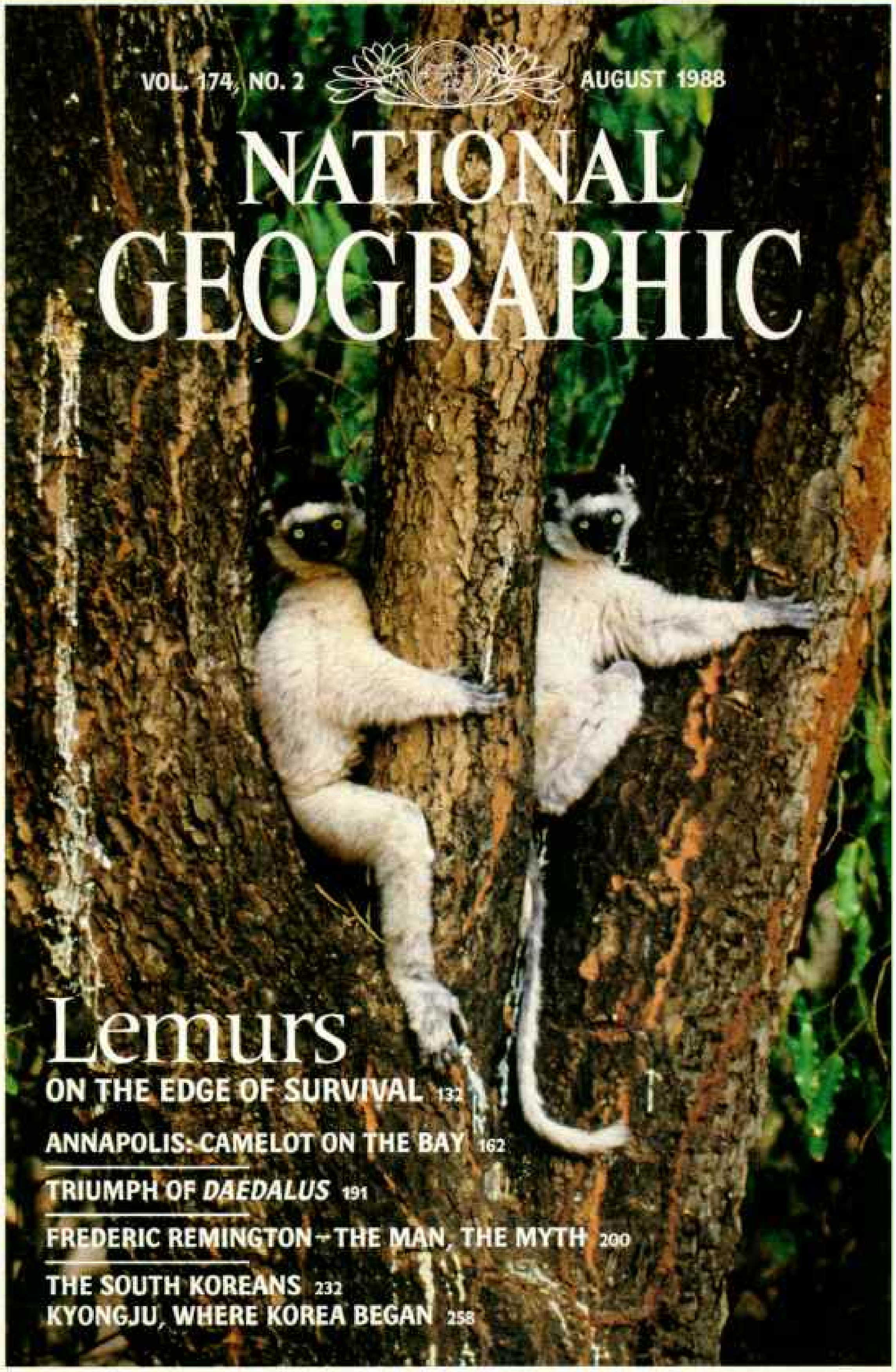
1888 · CENTENNIAL · 1988

VOL. 174, NO. 2 AUGUST 1988

NATIONAL GEOGRAPHIC



Lemurs
ON THE EDGE OF SURVIVAL 132

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

1888 1988 NATIONAL GEOGRAPHIC

AUGUST 1988

COVER: *Among the most animated of the primates known as lemurs, two sifakas seem to climb in tandem through a Madagascar forest. Photograph by Frans Lanting.*

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

FOUNDED 1888

WHEN PRESIDENT HARRY TRUMAN called on me and several hundred thousand other Americans to save Korea from Communism in 1950, he could not have imagined that almost 40 years later U. S. troops would still be there, or that Chinese and Russians would be playing games in Seoul—even Olympic ones.

More than three million American GIs have served in Korea since 1950—with still no national

SEOUL IN 1950, WIDE WORLD PHOTOS (TOP); 1987, NATHAN BENN

war memorial to mark their sacrifices. Nearly 15 billion dollars in aid has been invested. But the land is still divided, and corruption and human-rights abuses in South Korea have been too common. Now this nation, driven by the riots of 1987, seems on the road to a more humane, democratically elected government, though unrest continues.

The improvement in South Koreans' standard of living has been staggering. From a GNP of 600 million dollars in 1950, the economy grossed 118 billion in 1987. Even its benefactor, the United States, suffers a ten-billion-dollar trade deficit with South Korea, and it is growing.

Next month Seoul will host the XXIV Summer Olympics, with only North Korea, Cuba, and Ethiopia boycotting the games. Obviously the assignment Truman gave us in 1950 has been only half successful, but what a half South Korea has become.

Wilbur E. Garrett

EDITOR

MADAGASCAR'S LEMURS

On the Edge

Teetering on pinnacles of eroded limestone, a crowned lemur heads for a tree to feed on its foliage. Deforestation threatens these uniquely evolved primates of Madagascar, though researchers find some hopeful signs.

LEMUR CORONATUS—BODY LENGTH 13 IN (34 CM), TAIL 18 IN (45 CM)

# of Survival

By ALISON JOLLY Photographs by FRANS LANTING

Bizarre night prowler, an aye-aye wakes in its arboreal sleeping nest at dusk to begin foraging. An international effort seeks to preserve the habitat of these lemurs, threatened with extinction—although a few more aye-ayes have been recently discovered.

DAUBENTONIA MADAGASCARIENSIS
—BODY LENGTH 16 IN, TAIL 16 IN

IN THE LAST INSTANT of twilight, beneath a brightening blaze of stars, a silhouette rose and climbed from its leafy nest high in a forest tree. The shadow undulated along a branch, then leaped to a palm, running up a frond's midrib to reach a coconut.

The dark presence chewed at the fruit. I switched on my headlamp. Its narrow beam illuminated the object of my search—an aye-aye, strangest member of the family of lemurs, primates native only to Madagascar, the fourth largest island on earth.

The aye-aye hung hands down to stare back at me, like a child on a trapeze. It focused black, bat-like ears forward over a muzzle pulled into a grim smile by oversize teeth. Then it bent again to chisel the nut with its beaver-like incisors. Rapidly it ran the third finger of one hand in and out of the perforated coconut, extracting milky white meat by the clawful. Thinner than the aye-aye's other fingers, the probe was barely more than skin and bone. The aye-aye darted it behind the wicked-looking teeth to clean them—and then, did it sniff that skeleton finger or pick its nose?

The animal seemed calm enough, but I shook with excitement. In zoological expeditions to Madagascar spanning 25 years, this was my first glimpse of the black-and-silver lemur with the gargoyle face.

The hunt for hard-to-find aye-ayes had brought me to the palm-thatch village of Ivontaka on Madagascar's remote northeast coast, where mountains cloaked in blue-green rain forest step down to the turquoise sea.

And now I was watching this creature so bizarre that it took naturalists nearly a century to agree that it was a lemur, not a different order of mammal.

Despite a head too large for its body, the aye-aye was handsome, with a black ostrich-plume tail. Diamond-shaped markings enclosed amber eyes outlined in black. Shimmering silver-tipped guard hairs merged with black fur and blended on head and shoulders into a base layer of pale cream. If ever there was a witch cat conjured in tones of moonlight, it is the aye-aye.

The aye-aye is Madagascar's version of the woodpecker, a bird not found here. With its large, sensitive ears, it can hear insect larvae moving within decaying trees. It gnaws entry to a concealed grub and pulps the prey with its skinny claw. The aye-aye is also Madagascar's equivalent of the raccoon, raiding sweet crops like coconuts and sugarcane, to the fury of farmers.

Earlier a villager named Raoelison and I had climbed with Eleanor Sterling, a Yale University graduate student, into the high rain forest. In ten days' searching, Eleanor had found many abandoned aye-aye nests anchored in trees by liana vines and built of leafy broken branches.

Raoelison knew how eager we were to see lemurs. He shrugged and said he would beseech the forest to unveil the only lemurs likely to appear. Bracing himself on the slope, he shouted a singsong incantation. Soon there echoed an even louder bellowing, the roared alarm call of black-and-white ruffed lemurs. Their alert carries far through the forest, rousing all their kind within earshot and setting their black bell-rope tails swinging like pendulums from treetop perches. Most lemurs have a single offspring at a time, but ruffs, among the largest of lemurs, bear litters of one to five young, which grow within months to independence.

At last we spied the fresh nest of my first aye-aye in the coconut grove near Ivontaka. In that village it is taboo to kill them. In other villages, it is said, if an aye-aye is accidentally snared in a lemur trap, it must be anointed with special oils used in human burials before being released. But the aye-aye so terrifies many Malagasy—the people of Madagascar—that in much of the country tradition decrees that it be slain on sight, lest it uncrook its skeleton finger to point out a victim for death.

TWENTY-FIVE YEARS ago French naturalist and the doyen of lemur-watchers Jean-Jacques Petter, of the National Museum of Natural History in Paris, estimated that only 50 aye-ayes might survive. He feared their fate as a species was sealed. In 1986, however, Petter and colleague Roland Albignac visited the northeastern town of Mananara and, with permission, captured two females and a six-week-old infant they christened Humphrey. Now at the Vincennes Zoo in Paris, they and an even more recently captured pair at Duke University Primate Center in North Carolina are the only aye-ayes in captivity. Humphrey and friends provide the focus for a French drive to raise funds to save their habitat. The Madagascar government and the United Nations have proposed that the Mananara-Ivontaka region be designated a biosphere reserve to aid both animals and people. In one part of Madagascar, at least, an ancient taboo against killing aye-ayes has worked some good.

Zoologist ALISON JOLLY, visiting lecturer at Princeton University, is world renowned for her studies of Madagascar's lemurs. Photo journalist FRANS LANTING, based in California, specializes in natural history and human ecology.

But old traditions are breaking down. I saw my second and third aye-ayes in a chicken-wire cage where they could barely turn around, cowering in the sunlight under a ring of human faces. A barefoot peasant in ragged shirt and shorts had carried them 12 miles into Mananara. He set no ransom for his captives, but doubtless suspected that Eleanor and I paid our guides a princely wage and would reward him handsomely.

"No! No! No!"

We were appalled. We sought out the district forest officer, Roger Marcellin, city-educated and imposingly brawny. In his two-room home Eleanor and I sat beside a table adorned with a vase of plastic tulips on a crocheted doily. The farmer shrank into a corner, shielding himself behind the bouquet.

Forester Marcellin reminded the farmer that since the 1920s Madagascar has forbidden trapping lemurs without a permit. Also, that donation of foreign funds may help preserve remaining forest watersheds to irrigate rice, the dietary mainstay. All this because people abroad want to rescue aye-ayes. The farmer drooped with disappointment while I told the tale of killing the goose that laid the golden egg.

Inquisition over, we went to release the imprisoned lemurs. The smaller of the two butted his jug head into the other's flank; he wanted his mother to play! She swung her head around, the pupils of frightened eyes contracted to pinheads. She laid a hand across the youngster's shoulder, her fingers like knobbed licorice sticks, but making a wholly familiar maternal gesture. We placed the lemurs far from town in the crotch of a forest tree. The juvenile curled up with his plumed tail over his eyes. We can only hope that they survived.

With a skeletal middle finger an aye-aye extracts coconut meat (right) after biting through the nut. Aye-ayes are killed by villagers who fear their crooked digit as a harbinger of death. A warden displays the tail of an aye-aye killed by a village dog. Yet in some areas aye-ayes benefit from taboos against harming them. They fill an ecological niche filled elsewhere by woodpeckers—absent from Madagascar—using bat-like ears to detect grubs beneath bark, gnawing with beaver-like incisors, and scooping out the meal with their dexterous digit (below).

DRAWING BY STEPHEN BASH

LEMURS are primates, like monkeys, apes, and us. Humans share with lemurs a mutual forebear, a squirrel-size mammal that surveyed the subtropical forests at least 50 million years ago with forward-facing eyes supported by a pillar of facial bone like the one we can feel at the edge of our own eyes. Thumbs projected from its hands and nails tipped its fingers, just as in lemurs of today, its living descendants.

Ancestors of lemurs first appeared more than 40 million years ago, rafting on branches or logs across the strait to Madagascar, which had begun to unmoor itself from Africa 125 million years earlier. Few other African mammals made it to the errant thousand-mile-long island; not wild dogs or lions or elephants. Important for the lemurs, the larger brained and swifter witted true monkeys missed the boat, evolving later in Africa.

Without primate competition the lemur Robinson Crusoes now compose 28 species and 40 races found nowhere else. They form an evolutionary panoply: gaudy and drab, large and small, gregarious and solitary.

Mouse lemurs, reclusive and nocturnal, feed on fruits and insects. Leaf-eating indri—black-and-white and as large as small children—roam by day in troops, lifting their muzzles in eerie song. Red-bellied lemurs form monogamous pairs. Promiscuous ring-tailed lemurs swagger beneath upraised barber poles of velvety black-and-white-striped fur. And until humans arrived about 1,500 years ago, Madagascar supported more than a dozen species of giant lemurs, which shortly became extinct. One clung like a koala to tree trunks but was bigger than a St. Bernard.

Zoologists have long feared that the giants will be followed into extinction by Madagascar's surviving lemurs. They indeed face tremendous odds. In the past 25 years the people of Madagascar have doubled in number. Now 11 million, they are desperately poor farmers, loggers, and cattle herders. To subsist in a nation whose economy has stagnated for decades, they attack their island's trees—deciduous in the west, tropical in the north and east, spiny in the desert south. Slashing, burning, and sawing to create cropland, pasture, and firewood, they have reduced Madagascar's rain forest by half just since 1950, leaving lemurs besieged in the forests that remain.

Yet lately the future for lemurs has begun to brighten. There was the 1986 capture of three aye-ayes, a species once thought to be extinct. The same year saw the rediscovery of a bamboo-eating species sighted only half a dozen times in the past century. And even more recently an entirely new species was identified—a russet lemur with golden eyebrows and orange muttonchop whiskers.

THE REVIVAL of lemur fortunes has hopeful implications for the Malagasy. Their government sees the necessity of preserving and maintaining forests for firewood and as watersheds. Increasingly the Malagasy understand that the lemurs exert wide-eyed appeal on conservationists and foreign-aid donors whose money can help save Madagascar's forests for all its inhabitants.

"It would be a very good thing for this region to have a reserve for aye-ayes if it brings help to the people, not just the forest," the village president of Ivontaka told me. "You know, in a town south of here the river has dried up for the first time in living memory, because of deforestation." The Malagasy are learning that conservation can avert the ultimately suicidal consequences of destroying their own environment.

To assure the future of lemurs, much more must be learned about their behavior. The competing claims of humans and lemurs can be reconciled only if we know how much social as well as physical space lemurs require. Moreover, behavioral knowledge of lemurs

(Continued on page 145)

Easy meal for agile hunters in the south (facing page), nocturnal lepilemurs spend the day dozing at their nest. A pair of avahi, also nocturnal, huddle together for warmth on a branch at dawn. These two species represent the smallest leaf-eating primates—a paradox, because leaves are a high-bulk, low-energy food, and most primates with such a diet have large bodies to accommodate large digestive systems.

ABOVE, AVAHI LANIGER LANIGER—BODY LENGTH 11 IN, TAIL 13 IN; LEPILEMUR MUSTELINUS LEUCOPUS—BODY LENGTH 10 IN, TAIL 9 IN

Palaeopropithecus
Weight about 110 pounds. Slow climber and suspender using all four limbs

▲ Lemur subfossil site (partially fossilized remains)

■ Special reserve

○ Nature reserve

Guarding superlative communities of flora and fauna, 11 nature reserves are closed to all except authorized scientists. Some 20 supplemental special reserves allow subsistence hunting and fishing.

NORTH

Scale varies in this perspective.

Antsiranana
MONTAGNE D'AMBRE NATIONAL PARK
Ankarana
Nosy Be
Nosy Komba
Mahajanga
Mananara Nord
Mananara Ivontaka
Soanierana-Ivongo
Indian Ocean
Betsiboka
Betsiboka
MADAGASCAR
Toamasina
Mozambique Channel
Antananarivo
Maevatanana
Maevatanana River
Antsirabe
Ranomafana
Fianarantsoa
Klanjavato
RANOMAFANA NATIONAL PARK (proposed)
Mangoky
ISALO NATIONAL PARK
Toliara
Onilahy
Beza Mahafaly
Menarandra
Mandrare
Tolanaro
Beza Mahafaly (Private reserve)
TROPIC OF CAPRICORN

VEGETATION
- Spiny desert
- Savanna and scrub
- Dry deciduous forest
- Rough secondary scrub
- Dense rain forest
- Moss-lichen forest

NGS CARTOGRAPHIC DIVISION
DESIGN: BOB PRATT; RESEARCH: ANN FERRY
PRODUCTION: RANDEY MURRAY; ISHWINDAR BADEY
MAP EDITOR: SUE PLATTS

Extinct lemurs: Giants of their day

Lemurs contributed a major chapter to the evolution of Madagascar's unusual wildlife. In the shaping of this fascinating collection, the animals that are missing are as important as those that are present.

About 165 million years ago a geologic tide turned as Madagascar drifted east from Africa. Among the few mammals that bridged the channel to the island were the ancestors of lemurs that began rafting on branches and logs to Madagascar more than 40 million years

Megaladapis
Generally the size of a small bear, with heavy cow-like jaws

ago. Conspicuous by their absence were elephants, large carnivores, and especially monkeys—potential competitors that evolved later on the mainland. Thus, no competition faced the lemurs, and eventually they developed into today's 28 species and 40 subspecies. Gone forever are more than a dozen of their forebears, nearly all of them larger than today's lemurs.

Hanging to feed among the foliage, Palaeopropithecus *(top left) was the size of a chimpanzee but moved more like a sloth, never bounding, hopping, or leaping. Like most ancient lemurs, it spent some time on the ground because of its weight. Among the largest was* Megaladapis *(lower left); one species may have weighed more than 200 pounds. A browser, it probably clung to a tree like a huge koala, using a prehensile snout to draw leafy branches toward its mouth. Basically terrestrial, baboon-like* Archaeolemur *(bottom right)—a short-limbed quadruped with a wide, heavy trunk—was built for power rather than speed.*

Skull of Mesopropithecus pithecoides *(top right, at center), among the smallest extinct lemurs, is surrounded by extinct giants (clockwise from lower left):* Archaeolemur edwardsi, Megaladapis grandidieri, Palaeopropithecus maximus, *and* Pachylemur jullyi.

These large, gentle creatures enjoyed a long heyday until about A.D. 500, when a far more aggressive primate, man, began arriving with a mixed heritage from Africa and the Malay Archipelago. Within the past thousand years, 14 species of lemurs have become extinct, their habitat burned for farmland and overgrazed by livestock, and their doom hastened by overhunting. Those same problems beset the survivors today.

PAINTING BY STEPHEN NASH

SKULLS COURTESY COLLECTION OF THE ACADÉMIE MALGACHE

Archaeolemur
Weight about 35 pounds, size of a female baboon; terrestrial.

Garbed in chocolate and cream, a trio of Verreaux's sifakas feeds on the leaves and fruit of a tamarind tree. Gaining their only moisture from dew—they have never been observed to drink—these diurnal lemurs live in troops of three to nine individuals.

PROPITHECUS VERREAUXI VERREAUXI—BODY LENGTH 17 IN, TAIL 21 IN

Often changing troops from year to year, males stake out territories of several acres by rubbing branches with a scent gland on their throat. They confront ground enemies with the alarm call that gives them their name: Shifakh!

A rare glimpse of lemur neighbors

Only on this eccentric island could there live a mongoose with the vivid hue of the Malagasy ring-tailed (above). It prowls the trees and the ground for insects, eggs, snails, even reptiles and small lemurs.

A legend says that if a pair of these mongooses wrestles playfully in front of forest travelers, they must not laugh aloud lest they become forever lost.

Another of the island's indigenous carnivores—only seven species exist—a Malagasy civet moves through a bamboo thicket (lower left). Like the mongoose a member of the viverrid family, this secretive forest dweller hunts crustaceans, worms, small eels, and frogs.

Another potential meal for such predators might be a foot-long rodent with large ears that leaps like a small kangaroo and plays the ecological role of the rabbit—the giant jumping rat. With an extremely limited distribution, it clings to a precarious existence in the basin of a single Madagascar river. As a means of rescue, a baobab forest reserve is planned.

ABOVE, *GALIDIA ELEGANS*—BODY LENGTH 15 IN, TAIL 12 IN; BELOW LEFT, *FOSSA FOSSA*—BODY LENGTH 18 IN, TAIL 9 IN; BELOW RIGHT, *HYPOGEOMYS ANTIMENA*—BODY LENGTH 12 IN, TAIL 8 IN

(Continued from page 138)
offers insights into the earliest origins of group life among our ancestors.

INTENSIVE study of lemur society began only in 1963, when I started following a troop of ring-tailed lemurs on daily parade through an oasis beside the Mandrare River in the spiny desert of southern Madagascar. An amber-eyed harridan I called Aunt Agatha led them, and one day she astounded me by bouncing up to the troop's dominant male, Vercingetorix, to cuff him on the nose and appropriate a ripe tamarind he had just begun to eat. I waited for him to retaliate; instead, he meekly looked for other fruit.

Vercingetorix was a beautifully muscled ringtail, with sharp, white canines and one battle-scarred ear. Often he gouged a sapling with his wrist spurs, or used them to comb a glandular scent through his black-and-white-striped tail. He then shivered the tip like a feather duster, an act of insult he usually aimed at the third-ranked male. That bullied lemur, lacking courage to stink-fight, would leap away with a spat call, a series of pleading squeaks pressed past lips drawn back in a grimace of fright. Because Vercingetorix so lorded it over other males, I couldn't understand his tolerance of Aunt Agatha.

All primate studies at that time reported that males dominated females. But after Aunt Agatha opened my eyes, I realized that every female in her troop took precedence over males when feeding.

Building on those early observations, other zoologists have witnessed a similar pattern of female priority and male chivalry in different lemur species. Among the monogamous indri, for example, the female browses succulent treetop leaves while her mate waits in the forked lower branches. If his patience wears thin and he climbs higher, she cuffs him back to his place.

Lemurs' code of female rights may stem from their brief mating season. During only two weeks in April, each female ringtail in a troop comes into estrus for a few brief hours. Aroused males give up stink-fighting and slash in earnest with their canines. As long as a wooed female stays in the troop's center, the males fight; but if she withdraws branch by branch from the scene of combat, the male best able to fend off competitors can follow her until eventually they are alone. Sometimes this disrupts the established pecking order. Fourth-ranked Bunthorne bested Vercingetorix and all other males of the troop to mate with at least three of nine females.

After this tournament and orgy a ringtail troop lies about exhausted, males gashed on flank or thigh or ear. If a female does not conceive, she may come into heat again in a month or two, but her late-born infant—if she goes on to have one—misses the usual September birthing season and arrives with less chance of survival.

Their breeding cycle leaves lemur mothers pregnant or lactating in the harshest seasons. In southern Madagascar July is dry and cold, and young lemurs and poor Malagasy children alike wheeze with bronchitis and die of pneumonia. September is dusty and hot. In deciduous forests, trees stand leafless. At dawn pregnant ringtails lick dew from bare branches; at noon they drape themselves panting in the trees; at dusk they slip to a stream to gulp water, alert for hawks hunting along the banks. Not until cool darkness descends do the mothers give birth. In such conditions

With a way of life as endangered as the lemurs that have long been part of their diet, a handful of the Mikea people still practice hunting and gathering in the western dry forest. Here, where sources of water are crucial, Mikea grate baboo roots they have collected for their moisture (below) in a camp with a baobab-bark shelter. The forest is under pressure from immigrants who fled a 1985-86 drought in the south, where workers traverse a parched sisal plantation (right). Extremes of climate exacerbate man's already devastating impact on the land. Four-fifths of Madagascar now lies barren, cleared by fire for cattle and subsistence crops.

ringtail females need every scrap of food they—or their mates—can find.

The males grow scrawny, seemingly strung together with tendons only. A respite comes with October, when a few trees set flower and fruit in time to produce seed for November rains. A ringtail troop gobbles nectar from the mauve blooms of bauhinia trees. The males regain strength and wander, until a quarter or a third of them have changed troops. They feed, fatten, and feud with their new companions, basically going into fight training for the next mating season.

The emerging understanding of lemur seasonality has helped undermine an old view that sex is the glue of primate relations. Inspired by Freud, zoologists once argued that despotic primate males were attracted to females who were continuously, or at least frequently, sexually receptive. The theory does not apply to lemurs. Lemur troops are complex social units—nurseries, feeding cooperatives, and defense guilds. They are not just seraglios.

A ringtail troop is clearly a matriarchy. Daughters remain with the mothers who bear them and the aunts who help raise them. If another troop approaches, it is these Amazons who fly at the intruders, babies on their backs, to defend their territory and larder.

Whether related ringtail females are loyal to one another for life isn't yet clear. An answer may come from the Beza Mahafaly Special Reserve in southwestern Madagascar, where Malagasy and U. S. scientists have collared ringtails with red, green, or blue tags in an attempt to track individual ringtails throughout their 20-year life spans. All but two female white sifakas tagged in 1984 have so far stayed in their original groups, but many males have jumped troops one or more times each year. From this study should come our first detailed findings about lemur migration.

When we are able to follow marked animals over their lifetimes, we may understand the evolutionary social advantages of being dominant like Aunt Agatha, status conscious like Vercingetorix, or opportunistic like Bunthorne.

