancient lock (below left). Near Tower Bridge, cargoes of exotic spices have landed for hundreds of years. At Butlers Grinders Henry Barham



port, and the following centuries saw trade increase. In medieval days Geoffrey Chaucer served as commissioner of maintenance of the river between Woolwich and Greenwich. Captain James Cook organized his voyages from the village of Deptford. The *Mayflower* crew boarded their ship in Rotherhithe. John Newton, who forswore his career as a slave captain and wrote "Amazing Grace," was a native of Wapping. And generations of Britons have taken pride in the riches

of empire that poured through the docks.

The docks have had a darker fascination too. Captain Kidd swung from the rarely idle gibbet at Execution Dock in Wapping. Writers Daniel Defoe, Charles Dickens, Arthur Conan Doyle, and George Orwell delved into their squalid depths. In 1902 Jack London had to beg a cab driver to take him there. And on a typically clogged rush-hour afternoon, so did I.

I don't think I ever heard anyone say he

(below), among the last of the old-time grinders, tends the granite wheels that reduce imported Indian turmeric roots to powder. The atmosphere is fragrant with memories, as Victorian author Walter Besant mused: "There is no seaport in the country . . . so charged and laden with . . . the suggestion of things far off."



lived in Docklands; people are passionate about their neighborhoods. On the Isle of Dogs (technically a peninsula) residents even refer to themselves simply as living on "the island"; they have the same attitude in peninsular Wapping and Rotherhithe. Once entrenched families forced to relocate just half a mile away feel as if they've been banished to Lapland. And for all the contact they have, the north and south bank communities might as well be on opposite rims of the Grand Canyon.

LIVING IN DOCKLANDS, I discovered, is about as comfortable as living in a house on moving day, with the resident large and noisy family refusing to vacate while the new large and noisy family begins unpacking. The turmoil of this regeneration is difficult to overstate. The workday air shudders with the thunder of pile drivers and jackhammers as concrete mixers and Esso tanker trucks vie with Rolls-Royces and Daimlers; motorcycle messengers swoop in between



"Having a steam" at quitting time is a local tradition. Yet as the docks failed, so have

"We'd have a laugh 'cos we was all mates."



oases like East Ham Baths, closed in May 1990 for lack of funds.

struggling city buses; parking is nonexistent; traffic is paralyzed. (On weekends, with offices and construction sites empty and streets deserted, an equally disturbing quiet falls.) Restaurants do a booming business with expense account lunches, but it's almost impossible to find a place open for dinner. The locals eat at home, and if I didn't want to do the same I had to muster my energy for the slog, as they say, "into the city."

Everyone from cab drivers to government ministers realizes that all the vaunted advantages of shopping malls and office towers will be meaningless without a way to get there. The effort to build new roads (especially the major tunnel called the Limehouse Link), expand the Docklands Light Railway, and begin work on the new eastward extension of the Jubilee Underground line (due for completion by 1995, at the earliest) creates an environment in which any project more demanding than getting to the pub becomes a major challenge.

Simple transport provides an exciting element of suspense, as average traffic speed here is estimated at only 11 miles an hour. And the Docklands Light Railway, which was intended to soar above the bottlenecks, is the victim of its own success. Trains routinely carry three times their projected ridership and struggle with unpredictable stalling (construction has frequently deranged the power lines). "We've been busy burning the timetable," one exasperated commuter told photographer Joe McNally. "We know it's a work of fiction, but we find it deeply offensive."

Mere growing pains, say the boosters; lack of intelligent planning and shoddy, make-money-quick workmanship, retort the critics. "It's the problem," cracks Ken Bennett, "of trying to build a city out of bugger-all."

ONE FACT certainly remains clear: The present perfectly mirrors the past. The dock area has always been subject to change without notice. However much the locals may bewail the destruction of their heritage, that heritage has consisted mostly of similar upheavals, all for commercial gain. The original tidal marshes were drained and walled to make them useful as pastures; then came various shoreside enterprises (leather tanning, vinegar works, lead refining, limekilns), followed by increasingly heavy industry. Virtually every decision affecting the area has been motivated by hunger for profit, and

speculators have never been lacking. In 1802 the West India Dock Company opened a massive enclosed wet dock—basically a huge lake surrounded by brick walls—to protect its goods. In those days ships tied up five deep in the Thames, waiting for weeks to unload cargo, and the pilferage was spectacular. Other merchant conglomerates followed suit, and their determination to defend their property is attested by grim stretches of surviving brick wall 30 feet high to prevent workers from throwing goods over. Armed guards manned the few gates. Dockers commonly referred to working "inside."

So the issues today have a very familiar ring: Sudden, catastrophic unemployment? When the shipbuilding industry went bust in 1866, 30,000 workers were on relief in Poplar. Derelict land? A journalist for the *New York Times* reported in 1867 that the Isle of Dogs presented "a mournful scene of desolation . . . and no-one here looks for a revival of the business." Destruction of community? In the 1820s the digging of St. Katharine Docks entailed not only the total demolition of the beloved medieval hospice and church of St. Katharine but also drove more than 10,000 people from their homes. (Too small even by the standards of the day, the dock rarely made a satisfactory dividend and was one of the first to close.) Land developers? In 1845 William Cubitt leased a hundred acres of pasture on the Isle of Dogs, much of it sublet to industry and housing; the neighborhood is still called Cubitt Town.

The early Victorian shipbuilding industry flourished, thanks largely to workers from the north; today the big industry is construction, also full of northerners. I attempted some friendly badinage one evening in the City Pride pub, but between the Scottish bartender and the electrician from Liverpool I couldn't understand one syllable.

Today differs from the past, however, in the role government is playing. In 1979 Margaret Thatcher became prime minister in the depths of the worst recession since the thirties. Regarding the stretches of impoverished (though not uninhabited) riverside land as prime investment territory, she created the LDDC. It had one mission: regeneration of the area.

Still, those who are most bitter about the LDDC's lack of democratic accountability—the chief executive reports to the secretary of state for the environment—also admit that the democratic process failed throughout the

A neighborhood's ticker beats loudest in cockney pubs like the Anchor & Hope (bottom) or the Tooke Arms (below), where patrons enjoy a pint or two and three-card draw. While many pubs have begun catering to newcomers, a classic Docklands "local" remains a combination of bar, family room, and front porch.



seventies to produce a workable regeneration plan. So the LDDC bought great stretches of land, derelict or occupied, on the simple theory that anything was better than the way it was, and the sooner, the better.

"We wanted to suck in money" is how Peter Turlik, director of strategic affairs for the LDDC, puts it. A planner by training, Turlik remembers the days not so long ago when he could barely entice investors to have a look at the available land.

"The process of regeneration is a fairly complex thing, but at the end of the day somebody has to make a decision," Turlik says confidently. "Secretary of State for the Environment Michael Heseltine had been very impressed with how America had turned around its waterfronts with the cooperation of private and public money. In his mind, what was required was a lot of vision, and a single-minded authority needed to be set up. It was anathema to the public"—Turlik adds



mildly—"because there was no public say." (The public has been having its say ever since in the form of simmering community protest.) "So we moved away from master planning in the traditional sense," he says. "The first companies to come here were given their pick of sites. It was a very hard attitude, but we could take a very businesslike approach. It

"The most clay pipes I've found in a day is 52," says mud larker Ron Goode, who is filling a museum with the artifacts he's scavenged from the Thames at low tide.



antagonized a lot of people, but I think the results vindicate that approach."

Those results are mixed, at best. On the Isle of Dogs the early laissez-faire inducements have left a wildly eclectic architectural jumble that still sparks heated debate, including plenty of vivid and well-publicized criticism from Prince Charles. ("The triumph of commercial expediency over civic values" was one of his gentler remarks.)

"It's not a very coherent plan," says Professor Diamond of the London School. "It's more a set of projects that fit together. Sometimes they fit well, sometimes they don't."

"It's very easy for people to say, 'That's the way they should have done it,'" Turlik retorts, "but we had a staff of only 25 people in an old warehouse. Things didn't really start to happen till Thatcher was reelected in 1987. The population of Docklands has risen from 39,000 to just over 60,000 now, and by the year 2000 it will be 110,000 to 115,000."

SHOULD THAT PREDICTION come true, most of the credit will be due to one massive undertaking: Canary Wharf. Though many developers trumpet the benefits their projects will eventually give the community, Canary Wharf, in size and aspiration, surpasses them all.

With a nice touch of historical symmetry, this 26-building, 4-billion-pound complex is rising on the Isle of Dogs on the very site of the area's first great commercial speculation, the West India Docks. Billed as the largest multiuse development in Europe, crowned by Britain's tallest skyscraper, its colossal bulk, even under construction, looms with "ghastly and inappropriate splendor," as Poe would have it, over its humbler surroundings. Though real estate analysts generally concede that the office-space market does not require a skyscraper that size, "that tower is a beacon," proclaims Executive Director Robert John with a Welsh flourish, "and for local people it's a beacon of hope." (Being visible for miles, it also makes an inescapable advertisement for itself.) Blue-chip commercial tenants such as Morgan Stanley, Texaco, American Express, and Ogilvy & Mather are already lined up, and that bulwark of British department stores, Marks & Spencer, leads what is hoped will be an impressive list of shops. Also planned are a health club, underground parking, restaurants, and leafy promenades.

The developer, the Canadian firm Olympia & York, has a history of success with such megaprojects (the World Financial Center in Manhattan is another) and is famous for making a long-term commitment to the neighborhoods it does so much to change. Mari James, a political scientist, joined O&Y in 1988 to work with the Isle of Dogs community in establishing education and training schemes. She likes the company's sense of mission.

"If we're going to have to be training workers, we'd like to provide that training for local people," she explained. "We expect there will be 20,000 to 25,000 jobs by the end of 1992, from security to gardening, maintenance, offices, and shops. We want Canary Wharf to be busy seven days a week.

"We're actually achieving something that makes a *difference*," James says proudly. "My parents left South Wales because the coal mines were closing. What this community is going to have—and on its own doorstep—is some of the best opportunities in the

Going starkers on a trip to the beach, young Christopher Kimpton scrambles up the Thames riverbank, where locals and their children have played for generations. New shoreside development often blocks public access to the river—a sore point for many East Enders. “We used to just sit by the river,” says Jamie Locke. “Now they shout they’ll call the police.”



U.K. A lot of areas don't have that choice.”

Many youngsters remain hard to convince. I talked to some high school students at George Green's School on the Isle of Dogs (a school that has actually been “adopted” by O&Y) and was surprised by a chorus of despondency. “I don't think most kids will be able to get jobs in the offices. . . .” “We won't be able to afford to live here. . . .” “If you worked over there, they'd be completely different from us. Don't know if you could get along with them. . . .” And this is the generation that's supposed to benefit most.

But some locals are ready for improvements. There is even optimism. “Nah, the neighborhood hasn't changed,” said young “Noddy” Goodman at the wheel of his minicab. “If people are getting something by hard work, let them enjoy it. Good luck to 'em. They've never done me no harm.”

“I think it's for the better,” chirps bus driver Peter Tilden. “We need something

down in the East End. All the old 'uns—they'll complain about anything, won't they? But the young ones are ‘Yeh, let's go for it.’ It's giving jobs, innit?”

The violent denunciations of the yuppies led me to suppose they were everywhere. But I hardly ever saw one. They spend long days away at work, and at night they tend to keep to themselves inside their expensive condominiums. The locals, who have run in and out of one another's kitchens for generations, find this lack of sociability bizarre. “They say we're prejudiced against them,” says Billy Collins, “but I think they're just as prejudiced against us.”

Even the personality of the pubs is splitting. Neighborhood places still traditionally serve as a combination bar/recreation hall/front porch where whole families from infants to grandparents come to spend hours on end. Joe McNally and I passed a Hogarthian afternoon at the Tooke Arms with a group of men and

"I'm the fourth bloody generation—why should I have to go?"

—RENEE HAMES, RETIRED RECEPTIONIST

To mend unraveled lives, Sister Christine (below, at right) runs a neighborhood network to help the elderly cope with development. George Meacher (right) dismisses the flat he was given when his home was razed. "They're trying to make a yuppie out of me," he says bitterly.



women holding a wake with singing, ribald repartee, and endless rounds of ale, gin, and the dangerously potent Stingo Dark Barley Wine. Just up the road, though, at the newly upscaled City Pride, an "islander" watched the office workers from nearby Price Waterhouse and other businesses pause for refreshment. "People come in and buy a pint and then leave," he said in amazement. And over at the White Swan and Cuckoo in Wapping, the traditional ploughman's lunch, typically featuring the humble cheddar, has been promoted to a "ploughperson's" repast, with Brie.

Yet there are signs of growing détente. "I personally don't feel it's detrimental—new people can add something," said young mother Yvonne Webb in reawakening Rotherhithe. "They don't have to take something

away. The neighborhood would have changed anyway and got more and more slummy. So we feel quite happy about the improvements." Even those who aren't likely to buy a more expensive house are certainly reaping the benefits of better public services. There is even—heavens—some sympathy creeping in for the newcomers.

"I feel sorry for them, stuck with increasing mortgage rates," says Derek Peel in Wapping. "They have to sit at home at night, no matter how much they sit in style."

SO THE STALWART EAST ENDERS are managing the changes with their usual ingenuity. "The character of the people is resilient," remarks Nick Richards, rector of St. Mary's in Rotherhithe. "They've got a lot



of humor and, in a way, are quite innocent in taking people as they find them. Anyone who pretends gets the old heave-ho. You'll be seen through and told so." This is something Londoners treasure about the cockneys.

Londoners also prize their tough pragmatism; though they may sentimentalize the pleasures, I never met anyone who denied the suffering. There are plenty of dockworkers who remember ships and cargoes as clearly as the brothers and fathers and uncles routinely killed or maimed in a hundred inescapable ways. Even on a good day their backs would bleed from hefting two-hundredweight bags of cane sugar, their lungs poisoned from ten-hour shifts unloading asbestos, hands scorched by cement fresh from the kilns. And the docks were shared with countless other

workers, from bargemen and tugboatmen to tea sifters and barrelmakers; there were chemical plants, paint factories, fertilizer processors, flour mills, glue factories, match works.

"You'd stand on the pavement and the foreman'd be on the road, and he'd go along and say 'Here you go, Harry; here you go, Ed,' " 85-year-old tally clerk Bill Manning remembers of the old casual labor system. "Sometimes he'd throw the tally chips into the crowd, and the men would fight for them."

"My mother used to pawn her wedding ring regular," adds another docker.

"When it came to feeding the multitude," recalls George Meacher, a retired ship plater's helper, "my mother had Jesus Christ well and truly beat."

Yet men and women alike watch the

metamorphosis of their world with a baffled and unappeasable yearning—not for the suffering, but for the solidarity. And it is a mistake to suppose that better buses compensate for the obliteration of such a history.

Some losses in the community are being regained, though the process is hardly noticeable amid all the other excavation: Archaeologists

are at work. “We knew a lot of the heritage would be destroyed,” says Mike Hutchinson at the Museum of London. So he and Steven Haynes work with the LDDC and individual developers to arrange digs before the bulldozers move in.

“Developers aren’t that bad,” Hutchinson admits. “They themselves don’t know if the

plot they want is archaeologically important. We make sure any remains are preserved before the developers go in, or we excavate in a controlled environment so at least we know what was down there.”

They are locating traces of occupation 3,000 years old. “We found a flint knife dating from the Bronze Age,” Hutchinson told me. Their greatest triumph so far: finding conclusive evidence of the mid-18th-century Limehouse Kiln at Dunbar Wharf. “The kiln manufactured Limehouseware, which is the earliest known English copy of Chinese porcelains,” Hutchinson said. “It is very rare, and it was turning up at auctions but couldn’t be firmly attributed.” Now it can.

BUT YOU DON’T HAVE TO dig for history, as I discovered the day a small, wiry cockney, a former docker (and circus clown) named Ron Goode, took me mud larking. Mud larkers are basically scavengers. Like generations of

East Enders, we wandered along the shore of the river to see what 15 feet of tide had left behind.

For centuries children scrounged for pieces of coal, wood, and anything else that could be used or sold; it meant survival. Ron got into it strictly for fun, and he now has a collection ranging from Roman and Chinese coins to Georgian shoe buckles, lead musket balls, cannonballs, spurs, Victorian foot pattens, keys, locks, and countless clay pipes. Along



More toy than train—that’s how many view the Docklands Light Railway (facing page).

Built to connect with major commuter lines, it has been plagued by overcrowding and frequent breakdowns. Yet for former cab driver Danny Denham (top) work as a train captain on the railway (above) is a promising new start at age 52. Docklands promoters estimate development will create 220,000 jobs by the year 2000.





To preserve historic buildings above, a crew of miners uses only hand tools to “muck

“I’m just a cockney, that’s it.



out" a tunnel linking the Docklands Light Railway and the London Underground.

That's all I want to be." —BILLY COLLINS, CAB DRIVER

Topping out at 800 feet, Canary Wharf's showpiece skyscraper, the Tower, will be Britain's tallest, with offices renting for half what they would cost in central London. But down-to-earth Docklanders living in its shadow are already up to here with the new building—it blocks their television reception.



That and other grievances get aired at emotional community meetings. On the Isle of Dogs, Mick Gleave of the BBC argues the television issue with Poplar resident Lill Hatter (bottom). A new transmitter is in place to bring interference-free TV to the Docklands, but a question remains: Who will foot the bill for the new aerials?



the way he has taught himself the history. "This button," he points to one, "could have been lost on January 8, 1806, during the funeral procession for Lord Nelson, which rowed from Greenwich to Whitehall. A considerable number of gunboats and rowboats of the London River Fencibles took part—they were a kind of river home guard during the Napoleonic Wars."

He pulls on his Wellington boots, ties a canvas zipper-pocket cash belt around his waist, and grasps a small metal hoe. As we saunter along the shore, he explains some of the finer bits of lore: "Most things come from where it's muddy, not where it's stony. . . . A little boy came up to me once: 'Here Ron, what coin's this?' It was a George III Spade guinea. I went

a bit green. If he hadn't been there, I'd certainly have found it myself, and I knew he'd try to sell it, which I never do. . . . This is roughly where I found the Anglo-Saxon coin. . . ."

He tries to get me to see a lead musket ball, but I can't distinguish it among the pebbles. "I should have let you pick it up," he says. "That's the only way you can teach anyone, is to make them look." He spots a tiny brownish metal disk marked with an X. "It's a lead token from the 17th or 18th century. It may have been used as change by shopkeepers, or it may have been given as a receipt."

The south shore tells the life story of the old neighborhood: bolts and nails from the ship-repair yards, chunks of marble from the monument maker's workshop, plenty of bricks laid

"I enjoy people," says ebullient Peter McCoy, fish merchant at Billingsgate Market. Unlike many East Enders, McCoy has embraced the new immigrants from Asia and the Caribbean and goes out of his way to make them feel at home. "I made a point of learning a Chinese word," he remembers with a grin, "and the first person I tried it on was Vietnamese."



down to create a level bed for the anchored barges at low tide, bits of delftware from the ceramic factory near King's Stairs.

The old stuff seems, oddly, to last the longest. "The things that are made today won't last long in the river," Ron said. "Even the coins." A permit is required for digging, but anything that's on top is fair game, and I staggered home with a bag loaded with cannonballs, fragments of plates, ceramic marbles, the bottom of a Victorian stoneware bottle ("Townsend's Superior Ginger Beer, Salford, 1873"), a piece of an 18th-century wine bottle, and a few chunks of marble. I've got Docklands history on my windowsill.

And in my nostrils. On the south bank near Tower Bridge, where tea and spices used to be unloaded, is an aromatic relic of the old exotic days. Butlers Grinders, which moved into an ancient warehouse in 1946, pulverizes a variety of spices on commission. The sheds are piled with 50-kilo hessian sacks of mace from St. Vincent, Indian cumin, Turkish fenugreek, Moroccan coriander, Nigerian ginger. Small rooms rumble with the massive granite grindstones; in one, everything, even the worker, is filmed with golden turmeric; another room is pungent with pepper;

in another, the sweetness of cinnamon.

"I don't really smell it," shrugs product manager George Gardiner, "unless I've been away for a while." Gardiner, who has been here since 1954, has seen the old commercial district undergo major alterations. True, his historic warehouse-lined street, with the evocative name Shad Thames, is still arched with connecting iron walkways, protected by law. But residential renovations are sweeping the area.

So Butlers stands like a little island amid a rising tide of residential property, mostly still vacant. (I, for one, would be willing to pay extra to live downwind of those clouds of perfume.) But getting trucks down the narrow, potholed streets is not a practical long-term proposition, and the business, still flourishing, has nowhere nearby to expand. So it will be moving out whenever it can get a good

price for its lease. Hard to believe, I thought gloomily as I wandered the empty streets, that this was once the very center of empire.

A FEW PROFESSIONS, though, have made the most of moving to Docklands. The high-tech businesses won't really make their mark until Canary Wharf opens this summer, but some of the sturdiest trades have already made themselves at home. Newspapers are one, which is a nice bit of irony, for just as modernization in shipping doomed the docks, improvements in printing technology allowed Fleet Street to take over their territory.

"Every paper in Fleet Street was having trouble with the print unions," said Adrian Lighter, who was editorial manager at the *Daily Telegraph*. His modern office was as cool and gray as his computer terminal, nothing like the cramped space they left behind.

"We got to within a week of bankruptcy," Lighter remembered. "But Rupert Murdoch, owner of the News International papers, broke the unions' power. He set up a printing plant in Wapping, installing computer-based technology. He shifted the *Sunday Times* and daily *Times* overnight—they just walked out

of Fleet Street." A wall nearby bore a scar of the struggle: "Electrocute Murdoch," it said. But all the papers have benefited financially from the more efficient, high-tech production. And in Docklands, the *Guardian*, *Financial Times*, *Daily Mail*, Reuters, and others have found room to grow.

One of the oldest of old London businesses has been in Docklands since 1982: Billingsgate, the fish market. Nowadays the fish come by truck from the coast rather than up the river, and what the spacious-new market may lack in the picturesque is made up for by efficiency. No longer do men, protected by special leather hats, carry wooden trays of fish on their heads — "The old market was hills to climb," 78-year-old porter Manny Abrahams told me. "Here it's all flat, so it's easier to pull the trolleys by hand instead."

For three frenetic hours, from 5 to 8 a.m., the place swarms with buyers and sellers. After that, the rush hour makes the roads impassable, and the vendors either go upstairs to tend their fax machines or settle into the market café for steaming plates of smoked fish and huge mugs of coffee.

Manny Abrahams misses the old days. He used to have the oldest leather hat; his father bought it from somebody else in the market. "I was the very last one to wear my leather hat—I was never without it," he told me. But the business has changed. "Compared to what it was, trade is dead now, absolutely bloody dead," he said. "Supermarkets have frozen fish, so the housewife doesn't need fresh."

Don ("they call me Babe sometimes") Ruth bears the brave badge of Billingsgate Porter #1. He could pass for a genial retired middleweight, and even at a mere 61 years he remembers the old days well.

"The other market was magic," he muses. "It was really hard work, but you accepted it. It was a good life. You could have a laugh every day." Ruth admits some advantages of the new streamlined market, but he sees drawbacks too. In the old unrefrigerated days, quick sales were crucial. "What's made people lazy now — it may be hygienic, but it's them

"In school we have no racism," says Ann Dodd, head teacher at St. Peter's School in Wapping, where immigrant and English kids study computers side by side. At home, poor families often find little in common besides fierce competition for public housing. Says Mrs. Dodd, "Sometimes I think school is the only secure place our children have."



fridges. Without the fridge you'd do anything to get rid of the fish. It was turnover all the time. To me, all the youngsters are concerned about is how early they can get away. They don't seem to take much pride in it."

One man whose eye is firmly on the future is the irrepressible Peter McCoy at Sudders' stall. With a sharp sense of the ethnic market and an endless stream of bawdy banter that sends the Caribbean women into gales of giggles, he has built up a substantial clientele from the new immigrants.

"The art is to talk to as many people as I can," McCoy explains. "Twenty years ago I noticed quite a big buildup of black immigrants, and I thought I should do something. I'm developing a Chinese trade now as well. I always refer to the fish by their Chinese name — it wins their confidence. And I try to learn a new word every couple of days."

I like to think of McCoy when the subject of racial tensions comes up, as it inevitably does. Though the East End has historically been repopulated by waves of immigrants (which you'd think might encourage tolerance), a 20-year deluge of Bangladeshis, and to a lesser extent Vietnamese, has saturated the area.

Conflict is unavoidable, from the classroom

to the street, where a Bengali father, Mr. Ali, stops Sister Christine to ask for help in dealing with some girls in his apartment block who spat on his two little daughters.

THERE ARE GLIMMERS of hope. In Wapping, which may contain the greatest extremes of wealth and poverty in Docklands, a small United Nations is thriving at St. Peter's School, where 230 children happily mingle language, culture, and religion.

"When I first came, it was probably 90 percent Bangladeshi children," the head teacher, Ann Dodd, told me. "Now that's changed enormously as Wapping has changed. You

had a tremendous number of church schools in this area—a great number came as missions to the East End. I wouldn't be interested in educating just Church of England children."

The day I visited, the children were making costumes and cooking coconut pastries to celebrate the Muslim holiday of Id. They also observe Hanukkah, Christmas, and the Hindu Festival of Lights. "I think there's a danger pretending there's no difference," Mrs. Dodd says frankly. "I would say to the children, 'Christians believe this, and Muslims believe that.' I tell them if we're praying a prayer not in line with their belief, just stand respectfully. But we do try to draw in the strands we have



in common, instead of what separates us."

It would be easy, wandering through her cheerful, immaculate school, to imagine that there is no conflict in the world. But it is her ambition to prepare the children for it. "I think some of the wealthier children do learn something here," she says thoughtfully. "Our Bangladeshi families can teach you a lot in terms of not being materialistic. I hope we give our students a sense that they are all special, and that they all have something to offer."

That would make a very satisfying ending to this story. But the ending is still very much in doubt. What Ken Bennett called "the fragile Docklands bubble" will be kept aloft only by

success on many fronts over a long period. And the boom times of the eighties have—in classic Docklands fashion—presaged a slump. Mortgage and interest rates are high, and the hectic building programs have resulted in a glutted market, which has gone dangerously soft. Investors are pulling back.

The London Arena, a 26-million-pound sports and concert hall, is faltering. The four-year-old London City Airport, billed as the new savior of the Royal Docks area (and gleaming gateway to and from important European capitals), is only now showing signs of life. The moguls of Canary Wharf even held a rare press conference to express their confidence in the project and have had to entice some tenants with very sweet deals.

Ken Bennett, for one, refuses to be discouraged. "There's a hell of a lot wrong with the place, but you've got to stick with it," he says forcefully over his evening pint at the Ferry House. "People have lost money, but that was greed. My heart does not bleed for people who can't pay three mortgages.

"We're a nation of people who knock success, but there is a great future here. We have to believe that. If you don't have faith in it, you're kicking yourself to death. It's going to have a hell of a shakedown here, but it's all going to come good in the end."

Now, that's the old Docklands spirit, I thought—Bennett's already half cockney himself. And 19-year-old Steven Devereux is plainly looking forward to his future. "It's our age now," he says. "Everyone can do it if they try. People are just being negative; there's opportunity here, if they want it."

"Oh, it'll probably end up like everything else we do," a friend airily told me. "We'll get it half right." A white van whizzed through clouds of construction dust: "B. Patient, Ltd., Ceramic Tiling." That's not easy.

In the meantime, the philosophy of the old days will do very well for the new: "You just took a chance," says old George Meacher, "and hoped for the best." □

With a touch of sass, Julie Evans celebrates her sister's wedding on the Isle of Dogs. Three of the bride's attendants sported tattoos.

Savvy and fun loving, East Enders have always found a way to stand adversity on its ear. Like their forebears who launched an empire from these docks, the natives view the new Docklands with a hopeful yet skeptical eye.





REMEMBERING THE

BLITZ



For eight hellish months early in World War II, Nazi bombers pounded London by night. Like Britain, St. Paul's Cathedral stood battered, but stood fast.

By CAMERON THOMAS

WHEN THE BOMB HIT, my brother Pete and I were in the coffee shop adjoining the Balham Underground Station. There was a terrific blast of hot air, and a roaring noise like one of today's jets taking off. Then I was lifted from the stool and hurled to the floor just under the big window. The glass had shattered; there were bits sticking out of everything. The lights were out, but we could see clearly from the flames just outside. I waited for another explosion, but it didn't come.

I was drenched with sweat, more from sheer terror, I think, than from the heat, but I was alive and miraculously unhurt except for a couple of bruises I got when I hit the wall. Pete was unhurt too.

We were worried about our mother. We tried to go up Station Road to our usual shelter in the cellar of the fish-and-chips shop, but the police turned us back. There was a lot of shouting and screaming and people running. Rescuers were still trying to get down to the people below in the Underground station, so we ran up the High Road.

Then the guns on the common opened up, and we heard the drone of another Heinkel. You could always tell a Heinkel because its engines seemed to be out of sync. We dived for cover behind a mound of debris that I think was a bakery the day before. The bombs came down about half a mile away.

When we reached the shelter, everyone was all right. Mother was crying. She said she thought she'd lost us. And Lotta was singing. Lotta was the shopkeeper's daughter, and though not blessed with the gift of music or voice, she insisted on "keeping up the spirits" of her captive audience far too often for my liking. Unfortunately, she seemed to know only two songs all the way through: "All the Things You Are" and "We'll Meet Again."

It was October 14, 1940, the night we lost our second house, the 38th night of the great air bombardment of London, later to become famous forever as the Blitz.

"For fifty-seven nights the bombing of London was unceasing," Winston Churchill was to write in *Their Finest Hour*. "Never before was so wide an expanse of houses subjected

CAMERON THOMAS now lives in Sidney, British Columbia, where he works as a free-lance writer. He retired from a career with a Toronto television station in 1979.



GEORGE FISHER, MAGNUM



IMPERIAL WAR MUSEUM, LONDON



HULTON PICTURE COMPANY

Laying plans for a sneak attack, Reichsmarschall Hermann Göring and his staff spy the British coastline from occupied France during the summer of 1940 (top). On September 7 a thousand Nazi warplanes dashed across the English Channel, launching the Blitz. Each night in London (above) defenders used searchlights to spot German raiders targeting industrial areas. Alarmed civilians soon flocked to rail stations (left) to load their children on trains to safety.

to such bombardment or so many families required to face its problems and terrors."