Lemurs apparently have no trouble identifying members of their own troop or even those of others. Lemurs, like monkeys, have social knowledge and social uses of intelligence, though they lack the particular cleverness of monkeys in handling objects. This suggests that our own ancestors' intelligence may first have begun to expand out of social necessity, and only later from the skills needed to find food or employ tools.

ONCE there lived lemurs the size of great apes. The first Malagasy almost certainly knew the taste of these giants.

Imagine: 1,250 years ago dark-skinned hunters skirted a cliff in northern Madagascar. Beneath the precipice a stream threaded a canyon shaded by buttress-root trees spangled with flowers and fruit. One branch bowed under the weight of an animal swaying upside down, moving along the limb hand over hand, like a sloth. With hind legs only half as long as a man's, it had spindly arms equal to those of any of the hunters stalking it. It reached out long, curved fingers of an indolent hand to hook twigs and bend their leafy tips to its nibbling mouth. When the hunters came, the animal dropped its muzzle to regard them with bewilderment before giving its shoulder a quick lick. It was easy prey.

Perhaps a thunderstorm suddenly boiled up indigo over the canyon rim, as happens today. Quickly the hunters would have slung the slain lemur from a shoulder-borne pole to make for a sheltering overhang in the cliff. There they kindled a fire, prepared the lemur flesh, and roasted their meal. Warm and dry, they ate as the rain sluiced down outside, and they probably picked their teeth.

Archaeologist Robert Dewar of the University of Connecticut and colleagues from the Musée d'Art et d'Archéologie in Madagascar have themselves waited out storms under that limestone overhang near Antsiranana at the island's northern tip. From that large rock shelter—named Anja for an archaeologist's six-year-old daughter—they unearthed in 1986 the oldest known human traces in Madagascar: a few potsherds, the remains of cooking hearths, animal bones, all dating from about A.D. 750.

Least and largest: Smallest primate, the mouse lemur weighs less than three ounces. This species (above) frequents eastern rain forests and loves to gorge on berries. Animated teddy bear, the indri can make 20-foot leaps despite weighing some 15 pounds. Pairs often awake in midmorning and produce weird, wonderful songs, described by photographer Lanting as "polyphonic saxophones."

ABOVE, MICROCEBUS RUFUS—BODY LENGTH 5 IN, TAIL 8 IN; INDRI INDRI—BODY LENGTH 24 IN, VESTIGIAL TAIL 2 IN

MADAGASCAR was one of the last habitable corners of earth settled by humans. The first arrivals, of African and Asian descent, probably landed around A.D. 500. Half a millennium later Arab trading dhows touched at Madagascar, and village sites of the 11th century show their crews' influence.

A later layer in the Anja cavern has yielded earthenware and a fragment from a 12th-century glass ewer, all from the Persian Gulf. Also in Anja and other rock shelters in northern Madagascar are fragments of giant lemur bones, but not whole skeletons, as though the animals might have been butchered. It seems plausible that during the 11th and 12th centuries people were still eating lemurs of a kind we will never see.

Since humans first reached Madagascar, 14 species of lemur have disappeared, nearly all larger than those that survive today. Their skeletal remains tell us that one rivaled a gorilla in size and was probably earthbound by its great weight. Two species ran on the ground, one slender and fleet, the other stockier and slower.

It used to be thought that Madagascar was wholly forested. New studies of fossil pollen by David Burney of Duke University show that in antiquity

most giant lemurs lived in now vanished pockets of forest amid grassy savannas, which spread across central Madagascar. Within the past thousand years the giant lemurs vanished, along with many other creatures, including huge tortoises and *Aepyornis*, "elephant birds," half again as heavy as modern ostriches. Hunters sped the extinctions, and dry-season grass fires set each year by herders to improve grazing for cattle and goats altered the ecology of the savanna. Environmental pressures have overtaxed the lemurs' habitat ever since.

AMID the beetling limestone crags of the Ankarana massif in northwestern Madagascar grow sunken forests, rooted in sinkholes. Percolating water carves channels and pools for blind white fish and subterranean crocodiles. Collapsing underground caverns form sinkholes that become natural traps for tree-browsing lemurs.

When cyclones suddenly flood the isolated forests, the bodies of drowned lemurs wash into cave galleries. Recently in such caves Martine Randriamanantena of the University of Madagascar and Jane Wilson of the University of Southampton in England have found skulls of a once wide-ranging lemur.

The skulls matched those of the present-day greater bamboo lemur, a species the researchers believed to be recently extinct or perhaps only just surviving.

Bamboo lemurs are among the few mammals—the best known being the giant panda—that can digest the fibrous giant grass. Small gray bamboo lemurs have been sighted off and on for decades, but their larger cousin seemed to have vanished near the time it was identified about a century ago. Weighing five pounds, it was a

HAPALEMUR AUREUS—BODY LENGTH 17 IN, TAIL 18 IN

Newfound faces in the forest, golden bamboo lemurs, here feeding on the tips of giant bamboo spikes, were identified in 1986 by several researchers, including German zoologist Bernhard Meier (left, at right) and his local colleague, Emile Rajeriarson. The exciting find was a bonus during successful attempts at rediscovering the greater bamboo lemur. Three bamboo-eating species are now known; all range the eastern rain forest (right), where the proposed Ranomafana National Park may eventually preserve 100,000 acres of habitat.

In a profitable partnership on the islet of Nosy Komba, black lemurs attract visitors to a village (facing page) whose residents benefit from a small entrance fee. The lemurs, in turn, have free access to banana-toting tourists. Young people are taking their wildlife more seriously; here forestry students help their professor examine a sifaka.

grizzled olive-gray, with a wide, heavy face and tufted ears.

Not until 1964 was anything like the greater bamboo lemur seen again. French naturalist André Peyriéras was offered such an animal in a rural market. An eight-year search failed to yield further traces of the seemingly mythical creature.

Then in 1972 Peyriéras visited a coffee-plant research station near Ranomafana in eastern Madagascar, accompanied by Roland Albignac, Jean-Jacques Petter, and Malagasy naturalist Georges Randrianasolo. The station manager directed the biologists to a nearby "sacred" forest. It was home, he said, to small gray bamboo lemurs—and to a distinctly larger species that also ate bamboo. Electrified, the biologists rushed to the trees. A large olive-gray lemur they found shredding bamboo stalks must have twitched its tufted ears in consternation at the sight of four humans breathlessly exulting among the canes.

But the rediscovered greater bamboo lemur lapsed into obscurity. Then in 1986 Patricia Wright of the Duke University Primate Center and West German zoologist Bernhard Meier renewed the search.

TOP AND FACING PAGE, LEMUR MACACO MACACO—BODY LENGTH 16 IN, TAIL 22 IN

RANOMAFANA town lies in the shadow of Madagascar's eastern escarpment. This massif wrings rain from trade winds, clothing itself in misty forest and propelling the Namorona River over its lip in a half-mile drop of rapids and cascades. What was formerly a broad belt of rain forest now is a corridor only 10 to 15 miles wide, on slopes too steep for local slash-and-burn farmers.

In this forest live perhaps 11 kinds of lemurs. With Bernhard one morning I spied upon a troop of Edwards' sifakas, brown animals banded with cummerbunds of white fur. They lolled like chocolate teddy bears on the sun-washed limbs of a dead forked tree, four adults on one branch, three more grooming a baby on the other. When one adult hopped to the opposite perch, the rest quickly followed, the baby last of all, flinging himself across the gap to belly flop on top of the whole troop. And then the branch snapped.

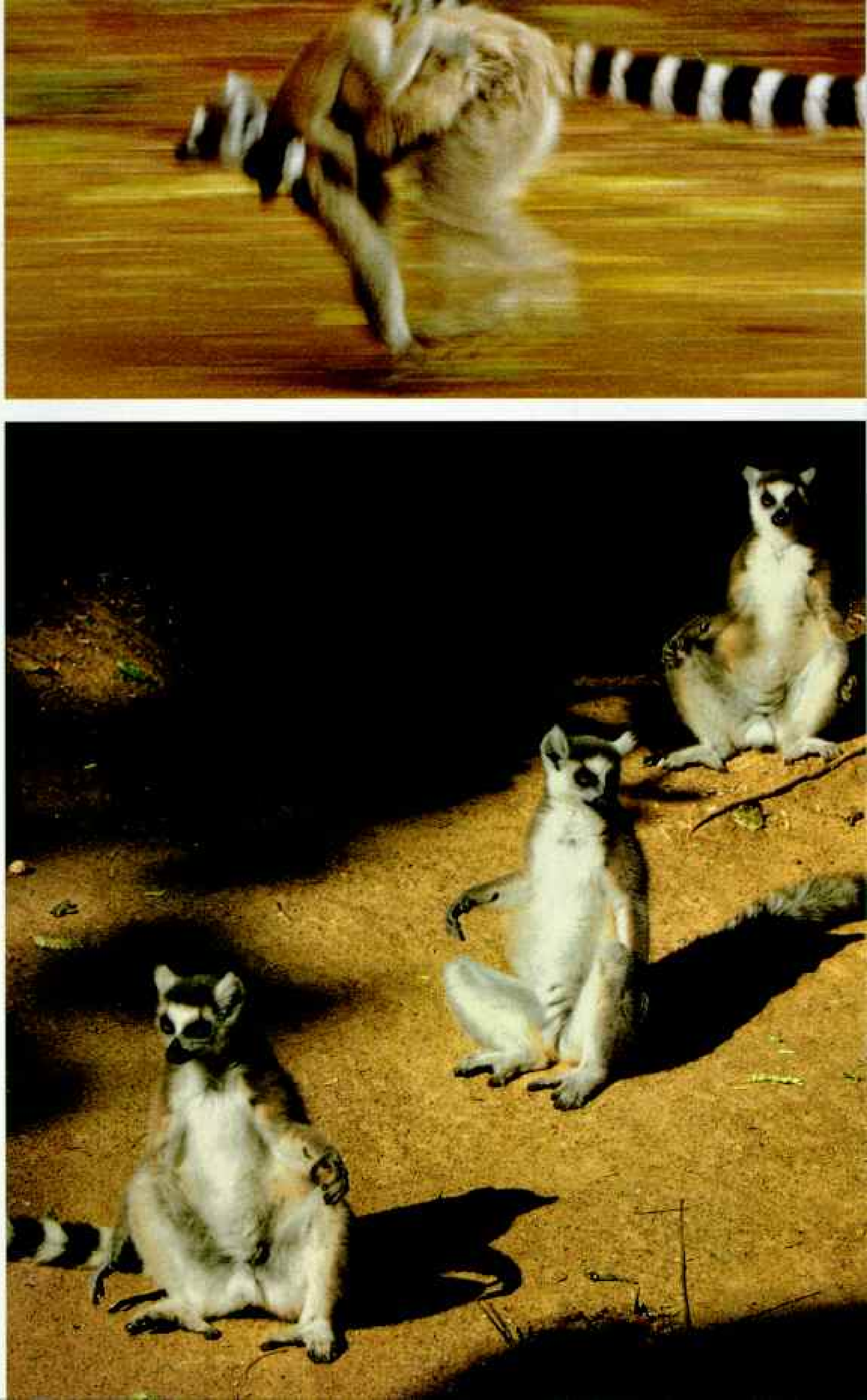
It rained sifakas. The mother landed only a yard from us, amber eyes wide. Like the rest of the troop, she hit the ground leaping, and in two bounds regained the treetops, her unhurt baby hopping after.

After days of searching, Patricia Wright heard a strange cry in the upland rain forest, a growl that concluded in apoplectic rawing. Hoping for the first resighting in 15 years of the olive-gray greater bamboo lemur, she instead glimpsed a lemur with russet fur. Studying it closely, she learned that it also was a bamboo-eater.

It was Bernhard who gave me my chance to confront this puzzle. "Come here!" he called quietly one day.

Feeding together on an overhead branch, but well apart,

(Continued on page 158)



"Beautiful beast," an English trader in 1608 called an animal with a "long taile like a Fox, gurled with white and blacke"—the ring-tailed lemur. Highly sociable troops contain 5 to 30 members and thrive in a moist habitat with lush vegetation. On the edge of the southern desert such an oasis exists in a private reserve where ringtails soak up the sun. Weeks old, a youngster whizzes along bareback atop its mother (left).

At this reserve the author pioneered detailed research into lemur society when she began observing this species in 1963. Although prior studies had concluded that male primates dominated females, she discovered the opposite to be true among ringtails, behavior later borne out by other lemur species.

LEMUR CATTA—BODY LENGTH 17 IN.; TAIL 23 IN.

Lemur's nightmare, a sleek hunter called a fossa (left) pursues small mammals and birds both aloft and on the ground. Its powerful tail, as long as its body, acts as a brace when climbing and partially wraps around tree trunks as a brake during descent. The island's largest carnivores, fossas are related to mongooses and civets. Several were temporarily trapped in the western forest by photographer Lanting, who built a large enclosure to habituate them to his presence, a technique he used to make several photographs in this article. One fossa chewed its way out of a wooden trap, and another mangled a steel cage. Lanting turned over two of the animals, rarely displayed, to a Madagascar zoo.

At a water hole where a fossa's 15-minute-old scent lingers, red-fronted lemurs nervously risk a drink. One alarm call from an alert individual announcing a ground predator would send the group scurrying for the trees. They would head for low cover upon hearing a different warning for a marauder such as a Henst's goshawk (above).

LEFT, *CRYPTOPROCTA FEROX*—TOTAL LENGTH 66 INCHES; UPPER, *ACCIPITER HENSTI*; LOWER, *LEMUR FULVUS RUFUS*—BODY LENGTH 18 IN., TAIL 21 IN.

Graceful in the air, awkward on the ground, a sifaka (left) leaps from familiar tree to terra incognita below. The reddish brown coat of another treetop acrobat identifies it as a female black lemur (right). Males of the species are black, however, and outnumber females.

were a lemur pair and their half-grown male juvenile. Small round ears and golden eyebrows, arched as if in surprise, rose above orange-whiskered cheeks crammed with bamboo. The rich russet of their coats ran halfway down their tails, to finish in black plumes. The female adult held a two-foot-long bamboo spike and stripped away its outer layers with her teeth, as if eating corn off a cob bigger than herself. For the juvenile, his mother peeled bamboo and shared with him the tender greenness within.

"But they're the wrong color!" I exclaimed. "I saw the greater bamboo lemurs André Peyriéras brought back from the coffee station. I could swear those animals were gray."

Doubtful that we were seeing a distinct species and not merely a different-colored race of the greater bamboo lemur, André later captured one pair each of the two kinds of large bamboo-eating lemurs. Chromosomal and anatomical studies done later in France confirmed his and Bernhard Meier's suspicions that a completely new species had been discovered—the golden bamboo lemur.

Thus at least for now three different species of bamboo lemurs are known, with three different eating habits, as Patricia Wright discovered on her return in 1987. The widespread small gray ones nip off bamboo leaf stems. The rediscovered greater grays eat a variety of food, but only they can shred stalks into spaghetti and dine on the pith. The new golden bamboo lemur scissors off the topmost tips of young bamboo shoots. All three species share the same forest at Ranomafana.

Nor are these lemurs the only wildlife riches of the escarpment near Ranomafana. At least 18 other mammal species unique to Madagascar live there too, including the sucker-footed bat. This creature is so bizarre that it is the only species in its genus and the only genus in its family. It roosts in the national tree of Madagascar, the traveler's palm, and walks up the tree's shiny, broad leaves headfirst, secured by adhesive feet.

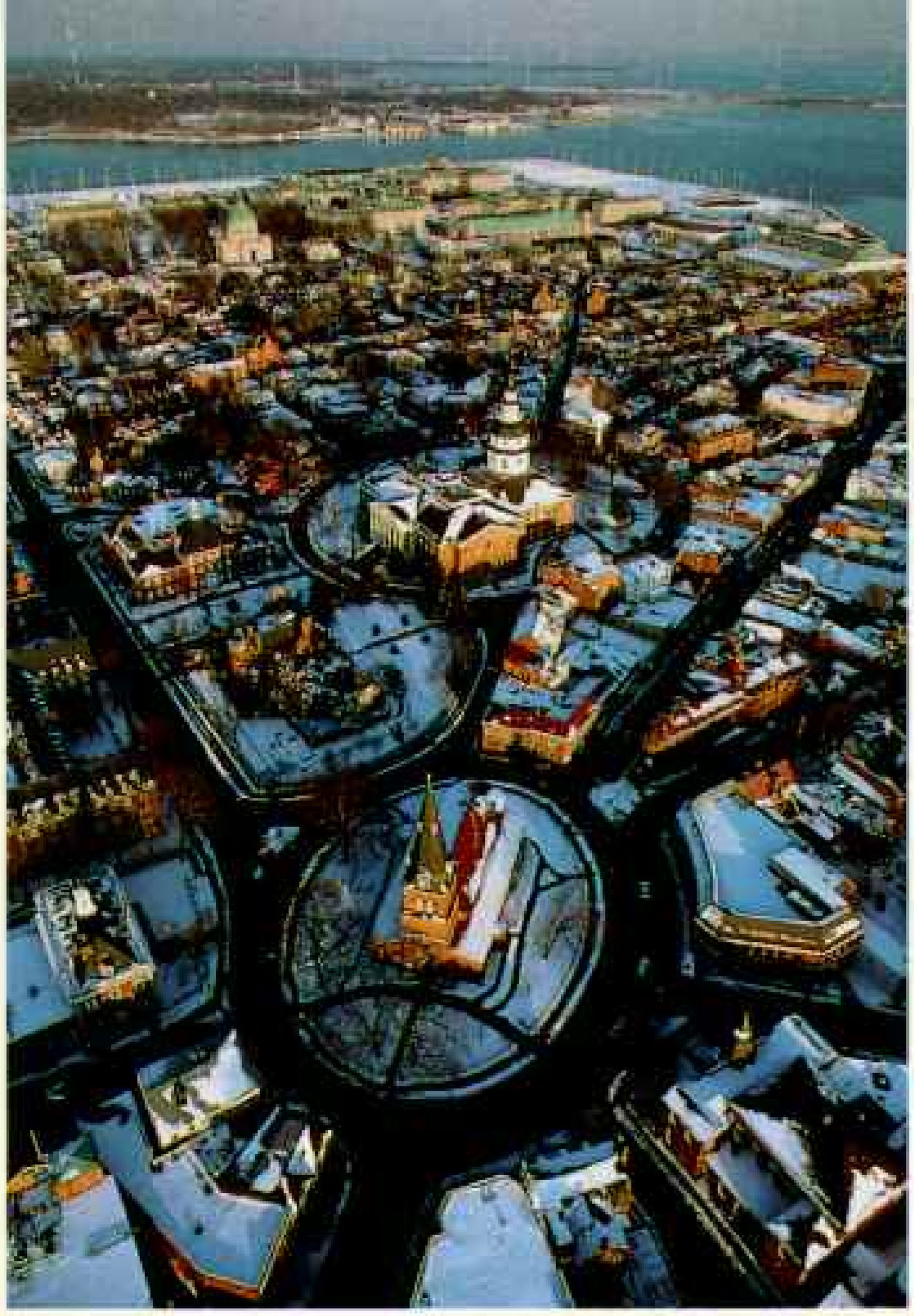
IDENTIFYING the golden bamboo lemur has led Madagascar's Ministry of Livestock, Fisheries, and Forests to revive old plans to create a national park in what is left of the once extensive Ranomafana rain forest.

With its own natural trampoline—hindquarters that can launch it 20 feet—a sifaka maneuvers toward a baobab. Despite increasing concern, the question of lemur survival remains suspended.

Loggers and local farmers imprudently denuded many slopes, until in 1985 a cyclone triggered landslides that crushed whole families in their houses. Chastened farmers—if not the loggers—now think it wise to spare the remaining virgin forest, where rosewood trunks swell far too large to encircle even with outstretched arms. Last year village after village warmly welcomed a team, led by Patricia Wright, tracing out boundaries for the new park.

With the protective measures of conservation and its potential economic benefits, the proposed Ranomafana Park could become a model for others in Madagascar. Hot springs and the attraction of unique animals offer promise for tourism and new jobs. Preservation of the rain forest will forestall erosion and prevent silting at a downstream hydroelectric dam serving three major towns. Blocked irrigation channels can be cleared to revive abandoned rice fields, lessening peasants' dependence on slash-and-burn agriculture. New impetus may flow to an already established project to replant the region's barren slopes with fruit trees.

If all this happens, it will be because of the determination of the Malagasy people themselves. But the renaissance of Ranomafana stems from a lemur. Golden bamboo lemurs have been munching bamboo shoots, pairing off, and raising babies for millennia. Now our newly recognized cousins may help us save a portion of our common environment to the benefit of all. □



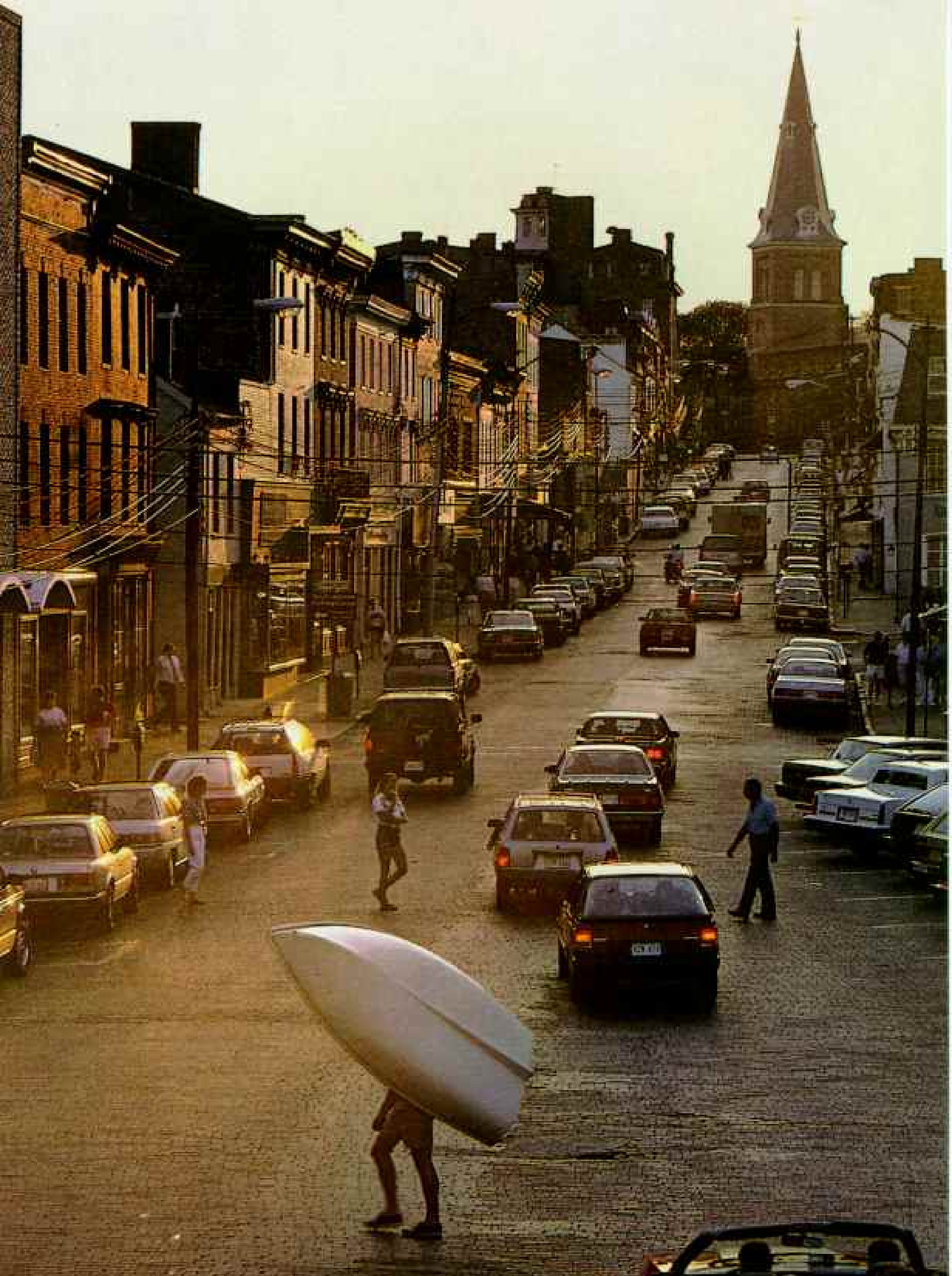
ANNAPOLIS

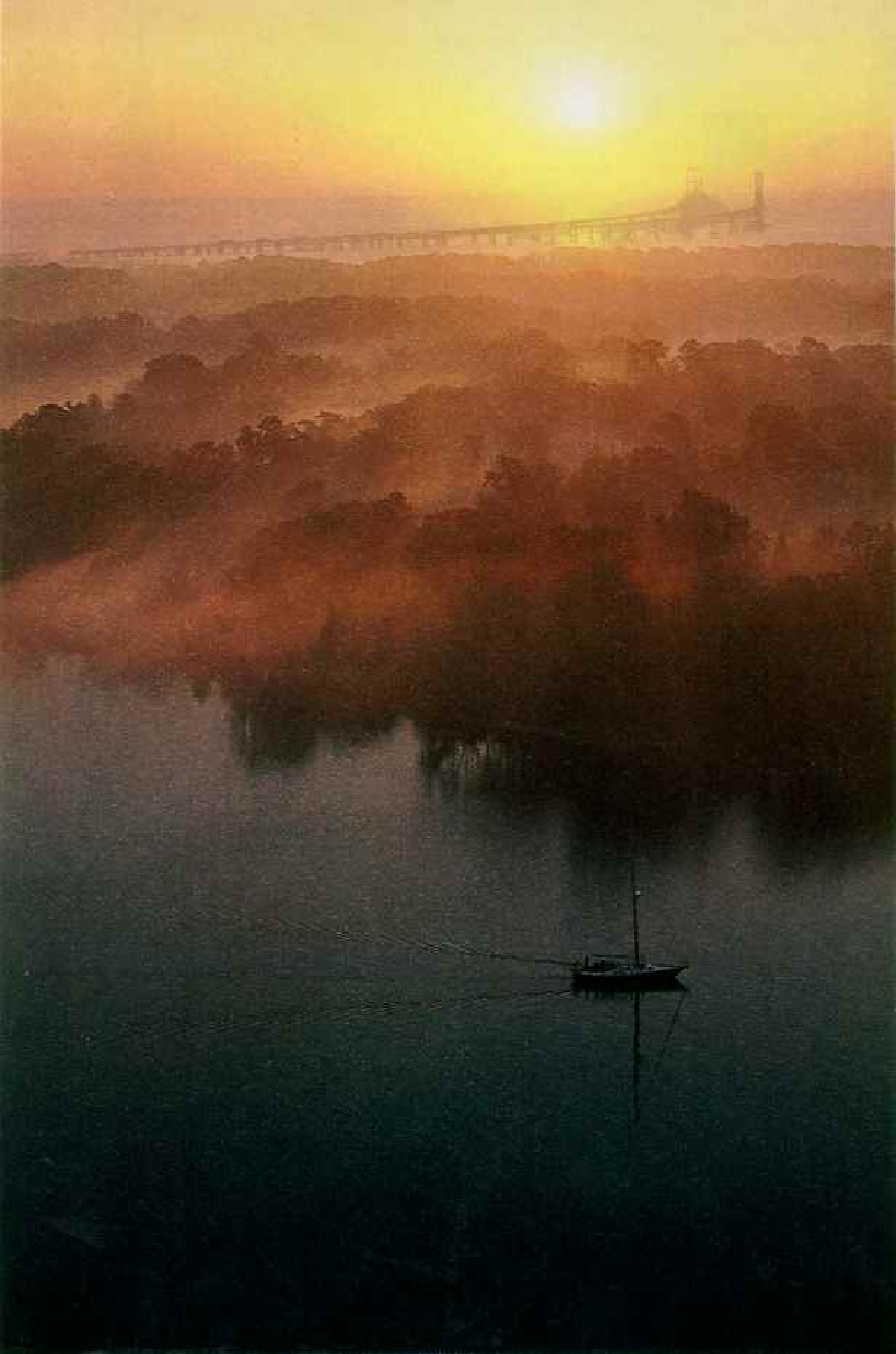
Camelot on the Bay

By LARRY KOHL
NATIONAL GEOGRAPHIC SENIOR STAFF

Photographs by KEVIN FLEMING

Jewel of the Chesapeake, yesterday and today, Maryland's capital city has awakened from a long sleep to new renown as a boating center for the East Coast, showcase for preservation, and magnet for the upwardly mobile. Within hailing distance of the 209-year-old capitol (above) that once housed the Continental Congress, the bricks of Main Street slope from Church Circle to the waterfront, home of the U. S. Naval Academy.





Close to, yet far from, the traffic of the Chesapeake Bay Bridge, Whitehall Creek drowses under a morning mist. Cradles for battered nerves, countless coves and creeks around Annapolis act as a powerful lure for the six million people of the nearby Baltimore and Washington, D. C., area.

RUNNING WITH THE WIND, our sloop bounds from trough to crest through the heavy swells of Chesapeake Bay on a direct heading for Annapolis harbor. Off to starboard Bancroft Hall, massive stone dormitory of the U. S. Naval Academy, looms resplendent in the late afternoon sun over the Severn River.

"Ready to jibe!" shouts the helmsman; the crew of ten take up positions along the deck. Two of us grab the handles of a "coffee grinder." Like shimmy dancers in a speeded-up film, we winch away until the sloop's huge scarlet spinnaker draws taut and trim on our new course.

Sailing into Spa Creek and the heart of Annapolis, we moor at the foot of Shipwright Street. Exhilarated by the hands-on experience of sailing in Annapolis's Wednesday-night races, I beeline for Marmaduke's, a pub where local boaters gather for video replays of the event. My crewmates, mostly from the Washington, D. C., area, head home—with thoughts, no doubt, of more sailing on the weekend. Lawyers, dentists, bureaucrats: They and thousands like them have made Annapolis a sailing center for the East Coast.

Behind the flash and glamour of its boating scene, however, lies another Annapolis, richly layered with history and tradition—a capital, whose fortunes have always been tied to the Chesapeake Bay.

Eighty years older than Baltimore, its huge sister near the head of the bay whose deep harbor makes it Maryland's chief port, Annapolis has been Maryland's political capital since early colonial times. News to many, it even served briefly as capital of the United States. That was 204 years ago, during its golden age as a model English town in a rude new land.

In those colonial days, when virtually all commerce was by water, Chesapeake Bay offered English shippers easy access to Maryland's great tidewater tobacco plantations. It also provided food for a population that would farm in the summer and fish year round.

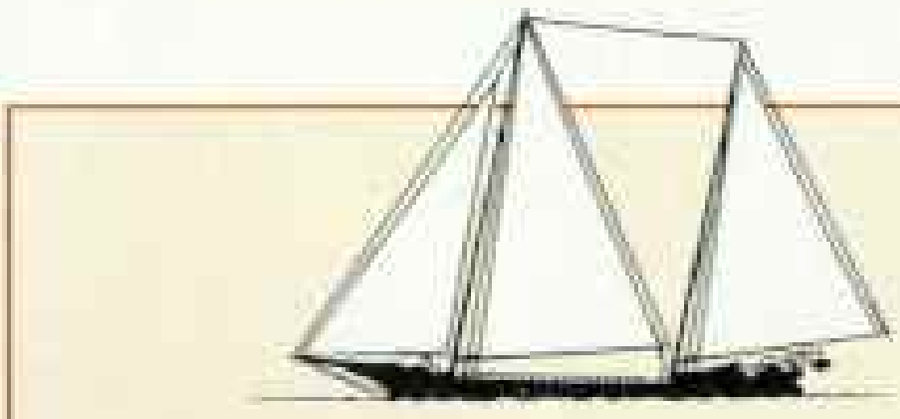
Once the domain of skipjacks, bugeyes, and other legendary fishing craft, the Chesapeake has been all but conquered by invading fleets of pleasure boats. Today far fewer people earn a living from the bay than those who spend their earnings to be on or near her waters. In the midst of it all is Annapolis, favored (or cursed, depending on one's view) by other geographic factors as well.

About an hour's drive from both Baltimore and Washington, the area has become a magnet for city-weary immigrants and tourists. Wedged between these two metropolises with their six million people, Anne Arundel County, with its county seat, Annapolis, is booming. Though the city proper has little room to grow, new subdivisions have sprouted like spring wheat around it and its adjacent peninsulas, boosting the region's population to nearly 155,000.

"Many of the newcomers are commuters willing to spend two hours a day on the road," Chris Coile, one of the area's top realtors, told

Five generations gather at the William Paca House to honor its namesake and their forebear, one of four signers of the Declaration of Independence who lived in Annapolis during its golden age. Dating from the 1720s, the home (right) of another signer, Charles Carroll, is one of the city's oldest. Excavations here in the historic district by archaeologists from the University of Maryland have yielded a trove of colonial artifacts.

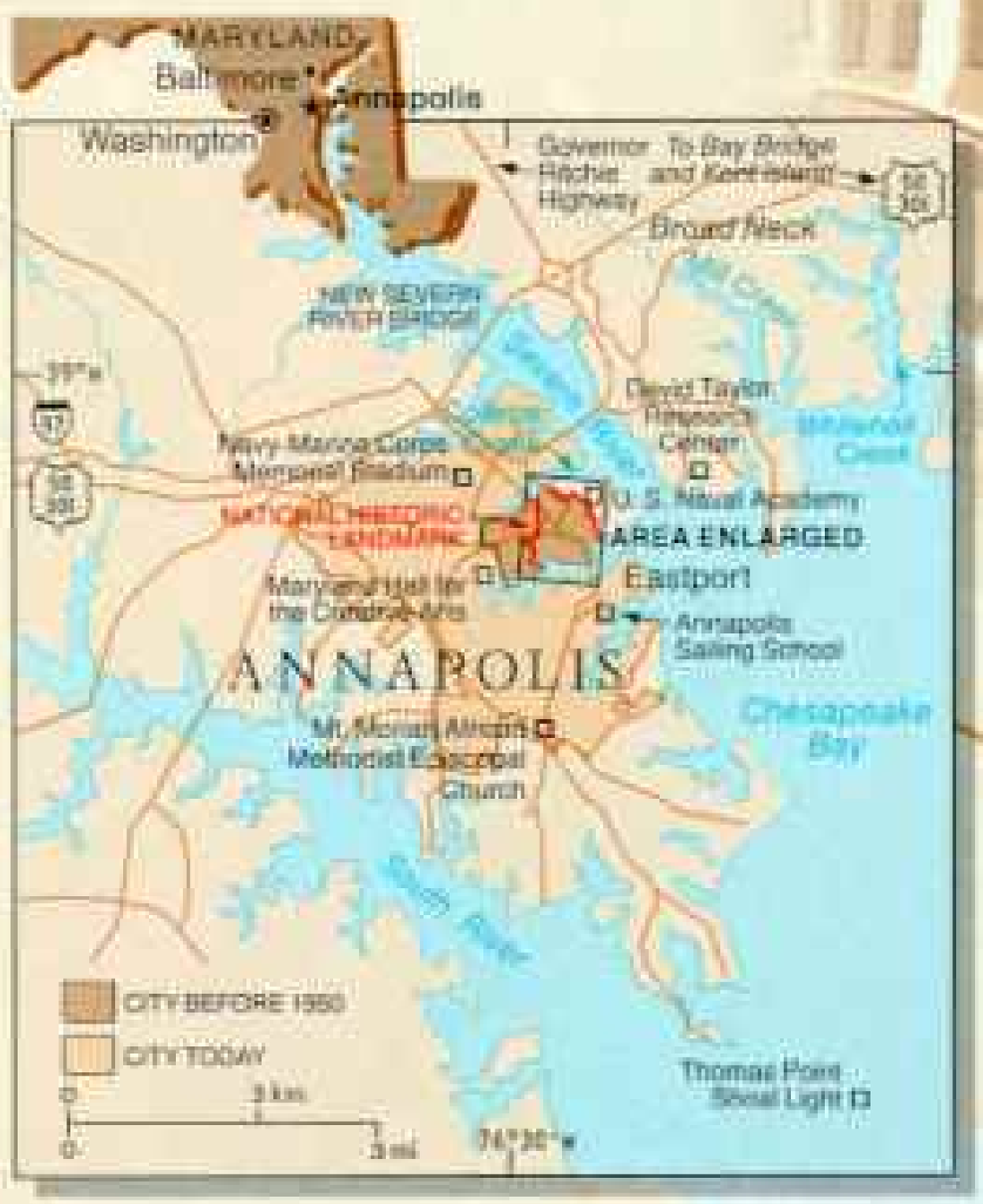
Guardian angel of a "museum without walls," St. Clair Wright has never lowered her guard in 36 years with the preservation group Historic Annapolis, Inc. Currently fighting to have "disfiguring" power lines (above, in background) buried beneath city streets, she and her group have been instrumental in restoring 470 buildings in the historic district, which the National Park Service designated as a historic landmark in 1965. Believing that "landmarks are for living," she finds particular joy in seeing centuries-old buildings adapted to modern use. A showcase for 17 designated architectural styles spanning 300 years, historic Annapolis boasts more prerevolutionary brick buildings than any other U. S. city. Dating from 1695, the radial street plan reserves highest elevations for church and state, and allows many vistas of the city's waterfront.



Historic ANNAPOLIS

1 U. S. Post Office 1910
2 St. Anne's Church 1858
3 Reynolds Tavern 1747
4 Maryland Inn, ca 1770
5 Old City Hall and Engine Station 1764, 1821
6 Franklin Law Office, ca 1860
7 John Shaw House, ca 1725
8 Governor's Mansion 1868, 1936
9 Maryland State House 1772
10 Old Treasury Building 1735
11 66-68 State Circle, ca 1880
12 Bordley-Randall House, ca 1725
13 Opera House 1872
14 Commodore Waddell House 1866
15 McDowell Hall 1742
16 Liberty Tree, 400-year-old tulip poplar
17 Charles Carroll, the Barrister, House 1723
18 Ogle Hall (USNA) 1739
19 Chase-Lloyd House 1769
20 Hammond-Harwood House 1774
21 Lockerman-Tilton House, ca 1770
22 Peggy Stewart House, ca 1781
23 Chapel (USNA) 1904, 1939
24 John Brice III House, ca 1766
25 John Brice II House 1690-1720
26 Gassaway-Fleisheyer House 1870
27 William Paca House 1765
28 James Brice House 1767
29 Patrick Creagh House 1735
30 Sands House, ca 1690
31 Middleton Tavern 1740
32 Tobacco Prise House, ca 1720
33 Shiplap House, ca 1713
34 The Barracks, ca 1770
35 Market House 1858
36 Victualling Warehouse 1793
37 Traditional Customs House, ca 1770
38 Rebstock-Brewer House 1740
39 Ridout House 1764
40 Ridout Row 1774
41 Charles Carroll House 1720
42 St. Mary's Church 1858
43 Upton Scott House 1762
44 Lloyd Dulany House 1772 (site of George Mann's Tavern)
45 Callahan House, ca 1775
46 Zimmerman House 1887
47 Jonas Green House, ca 1699
48 Banneker-Douglass Museum of Afro-American Life and History 1874
49 Acton House, ca 1735

6 FRANKLIN LAW OFFICE 7 JOHN SHAW HOUSE



27 WILLIAM PACA HOUSE

23 U. S. NAVAL ACADEMY CHAPEL

NATIONAL HISTORIC LANDMARK BOUNDARY

St. John's College

State Office Buildings

U. S. Naval Academy

Bancroft Hall

Gate 1

Gate 2

Gate 3

Gate 4

Garden

Library (Woodward Hall)

Hanson Field

Hassey Hall Field House

Visitor Information Center

City Dock

City Hall

County Court House

Annapolis Hilton Hotel

Annapolis Yacht Club

Spa Creek

To Eastport

WEST STREET

MAIN STREET

CHURCH CIRCLE

NORTH

0 200 m

0 600 ft

9 MARYLAND STATE HOUSE

me. "But most find their opportunities here, either in the large industrial parks near the Baltimore-Washington International Airport in north county or in the many high-tech firms around Annapolis."

Capitalizing on the bay, the county seeks new businesses by placing ads in magazines like *Sail* and *Yachting*. They picture an executive on his sailboat, one hand on the tiller and one on his personal computer.

"Boating has become the second most popular sport, after golfing, for executives," says Lissa Brown in the county's Office of Economic Development. "But word is getting out that we're pretty choosy. I had to explain to one chemical company that citizens here are very sensitive to environmental issues, and perhaps they should look elsewhere."

With an enviable 3.5 percent unemployment rate, the county can afford to be choosy. A third of its workers hold state, local, or federal jobs, and more than half the remainder work for government suppliers. Twenty-three percent of county households earn more than $50,000 a year, contrasted with 16 percent nationwide.

Certainly a success story. But I also found a city wrestling with modern conflicts—chief of which is how to cope with its own success. Recently Annapolis has been hailed for entering a second golden age. But many fear the gold in Annapolis may turn to brass. The city is overloved and overcourted, they say. According to the mayor, Dennis Callahan, "everyone wants to get in, and no one wants to get out."

Forever young, a 200-year-old doll is displayed in the Hammond-Harwood House beneath a portrait of the toy's first owner, Ann Proctor of Baltimore, painted by noted artist Charles Willson Peale. One of the city's most admired homes, the Georgian house was once owned by St. John's College. Under the gaze of King William III, for whom the school was originally named in 1696, a student (facing page) defends his senior thesis.

EAGER TO LEARN of Annapolis's first golden age, I join Ed Papenfuse, Maryland's state archivist, for a look at the city from atop the dome of Maryland's State House, the oldest capitol in the United States in continuous use.

Under our gaze Maryland's "ancient city" unfolds like a green tapestry, studded with the brick and mortar of a history extending back to 1649, when a band of Puritans fleeing religious harassment in Virginia settled at the mouth of the Severn River.

"Early inhabitants called it Anne Arundel Town," Ed says, "for the wife of the second Lord Baltimore, proprietor of the colony of Maryland. In 1695 it was renamed Annapolis for Princess Anne of England, a year after Royal Governor Francis Nicholson moved the colonial government here from St. Mary's City, down the bay off the lower Potomac.

"Tanning and shipbuilding were the town's original industries. In the 1740s the city began to bloom as the citizens and government of colonial Maryland became increasingly independent of the crown."

A population of artisans and craftsmen arose in Annapolis to build the stately Georgian mansions that so impressed Thomas Jefferson that he noted in a 1766 letter, "The houses are in general better than those in Williamsburg." Literary clubs emerged to sharpen local wits and the forensic skills needed to

argue the case for a free America. Three of the city's great homes, in fact, were built by signers of the Declaration of Independence.

The Annapolis races, social event of the season, were often attended by a young colonel from Virginia, George Washington. After the Revolution, when Annapolis was serving nine months as capital of the new republic, Washington made his most celebrated visit to the city, to resign his commission as commander in chief of the army.

Washington's resignation on December 23, 1783, symbolized the subordination of military to civilian rule that would be codified nearly four years later in the Constitution. On January 14, 1784, in the old senate chamber of the Maryland State House, American sovereignty became indisputable fact when the delegates ratified the Treaty of Paris, officially ending the Revolutionary War.

The city fathers tried but failed to have Annapolis chosen as the permanent U. S. capital. In 1800, after meeting in Trenton, New York City, and Philadelphia, Congress finally settled into its new federal city, Washington, 35 miles west of Annapolis.

IT'S BEEN SAID that Annapolis slept for the next century and a half. Except for brief state assemblies every year or two, little disturbed its small-town atmosphere. After the U. S. Naval Academy was founded here in 1845, Annapolis became a sort of company town, catering to its large and

Last manned lighthouse of its kind—until the U. S. Coast Guard automated it in 1986—Thomas Point Shoal Light stands solitary watch at the mouth of the South River near Annapolis. The Coast Guard recently redesigned bay channel markers to accommodate large numbers of ospreys whose huge nests formerly obstructed the lights. Maryland's "beautiful swimmers," blue crabs have replaced oysters as the bay's most valuable seafood crop. Shedding its outgrown shell (left), one emerges in the soft-shell state savored by epicures.

prestigious guest institution. By the 1900s many of its historic buildings had fallen into disrepair. Renowned for its seafood, Annapolis became affectionately known as Crabtown.

For many those were Annapolis's golden years. One is 68-year-old Robert H. Campbell, whose roots here go back more than 200 years. An auctioneer and appraiser, with a long record in local politics, Bobby knows the old days better than anyone else. In the small antique-filled parlor of his home at the foot of Prince George Street he reminisces:

"When I was a boy, the oyster-shell piles around City Dock were as big as houses. We kids used to slide down them in cardboard boxes. Sewers used to empty into the dock, along with fish entrails from the markets. Today if they have a sewer leak or spill, the Department of Health stops everything in the river. But back then we used to swim in the stuff. We'd push it out of the way with our hands."

Even then, Bobby recalls, Annapolis used to entertain a fair number of tourists. "They'd come down from Baltimore on side-wheelers like the *Emma Giles* to see us countryfolks. Like my father when he was young, I used to sell deviled crabs at the wharf. Two for a quarter. Now they cost you eight or ten dollars each, and they call them crab imperial.

"Pinkney Street used to be called Soap Suds Alley," Bobby continued, dipping into 19th-century lore. "The women there would take in washing from the better-to-do folks up around

Crabtown capers at the Navy-Marine Corps Memorial Stadium (below) highlight the 42nd annual Annapolis Crab Feast, the world's largest, according to its Rotary Club sponsors. Some 2,400 hungry participants showed up at the stadium last July to consume 19,000 Maryland blue crabs. While disease and pollution have caused significant declines in oyster and rockfish harvests, the bay's hardy crabs are thriving.

Maryland Avenue. When they were finished, they'd toss the water in the street, and it would all run down into City Dock.

"By my time Soap Suds Alley had become Pinkney Street and turned mostly black, like Fleet Street. Other streets, like Cornhill, were mostly white. Blacks and whites lived and worked together then. We had separate schools and churches, but I'd say that we were better integrated then than now."

Today Crabtown stands transformed, thanks largely to a citizens group known as Historic Annapolis, Inc. At its headquarters in a Victorian house on Prince George Street, I met with the person who, more than any other, is responsible for the look of present-day Annapolis, St. Clair Wright.

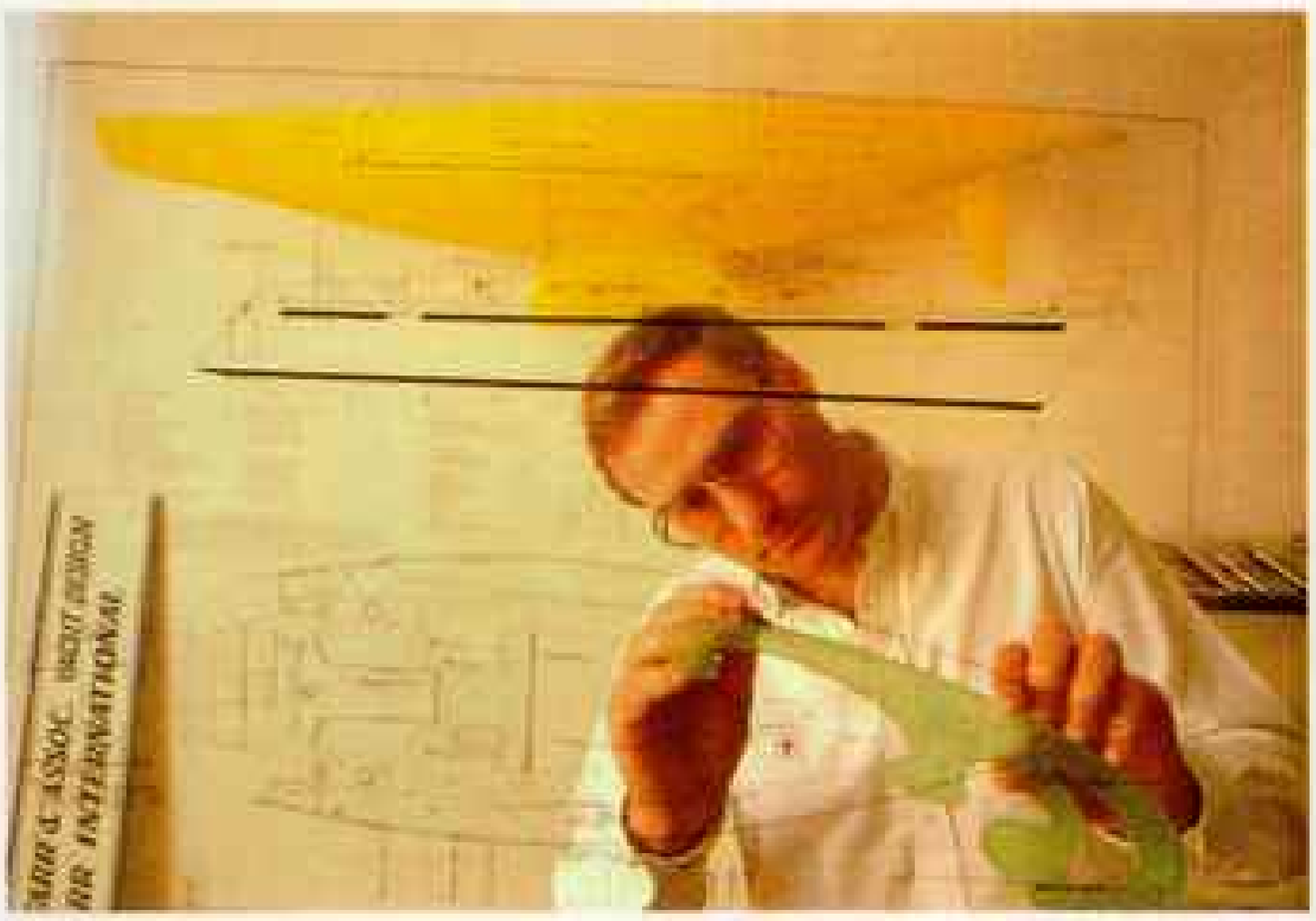
Chairman emeritus of Historic Annapolis, she exemplifies a breed of American women whose unflinching guardianship of local heritage has earned them, at the National Trust for Historic Preservation, the respectful

sobriquet "dragon ladies." Knowing this, I am disarmed by her gentle countenance and manner.

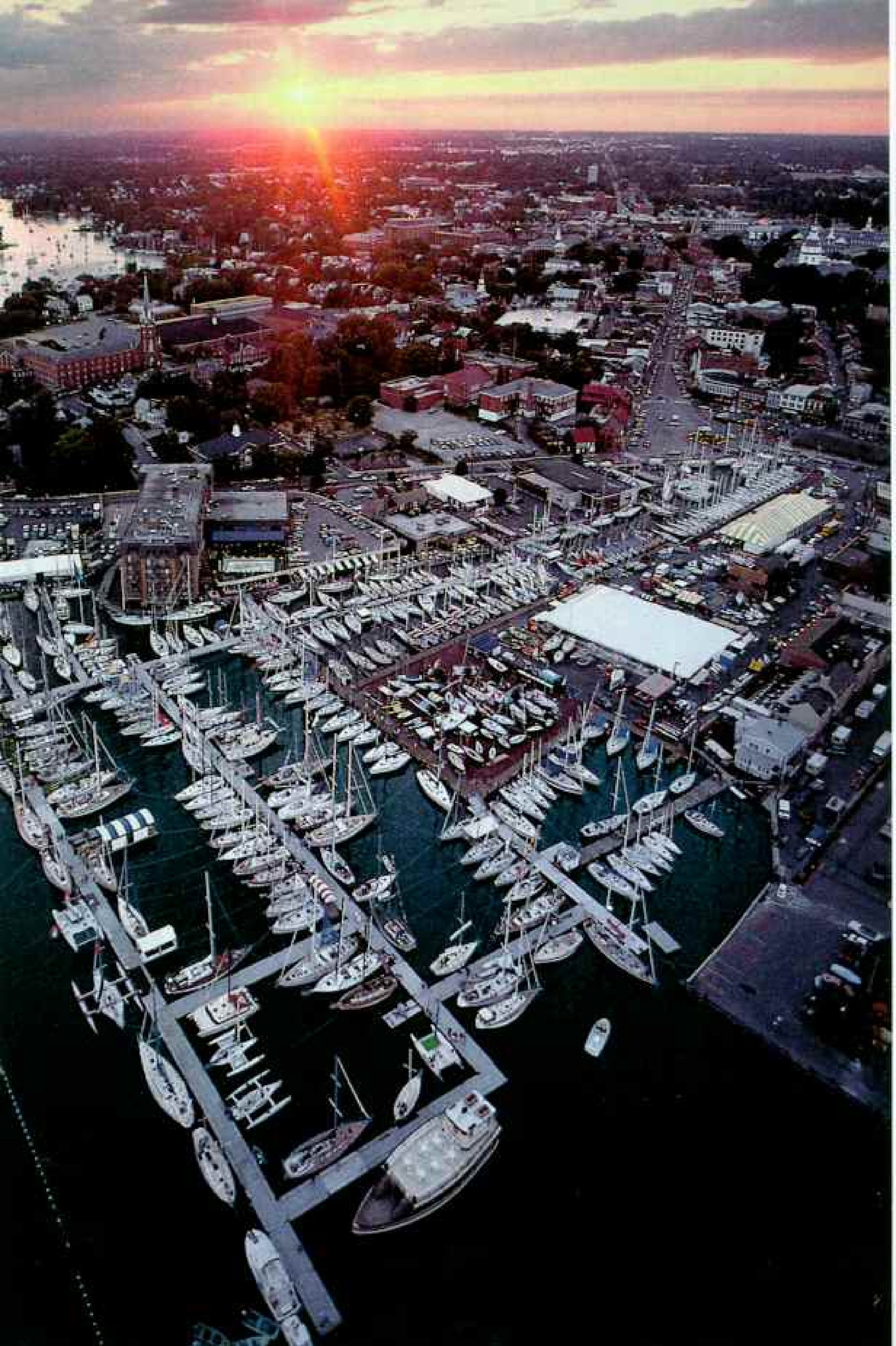
"In 1962," she tells me, "the Navy wanted to appropriate three residential blocks to expand the academy. We did everything we could to stop them. We made up booklets showing why this neighborhood was important architecturally and historically, and sent them to every preservation group in the country that had a congressman on the Joint Armed Services Committee. And we asked all these groups to write to President Kennedy. Later we learned his desk was piled high with letters saying, 'Don't destroy Annapolis.' "

Well, they didn't. And now nothing can be built or renovated in the historic district without approval and guidance from the Historic District Commission. Even the shape of a shop sign must pass muster.