Now, 50 years later, I left my Canadian home to return to Balham to discover who, and what, still remained among the fragments of my childhood. I returned with mixed emotions. I searched for old friends, looking for the fresh faces I knew then, and I couldn't find them. But the streets were the same.

Balham was referred to in those days as



LONDON TRANSPORT MUSEUM; LAUREN GREENFIELD (CLOCKWISE)



Still standing is the coffee shop where author Cameron Thomas (above) found cover when German bombers blasted nearby Balham Underground Station. "I thought we were all going to die," recalls Thomas, who was then 16 years old. "The stiff upper lip we British are so proud of went a little flappy that night."

The next morning he found a bomb crater (top) near Balham's entrance. Deadlier scenes filled the station below, where hundreds had sought shelter. Sixty-eight people perished when sludge from blasted sewers and waterlines gushed through the station.

lower-middle to working class, according to which end of town you lived in. It stretched a little more than a mile from Clapham South Station, at the top of the hill, to Balham Station. It was well served for its size, boasting three cinemas, countless pubs, and, at the bottom of the hill, the Hippodrome music hall, known simply as the Balham Hip.

They're gone now. Where the Hip stood is an ultramodern apartment block, and the picture house has been replaced by a Superdrug store. John Best, the butcher I worked for each Christmas plucking turkeys in a cold back room for a few pence a bird, has gone too.

Yet I discovered that a few places remain of my childhood: Woolworth's and the old public school in Oldridge Road and the greengrocer, R. Kelly & Sons. The Kellys have been in business there since 1938, and Bob, the grandfather, still puts in a half day's work helping his nephew Alan run the business. Before the war we could buy a pennyworth of bruised fruit (a "penn'orth of specks," we called it) and for that humble coin receive a bag of apples, pears, and possibly an orange and banana, all a little bruised or overripe but delicious when the bad parts were cut out.

Even the coffee shop is still there—it's called Nick's Quick Snacks now.

JUST BEFORE FIVE O'CLOCK on the afternoon of September 7, 1940, the first wave of German bombers, some 300 of them, escorted by twice as many fighters, followed the River Thames to London, dropping their bombs on the Royal Arsenal, power stations, gasworks, and the miles of docks that lined the river. Many port records of the time were destroyed in the bombing, but Bob Aspinall of the Museum in Docklands told me that there were possibly as many as 500 ships, carrying half a million tons of food and other vital supplies, moored that night. By late evening many of them were on fire, or sinking, or, very often, both.

On that first night, twins Lily and Ethel Wilkins were preparing to sit down to tea with their family in East Ham when the siren wailed. (Like hundreds of thousands of other schoolchildren, including my two younger sisters, they had been evacuated from London the previous fall as war threatened—and, like countless others, they had returned to the city as months passed without danger.)

"We were 11 years old and had no idea of



Air attack on Britain

The Blitz capped the Battle of Britain, which had begun in July 1940. When the British refused to surrender after the fall of France, Göring ordered the Luftwaffe to attack their ships and harbors. But with help from an early radar network, Royal Air Force planes held the enemy at bay.

In August the Nazis turned to Britain's airfields and radar stations, destroying hundreds of planes and killing scores of pilots. When the Germans began bombing London in September, the outnumbered RAF had time to repair airfields and remount its defense. The Blitz ended in May, when Hitler, now obsessed with defeating Russia, shifted his air force to the Eastern front.





NATIONAL ARCHIVES

A year before the Blitz, German intelligence charted London's docks, critical to the British economy, with the help of aerial photographs (above). But Hitler's goal was air superiority, so he concentrated on RAF bases. That changed when the Luftwaffe accidentally bombed London during a raid on RAF airfields in August 1940. Britain retaliated by bombing Berlin, and an enraged Hitler ordered attacks on the British capital.

Germany struck the docks on the first day, attacking with Heinkel He 111 bombers (right) and fighters armed with incendiary and high-explosive bombs. Caught by surprise, London's 90 antiaircraft guns were over-matched by the German armada. Flames engulfed warehouses and homes; when night fell, the fires guided German pilots returning with more bombs. By morning dozens of cargo ships were ablaze or sinking in the Thames. Hundreds of Londoners had been killed and thousands injured—a toll that rose through the 57 consecutive nights of bombing that began the Blitz.





PAINTING BY NATIONAL GEOGRAPHIC ARTIST WILLIAM H. BOND

what was going on," Lily told me. "The air-raid warden came and told us to go to the school. There was no time to pack anything; we just got up from the table and left.

"We sat in the school all night and heard the bombs. In the morning we were told we'd have to find our own way to a safer place. My dad had a brother in Walthamstow, about five miles away. The streets were just piles of rubble, and fire engines and hoses were everywhere, blocking the roadway. We had to walk. Ethel's feet were bleeding because she had no shoes or socks, so my dad wrapped them in a scarf and a handkerchief. As we walked down Crownfield Road, a lady saw Ethel's feet and gave her a pair of shoes." Crownfield Road was hit the following night. The lady's house was demolished.

In nearby Stepney, Len Webb, 12, and his family huddled in the prefabricated Anderson shelter in their backyard. "I remember that we'd been in the shelter for a long time, and it was very hot and stuffy," he recalled as we sat in his garden last year. "Then the bomb hit the house. First we heard the swish as it came down. You knew it was near if you heard the swish. We heard an explosion, and at the same time the shelter heaved up and down and filled with dust and smoke. We could see flames. Then the house must have collapsed because we got covered in bricks and stuff.

"We tried to get out," he went on, "but the entrance was blocked with bricks and rubble. We started to dig our way out with our hands. A lot of the rubble was too heavy to move, and I thought we were going to die there. After a little while we heard a rescue squad, and we yelled to tell them we were still inside. There was just a space where the house was earlier on that day, and a lot of the other houses had gone too:

"My dad decided to take us to my uncle's. It took us a long time to walk there, and a lot of times we had to find shelter again because the bombs kept coming all night. When we got there, they were all in a street shelter, so we went in too. About four in the morning a bomb hit really close. After the all clear we went to my uncle's house, but it wasn't there any more. We'd been bombed out twice in the same night."

Len looked up with a rueful smile. "It's a pity we weren't in the rubble business then," he said in his gentle way. "We'd have made a fortune." *(Continued on page 74)*





ILLUSTRATED LONDON NEWS

To escape the terror above, many Londoners took refuge in Underground stations. Each night some 60,000 people bedded down in stations such as Piccadilly Circus (above). First-aid teams stitched and splinted the wounded (right), shuttling the most seriously injured to those above-ground hospitals that hadn't been hit.

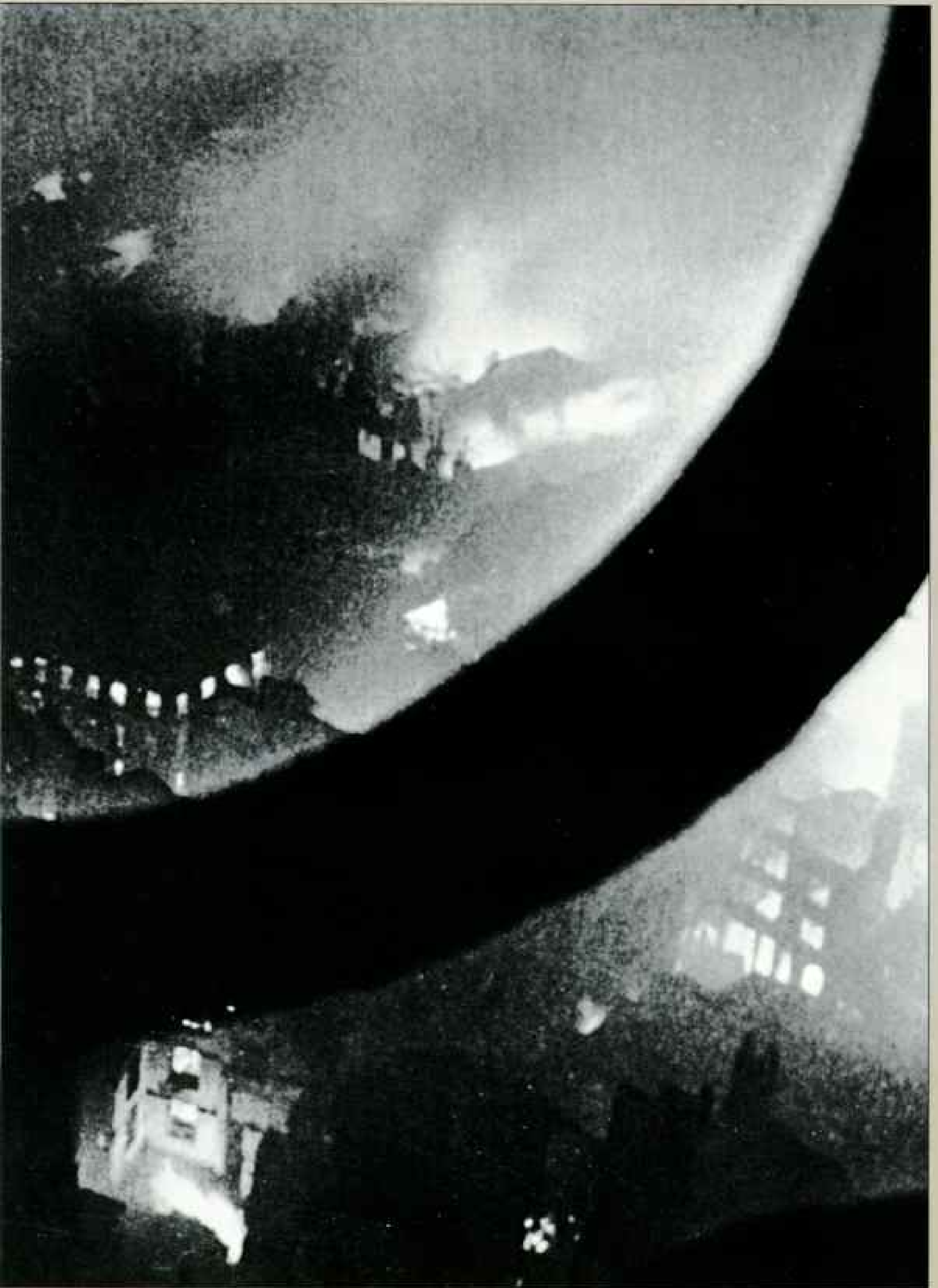
Those intent on facing the Blitz at home took cover in partly buried Anderson shelters (left). The corrugated steel structures, offered free by officials to 2.5 million poor families, saved thousands of lives.



GEORGE HODDER



A fire storm from incendiary bombs raged through Paternoster Square, as seen from the dome of St. Paul's Cathedral, on the night of December 29, 1940. Exhausted firefighters and volunteers braved continual bombing to



IMPERIAL WAR MUSEUM

fight the flames through the blazing darkness. In something of a miracle, an obscuring fog over the Channel thwarted a second wave of bombers. Even so, by the next morning 16 firefighters and 160 civilians had lost their lives.



"Business as usual" were words to live by for Londoners, who crept from their bomb shelters at dawn to pick up the pieces of their daily routine. One storefront sign read: "This store is only closed when there is danger overhead & is reopened immediately our roof spotters give the Danger Past signal."

The Blitz brought a new twist to window-shopping on Oxford Street in the West End, where a woman might casually reach into a blown-out glass front to examine the texture of a fur coat (left). And as long as families were in need, the milkman was willing to make his rounds over piles of debris (right).

Queen Elizabeth, too, made regular rounds to reassure shaken citizens and hear their stories. Londoners told tales about their children's cuts and bruises, about the loss of loved ones (some 20,000 died during the Blitz), about the staunch Britishness of the woman who swore she was not going to let her dinner "spoil for no 'Tler."

On September 11 Elizabeth, today the queen mother, visited East Enders living by the hard-hit docks (below). When Buckingham Palace was bombed two days later, she said, "I'm so glad. . . . It makes me feel I can look the East End in the face."



GEORGE ROOPER (TOP); HILLTOP PICTURE COMPANY (BOTTOM AND RIGHT)





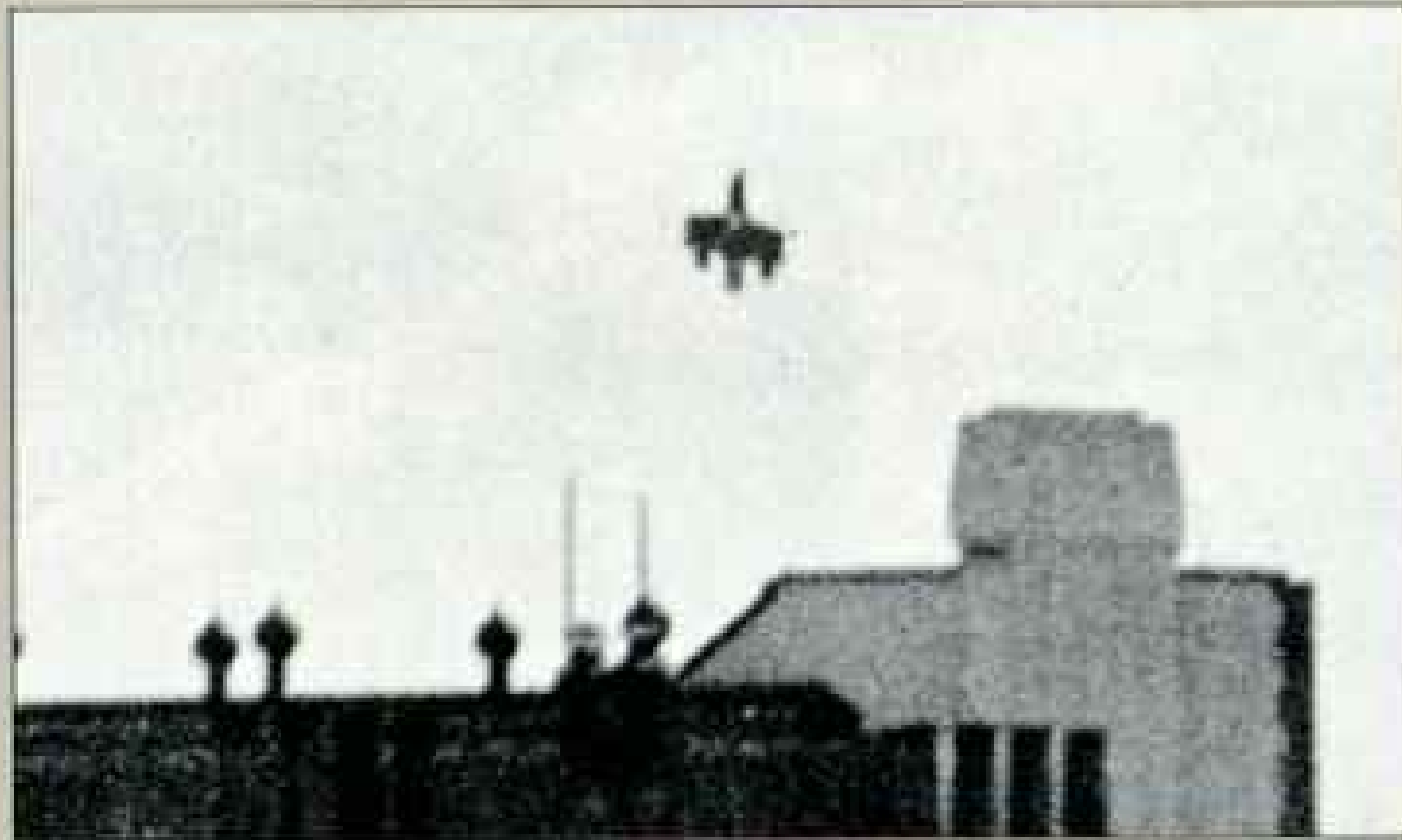
Scourge of the Luftwaffe: Britain's Hawker Hurricane single-seat fighter, though older and slower than the Messerschmitt Bf 109, was easy to repair and achieved remarkable success when flown by skilled pilots. They loved the Hurricane because, though outmoded, it could take a beating and remain airborne. An unidentified RAF pilot (below) was reunited with

his bull terrier after guiding his battered plane 36 miles back to the airfield.

Flying in V-formation (right), squadrons of the eight-gun fighters claimed 80 percent of RAF victories during the Battle of Britain; only later was the famous Spitfire flown in large numbers.

Its wings and tail clipped in combat by a Hurricane, a

German Dornier bomber plummeted nose first into the forecourt of Victoria Station (below) near Buckingham Palace. Two crewmen were killed on impact. Of the three who bailed out, two were captured and taken into custody. The pilot, badly wounded, landed at Kennington and was brutally attacked by a civilian mob. He died of injuries the next day.



IMPERIAL WAR MUSEUM

(Continued from page 68) There was no end. Night after night they came, and we watched from the rooftops as the bombs kept edging closer. They hit around the Elephant & Castle area, then at Kennington, just a few Underground stops from Balham. And the East End was still burning. Grace Dalton, then 11, lived near the Royal Docks in Silvertown, one of the first and hardest hit areas.

"I was blowing out the candles on my birthday cake when the first bombs hit," she said. "And then another lot hit the dock just behind our street. We didn't have an air-raid shelter, so my dad decided to take us 'anywhere the buses are going,' he said. But there weren't any buses. I remember being mad that my party was spoiled, so on the way out I crammed my pockets full of cake.

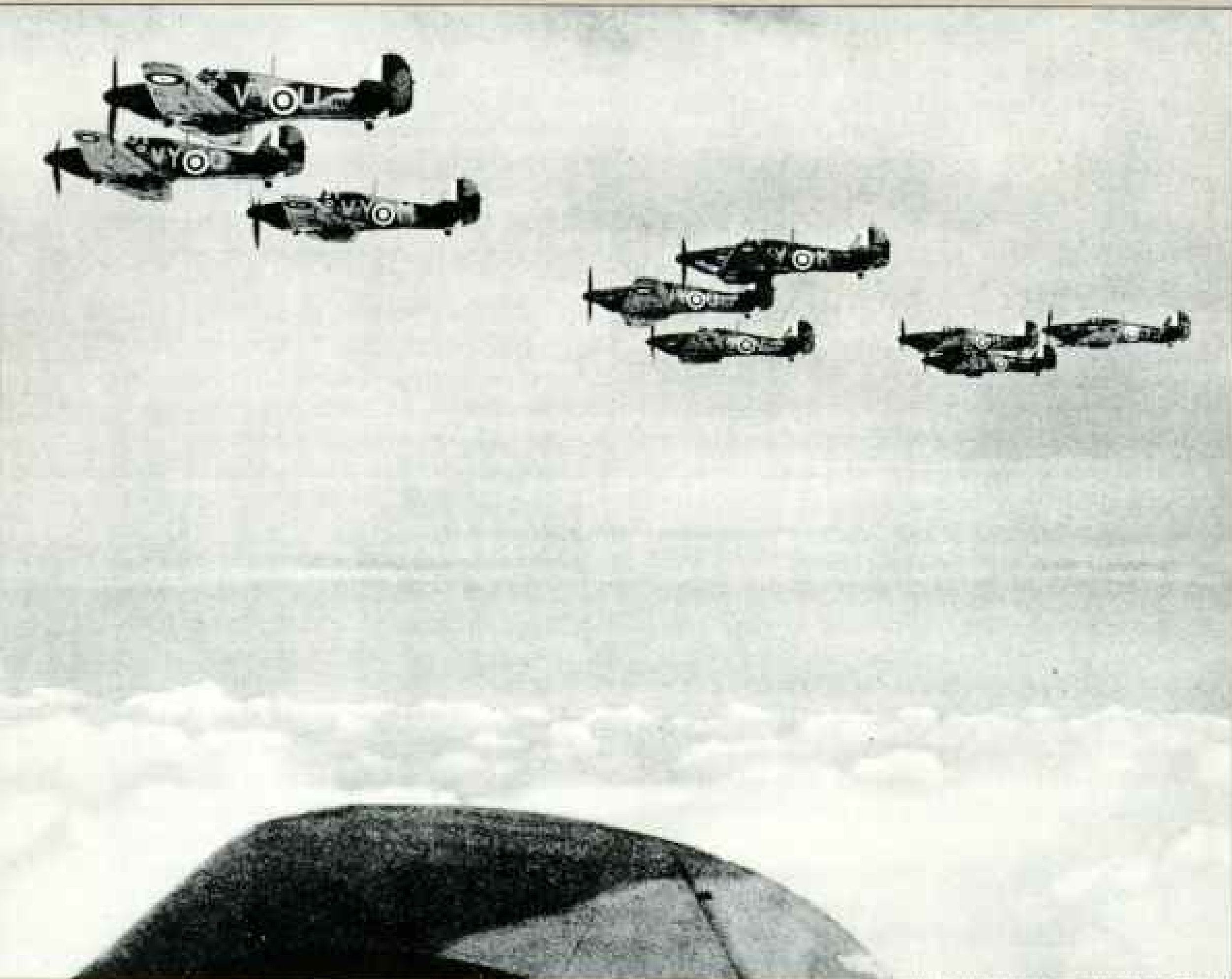
"It looked as if the river was on fire," Grace continued, "and I didn't think we would get away. There was a street shelter, so we went in there. I was hungry and ate my cake. It was all

squashed up from being in my pocket, but I didn't care. When we looked out in the morning, most of the houses were gone. All that was left were broken pieces still on fire.

"The council relocated us to a big house in Hendon, miles away from the docks, but my grandfather refused to go. He said he was born in Silvertown and nobody was going to make him leave. He was killed a few days later when a direct hit demolished the house."

BALHAM HAD LITTLE INDUSTRY, certainly not enough to attract the attention of the enemy. The real targets were a couple of miles away, primarily the power station at Battersea. It was well protected by anti-aircraft guns, possibly one reason bombs destined for its destruction finished up on us.

No one was told where to take shelter, that I recall. When the bombing started, people just found a refuge and adopted it. The High Road shops opened up their cellars and erected



ILLUSTRATED LONDON NEWS (ABOVE AND FAR LEFT)

wooden steps down into them. Thousands used the Underground stations, though at the start this was forbidden. As the raids intensified, however, people simply ignored regulations and took up nightly residence.

Faced with this fait accompli, the authorities did their best to arrange some measure of comfort and sanitation, and the Salvation Army was there with tea and sandwiches. One Balham member of the "Sally Ann," as the Salvation Army was affectionately known, was Helen Brett, who now lives in retirement with her husband, Stan, in Morden. Although I cannot remember meeting her personally, she was one of the group who at that time looked after our section of the town and was always a welcome sight.

"The strange thing is, I don't remember us being frightened," Helen told me. "One time we were on Clapham Common taking tea to the boys and girls at the antiaircraft gun sites. It was right in the middle of a raid, and we

were trying to hurry. The lady carrying the teapot tripped, and the lid fell off. The bombs were dropping nearby, and the guns were going off all around us, and all we could think of was the teapot lid. We were all on our hands and knees looking for it. The only thing we were concerned about was that the lads' tea would get cold."

The cellar of our local fish-and-chips shop soon became a second home to us, housing some ten or twelve families. Spaces were claimed according to family size and bailiwicks marked out with chairs, stools, and mattresses. There was little privacy in that netherworld, except that which a stretched clothesline and a couple of blankets could provide. Family quarrels still erupted, the antagonists ignoring the proximity of their neighbors and vice versa. Babies were openly bathed and fed and changed, and no doubt a few even were conceived in that miserable environment.

Most of the men and boys went home in

the mornings to clean up and change clothes before going to work. (I had a job at the Philips factory assembling wiring harnesses for aircraft radio systems.) We came back in the evening, usually with another raid in progress. During the day the wives would go home, returning to the cellar as the sirens went again.

The bombers were over us regularly now, but we learned to ignore any but the closest threats. The planes usually dropped their bombs in sticks of five or six. When we heard the first one hit, we held our breath and waited for the next one. If it was louder, we knew they were coming toward us, and we'd wait in agony until we'd counted them all. Then we'd relax and joke about their bad marksmanship until we heard the next lot coming.

On quiet nights, especially if it was raining and activity from above was minimal, we would go down to the local pub. Even Bert, our oldest cellar resident, would totter down the road on his 90-year-old feet, much to the dismay of his wife, who, though scared not one whit by the bombs, worried that he would catch his death of cold in the rain.

ONE MORNING, after a severe pounding, my brother and I discovered our street closed off by the police. A land mine dropped by parachute had hit close by but had not yet gone off. I heard the explosion a few hours later and got permission to go home and make sure everything was all right. It wasn't. The house wasn't there any more. Nor were the neighbors' houses. There was one wall in the area left standing. A jug on a shelf was undamaged. There was nothing else.

My mother was still in the shelter down the street, having been denied permission to return to the house alone. My father remained in a shelter in the city that night, so he knew nothing of the situation till later.

Pete and I had recently bought our first new bikes, and they had been standing together against the back wall. The wall was gone, and my bike looked like a burned pretzel, but his was undamaged. The landlord rented us another place in Balham Grove, but before we could even get it furnished that went up in smoke too.

The night we lost the Balham Grove house was the night the bomb hit while Pete and I were in the coffee shop. I was fed up with the mole-like existence we were living, fed up with being on the receiving end all the time, fed up

with the endless grind at the factory. And I don't think I could have taken much more of Lotta's singing, night after night. Even today her songs remind me not of springtime and romance but of bombs, blackouts, and fish and chips. Still, I like to think she is out there somewhere, keeping some poor soul's spirits up.

SO I FINALLY walked down to the RAF recruiting office, added 18 months to my age, and swore that my birth certificate had gone up with the house, which may have been true. There were quite a few of us there. The recruiting sergeant looked us all over, remarking how coincidental it was that all our birth certificates had been destroyed. But there was a demand for air crews, so he let us sign up. Most of us had not yet begun to shave.

Pete joined up too. After we were called to duty, we stayed together for our three months of initial training before going to separate flying schools. I saw him only once after that. We spent a weekend leave pubbing around London before joining our respective squadrons. He was killed piloting his Lancaster on a bombing operation over Germany the night before he was due to go home for Christmas. It was December 23, 1944. He was 22.

The continual bombing would last another 19 days after I enlisted, though for Balham it seemed that the worst had passed. But it was not quite the end. May 10-11, 1941, was a freezing night. There was a full moon, and despite improved defenses 500 planes got through. The death toll was the highest in any single raid.

I was not witness to this last attack. By that time I was already into my initial training. (I now shaved once a week.) I was later posted overseas, where I served as a night fighter pilot and later as a fighter-bomber pilot in the Far East campaign against the Japanese.

After my return to civilian life I was for a long time very disillusioned. I was also unemployed, and basically unemployable, along with thousands in the same situation. I took a government-sponsored engineering course and spent four evenings a week for the next three years at night school. Some years later I met Grace Dalton, the girl who had stuffed her birthday cake into her pockets. She has been my wife ever since. We moved to Canada and built a new life, which eventually included three children and three grandchildren. We seldom talk about the war. □



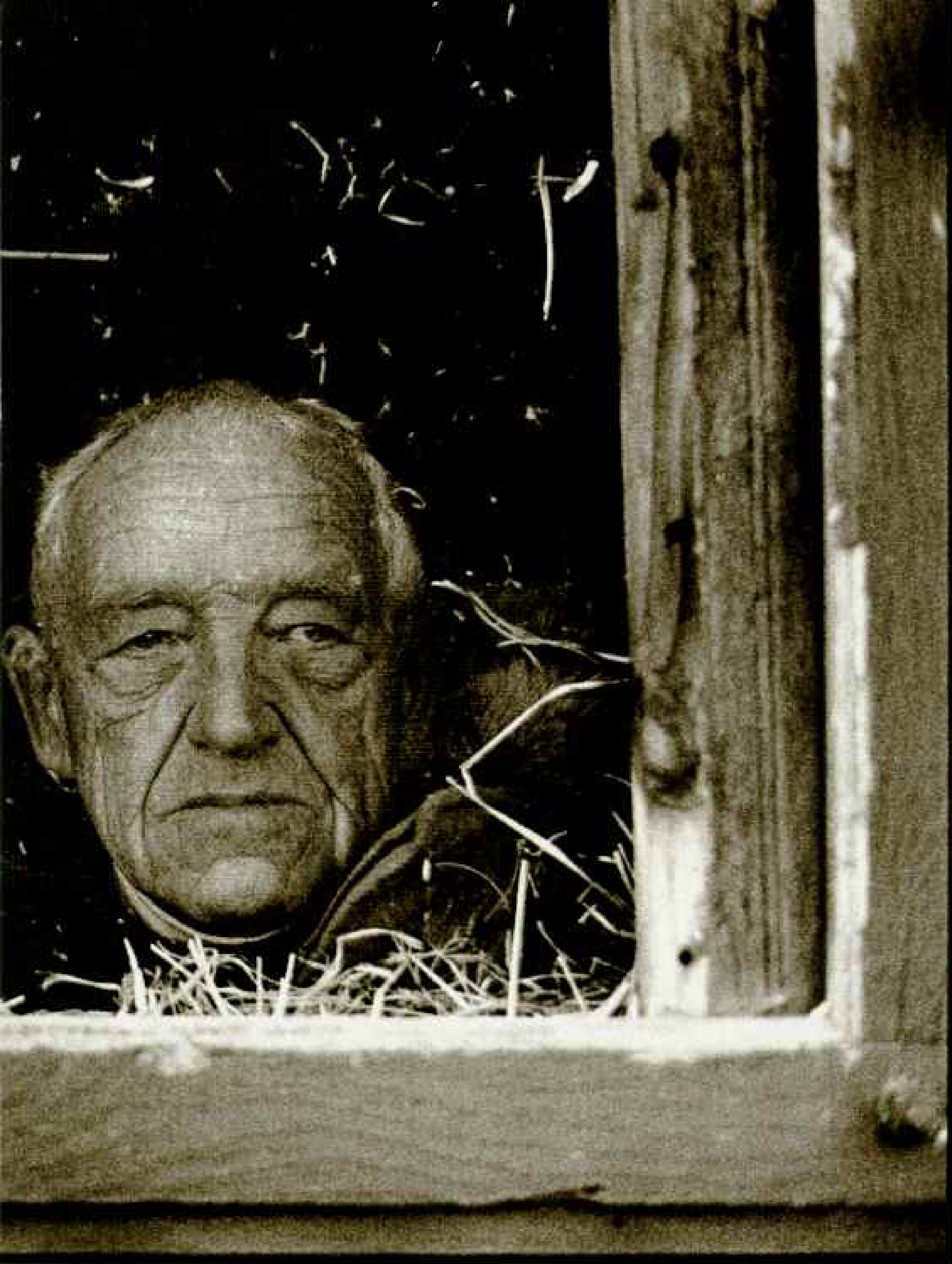
TIMES NEWSPAPERS LTD.