Today many of the district's meticulously restored buildings have become holy places



Shoes away to protect the deck, visitors inspect a luxury sloop at the nation's largest in-water sailboat show (right), held each October a week before the city's equally popular powerboat show. A nautical supermarket, Annapolis berths more than 200 maritime services. One of several boat designers here, New Zealander Bruce Farr (top) has designed two America's Cup competitors, including New Zealand's entry in the 1987 race.



for legions of visiting heritage buffs. The Hammond-Harwood House on Maryland Avenue is thought by many to be the masterpiece of renowned colonial architect William Buckland. Tradition has it that Mathias Hammond built his dream house for his fiancée, who then jilted him because she thought he cared more for the house than for her.

But the real pride of Historic Annapolis is the William Paca House on Prince George Street, built by Paca before he became the governor of free Maryland in 1782. I can't imagine that any building has been more painstakingly restored. Joints were even X-rayed to determine original nail holes. Admiring the millwork, I was amazed to learn that for 58 years most of it was buried under the plaster and paint of Carvel Hall, a 200-room hotel. In a fiercely fought campaign, Historic Annapolis not only saved the house from demolition in 1965 but also went on to restore its terraced garden, which archaeologists helped unearth from the concrete crypt of a parking lot. Today Paca's garden, with its reconstructed brick canal and Chinese Chippendale bridge, lies like an emerald pendant over the heart of old Annapolis.

PRESERVATION turned Annapolis around. But there are some who use the term "gentrification" for what happened. One is city alderman Carl Snowden, a former black activist who walked with me through his old neighborhood near City Dock.

Passing a strip of fashionable bars and restaurants, he pointed to a popular watering spot. "McGarvey's here used to be called the Downtown Tavern and was a black bar." We turned into a narrow, picture-postcard street that climbs crookedly to State Circle. "This is where I used to live: 8 Pinkney Street," he said. "Today these houses are going for extraordinary amounts: $125,000, even $200,000 for the nicer ones. Some people buy two and make them into one house."

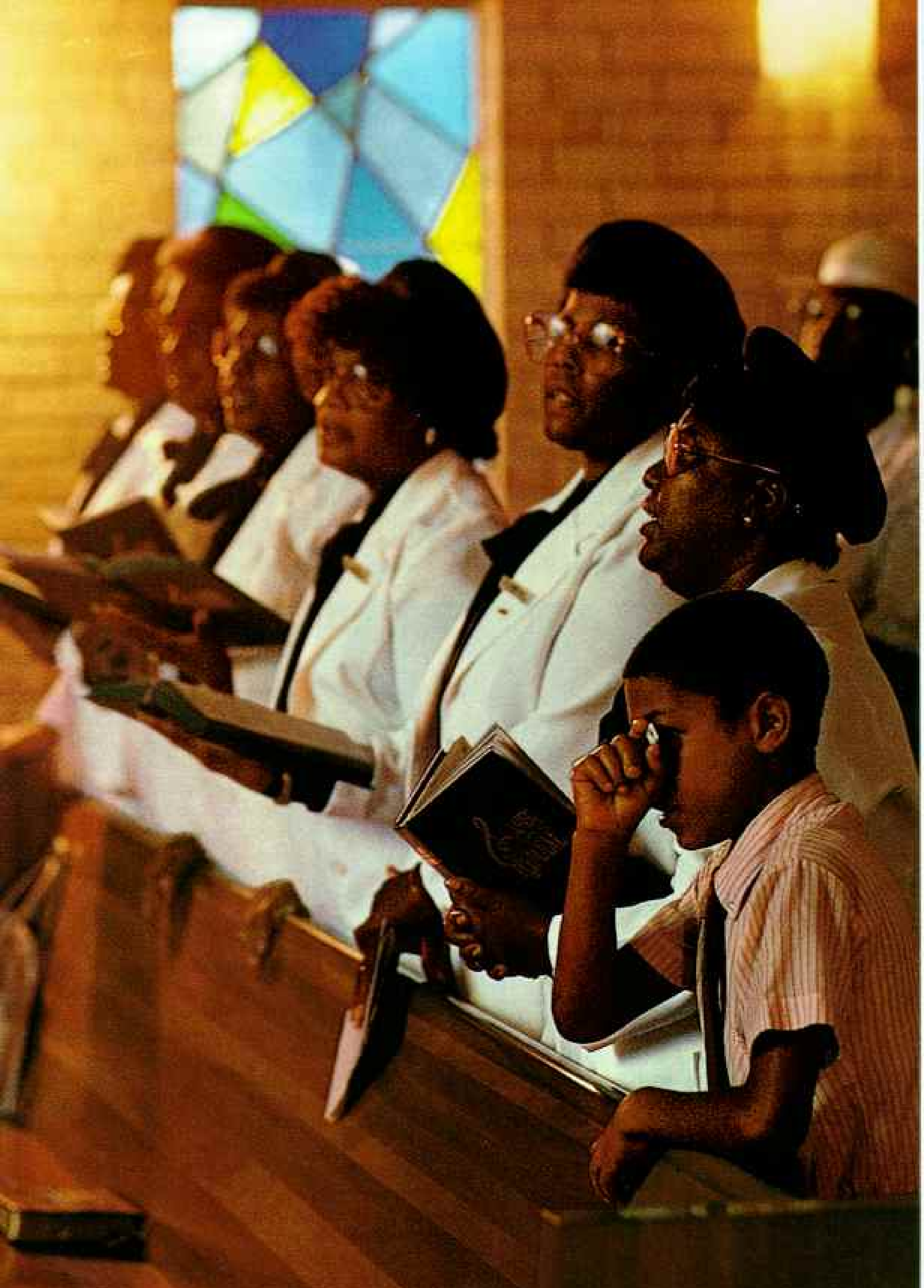
How could these simple clapboard cottages fetch such prices? The lure of history, no doubt. The street is redolent of it. But recent history has changed aspects of downtown Annapolis. Today, for instance, few blacks remain in the center city.

Many people therefore are surprised to learn that a third of all Annapolitans are black and that many live in public housing near the edge of the city. One summer night I dropped in on a group that calls itself the Downtowners, which describes the part of Annapolis where their hearts still reside.

While children played among the folding chairs, women peeled tinfoil off steaming dishes of chicken and baked beans. With me at the table were Herbert and Pauline Johnson, one of a dozen or so black families still living downtown. "I'll stay on Fleet Street till they carry me out in a box," vowed Herbert, who has lived in the old neighborhood 70 years.

As Annapolis draws ever more affluent inhabitants, others besides blacks are being displaced—for example, those who help satisfy

Thanksgiving dinners are prepared for needy families at the Christian Workers Mission. Members of the Mt. Moriah Church (facing page), whose old quarters are now a museum of African culture, meet in a building near the edge of town. A third of the population, blacks have deep roots in Annapolis—the slave port where Kunta Kinte, immortalized by writer Alex Haley, landed in the 1700s.



the city's voracious craving for seafood.

Across the Severn, just beyond the Navy's David Taylor Research Center facility on a placid backwater called Mill Creek, live a dozen or so watermen. One of them, Jimmy Cantler, owns the Riverside Inn, where on any day you can see legislators, midshipmen, and other savvy locals cracking blue crabs on brown butcher paper, dipping the succulent morsels in drawn butter or vinegar, munching with beatific smiles, and dropping the leavings into empty cardboard cartons.

Like most of what Jimmy calls "serious" watermen, his four brothers and son, Eddie, fish for anything of value, though crabs and oysters are their mainstay.

While he tends to the soft-shell crabs behind his restaurant, moving them from one water-filled tray to another during various stages of molt, I ask him if Mill Creek will ever become a parking lot for pleasure boats, like the creeks in Annapolis.

"Well, we've already been zoned out of town. People don't like the mess of a waterman's operation. Frankly, there's more money these days in boat slips than in fishing."

In the darkness of a cold October morning I join Eddie Cantler and his partner, Buddy Sanner, for a day of oystering.

Warming up with coffee and doughnuts over a space heater in the cabin of Eddie's oyster boat, we motor north, under the huge twin spans of the Chesapeake Bay Bridge. Reaching Swan Point, north of Kent Island, we find 40 or so other boats already there, waiting for sunrise, the legal starting time.

Nature's green light turns out to be a dazzler as the sun breaks above the Eastern Shore, gilding the bay with shimmers of gold. Eddie and Buddy take up positions behind a metal culling board and activate two hydraulically rigged tongs, operated by foot pedals.

The first dip is laden with oysters. But no—they're mostly empty shells. Culling quickly, each man finds three or four oysters more than the legal size of three inches. With the back of their hands, they sweep the shells and undersized oysters back into the bay.

"Oyster spats need shells to grow on," says Eddie. "We help cultivate them by turning the shells over. It's like a farmer tilling the soil."

By 3 p.m. two knee-deep mounds of oysters fill the foredeck. The watermen have caught their limit—this year only 30 bushels a boat. Before the onslaught of MSX, a disease that has devastated the bay's oyster crop, they would have been allowed 50 bushels per man.

But smaller harvests mean higher prices. At Whitehall Creek on Broad Neck peninsula, a wholesaler peels off six crisp hundred-dollar bills and three twenties for the day's catch: $22 a bushel. Fair, I suppose, for eight hours of back-wrenching labor on this cool, sunny day. But the oyster season runs through the heart of the winter, when Chesapeake Bay watermen endure sleet, ice, and arctic windchill to keep their small food factories afloat.

Watermen are rare sights in Annapolis these days. Especially during the summer when

Annapolis sojourner Walter Cronkite autographs the sleeve of Charlie Snowden, a cook at McGarvey's, while the restaurant's owner, Mike Ashford, looks on. Like thousands of other East Coast yachters who cruise the Caribbean-to-New England circuit each year, Cronkite rarely misses the opportunity to stop over in Annapolis with his 48-foot ketch.

Main Street belongs to the tourists, who throng the restaurants, boutiques, trendy bars, and souvenir shops that have proliferated. That's when Annapolitans go out of their way to avoid downtown, with its clogged streets and woeful lack of parking.

BUT TOURISM has become a cornerstone of the city's economy. Last year 4.5 million visitors pumped an estimated 400 million dollars into local cash registers. So, graciously or grudgingly, the city makes room. It's one price, some say the steepest price, to be paid for living in a city that fulfills two normally conflicting desires: to be cosmopolitan and to live life on a human scale. As one resident put it: "How many other cities of 34,000 can boast a symphony orchestra, an opera company, and three theater groups?" And the boats, it should be added. Always the boats.

One summer afternoon, in a dinghy, I motor down Spa Creek, past the drawbridge where cars yield the right-of-way to tall-masted sailboats.

Puttering into City Dock, a channel some locals call "ego alley," I'm bedazzled by the multitude of gleaming yachts—motor and sailing craft of every description—tied to the bulkheads. As yachtsmen polish their brass work, halyards slap restively against a forest of aluminum masts.

To port, boaters sipping gin and tonics at the Hilton's dockside bar are tossing cocktail crackers to the ducks. Diesel fuel accents the salt air, but so does something else: the smell of success. For what I see here is the playing out of an American dream.

Three months later I witness the marketing of that dream, when the nation's largest in-water sailboat and powerboat shows monopolize City Dock for two weekends in October. Many of those attending the sailboat show learned their ropes at the Annapolis Sailing School. With five branches in the continental United States and the Caribbean, the school graduates more than 7,000 sailors a year.

Hard to believe, but some in Annapolis are immune to boating mania. One is David Williams, native Annapolitan and member of the Severn River Association—a preservation group dedicated to safeguarding the river and its watershed.

"I have no arguments with boating people," he told me in his tiny book-cluttered office at Anne Arundel Community College, where he teaches biology. "Except that there are so many of them. And everybody wants a boat in his backyard, which means they have to live on the water.

"Boats have a tremendous impact on the ecological balance of the Severn and the bay," he claims. "The worst problem is that most of them flush their toilets. And then there are the petroleum products: The motors all have exhausts, and they all leak. Finally, the paints used on their bottoms have biocides in them to inhibit barnacles."

But boating is only one of David's concerns. He cites the effects of uncontrolled development: grading for homes and highways, septic systems, and road runoffs, all adding to the bay's woes.

David, who lives in a small house in Eastport, has no desire to live on the water. "But I want there to be places where I can see the water without trespassing. And I'd like to get there without fighting traffic."

Finally he smiles at the paradox of growth in Annapolis: "We'll fight a new development and lose. The new people move in, become good neighbors, and right away become environmentally aware."

The phenomenon David refers to is described by Mayor Dennis Callahan, himself a relative newcomer, as the "drawbridge mentality."

"Once the castle is perceived to be full, the inhabitants want to pull up the drawbridge," he explains to me in his office on Duke of Gloucester Street.

In order to curb growth and preserve the quality of life, the city council recently approved a tough package of zoning laws. It includes critical-areas zoning for city shores, which the mayor maintains is more stringent than laws adopted by the state of Maryland to protect all of its Chesapeake shores.

This March he took me to see a five-acre tract of wetland habitat at the headwaters of Spa Creek saved from development by that legislation. Standing on a footbridge, he points through the reeds:

"A walking path goes up from here along that rise with a spectacular view of downtown Annapolis. My wife, Brenda, and I walked it last fall. It's truly beautiful. And they could have put another hundred condos here."

But Annapolis's passion for preservation is not limited to its environment and its historic

buildings. Callahan, in fact, won office in 1985 largely on a platform of preserving the city's boatyards and maritime services, most of which are located on the Eastport peninsula.

"We don't want to kill the goose that laid the golden egg. We had to ask ourselves: 'How can you ensure that working boatyards will stay, when developers are offering owners three million dollars for their property?' Our new zoning laws were the answer. Now the primary way the city will grow is through annexations."

FOR MANY PEOPLE the name Annapolis has become shorthand for the U. S. Naval Academy, a confusion of terms that riles some locals. Other than that, city and academy coexist in the harmony of mutual admiration. Hundreds of area families participate in a midshipman program that provides the academy's 4,500 students with homes away from home.

Visiting the tree-shaded academy yard is like stepping into a small federal city. Sedate buildings in the beaux arts style mix easily with the glass and concrete of recent additions, like Rickover Hall, named for Adm. Hyman Rickover, father of today's nuclear Navy.

In that center of the academy's imposing science complex, I met first classman Andy Johnson. Like many at the academy Andy has the military in his blood—father and uncles graduates of the Air Force Academy and West Point. Cutting an impressive figure in his Navy blues, the six-foot-four midshipman from Austin, Texas, had two summer cruises under his belt, both in the Pacific.

"When I was on my cruises, I knew what was going on in the engine rooms from what I learned here," he said, walking me through a room filled with huge turbines, pumps, and boilers. "Over here is a gas turbine, which a lot of our ships are turning to from steam. You can take the whole thing out and repair it, or put another one in."

We proceeded to an underground labyrinth of instruction labs for a daunting look at the technological gantlet all midshipmen must run. Wave-generating tow tanks test the mettle of scale-model ships designed and constructed largely by midshipmen. Wind tunnels test model aircraft; Andy points out a friend testing fuels for a lunar lander. In a physics lab students are learning the mysteries of lasers.

One of the most repeated words at the Naval Academy is leadership. Discipline, sports, honor codes—all are aimed at fostering leadership. I was curious to learn how female middies, 12 years after breaking the academy's entrance barrier, were measuring up. Battalion commander Ann Kelly, an attractive brunette from Wyoming, a picture of subdued femininity, was about to inspect a company of fellow midshipmen in Bancroft Hall.

As the mids began to muster, a male plebe "chopped" a corner in front of Ann.

"Beat Army, ma'am!" he bleated, and took his place.

A vision of spit and polish, the company stood rigidly, chins scrunched against chests.

For a city of only 34,000, Annapolis boasts an enviable richness of arts and crafts. Moe Turner (right), one of 17 artists-in-residence at the Maryland Hall for the Creative Arts, finds inspiration at Fleet and Cornhill Streets. Tony Smith (above) inspects an electric guitar that he helped make at the Paul Reed Smith shop, whose customers include rock groups such as Santana, the Doobie Brothers, and Heart.

Spinnakers billowing in the breeze, a colorful host of racing sloops fills the harbor during the Wednesday-night races sponsored by the Annapolis Yacht Club. On line

for June 1989, the prestigious Annapolis-to-Newport Race shares biennial glory with its sister event, Rhode Island's Newport-to-Bermuda Race.

Squaring off in front of each person, Ann chatted with a few while scrutinizing them, head to toe, for dress-code infractions.

Instead of some hard-nosed dressing-down her inspection seemed almost amiable.

"Everyone has their own leadership style," she explained. "Yelling is not part of mine. I use a positive approach."

As different from each other as yin and yang are the academy and its neighbor, St. John's College. Calmed by an air of timelessness that hangs sweet around their centuries-old "liberty tree," students here imbibe the wisdom of centuries in a study program centered on the "great books."

The instructors, whatever their degrees, are called tutors and are required to teach all subjects. With a sister campus located in Santa Fe, New Mexico, the college consistently ranks near the top in national polls for academic excellence.

To observe one of St. John's most honored

Victim of the May heat, a midshipman collapses at the U. S. Naval Academy during a dress parade when the sun spares neither gender. Composing 8 percent of the 4,500 midshipmen, women have steadily gained honors and respect at the academy since they were first admitted 12 years ago.

Many vie, but few are chosen, for the academy's first-rate, tax-paid education:

Only 1,315 of 15,565 applicants were successful last year. Tearful good-byes are common on induction day, as incoming students prepare for the isolation of plebe summer. Thanks in part to the ambience of its host city, the Naval Academy enjoys a lower rate of attrition than the other service academies.

traditions, I joined several students in the library as Claudia Probst, a 21-year-old New Yorker, defended her senior thesis on Plato at her pregraduation orals. Both the student and her three inquisitors, it was obvious, were learning from the experience.

"St. John's helps us see which ideas have stood the test of time," she told me. "And how those ideas have influenced thought across the disciplines.

"We don't pick and choose our own courses here," she added. "How can a basically uneducated freshman know what path she should take? I never would have discovered my interest in Greek philosophy if I had had to choose my own curriculum."

Back in the late sixties, when the hair was long and war sentiments short, epithets and overripe fruit reportedly flew as midshipmen paraded past St. John's campus. Today animosities have cooled. Six years ago, in fact, a tradition was born when the Johnnies

challenged the mids to (ahem) a croquet match. Accompanied by baroque music and feted with champagne, it has become an Annapolis event.

THROUGH THE YEARS Annapolis has seen more than its share of colorful governors come down the pike. Today one comes down the pike most every day: Governor William Donald Schaefer, former mayor of Baltimore, who chooses to spend most evenings in his home city. This surprises nobody, since Schaefer was the driving force behind Baltimore's recent economic revival. Heads may roll if his drive down Governor Ritchie Highway and across the Severn River Bridge is impeded by traffic snarls.

Aptly described as Maryland's "stern Dutch uncle" for his steamroller style, Schaefer was quick to make his presence felt after his election in 1986. At his order the marble floors of the State House are now buffed each night. And he once startled employees in the state cafeteria by crawling under tables inspecting for dirt.

Around nine almost every morning one can see a former Maryland governor, Marvin Mandel, eating breakfast at Chick and Ruth's Delly, the last restaurant on Main Street to avoid gentrification. His 1977 conviction for mail fraud and racketeering was recently overturned by a federal judge. Mandel harks back to Maryland's old school of political wheeling and dealing, which included Vice President Spiro Agnew, another former governor. But, say Annapolitans, the schemes behind those old scandals were hatched in Baltimore, which many consider the real seat of the state's political power.

Unlike the governor and his staff, the 188 members of the Maryland General Assembly convene in Annapolis full-time only 90 days, early in the year. Besides the usual plethora of lawyers, it includes farmers, small-business men, and other "citizen legislators."

Mark Pilchard, a hog farmer from the Eastern Shore, noted the changes he's witnessed since his first election to the House of Delegates 29 years ago:

"When I came here in 1959, we had one secretary for the whole Eastern Shore delegation. The state budget was about 300 million dollars. Last year it was nine billion dollars."

And that, in itself, is one clue to what's

happening in Annapolis, coffer of the state's burgeoning wealth. Caught up as it is between so many competing forces, the city struggles to preserve not only the integrity of its traditions but also its present prosperity. Will those goals prove mutually exclusive? Only the future knows. But meanwhile, to inhabit the moment in Annapolis can still be a joy.

One balmy August night I strolled along the waterfront. Clouds blocked the stars, turning the harbor into a canvas of black velvet,

washed with ripples of reflected light from the shores of Spa Creek. Across the Severn, arrayed in twinkling red, the Navy radio towers were sending messages to submarines in the far reaches of the Atlantic.

Then, like an apparition, out of the still darkness a solitary sloop emerged. Ghostly white, like the wing of a giant albatross, it angled into harbor. A voyager from the West Indies, I fancied. Drawn to Annapolis by some mysterious force. □

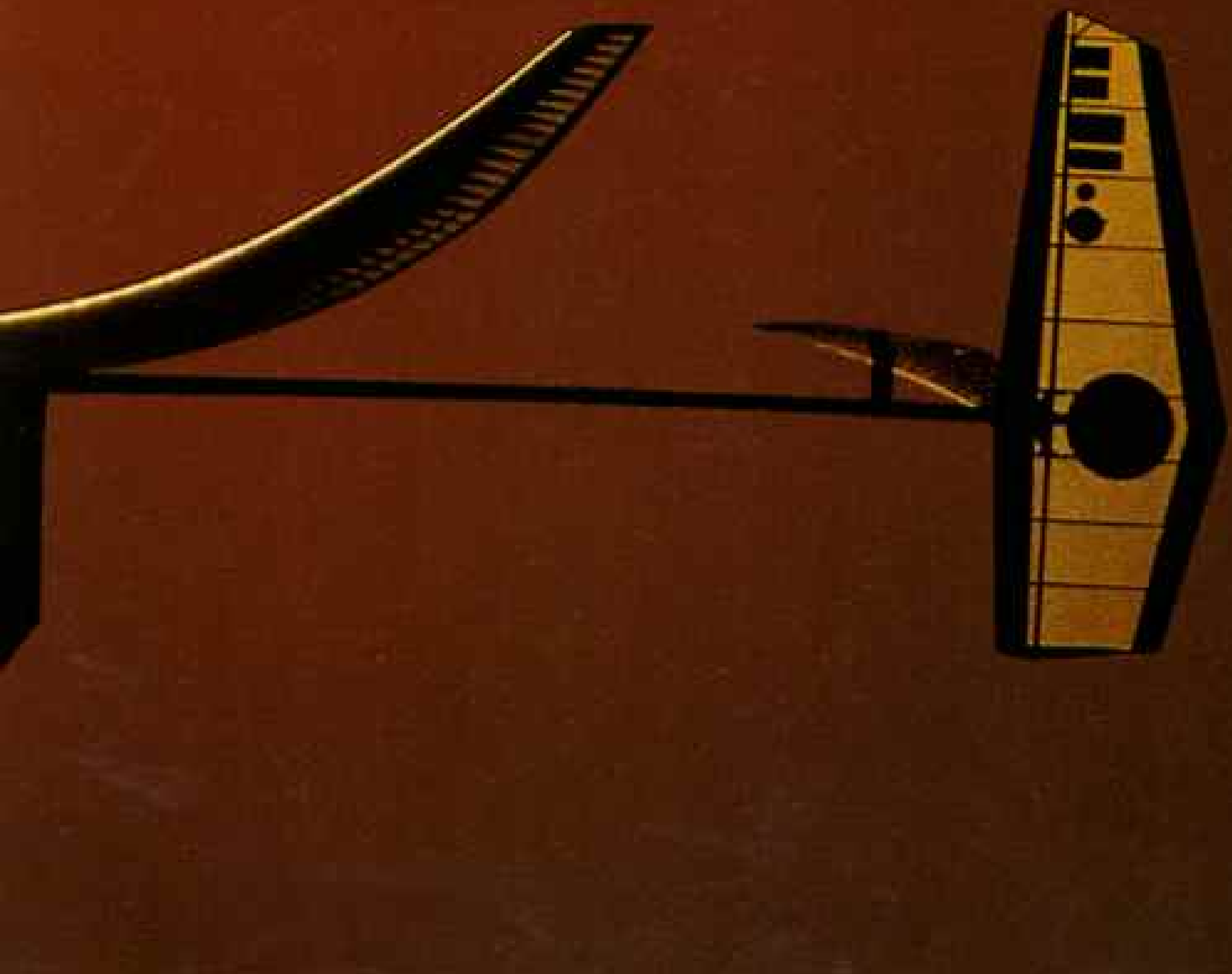
The "governor's office" at Chick and Ruth's Delly, normally reserved for ex-Governor Marvin Mandel, at right, gets a surprise visit from the current chief executive, William Donald Schaefer, center, and state comptroller Louis Goldstein. Favored by lawmakers and lobbyists, the deli proves that politics is still the city's most enduring tradition.

Triumph of *Daedalus*

By JOHN S. LANGFORD
DAEDALUS PROGRAM MANAGER

Photographs by CHARLES O'REAR WEST LIGHT

By pedal power Daedalus takes wing from Crete to the island of Santorin, 72 miles away. A Greek pilot's strong legs and Massachusetts Institute of Technology know-how combine to set a new record for long-distance, human-powered flight.



DAEDALUS! On the wings of myth he flew from the Minoan palace at Knossos in Crete, evoking wonder and awe. Though mythology is replete with flying creatures, Daedalus introduced a new dimension—man flying under his own initiative.

Thus we have given his name to a diaphanous aircraft of graphite fiber and plastic that will become one with its pilot. Perhaps the ancients, who were always combining humans with animals to create such characters as Pan and the Minotaur, would appreciate our craft—half man, half machine, each incomplete without the other.

The *Daedalus* team on Crete numbers 40, mostly faculty members, graduates, and students from the Massachusetts Institute of Technology, where our research project was conceived and the aircraft built. Our goal is to break the distance record of 22.5 miles set over the English Channel by Bryan Allen in *Gossamer Albatross*.* But we've really set our sights for Santorin, 72 miles away.

Though some myths say Daedalus landed in far-off Italy, we chose Santorin because it is the first major landmass north of his takeoff point at Knossos. Ironically, this volcanic island that the ancients called Thera convulsively exploded in the second millennium B.C., belching a deadly cloud of ash that affected the whole Minoan world.

In the glare of automobile lights (below) on a calm April morning at the Greek Air Force Base near Iraklion, team members ready the aircraft for flight. Offshore the support flotilla waits: a patrol boat of the Greek Navy, two coast guard cutters, two photographic boats, a command boat carrying Steve Bussolari—an MIT professor who directs *Daedalus* flight operations—and me.

In three inflatable craft that will shadow *Daedalus* closely, students check provisions for the ride to Santorin: fuel, lifejackets, rescue gear, smoke markers, and snacks. They also check airplane disassembly kits.

*Bryan Allen described the "Winged Victory of 'Gossamer Albatross'" in the November 1979 NATIONAL GEOGRAPHIC.

hacksaws, wire cutters, and pliers for dismantling *Daedalus* in the event of a water landing. Though we are confident of our craft, the flight is no sure thing. I give us a 50-50 chance.

As we wait, the calm gives way to a breeze that increases to more than five knots, the upper limit of wind that *Daedalus* can tolerate without risking structural failure. Reluctantly, Steve broadcasts, "Let's scrub it."

Three years of weather observations in the Aegean have taught us that, in the six-week period we have budgeted for the flight, perhaps only two days will offer the nearly calm conditions we require.

What we don't know now is that we won't awaken to one of those days for 20 mornings.

In a way *Daedalus* is the result of several years of work on human-powered aircraft by MIT students. We got airborne with *Chrysalis*, a biplane that made more than 350 flights with 45 pilots and taught us a lot about low-speed flight. With *Monarch* we won the Kremer World Speed Competition, attaining 21 miles per hour, or, as one MIT wit observed, "Mach .03."

With a wingspan of 112 feet, *Daedalus* required a special hangar (below, top) that we shipped to Crete and anchored in concrete as protection against occasional high winds. Inside the hangar, Greek pilot Kanellos Kanellopoulos tests the plane's seat for comfort and then eases out of the fuselage pod, assisted by professor Mark Drela and student Tidhar Shalon.

When the weather turned favorable, it was Kanellos's turn in the rotation of our five pilots. During seven months of training he had bicycled more than 10,000 miles. "My legs feel good," he said before the flight. "I am ready to go."

FLEXING like a bow, the *Daedalus* wing bends in a test (below) of its graphite epoxy spars at the MIT-Lincoln Laboratory Flight Facility near Boston. As structural engineer Juan R. Cruz checks for stress, water-filled bottles simulate air loads encountered during flight. Two aircraft were built with funds donated by United Technologies Corporation and named for their year of construction, hence *Daedalus 87* and *Daedalus 88*.

Each revolution of the pedals (top right) was translated by gearboxes into one and a half revolutions of the propeller. An upper gearbox—this one from a *Daedalus* prototype (bottom right)—transmits power directly to the propeller. A technician's index finger points to a bell crank that enables the pilot to adjust the propeller's pitch to regulate the "bite" of air it takes during flight: low pitch for power on takeoff, higher pitch for endurance during cruise.

The aerodynamic design of *Daedalus* was by Mark Drela (middle right), an MIT assistant professor of aeronautics and astronautics, who uses Kevlar yarn to lash fuselage tubes made of sheets of a superlight, super-stiff graphite epoxy that are layered, shaped, and baked in an oven. The thickest graphite piece, a section of the hollow main wing spar, consists of 12 layers but is as thin as a dime.

Surely the gods smiled at *Daedalus*, in flight (right) over the Aegean between the command boat and one of the inflatables. And mortals can almost count the 102 wing ribs, each precisely cut from $^{3}/_{16}$-inch-thick polystyrene foam. The fuselage pod is suspended beneath a 29-foot boom, which supports the 11-foot propeller turning at about 105 revolutions per minute. The airplane's skin is Mylar, a thin plastic film.

With a small control stick in his right hand, the pilot maneuvers the rudder and elevator. Except for a few metal screws, everything in the airplane has been handcrafted and meticulously screened for weight—even the glue was weighed.

Director of engineering Harold H. Youngren wagered "a roast pig" that the airplane would not come in under 70 pounds. He lost. Flight-ready, *Daedalus 88* weighed in at 68.5 pounds.


DAEDALUS

THE FIRST HINT of trouble after a flawless flight: As Kanellos turns into the wind to land on the beach at Santorin, the airplane's ground speed begins to drop until the aircraft is almost hovering. "Right rudder, right rudder," cries Steve Bussolari, hoping to slip the aircraft over to the beach.

Then a gust of wind seems to lift *Daedalus*. Kanellos hears a loud crack, and Tidhar Shalon, in an inflatable boat nearby, sees the tail twist as the graphite in the tail boom splinters just aft of the elevator.

The control stick goes limp in Kanellos's hand, and a second, sickening crack ensues as the wing spar fails on the right side.

The plane rolls slowly to the right. Impact is soft and the fuselage begins to fill with water. Instinctively Kanellos pulls his feet from the pedal stirrups and dives through the Mylar, an act he later cannot remember.

Grant Schaffner dives from an inflatable and swims to the rescue (left), but Kanellos has already surfaced with a smile.

HITTING THE BEACH at Santorin, Kanellos is escorted by, from left, student Grant Schaffner, pilot and University of Connecticut medical student Glenn Tremml, student Siegfried Zerweckh, and pilot Frank Scioscia.

Kanellos wears shorts in which he cut dozens of small holes as a joke to show the extreme measures taken to conserve weight. Chest electrodes recorded his heart rate.

Looking like a shopper at a rummage sale (top right), Tidhar Shalon helps gather the remnants of *Daedalus* for shipment back to Crete.

To power the aircraft, we searched for the world's best human engines. Ethan R. Nadel, professor of epidemiology and physiology at the Yale University School of Medicine, joined with Steve Bussolari to devise a series of tests to measure the pilots' maximum mechanical power output and endurance, to screen pilot candidates for aerobic capacity, and to explore avenues for extending their endurance.

Glenn Tremml and Lois McCallin, a triathlete from Boston, emerged from this program to set world distance records in 1987 for men and women in *Light Eagle*, the *Daedalus* prototype.

Kanellos, cycling champion of Greece 14 times, stood out among the Greek applicants. From hundreds of others, we selected Frank, Greg Zack, and Erik Schmidt, all U. S. national-class cyclists, and retained Glenn. The ability of these pilots to process oxygen—twice that of most people—is a gift of genes honed by years of aerobic exercise. It was nothing for them to cycle 60 to 100 miles a day in training, much of it uphill. Frank casually mentioned one evening in Crete that he had done 145 miles that day.

We had earlier determined that the energy budget for the flight would be equivalent to pedaling a racing bike at 23 miles an hour for six hours. Without glucose replacement this output would exhaust the body's reserves in three hours. Ethan, with the help of the Shaklee Corporation, developed an in-flight drink that replenishes fluids and salt and nearly doubles the amount of glucose delivered to the bloodstream by

IN ADDITION to team members already mentioned, these also played crucial roles: Mary Chiochios, Tom Clancy, Jean-Joseph Coté, Stephen Darr, Brian Duff, Steven Finberg, Jack Kerrebrock, Sarah Morris, Peter Neirinckx, Robert Parks, Claudia Ranniger, Tom Schmitter, Christine and Peggie Scott, Marc Schafer, Bryan Sullivan, Matthew Thompson, Louis Toth, Timothy Townsend, Dave Watson.

off-the-shelf drinks. With "Ethan-ol," as it was dubbed, the pilots' glucose levels were sustained for six hours.

Lean as greyhounds except for bulging thigh muscles, the pilots recycled food into energy at fantastic rates. Onlookers were amazed as they consumed up to 7,000 calories a day.

Læs Wong, a Shaklee nutritionist, supervised the pilots' high-carbohydrate, low-fat diet. When he ruled Crete's nutritious but fat-rich olive oil off-limits, the Greek chefs at our hotel were astonished.

The conditioning program was put to the test when, after three weeks of cancellations due to weather, Steve announced the arrival of a high-pressure system that promised light winds, perhaps even tail winds from the south. The next morning, with Kanellos in the cockpit and everyone on station, the promise came true. A thrill of expectation surged through the flotilla as team member Dimitra Pavlou reported from Santorin, "Winds 1.4 meters per second, from the *south*." Steve broadcast, "The research part of this project is now officially over. Let's take off."

At first I could see only the flickering propeller, then the thin white line of the wing across the horizon. Kanellos was airborne at 0703 local time on April 23, 1988. As he soared over the water, he exclaimed, "It is better than perfect!"

Indeed it was. With the lead inflatable pointing the way to Santorin, the rest of the flotilla tucked in behind our airplane, translucent in the early sun. Kanellos reported an airspeed of 14 knots, while we noted a healthy tail wind. We had been prepared for failure, but were we prepared for success?

As Kanellos churned out the miles, pedaling nonstop, Steve radioed minor course corrections and prompted Kanellos to keep up his drink schedule. "Don't worry. My stomach is full," he responded.

At 0829 Steve called Kanellos: "You have now flown 23 miles, breaking the straight-line record for a human-powered airplane."

A bulky container ship angled across our course, leaving a wake that would threaten the low-flying *Daedalus* as well as the inflatable boats. Crisp Greek commands filled the air as Capt. George Foussianis steered his patrol boat, churning a boisterous wake, directly toward the intruder. The ship altered course.

At 0952 we broke the record for time aloft and would set a new one of 3 hours, 54 minutes, and 59 seconds at Santorin. The flight also validated a highly efficient airfoil design for human-powered aircraft. And most important, our fragile low-flying plane had accumulated data that could be useful in construction of high-altitude endurance aircraft. Never mind that splash-dunk off the beach. The *Daedalus* had triumphed. □

The MAN & the MYTH

REMINGTON

Wealthy, successful, and self-assured, Frederic Remington posed in 1902 as a leading artist of the Wild West. Raised in upstate New York and sent to Yale, he was an Easterner to the core. Yet he made his mark on the nation's imagination by depicting the fading world of cowboy, Indian, and cavalryman. Catching the public's fancy, he portrayed those moments of conflict that defined the West's romantic heroes, as in his 1889 masterpiece, "A Dash for the Timber" (overleaf). His vision became our vision, and his images linger still: At Fort Huachuca, Arizona, riders of B Troop, 4th Cavalry, a volunteer ceremonial unit, practice maneuvers that Remington would have seen in the field there a century ago.

By LOUISE E. LEVATHES
NATIONAL GEOGRAPHIC EDITORIAL STAFF

Photographs by CHRIS JOHNS

OPPOSITE PAGE FOLDS OUT >

FREDERIC REMINGTON ART MUSEUM, OGDENSBURG, NEW YORK (LEFT); AMON CARTER MUSEUM, FORT WORTH (OVERLEAF)

THE CLOSEST HE EVER CAME to being a cowboy was the ten months Remington spent on his sheep ranch in Kansas. He relished the company of "men with the bark on," like these hands relaxing after a New Mexico roundup.

FREDERIC REMINGTON ART MUSEUM

FOR A YEAR I have known your daughter Eva, and during that time have contracted a deep affection for her. I have received encouragement in all propriety and with her permission and the fact of your countenancing my association, I feel warranted now in asking whether or not you will consent to an engagement between us. If you need time to consider or data on which to formulate I will of course be glad to accede to either. Hoping this will not be distasteful, allow me to sign

Your obd Srvt,
Fred'c Remington

MEN HAVE ALWAYS GONE WEST, looking for something.

In the summer of 1881, when he was 19, Frederic Remington made a brief trip West in search of adventure—and himself.

Lawton Caten, an upstate New York businessman, had turned down his polite request for the hand of his daughter, saying that Eva was needed at home because his wife had died. Remington was also set adrift by the untimely death of his father, a Civil War hero whom he idolized. He had given up his art training at Yale (which his mother thought was foolishness anyway) and was uncertain now what he would do.

At home in Ogdensburg, New York, Remington was a young man without a future. In the West that first summer he was suddenly a man without a past, joining drifters and adventurers in their dreams.

Years later, when he was a well-established artist, he would recall:

Evening overtook me one night in Montana, and I by good luck made the camp-fire of an old wagon freighter who shared his bacon and coffee with me. I was nineteen years of age and he was a very old man. Over the pipes it developed that he was born in Western New York and had gone West at an early age. His West was Iowa. Thence during his long life he had followed the receding frontiers, always further and further West. "And now," said he, "there is no more West. In a few years the railroad will come along the Yellowstone and a poor man can not make a living at all. . . ."

Without knowing exactly how to do it, I began to try to record some facts around me, and the more I looked the more the panorama unfolded. . . .

Although it is doubtful that Remington decided then to chronicle the closing of the American frontier, he certainly must have

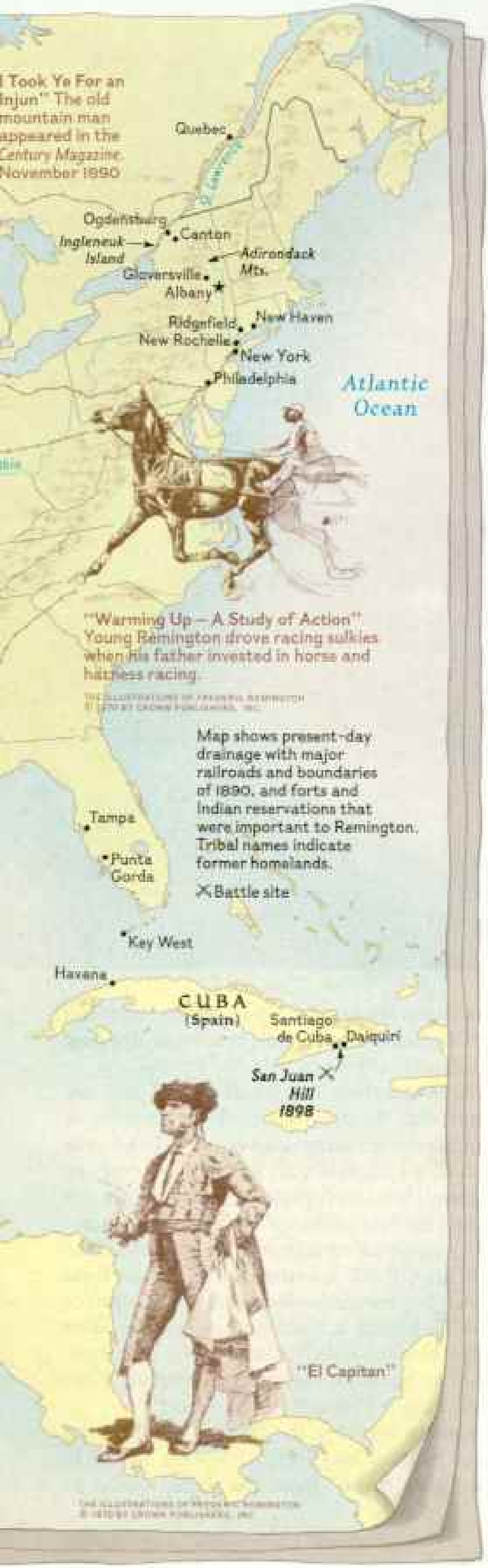
Frederic Remington

THE ARTIST'S West stretched from the Mississippi to the Pacific, from Calgary to Mexico City. After an 1881 gentleman's junket to Montana Territory at 19, Remington traveled for much of his life among what he called "my people," away from "all the fuss and feathers of society." He moved by rail, stage, and horseback, bunking at forts and reservations and sometimes in fine hotels.

He sold his first crude sketches to *Harper's Weekly*, whose staff artist made them publishable. Thereafter Remington taught himself and became much in demand as a magazine illustrator. For Theodore Roosevelt's *Ranch Life and the Hunting Trail*, he did some 90 illustrations, including the exuberant cowboy at lower left.

In 1892 Remington illustrated a gilt-edged edition of *The Oregon Trail*, about the 1846 trip of Francis Parkman. The aged author called pictures, such as the Indian at upper left, "as full of truth as of spirit." Fearing the public would lose interest, the artist sought new subjects from the Adirondacks to Mexico City (right). But the public has remained faithful to his romantic West.

NGS CARTOGRAPHIC DIVISION DESIGN: DAVID R. CHANDLER; RESEARCH: MARGERY J. FLYNN; PRODUCTION: CHARLES KOBAT, JAMES R. McCLELLAND, JR.; MAP EDITOR: SUE PLATIS



been moved by what he saw. In the panorama around him were cowboys working on open ranges and driving cattle long distances to railheads in Kansas and Missouri. Although reservations had been established, renegade bands of Indians still skirmished with the U. S. Cavalry. And millions of buffalo were being slaughtered, signaling an end to the nomadic life on the Great Plains.

In the next 28 years, until his death in 1909, Remington produced some 2,700 paintings and drawings, 22 bronzes, six anthologies, two novels, and dozens of magazine articles. He and his contemporary, Charley Russell, created our visual myths of the Old West.* Through their works Easterners who were becoming disenchanted with urban life would view the frontier to the West not as an empty, uncivilized place but as a land of limitless opportunity and freedom. The self-sufficient cowboy became the national hero, and the Western experience began to represent something uniquely American.

SKETCH IN A SCHOOLBOY'S NOTEBOOK FORETOLD THE SEARCH FOR SUCCESS FREDERIC REMINGTON ART MUSEUM

Remington seldom depicted the homesteader or small-town frontier life. His heroes had no families, or if they had, they lost them. Remington's West was generally a land of danger and conflict where the cowboy, the Indian, and the trooper are battling either the elements or one another. To live in the West meant to confront life at its most real.

Remington's work is as immensely popular now as it was in his lifetime. His paintings have brought more than $600,000 each at auction, three million dollars in private sales; his bronzes command the top price for Western sculpture, more than $700,000. Theodore Roosevelt and Enrico Caruso acquired Remingtons, and casts of "The Bronco Buster" and "The Rattlesnake" adorn the office of President Ronald Reagan.

*See "C. M. Russell, Cowboy Artist," by Bart McDowell, in the January 1986 issue of NATIONAL GEOGRAPHIC.

Remington, however, never achieved the critical acceptance he so desired. That may be corrected. An exhibit of his work, brainchild of Peter Hassrick, director of the Buffalo Bill Historical Center in Cody, Wyoming, is touring the U. S. and will reach New York City's Metropolitan Museum of Art next February.*

"I think the exhibition will show that Remington is a much better painter and sculptor than he has generally been given credit for by art critics," said Lewis Sharp, a curator of American paintings and sculpture at the Metropolitan. "We are not treating him as a Western artist, but as an American artist who has an important place in history along with Copley, Homer, Eakins, Whistler."

Remington was a "huge specimen of humanity" who weighed more than 250 pounds. His Adirondack guide once remarked, "Remington never stays put for long in any one place, but there's an awful lot of him while he's around." The artist once walked into a publisher's office dressed like a cowboy and spouting Western lingo as if he'd just walked off the range. Stories circulated that he had been a cowboy, seen action with the Cavalry, lived among the Indians. In fact, he had not—although he made frequent trips West.

Remington roamed his "grand silent country," taking pictures and making sketches in a safari helmet, English riding breeches, and fancy Prussian boots. And when fatigue and discomfort overtook him, he retreated to his New York mansion or summer cottage in the Adirondacks. He was the first urban cowboy.

I never intend to do any great amount of labor. I have but one short life and do not aspire to wealth nor fame in a degree which could only be obtained by an extraordinary effort on my part. —Frederic Remington at 16.

REMINGTON's rebellious, fun-loving nature was evident not only in this 16-year-old's letter to an uncle but also at a much earlier age—when he painted Alice Pettibone's cat green. His father sent him to military school at 13, hoping an Army career might appeal to him. But he ran away from one school because he didn't get enough to eat and whiled away his time at another drawing caricatures of his teachers.

As biographers Peggy and Harold Samuels point out, Remington liked art because it appealed to his sense of adventure. In his year and a half at Yale's art school, however, he became bored with studio drawing classes and joined the football team for some excitement.

As soon as Remington turned 21 and came into his $10,000 inheritance, he got out from under his mother's wing and her insistence that he pursue a business career. The West called him again. With the help of a Yale classmate he bought a sheep ranch near the Flint Hills outside Peabody, Kansas.

Kansas was then the frontier. Each spring large herds of longhorn cattle were moved in the "long drive" from the Texas plains to

*"Frederic Remington: The Masterworks," which opened at the Saint Louis Art Museum, will be at the Buffalo Bill Historical Center in Cody, Wyoming, through September 5, then travel to the Museum of Fine Arts in Houston, October 15, 1988–January 8, 1989, and to New York City's Metropolitan Museum of Art, February 10–April 16, 1989.

FREDERIC REMINGTON ART MUSEUM

SEEKING HIS FORTUNE on the Kansas prairie, Remington put most of his inheritance into his Peabody ranch. But he invested more time in carousing, hunting, and sketching than in animal husbandry and soon left to become a Kansas City saloon owner. Today artist Doug Claassen finds inspiration in owning the Remington homestead (top).

SPOOKED BY LIGHTNING, cattle bolt in "The Stampede" (1908), and frantic wranglers gallop to circle the herd. Influenced by Eadweard Muybridge's action photographs, Remington

THOMAS GILCREASE INSTITUTE, TULSA

learned to depict horses accurately and tried "to paint running horses so you would feel the details and not see them." He wanted for his epitaph: "He Knew the Horse."

centers like Abilene on the Kansas Pacific Railroad. Kansas, in midwinter when Remington arrived, however, was gray and depressing. He soon discovered that his ranch had few comforts, and the work was harder than he had expected. He hired two hands so that he could take afternoons to shoot jackrabbits with the boys.

One night, as a joke, he and his pals set a fire outside the Plum Grove schoolhouse during the Christmas pageant. It caused a panic, and Remington was nearly run out of town. Nobody in Peabody thought he would amount to much. The artist would have been amused to learn that in 1962 the town proudly named a school for him.

Remington sold his ranch but made a second try at life in the West in Kansas City, investing in a hardware business, then a saloon. Shunning the attentions of the local belles, he continued to write to Eva, and they were eventually married in 1884. Eva thought her new husband was a prosperous businessman. Instead, she discovered upon her arrival that Remington was broke, having been swindled out of his investments, and spent his days lassoing sunflowers and drawing cowboys in saloons. After two months she despondently boarded a train home. Remington remained, ignoring his mother's desperate pleadings to return to Eva and get a "real man's job."

The next summer Remington rode out of Kansas City on a flea-bitten $50 mare to explore the Southwest and sketch. He had nothing now but his art.

"The sketches which he brought with him were very crude," said Henry Harper, publisher of *Harper's Weekly*, "but had all the ring of new and live material."

Harper bought two of Remington's sketches from that Southwest trip, "The Apache War: Indian Scouts on Geronimo's Trail" and "The

HOPING FOR "A LOVELY SCRAP," Remington (bottom, in white cap at right front) joined journalists gathering in Key West on the eve of the Spanish-American War. The artist had already contributed to war fever with a provocative drawing (below). It later proved inaccurate, but not before helping to sell nearly a million newspapers for William Randolph Hearst, who had cabled Remington: "You furnish the pictures and I'll furnish the war."

The misery of the troops changed Remington's mind about martial glory. Theodore Roosevelt, a lifelong friend, leads "Charge of the Rough Riders at San Juan Hill" (1898)—one of Remington's few paintings of the conflict.

NEW YORK JOURNAL (TOP RIGHT); FREDERIC REMINGTON ART MUSEUM

Apaches are Coming," which were the first works that appeared over his own signature as a professional illustrator.

Through the persistent efforts of both families, Remington and Eva were reunited in Brooklyn. He promised that if he failed at his art, he would pursue her wish to take a job in business. Within a year, however, Remington had talked *Harper's* into an assignment covering Geronimo's daring escape into Mexico, which captivated the country. He was 24, and this was his big break.

On May 14, 1886, Capt. Henry W. Lawton of the 4th Cavalry led a contingent of 35 hand-picked soldiers and 20 Indian scouts out of Fort Huachuca in southern Arizona to find Geronimo. The Indian leader and his band of Chiricahua Apache had repeatedly escaped from the San Carlos reservation, raiding homesteads and wagon trains and ambushing the Cavalry from their mountain sanctuaries. Remington intended to join Lawton's party but changed his mind when he was warned it would be a punishing mission.

For four months Lawton was led back and forth across the border, seldom encountering the Indians face-to-face. Apache warriors would ride their horses 200 miles or until they dropped dead. Then they would eat them and steal others. The Cavalry seldom managed more than 40 miles a day.