A defiant Prime Minister inspected the House of Commons, hit hard on what was to be the last night of the Blitz. Just a few days before, Winston Churchill had told the House: "Let it roar, and let it rage. We shall come through."



Painter Andrew Wyeth surveys his lifelong stamping ground in Chadds Ford,

THE WYETH
FAMILY **American**



Pennsylvania, home to three generations of Wyeths.

Visions

By RICHARD MERYMAN
Photographs by
DAVID ALAN HARVEY



NEWELL CONVERS WYETH, the great American artist and illustrator, can best be described as two men fighting in a sack. Torn apart all his life by the opposites in his nature, he was at once a questing intellectual, open to new ideas, and an untrammelled romantic with virtuoso imagination imbuing whatever it touched with meaning, personality, and excitement.

This blend in N. C., as he was known, produced some 3,000 works, including illustrations for 112 books. Generations of Americans, imagining Jim Hawkins in *Treasure Island* and David Balfour in *Kidnapped*, see in their minds N. C. Wyeth's images.

He created a unique world electric with

fantasy—a land inhabited by cowpunchers baked to sinew in the desert sun, by cruel pirates huge of leg and arm, by painted Indians at one with the wilderness, by massive knights sheathed in mail. N. C.'s genius lay in his gift for action and the eloquence of simplicity, the detail that told a whole story—rotting teeth in a horrifying hole of a mouth, men and horses inches from destruction, a cutlass splintering a doorjamb.

Just as his creations were larger than life, N. C.'s romantic idealism was boundless. He considered the "spirit of family reverence" a lost art, and when his own family came, he set out to be the ultimate father. Until his death in 1945, he managed a hothouse of creativity to develop each child's talents to the utmost.

He succeeded to an extraordinary degree.



WYETH FAMILY ARCHIVES

Passionate and prolific, illustrator N. C. Wyeth produced some 3,000 works while nurturing the creative spirits of his family (left to right): Nathaniel, Ann, Carolyn, Andrew, wife Carol, and Henriette. They were, N. C. wrote, "an incorporate part of my body and soul."

N. C. WYETH

"Self-Portrait," 1913, Nicholas Wyeth collection, courtesy Brandywine River Museum

Three generations of Wyeths have become one of America's most famous and remarkable families, a dynasty of applied fantasy. N. C.'s daughter Henriette Wyeth, the oldest at 83, has had a distinguished career as a portraitist, especially of young children. Carolyn Wyeth, 81, named for her mother, established herself as a painter of intense originality, her output prized for its brooding, abstract power. Nathaniel Wyeth, who died at 78 in 1990, adapted N. C.'s schooling in imagination to science and was named the first senior engineering fellow at the Du Pont Company, the highest technical position at the time. Holder of 25 patents, he invented the prototype of the plastic bottle used today for carbonated drinks. Ann Wyeth, 76, became a gifted composer. When she was 19, her composition "A Christmas Fantasy" was played by the Philadelphia Orchestra, conducted by Leopold Stokowski.

The youngest child, Andrew Wyeth, now 74, has achieved the nearly impossible, broad popularity while assured of a major place in the history of American art. He is the quintessential painter, obsessed and undistractable. His contained, often poignant, often eerie pictures—combining romanticism and realism—have touched so deep a chord in Americans that he is a household name.

He has been given one-man shows by prestigious museums, including New York's Metropolitan Museum of Art, Washington's National Gallery of Art, and London's Royal Academy of Arts. He is a member of the American Academy and Institute of Arts and Letters and the Académie des Beaux-Arts. In October 1990 he was awarded a Congressional Gold Medal.

And N. C. Wyeth's legacy continues into the third generation. Twelve of his thirteen surviving grandchildren work in the arts.

To his children, N. C. was like a god. Physically overpowering, he was six feet tall and weighed 240 pounds, with thrusting shoulders and a barrel chest. He could hold at arm's length two filled dairyman's milk cans. His curly-haired head was large and magnified by a wide-brimmed Western hat. Nevertheless his body, like his character, was a

study in opposites. Until later in life, narrow hips led into surprisingly slender legs, which he covered with knickers—often stained on one side where he impatiently wiped his brushes. His voice was unexpectedly high with a slight New England twang—but from that big chest could issue the bellow his children sometimes confused with the locomotive whistle at the town's railroad crossings.

He radiated vitality and enthusiasm. There were no small passions, no passive reactions. But in repose he fell into somberness. "Pa had a very solemn, heavy seriousness," says Henriette. And N. C. once described his "strange love for things . . . delicately perfumed with that sadness that is so exquisitely beautiful."

THE ROMANTIC SIDE of N. C. also embraced a near pantheistic relationship with nature. To ingrain into his children his own "sense of identification and unity with nature" and to develop their "fine power of observation," he took them on walks and picnics in the woods. They searched for mushrooms and birds' nests and found in the wet leaves of melting winter the first, starry spring beauties. Driving the family in a big Ford touring car along the narrow roads of Chadds Ford, Pennsylvania, under a full moon, N. C. turned off the headlights and exclaimed, "Look at it, look at it."

Systematically stoking their imaginations, N. C. joined his children at play, helping them build dams in the brook below the house, making paddle wheels of wood with a jackknife.

In the evenings with the children clustered around him, he drew pictures of giants holding children. "Even eating the head off one," according to Andrew. He drew "Old Kriss" (N. C.'s version of the European Santa, Kriss Kringle) sitting in a bathtub, elves sliding down his back and diving into the toilet.

He read aloud from such books as *Treasure Island*, taking all the voices, and he savored the horrors of *Dracula* and *Grimm's Fairy Tales*. "Pa made everything so dramatic," Henriette remembers, "all the violence and the thunder and the retribution."

The children wanted to please this wonderful father—and were awed by the explosive temper that waited behind his expansive kindness. Once a visitor interrupted his

RICHARD MERYMAN is a free-lance writer who has known the Wyeths for 25 years. His latest book is a biography of Andrew Wyeth published by Harry N. Abrams, Inc. Photographer DAVID ALAN HARVEY is a frequent contributor to the magazine.



N. C. WYETH

"Old Pew," 1911, private collection, courtesy Brandywine River Museum

Hired to illustrate Robert Louis Stevenson's Treasure Island, N. C. Wyeth was drawn to vivid scenes such as Pew, the blind pirate, "tapping up and down the road in a frenzy, and groping . . . for his comrades." Often Wyeth used details from his own life, modeling the Admiral Benbow inn, background, on his childhood home in Needham, Massachusetts.

dissertation on a new painting, and N. C. threw him bodily from the studio. When a horse balked at a railroad crossing, N. C. beat it with the reins until its head was bloody.

COMPARING HER GRANDMOTHER and grandfather, Henriette's daughter, Ann Carol, described N. C. as "qualified love." Her grandmother was "unqualified love—vital, fresh, infusing—like spring." N. C. met Carolyn Bockius of Wilmington, Delaware, on a sleigh ride. One of ten children in an elegant Philadelphia family that had fallen on difficult times, she was an exquisite 17-year-old with large dark eyes, a cloud of chestnut hair, and a slender body held very straight.

They were married in 1906 and soon moved to Chadds Ford, where part of the Wyeth clan still lives. In 1911 N. C. purchased 18 rolling acres and built a small, two-story, brick and white clapboard house and a studio overlooking the village. Carolyn Wyeth kept the house, Nat recalled, "like an old polished shoe." It was scrubbed and sweet smelling, filled with flowers and the smell of baking. Not particularly practical, Carol Wyeth (as N. C. called her) happily ceded the daily details of parenting to N. C. "He was," his daughter Henriette says, "a big nanny."

At dawn N. C. would go up to his studio, work on a picture for an hour, and sometimes descend to improvise at the piano—a lush wash of sound, all cannonades and rippling breezes. He usually cooked breakfast, further rousing the household by banging pots and grinding coffee.

He did not return to the studio until the help were given their instructions, the mail fetched, the grocery list made out—and everybody was productively occupied. Henriette says, "You had to be doing something important all the time, or you felt like so much dust to be swept up." In the middle of the night N. C. went from room to room checking the children, especially Andrew, the youngest. He was a delicate, high-strung, sickly child, and he woke on occasion to find his father asleep beside him.

Though Andrew's skinny body was in constant motion, full of what N. C. called "Andy's incessant aliveness," he had "an almost pitifully sensitive and vulnerable soul

and mind and spirit," according to Henriette. When Andrew needed simple loving and calm—which was often—he would search out his mother and sit next to her. She gently listened and then would cook him his favorite dinner, a lamb chop with a big baked potato.

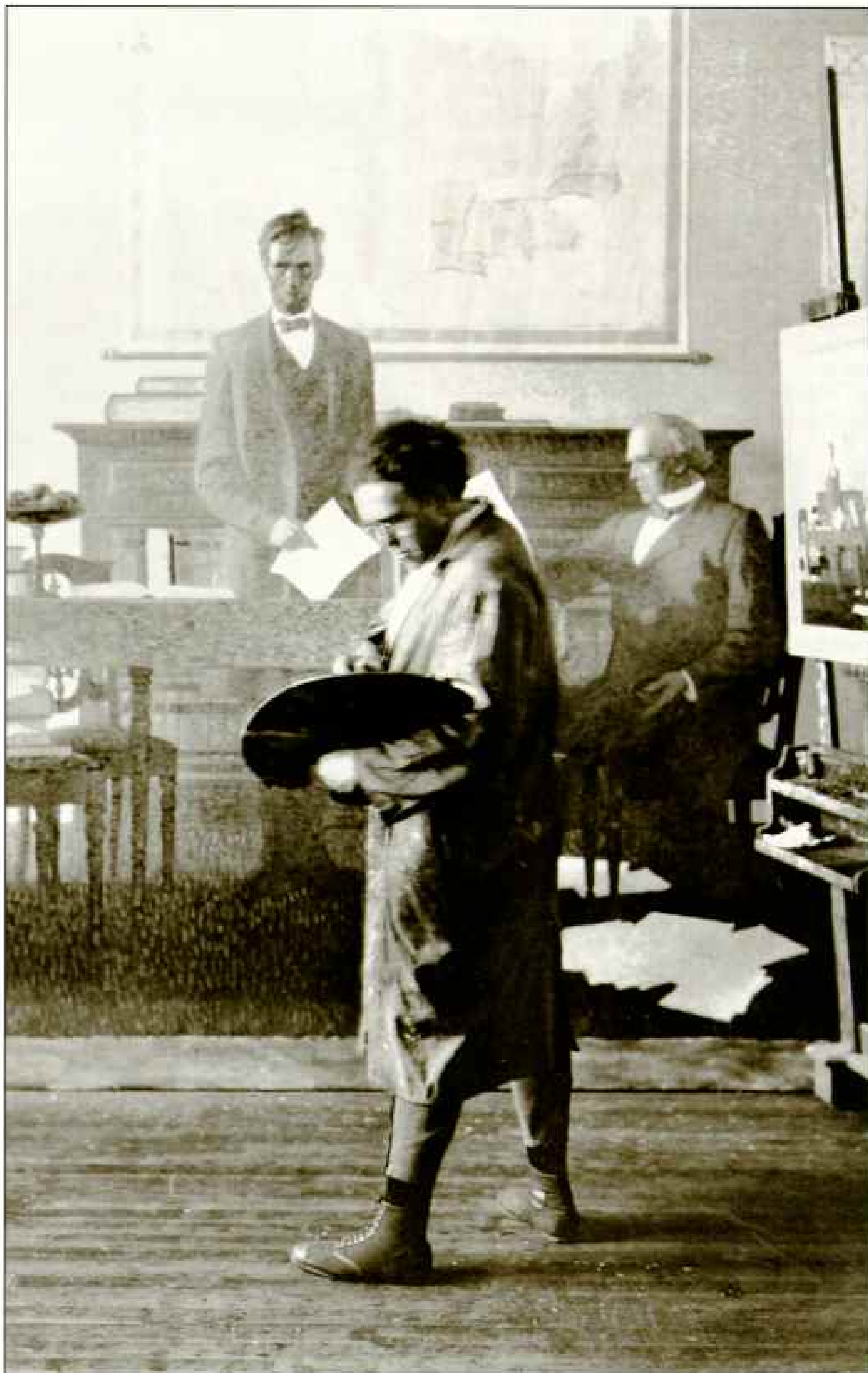
Carol Wyeth was a resource of warmth for the entire family. Without her, N. C. once wrote, "we would all fall to the ground." For daughter Ann, she was a soul mate, joining her at play with the elaborate dollhouse made of rooms walled off by plywood. Even when Ann began dating boys, mother and daughter would still count the tiny knives and forks and talk about the dolls, so alive in Ann's imagination.

Carol Wyeth was a ferocious protector of



Exuding childlike enthusiasm and a love of nature, N. C. Wyeth turned family outings into adventures. Yet at work, with his imaginative palette overflowing, he often felt frustrated by commissioned projects such as "In the Dark Days of the Civil War" (right), a mural that seemed "inadequate and hurried." He desperately wanted to be known as an artist, a "painter who has shaken the dust of the illustrator from his heels!!"

Years later, still an illustrator, he took heart from his children's artistic gifts: "The unfolding of all the younger members of the family is a glorious episode in my life."



WYETH FAMILY ARCHIVES (80TH)

her daughter Carolyn, a rebellious eccentric since birth. "She's up at daylight . . . and she crowds every minute with action," N. C. wrote of Carolyn. "Often one sees her walking about with some favorite hen or rooster in her arms, holding its head close to her face and talking to it as though it understood every word."

On cold mornings Carol allowed her daughter to warm chilly chickens in the oven—and joked to Carolyn, "You love animals because they don't talk back to you." Carolyn felt her sisters "were slick in their clothes—clean and tidy. They would go down into the woods and play by themselves and not include me. But I think great stuff comes out of being alone. You can really dream."

HIS CONFLICTED CHARACTER was inherited, N. C. believed: the Teutonic toughness coming from his German-Swiss grandmother and his artistic talents from his French-Swiss grandfather, a horticulturist who emigrated in 1855 and eventually worked at the Harvard Botanic Garden.

As a boy N. C., a rebellious student, cared only for drawing. Henriette recalls that N. C.'s father, a grain merchant and farmer, "thought it was insane and weak to think of just doing pictures." He enrolled his son in a mechanical arts trade school. N. C.'s mother intervened and sent him to art school in Boston. At 20 he was accepted into a school of art taught by Howard Pyle in Wilmington, Delaware. Pyle, later considered the father of modern American illustration, ignited N. C.'s gifts, giving him the technical training that allowed him to implement his genius for expressing pure, romantic emotion.

Everything within N. C. — his hyperbolic imagination, his Swiss tradition, his unbridled enthusiasm — climaxed at Christmas. Being the producer and stage manager and lead actor of Christmas, N. C. once wrote, "set me crying in pure and exultant joy."

On Christmas Eve empty stockings hung from the children's bedposts. Andrew says, "I remember waking up in a sweat and in the dark feeling for the stocking and the different shapes inside. One year there was this strange figure made out of wood with big feet and a marvelous head with a pointed hat. I clutched it to me in the dark, smelling the new paint on its
(Continued on page 93)





"This is not just a pleasant picture," says Andrew Wyeth. "It's a culmination. These are all people I've painted in the past." His models—neighbors all—dance around a winter maypole in gleeful anticipation of Andrew Wyeth's death. "When I worked, I raised hell with them mentally and emotionally," he says. "They wish I were dead, so they wouldn't have to pose anymore."

At the foot of the hill, the Kuerner farm, at left—one of Andrew's favorite subjects—stands beside the railroad tracks that lead to the crossing where N. C. Wyeth was killed by a train in 1945. "I've never painted anything like this before," says Andrew of this funereal frolic, "and I never will again."

ANDREW WYETH
"Snow Hill," 1989, Wyeth collection



ANDREW WYETH
"Christina's World," 1948,
Museum of Modern Art, New York

"I love the objects that I paint," says Andrew Wyeth. *Cases in point: his self-portrait (upper right), the portrait of his wife, Betsy*

(lower right), and the world inspired by their polio-stricken friend Christina Olson. "I get excited by the shape of a person's

nose, the tone of their eyes, or the way their back looks when they're turned away from me. That's my reason for painting."



ANDREW WYETH
"Trodden Weed," 1951, Wyeth collection



ANDREW WYETH
"Maga's Daughter," 1966, Wyeth collection



"She was remarkable in her earthy, German quality," says Andrew Wyeth. For 15 years Wyeth and his model, neighbor Helga Testorf, collaborated in secret. When revealed in 1986, their hundreds of intimate works stunned the art world—and turned Helga's world upside down. "Art is selfish," says Helga, who has never before allowed her photograph to be published. "Do you think I'm selfish?" asks Andrew. "Yes," she says, "but you call it love."

ANDREW WYETH
"Night Shadow," 1979, Wyeth collection





(Continued from page 86) face, feeling the nose and wondering what it was." Years later, reliving the powerful emotions of that moment, he painted the attenuated figure of neighbor Tom Clark, large of nose and feet.

On the roof the children heard Old Kriss. Heavy boots stamped, sleigh bells rang, a booming voice called to the reindeer by name. Soon the children heard Old Kriss on the stairs coming in full costume to shake hands with each child. One year Andrew, listening to Old Kriss's approach, held his breath till his eyes popped and, in a frenzy of fear and excitement, wet his bed. When they at last could rush into the big room, warmed

by the logs in the fireplace, N. C. made them stop and savor the tree, decorated with real candles burning.

Under the tree was the raw material for the children's own intense fantasy lives. Ann yearly received at least one large, beautifully realistic doll bought by her mother, who often sewed period dresses and nightgowns. And Carolyn received toy animals. Nat built Andrew a castle on which N. C. painted the stones and climbing vines, reciting a story with each detail. Brushing a stain below one of the windows, N. C. said, "That's where one of the lazy guards had to go to the bathroom and just let it go out the window."

N. C. once wrote to his mother about the children, "As they weave the textures of their lives the background of memories will give them untold pleasures, and *perhaps* be the basis upon which they can build an important life work." Andrew Wyeth has said, "It was the most imaginative, rich childhood you could ever want. That is why I have so much inside of me that I want to paint."

EVEN MORE than his father's, Andrew's fantasy world was an extension of life itself. In the house and yard he staged epic battles with the thousand toy soldiers he accumulated. In the studio he studied the illustrations stacked in the storeroom and inhabited his father's characters as completely as his own skin. He recruited Ann and a couple of children from town, who joined him in putting on N. C.'s costumes and weapons—jerkens and leather vests, cloaks and capes, swords, and bows and arrows. The dramas they performed in the woods—Robin Hood, the Three Musketeers—were enactments of secret charades lived by Andrew all day, all week.

"Drawing and painting were just something we all did, like playing outside in the snow," Carolyn remembers. In Andrew's childhood pictures, World War I soldiers advanced into shot and exploding shell, death was everywhere, knights fought, redcoats warred with colonials. One picture had a musketeer roasting a wienie over a fire.

Andrew showed his pictures only to his father, who gravely studied them and, sometimes demonstrating with a pencil, gave advice: "Andy, you have to free yourself" or "Keep alive to everything." Andrew worshiped him.

"In my family," says painter Henriette Wyeth, "painting and drawing were like bread and butter on the table—commonplace and wonderful. But I really wanted to sing, to be on stage." Her voice, though, proved too small, and a childhood bout with polio put the piano out of reach. She devoted herself to painting and drawing instead—"and that was just as it should have been," she says.

In 1940 Henriette followed her husband, the late painter Peter Hurd, back to his home in New Mexico, where she still lives and paints. "Men are infinitely more powerful and better painters than women," says Henriette, now 83. "Women should be the power behind the throne."







HENRIETTE WYETH

"Death and the Child," 1935, private collection, courtesy Brandywine River Museum

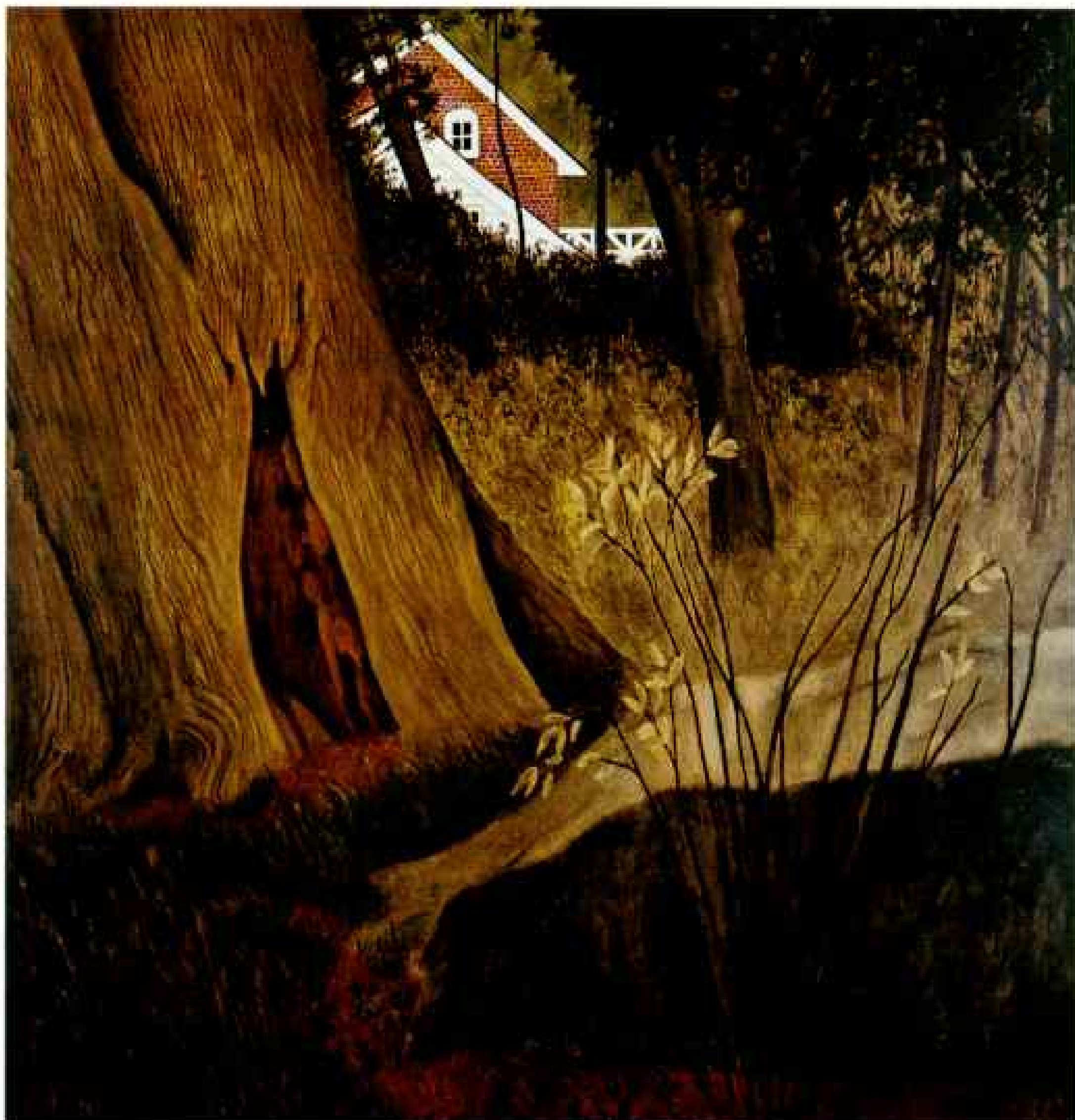
"This child is being saved from all of the loathsome disappointments and corruption of life," says Henriette Wyeth. "It's a saving grace. There are worse things than death."

The family was, an in-law remembered, "like a medieval guild, a family of craftsmen, everybody working on something." At two, already showing her musical talent, Ann lay in bed humming Beethoven melodies she heard on N. C.'s records. Later he gave her books on musicians, started her on the piano, gave her records of her own.

At 17 she began studying composition with N. C.'s friend Harl McDonald, a concert pianist and composer and manager of the Philadelphia Orchestra. She found she could

transpose her father's art philosophy to music: "You must have the strong emotion first," she says, "and then the theme just comes to me—sometimes I can hear it right to the end—and it will be there inside me, filmy like a cloud, and I lay down the line and then go back and paint in the music."

When she finished a composition, N. C. was the first to hear it, and sometimes he cried as he listened. Once, pointing to a picture of Sibelius on the wall, N. C. said, "I wish *he* could hear this." Ann remembers,



CAROLYN WYETH

"Up from the Woods," 1974, private collection, courtesy Brandywine River Museum

"This is a tribute to my mother," says Carolyn Wyeth. "She was very gentle. Pa's the one who scared us." Their home—white the way her mother liked it—remains Carolyn's refuge.

"He always made me feel that the next one I wrote would be even better."

Carolyn took care of a big vegetable garden and her beloved animals. She drew constantly and brought her Shetland pony through the huge door of her father's special mural studio and painted its portrait. "Carolyn was as fascinating as Andy," Henriette remembers. "Very imaginative, everything turned into a different color . . . wonderful . . . black moons in a pale lemon sky."

From the time he was old enough to hold

tools, Nat the engineer had a workshop. He made toy speedboats powered by alarm-clock motors and a carbon-arc searchlight using dry-cell-battery cores. Nat's engineering mind put him off to one side in the family, but, he said, "I relished it because I had one step on them. Father always held the stage. But things I brought up were completely out of his field."

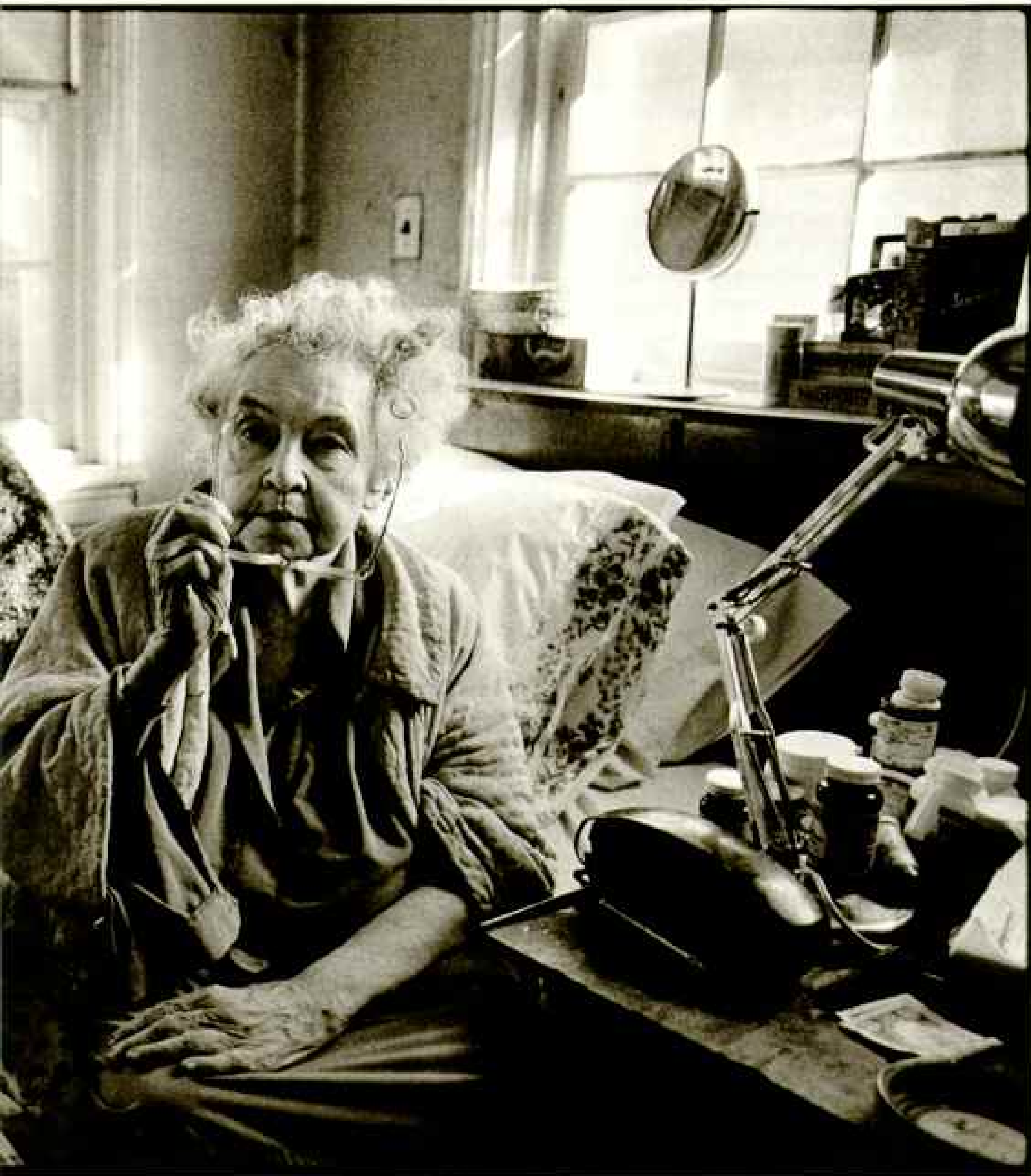
Nat was the one child who went on to higher education, graduating from the University of Pennsylvania. N. C. believed that

"Enthusiast, anarchist, pugilist—an angel all in one!" was N. C. Wyeth's description of his daughter Carolyn Wyeth in 1913. Today she remains as feisty as ever. Living with her dogs in her childhood home, she remembers her father as a stern teacher and critic—domineering, rigid, bossy. She rebelled to establish her own artistic vision.

Jamie Wyeth, Carolyn's nephew and former student, says that "her paintings don't fit into the Wyeth niche, so they're missed by everybody. And that's tragic."

"Maybe I like animals," Carolyn has said, "because I've never gotten much from people."





schools, run by commonplace minds, flattened out individualism. "We are pruned to stumps," he wrote, "one resembling the other, without character or grace." The other children attended private and public schools when they weren't being tutored at home. Andrew, judged too sensitive and nervous for the rough realities of public school, was removed after only two weeks. And besides, as N. C. told Andrew, "No first-rate painter ever came out of a college."

THE FIELDS AND FORESTS of Chadds Ford were the best classroom and inspiration, in N. C.'s view: "I feel so moved sometimes toward nature that I could almost throw myself face down into a ploughed furrow."

During N. C.'s early years at Chadds Ford he produced his greatest series of illustrations for books, doing *Treasure Island*, *Kidnapped*, and *The Black Arrow*. But even then he was staking his self-esteem on becoming a great artist. Increasingly he flagellated himself for prostituting his talent, for having "bitched myself with the accursed success in skin-deep pictures and illustrations! . . . day in and day out I feel those insufferable pangs of yearning to express my own life as it is in this beautiful home and these hills."

N. C. developed a comprehensive theory of painting, which he taught the few students he took on and his own children as each was deemed ready. He believed in a severe technical foundation, months of drawing cones and spheres and plaster casts. Then he moved to anatomy. He had Andrew draw a skeleton again and again and then draw a walking skeleton from memory. He never taught a formal technique for painting a picture—a way to paint the hair, how to handle the brush to get an effect. He taught a way to see and feel the quality and depth of an object, taught how to *live* a subject, how to find in it a personal echo.

"Never paint the material of the sleeve. Become the arm!" he told Carolyn. "Get your love into it." Two years before Nat died, Andrew painted his brother and quoted what their father had once said: "When you're painting that ear, you are painting something that is pulling in all the information from the world and feeding a human brain that has never been equalled. You have to get *that* into that ear."

N. C. believed the finest art comes from a broad appreciation of all arts. Family meals were filled with laughter, argument, and homilies from N. C. He discussed Thoreau, Goethe, Emerson, Tolstoy, Homer, Keats, Emily Dickinson, and Robert Frost from the books he read late into the night. He discoursed on the majesty of Beethoven and Bach, the romantic sweep of Sibelius.

Art was almost always a subject. Michelangelo, Bruegel, and Rembrandt were N. C.'s gods. He assaulted the work of his contemporaries—"floods of unbeautiful and uninspired rubbish, which is criminally inflated and given publicity and prominence by ignorant and short-sighted critics, and kept alive by the senile babblings of superficial and self-exploiting snobs."

Arguing for his principles, his Puritan roots would show. He once told Henriette never to draw a woman with her legs apart. But ever a man of contradictions, N. C.'s clowning, broad humor would emerge. He would scare his grandchildren by pushing out his false teeth until he looked like a skull. Sometimes, to denote a good dinner and well-filled stomach, N. C. would belch and, pulling on one finger, break wind.

Each of the children was some facet of N. C., Carolyn being the earthy, fierce, independent part. Ann was the loving, kind, musical part. Andrew combined N. C.'s prankish and supersensitive sides. Nat had both the gregarious, joking, sometimes earthy quality of N. C. and his intense self-discipline.

N. C. met his equal in Henriette. She had his romantic, intense emotions. Her brilliant, dazzlingly verbal mind mirrored his interest in new ideas and helped open N. C.'s idyllic cocoon to the outside world.

HENRIETTE'S RIGHT HAND was withered in childhood by polio. "I hated my shortcomings physically," she says, "and all I did was try to improve." She could read well at age five. She gulped books, scanning a page in seconds—and found pinned to her drawing board a magazine article on the importance of reading slowly. Strong-minded, she left it there, and the next day it disappeared.

She began painting at seven. Her facility was so precocious, she was ready at 11 for training in N. C.'s studio. At the same time,



"Fame and fortune is not what Mama is all about," says painter Ann McCoy, left. Her mother, composer Ann Wyeth McCoy, agrees. "I had just enough talent to make me want to write music for myself, and it fit in with my married life. I had the best of two worlds."

in Philadelphia, her father introduced her to ballet and symphony concerts.

When Henriette was 15, N. C. felt he had no more to teach her and allowed her to attend the Pennsylvania Academy of the Fine Arts in Philadelphia. Now slim, modish, and witty, she was introduced to both Impressionist painting and to a fascinating, flamboyant author named Joseph Hergesheimer, who escorted her into the glittering, cosmopolitan circles of the day.

Back in the determined simplicity of her home, "modern art" was still a blasphemy. When Henriette painted a portrait influenced by Cézanne, N. C. tongue-lashed her for contracting "the disease of sophistication." She dutifully burned the canvas in his studio fireplace—and left the ashes for him.

But simultaneously N. C. followed up on these alien ideas, searching for artistic answers, for ways to paint what he called "true art." What he achieved instead, Henriette says, "were paintings that were intellectualized, not from the center of his being."

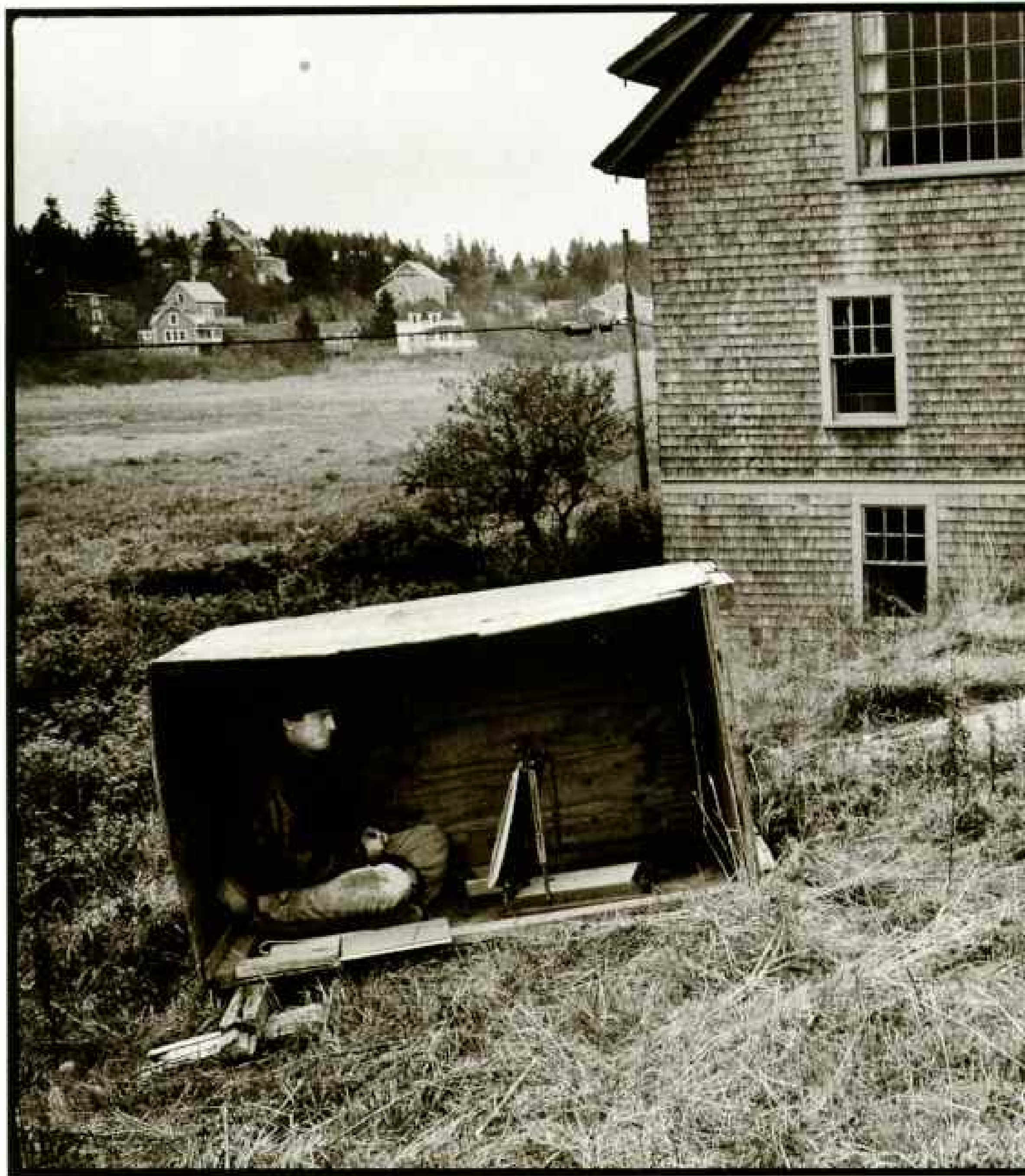
Carolyn remembers, "Anybody who came along . . . my father would all of a sudden get

under their spell—as bold as he was. He would be swayed by this man, by that man, which is a terrible way to be. Bad. He did great stuff like *The Black Arrow* and then did Impressionist crap."

N. C. told himself he did illustrations only to finance time for his "easel paintings," but in fact he was paying for the trappings of fame and financial success. He had servants and a Cadillac. He installed a tennis court and bought a house in Port Clyde, Maine. Disgusted with himself for violating his reverence for simplicity, he once wrote, "I am living too well, too luxuriantly for the proper disciplining of my nature."

The exuberance, the enthusiasm, the intellectual energy of the man and his household attracted the celebrated and the wealthy: from Wilmington, the du Ponts, and from Hollywood, Douglas Fairbanks, Mary Pickford, Lillian Gish, and John Gilbert. Scott and Zelda Fitzgerald visited. H. L. Mencken and N. C. argued uproariously.

At these parties small Andrew would sneak gulps of his siblings' drinks and be a general nuisance. When his sisters went out to sit





Hiding from the hordes of summer tourists, painter Jamie Wyeth, son of Andrew, escapes to his quiet, portable, plywood studio on Maine's Monhegan Island. "Tourists can't get behind me while I'm painting and click their cameras," he explains. Monhegan Mayor Bill Boynton says, "Some people make fun of the box, but most of us understand that it protects his privacy." The locals lend a hand too by helping Jamie lug the unwieldy box from place to place.

The restricted vision inside helps him frame his subjects. Here he works on the painting "Islanders" (following pages).

with young men in cars, he hid underneath and made obscene noises. Once he put a laxative in the punch bowl and locked the bathroom doors. "You're a demon child," Joseph Hergesheimer told him.

ANDREW, while adoring his father, was afraid of him—frightened by N. C.'s power to crush his sensitivities. He believed that this man he idolized had betrayed his own precepts for a creative life. On some level Andrew swore this would never happen to *him*.

He slipped from under his father's personality and disappeared into the countryside, playing his make-believe games or soaking up alone the look and feel of the woods and cornfields. He developed the obsessively secret world that later would be the center of his creative process. Free of scrutiny, his fantasy and emotion merged into a daydream that still floods beneath the surface of his works.

When Andrew acquired his driver's license, he escaped to Maine and joined his one intimate lifelong friend, Walter Anderson, a raffish fisherman disapproved of by N. C. They roamed the ocean landscape where Andrew did deft, highly colored watercolors. He reveled in the high-speed, out-of-control quality of that medium.

In 1937, at 20, Andrew had a one-man show in New York City and sold out the second day. N. C. was ecstatic at Andrew's success, but it was a fulfillment of what N. C. could *not* do—harness his imagination to painting his own life. A year later he wrote to his daughter Henriette: "I am at once stimulated beyond words to new, purer effort, and plunged into black despair."

Now the father was trying to learn from his son, who was perfecting a tricky medium that N. C.'s former student Peter Hurd had brought to Chadds Ford. It was egg tempera, used by the Renaissance masters—dry pigment mixed with egg yolk and distilled water and painted onto a gesso-coated panel. Andrew thought its capacity for minute detail would let him be more precise, reach deeper into what excited him to paint.

N. C. was alarmed by Andrew's temperas. He doubted their subject matter, their moody monochrome simplicity, their lack of high, surefire color. "He gave me hell," Andrew says. "He thought I was going down the wrong road." His father said Andrew would

be unable to sell his temperas—which now bring more than a million dollars each.

On his 22nd birthday, Andrew met a person who would forever believe in him. She was a handsome 17-year-old named Betsy James. Betsy, like Andrew, was a watcher of sensitive souls. That day in Maine she took him to meet her crippled friend Christina Olson, who lived in a large clapboard house above a blueberry field. Later Christina became one of Andrew's primary subjects, and *Christina's World* his most famous work.

When Andrew and Betsy became engaged, N. C. was deeply disturbed. The final





"One of the great misconceptions about the Wyeths is that our paintings are too accessible," says Jamie. "Peripherally these paintings look like, 'Gee, what an American scene.' But there's an ominous quality here, something foreboding."

JAMIE WYETH

"Portrait of John F. Kennedy," 1967, private collection.



JAMIE WYETH

"Islanders," 1990, private collection.

breakup of his family was almost intolerable. The first to go had been Henriette, who in 1927 agreed to marry artist Peter Hurd, a romantic Western figure—“Shelley in cowboy boots,” as one writer described him.

“Pa thought I would be lost,” Henriette says, “that I would be doing nothing but washing dishes and scrubbing floors.” They married anyway in 1929, and Peter Hurd bought a ranch in his native New Mexico. The magnetism of home held Henriette in Chadds Ford part of each year for a decade. Finally she left and settled in New Mexico, where the antique-filled house felt like a corner of old Chadds Ford. But she continued traveling to do portraits. Her attachment to N. C. and Chadds Ford remained strong.

N. C. initially opposed Nat’s marriage to a niece of N. C.’s teacher, Howard Pyle, in 1937. N. C. forbade Carolyn’s 1940 marriage to a handsome painter named Francesco Delle Donne—but her mother and Andrew took Carolyn’s side, and she married anyway. After two stormy years she moved back home, where she has lived ever since.

Ann never entirely broke away. She married another of N. C.’s students, the painter John McCoy, in 1935, and they settled in Chadds Ford, where father and daughter saw each other almost daily.

WHEN ANDREW ANNOUNCED his intentions, N. C. offered to build his son a studio and support him financially if he stayed single.

Andrew and Betsy were married in 1940. As the ceremony ended, father and son fell weeping into each other’s arms.

N. C.’s bouts of melancholy were compounded now by anguish over World War II—“the world dementia”—and a sense of failure, of never escaping a “clever lyricism.” His children would find him sitting in the darkness of his studio, head in his hands, staring at the floor. He wrote: “All sense of serenity and security has crumbled away, and all I can do . . . is to gawk stupidly at the retreating pageant of my dreams and hopes.”

In October 1945 N. C. set out in his station wagon on an errand with Nat’s precocious three-year-old son, Newell. Just short of a railroad crossing they stopped, probably to look at the rare sight of a couple bundling cornstalks by hand. A train was approaching in the distance, but they drove forward. The

car stalled on the tracks. Seconds before the locomotive crushed the car and killed them both, the engineer saw N. C. fling his arm up, as though to ward off the train. “By god,” Andrew exclaims, “it took a locomotive to kill N. C. Wyeth.”

Now Andrew himself had been slugged by the impermanence of life, by the preciousness of the present that is already the past. Loss and fear, love and rage were henceforth the foundation of his work. With N. C.’s death, three days shy of his 63rd birthday, “the landscape took on a meaning,” Andrew says, “everything a symbol—my father all around me. I finally had a reason to paint—a terrific urge to prove that what he had started in me was not in vain.”

TODAY N. C. WYETH and the boundless imagination he so tirelessly cultivated lives on within his children. In Ann’s fantasy her father is vividly alive—“I see him often, the way he would walk by a window or the way his shoulders look going through the door, the way the head leans back. I can easily smell him, his hair, the way it was when I came up behind him at lunch and hugged him.”

Deprived of her father’s energizing ambition for her, Ann did not have the obsessive drive to become a recognized composer. “I wish I could have written more, maybe done longer things and more orchestrations,” Ann says. “I didn’t have a big enough desire. I guess my problem has been, I’m too normal. I wanted to be married and have children. I just did the music like cooking.” Ann, a widow since 1989, spends hours at the outdoor dollhouse built for her by John McCoy. “They are like real people to me,” she says of the dolls. “I guess I never grew up.”

Carolyn opened an art school in N. C.’s studio and passed on her father’s precepts. She became more and more eccentric. “I’ve always gone overboard on everything—order too damned much food, order enough paint and canvasses for four artists. Do everything in a big way. I’d probably explode without my painting.”

Of all the Wyeth children, Carolyn is the closest to Andrew. She lives alone now, in the back of the family house with her beloved dogs. But in her courageous independence, there is a kind of gallantry. “I’ve shocked my family to pieces—not Andy,” she says. “But



"I don't know how I'm going to paint here," says Jamie Wyeth about his new home on Maine's tiny Southern Island. "My mother renovated the place, and now it's like living in an Andrew Wyeth painting."

I just want to be myself. That's the way a painter ought to be."

Peter Hurd died in 1984, and Henriette lives on their ranch in New Mexico. She is physically frail, bedeviled by health problems, but her spirit and mind—and her determination to paint till she drops—are annealed like steel. She no longer has the stamina to do portraits, to "relate the gorgeous toughness of life." But she still explores on canvas her love for translucence and texture, for the crisp radiance of flowers.

"Pa was looking for work from me that shook the earth," Henriette says, "but I stayed with glowing, delicate, well-drawn realism—and loved it—and did my damndest. But you never get a subject wrapped up. There's only a glimmer of impossible light, and it vanishes right away."

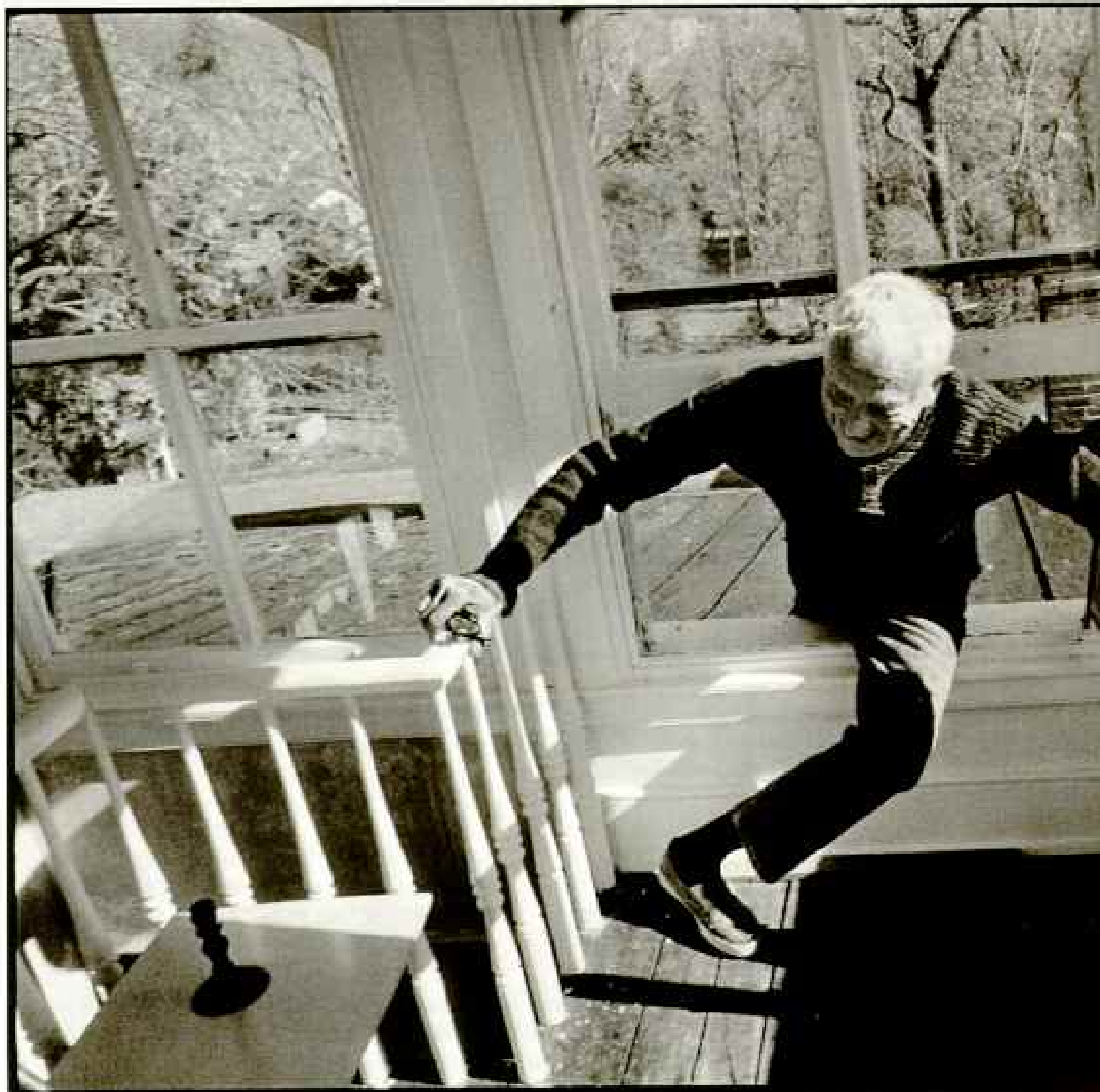
The spirit of N. C., goading, instructing, instilling, is still present in his grandchildren. Ann's daughter, Robin McCoy Bent, 47, paints with the directness, drama—and even humor—of a child. "All those years I was not painting," she says, "I was painting in my mind. In this family everything always had

possibilities—'What if knights were going along there, oh, look how those hands are, the way that hair falls.' That's why we're never bored."

Her sister, Ann Brelsford McCoy, 50, lives in Chadds Ford and for 11 years has been pouring her empathy for people into portrait painting. Her brother, Denys, 52, is a filmmaker who shares his grandfather's fascination with the artifacts of romance, collecting antique flags, saddles, and N. C.'s briefcase, rifles, and Western hats.

Henriette's son Peter, 61, is a harpsichordist, choirmaster, and musicologist specializing in medieval, renaissance, and baroque styles—a love partly inspired by N. C.'s illustrations. Peter's sister, Ann Carol, 56, paints colorful, mythic horses that might float within a dream.

Five sons survive Nat Wyeth. Howard, 47, is a drummer and ragtime pianist who has toured and recorded with Bob Dylan. Newell Convers III, age 44, is a physicist now working in underwater acoustics. David, 37, an actor, works part-time in book publishing. John, 41, is a playwright who has seen



Always pursuing a new angle, Andrew Wyeth steps off the roof and through the cupola window of "Painter's Folly," once the summer home of N. C. Wyeth's teacher Howard Pyle. "If there's something you want to do and you feel emotionally strong about it, then do it," counsels Andrew.

Growing older while steadfastly refusing to grow up, the Wyeths live as if responding to a distant echo. "[I] constantly dream of renewed youth," wrote N. C. Wyeth in 1943. In art and life, his dream endures.

several works produced. Andrew Nathaniel Wyeth, 43, is an artist who paints early New England structures with crafted realism and his grandfather's feeling for the past.

Andrew Wyeth's older son, Nicholas, 47, is an art dealer specializing in family works. His imagination, fixed on model airplanes, is fulfilled by seeing his handiwork fly.

The Wyeth name is an asset—to a degree. "It gets first-step attention," says Nat's painter son, Andrew, who signs his work just ANW. "But what happens afterward is not up to the name." After that entrée, family reputation can be heavy freight. David



Wyeth, the actor, feels doubly burdened—by the accomplishments of his grandfather N. C. and illustrator Howard Pyle, his granduncle.

The burden is there too for Henriette's other son, Michael Hurd, 45, who emerged from Stanford University determined to "escape this octopus of a family that so overwhelms you" and worried about producing "generic Wyeth-Hurds in diluted form." Painting with his father, Michael remembers, "I discovered an inner core that was *me*, interests I was excited to communicate visually." He was trained by art school and by his mother, who calls his work "peculiarly

Michael, a tough, sensitive summing up of atmosphere and color."

Michael is hardworking; he oversees both the family ranch and the gallery he founded to show the family pictures. Currently he is doing a commissioned series of paintings on "The Road West" from New Mexico to northern California—a lonely gas station awaiting a desert storm, a sculptured sand dune smothering lime green grass.

ANDREW WYETH'S younger son, Jamie, 45, believes the looming Wyeth name obscures a clear view of his paintings: "I don't dwell on it, but your work is *always* going to be compared."

Jamie is nevertheless a nationally known painter who had a one-man show in New York City at 19 and has served on the National Council on the Arts. A master of technique, Jamie can achieve any effect, any emotion he wishes. A young boy on the Maine island of Monhegan and a pig on Jamie's Pennsylvania farm are painted with equal awe and affection, both lifted to a surreal importance. Though Jamie, like Henriette, has broadened his interests, his work remains in the tradition of N. C.—the loyalty to realism, the sense of a story behind the image, the glint of humor, the excited imagination, the drama.

"I had the most possible exposure to N. C.," says Jamie, "other than being with him physically." By age ten, Jamie cared for nothing else but painting. Andrew took him out of school. After mornings with a tutor he spent afternoons in N. C.'s studio, dressing up in the same costumes his father used, making up the same kinds of games with his friends, drawing inspiration from the same N. C. books and pictures. He studied two years with his aunt Carolyn, who added her own influence: "No tricks, no pretty veneer," Jamie explains.

Now it is the turn of the fourth generation. "All of us have this childlike quality," Robin Bent says. "Grandpa started it, created this world—witches, goblins, and fairies—and I've brought my children up that way."

Last Halloween, Nicholas and Jane Wyeth and their daughter were carving ghastly grins in pumpkins. Glancing at the prosaic eyes and nose cut by Jane, 11-year-old Victoria said, "Never mind, Mom, we'll do the rest. You're only a Wyeth by marriage." □

China's Youth Wait for Tomorrow





Two forces pull today's young Chinese: the Maoist legacy and the path to reform. The student-led democracy movement of 1989 gave hope for a free future, but government gunfire at Tiananmen Square in Beijing killed hundreds of people and untold dreams. An opera singer puts on the face of tradition (above), but rock star Cui Jian, masked in protest, sings another song: "The future I'd been seeing sure isn't here today."

By ROSS TERRILL

Photographs by LEONG KA TAI GROUP PHOTO

The power of one: An unarmed protester confronts tanks near Tiananmen Square. In June 1989 idealism challenged military might—and, this time, lost.

CHARLIE COLE, AP/WIDEWORLD





THEY'RE GOING TO SHOOT!" The voice was disembodied, hidden somewhere in a surging crowd of thousands. We turned and fled as one, bumping into one another to escape the People's Liberation Army, which now opened fire near Tiananmen Square in Beijing. People fell, buses burned, and the air was thick with curses.

It was June 4, 1989. For the first time since the revolution of 1949, Chinese troops were shooting at citizens in Beijing's streets.

"Tell the world our government has gone mad," a woman shouted to me.

Another woman rushed around crying out in despair: "Our students, our students!

What are they doing to our students!"

Through coils of smoke I made out the giant portrait of Mao Zedong that hangs in Tiananmen and also the tall white Goddess of Democracy erected by the students—symbols of divergent philosophies of how to order society.

By morning Tiananmen Square was full of tanks. Hundreds of young people were dead—students, workers, small businessmen, and a few soldiers. Over the next weeks thousands more were jailed, and for every one person put in prison, a hundred more were harassed, and a thousand were scared into silence. "If you make a remark about the price of tomatoes," a shopper said, "a neighbor might consider that a political complaint and tell the police."

The army's attack brought one of those sudden, violent changes in direction that have punctuated communist China's four decades of history. For seven weeks before the massacre, students in more than 80 cities and towns, backed by millions of their countrymen, had captured the world's attention by calling for democracy in China, the most populous country in the ever-shrinking communist bloc.

In a culture where staying in line has long been the norm, the student movement was like a thunderstorm, watering a parched terrain and illuminating it with flashes of lightning.

Author ROSS TERRILL, a veteran visitor to China, has written about Sichuan Province for the magazine. His article on Hong Kong appeared in the February issue. This is the first NATIONAL GEOGRAPHIC assignment for LEONG KA TAI, a photographer based in Hong Kong.

During the months and weeks leading up to the massacre, I sensed the exhilarating change in the air, a cry for individualism that triggered the student movement. I found young Chinese speaking as never before — about politics, religion, modern music, and freedom.

By 1989 the changes of the post-Maoist era had put the young in a different mental and material position. A China that offered more to its young people found that as a result it was losing their spiritual adherence. Immediate grievances also fueled the democracy movement, including anger at corrupt officials, poor conditions on campuses where students ate frugally and lived as many as eight to a room, and the devaluation of education in a repressive society obsessed with money-making.

With the massacre, top leader Deng Xiaoping, who had opened China to Western ideas





F. DURAND, EPSON



PETER TURBLET, BLACK STAR



AGENCY WIRE PICTURES (LEFT), PETER CHARLESWORTH, JB PICTURES

Thousands of young people had occupied Tiananmen Square for more than six weeks when the statue they called Goddess of Democracy was carried there by demonstrators (above). Students assembled the 30-foot-high plaster figure on May 30, 1989. Five days later it was crushed by army tanks.

Several thousand people were arrested in the aftermath of the uprising. Wang Dan (top left) and Chai Ling (top right), leaders of the student movement, were targets of the government crackdown. Chai Ling went into hiding, then escaped to the United States. In January

1991 Wang Dan was convicted of "counterrevolutionary" sabotage and sentenced to four years in prison. His status as an international celebrity may have saved him from a worse fate.

Two anonymous men arrested in a pro-democracy demonstration in southern China were prepared for execution (left) and shot in the back. Photographs of the corpses were posted as a public warning.



and initiated bold economic changes, dashed young hopes with an angry no to political reform and freedom of the mind.

For the moment hope was gone, at least inside China. No one could foresee a better tomorrow, so people gave up trying, even caring. People were scared of the government, and the government was scared of the people, as evidenced by a grim joke making the rounds in Beijing:

Two young police officers, Jiang and Tan, were standing on duty at Tiananmen Square. In a quiet moment Jiang asked Tan what he really thought about June 4. "Aw, I don't know, really," replied Tan cautiously, "what do you think?" Jiang: "Just about the same as you think, I guess." Tan: "Look, Jiang, if you

think about June 4 what I think, I'm going to have to turn you in."

A YEAR AFTER THE MASSACRE I traveled widely to see how the young had been coping and to hear how they view the future—for the young will control China's future. Of the 1.1 billion Chinese, nearly two-thirds, some 750 million, are under 35 years old. This means "youth" to the authorities in a society where you are young until you get a job with some responsibility—youth, in a way, until you have waited long enough to replace the middle-aged.

I interviewed young Chinese in parks and shops and darkened bars, in public baths and train stations, in university dorms and hotel



rooms. I was surprised to find that while young people are cautious in talking, their dreams have not been destroyed by the June 4 shootings, just tucked behind a curtain of discretion. To protect some of those quoted here from official reprisals, I have used pseudonyms to conceal their identities.