The remote deserts the troopers ventured into were infested with rattlesnakes, scorpions, and huge tarantulas, and the heat was so intense that many stripped off their wool uniforms and rode in their underwear. Lawton lost 20 pounds, and most of his men had to be replaced before Geronimo was finally persuaded to return to San Carlos.

Remington, meanwhile, had a comfortable stay at the Palace Hotel in Tucson. There he ran into a group of black soldiers from the 10th Cavalry, called the buffalo soldiers by the Indians because of their black, curly hair. They told him about the daring rescue of a wounded black corporal by a white officer on a scouting mission. Remington immediately went to the hospital at Fort Huachuca to interview and sketch the corporal. *Harper's* featured the story, along with Remington's other tales of "Soldiering in the Southwest."

This kind of word-of-mouth journalism was not unusual in the decades before photographs could be reproduced in magazines. It is a credit to Remington's imagination and talent that his illustrations and stories are so full of life, considering how little action he actually saw.

Remington's work became larger than the events he was covering. And the West he created is less a place fixed in time than it is, as I discovered, an adventure of the spirit.

"ANYTIME NOW, GENTLEMEN," Lt. Charles Atkins said impatiently. The troopers, midway in their 27-mile ride from Fort Huachuca to Tombstone, gave their horses a final drink in the San Pedro River.

"RIGHT DRESS!" shouted 1st Sgt. Bob Phillips.

The line of 15 troopers in their tan, broad-brimmed hats and blue campaign uniforms looked sharply right and closed ranks.

"READY FRONT!" They faced front.

Sergeant Phillips saluted Lieutenant Atkins: "Sir, the troop is formed."

"Take your position," said Atkins. "TWOS FORWARD! MAAAAA—RCH!"

Pairs of troopers galloped up the steep riverbank. When they reached the paved road, children leaned out of passing car windows and waved. The 20th century greeted the 19th.

Fort Huachuca is now the intelligence center for the U. S. Army, and 14 years ago, B Troop, 4th Cavalry, descendant of the regiment that ran Geronimo down, was reactivated as a ceremonial unit. Most of the troopers are military personnel who volunteer their time to train and perform at parades and military ceremonies around the country. They are living the spirit of the Old West and of Remington's paintings with boyish enthusiasm.

"I feel as if I'm stepping back in history," said Atkins, an Army intelligence officer. "We're riding to Tombstone to commemorate the gunfight at the OK Corral in 1881—when troops from Fort Huachuca were called in to restore order. Looking at the Chiricahuas, I can just imagine the Apache hiding there. Waiting for us. . . ."

The rest of the way to Tombstone, Atkins picked up the pace, galloping most of the time. The horses soon glistened with sweat in the hot desert sun and lowered their heads in fatigue. "There's going to be a lynching when we get to Tombstone," said one tired trooper.

Remington, too, had once been subjected to a rigorous trip on horseback so that he would not "get away with the impression that the cavalry don't ride." Leaving from Fort Grant,

RIDING A MAKESHIFT MOUNT, a friend poses for a camera study outside Remington's studio. To aid accuracy, Remington often carried a Kodak into the field. Good photographs were a big help, he said, but "the artist must know more than the Kodac."

FREDERIC REMINGTON ART MUSEUM

his scouting party followed a circular route over Arizona's Sierra Bonitas and Pinal Mountains, changing command two times in only 12 days in an effort to wear Remington out.

"I pulled myself together and declared to my comrade that I felt as good as new," he wrote in a *Century* article, "A Scout with the Buffalo-Soldiers." "This was a palpable falsehood, as my labored movements revealed to the hard-sided cavalryman the sad evidence of the effeminacy of the studio." After the trip Remington was convinced "that soldiers, like other men, find more hard work than glory in their calling."

Remington's father joined the Union Army a few months after Frederic was born and didn't return home again until the boy was almost four. Relatives noticed that whenever Frederic drew a group of soldiers, there was always one who bore a strong resemblance to tall, lean Col. Seth P. Remington.

FOLLOWING THE CAPTURE of Geronimo, the Army's attention shifted to the uprising of the Sioux in the northern plains. To the Sioux the way of the plow was foreign, and cattle would never replace the sacred buffalo. They turned for help to Wovoka, a prophet of the Ghost Dance religion, who had a vision that all Indians would be lifted into the air and when they were set down again, everything would return to the way it was before the white man. The Sioux withdrew their children from reservation schools and refused to obey the police and Indian agents.

On December 15, 1890, in Standing Rock Reservation in the Dakotas, the great Sioux chief Sitting Bull resisted arrest and was killed. Two weeks later, at a camp by Wounded Knee Creek, several hundred of Sitting Bull's followers who refused to surrender their weapons were shot down in a fury of gunfire by troops too eager to avenge Custer's death 14 years before.

Harper's Weekly sent Remington to the Dakotas to write about and draw the Ghost Dance. Five years after being broke in Kansas City, he was, at 29, a prospering and celebrated illustrator. His technique had advanced from the roughness of his Southwest sketches to the fine handling of action and drama evidenced in such paintings as "A Dash for the Timber." Remington had done illustrations for young Theodore Roosevelt's book *Ranch Life and the Hunting Trail*, John Muir's *Picturesque California*, and a lavish new edition of Longfellow's *The Song of Hiawatha*, which established him as an interpreter of Indian life. Eva, however, complained that he was working too hard.

"Fred is working as hard as he would if he had 40 children hanging to his coat tails crying for bread," she said.

She and Fred would, in fact, have no children, and he became a regular at stag affairs at the Players, a New York club. His passion for the West and for his work extended into a voracious appetite for good cigars, good whiskey, and large quantities of pig's knuckles and milk gravy. And he enjoyed the companionship of "hard-sided, plain-spoken men," as he called them, "men

ATMOSPHERIC NOCTURNAL SCENES, such as "In from the Night Herd" (1908), reflect the mature Remington transforming himself from illustrator to serious artist. He adopted the loose brush strokes, diffused light, and interest in color of Impressionists such as Claude Monet, whose work he admired. Remington's subject remained the West, and on pack trips like those today (below) in the Big Horn country of Wyoming, he filled blank pages with color studies rather than documentary sketches.

with the bark on," rugged outdoor types.

Meeting Remington in 1890, a lieutenant with Gen. Nelson Miles's forces described the artist as "a big, good-natured, overgrown boy—a fellow you could not fail to like the first time you saw him." The officer also noted how Remington worked in the field. There were "no pencils, no notebooks, no 'kodak'—nothing, indeed but his big blue eyes rolling around at everything and into all sorts of queer places."

Remington actually did use a camera to assist him with his illustrations, and he was an avid collector of Western props—Cavalry sabers, old rifles, Indian saddles, tomahawks, animal heads—which filled his large studio in New Rochelle, New York. At home he worked from 8 a.m. to 3 p.m., tilting back his rocking chair to survey his progress. He worked rapidly, whistling monotonously, and usually quit in time to take a long walk or horseback ride before dinner.

Remington was only two miles away from Wounded Knee when the massacre occurred. Although he later had a chance to join the burial party, he did not. His "natural prudence" counseled against it, he wrote.

Remington portrayed the massacre at Wounded Knee as a glorious moment for the Cavalry. He drew not one killed or wounded Indian although dozens of women and children perished. Remington's work helped exonerate the commanding officer, who came under investigation. It was a moment of moral blindness for him and the country.

Although Remington was unable to confront the reality of Wounded Knee, he was more sensitive to Indians in later works and fascinated by their spirituality.

"I believe that no white man can ever

NATIONAL COWBOY HALL OF FAME, OKLAHOMA CITY

penetrate the mystery of their mind or explain the reason for their acts," he wrote.

Both "Ridden Down," a portrait of an exhausted Crow Indian facing death at the hands of his enemies, and "The Sun Dance," a shocking painting of a Blackfeet brave, half in a trance, hanging by his flesh, give one the feeling of actually witnessing these moving events. When not working as a journalist, Remington became a better journalist, distilling raw truth about the West from his memory, experience, and imagination.

Indian religious practices, which were banned and went underground during Remington's troubled times, gradually resurfaced in the 20th century. After the civil rights movement of the 1960s and the changes in federal policy, more Plains Indians returned to worship in sacred sweat lodges and to participate more openly in the ritual of the Sun Dance.

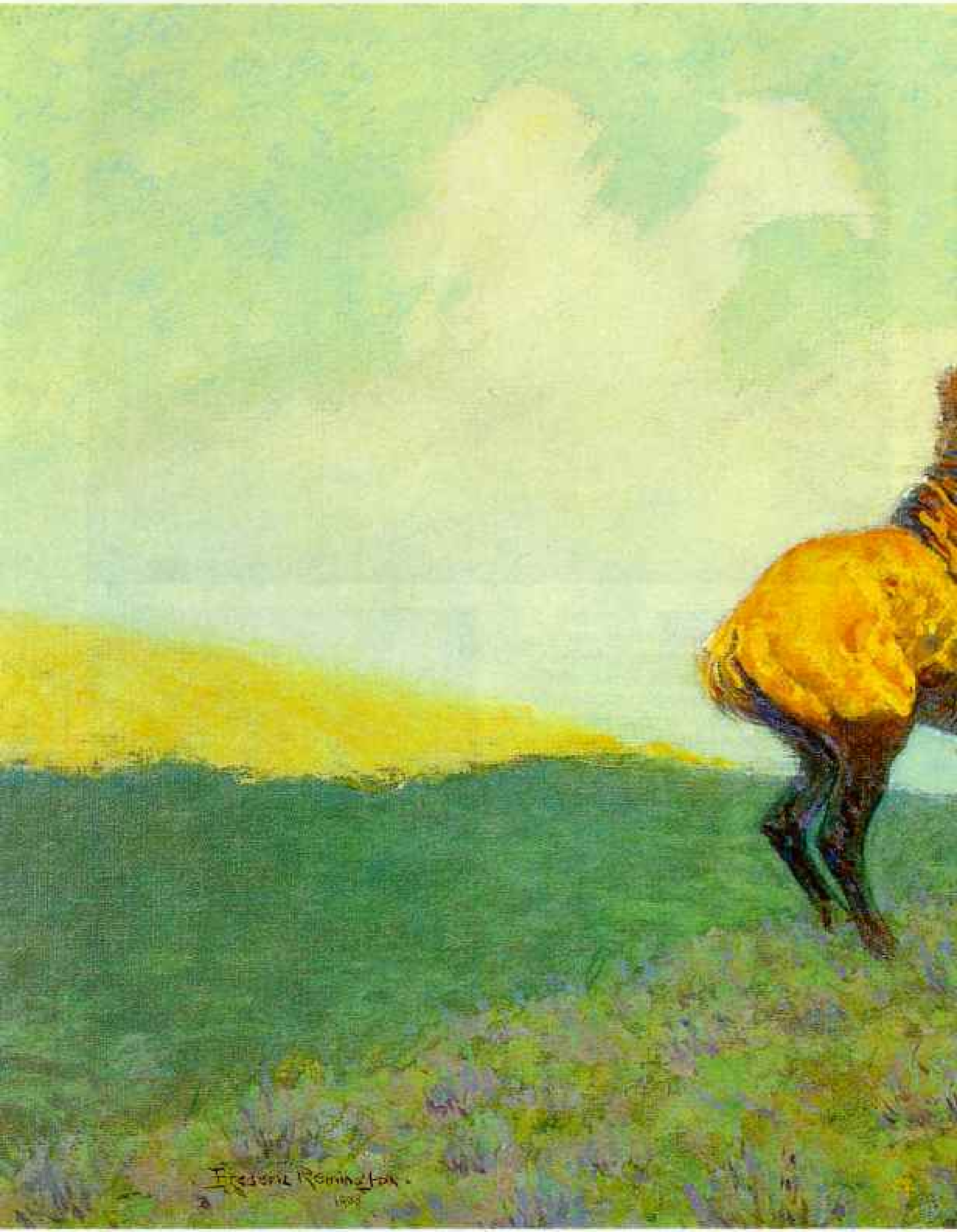
JOHN BUSTER YELLOW KIDNEY, a tribal court judge and medicine man on the Blackfeet reservation in Montana, spoke to me in a low voice:

"Last spring as my wife lay dying, she had a vision that we should build a medicine lodge and hold a Sun Dance for her. But a few days before she died, we had not finished the lodge, and she *(Continued on page 224)*

"I AM TO ENDURE in bronze," Remington boasted to a friend in 1895 as he experimented with sculpture for the first time. Striving to depict action in three dimensions, Remington innovated with form. In "The Rattlesnake" (1908 version), he employed a daring, cantilevered design (left) to capture the panic of horse and rider. Taking full advantage of the lost-wax process of casting, he created authentic-looking surfaces like the woolly texture of the cowboy's chaps. Surprisingly the rider's spurs were attached upside down to at least one casting.

In constant demand during his lifetime, Remington's 22 bronzes are even more popular today, now that their copyrights have expired. Several thousand are reproduced each year by the Artist and Sculptor's Foundry in Burbank, California, where a copy of Remington's "Coming Through the Rye" (1902) is sandblasted (above) before its patina is applied. Such replicas sell for a fraction of an original's cost. A comparison between an early casting of "The Cheyenne" (1901) and a reproduction (bottom right) testifies to Remington's superior craftsmanship in the horse's mane and the rider's hair and facial expression.

ROBERT WEIGLEIN, BUFFALO BILL HISTORICAL CENTER, CODY, WYOMING (LEFT); SUSIE BRIMBERG (CENTER); R&S PHOTOGRAPHER VICTOR R. BOSWELL, JR. (BOTTOM)



"WITH THE EYE OF THE MIND" (1908) suggests that the Indians too had lost their West, keeping it only in memory. These horsemen, perhaps reservation Indians, see in the clouds a vision of the

THOMAS GILCREASE INSTITUTE

bonneted warrior of their storied past. Remington wrote of the Indians that "no white man can ever penetrate the mystery of their mind." But in this sensitive oil, he seemed to try.

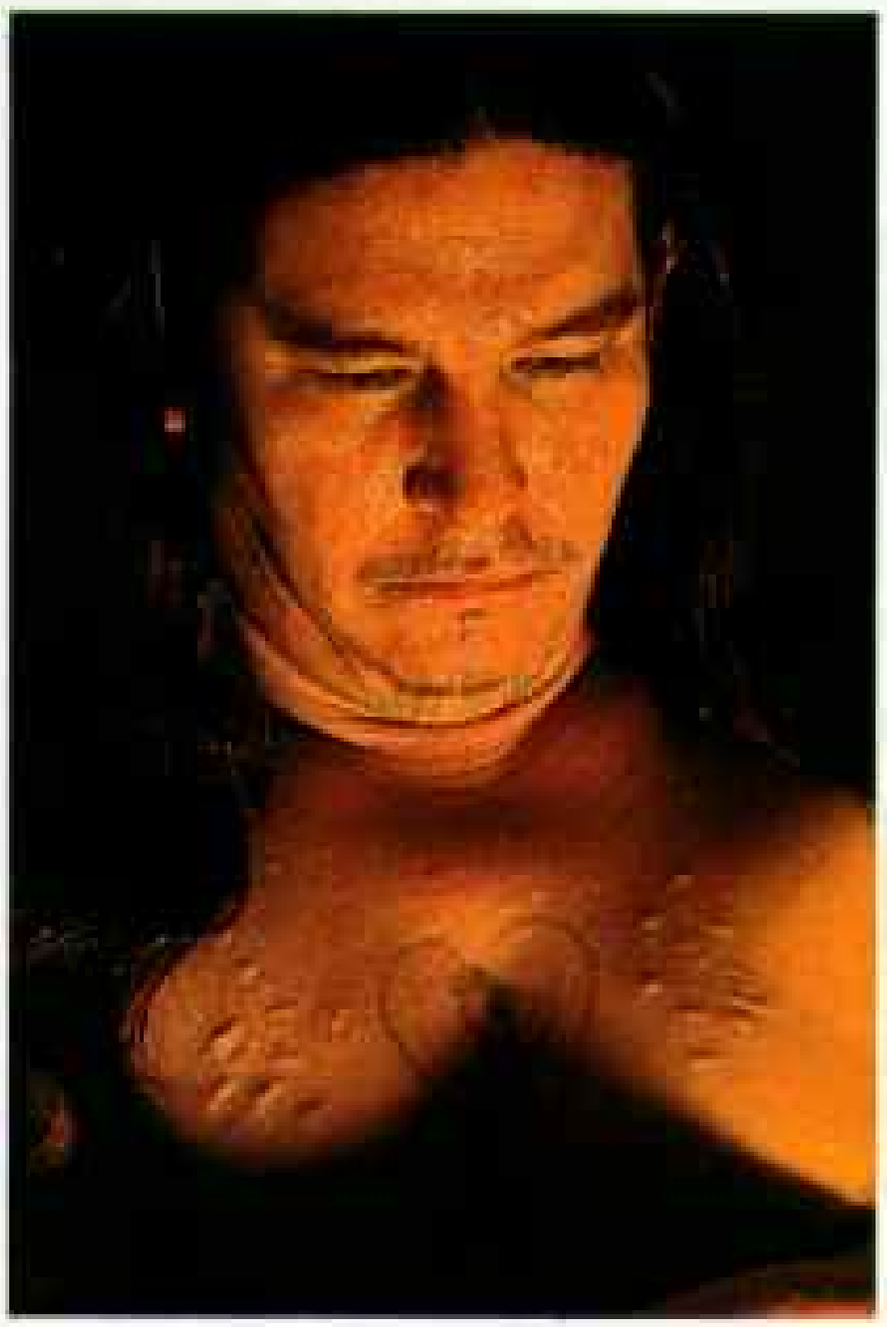
said, 'Go ahead with it. I will not be there, and yet I will be there.' And so we did."

Forty people took part in the life-renewing ceremony. For four days over the summer solstice, Buster, a pensive man in his 50s, and two of his sons danced barefoot from sunrise to sunset in the sacred lodge. They slept on the sage-covered ground where they had danced and denied themselves food and water. On the third day they made incisions in their chests and with leather lashes tied themselves to the sacred cottonwood pole in the center of the lodge and danced until the flesh was torn from their bodies. Following tradition, some of the dancers also dragged buffalo skulls attached to their backs around the lodge until the chain of skulls also pulled loose from their flesh. On the last night Buster, his family, and guests feasted on a buffalo killed on the reservation.

"For us, the Sun Dance is performed as a matter of life and death," he said. "Flesh is offered to the Creator because you can only give what you cherish most—that which is part of your body."

IN THE 1890s Remington visited England, France, Germany, Russia, and North Africa, working on several articles. He called Europe nothing but a "ten-cent side show" and despised the large number of immigrants who poured into New York, altering the complexion of his beloved country.

America, particularly the West, was changing faster than Remington liked. The heyday of the cattlemen on the open range was over. By the late 1880s the virgin pastureland was exhausted and the fences were going



MOST SACRED CEREMONY of the Plains Indians, the Sun Dance was outlawed in the late 1880s, but not before Remington witnessed the ritual among the Blackfeet and Sioux, painting it in 1909 (below). Santee Sioux Rick Thomas, a Vietnam veteran, credits such rites with helping him overcome alcohol problems; he bears the scars of six Sun Dances. Robert Fast Horse and Ron Mousseau seek spiritual rebirth in a Pine Ridge, South Dakota, sweat lodge.

FREDERIC REMINGTON ART MUSEUM

up, ending the long spring cattle drives.

Remington mourned the passing of the original cowboy in a series of illustrations for "The Evolution of the Cow-Puncher," an 1895 article by Owen Wister. Here Remington and Wister portrayed the cowboy as the last cavalier, the noble descendant of chivalric knights and crusaders. This was the first depiction of the storied cowboy in American literature and set the stage for the cowboy character in 20th-century novels, films, and plays. Movie director John Ford credited Remington with inspiring scenes from such Westerns as *She Wore a Yellow Ribbon*.

Remington's Western art became less literal and narrative as he began to focus more on broad human themes. His brushstrokes loosened. His trips abroad had exposed him to the work of the French Impressionists, and he admired the luminous style of American landscape painters. Remington worried, however, that he had lost his sense of color because he had done so much work in black-and-white illustration. He confided to Wister in 1895: "I have to find out once and for all if I can paint."

The previous autumn he also rather impulsively took up sculpture, after playwright Augustus Thomas, visiting his New Rochelle studio, complimented the artist on his ability to draw figures from any perspective.

"Frederic, you're not an illustrator so much as you're a sculptor," said Thomas. "You don't mentally see your figures on one side. . . . Your mind goes all around them."

Remington worked on his first bronze, "The Bronco Buster," with sculptor Frederic Ruckstuhl, who brought him the necessary tools. The idea of a cowboy riding a rearing horse came out of his illustrations and was an immediate success, although some buyers were shocked by the high price and gritty realism of the piece, a rider clutching the mane of a wild-eyed animal. It took Remington a year to balance the dynamic composition without a central support column, an extraordinary achievement.

"Remington's aggressive, cantilevered compositions were innovative from the first," wrote Michael E. Shapiro of the Saint Louis Art Museum in the Remington exhibition catalog. "The artist continually tested the limits of the medium of bronze to convey his combative vision of life."

Remington produced 22 different bronze sculptures, and the number of casts that he personally supervised during his lifetime was quite small, under 500. His foundry, Roman Bronze Works in Brooklyn, however, continued producing works after his death and after his wife's death in 1918, although her will stipulated the molds were to be broken. When they were eventually destroyed, a stampede of recasting followed. For every original Remington there are many fakes in circulation; it is sometimes difficult for experts to tell them apart. Today Remington bronzes are in the public domain, and many U. S. foundries are legally turning out reproductions that range in price from $500 to more than $22,000.

"My oils will all get old and watery . . . they will look like stale molasses in time," wrote Remington, "but I am to endure in bronze."

And, indeed, he has. Pieces like "The Bronco Buster," "The Cheyenne," and "Coming Through the Rye" have become symbols etched in the public consciousness of the unrestrained spirit of the West.

IN HIS TRIPS WEST later in his life, Remington gravitated toward Wyoming's Big Horn Basin, where his friend Buffalo Bill Cody had a ranch.

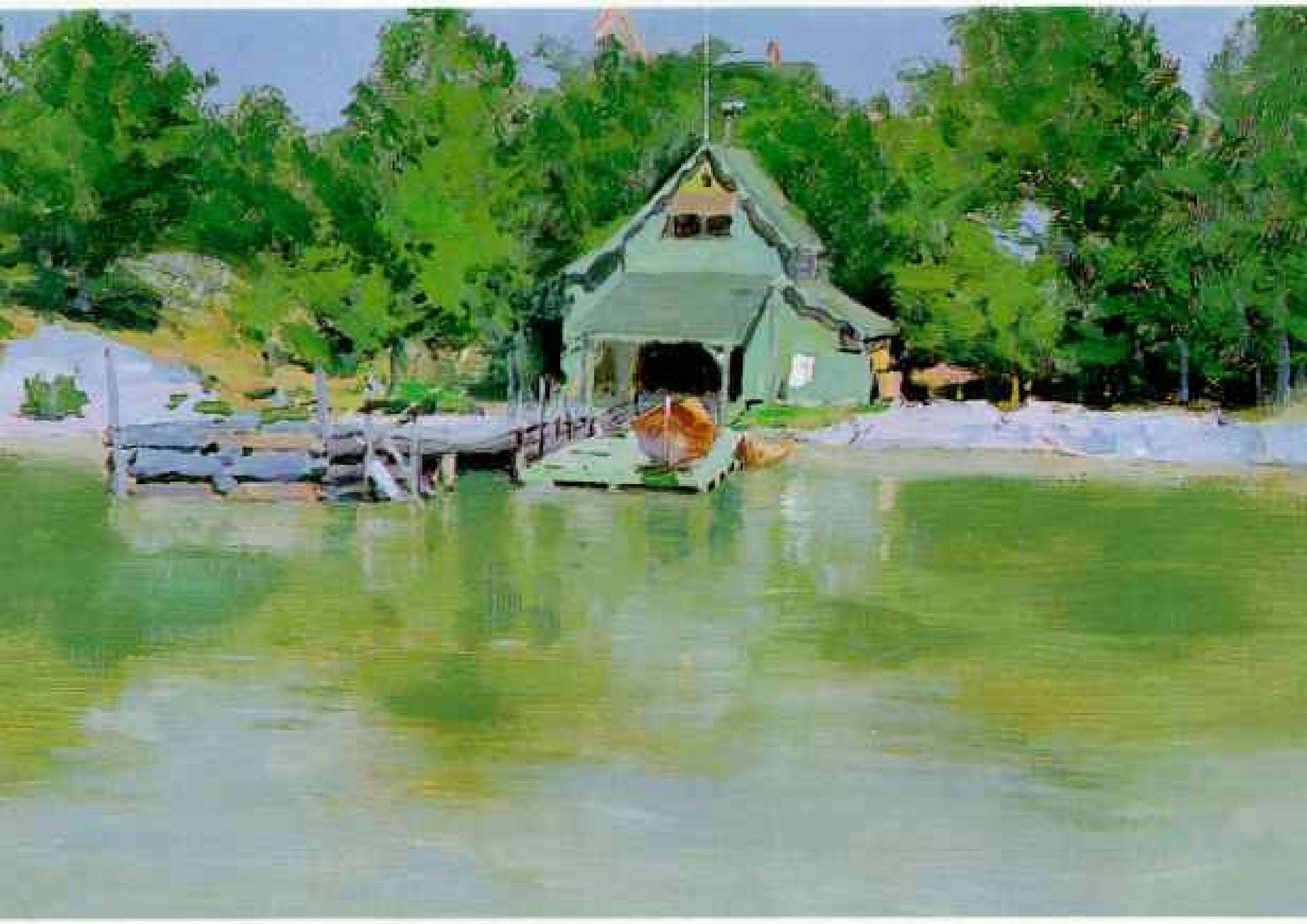
The Big Horn Basin, a windy, arid bowl surrounded by high peaks, was one of the last areas in the West to be tamed. Trail routes and the railroads passed it by to the north and south. The first homesteaders did not venture into the basin until the 1880s, a decade after Yellowstone National Park was established nearby.

Remington visited Yellowstone, but he seemed more intrigued with the jagged-rimmed rock formations in the basin, which he painted many times. The sky is open here, and colors are perceived with an unusual clarity—azure blue, deep purples and reds, and a sunny cadmium yellow that dominated Remington's palette in his later years.