Many young Chinese are still vehemently at odds with tradition, their elders, and the Communist Party. These young people want to make money, listen to unorthodox music, and experiment with forms of individual expression new to Chinese society.

A generation is waiting—for Deng Xiaoping and his generation to pass on, for the verdict on June 4 to be reversed, for a suffocating Chineseness to be replaced by a sense of China

Some lean into shovels; some lean on them. Recruited as "volunteers," 100,000 students worked in the autumn of 1990 to ready Beijing for the 11th Asian Games. Other city residents were told to attack the "four pests": mosquitoes, flies, rats, and roaches.

as one nation among others in a crowded world, for communism to collapse and for democracy to rise in its place.

"This period of waiting," said one friend, a social scientist in Beijing, "is not dying, and not living."

Lin Mu, a 28-year-old government official in Beijing who supported the students, put it this way: "China is like a household in which old people rule, middle-aged people operate things, and the young stand aside and watch."

On the campuses a sullen tranquillity reigns. Many student leaders from 1989 are in prison, banished to the countryside, or in exile. At top schools the freshman class is required to undergo a period of military training. "If they teach them to shoot," quipped a teacher of political science I met at Beijing University, "next time around the students will win."

Across town at a school of communications, I listened as Zhao Yulan, a journalism student, recalled how a classmate of hers, depressed at the atmosphere of recrimination and brainwashing on campus after the massacre, leaped to her death from the 12th floor of a building. "Such a pity she took it all so seriously," said Zhao. Zhao also lost a professor as a result of the turmoil—he was in Canada and decided to stay, like thousands of others living abroad on June 4. Some 100,000 students are overseas, half in the United States. Many will avoid returning to China.

"The part I like best in *Tom Sawyer*," a recent graduate told me in Beijing, "was when he runs away." This 27-year-old, who left his village at 12 to attend school in a town, was reflecting the escapism and independent spirit I found among many of his contemporaries. In the southern city of Guangzhou I met two young men, Feng and Yang, who are so disaffected that they keep their watches on Hong Kong time. In Beijing I discovered young Chinese, alienated by the government-controlled press and hungry to read something different, snapping up love stories, martial-arts books, and fantastic ancient tales from a tiny roadside stall in a dusty industrial neighborhood.

IN THE DAYS just after June 4, Lin Mu, the Beijing official, began to chain-smoke. "These are our drugs," said Lin as he held up a cigarette, smoke clouding his eyes. Lin also took up mah-jongg. "I always thought of it as an old man's game," he said, "but since June 4 it's been my game too. Mah-jongg is a good escape from reality, and everyone starts equal."

A few days after the massacre, with occasional gunshots still rattling down the capital's streets, I listened as Lin described the tragedy. "For the first time in my life I saw a man die. The left side of his face was blown away by a bullet." I asked Lin if he threw any rocks. "Not exactly," he replied softly. "But I used a metal bar—the sort a cook uses to mix a large pot." I looked across at Lin. His face tensed.



"I hit a soldier on the head." A silence stretched between us, and then Lin went on: "He had just shot that man."

"Did the soldier die?"

"I only wounded him," Lin replied, almost whispering.

Later Lin showed me a letter dated June 5 from his father, an architect who had been a target of Red Guards during the Cultural Revolution. "Please leave Beijing, and don't have anything more to do with the democracy movement," the elder Lin wrote. "In China intellectuals are always getting out ahead of the ordinary people. It makes trouble—and it makes you young intellectuals vulnerable.



Gymnast Li Jing shows perfect form on the pommel horse. In his dormitory (left), tapes and a model cathedral are souvenirs of the star athlete's international travels.

The 21-year-old from Hunan Province went on to win two gold medals at the Asian Games, a spectacle mounted every four years and held in Beijing in 1990. China hoped that promotion of the competition would help rebuild a reputation badly stained by the Tiananmen repression.

"The crisis of 1989 was a small crisis, son, compared with the big crisis of the Cultural Revolution," the father continued. "Just study, and try your best to scrape out a living—for there are so many dangers. China is China. Democracy can't come here as easily as in other countries. No recipe for China's problems can neglect our long traditions, our backwardness, or that most Chinese are farmers."

Lin could take solace in his father's concern and the shared views of a tight network of former classmates. Other young people, having lost faith in the ideology of communism, found comfort in their religion. For centuries Confucianism, Buddhism, and Taoism offered a path of retreat from unappetizing politics. When Mao came to power, the religions, including the newest arrival, Christianity, were forced into the procrustean bed of Maoism—meant to explain everything and encompass everyone. In the Deng era religion revived, because a vacuum of values existed and because freedom to make money also meant freedom to express faith. Through the open door the Bible came as readily as the computer.

"In China," said Zhu Yasheng, "there is nothing you can believe in." It was the day after Tiananmen, and this 16-year-old student was explaining why he had recently become a Catholic, the first in a family with strong ties to the Communist Party. He flashed a smile conveying both innocence and passion as we sat in the cathedral just west of Tiananmen Square. Shortly before, he had marched in a pro-democracy demonstration with other young Christians behind a banner reading, "The Lord Loves You, Long Live Democracy."

When I returned to China a year later, I heard that my young friend had joined the military. Surprised, I went to the family's home to inquire. Yasheng's father, a party member and master chef for senior government leaders, tried to reassure me: "Yasheng is fine," said Mr. Zhu. "He is at an air force base south of Beijing. The discipline is good for him. You see, Yasheng's grades were poor, and his middle school thought some time in the military would have a good effect on him."

The elder Zhu could not have been nicer—

though perhaps he could have been more candid. Yasheng had told me his grades were excellent, and I knew how much the arrest of a classmate for the crime of "attacking a soldier" on June 4 had upset him.

In Yasheng's room Mr. Zhu proudly showed me books and photos of school and family outings. There was no sign of Yasheng's Catholicism. Where was the Bible he had asked me to send him from Boston?

I asked Mr. Zhu if his son kept up his religious observances. "When he visits Beijing, he does," the father replied, "but he can't at the air force base." I got to the point. "Did the school send Yasheng into the military as a punishment for his participation in the democracy movement," I asked, "and to try to knock Christianity out of him?"

"No, no, no," said Mr. Zhu with a broad smile. "It was his low grades."

Later I showed a Chinese friend the address that Mr. Zhu gave me for his son. "Strange," the friend said, looking at the Chinese characters. "It's an invalid address. The code is for Xuan Wu District, here in central Beijing, where I live. The air force base at Nanyuan is to the south and has a different code."

Months later I have not heard from my young friend, and I suspect that he did not willingly join the air force.

CHINA IN 1990 reminded me of Hungary after the bloody uprising against Soviet tanks in 1956. Now, as then, a terrible event was being treated officially as a small ripple, yet most people seemed to feel it was a landmark and that something like the student democracy movement might recur.

Will it take another Communist Party split at the top to give youth their next window of opportunity? *(Continued on page 126)*

Police officers pass in review during a parade in Beijing for high officials. The People's Armed Police force was increased during the past decade, when reforms brought rising incomes—and crime rates. Yet the force failed to control growing student unrest in 1989, and hardened units of the army were finally called in to reclaim Tiananmen Square.





Riding the tiger of ambition to a new life

YANG ERCHE NAMU came to many crossroads in her long journey from the far mountains of Yunnan Province to success in the capital city of Beijing, where she performed as a singer with the stage name of Yang Yang (bottom right). Status brought her an apartment and the luxuries of makeup and watches and appliances.

Such a life is beyond the imaginings of most people in Luoshui, where Namu was born, a remote village nestled near the Sichuan border in an area far from the Han majority. Known as the Mosuo, her people are classified as a subgroup among China's 55 official minorities, although the Mosuo consider themselves to be an entirely separate people.

When Namu left home in 1983, she spoke only the Tibeto-Burman Mosuo language and not a word of Chinese.

"I just wanted to sing," Namu says. She made her way to Shanghai, where she gained admission to music school and set about learning the language.

Namu was bold. Once, when asked her age by a Shanghai school official, Namu pointed to the next girl in line, "Just write down *her* birthday." The Mosuo do not record birth dates. Namu remembers that "one time I asked my mother when I was born. She told me it was before the rooster crowed."





HER CELEBRITY having come home ahead of her, Namu—hugging her mother—was back in Yunnan for the first time in three years. She was soon invited to sing for the village monks and, in traditional Mosuo costume, took a turn at her old chores.

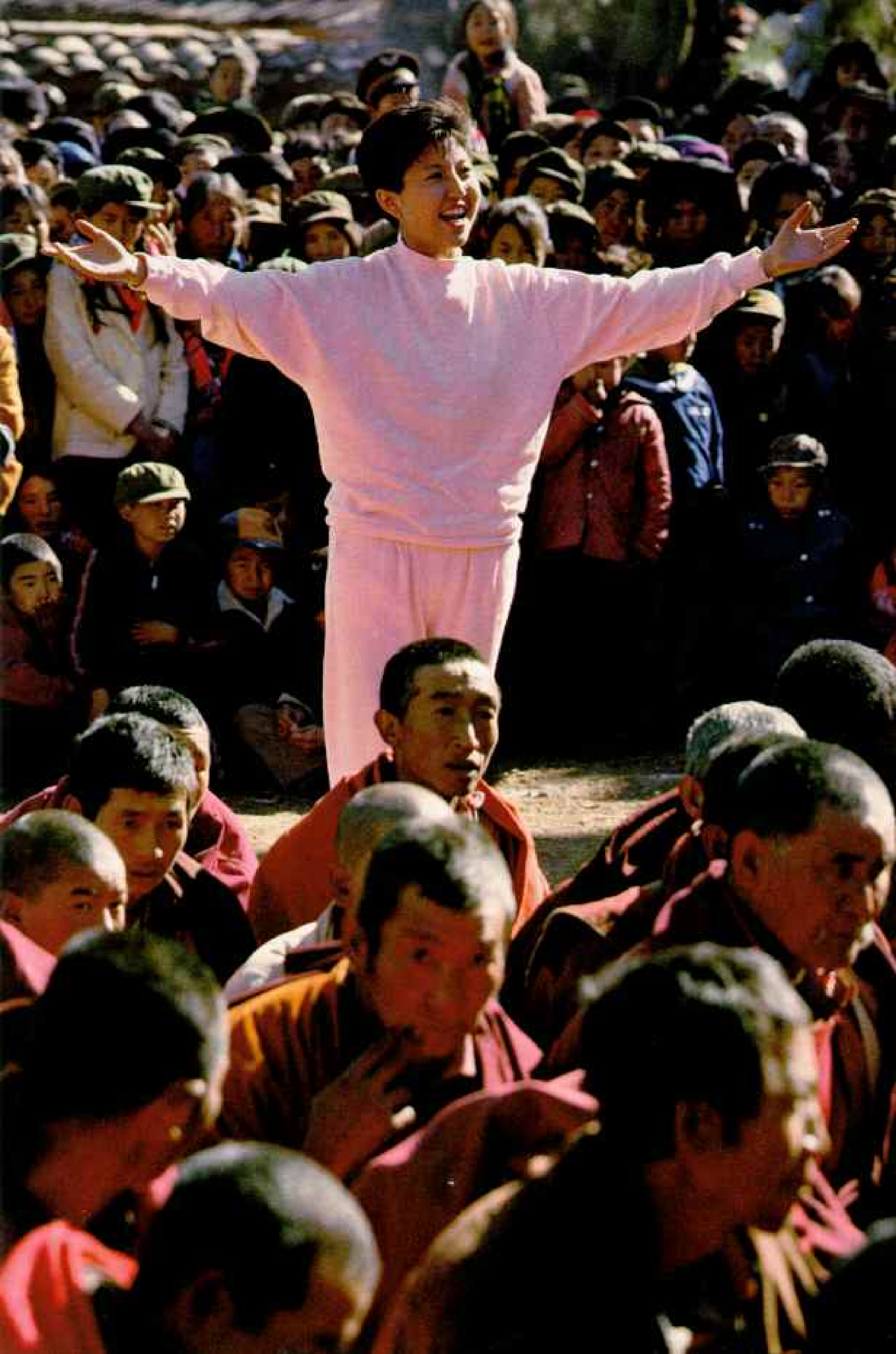
Among the gifts she brought to her family from Beijing was a large container full of coffee, “like gold in China.” But her mother scattered the coffee to village pigs. “She thought the present was the can.”

“You are the light of our people,” Namu’s uncle had written, and her ambition grew to make China take new notice of the Mosuo and other minorities. Hoping to use her increasing national fame to promote appreciation of the minorities through their music, she returned to Beijing. Yet in the spring of 1990 she fell in love with and married a young American who had been working in China.

Now Yang Erche Namu believes she is the first Mosuo to live in the United States. She is learning English quickly and sings with a group in San Francisco.

Never caught up in the politics of her generation, Namu enjoyed her fame and privilege in Beijing. Even so, for her as for others, the chosen path led to yet another crossroads—and away from China.







(Continued from page 120) Some think so. Others refuse to take the Communist Party seriously. Reasonable people can well conclude that it is pointless to start another democracy movement while Deng is alive. Deng's death will probably lead to a struggle and perhaps another wild swing in China's course. Meanwhile pro-democracy Chinese in Hong Kong, New York, Paris, San Francisco, Melbourne, and other cities keep the torch alight until it can flare again within China.

Disaffection still smolders inside China, just beneath the surface. Youth, once deferential to elders, now criticize them as rigid, cautious, dull, fatalistic, addicted to boring Beijing Opera, and passively inclined to give the Communist Party the benefit of the doubt.

"Our rulers are all old men," complained a young clerk in Guangzhou. In the capital a well-informed son of Chinese diplomats told me of his embarrassment about the 86-year-old Deng Xiaoping. "When Bush's adviser [Brent] Scowcroft was here," he said, "Deng in his dotage offered greetings to President Carter instead of President Bush! We young people feel awful about such things."

Traditionally youth obeyed age, and the individual seldom assumed he was master of

his own ship. In a land where dynasties rose and fell even before the Christian era began, the past so crimped the present that it was considered risky to do anything for the first time.

Although urban youth have moved away from that tradition, Chinese parents often have not. They feel young people are dreamy, noisy, materialistic, undisciplined, and blasé about past revolutionary struggles. The middle-aged are unsettled by rock and roll, motorcycles, fever to go abroad, and casualness about sex. Photocopiers and fax machines unnerve the old communists, the rising youth crime rate shocks them, and "misty" poetry ("I have to connect my heart with the moon") provokes them. The technology, art, news, and values from the outside world threaten a beleaguered authoritarian order.

"The young," said Yang Bingzhang, a former Red Guard in his 40s, "are naive about the West. They think it's all flowers and free sex. My generation was interested to go to the West for a purpose. These kids just think of getting there—of leaving China."

Each generation has its dreams and its demons. Those old enough to remember 1949 recall the excitement with which a united China stood up in the world, and the terrible disorder and inflation preceding it. Middle-aged

Fashionable Chinese often rent Western wedding clothes from photography studios. A couple do not exchange formal vows; the two sign papers at a government office, where they are given a lecture and declared married. These Guangzhou newlyweds celebrate with a lavish banquet in a restaurant. The bride serves tea to their guests and receives gifts of money in return.



people display a more circumspect range of emotions, mindful of the communist record of zigs and zags, beginning with the disastrous Great Leap Forward of 1958-59. The Red Guards of the Cultural Revolution, now entering their 40s, were idealists who lost their faith during the stormy 1960s. The younger citizens form a "me" generation with cosmopolitan instincts. They do not recall the Cultural Revolution, let alone the "liberation" of 1949 that stirred their grandparents.

In Beijing I asked an elderly pedicab driver if today's youth are better or worse off than his generation. "Better," he said, "because of birth control. Fewer kids, smaller families—it's a better deal." The one-child family, a policy that helps control China's population (which grows by 17 million a year), is better off economically—at least in the cities—than yesterday's sprawling family. But, talking to the elders, one often gets the impression that the only child of today is spoiled and self-centered.

"Recently I gave a lecture to 200 students," said Chen Zhiya, a former military officer in his 30s who is co-director of a think tank. "After a painstaking explanation of the fundamentals of international relations, you know what questions I got? They asked me what brand of cigarettes Americans smoke! They

asked me if I liked the American way of life! These kids are really off the track."

The generational tension took on a political edge after the brutality of June 4. The Chinese government criticized the student democracy movement as "counterrevolutionary." And, in the Communist Party's view, youths' "bourgeois individualism" and "fawning on the West" bred conduct that justified the tanks and the bullets of Tiananmen Square.

BY 1990 THE BEIJING MASSACRE seemed a distant memory in Lieshan, Anhui Province, where coal dust rises above sweet potato fields. But miners like Tan Weiqun were still sympathetic to the students. "If a student leader escaped here and stayed with us, I am sure he would come to no harm," said Tan, a dark-skinned, muscular 24-year-old who spends 12 hours a day underground, digging coal as he has done since age 19. He began this job to raise enough money to marry a girl from his home village. To get married, Tan reckoned he needed 20,000 yuan (\$5,405) for a house, furniture, a television, and a small tractor for work in the wheat fields. But to date he has managed to save only 800 yuan, so his marriage plan is on hold, and mining has become his world.

"You see, I am influenced by the other young miners," Tan says. "They say, 'Today's wine I drink today; tomorrow's sorrow I bear tomorrow.'" Tan and his friends spend tidy sums drinking fiery liquor, dallying with local prostitutes, and eating the pot-stewed pigs' ears famous in the district.

"Cityfolk don't like the hard work of mining, even though the pay is good," Tan said, "so most coal miners are from villages, especially villages in the poorer areas." Tan earns 300 yuan a month, double what most city workers earn. But the work is draining. "I'm too tired to move when I come up," he said.

Tan is but one of 80 million people who left farming in the 1980s, and another 100 million are expected to leave the soil during the 1990s. Yet the village is still China's center of gravity and also Deng's political constituency, for he liberated rural China from collectivism. Ironically communism died as a policy in the villages—at his command—before it died as a faith in the gunfire of Tiananmen Square. But even if the villages shrug at communist ideology, urban China still looks down on peasant China as culturally backward.



Bringing in sewing while bringing up baby, seamstress sisters work at home in Shandong Province (above). In a Beijing hotel a waitress eyes hemlines of Filipina dancers. Foreign contacts give young city workers a window on the world not shared by rural Chinese.

For Tan the miner, who grew up in a farming family, even the gritty work of digging coal represents a step up. Hopes are modest in rural China, where 75 percent of this country lives. More than 180 million are illiterate, and young peasants keep empty Coca-Cola cans around the house as emblems of culture. A young person in Shanghai may dream of moving to California to study some day, but for someone in the country the lights and money and freedom of any city in China are dreams enough.

YOU OFTEN FIND FARM BOYS coming and going from Beijing's Yong Ding Men train station, the incoming youths identifiable by their rough accents and tanned skin, the outgoing ones by the addition of flashy clothes. I met four teenagers from rural Shandong Province as they sat in a row by a hedge, waiting for the train home to Jinan. They wore matching pink-and-white check shirts, recently bought, and each carried his possessions in a blue cloth bundle.

"We are going back to Shandong only to help our parents with the harvest," one explained, looking up from a paperback book

entitled *The Devil of Ancient Times*. "As soon as the harvest is done, we're returning to Pinggu." The boys earn good money in that county east of Beijing, where they make furniture for farmers who built large houses after Deng's agricultural reforms.

Like others of their generation, the Shandong youths are interested in making money, even if it means menial work, risk, or relocation. At the Ya Lin (Elegant Forest) restaurant in Beijing, I met some young men from Anhui Province who didn't complain about working ten hours a day, six days a week, waiting tables. They believe that money is the most important thing in life.

"Could money really be more important than freedom?" I asked Gao, a young cook who helped his friends land jobs at the Ya Lin.

"Yes, because it gives freedom for us to open our own business one day."

"Will you ever return to Anhui?" I asked one of the 18-year-old waiters.

"Well, whether I go there or stay in Beijing," he said spiritedly, "at least that will be my own decision."

Such youths are part of a floating population



of 70 million who are on the move around China, searching for a better life. Beijing alone is reported to have 1.3 million, Guangzhou 1.1 million, and Shanghai 2.1 million. The ebb and flow is at once the result of liberalization and of reform's failure to solve massive underemployment.

A loosened economy, a willy-nilly decentralization, and a richer flow of information—all have allowed youth a mobility unheard of before the 1980s. Deng's reforms, begun in his native Sichuan Province, moved China from collectivist austerity to individual enterprise.⁴ As a result of the economic changes and Deng's opening to the West, the Chinese were able to devour the foreign world on television, meet hundreds of thousands of newly prosperous Taiwanese visitors, listen to cassettes of Hong Kong pop stars, and read the novels of Sidney Sheldon and Stephen King in hasty Chinese translations. Many people traded the baggy clothing of the Maoist era for more stylish Western suits and ties, bright sweaters, and high heels. New policies produced higher living standards, even higher expectations, and a louder cry for political freedom.

Deng could not stop the social consequences of his opening of China, but in the year after Tiananmen Square the government, out of fear of losing control over an awakened youth, reverted to nationalistic authoritarianism. In a corner of the Forbidden City, I found an exhibition on AIDS and other sexually transmitted diseases that blamed foreigners for them all. "The rotten mentality and life-style of capitalist society have taken the opportunity to penetrate Chinese society," ran a caption amid pictures of gay-rights marches and American GIs with prostitutes. Written in Chinese, the message was not meant for foreign eyes.

BEIJING MAY HARP on ideology and strut with cultural pride, but practical-minded Shanghai is back to making money and welcoming foreign visitors in the process.

"We know how to do things in Shanghai," said Han, a 30-year-old who earns 500 yuan a month driving a taxi through his city's tangled streets. "We are more civilized," he added proudly, explaining why there was no Shanghai massacre in 1989. On China's National Day, October 1, 1990, the nation's largest and most Western-looking city was a festival of



Joint-venture companies employ skilled young Chinese, such as this worker making artificial heart valves at an Australian-backed firm in Guangzhou.

consumerism as shoppers licked ice cream cones in crammed Nanjing Road, grabbed at silks in department stores, and presented sticky moon cakes as gifts at parties. Prompted by former mayor Zhu Rongji—named a deputy prime minister in April 1991 and one of the few widely admired politicians in China—this port city of 13 million has taken the lead in trying to put June 4 behind the nation.

In a northern industrial suburb, I found the entrepreneurial spirit very much alive at the Harmony Café, where Ji Wenhua employs five people. He opened his business, about the size of an American living room, in 1981 as a breakfast shop and gradually expanded it. Now 35, he maneuvers his way through a jungle of per capita tax, security tax, business tax, sanitation tax, urban-planning tax, construction tax, and commercial tax and still manages to clear about 3,000 yuan a month. Ji had previously worked in a factory and felt his wage there was too low. The "iron rice bowl" system, which guarantees employment but kills initiative, became too stifling, so

⁴See "Sichuan: Where China Changes Course," NATIONAL GEOGRAPHIC, September 1985.



Foreign-owned boutiques attract foreign buyers, among them Hong Kong Chinese. Young Chinese are avid window shoppers, but goods in stores like Pierre Cardin in Beijing are too expensive for most. Signs in the window beckon Asian Games visitors.

he decided to risk striking out on his own.

Like many independent-minded Chinese of his generation, Ji concluded that the freedom that comes from making money is the best prize life can offer. For young businessmen like Ji life goes on, essentially unchanged by the events of May and June 1989, as it does for Mao Yixin, a 31-year-old engineer who works long hours at the Shanghai Marine Measuring-Instrument Factory.

Mao, whose educated parents lost their jobs in the Cultural Revolution, turned to science, a realm in which ideology—the cause of his family's grief in the 1960s—has no place. Although Mao loves his work, he chafes at the rigid structure of socialist industry.

"You may work more, but you won't earn more," he said. "Many people feel the more you strive, the more mistakes you make." Mao thinks managers should be paid ten times what workers get but that managers should be subject to dismissal. In his factory, though, he sees people more interested in job security and conformity than innovation.

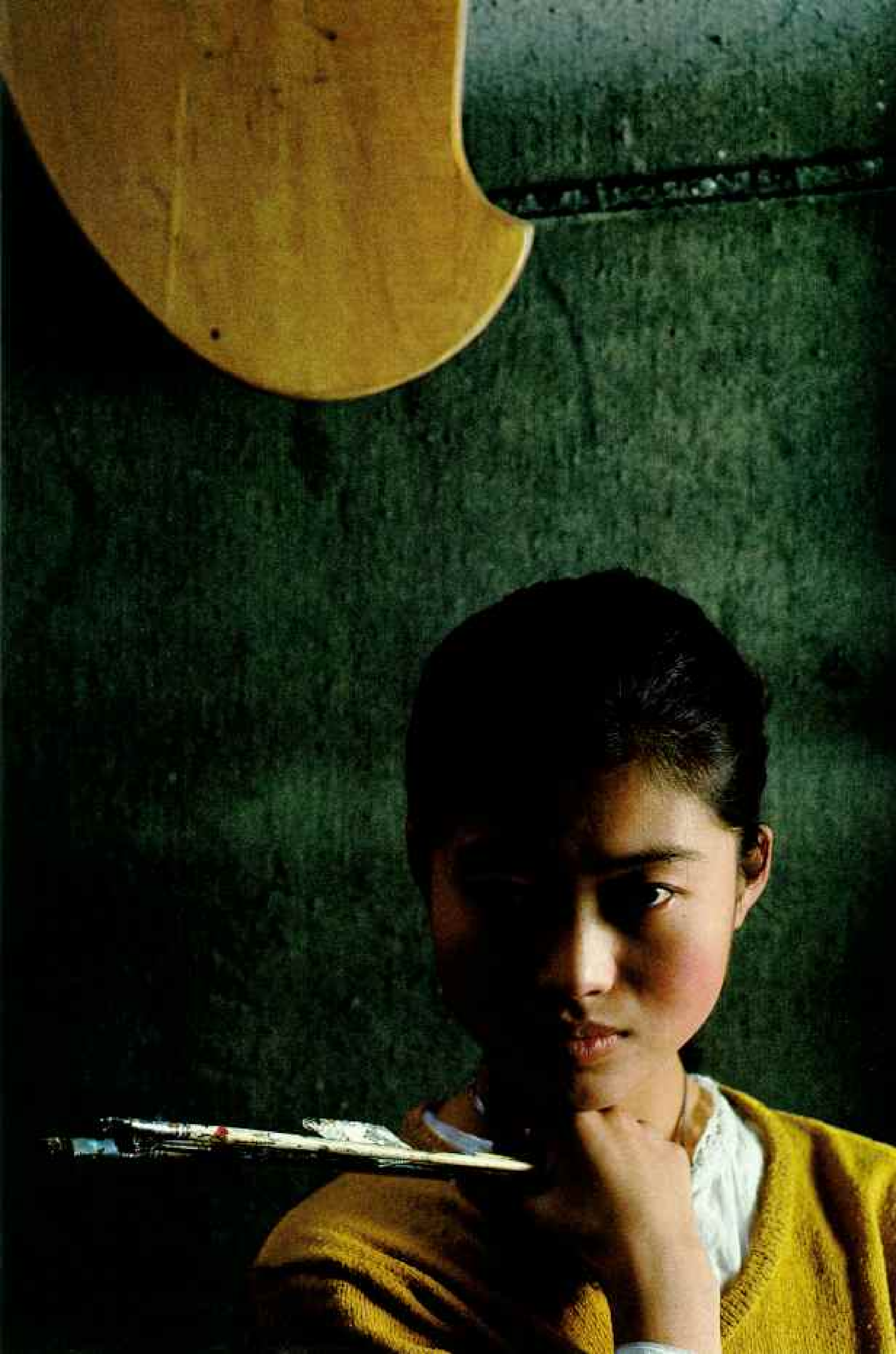
Mao admires the new breed of young private businessman—from a distance. He

still lives with his parents, follows the rules, and exemplifies the steady passivity of many Chinese in their 30s.

TRADITIONS, whether in the factory or the home, still weigh heavily on China's youth. Families use their connections to find jobs or housing for relatives; several generations may live under one roof, and even in urban families parents involve themselves in the marital affairs of their children, as I found in the case of Kang and Song.

While he was a student at Nankai University in Tianjin, Kang Zhenzhou, an energetic 26-year-old with a sharp sense of humor, took a fancy to Song Yufeng, a bespectacled young woman of birdlike grace. They decided to get married.

"What I did not bargain for," Kang said, clutching his head with both hands, "was getting married four times!" The first wedding, in June 1988, was a party in a student restaurant on the Nankai campus, presided over by the classmate who had introduced the couple. "I put a cup to her lips," Kang said, "and she to mine—that was the only traditional touch."





An art degree might secure only a factory job for painter Sun Dan (left), a student at the Central Institute of Fine Arts in Beijing. Few graduates can find jobs as artists, and official exhibitions are rare, so students stage their own shows (above) in private apartments.

Marriages two and three took place within Kang's family. Because his parents are divorced, a separate event was required for each. "My stepfather dislikes me," Kang said, "so my mother could not have our marriage at her house. It was held at her mother's. The main activity was for everyone to look over my wife carefully."

For the benefit of Kang's father the couple traveled to Jingdezhen, a city in Jiangxi Province famous for its porcelain. "Eating, eating, eating," was the way Kang summarized marriage party number three.

Meanwhile the young couple set up house in Beijing, where Kang began to work for a government ministry, and Song found a job at an embassy. But it wasn't over. Back in Tianjin, where Song's working-class family were fruit-sellers, a storm brewed as word arrived of the three marriages.

Kang's new father-in-law drew the young man aside for a chat. "He said there must be no sex until we got married in Tianjin." If Song got pregnant before that, the good name of the family would be disgraced, making life miserable. The ominous warning came too

late, but Kang gulped, kept silence, and agreed to wedding number four.

The Tianjin event was a traditional wedding, for which bride and groom dressed in red, symbolic of good fortune. When the couple were shown to a family bedroom, they found red sheets on the bed; and curled up on top was a 7-year-old boy. The boy was another traditional touch provided by the Songs—to spur the couple to produce an excellent son.

"A little boy between us!" Kang recalled with a mixture of disgust and amazement. "I was so angry with it all," Kang said, "that on the train back to Beijing I fought with a fellow passenger over a seat. I got a black eye, while my wife sat crying." Now that Kang and Song have settled in their new apartment, away from both families, life is less stressful.

IN QING HUA BATHHOUSE in Beijing, naked bathers emerged from steaming hot pools and lay on rickety wooden couches to sip tea and smoke. Two young men took up a position near me. As we chatted, the youths showed a geographic curiosity. How many hours to fly to America? How many sheep in



Dancers meet daily to tunes from portable stereos in Beijing's Ditan Park. Traditionally, morning exercisers practiced *tai ji quan*, an ancient martial art of slow and measured movement. Now young urban Chinese jitterbug or tango before going to work.

Australia? From their polished speech and confident manner, I took them to be from Beijing, but I was slightly surprised that the conversation did not turn quickly to the subject of money-making.

I asked if they were students. One youth flashed a smile and shook his head. Were they workers then? The second grinned, turned to the cupboard that holds the bathers' clothes, and flung open the door to reveal two uniforms of the People's Liberation Army (PLA).

"Life in the army is tough and disciplined," the first fellow said. When I mentioned I had once been in the Australian Army, he asked, "Who arranged for your job after you left the army?" These soldiers see their destinies lying in the state's hands, and they cling to a certain pride despite the besmirching of the PLA's reputation in the Beijing massacre.

"What do Chinese youth think of the PLA these days?" I asked the second man as an attendant came by with fresh hot face towels. "The army *is* Chinese youth," he replied, "and Chinese youth are us. People don't have any detached view of the PLA." In a way he was right. The Chinese Army, three million

strong, has always had its roots in rural China, and the People's Republic of China has never known a military coup, which makes it different from countries elsewhere, especially those in Latin America and Africa.

Now the soldiers from the bathhouse were ready for duty again. On went their uniforms and caps with the red star, and they stepped out into the foggy night.

NOT ALL YOUNG CHINESE sympathized with the student democracy movement, and some, like Fan Qihui, were frankly critical.

"If the student leaders had won power, they would probably be as oppressive as our present government," said Fan, a fashion designer in his 20s. "Neither side cares about artistic people like me. I think China is too big to be run in any way other than as a dictatorship," he said when I met him in 1990.

Fan faults the music of Cui Jian, the 28-year-old who is China's most famous rock star, as being too negative. Cui's song "Nothing to My Name" became the unofficial anthem of the student movement. Since the



Locked in a whirling dance with man-size puppets, Mongolian "wrestlers" delight spectators— young and old— during New Year festivities in Hebei Province. Traveling entertainers provide amusements from opera to song and dance for China's remote villages.

massacre, Cui has had an uneasy relationship with the authorities. He is allowed to give some concerts but denied television coverage.

"The important thing is to express my real feelings," Cui told me, summing up the spirit of today's youth. Influenced by Western music as a boy, he began as a classical trumpeter but was dismissed from his state troupe for experimenting with rock. Cui, passionately attached to music as the coinage of cosmopolitanism, is the best known of thousands of rock musicians who make the dance halls, tiny bars, and hotel clubs of China's cities havens of a counterculture. The pop-rock scene makes the government uneasy because it came into existence not by state fiat but spontaneously and because of its soul-stirring emotionalism and links with the non-Chinese world.

"Music, especially rock and roll, requires freedom," Cui told me over a drink in a dark Beijing night spot. "In China only a minority enjoy freedom." Cui and his generation love China but not in the old way. They do not remember the historical bullying of their country by the West and Japan, and their patriotism is not an automatic defense of the citadel.

They want a rich future for China, flowing from their self-realization as Chinese individuals. In their view even the nation is not more important than the freedom of the individual.

BY THE AUTUMN OF 1990 the smoke of guns had long given way to the more familiar pall of dust in Beijing. Hosting the 11th Asian Games, the government was working hard to rebound from the massacre. By the time the games opened on September 22, Tiananmen Square was like a theater set, adorned with figures of birds and animals, potted plants, an illuminated water fountain, and balloons dancing overhead. Athletes of more than 30 nations flooded the Beijing Workers Stadium for the opening ceremony. When I entered, five PLA men on each side of the gate inspected me from head to toe, ensuring that I was smuggling no weapons or posters that might mar the day's carefully orchestrated show. Behind me, within the stadium grounds, busloads of soldiers crouched with muzzled hounds. In the distance I saw barricades at the mouths of residential lanes, with Beijing citizens on the outside, staring in



Taking a cue to relax, People's Liberation Army soldiers unwind in their barracks. In 1989 elderly army leadership gave the word to shoot demonstrators at Tiananmen Square; next time, the young may not obey orders to fire against their own.

silence. I ran into yet another soldier, at the section where my seat was reserved.

"Take a photo," he demanded—to verify that my camera was really a camera.

Inflated plastic dragons and pandas floated across the sky as Chinese and Japanese performers did slow motion *tai ji quan* routines on the grass. Thousands of schoolchildren in the stands flashed colored cards to render a pleasing backdrop for the television cameras and the VIP box. There were smiles and pretty costumes on all sides, yet ticketholders were so outnumbered by PLA, police, stewards, guards, and officials that I felt myself to be on stage. It was a great show, and by the end of the games everyone I met was proud that China topped the medals list, with a total of 341 to South Korea's 181 and Japan's 174. Yet the government alienated many young people by the strict controls and expense of the event.

"The people pay the money, and the government gets the glory," growled a young cab driver, complaining that the games were too expensive. Workers were pressured into helping defray the cost of the games—about 530 million dollars.

"I don't like paying to be searched," said a rakish young man who had managed to buy a scarce ticket. In my luxury hotel I had the same sense of unease, paying to be watched by a phalanx of security guards. Although there was no bloodshed this time, the security reminded people of the Tiananmen violence.

I returned to the square with my friend Lin Mu, the young government official who had heard the bullets whizzing, seen a man die, and wounded the soldier who pulled the trigger. In Chongwenmen Street he pointed out some saplings among taller trees. "They were planted only last year," Lin said, "to replace trees destroyed by the tanks."

We both fell silent at the memory of June 4, which seemed a long time ago. I looked across the gray expanse of Tiananmen Square and thought about the China of today—a communist nation, half open to the world, led by old men—and I wondered about the China of tomorrow. Given half a chance, the saplings beside me would thrive, and by the time they were fully grown, today's youth would be in charge. Their China would surely be different. □



Once our engineers had completed six million miles of testing on Saturn cars and parts, it was time for a second opinion. And a testing track in England owned by Lotus is just about the toughest second opinion you can get.

John Ressler, the Saturn project engineer overseeing the Lotus tests, recalls his first day.

“When we brought our coupes over to the Lotus track, we got these skeptical looks like, ‘What are those Americans doing here?’”

Lotus drivers ran two Saturn coupes day and night, at high speeds, for hours on end.



They drove them on narrow, twisting roads,

Testing our brand-new car meant driving it under every



condition imaginable, for as many miles as possible. Including a test by Lotus at the Millbrook Proving Ground to examine its performance under European driving conditions.

over steep mountain inclines and around high-speed ovals, testing for performance and endurance.

Any new car has to face a lot of skeptics. From test drivers to car buyers. "By the time we went 200,000 miles on their track, their doubtful

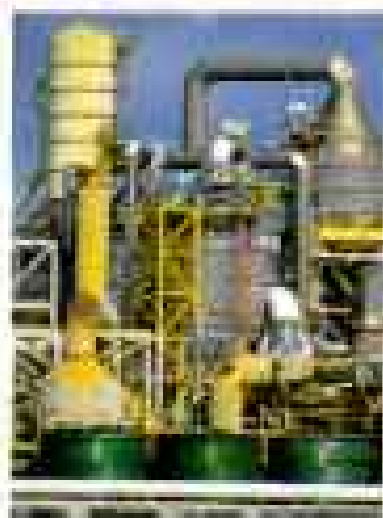


looks were gone," says John. "That's when I knew we got the second opinion we wanted."

A DIFFERENT KIND OF COMPANY. A DIFFERENT KIND OF CAR.

If you'd like to know more about Saturn, and our new sedans and coupe, please call us at 1-800-522-5000.

You're driving by that
like you do every day,
asks you what they
answer that you're not
occurs to you that you



It also occurs to you that you don't have the foggiest idea how to go about finding out.

Well, we can't say we blame you. Over the years, our industry hasn't exactly been noted for open doors, much less open dialogue.

Others are offering tours to anyone interested in a firsthand look at the way we make, handle and dispose of chemicals. Because, ultimately, the best way to answer your questions about what goes on behind the walls of our plants is to show you what goes on behind the walls of our plants.

We're opening the lines of commu-

**chemical plant, just
when one of your kids
make in there and you
really sure and it
probably should be.**

But recently, the member companies of the Chemical Manufacturers Association have taken some crucial steps towards changing that. Through an effort called Responsible Care.[®]

Many of us, for example, are now regularly holding community meetings. Which give the people who live near our plants an opportunity to tell the people who run them about their fears and concerns. And to ask questions of the people who actually run the plant, day in and day out.

nication in other ways. In some cases, quite literally. Call **1-800-624-4321*** and we'll tell you how you can find out what your local chemical company is making. We'll also send you our **Responsible Care[®] Brochure**, which details other ways we're working to keep you informed.

So that the next time you're driving by that chemical plant, like you do every day, and one of your kids asks you what they make in there, you can tell him.

*8 a.m. to 7 p.m. EDT

**The Chemical
Manufacturers Association.**

We want you to know.

Report from the Editor



CHRISTIAN C. SANDERSON MUSEUM (ABOVE LEFT); N. C. WYETH



The Wyeths: Traditions of Excellence

Few names in American art have greater luster—or more individual bearers—than that of the Wyeth family. Today succeeding generations of Wyeths continue the tradition set by senior member N. C. Wyeth (top), a distinguished illustrator whose paintings in the early 1900s graced such classic adventure novels as Robert Louis Stevenson's *The Black Arrow*,

Kidnapped, and *Treasure Island*.

Wyeth was well-known to Society members for his dramatic series of "Discovery" paintings published in the magazine in 1928 and 1929. The original murals still hang in the Society's Hubbard Memorial Hall. Wyeth's son Andrew is regarded as one of America's foremost artists, and Andrew's son Jamie is also nationally acclaimed.

Fourteen other members of the family have distinguished themselves in the worlds of art and music. One son, the late Nathaniel Wyeth, forsook art for science and invented the prototype of the plastic bottle that is used today for carbonated beverages.

In the article entitled "The Wyeth Family: American Visions" beginning on page 78 of this issue, author Richard Meryman and photographer David Alan Harvey present an intimate portrait of this great

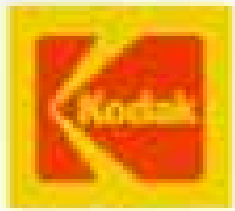
American family, accompanied by paintings of N. C., Andrew, Jamie, and N. C.'s daughters Carolyn and Henriette.

To his children N. C. Wyeth was a teacher, a tyrant, a worker of miracles, and a loving father who insisted on playing the role of Santa Claus each Christmas Eve, complete with a boot-stomping trek across the roof to deliver gifts to the household. The effect was thrilling as well as a bit fearful, inspiring Andrew to remark many years later, "I don't think there is anything that is really magical unless it has a terrifying quality."

Summing up the work of the Wyeth family, James Duff, the director of Brandywine River Museum in Chadds Ford, Pennsylvania, says: "Their art is extremely disciplined, and from within the conditions and limits it sets for itself comes a cogent, American vision of man in his world."

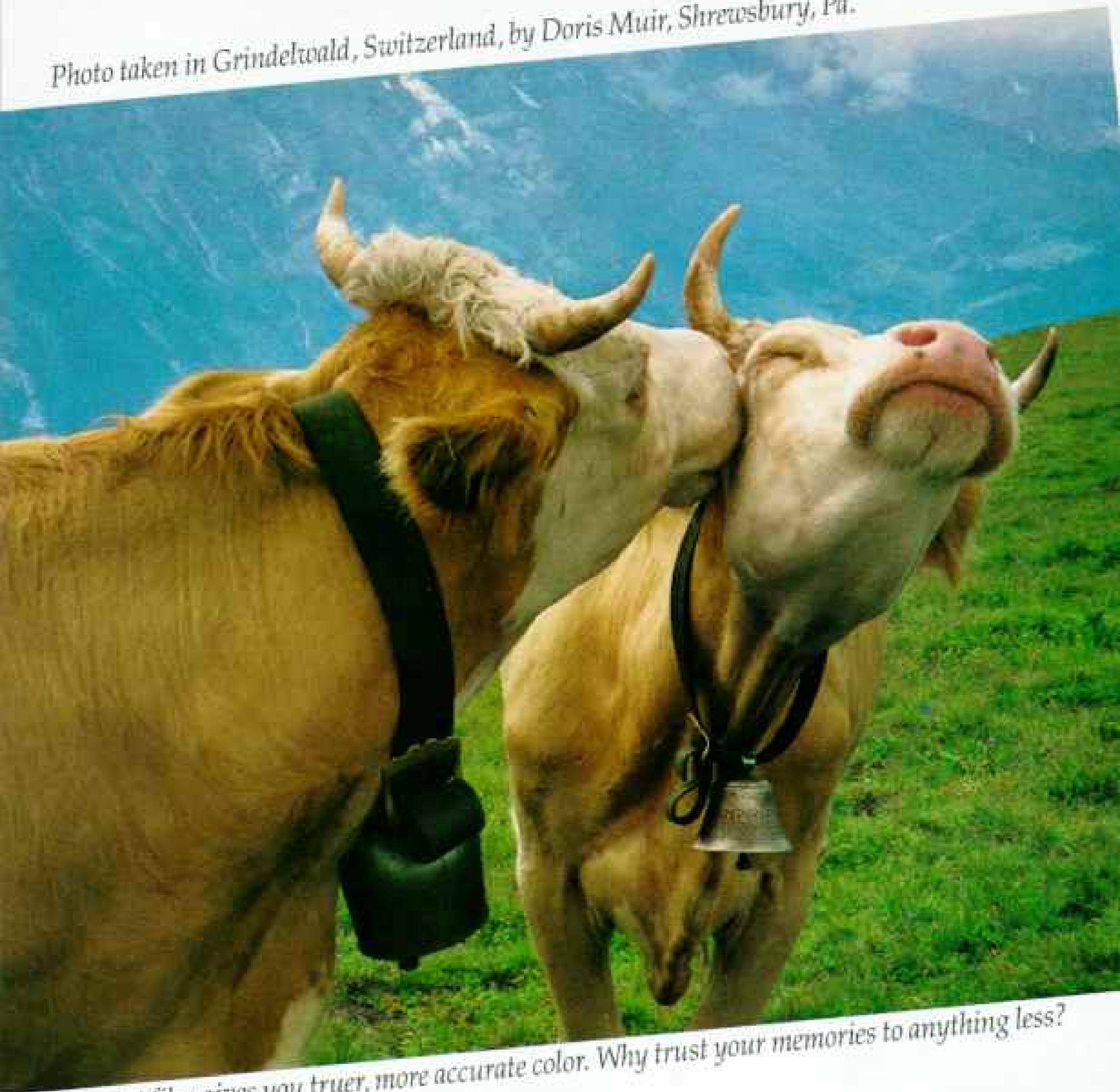
The Wyeth legacy is a powerful and continuing one.

William James

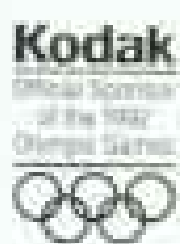


© Eastman Kodak Company, 1991

Photo taken in Grindelwald, Switzerland, by Doris Muir, Shrewsbury, Pa.



No print film gives you truer, more accurate color. Why trust your memories to anything less?



Show Your True Colors.™



"EDDIE, YOU'VE COME BACK. IT'S A DREAM
WE'LL NEVER DANCE ALONE AGAIN."



COME TRUE

IN THE REAL WORLD, IF YOU DON'T TAKE THE RIGHT STEPS FOR YOUR FUTURE, YOU MIGHT NOT GET ANYWHERE.

In what promises to be a turbulent decade ahead, a lot of people are going to need the knowledge, experience and financial services The Prudential provides, to help make their dreams come true.

In the real world, for example, one of the most important decisions you'll have to make is choosing an insurance policy. At The Prudential, we realize how confusing insurance terminology can be. That's why our agents are trained to answer as many questions as you may have, as often as you like, in simple terms you can understand.

If you're seeking the right investments for the future, talk to our people at Prudential Securities. We believe that even in difficult times, there's still money to be made. Through keen insight and thoughtful analysis, we'll offer you investment alternatives that can help bring you closer to the financial security you're looking for.

And when it comes to buying or selling your home, you can get expert help from The Prudential Real Estate Affiliates. With our nationwide network of professionals specially qualified to Prudential's standards and our innovative computer system, we can do everything possible to address your real estate needs.

So, if you're looking for the right steps to choreograph your future, just make your move to the companies of The Prudential and build your future on The Rock.[®]



The Prudential 

BUILD YOUR FUTURE ON THE ROCK.[™]



THERE'S BEEN A LOT OF TALK about the environment lately. But out on Chesapeake Bay, sailing around on a vintage skipjack, a group of school kids are learning that when it comes to the environment, actions speak louder than words.

Myrtha Allen, Environmental Sciences teacher at P.S. 405, Baltimore, explains, "Most of my kids are city born and bred. They live in apartments, they get their milk in cartons, their eggs in those styrofoam containers. They were about as interested in the environment as they are in

“IT WAS THE FIRST FISH
Jawan had seen that
WASN'T SURROUNDED
by french fries.”

MYRTHA ALLEN, Teacher

homework." She smiles at a nearby eight-year-old. "And who can blame them? Some of them, like Jawan here, had never even seen a live fish before."

That's where the Chesapeake Bay Foundation stepped in. Since 1966, when it started in Annapolis, Maryland, with a rented fishing trawler and little else, the Foundation has taken more than 300,000 students out into the Bay to experience the environment first hand. And at the same time making them aware of how important their contribution is to the future of the planet.

Myrtha puts it simply. "To get these kids wanting to clean up the world, we've got to get their hands dirty."

And they do. They get very dirty.

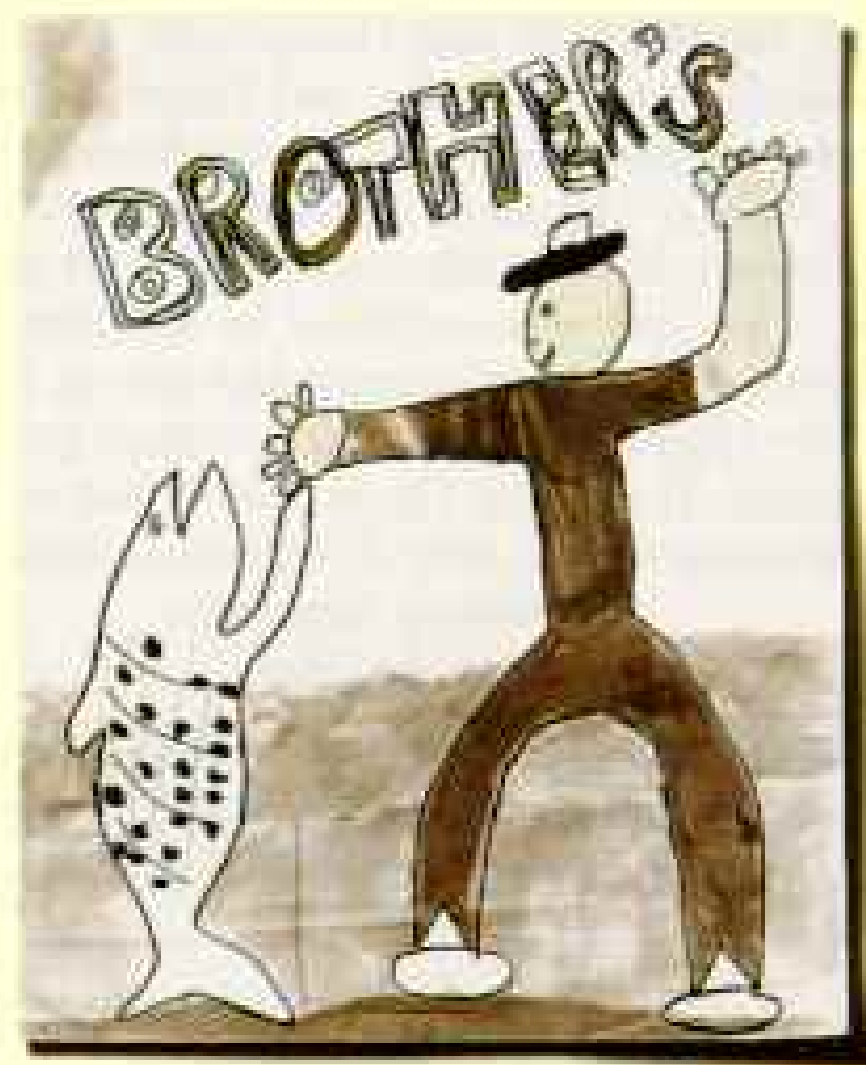
"Oh yeah," chuckles Myrtha, "we do it all. Once we threw a net in just to see what we'd get. When we pulled it up, sure enough there were the milk cartons, the soda cans, the egg containers. And flapping around in the middle of it all was this big, cranky striped bass. You should've seen their faces.

"We took 20 little consumers out on a boat that day. We came back with 20 budding environmentalists."

At Toyota, we're proud that through the

support we give to the Foundation more kids like Jawan will be able to experience our fragile environment first hand. And hopefully start playing an active part in preserving it.

Is the program working? "These kids are organizing neighborhood recycling drives,



they're writing letters to Senators. Take a look at these posters some of my students have been doing."

The classroom walls are alive with crayon and pencil. Bright orange crabs. Smiling oysters. Families of ducks.

And one poster that stops everyone. It's of a smiling little boy holding hands with a big striped bass. And boldly scrawled above both their heads is one word: "Brothers".

And it's signed by Jawan. Age eight.

TOYOTA

INVESTING IN THE INDIVIDUAL

Forum

Eastern Europe

I liked "Dispatches From Eastern Europe" (March 1991) even if reading it was like going back in my bad dreams. I lived in eastern Czechoslovakia for almost 35 years. The majority there are Slovaks, but there are also Hungarians, Ukrainians, Poles, Germans, Czechs, and Gypsies, and very strong religious divisions among Roman Catholics, Greek Catholics, Russian Orthodox, Jews, and others. Hate dominates everyday life and politics. This hate was exploited by the communists and before them by German and Slovak Nazis. It will be exploited by any other political group that emerges. That's why I have doubts that achieving democracy will be easy. It will take generations.

VOJTECH ACKERMAN
Houston, Texas

In June 1990 my Navy Reserve training took me to Poland for the first visit by U. S. Navy ships in 67 years. The outpouring of affection for America

and her Navy during the three-day port call was astonishing. Our sailors were treated as celebrities in Gdańsk, Sopot, and Gdynia. More than 30,000 people came aboard the two ships opened for visiting. Although vestiges of the bad old days remain, the Poles I met enjoy their new freedoms and want closer ties with the United States.

LT. COMDR. MARK S. JOHNSON
USNR
Eden Prairie, Minnesota

One photograph (pages 6-7) typifies a disturbing phenomenon in our society — Polish, American, or otherwise. Two young men (neofascists) armed with clubs attack a student. Around them a crowd rushes to the scene. At least 12 adults are focusing on the violence. All have the same objective: to get a good photograph. We will do almost anything to record violence but apparently nothing to stop it.

THOMAS A. BODDEN
Wailuku, Hawaii

Lechuguilla Cave

Tim Cahill deserves highest praise for doing the caving and for writing such an intriguing report. However, I could find nothing about how to pronounce Lechuguilla or about the derivation of the word or why it was selected to identify such an awesome wonder.

ROBERT E. POERSCHKE
Wake Forest, North Carolina



1. Worldwide Acceptance.
2. Hand-Delivered Refunds.

Lechuguilla (pronounced lay-choo-GHEE-ah) was named for a local plant, *Agave lechuguilla*, commonly found around the cave's entrance.

During the recent rescue of caver Emily Mobley from Lechuguilla Cave, it was great to turn to your magazine for the exact location and for photographs showing the degree of difficulty rescuers were experiencing. The *Today Show* even used your map of the cave on their show (April 3). I wonder how much damage was done to bring Ms. Mobley out of there safely and how polluted the underground waterways are now.

LESLIE COPPEDGE
San Antonio, Texas

The rescuers took every precaution to protect both Ms. Mobley and the cave. Little if any damage was done to cave formations, and no waterways had to be traversed to remove her.

Montreal

Your analysis of our French culture was very well done. It is refreshing to know that there are people from different backgrounds who understand what is going on in Quebec. We have been trying to keep our ancestral culture for the past 300 years, but it is becoming more difficult. It surpasses politics and is in everyone's heart and soul. Meanwhile, we have been treating Native Americans the same way we have been treated and worse. Now that they are

standing up for their rights, others are asking the same question: What do Native Americans want?

CLAUDE M. DAVID
St. Lazare de Vaudreuil, Quebec

Most Canadians want Quebec to remain part of Canada, even if it means granting the government of Quebec more control over its destiny.

RICHARD DEMPSEY
Vancouver, British Columbia

Your article captured the francophones' desire to be recognized. But you did not broach the bitterness and disappointment of English Montrealers who, having been relegated to second-class citizenship in their own city and province, decided there was no alternative but to leave. There is bitterness because of the failure of the federal government to challenge the language laws that made it a crime to place an English "For Sale" sign in front of a home. There is disappointment because Montreal was our city too, and we made up part of its vitality.

PETER PELLERIN
Huntington Beach, California

Recently civic fathers have promoted the city as Canada's Ville Universitaire, or University City, hoping to attract high-tech industries in the way that Boston and Silicon Valley in California have



1. Worldwide Acceptance.
2. Hand-Delivered Refunds.
3. Supports the U.S. Olympic Team.

On the face of it, Visa Travelers Cheques and the travelers cheques from American Express appear to be the same.

But the reality is, whenever you buy Visa Travelers Cheques, we'll make a donation to the U.S. Olympic Team. So not



only can you feel confident about the cheques you carry, you'll also have helped our Olympic athletes in their bid for victory in '92.

So now that you see these travelers cheques for what they really are, your choice should be clear.

been doing for years. Yet you omitted my alma mater, Concordia University, one of Canada's, and certainly Montreal's, more interesting and respected universities.

JOHN N. ECONOMIDES
Montreal, Quebec

Giant Octopus

I'm not surprised that biologists consider the octopus to have the same intelligence as a house cat. Almost 20 years ago at Dulles Airport I picked up the first octopus to be displayed at the National Aquarium. The curator and I placed her in a tank equipped with caves and waited. She methodically explored the rocks, then came to the surface to study her landlords. She extended an arm, felt the burlap around the tank, and glared at us. She studied the wall and air pipe. Seconds later she extended an arm, did a one-armed chin-up, and was up the wall. After a few days she settled in under a tank lid that finally outsmarted her, and until she laid her eggs and wasted away, she enjoyed being petted and hand-fed.

TOM OPILLA
Laurel, Maryland

Santa Fe Trail

A Civil War battle occurred on the trail. Known as the Gettysburg of the Far West, the Battle of Glorieta Pass marked the height of the Confederacy's western ambitions and the end of its Territory of Arizona. Colorado troops stopped the Texas Confederates in their attempt to move toward the gold fields and the West Coast. Excavations have just uncovered the remains of some participants.

MAJ. WARNER D. FARR, USA
San Antonio, Texas

The near perfect blend of pictures, personalities, and story made this one of the most entertaining and informative articles in a long time. The Santa Fe Trail Association is mentioned. If membership is open, I would like to join.

JIM REED
Leland, Mississippi

Write to: Santa Fe Trail Association, Santa Fe Trail Center, Route 3, Larned, Kansas 67550.

One important story that should not be ignored is the marking of the trail by the Daughters of the American Revolution from 1906 to 1914, with granite markers approximately every 15 miles. Almost all of these markers are still standing.

MIKE McDONALD
Santa Fe, New Mexico

At first I thought the photograph by Bruce Dale on pages 112-113 must be an Albert Bierstadt painting. Bierstadt's most severe critics accused him of overdoing or overdramatizing his landscapes. Can it be that this is how he "saw" his landscapes?

ROBERT V. SPRATLEY
Succasunna, New Jersey

North Pole Ski Trek

I appreciate the physical ordeal encountered by the authors on this great challenge to reach the North Pole under their own power, totally unassisted. However, I fail to see the justification for killing a polar bear, a vulnerable species protected by the U. S. Marine Mammal Protection Act. That an incident might occur was predictable, so why were precautionary measures to avoid a lethal encounter not taken? The damage to a part of the Arctic ecosystem negates the "victory." The sensationalism inherent in the photographic sequence of the kill should have been avoided.

HEIDI ENSLEY
San Diego, California

When I asked a Norwegian friend if he had read the remarkable story about two countrymen, he said yes and added that there are still some Vikings left in the world.

ARE VAN OEVEREN
Vancouver, British Columbia

Forum

I was taken aback by unfair comments on Lithuania in the March 1991 Forum. One writer says Lithuania does not deserve a place in the "Common European House" because of its alleged intolerance against minorities. Such arguments, which by curious coincidence are used by the Kremlin hardliners, have been more than dispelled by the February 9 elections, when an impressive percent of the minorities, including Russian residents, voted for independence. In the aftermath of Bloody Sunday, January 13, the biggest spontaneous pro-Lithuanian demonstrations were by Russians in the streets of Moscow.

M. G. SLAVENAS
Buffalo, New York

Earth Almanac

Your "Cars Stay Home; Mexico City Fights Air Pollution" is an understatement of the pollution problem in Mexico City, which deserves a much larger article in your magazine. The problem stems from the use of very low quality fuel in cars, trucks, buses, boilers, generating plants, and everywhere that oil-derived products are needed for energy.

In early March we had the worst air pollution indices known to us, but city authorities didn't suspend school or delay the start of classes until after rush hour. Children, especially small ones, are constantly ill with sore throats, coughs, and irritated noses. The city government is doing too little, too late.

JAIME HALE
Mexico City, Mexico

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

Discovered buried in India 2800 years ago.

India remains the oldest source of diamonds.

Since first unearthed between the Godavari and Krishna rivers, the cherished diamond has been considered a harbinger of victory and an emblem of fearlessness.

Hindu writers believed that if a flawless diamond were offered up to the gods, the donor could attain Nirvana.

Through the centuries, the diamond remains among the most treasured and costly of time-honored stones.

Yet isn't it worth it for the woman you love?

A diamond is forever.



Nori (glutinous rice paste) is carefully applied to precise designs outlined on a tan (bolt) of pure white silk. After dyeing and steaming, paste-coated designs "resist" coloring.

Designs are recoated with paste and the entire tan of silk is redyed. Color must be perfectly even because all parts of the kimono are cut from a single tan.