In 1908, on his last trip to the West, Remington went on a camping trip with George Beck, one of the founders of Cody, Wyoming. They were headed toward Bridger Lake, at the confluence of the Yellowstone River and Thorofare Creek, a four-day ride from Cody. Along the way, however, Remington became ill after gorging on half a dozen trout and stayed behind. Beck killed an elk for Remington to take back as a souvenir. But when he returned to Deer Creek, he found Remington had become restless in

ROBERT WEIGLEIN, BUFFALO BILL HISTORICAL CENTER (TOP)

THE PLAY OF LIGHT on water and the colors of shadows drew Remington to nocturnal boat trips around his water lily-choked island in the St. Lawrence River. The passage (left) between his Ingleneuk and nearby Cedar Islands became scenery (above) in "Radisson and Groseilliers" (1906), finished in his New Rochelle studio. Filled with "curios from the desert and wilderness," according to a friend, the studio has been reassembled at the Buffalo Bill Historical Center in Cody, Wyoming.



ALL FROM FREDERIC REMINGTON ART MUSEUM

"INGLENEUK INDIANS," Remington labeled this candid of him and his wife, Eva, at their summer home. Here he could paint uninterrupted by "publishers' telephones —[and] trolleys." This oil of his boathouse (1903) reflects the technique of the Impressionist. Remington loved to swim, play tennis, and paddle—with his dog, Sandy —his cedar canoe.

the stormy weather and had headed home.

"He loved the sun and was one of the most affable of men when it was pleasant and warm," wrote Beck in his memoirs, "but when the weather was gloomy he was miserable."

THERE HAD BEEN a frost in the night, and when we awoke a mist lay over Bridger Lake and Yellowstone Meadows. We could hear the bells around the necks of some of our horses although we couldn't see them. But most had taken off in the night to find better grazing.

From here, trails shoot off to Cody, Jackson Hole, and Dubois. Bridger Lake is the center of the Yellowstone backcountry, one of the largest protected wilderness areas in the lower 48 states. Elk and bighorn sheep first used these trails to get to winter grazing in the Big Horn Basin. Indians and trappers followed them. Finally outfitters came like John Winter, whose pack trip photographer Chris Johns and I had joined.

Four days we had been on horseback, covering more than a hundred miles, and we had not seen a power line or a paved road.

"I wonder who caused this mischief?" said Winter, a tall, soft-spoken man whose father had been an outfitter before him. He had ridden in a wide circle around our camp and had not found his packhorses.

Chris and I saddled up to help him look. He first explored the woods in back of camp. Winter listened for the horses' bells and searched the ground for tracks. Finally he found hoofprints heading toward Thorofare Creek.

Farther upstream we spotted the horses on a hillside and galloped up to them.

"Lead 'em straight across the meadow and into the timber," Winter instructed me. "We'll be behind."

I started across the sedge meadow to give the horses someone to follow. The ground was sodden, and I could see pools of water around me. Heavy rain and snow over the Continental Divide create these lush but dangerous areas that had unnerved Remington.

The next day we encountered one of those great spongy mountain meadows, which we were forced to skirt on the rocky timberstrewn hill-sides, until finally we ventured into it. We curved and zigzagged through its treacherous mazes, fording and recrossing the stream in search of solid ground.—"Policing the Yellowstone," *Harper's Weekly.*

Suddenly the horses bolted at a full gallop on either side of me. I followed them. Looking back, I saw Winter with a determined look on his face spur his horse across the meadow to cut them off. Then he fell. Horse and rider tumbled into a hidden gully in the sedges.

I stayed with the horses until they stopped by a large pool, uncertain how to cross. Winter came on foot, carrying a bridle.

"Need another horse," he said.

I gasped in horror.

"Horse's neck snapped when he went down. He's gone. Didn't know what hit him."

Winter went over to a black horse and gently put the bridle around his head. I was frozen in my saddle. How could this happen? One minute a strong, magnificent animal is galloping across a meadow. The next, lying lifeless in a gully? Did we all need such a grim reminder that life hangs on a thread here?

"It might have been Winter," Chris said to me. "Thank God he wasn't hurt."

Two days before, we had been riding on a high, windswept ridge just below the Divide. Nothing around us but an endless expanse of alpine meadow. The sun shone brilliantly. I felt exhilarated, full of life's possibilities. Winter felt differently.

"This country humbles you," he had said. "Here, a storm could come up. Something could happen to the horses. You could get killed. I feel pretty small. That's the way it should be. . . ."

Now I understood him.

And I understood Remington better. In a bronze called "The Wicked Pony," a fallen rider angrily grabs his horse's ear, hoping to pull the animal to the ground. Instead, said Remington, who had witnessed the event, the horse's hind legs came down, crushing the rider's skull and killing him instantly. Remington did not spare us the West's harsh realities.

AFTER SPENDING most of his life missing a good fight, Remington finally stumbled into one: the Spanish-American War. As a war correspondent he joined Teddy Roosevelt and the Rough Riders in June 1898 for the invasion of Cuba. For ten days he slept in the open rather than in a staff tent, determined this time to see some action. He soon ran

PASSING INTO THE NIGHT, "The Old Stage Coach of the Plains" (1901), with its shadows and eerie hues, evokes the hazards of travel through Indian country. Ranch veteran Lester Tucker (below) sometimes models for contemporary artists trying to recapture the last days of the Old West that Remington made a part of our artistic heritage.

AMON CARTER MUSEUM (RIGHT)

out of food and water and became ill with fever. He was shocked by what he saw.

The sight of that road as I wound my way down it was something I cannot describe. The rear of a battle. All the broken spirits, bloody bodies, hopeless, helpless suffering which drags its weary length to the rear, are so much more appalling than anything else in the world. —"With the Fifth Corps," *Harper's Monthly.*

With the exception of "Charge of the Rough Riders at San Juan Hill," a painting commission he reluctantly accepted, Remington's illustrations and writings were more concerned with the grimness than with the glory of war. The experience matured and humbled him. Afterward he turned away from illustration and devoted himself to becoming a fine artist.

In 1899 he saw an exhibit of nocturnes by California artist Charles Rollo Peters and concentrated more on his own night scenes, which many consider his finest paintings. At his summer house on Ingleneuk, a small island in the Saint Lawrence River, Remington spent evenings in his skiff, studying the moonlight and sketching. He also began to do pure landscape in an impressionistic style and to develop his theory of art:

Big art is the process of elimination; cut down and out—do your hardest work outside the picture, and let your audience take away something to think about—to imagine. . . .

In 1905, just before Christmas, Remington invited the young illustrator Charles Chapman to spend the weekend in New Rochelle. They walked in the woods as new snow collected on the branches.

"Just look at the beauty everywhere," exclaimed Remington. "Why can't we get it, come somewhere near it. It's maddening."

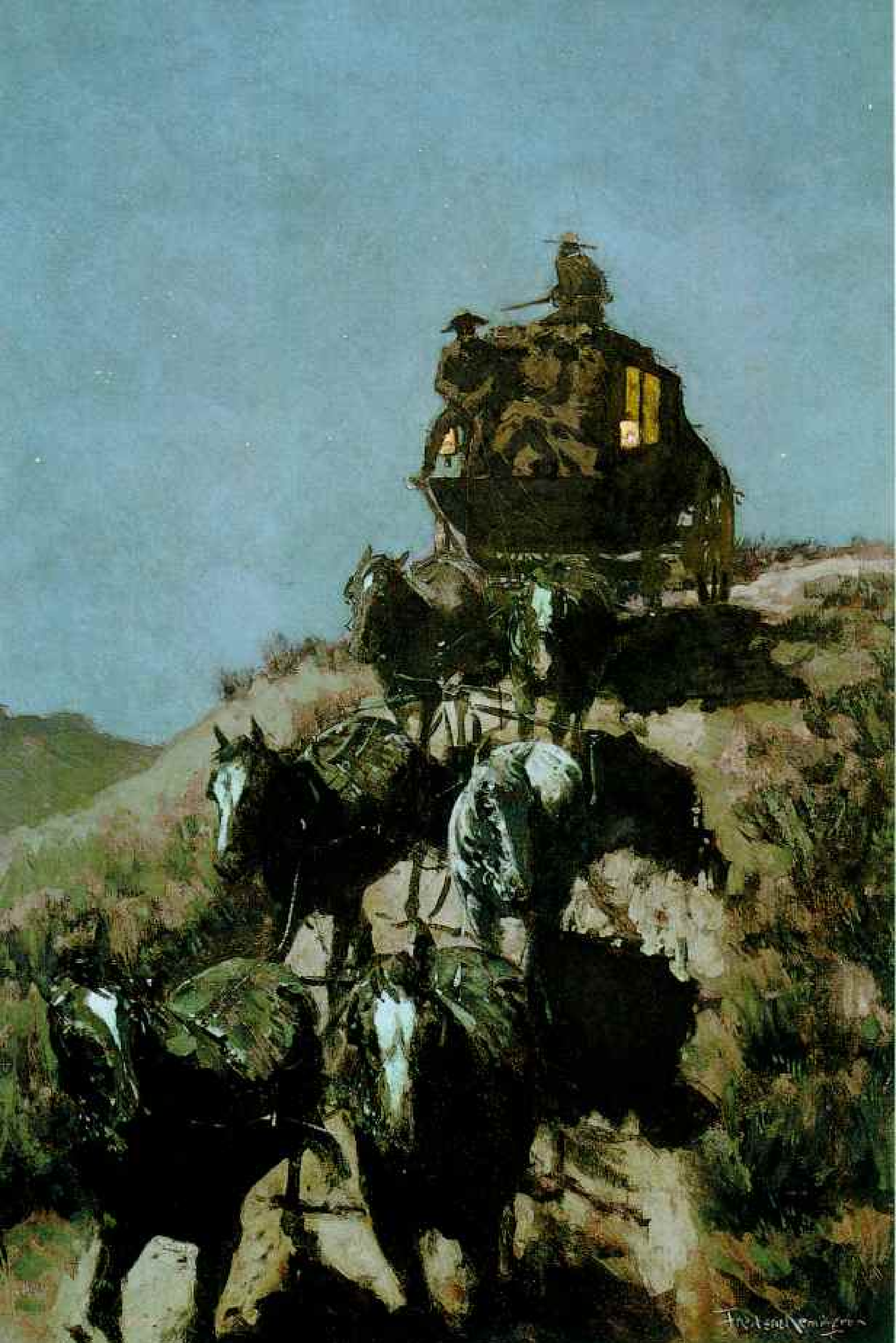
In his frustration at not being able to paint landscapes, Remington tossed a dozen of his recent studies into the fireplace when they returned. Chapman looked on, horrified.

Again in 1907 and 1908 he made bonfires of some 90 paintings, most of them action-packed scenes that characterized his work as an illustrator. Remington was emphatically divorcing himself from his past. He was searching for grand themes and for acceptance in the art establishment—an acceptance he never fully received. Many academicians didn't take Remington seriously, because of his popularity, brash personality, and ostentatious life-style.

With his voracious appetite Remington suffered chronic stomach pains. One severe seizure, however, turned out to be acute appendicitis. An emergency operation was performed on his kitchen table with the doctors struggling to cut through his many layers of fat. But the appendix had already burst; there was little they could do. On December 26, 1909, Remington died. He was 48.

President Roosevelt thought a monument should be built to him. None ever was. Who would have been the sculptor? Theodore Roosevelt himself carved the tribute in words:

He is, of course, one of the most typical American artists we have ever had, and he has portrayed a most characteristic and yet vanishing type of American life. The soldier, the cow-boy and rancher, the Indian, the horses and the cattle of the plains, will live in his pictures and bronzes, I verily believe, for all time. □



Their nation's dynamic economic growth is shadowed by recurring civil discontent.

THE

Deferring to the city's old South Gate, traffic swirls through Seoul.

SOUTH KOREANS

By BOYD GIBBONS
NATIONAL GEOGRAPHIC SENIOR STAFF

Photographs by NATHAN BENN

ON A RAINY November morning in a village near Chiri Mountain in South Korea, I stood awkwardly outside the small room of the Organization for Respecting Elders with a bag of pears in one hand and my shoes in the other. The wet slopes were shrouded by low-hanging clouds. Inside, a group of old men, sitting cross-legged on the floor in their stocking feet, looked up from their conversation and motioned for me to enter. The floor was bonded with mulberry paper and polished to a golden sheen, and on the wall a large pendulum clock ticked quietly.

I had brought the fruit for a rice farmer who had served me some *kimchi* the previous evening—kimchi being the incendiary pickled cabbage that no Korean is without. He now smiled in greeting, indicating by his eyes who, in this status-conscious country, would do the talking: Mr. Koh, a handsome gray-haired man wearing the traditional baggy trousers tied at the waist and ankles and a green satin coat hung with large pendant buttons of glass.

Mr. Koh spoke briefly of the December election, saying that the men were for Kim Dae Jung, the opposition politician who was born in this province of South Cholla. The government party candidate, Roh Tae Woo, was "just a continuation of military rule."

Since the end of World War II, when it was freed from 35 years of Japanese occupation, South Korea has been ruled in succession by three dictators: a civilian, Syngman Rhee, and two army officers, Park Chung Hee and Chun Doo Hwan. Following Park's assassination in 1979, General Chun's coup against the military command succeeded because his close friend, Gen. Roh Tae Woo, supported him by bringing troops into Seoul. On June 10, 1987, President Chun picked Roh as his successor, touching off mass demonstrations that occupied the world media and abated only when Roh made a surprise capitulation to opposition demands for direct presidential elections, the first in 16 years, which he won—with 37 percent of the ballots—over a divided opposition.

The man next to me began complaining how the leader of the village farming cooperative was appointed, not elected—no particular surprise, as the co-ops are essentially governmental and the only elected officials in the country are the president and members of the National Assembly. All other officials, including the mayor of this village, are appointed by the central government in Seoul.

Mr. Koh interrupted him. "Don't talk of that in front of the foreigner."

"What's wrong with telling the truth? Let him know," the man said. Koh cut him off and changed the subject. Koreans are preoccupied with appearances, especially for foreigners, and they are not comfortable with saying precisely what they think or how they feel.

"If we hadn't had help from the U. S. in the Korean War," Koh said, "I don't think we would be living this kind of good life now. When we were growing up, we suffered from not having enough to eat." I asked about those days. He shifted to another theme. "Regrettably this young generation doesn't care for the tradition of showing respect for the elderly."

Centuries of Confucian culture and rule have layered an authoritarian hierarchy on Korean society—ruler over subject, parents over children, husband over wife, elder over younger. Only friends are equals. Status is reflected even in the language, with different verb endings for a higher person to use when talking to a lower, and the reverse. Young Koreans often forget these intricate linguistic subtleties when talking to elders.

The agrarian Confucian society of the village has been wrenched into this century almost overnight. It's no wonder it has been in turmoil. In 1953 the entire peninsula lay devastated by the Korean War, and millions of Koreans were dead. In the 1960s you could still see bullock carts on the streets of Seoul. The south bank of the Han River, which flows through Seoul (map, page 243), was mud flats. Today it is metastasizing with office and apartment buildings to the horizon.

Twenty-five years ago 70 percent of Koreans were farmers. Today there are an impressive number of Ph.D.'s among their bright technocrats, and 65 percent of the population is urban—a vast, sudden uprooting. One of

Patient hands tend a young girl in a working-class district of Seoul; her face seems to belie the toughness for which Koreans are known. Despite numerous invasions, and colonization by the Japanese for a third of this century, Koreans remain one of the world's most homogeneous peoples. This September South Korea will open its doors as host of the Seoul Summer Olympic Games.

every four South Koreans lives in Seoul, and more keep arriving, emptying the countryside, moving again and again—a distinctly mobile, crowded society. With the kind of frenetic traffic jams that commuters on the Hollywood Freeway would appreciate, Seoul is where the money is, the prestige, the influence, the power, the smog.

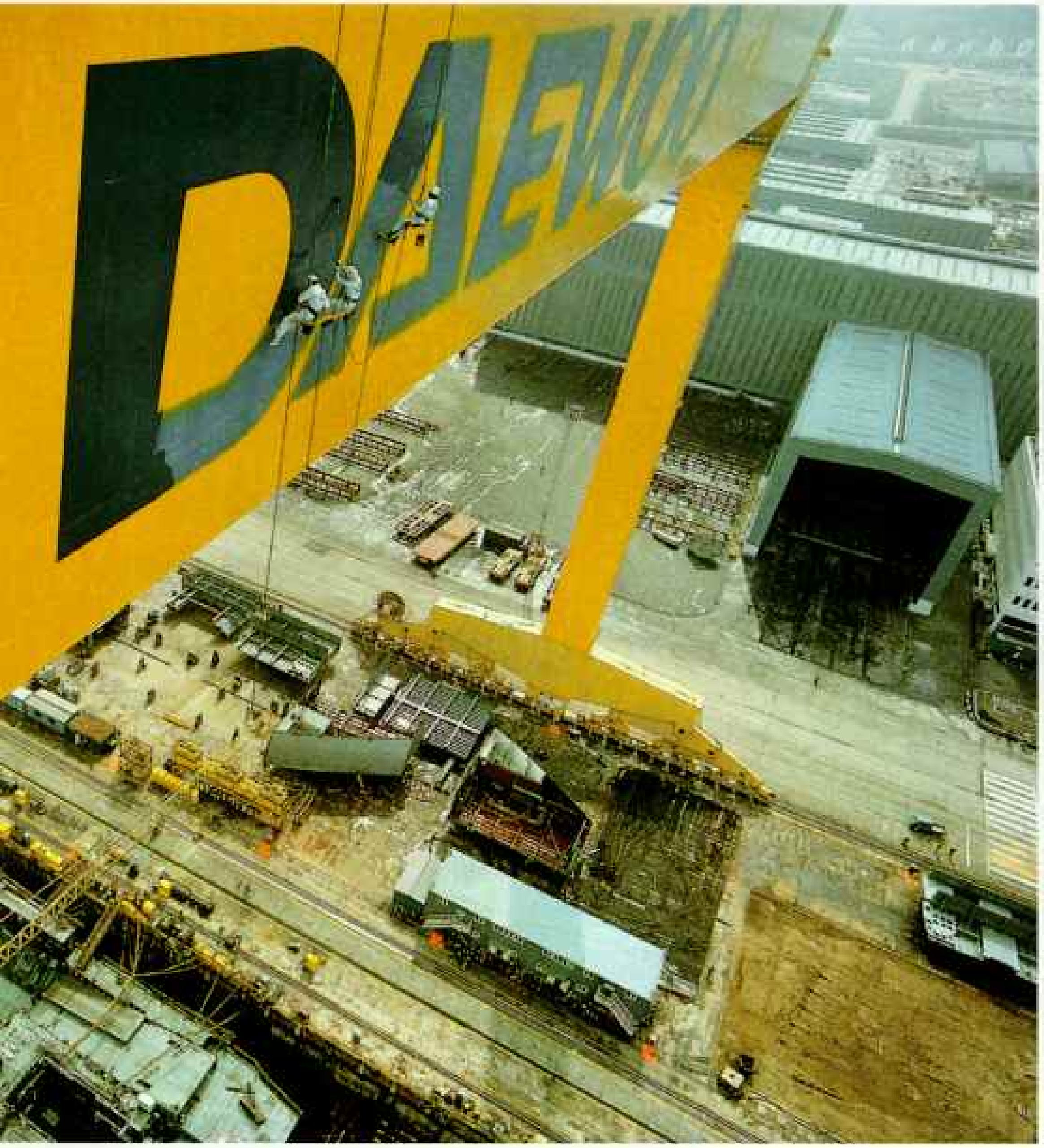
In 1961 Gen. Park Chung Hee seized power by coup and surrounded himself with economists educated in the West. They helped him make South Korea, with virtually no natural resources, a world trader. Park raised interest rates to attract money into banks, got the economy rolling by building bases and supplying troops for the U. S. in Vietnam, and borrowed deeply from abroad to go into heavy industry.

South Korea claims the world's highest annual growth rate—12 percent—in gross national product (GNP). The nation now runs a ten-billion-dollar trade surplus with the United States and a deficit with Japan, in effect buying Japanese technology with dollars but encountering U. S. protectionism for its reluctance to open its own markets.

And what markets. Next to the man selling generators a woman sells dried squid; stalls are full of conduit pipe or strawberries, tennis shoes, dried fish, tuxedos—labyrinthine markets, miles of underground arcades, a cacophonous mercantilism that makes the American shopping mall look abandoned. The irony is that Koreans have a national savings rate of 33 percent. They need it because they have no unemployment or retirement benefits and virtually no bank financing for consumers.

South Korea's economy is dominated by big conglomerates, or *chaebol*—Daewoo, Hyundai, Samsung, Lucky-Goldstar—wired to the government by money and connections. Last year the Hyundai Excel was the hottest import car in the U. S., and now the Pontiac LeMans is rolling in from Daewoo's plant in Puchon. South Korea manufactures fuselage sections for the F-16 and wing parts for the 747. It is the world's 12th largest trading nation.

Junior staff in a chaebol—that most hierarchical of institutions—salute the boss as in the military. One who is regularly saluted is



Gutsy painters dangle from a crane above the world's biggest dry dock in the Koje Island shipyard owned by Daewoo, among the largest of the South Korean conglomerates, or chaebol. Playing games for imaginary profits (facing page) teaches teamwork to management trainees at Sunkyong Group in Seoul. In Kumi a microchip wafer gleams at a Goldstar Semiconductor factory.

"Without risks, how can you get chances?" asks Daewoo Chairman Kim Woo Choong (right), who prospered by buying failing companies. Presiding at a management meeting, Chey Jong Hyon (above, foreground) took over the chairmanship of the Sunkyong Group upon the death of his brother. Company leadership customarily passes to family members. Women have little chance of rising in the male-dominated business world.

Kim Woo Choong, the founder and head of Daewoo. He is 51 years of age and in motion when still. He takes no vacations, no weekends off. Kim began Daewoo just 21 years ago. It didn't hurt that he always had close connections with President Park Chung Hee, but no one denies that his energy and salesmanship have largely been the reason for the success of this highly leveraged, seven-billion-dollar conglomerate. We met one Sunday in his large office across from the Seoul Railway Station and then moved next door to the Hilton—which his wife runs—for lunch.

"In a country with a $2,800 per capita GNP," he said, "we shouldn't play golf. Poor people can't afford that. I tell my executives, 'No golf.' In Korea nobody respects businessmen because, historically, doing business was low-class, and they weren't well-educated. Now they are. Before I die, I want to see businessmen respected as much as professors.

"Korean advertising makes it appear that we are an advanced country. It's not true. We can copy, modify. Design? We buy that. It may take 20 years for basic science to develop here. The U. S. is pushing Korea hard to open our markets. We have no choice. We are a trading country and have to compete. We need the technology."

At a breakfast in the Chosun Hotel, surrounded by Westerners and Koreans cutting deals, Jack Ward of General Motors in Seoul said, "Koreans won't settle for second best. They don't think compromise. They want to win 100 percent. At the start of a business deal the Westerner is ready to do business in five minutes. I sense immediately the confusion on the Korean's face. He sees this meeting as building personal relationships. Then he begins adapting, trying to do business the Western way. Koreans know how to survive."

Allen Patrick of Ford Motor Company told me, "I've worked in Brazil, Mexico, Europe. I've never seen people work as hard as Koreans. They make the Japanese seem lazy by comparison. They can also be hardheaded."

MODERN KOREAN SOCIETY seldom reflects the Confucian ideals of serenity and calm. Koreans are intense, visceral, impatient, fractious, raucous. They touch a lot; men squeeze your knee to make a point, walk arm in arm, shove past you on the sidewalks, shoulder ahead to be first in line, and drive as if pedestrians and other cars are targets. Arguments detonate out of nowhere. This is a man's world, and they're out late every night singing, carousing, and drinking like fish. Men with status strut on their heels, chest out, arms parenthetical—"Out of my way!"

Every Korean has a group of lifelong friends toward whom loyalty is as important as affection. "Qualifications are not nearly so important as what province you come from or what school you attended," an American banker observed. "Everything's personal here! It's maddening!"

Political parties, especially among the opposition, are not aggregations of people

with similar philosophies and goals so much as factions clinging to a personality, splitting and resplitting overnight—enough cabals and vendettas to jump-start Byzantium.

The National Assembly and judiciary have been compliant to the demands of the Blue House, from which the president exercises power principally through the intelligence agencies: the KCIA (now the Agency for National Security Planning) and especially the Defense Security Command (DSC), which has agents throughout the army—the ultimate power—and beyond. Both Chun and Roh were commanding generals of the DSC.

In his inaugural address President Roh said,

Feast of the Lanterns, the celebration of Buddha's birthday, sets the night aglow at Toson Temple, north of Seoul. A common symbol in the East, the swastika was emblazoned in hopes of good fortune. During the Choson dynasty (1392-1910), the influence of Buddhism lessened as the court emphasized the teachings of Confucius. Though its active followers have dwindled in number, Confucianism with its ethic of obedience to hierarchy still deeply influences society.

"The day when freedoms and human rights could be slighted in the name of economic growth and national security has ended. The day when repressive force and torture in secret chambers were tolerated is over." That is new language from the Blue House. South Koreans hope he means it, and can deliver.

IN PROPER KOREAN FASHION, I held my glass with two hands as Min filled it with beer. Then to reciprocate his gesture of friendship, I picked up the bottle—both hands again—and poured beer into his glass.

Min works for a small export company, finding Korean manufacturers for American firms that sell batteries, toys, garden tools, barbecue grills. On this Sunday afternoon we were sitting around a low table in his living room in Seoul with a group of his friends, watching a boxing match on television. Like Min, they were all middle-aged, middle-class, and male, but unlike most Korean friendships, which center around the same school class or hometown, these men were drawn together by a tennis court in the huge apartment complex where they live.

"Frankly, we don't go out with our families often," said Min, a short, rectangular man. "I love tennis too much."

Treading a well-worn path, South Korean soldiers patrol the Demilitarized Zone separating their country from North Korea. Loudspeakers on either side of the DMZ blare propaganda berating the government of the opposing nation.

A key rattled in the lock, and Min's wife entered the apartment. Compact and all direct current, she is a rarity, a working wife, managing a large crew of women who sell children's books door-to-door. In the past, women were not permitted outside the home after dusk, and today few Korean men—Min is one—encourage their wives to work.