Following age-old practice, fabric is washed in the Asano River to remove excess paste and dye. Tile-roofed huts on the riverbank are Yuzen workshops.



Adding minute details to an immense pattern, each kimono artist brings touches of originality to the traditional process of Yuzen (multicolored paste-resist dyeing).

Goshiki (five colors) and old motifs from nature are combined in fresh new ways. Ultravision projection TV captures the classic and contemporary art of Yuzen.

Enter the world of Yuzen: kimono art of Japan.

Almost 300 years ago, Miyazaki Yuzensai brought kimono art to life with a revolutionary dyeing process. Now Hitachi explores the art of Yuzen with our revolutionary 46-inch Ultravision projection TV, featuring 825-line horizontal resolution and 3-way surround sound. Through the art of creative research and imaginative design, we bring a brilliant spectacle of faces and places, sights and sounds to your life. Hitachi. Like the masters of Yuzen, we're dedicated to a colorful tradition of innovation.



46-inch **ULTRAVISION** CU4601B
Innovated TV presents



2 out, bottom of the 9th.
You'd better catch it.

Certain moments are meant to be saved forever. Which is easy to do provided you have the right equipment.

That's why Canon has a full line of advanced, simple to use 8mm camcorders, each designed to help you relive those moments long after the action is over.

From the affordable E61 to the compact E08 to the sophisticated L1 with interchangeable lenses, every Canon camcorder gives you versatile features like autofocus power zoom lenses and

The E61 features an f8 power zoom lens and a 2 lux low-light rating.



wireless remote control capability. And each Canon lens is expertly crafted so you get a clear, sharp image. So whichever model you choose, you'll be well equipped whether you're looking to save the inning, the game or the whole season.

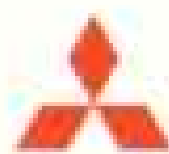
This summer look into a Canon camcorder. After all, there'll be some memorable moments out there just waiting to be caught.

Canon
Canovision 8



The Official Camcorder
of Little League Baseball





The name Mitsubishi means "Three Diamonds." And for 75 years, the triple diamond has represented the company's unbending quality standard.

controlled suspension) and TCI™ (dual-mode traction control).

A gracious host, the Diamante incorporates ETACS-IV™—a system

exhaustive safety engineering: from rigid passenger shell buffered by a crumple zone, to driver-side airbag and ABS anti-lock brakes.*

INTRODUCING DIAMANTE. A NEW LUXURY PERFORMANCE SEDAN, BRILLIANT IN EVERY FACET.

Now, on the eve of its diamond anniversary, Mitsubishi Motors proudly announces the highest expression of that standard—the new Diamante. A new luxury performance sedan so thoroughly accomplished, it has already won Japan's coveted "Car of the Year" award. Against a field that included the Acura Legend, Acura NSX and Infiniti G20.

Everywhere, the Diamante's design reflects a quest for integration and balance.

Beginning with a V6 engine that is powerful, achieving 202 horsepower in the 24-valve version. Yet also serenely smooth and quiet, befitting a luxury sedan.

Likewise, the suspension is fully independent, with a multi-link rear design, to strike a balance between tenacious roadholding and a gentle ride.

These handling traits can be enhanced, in the Diamante LS, with optional Active-ECS™ (electronically

that quietly extends ten courtesies, from automatic doorlock above 12 mph, to automatic headlight shutoff.

Every object in the cabin exudes

All told, the Diamante offers more performance, luxury and technological innovation than many established luxury cars. Even some costing



quality, both to the eye and to the touch. The computer-designed front seats provide extra support at anatomical centers of gravity. Virtually every luxury amenity is available, from leather seating surfaces to complete prewiring for an optional cellular phone.

Of course, this wealth of performance and luxury is blended with

considerably more.

You are invited to take a test drive and judge for yourself. Please call 1-800-447-4700 for your nearest Mitsubishi Motors dealer.

MITSUBISHI 
The word is getting around.

*ABS optional on Diamante, standard on Diamante LS.



IF YOU CAN MAKE IT IN THE MOUNTAINS, YOU CAN MAKE IT IN THE JUNGLE.

The city you return to after a week with Outward Bound® won't be any different from the one you left behind.

Trains will still leave the station without you. Your dollar won't buy any more than anyone else's. And no one will be waiting at your doorstep to offer you a better job.

One thing, however, will change. You. (Which, of course, changes everything.)

The mountains, rivers, oceans, and trails of Outward Bound will leave you stronger, and more confident.



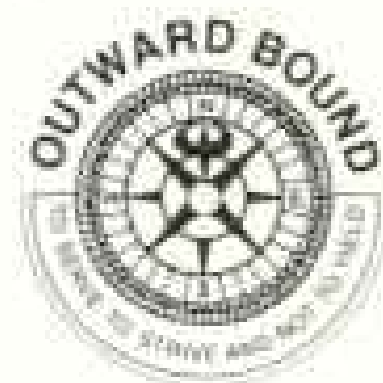
You'll have a better understanding of yourself. And a feeling that you can accomplish anything you put your mind to.

All of which leave you better equipped to beat a path to success through the most challenging jungle of them all.



There are over 600 Outward Bound courses in 20 states to choose from: hiking, sailing, skiing, canoeing, even dogsledding to name a very few. None require special skills or training.

~~~~~  
Find out which one is right for you. Call 1-800-243-8520 today. Ask for a free color catalog. Or just write to Outward Bound USA, 384 Field Point Road, Greenwich, CT 06830. Financial aid and academic credit available. 1-800-243-8520



## Fergie on a rock

—by—  
Ann Crump,  
painter

The Nikon N6006 is a serious SLR that almost anyone, anywhere can pick up anytime and have fun with.

Case in point, one Ann Crump, watercolorist and oil painter from Belvedere, California.

In other words, she's not a professional photographer.

Yet, using the N6006 and a 28mm Autofocus Nikkor lens, she and her three-year-old pug Fergie have created nothing short of a masterpiece.

Or at least one killer dog picture.

The N6006 is why. It focuses automatically in light as dim as a single candle, or you can focus manually.

It selects the proper exposure automatically, or lets you do it.

You can select from a Spot Meter, a Center-Weighted Meter, or the Nikon Matrix Meter, which reacts instantly when the action is moving fast or the light changes unexpectedly.

Here, the built-in flash automatically brightened the foreground while letting the sun shine through in the background.

Maybe you thought a picture like that was too difficult.

Well, Ann Crump did it with just one hand, while holding a dog biscuit over her head.

Quite a picture in itself.

The Nikon N6006 is controlled by a convenient dial and a simple multi-button keypad. An LCD readout clearly shows you what you're doing. Press any two buttons

who use 35mm use Nikkor lenses.

In other words, the N6006 is not a toy.

It's the camera designed for people with dogs to walk, kids to chase and a job to go to.

And somewhere in between all



See the N6006 at authorized Nikon Dealers. Just look for this symbol. For more about the N6006 and the benefits of the exclusive Nikon MasterCard, call 1-800-NIKON-11.



on the keypad and the camera reverts to totally automatic.

It forgives you, instantly.

With Focus Tracking, the N6006 can even keep moving subjects, such as cars or bikes, in focus.

Its motor advances the film fast and rewinds automatically.

You can choose from twenty interchangeable autofocus Nikkor lenses. Nearly seven out of ten pros

that, pictures to make.

Well, with the N6006, it's not any harder to use a Nikon. It's not any harder to take the kind of pictures you've always dreamed of instead of just plain old pictures.

After all, the shot above was made by an ordinary person using an extraordinary camera.

Could it possibly be more beautiful?

**Nikon**  
The world's most  
productive people



Fergie, ordinary dog  
Ann Crump, regular  
person. They took a  
walk with the N6006  
and some beef ribs.  
Art happened.

The N6006's autofocus  
built-in 311-Dark  
interchangeable  
Nikkor lenses. Call  
1-800-NIKON-11  
for a free booklet.





# Geographica



JIM BRANDENBURG, NIMROD PICTURES

## Mystery of the Shrinking Red Deer

**H**undred-thousand-year-old bones found on the island of Jersey in the English Channel may help solve an old mystery. Scientists have long known that during the Pleistocene epoch, when seas rose and fell, large mammal species caught in areas that became islands often grew smaller over time. But no one knew how rapidly this dwarfing occurred.

Zoologist Adrian Lister of the University of Cambridge may have an answer. At one site on Jersey, dating back 238,000 years to when the island was attached to the mainland, he found the remains of normal-size red deer (*NATIONAL GEOGRAPHIC*, October 1986), which weighed about 450 pounds. At a second site, dating back 119,000 to 123,000 years, he found bones half the normal length. This dwarf probably weighed only 75 pounds.

Knowing that the island was isolated by rising sea levels about 125,000 years ago, Lister calculates that the dwarfing process took 6,000 years or less. He believes the dwarfism resulted from Jersey's limited food resources: Amid scarcity, smaller animals had the best chance for survival. But when sea levels

dropped again, the island was temporarily reunited with the mainland, and the animals vanished. Perhaps, Lister says, they bred with mainland deer, couldn't compete for food, or became prey for the influx of mainland predators.



PAINTING BY PETER A. SAWYER

## Finding—Maybe Losing— an Unknown People

**A**lmost a century ago a traveler's report vaguely mentioned a tribe called the Birale living near a river in Gamo Gofa Province in southwest Ethiopia (*GEOGRAPHIC*, May 1983). But nothing was heard of the tribe again until the mid-1980s, when an English linguist met a Birale woman at a river crossing. He recorded about 60 words of her language. Other linguists were excited: The language seemed to bear little relationship to the tongues in the region.

Last year Harold Fleming of Boston University, an anthropologist and expert on African languages, led an expedition to seek out the Birale. The scientists found that the tribe had just 89 remaining members. Only 19 elders still speak the tribal language, Ongota.

The Birale live in grass huts, fish in the river, and hunt gazelle and antelope on a nearby savanna using bows and arrows—they fear guns.

The men tend to marry outside the group and raise children who, though they see themselves as Birale, speak the outsiders' language. Thus the language, and perhaps the tribe itself, may be doomed. Fleming believes Ongota is an ancient branch of the Afro-Asiatic linguistic family, which includes Arabic, Hebrew, Berber, and Amharic—the official language of Ethiopia.

## Data Hitch a Ride on a Meteorite Trail

**E**very day, hundreds of millions of meteorites, most no bigger than a grain of sand, hurtle into the earth's atmosphere, usually burning up before they hit the ground (*GEOGRAPHIC*, September 1986). Though the ionized trails left by meteorites last only seconds, they can be used, much like satellites, to relay data. Since 1977 the U. S. Soil Conservation Service has pioneered use of this process, called meteor-burst communications, to help

Quick, do you know  
the first name  
in microprocessors?

---

486™

---

386

---

386sx™

# Geographica

monitor water supplies in 11 western states.

Dubbed **SNOTEL**, for snowpack telemetry, the system allows two master stations in Boise, Idaho, and Ogden, Utah, to collect data on snowpack water content, precipitation, and temperature from 570 unmanned sites in remote areas.

The master stations query the monitors by emitting a very-high-frequency radio signal. In a hit-or-miss fashion—but one reliable more than 98 percent of the time—the signal encounters a meteorite trail 50 to 75 miles above the earth and is reflected back and caught by the remote station. The remote replies; the sequence takes less than a second. The data are used by many agencies to help predict floods and manage water for irrigation, power generation, and recreation.

## Travelers May Again Get Kicks on Route 66

**I**t wound, as Bobby Troup's song put it, "from Chicago to L.A. [actually Santa Monica], more than 2,000 miles all the way." But when the Interstate Highway System came along, U. S. Route 66 faded.



## Bird Gives Scientists Something to Chew On

**A** hummingbird with teeth? The tooth-billed hummingbird has been known, though rarely seen, for a century, but nobody has been able to figure out the purpose of the toothlike projections on its bill. As part of a major study to try to answer this and other questions about hummingbird evolution, Robert Bleiweiss of the University of Wisconsin went to Ecuador last year with National Geographic Society support.



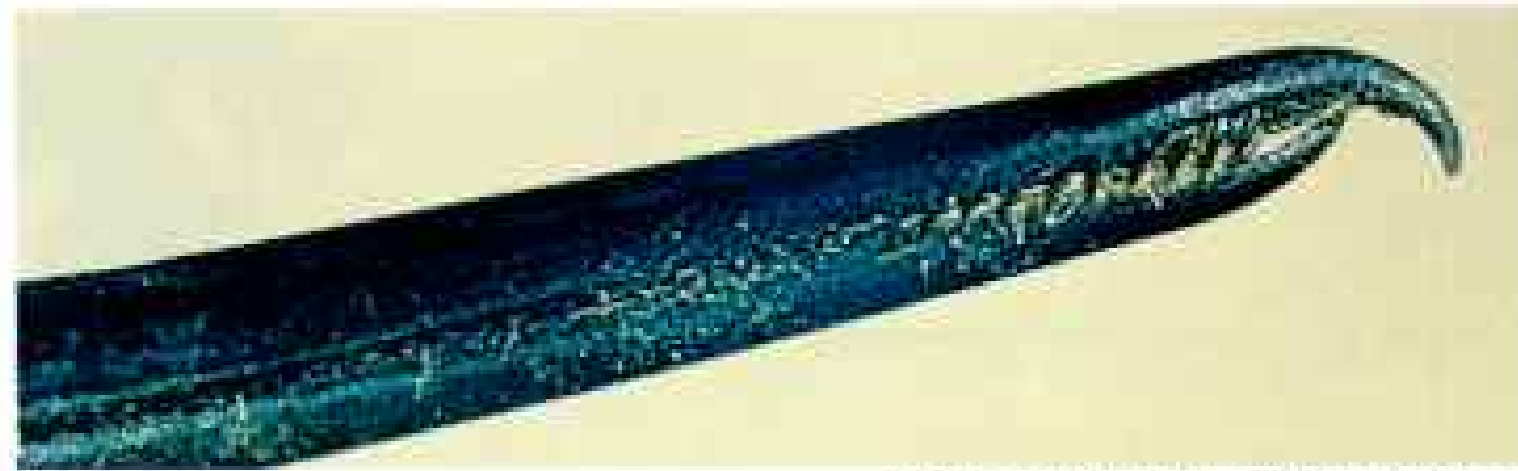
THE WALLIS COLLECTION/ROUTE 66 THE MOTHER ROAD

Now the federal government, working with preservation groups, is evaluating ways to commemorate the road that helped shape how Americans travel. Route 66 was the "mother road" for Okies who fled the Dust Bowl of the 1930s for a better life in California (*GEOGRAPHIC*, September 1984). In the 1960s it was celebrated in a television series.

A 1990 law directs the National Park Service to make a two-year study of how to save what is left of Route 66 and interpret its significant features. Aides to the law's sponsor,

New Mexico Senator Pete Domenici, say the study may propose saving buildings and signs that remain where the road still exists, encouraging economic renewal in the many small towns where Route 66 was Main Street.

Tom Snyder, a Californian who heads the Route 66 Association, says he would like uniform signs to "create a visual image of continuity" in the eight states the road passes through. "Route 66 was an experience in itself. The going was as important as the destination," he says.



ROBERT BLEIWEISS (LEFT); DONALD E. CHANDLER

Weighing about a quarter of an ounce, the tiny bird lives in lowland rain forests from eastern Panama, south along the Pacific slope of the Andes to Ecuador. Bleiweiss and his colleagues set up shop in one of the most humid areas of western Ecuador and soon heard the bird's distinctive call. But they seldom caught sight of its drab plumage, nor did they see it eat or make use of its mysterious bill. Mostly, they heard it "zipping around the forest," says Bleiweiss. The team managed to net nine of the mysterious birds. "We felt

lucky to find them," he says.

Bleiweiss hopes to determine where the species fits into the hummingbird family tree and learn more about the bird's behavior. He may not have much time. Logging threatens its habitat, especially in western Ecuador. "Here is a marvelous creature that we know little about," he muses. "In about 20 years we may not be able to study it."

Suggestions for *GEOGRAPHICA* may be submitted to Boris Weintraub, NATIONAL GEOGRAPHIC magazine, Box 37357, Washington, D. C. 20036, and should include the sender's address and telephone number.

# Time's up.

Intel 486™

Intel 386™

Intel 386SX™

You scored perfectly. Because Intel is the world's leader in microprocessor design and development. It's also the company that introduced the first microprocessor. And when it comes to investing money into the technology, Intel is first again. Giving you the assurance that with an Intel microprocessor inside your computer, you'll have the power and compatibility to take you into the future.

So if you want all that working for you, make sure the 386SX, 386 or 486 computer you choose has the first name in microprocessors inside. Intel.

**intel**<sup>®</sup>  
The Computer Inside.™



# What's right wi

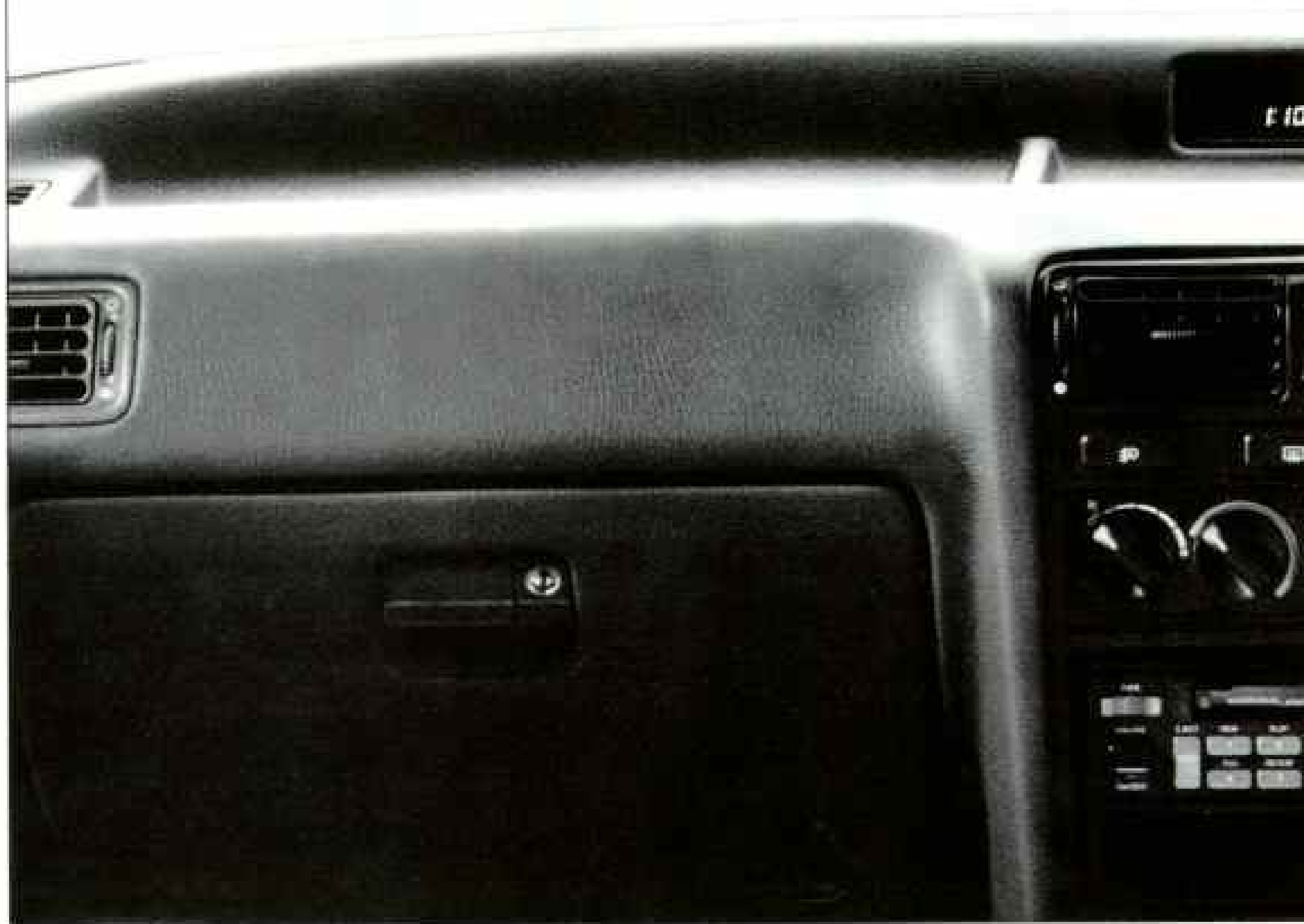
You won't see very many Accord Coupes that look like this one. There is no question about that. Unless, of course, you happen to work at Honda's factory located in Marysville, Ohio. Or live in Japan.

Carefully built and assembled at one of the automotive industry's most advanced manufacturing facilities, the

Accord Coupe is made only in America. But that's not the only place it's sold.

Thousands of new Accord Coupes are exported to Japan each and every year. Where they are prized for their engineering, value and craftsmanship. Just as they are here.

But the other reason the Japanese are fond of this car is because it comes



# th this picture?

with right-hand drive. Which is fitting since they drive on the opposite side of the road in Japan.

Mind you, producing both right-hand and left-hand drive cars from the same assembly line takes a lot of extra effort. The fact that Honda is the only U.S. carmaker to do so speaks for itself.

It's this kind of innovation and true

commitment to people's needs which makes Honda, well, Honda.

Because even though we sell more Accord Coupes in America, it's just as important to satisfy our customers in other parts of the world.

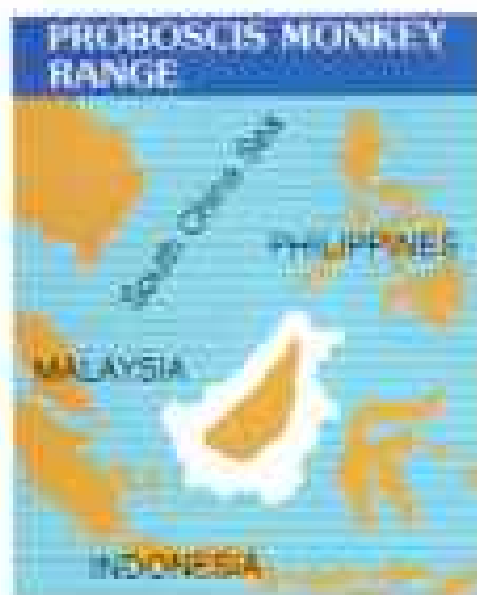
After all, when you look at the big picture, that's what it's all about.

**HONDA**





## WILDLIFE AS CANON SEES IT



### Proboscis Monkey

Genus: *Nasalis*

Species: *larvatus*

Adult size: Length of head and body, 54-76 cm; tail, 52-75 cm

Adult weight: Male, 24 kg; female, 11 kg

Habitat: Mangrove and riverine forests of Borneo

Surviving number: Unknown

Photographed by Andrea Gorzette

Clearly still a youngster with its short, turned-up nose, a proboscis monkey rests near a riverbank, a common gathering place for these monkeys. Because of their specialized adaptation to habitat along rivers and coastal lowlands, proboscis monkeys live in areas that are most likely to be developed, logged, or disturbed due to direct accessibility from the waterways. To save endangered species, it is essential to protect their habitats and understand the vital role of each species within the earth's ecosystems. Color images, with their unique ability to reach people, can help promote a greater awareness and understanding of the proboscis monkey and our entire wildlife heritage.



**COLOR LASER COPIER™**

**Canon**



Watch "NATURE" on PBS, Sunday 8:00 p.m.  
This program is funded, in part, by Canon U.S.A., Inc.

# NATIONAL GEOGRAPHIC MAGAZINE

GILBERT M. GROSVENOR, *President and Chairman*

WILLIAM GRAVES, *Editor*

## SENIOR ASSISTANT EDITORS

WILLIAM L. ALLEN, *Natural History* • ROBERT BOOTH, *Production* • THOMAS Y. CASBY, *Science*

ALLEN CARROLL, *Art* • JOHN B. GARVER, Jr., *Cartography* • DAVID JEFFERY, *Legends*

THOMAS R. KENNEDY, *Photography* • ROBERT W. MADON, *Layout and Design*

G. LOUIS MAZZATENTA, *Contributor* • ELIZABETH A. MOIRE, *Staff* • ROBERT M. PHILL, *Contract Writers*

JOHN J. PUTMAN, *Manufacturing* • LESLEY B. ROGER, *Research* • W. ALLAN ROYCE, *Illustrations*

MARY G. SMITH, *Research Grant Projects* • GEORGE E. STUART, *Archaeology* • PHILIP J. VERILIND, *Expeditions*

## EDITORIAL

**ASSISTANT EDITORS:** Judith Brown, William S. Ellis, Rick Gore, Alice J. Hall, Peter Miller, Mele Severy, Peter T. White, Eric Zingales. **SENIOR WRITERS:** Thomas J. Abernethy, Harvey Arden, Mike Edwards, John L. Elliot, Noel Grove, Bryan Hodgson, Michael E. Long. **SENIOR EDITORIAL STAFF:** Don Bell, Charles E. Cobb, Jr., Boyd Gibbons, Larry Kohl, Douglas B. Lee, Cathy Newman, Cliff Tardy, Jane Yessels, Margaret N. Walsh, Boris Weinstock. **Production:** John L. McClintock. **EDITORIAL STAFF:** Michael Kenna, Thomas O'Neill, Oliver G. A. M. Payne, Peter L. Porteous, A. E. Williams. **RESEARCH:** Michaeline A. Swaneey, *Assoc. Director; Research-Editors:* Camryn H. Anderson, Ann B. Henry, Jeanne E. Peters. **Researchers:** Danielle M. Beauchamp, Judith F. Bell, Catherine C. Fox, Sheila M. Green, Jan Holderness, Anne A. Jamison, Amy E. Kesterian, Kathy B. Maher, Barbara W. McConnell, Abigail A. Tipton. **Legends:** Victoria C. Ducheneaux, Margaret G. Zuckowitz. **Planning Council:** Mary McPeak

## ILLUSTRATIONS

**PHOTOGRAPHERS:** Kent J. Robertson, *Assoc. Director;* Susan A. Smith, *Asst. Director;* Sam Abell, Joseph H. Bailey, James P. Blair, Victor R. Bowtell, Jr., Jodi Cobb, Bruce Dale, Emory Keisler, Joseph D. Lavenburg, George F. Mobley, James L. Stauffield. **Technical:** Claude E. Peironi. **ILLUSTRATIONS EDITORS:** William T. Douthett, *Assoc. Director;* David L. Arnold, Dennis R. Dimick, John A. Echase, Bruce A. McElfresh, Charlene Murphy, Larry Nighwander, Robert S. Patton, Elie S. Rogers, Jon Schneeberger, Susan Weidman, Kathy Moran. **LAYOUT AND DESIGN:** Constance H. Phelps, *Assoc. Director;* Mary Kathryn Glassner, David Griffin. **Typography:** Betty Clayman-DeAiley, Douglas M. McKenny. **ART:** William H. Bond, Christopher A. Klein, *Artists;* Karen E. Gibbs, *Research.* **ENGRAVING AND PRINTING:** William W. Smith, *Director;* Justin R. Whitney, *Assoc. Director;* Judy L. Garvey, Janet C. Novak, Ronald E. Williamson

## CARTOGRAPHY

**Assoc. Directors:** John F. Doer, Allen T. M. Rechin, John P. Shupe, Leo B. Zebarth, *Asst. Dir.:* Harold A. Hanson, Harry D. Kaufman, Richard K. Rogers, Eric Sabbitt. **Geographers:** Ted Dichters. **Map Editors:** Charles W. Gotthardt, Jr., Roger J. John T. Blinzl, Thomas L. Gray, Etelka K. Horvath, Gus Platis, Jon A. Soyre, Thomas A. Wall, Thomas A. Walsh. **Designers:** John A. Borner, Robert E. Pratt, Nancy Schweickart, Sally S. Summers. **Researchers:** John L. Beeson, Diandra T. Beverington-Attardi, Ross M. Emerson, Marguerite E. Hunsaker, Linda R. Krime, Gailther G. Kybos, Mary C. Latham, David B. Miller, Dorothy A. Nicholson, Douglas A. Strobel, Juan J. Valdes, Andrew J. Wabli, Susan Young. **Map Artists:** Roland R. Nichols, *Supv.:* Iskander Badley, Edward J. Holland, James E. McClelland, Jr., Stephen P. Wells, Alfred L. Zebarth. **Computer Cartography:** Charles F. Case, Kevin P. Allen, Richard W. Bullington, Arthur J. Cox, Martin J. Golden, Barbara P. Holland, Jonathan E. Kaut, Ellen J. Landman. **Specialists:** Charles L. Miller, Henri A. Delange

## EDITORIAL SERVICES

**ADMINISTRATION:** Benita M. Swick, *Asst. to the Editor;* Elaine Rice Ames, Marie L. Barnes, Barbara D. Case, Sandra M. Deze, Lillian Davidson, Marisa Domeyko, Carol L. Dumont, Neva L. Folk, Eleanor W. Hahn, Ellen E. Kuhlberg, Katherine P. McGown, Charlene S. Valeri, Ruth Winston. **Picture Requests:** Barbara A. Shattuck. **Travel:** Virginia A. Buchant, Ann C. Judge. **RESEARCH:** Library: Susan Filer Casby, *Director;* David C. Beveridge, Ariane T. Drewes, Carolyn Locke, Marie Straub. **Illustrations:** Maura A. Mulvihill, *Director;* L. Fern Dams, Carolyn J. Harrison. **Records:** Mary Anne McMillen, *Director;* Ann E. Hubbs, Monnet M. Smith. **Correspondence:** Joseph M. Blanton, Jr., *Director;* Lee Smith. **Indexes:** JoAnne M. Blais, Anne K. McCain. **Translations:** Kathryn A. Buzn. **COMMUNICATIONS:** Steve Raymer, *Director, News Service;* Jay Anshelmich, Marilee Cross, Donald J. Frederick, Donald Smith, Robert C. Radcliffe. **Radio:** Dale A. Petroskey, *Asst. Vice Pres.;* Public Affairs: Mary Jeanne Jamison, Barbara S. Moffet, Susan S. Norton. **ADVERTISING:** JoAnne M. Hess, *Director;* Jon H. Latimore, *Trsh. Dir.;* Ronald S. Altman, Scott A. Brader, Robert G. Fitegal, Paul Gorski, P. Andrew van Deym, Gerald L. Wiley

## ADMINISTRATION

**ASST. VICE PRESIDENTS:** Joyce W. Graves, *Asst. to the President;* Carolyn F. Crowell, Robert G. Carey, Joseph S. Fowler, Donna L. Handinger, Thomas E. Kalkosky, Carol E. Lang, Richard A. Mechtler, George E. Newstead, James D. Pridemore, James G. Schmelzer, Carl M. Shearer, Peter F. Woods. **ASST. TREASURER:** Dorothy M. Wagner. **ASST. TO THE PRESIDENT:** Richard E. Pearson, *Business and Chair Affairs;* Kerrie L. Hershberger, Kerrie S. Marsh. **ACCOUNTING:** Laura L. Leigh, Larry E. Dowdy. **ADMINISTRATION:** M. Joan Vitz, *Business Manager;* Mary L. Blanton, Margaret R. Hernandez, Robert V. Koenig, Myra A. McLellan, Jennifer Mosley, Joyce S. Sanford, Myla Stewart, Frank M. Twigger, R. Miles White, Janet C. Yates. **COMPUTER:** Scott Broiden, Warren Burger, William L. Chawing, Curtis L. Conway, Jr., Fred R. Hart, George F. Hubbs, Ronald C. Kline. **EDUCATIONAL SERVICES:** Wendy G. Rogers, Dean R. Gage. **EXPLORATION:** Raula: Nancy W. Heem, Richard McWhaters. **GEOGRAPHY EDUCATION DIVISION:** Robert E. Duff, *Director;* Mary Lee Eiden, J. Jon Ferguson. **HUMAN RESOURCES:** Robert E. Howell, Glenn G. Pepperman, Shirley N. Wilson. **MESSAGE/MAIL SERVICES:** Barbara M. Davis, Carol A. Hrook, Kathleen V. Howard. **PRODUCTION:** Joan Anderson, James V. Bullard, James R. Diamond, Jr., Robert L. Feigt, Deborah A. Jones, Charles T. Kneeland, Lucy J. Lowenthal, F. William Rath. **PURCHASING:** Thomas L. Fletcher, Edmund E. Lapan. **FOREIGN EDITORS:** Robert W. Hernandez, *Director*

## PRODUCTION SERVICES

**QUALITY:** Frank S. Oliviero, Bill M. Aldridge. **PRE-PRESS:** Geoffrey T. McConnell, Martin G. Anderson, Billy B. Burnett, Richard A. Bendeck, David H. Christian, Phillip E. Flude, Bernard O. Quarrick, John R. Raap. **PHOTOGRAPHY:** Law: William S. Petrim, James H. Trutt, Alfred M. Yee. **PRINTING:** Hans H. Wegner, Joseph M. Anderson, Sherrie S. Harrison. **ADMINISTRATION:** Lawrence F. Ludwig, *Director;* Joan S. Simms

## ADVERTISING

Joan McCraw, *Vice President and Director;* Debra J. Grady, *New York Manager;* O. W. Jones, Jr., *Detroit Manager;* James D. Shepherd, *Western Manager;* Philip G. Reynolds, *Special Account Manager;* Laurie L. Kutsche, *Chicago Manager;* Michel A. Boutin, *International Director,* 90, Champs-Élysées, 75008 Paris; Bernadette Lantz, *International Manager,* New York. **Washington:** Alex MacRae, *Marketing/Sales Development;* Pandora B. Todd, *Production;* Sarita L. Muffat, *Operations;* Renee S. Clepper, *Research;* Gail M. Jackson, *Production*

## TELEVISION

Timothy T. Kelly, *Vice President and Director;* Tom Simon, *Co-Executive Producer;* Julia Mair, *Programming;* Sean Burke, *Business Operations;* Todd Berman, *Marketing;* Kathleen F. Teter, *Public Relations;* Patricia Gung, *Film Library;* George N. Lampathakis, Marjorie M. Mooney, Nida L. Shrewsberry. **EDUCATIONAL FILM:** Sidney Platt, *Director;* Donald M. Cooper, *Assoc. Dir.;* Suzanne K. Poife, Carl E. Ziehe

## EDUCATIONAL SERVICES OF THE SOCIETY

ROBERT L. BREEDEN, *Executive Advisor to the President*

Donald J. Crump, *International Publications;* Stephen J. Hubbard, Carolyn W. Jones. **BOOK DIVISION:** William R. Gray, *Asst. Vice President and Director;* Margery G. Dunn, *Senior Editor;* John G. Agnone, Greta Arnold, Leah Bendavid-Vit, Judy Boh, Jane H. Buxton, Victoria Cooper, Richard M. Crum, Mary Dickinson, Susan C. Eckert, Karen F. Edwards, Tosi Eugene, Ron Fisher, Patricia F. Frakes, Victoria D. Garrett, Mary Ann Harris, Carlinda E. Hill, Soez B. Kehl, Ann N. Kehall, Charles Kugod, Marianne B. Konzora, Artemis S. Lampathakis, J. Edward Lanowette, Bonnie S. Lawrence, Rebecca Lescaze, Sandra F. Lesterman, Tom Melham, H. Robert Morrison, Elizabeth Newhouse, Melanie Pat-Corner, Barbara A. Payne, Thomas B. Powell III, Cynthia Ramsay, Cindy Rose, Margaret Sedeen, Gene S. Stuart, Penelope Timbers, Jennifer C. Urquhart, Richard Wain, Marilyn Williams. **MAGAZINE DIVISION:** David P. Johnson, *Director;* Douglas E. Hill, *Financial Director;* Traveler: Richard Brandt, *Editor;* Paul Martin, *Managing Editor;* Lyle Rosborough, *Art Dir.;* World: Pat Robbins, *Editor;* Susan M. Tejada, *Managing Editor;* Ursula Vosseler, *Art Dir.;* Charles E. Herron, *Senior Illustrations Editor.* **EDUCATIONAL MEDIA:** George A. Peterson, *Asst. Vice President and Director;* Jimmie Abernethy, Julie V. Agnone, David Beason, Rick Brunds, Monica P. Bradsher, James B. Caffrey, Carolyn Hatt, Janet Hoot, Jr., Turner Houston, Betty G. Katcher, Louise C. Millikan, Lisa Olney, Linda Rinkinen, Barbara Seebert. **PUBLICATIONS ART:** John D. Gani, Jr., *Director;* Virginia L. Bana, *Assoc. Dir.;* Peter J. Balch, Gary M. Johnson. **MANUFACTURING:** George V. White, *Director;* John T. Dunn, *Assoc. Dir.;* Robert Messer, Gregory Stone



## NATIONAL GEOGRAPHIC SOCIETY

*"For the increase and diffusion  
of geographic knowledge."*

THE NATIONAL GEOGRAPHIC SOCIETY is chartered in Washington, D. C., as a nonprofit scientific and educational organization. Since 1890 the Society has supported more than 4,000 explorations and research projects, adding to knowledge of earth, sea, and sky.

GILBERT M. GROSVENOR, *President*

Senior Vice Presidents

ALFRED J. HAYRE, *Treasurer and C.F.O.*

JOHN T. HOWARD, *C.O.O.*

MICHEL A. ENGLISH

RAYMOND T. McELLIOTT, JR.

ROBERT B. SIMS

Vice Presidents

FREDERICK C. GALE, JOSEPH B. HOGAN,

JAMES P. KELLY, ADRIAN L. LOFTIN, JR.,

ROSS L. MULFORD, H. GREGORY PLATT

SUZANNE DUPRÉ, *Corporate Counsel*

## BOARD OF TRUSTEES

GILBERT M. GROSVENOR, *Chairman*

OWEN R. ANDERSON, *Vice Chairman*

LLOYD H. ELLIOTT, *Vice Chairman*

JOE L. ALBRITTON

*Chairman, Riggs National Bank*

THOMAS E. BOLGER

*Chairman, Executive Committee, Bell Atlantic*

FRANK BORMAN

*Chairman and C.E.O., Paines Corporation*

LEWIS M. BRANSCOMB

*Kennedy School of Government, Harvard University*

ROBERT L. BREEDEN

J. CARTER BROWN

*Director, National Gallery of Art*

WARREN E. BURGER

*Chief Justice of the United States (Ret.)*

MARTHA E. CHURCH

*President, Hood College*

MICHAEL COLLINS

*President, Michael Collins Associates*

GEORGE M. ELSEY

*President Emeritus, American Red Cross*

WILLIAM GRAVES

ALFRED J. HAYRE

A. LEON HUGGINBOTHAM, JR., *Chief Judge*

*for the Third Circuit, U. S. Court of Appeals*

JOHN JAY ISELIN

*President, The Cooper Union*

TIMOTHY T. KELLY

J. WILLARD MARRIOTT, JR.

*Chairman and President, Marriott Corporation*

FLORETTA DUKES MCKENZIE

*Former Superintendent of Schools, District of Columbia*

PATRICK E. NOONAN

*President, The Conservation Fund*

NATHANIEL F. REED

*Businessman-Environmentalist*

H. FRANCIS SAUL II

*Chairman and C.E.O., B. F. Saul Company*

ROBERT C. SEAMANS, JR.

*Department of Aeronautics and Astronautics, MIT*

PAUL B. TYLOR, *Vice President and Secretary*

## TRUSTEES EMERITUS

CRAWFORD H. GREENEWALT, CARYL P. HASKINS,

MRS. LYNDON B. JOHNSON, WM. MCCHESNEY

MARTIN, JR., LAURANCE S. ROCKEFELLER,

FREDERICK G. VOSBURGH, JAMES E. WEBB,

CONRAD L. WIRTH

## RESEARCH AND EXPLORATION COMMITTEE

BARRY C. BRIDG, *Chairman;* FRANK C. WETMORE, JR.,

*Vice-Chairman;* ANTHONY R. DE SOUZA, *Editor;*

*National Geographic Research & Exploration;* STEVEN S. SUTHER,

*Secretary;* H. J. DE BLU, *University of Miami;* WILLIAM GRAVES,

GILBERT M. GROSVENOR, BETTY J. MCCORM, *Smithsonian*

*Institution;* DAVID PADWELL, *Cornell University;* PETER H.

RAWIN, *Missouri Botanical Garden;* EDWIN W. SCIDER, *CHARLES*

H. SOYER, *University of Colorado;* JOHN H. STELLA, *Woods*

*Hole Oceanographic Institution;* GEORGE E. STUART, *GEORGE E.*

*WARNOR;* RICHARD S. WILLIAMS, JR., *U. S. Geological Survey;*

HARRY T. WILSON, *University of Michigan*

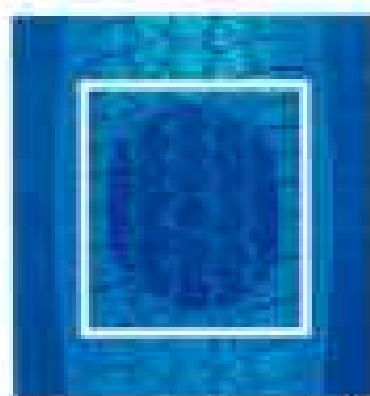
## EDUCATION FOUNDATION

LLOYD H. ELLIOTT, *President;* Betty Ellison





## GOODYEAR INVICTA GS. BASED ON A SIMPLE BUT PROVEN HYDRAULIC PRINCIPLE.



*Wet or dry, this is all that touches the road: the contact patch.*

No one likes to drive in the rain. Which is why Goodyear has devoted so many millions of miles to the science of wet weather traction.

It's this unequalled knowledge that has led to the development of the Goodyear Invicta family of passenger car tires.

Invicta radials have already found favor with some of the toughest tire critics in the world: the engineers who develop cars like the Lexus LS400 and the Buick Park Avenue Ultra.

Invicta radials were chosen as original equipment for these cars after rigorous comparison with other makes of tires. For things like treadwear, noise,



Goodyear wins the most important tests of all.

And wet traction.

No one likes to drive in the rain.

But you'll find it's when it rains that the Invicta GS really shines.



*Chrysler Town & Country*



*Toyota Camry V6*



*Invicta GS uses the wet-weather technology found in Goodyear's 185+ mph Formula One race tire.*

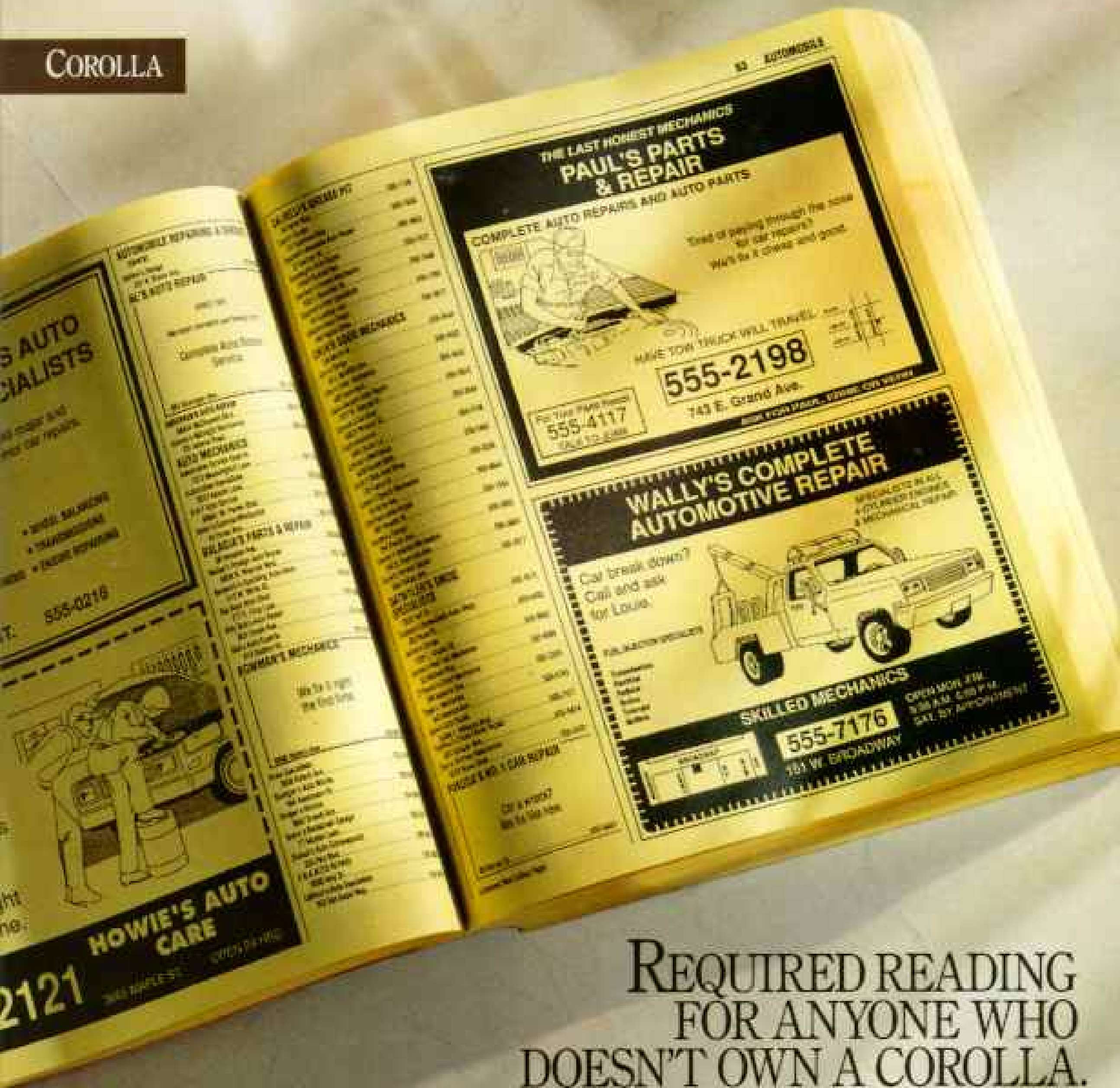
*You'll find Invicta radials on some of the best vehicles available in America. One of the reasons they were selected is their wet weather capability.*



# GOODYEAR

THE BEST TIRES IN THE WORLD HAVE GOODYEAR WRITTEN ALL OVER THEM.

COROLLA



## REQUIRED READING FOR ANYONE WHO DOESN'T OWN A COROLLA.

If you already own one, you know what it's like to drive one. If not, take note. The Corolla has a standard feature not found in any other car in its class—Toyota's reputation for reliability. We wrote the book on it. *"I love what you do for me."*

 **TOYOTA**



28 33  
MPG CITY/HIGH

Call 1-800-CO-TOLLA for a brochure and location of your nearest dealer. \*1991 EPA estimated mileage figures shown for the 4-door LE Sedan with 5-speed manual transmission. Get More from Life. Buy a Toyota. © 1991 Toyota Motor Sales, U.S.A., Inc.



## SHARE THE WONDERS OF NATIONAL GEOGRAPHIC WITH YOUR FRIENDS!

Treat your family and friends to an exciting gift of adventure and discovery they'll enjoy all year—membership in the National Geographic Society. Month after month, they'll delight in wonders of the world through the unique perspective of NATIONAL GEOGRAPHIC—people and places . . . flora and fauna . . . new discoveries and ancient cultures. To order memberships for family and friends, just mail your check with this form (or a copy of it) today!



National Geographic Society  
Washington, D.C. 20036 U.S.A.  
Copyright © 1991 National Geographic Society

**JUST \$26<sup>25\*</sup>**  
for 15 months  
beginning October 1991

- Enclosed is my check for a gift membership for the person named below:

- I have enclosed my membership dues.

MY NAME:

(Print full name of an individual only: Mr., Mrs., Miss, Ms.)

Street

City, State/Province

Country, Zip/Postal Code

GIFT FOR:

Name (Print full name of an individual only: Mr., Mrs., Miss, Ms.)

Street

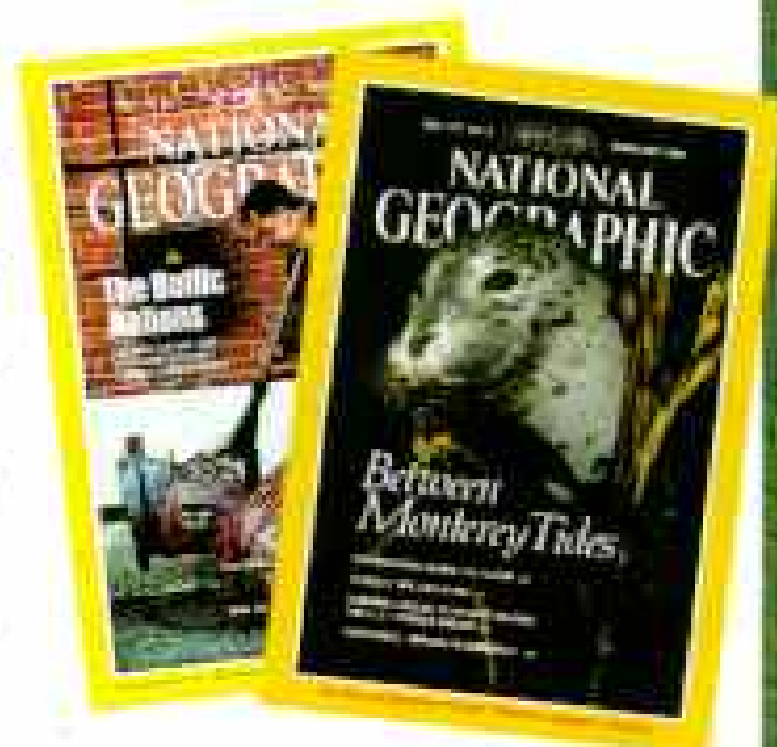
City, State/Province

Country, Zip/Postal Code

Gift card should read: From \_\_\_\_\_

\*U.S. rate; for Canada, must add \$50.00 U.S. funds (\$46.25 Canadian funds), which includes 7% GST. For all other countries, \$40.25 U.S. funds. Please add 9% sales tax for memberships being sent to any Maryland address. Eighty percent of dues is designated for subscription to the magazine. Upon expiration of the 15-month term, memberships are renewable on a calendar-year basis. Life membership (U.S. addresses only): \$550.

Mail to: National Geographic Society, P.O. Box 2895  
Washington, D.C. 20013 U.S.A.





# Earth Almanac



J. H. ROBINSON, ANIMALS ANIMALS

## Engineering the Egg Ensures Female Reptiles

**O**ne obvious method to boost a troubled wildlife population is to increase the number of females—no easy task.

For reptiles, however, an amazingly simple way has been found by researchers at the University of Texas at Austin. David Crews, James Bull, and Thane Wibbels have found that applying a drop of commercially produced estrogen—a sex hormone—to a developing egg results in a female embryo.

“I think we can resurrect species on the verge of extinction,” says Crews, whose team first worked with alligators (above), freshwater turtles, and lizards. Now, in Mexico, nests of endangered green sea turtles are being treated to see if all eggs produce females.

Biologists have long known that the temperature at which reptile eggs incubate determines gender. Warmer nests create more females in some species, males in others. Incubators can maintain female-favorable levels but work best in the lab, whereas the new technique can be used at remote nest sites.

But how does temperature govern



TED SPIEGEL

sex determination? It may activate enzymes that produce hormones in the embryo, the researchers believe. Trying a more direct method, they first injected estrogen into the eggs. That resulted in females but caused fatal infections in half the embryos. Estrogen dissolved in alcohol and absorbed through the eggshell proved simple, safe, and foolproof.

## Air-pollution Battle Hits Home in the West

**W**ood-burning stoves and fireplaces, symbols of energy independence during the 1970s oil crisis, are now under fire. Woodsmoke is a leading cause of winter air pollution in many western cities, says the Environmental Protection Agency.

Trying to reduce its “brown cloud,” Denver (left) is restricting those cozy fires because of their high emissions of particulates and carbon monoxide. In neighboring Jefferson County most wood stoves and fireplaces have been banned in new construction. Similar measures are proposed for Denver itself, and Seattle threatens to follow suit.

Less woodsmoke rises from sunny California, but there the backyard is under scrutiny. Used to ignite barbecues, lighter fluid and presoaked charcoal—which create smog-producing compounds—will be banned next year in some areas. Alternatives like electric starters are permitted. Chefs who cut the grass while tending the grill will be further regulated by 1994, when state emission standards for lawn mowers and small-engined yard tools take effect.



# WANTED: Eager Amateur Explorers



**WE SPONSOR EXPEDITIONS.  
YOU GET TO GO.**

Working with volunteers of all ages, help uncover tools and other evidence of prehistoric man in Africa... Help monitor huge leatherback turtles laying their eggs... Help survey Inca architecture and landscaping in mountainous Peru...

Right now, over 100 EARTHWATCH expeditions are being mounted in every scientific discipline, bound for points throughout the world. They'll be led by outstanding people, scientists who need your help.

As a team member, you help find the expedition you accompany. You contribute a fixed share of the expedition cost. But your share is tax-deductible as a charitable contribution in support of scientific research.

EARTHWATCH, a nonprofit organization, has been sponsoring scientific expeditions for 17 years. Last year, 2,700 EARTHWATCH volunteers helped out on expeditions. This year, you can help make the discoveries others will just read about. The next discovery could be yours.

Write or call for more information.

**EARTHWATCH**

680 Mt. Auburn Street, Dept. A, Box 403, Watertown, MA 02272 (617) 926-8200

## Heartwise™ didn't settle for just one opinion.

"... Psyllium, when part of a low-fat, low-cholesterol diet, lowers serum cholesterol levels, which I think will be good for most of us."

David J.A. Jenkins, MD  
Professor of Medicine and Nutritional Sciences, University of Toronto

"In my opinion, there are documented studies which reveal the cholesterol-lowering effects of psyllium when part of a low-fat, low-cholesterol diet..."

Robert M. Russell, MD  
Professor of Medicine and Professor of Nutrition, Tufts University, Boston, MA

"For the last few years, we have been urging our patients to consume at least 20 grams of soluble fiber daily. Without something like psyllium, it is often very difficult to achieve that intake."

Nikitas J. Zervasos, MD  
Clinical Professor, Department of Family Practice and Community Health, Temple University School of Medicine

MANUFACTURER COUPON / EXPIRES **DECEMBER 31, 1991**



# SAVE 50¢

If **Kellogg's Heartwise™** is not available in your market, call 1-800-962-1413, weekdays, 9:00 a.m.-4:00 p.m. (EST).

CONSUMER OFFER IS LIMITED TO ONE COUPON PER PACKAGE PURCHASED. RETAILER: KELLOGG SALES COMPANY. See terms and conditions on back of coupon. Offer good in U.S. only. Not valid in Canada. © 1991 Kellogg Company. All rights reserved. See back of coupon for full terms and conditions. Kellogg's, the Kellogg logo, and the "K" logo are trademarks of Kellogg Company. © 1991 Kellogg Company.



5 38000 55050 3

1/987

**Kellogg's** Heartwise:™ The cereal with psyllium.

TM & © Kellogg Company  
© 1991 Kellogg Company

## Pillboxes Converted for English Bat Invasion

Concrete curtain against a German invasion that never came, thousands of pillboxes were emplaced across southern England during World War II. Then the human population was endangered. Now it is England's bats that are in jeopardy, and in Surrey landowners are turning ugly war relics into bat havens.

The pillboxes (below) are "like an English Maginot Line that was never tested," says Martin Newman, director of the Surrey Wildlife Trust. The trust helps residents partly seal the forts and hang roofing tiles inside for bat roosts. Brown long-eared bats have already moved in, and species such as the seldom seen greater horseshoe bat (bottom) may follow. In 30 years England's bats have declined by 90 percent, their insect prey reduced by pesticides and their natural roosts in hollow trees lost to the farmer's ax. "Of course, trees don't carry Bat Roost signs," Newman laments.



FRANK GREENAWAY



MERLIN D. TUTTLE



H. BROOKE WALKER

## Novel Vending Machines Recycle Cans for Cash

They are user-friendly and environmentally sound, and they don't eat quarters.

These vending machines actually pay customers—for recycling containers in their mechanical maws.

Known as reverse vending machines, several thousand are now on duty around the U. S. Most are concentrated in the nine states that require deposits on cans and bottles.

One firm, Environmental Products Corporation, assembles its Redeemer machines (above) in Connecticut; about 3,800 are in use in that state, New York, and California. Different models process aluminum cans, glass bottles, and plastic containers. The machine pays five cents for each item and crushes or shreds it after a laser scanner records data from a bar code. In New York the machines have collected more than a hundred million containers in a month.

## Symbol of the South Grows Thin in Louisiana

To the chagrin of Southerners with poetry in their hearts, Spanish moss, the ghostly gray plant that beards tree limbs and dances in the languid breeze, is in serious retreat. In parts of southern

Louisiana it is gone with the wind.

Not a moss but an epiphyte, these air plants often secure their seeds in live oaks' craggy bark. Ken Whitam, a plant pathologist at Louisiana State University in Baton Rouge, suspects that Spanish moss has declined because of the effects of air pollution from chemical and oil refineries, as well as the debilitating



HENRY PALLE

attack of the fungus *Fusarium*.

During the 1970s the fungus plagued other southeastern states, where the moss seems to be recovering. The disease is now most active in Louisiana. In desperation, some homeowners there procure healthy moss specimens from distant sources and tie strands in their own barren trees, hoping that new generations will take hold.

## **A Nation of Readers...**

Want to read more?

Talk less.

Keep a book  
in your briefcase,  
by your bed.

Get up  
15 minutes early.  
Read a new poem  
aloud each night  
before dinner.

Can't sleep?  
Don't count sheep.

Read.

Turn off the tube.  
Tune into books.

Expand your  
horizons.

Read for fun.

Read for  
information.

Use your library.

## **A Nation of Libraries.**

American Library Association

## **Discover an exciting new way to achieve wellness of body and mind!**



There's no question about it. According to medical and fitness experts, regular aerobic exercise is vital for achieving all-around wellness. Aerobic exercise helps you prevent illness, feel better physically and mentally, boosts your energy level, and very possibly, increases your life expectancy.

### **NordicTrack For A Healthy Body.**

NordicTrack is a total-body exerciser that simulates cross-country skiing, considered by experts to be the world's best form of aerobic exercise. Just twenty minutes a day, three times a week will help you control your weight, strengthen your heart and lungs and help lower your overall cholesterol level.

### **NordicTrack For A Healthy Mind.**

Good physical health is just the beginning. With regular workouts on a NordicTrack you'll feel more mentally alert, relaxed, positive and self-confident. You'll also feel good because you're doing something positive for yourself. So discover the excitement of NordicTrack today, and start taking positive strides towards a lifetime of wellness!

# **NordicTrack**<sup>®</sup>

A GML Company

Call or Write for a

**FREE VIDEO  
& Brochure**

**1-800-328-5888** Ext. 245G1

NordicTrack, 141C Jonathan Blvd. N., Dept. 245G1  
Chaska, MN 55318

# On Assignment



Not even the bone-chilling waters of Canada's Admiralty Inlet can deter underwater photographer FLIP NICKLIN from taking a swim every Fourth of July. His bare-skin immersion lasted only seconds before the California native dashed for the ice edge and some warm clothes.

When protected by a dry suit, Flip could stay under the ice in the 29°F water for only 30 minutes before his regulator began to freeze and "my hands wouldn't work any more." The bonus, however, was 300-foot visibility, and "Where else can you find such amazing things as bow-head whales and narwhals?"

For Flip, the five seasons he spent at the edge of the Arctic ice continued his lifelong fascination with the world beneath the seas. His subjects have ranged from tiny krill to whales, which he documented for the December 1988 issue.

"The pub is one place where you find the East Enders at their best," says assistant editor ERLA ZWINGLE, who immersed herself in boisterous pub life for her London Docklands article. "East Enders are strong-minded, high-spirited, and wildly colorful talkers, and they have a fantastic sense of humor. In some countries you have to spend ages trying to get people to relax and speak frankly, but in Docklands I had to race to keep up."

Racing to keep up is something Erla understands. Her career in journalism took off at *American Photographer* magazine, where she worked her way from editorial assistant to managing editor. As a freelance writer she contributed five articles to the *Geographic*—including "The Tea and Sugar: Lifeline in Australia's Outback" (June 1986)—before coming on staff in 1990.



(THIS PAGE) ABOVE (TOP), JOE MURRAY



# PRECIOUS METAL



Did you know that the everyday can is 100% recyclable? It's made of high-grade steel that can be reused to make more cans, even surgical tools or jungle gyms.\* Steel cans also conserve energy. They require no refrigeration or freezing during transport, in store, or in the home. Consequently, the can is the most cost-efficient means to provide high quality fruits and vegetables year round. The steel can. Precious little could be done to improve it.

**FOOD FOR  
THOUGHT**