"Have you offered anything to eat?" Mrs. Min asked. "No," said Min impishly, "because there was no woman around to serve it." She waved away their laughter, removed her coat, and bustled around the kitchen.

Professor Lee, an economist, had sold his house in Seoul before going to the States for his Ph.D., and now, having returned, he felt trapped by the soaring real estate prices. "Suppose you want to buy a $60,000 apartment," he said. "You save $30,000 and raise the other $30,000 from friends. Then, with the deed as mortgage, you borrow $30,000 from a bank to pay back your friends. But the bank wants its money back in three years. Practically speaking, there is little credit in Korea."

Mrs. Min brought in dishes of kimchi and

REPUBLIC OF KOREA

CENTURIES OF ISOLATION ended when the Hermit Kingdom opened to Western trade in the late 1800s. Japan colonized Korea from 1910 to 1945. After World War II, Soviet troops occupied the north. The U. S.-controlled south became the Republic of Korea in 1948.

The end of the 1950-53 Korean War left the two Koreas fighting a cold war that continues today. In the 1970s South Korea was alarmed by the discovery of tunnels leading from the North Korea side. The Kumgangsan Dam, begun in 1986, also raises concern. South Korea claims that areas south of the Demilitarized Zone, including Seoul, could be flooded accidentally, or even intentionally as part of an invasion. Though North Korea denies any hostile intent, South Korea is building the Peace Dam to control potential flooding.

Poor in fossil fuel deposits, South Korea augments its hydroelectric production with four nuclear power plants.

GROWING EXPORTS

Heavily dependent upon exports, South Korea sold 35 percent of its gross national product abroad in 1986. Between 1970 and 1986 the value of exports rose nearly 40-fold.

AREA: 38,291 sq mi (99,173 sq km). **POPULATION:** 42,643,000. **CITIES:** Seoul (capital), 9.8 million; Pusan, 3.6 million; Taegu, 2.1 million. **INDUSTRIES:** Electronics, textiles, motor vehicles, chemicals, shipbuilding, footwear.

NGS CARTOGRAPHIC DIVISION DESIGN: DAVID CHANDLER; RESEARCH: MATTHEW THARP, MARK KOHLER, KAREN ALLEN; PRODUCTION: MARLY JUNE LIM CLAPSADDLE; MAP EDITOR: THOMAS ABBT

Mortally wounded by shrapnel from a riot-police tear-gas canister, student Lee Han Yol slumps in the arms of a friend during an antigovernment rally at Seoul's Yonsei University on June 9, 1987. Another canister flies overhead. Tony Chung of Reuters news agency appears at lower left; his photograph of the scene inspired the printing of banners and cloth patches. Violent demonstrations forced the first direct presidential election in 16 years last December.

marinated beef redolent of garlic, but she ate in the kitchen with her sister and mother. Except in the *kisaeng* houses, where night after night Korean men drop an astounding amount of money for whiskey and pretty women, men socialize with men and women with women.

Professor Moon said, "Although I was Western-educated, I have never told my wife 'I love you.' Nor have these men. Right?" They nodded. "You don't express those emotions. If you hear a couple talking that way, you know their marriage is in trouble."

Hearing this, the women edged into the living room. "Yes, but all Korean women would like to hear it," said Mrs. Moon. "They want affection, at least a word of love, but the men think they don't have to."

Korean women are looked upon as men's servants and washed up if still single at age 30. A married woman is not supposed to have male friends. Some women had told me how this caused them to have romantic fantasies. "I wouldn't risk ruining my marriage by fooling around," one said, "but walled off this way, we have dreams outside the home."

The family is the preeminent influence in everything Korean. Koreans rarely divorce. A divorced woman is socially scarred, has trouble finding a job, and has few rights over her children. "That's why women will put up with a bad marriage," a woman lawyer told me. "This is a male-oriented society. If the mother wants to take her children overseas, she has to get her former husband's consent.

But he can take them without her consent. Our entire society considers divorce a disgrace."

Korean mothers run the home, raise the children, and manage the money, investing in real estate, stocks, and especially in the informal women's savings groups called *kye*. "Middle-class Koreans," an envious American had said, "have more money in the bank than either you or I would dream of having."

At the far end of the table, Kim said he felt that the Western press was distorting South Korea with "the image of political crisis. Political protests are inevitable in a growing society. They are transitional, just as are the methods of the government in clamping down. Of course, the true Communists among the students are a very small minority."

Why then, I asked, was the government so ready to label any opposition as leftist?

"You see from where you sit," said Kim, an investigator from the prosecutor's office. "If you were a government official and saw

students adopting North Korean slogans, you would arrest and investigate them. The government is suspicious of their motives."

Sohn shook his head and said, "The government is oversensitive and overreacts."

"They have to react quickly," said Kim, "because of all this tension on the DMZ."

As "the shrimp among whales," Korea has managed to play off the major powers contending for the peninsula—China, Japan, Russia, and, most recently, the United States. But not without wounds. The Korean War, which stalemated in 1953 in a cease-fire, left the peninsula divided at the Demilitarized Zone—a euphemism if there ever was one. Two modern armies—840,000 troops in North Korea and 650,000 in South Korea, including 45,000 U. S. soldiers—face each other across a no-man's-land that is dangerous even for browsing deer. As soldiers say, "There ain't no D in the DMZ."

The roots of that war and the division of Korea into two enemy nations reach back to the closing days of World War II, when Japan collapsed and Soviet troops poured into what is now North Korea. Anxious to block the Soviets from occupying the entire peninsula, the Americans looked for a line on the map that would keep Seoul and Inchon out of Soviet hands. The 38th parallel seemed to fit, and the Soviets agreed. Unified in culture and geography for more than a millennium, Korea was freed of the hated Japanese only to be occupied and divided by the armies of the cold war.

Korea was then in ferment, as thousands of political prisoners, many of them Communists who had resisted the Japanese, were released from prisons. And millions of returning Koreans—many conscripted by the Japanese in the 1930s and '40s for their factories in Manchuria, China, and Japan—swarmed into the south, landless and discontented. Fiercely nationalistic and anti-Japanese, they were eager to establish an independent Korea and remove those Koreans who had collaborated with the Japanese: the landlords and police.

South Korea was rocked by labor strikes, a savage peasant revolt, a Communist uprising in its army, and sporadic guerrilla fighting, all crushed with help from U. S. troops. The Communists retreated into North Korea, leaving ideology divided at the 38th parallel.

The U. S. pulled out, and in June 1950,

having failed to foment a Communist revolution in the south, North Korea attacked, bringing Americans, with other United Nations forces, into the Korean War. Two million North Koreans fled south, rupturing families that are still separated, a powerful voice for reunification that resonates throughout the peninsula. The war infected South Koreans—most indelibly the army—with virulent anti-Communism. "When I came here in 1954," an American told me, "my interpreter was still looking to kill his best friend, if he could find him, because he was a Communist."

The continuing threat from North Korea is manifest. Five years ago in Burma, saboteurs almost assassinated President Chun with a

Enraged students meet an immovable police line on May 4, 1987, outside Seoul's Myongdong Catholic Cathedral, as they attempt to march in support of priests staging a hunger strike. Riot police called "grabbers" haul away a businessman during a demonstration in downtown Seoul (left). Antigovernment sentiment, spreading to the middle class, reflected the deep discontent with authoritarian rule.

bomb that killed many of his advisers. Last December a Korean Air Lines plane was blown from the sky by a time bomb apparently set by two North Korean agents, a reminder that the north, which has refused to send athletes to the Seoul Olympics, opening September 17, may try to sabotage the games.

Seoul is only 25 miles from the DMZ. Billboards on the buildings and mountains around Seoul screen guns, rockets, and radar, and the sidewalk flower planters are revetments for mortars and machine guns. There are tank traps on the way to the DMZ and boulders stacked over the rail and road cuts, primed with set charges. Buildings have thicker north walls, with tank drive-downs into basements windowed for guns. A wire fence along much of the coast is studded with painted stones arranged in coded patterns. Patrols check for rocks that have been jarred loose or incorrectly replaced and for footprints in the swept sand. Cables are stretched across the golf fairways to clothesline Pyongyang's gliders.

Three North Korean tunnels have been discovered beneath the DMZ, and U. S. military experts believe there are many more. They see the next Korean war as a "45-kilometer war," a lightning North Korean strike using its superiority in mechanized long-range artillery to pulverize everything from the DMZ into Seoul. "When the initial barrage lifts," one expert said, "we'll see caps blown off all those tunnels behind South Korean lines and North Korean troops pouring out."

THE GOVERNMENT often uses this threat in order to justify crushing political dissent. On May 17, 1980, following student protests, Chun extended martial law, closed campuses, and took over the government. He also sent Special Warfare paratroopers into the southwestern city of Kwangju, precipitating a massacre. For seven years Chun prohibited the press from mentioning the Kwangju "incident." Roh's administration, however, has tried to be conciliatory, publicly regretting the deaths, offering compensation and a monument. But Kwangju's citizens demand a full investigation and formal apology. Students

nationwide observe the anniversary with anti-government rallies. Kwangju remains one of Roh's stickiest legacies.

Through rice country I took the train down to Kwangju. South Korea has precious little level terrain. What there is of it is crowded with Koreans—in Seoul, Taegu, Pusan—or diked, cultivated, and covered with greenhouses. The rest of Korea is mountainous, the entire east coast uplifted and serrated by dramatic headlands.

Kwangju's pretty main street is shaded with ginkgo trees. The nearby mountains are softer and greener than the bouldered crags around Seoul. Kwangju is the capital of South Cholla Province. East of here is Taegu, capital of North Kyongsang Province. The antagonism between these two regions turned violent in the presidential campaign. Kyongsang has been the historical well from which Korea's ruling class has been drawn—Park, Chun, Roh, and most of the key generals and elite of Seoul—and into which the government has poured money and development. Cholla people say that Kyongsang people are brash.

Embattled victor in the December 1987 presidential vote, Roh Tae Woo vows to gradually democratize a country that has been under almost continuous dictatorship since 1948. But Roh attracted less than a majority, winning with a 37 percent plurality over a badly divided opposition in an election marred by charges of voting fraud.

In Seoul anti-Roh protestors sit on a ballot box seized as it left a municipal building hidden in a delivery truck. Election officials claimed that the box contained absentee ballots, which were to be counted elsewhere. Police later reclaimed the box, but it was not clear why it was being moved in a suspicious manner. The contents were destroyed by the authorities. In a rural schoolhouse (facing page), voting is closely observed by an election official, at right, and poll-watchers from different political parties.

In the April 1988 election of the National Assembly, Roh's party lost its majority. This surprising turnabout has, in the view of a South Korean diplomat, "given us an entirely new set of political questions" concerning how the government will deal with a duly elected opposition.

Anxious eyes watch for students to emerge from entrance exams at Yonsei University. Applicants to the nation's universities may apply to only one school at a time, and competition is keen. In Seoul a junior-high-school student takes a brief Sunday-morning break before hitting the books for 12 hours.

Kyongsang people often say that those from Cholla are too cunning and rebellious.

On the morning of May 18, 1980, Chun's Special Warfare paratroopers, told to put down a "Communist insurrection," waded into protesters, swinging iron-weighted clubs, cracking bones and fracturing skulls. For days they broke into homes and indiscriminately attacked people, chasing them down alleys, clubbing, bayoneting, and shooting them to death. Officially 193 people died, undoubtedly more. Enraged students raided an armory, leading an uprising that eventually drove the paratroopers from the city.

The army, with U. S. approval, made a surgical strike on Kwangju on May 27, securing the city—and killing about two dozen student leaders. Despite belated U. S. explanations that its operational control over the army has never extended to the Special Warfare units, anti-Americanism has festered ever since.

On the seventh anniversary of South Korea's most painful memory since the Korean War, I met at the Kwangju cemetery a trembling, emaciated young man, to all appearances a victim of cerebral palsy.

On the night of May 18, 1980, Kim—as I will call him—was studying at an institute to become a government employee, when paratroopers broke in swinging their clubs. He tried to escape, but he was clubbed and kicked

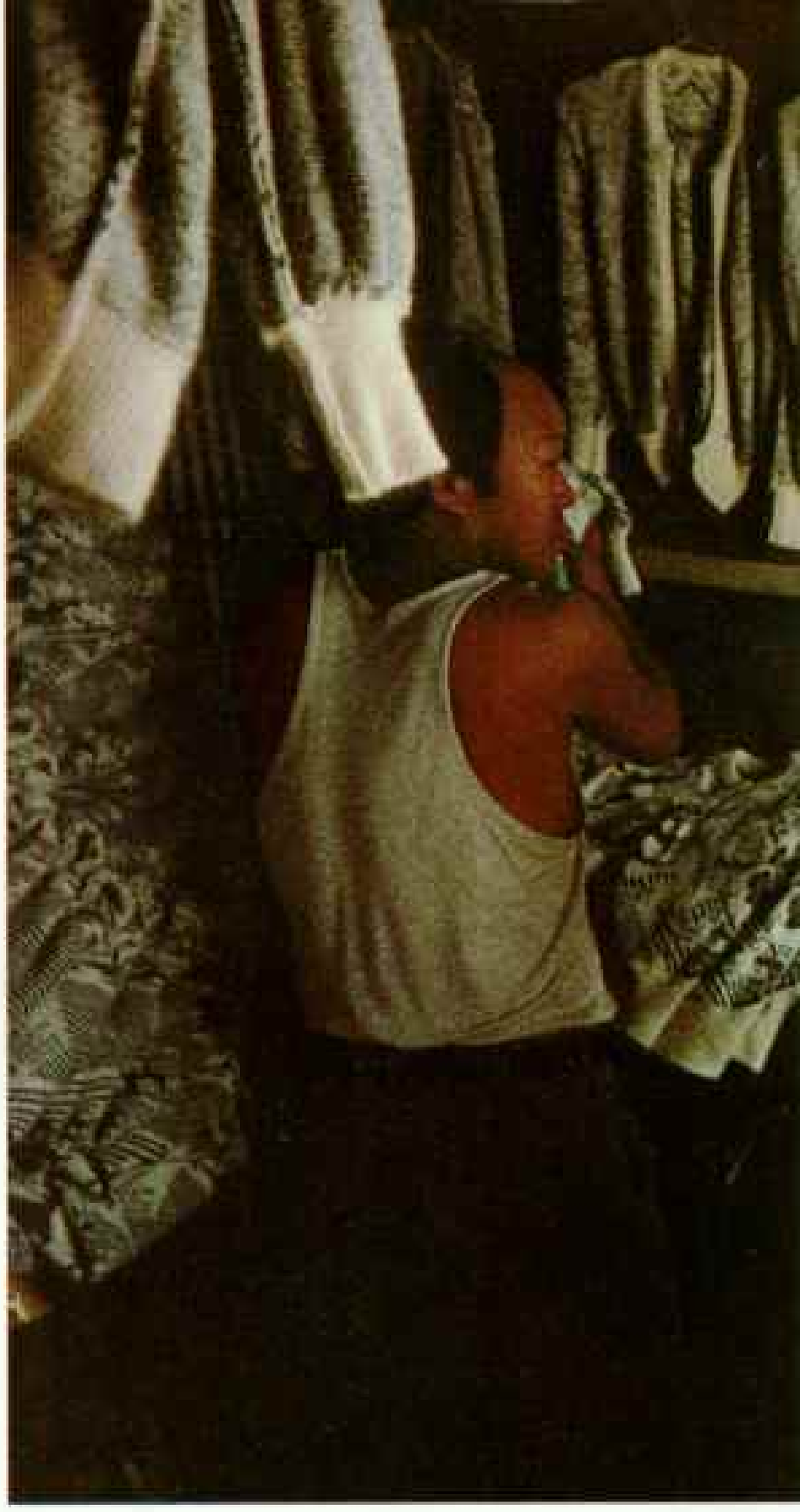
down four flights of stairs and thrown on a bus. "Then a soldier kicked me out of the bus and said, 'Get out or we will kill you!' The doctors say that my brain is wounded, and if they operate I will die. I live with my brother. I have to depend on someone 24 hours a day.

"I had my nephew write five letters to Chun Doo Hwan asking for compensation. I received nothing whatsoever, and the last reply was that if I wrote again, I would be arrested."

Brutality has a long tradition in Korea. I saw a good deal of it, by "grabbers"—the professional toughs of the riot police.

Grabbers travel light: running shoes, color-coordinated windbreakers and helmets, and open-fingered gloves for grabbing, with a coarse padding over the knuckles so punches won't slip. They are expert in tae kwon do, the Korean martial art—and they seem to enjoy using it. Grabbers gang up on individuals, fracturing wrists, cracking ribs.

For years this has been happening to opposition politicians, labor organizers, ministers, anyone who opposed the government—but



Unglamorous labor of Korean workers serves the exporters of fashionable garments. After nationwide strikes, the labor-union movement is taking aim at sweatshops, in which the workday may last 16 hours and longer.

especially students. The lucky ones are beaten up and driven out of the city to a remote garbage dump—not exactly a short stroll home in Seoul, a city of nearly ten million people. The leaders are usually imprisoned and tortured.

MY INTERPRETER, Jong, and I drove into the hills north of Kwangju to visit the grave sites of his father and ancestors. When Jong was a boy, his grandparents had wanted to have a grandson come live with them, and as he was the eldest of four boys, he was sent out to their farm for a couple of years.

"My grandparents loved me in the Korean way," Jong said. "That means I got spoiled."

Following Buddhist tradition, on the 49th day after his father's death, Jong's family prepared at the family altar fish, beef soup, and fruit wine—all foods his father had enjoyed—to keep his memory alive. Then for a year, in the Confucian way, they prepared the same foods on the 1st and 15th of each month.

At his father's grave Jong knelt on some pine boughs he had snapped off and bowed twice. He poured a little *soju*, a liquor, in three places around the mound ("three is a good number in Korea"), then we sat and shared the rest of the soju, some dried squid, and a few ripe persimmons. "We share this as though my father were alive," Jong said.

"My brother sometimes goes to the Christian church, and Christians aren't supposed to bow to others' idols. But I tell him that he better respect this family tradition."

First unified in A.D. 668 by a predominantly Buddhist kingdom, Korea was dominated by a Confucian dynasty from the late 1300s until the Japanese occupation of 1910. By the 1880s Protestant missionaries were introducing modern education, agriculture, and medicine. At night the cities glow with red neon crosses on thousands of churches.

"By 1970 we had three million Christians in Korea." Dr. Suh Kwang Sun is a professor of theology at Ewha Woman's University in Seoul. "Now there are some ten million. Why? Buddhism had been pushed into the background by 500 years of the Choson dynasty, which had become impotent and corrupt. Koreans needed a new value system that would match the invading Japanese. Christianity became an enlightening force among Koreans, a sanctuary. Today we never know when the North Koreans will attack. So where do you get comfort, assurance? The church. Koreans have lost their communities in this rapid industrialization. The churches give the uprooted courage and confidence to work diligently to become the newly rising middle class."

For some, however, it's a long way to the middle class. For years the government has kept wages low to compete in world markets. In 25 years, per capita GNP has made a phenomenal leap from $90 to $2,800, but

wages haven't kept up with living costs, especially for the textile girls who earn barely four dollars a day. The impressive "Miracle on the Han" factory tours bypass the pervasive "chicken-coop" sweatshops, where the 16-hour day is not uncommon.

The road through the steep mountains to Taeback, a coal-mining town, was hair-pinned, and the metal mirrors at the curves were so dented from rocks that we rarely saw oncoming trucks until they were upon us.

In a restaurant I talked with Park, a thin man with a narrow chin and pronounced cheekbones, his black hair falling straight over his ears from the center of his scalp like water off a rock. He operates a pneumatic drill underground for the Hanbo Coal Company and was on the midnight shift. I asked if he would like a beer with his meal, but he refused. "The air is dirty in the mine, and if you've been drinking, you get exhausted."

Park lives in one of the rent-free apartments the company provides for employees with seniority. He earns the equivalent of $600 a month, and he expects eventually to leave the mine and set up his own business.

Hanbo was one of thousands of companies struck last summer. The labor dispute began over vacation bonuses and the number of free briquettes the company would provide to heat the apartments. "We had a union, but the head of it was working on behalf of the company, so we kicked him out. But the new union leader has no influence and gets clobbered in negotiations with the company."

Admitting that the workers hadn't shared in the country's growth, the government pressured the companies in last year's strikes to

Sorting out the catch, dockworkers prepare fish for the daily auction in Pusan, South Korea's second largest city and its biggest port. A government drive has propelled the country's deep-sea fishing fleet to the position of the world's fifth

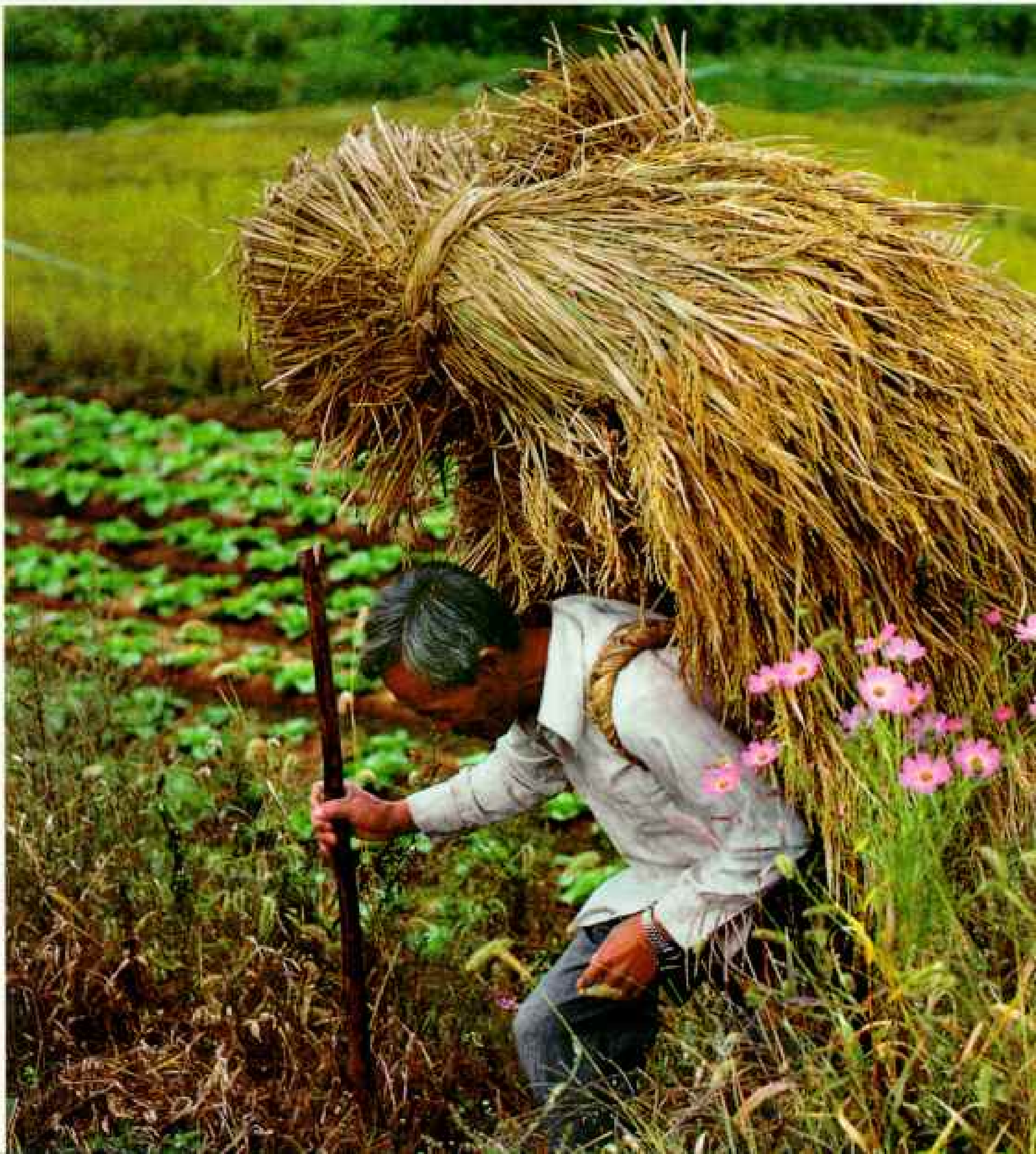
largest. Pusan was the only major South Korean city besides Taegu to escape occupation by the enemy during the Korean War, when it temporarily served as the nation's capital.

give workers substantial wage increases and the right to form their own unions. Then it labeled the organizers "impure elements"—meaning leftist—and threw them into prison.

SOUTH KOREA has one of the world's highest percentages of citizens attending college. More than a million do, half of them in Seoul. Since the days when scholars challenged the king on matters of virtue, students have held a peculiar niche in Korean society as the "national conscience." No student wants to be remembered as belonging to the class that failed to demonstrate against the government.

South Koreans admit to a profound generation gap. Almost 70 percent of them were born after the Korean War—certainly all the students, who bear neither memories nor the ideological scars of that bloody conflict and little appreciate American help then or since. Among all Koreans there is a powerful nationalism—with racial pride humming in the veins—and though older Koreans may look West with gratitude, students usually do so in anger. They see Caucasian mannequins in department-store windows, a U. S. Army golf course smack in the middle of Seoul, and are quick to fasten on any inroads of Western culture as a dilution of their own. The activists—ever high on moral certainty—will doubtless keep demonstrating.

Like the Japanese, Koreans drive their children to study in order to pass the exams to get



into the top schools, such as elite Seoul National University. In South Korea education and status are as one; graduates of SNU get somewhere. Most high-school students don't make it to college, and of those who do and graduate, many have difficulty finding work. The economy hasn't absorbed the Korean passion for education. "From junior high through high school," a professor told me, "the children are studying until 2 a.m. to pass those exams. Parents have little time to see them."

"Students who fail the entrance exams feel they've failed life," his wife said. "A really sad thing. Even when they're in kindergarten, parents push them to be first in the class."

Outside a library in Taegu, I saw a line of boys and a line of girls waiting to get inside to study. The library had about 2,400 seats, and 4,500 kids had shown up. First come, first served, 15 cents a ticket. Some had begun lining up at 4 a.m. It was Sunday.

In any year a high-school graduate can apply to only one university. If his examination grade is too low, he waits until the next year, head down in a cram school. "I didn't see my niece for three years," a woman said. "She was studying seven days a week to pass the exam for entrance into Ewha University. She had failed twice before."

In this rote-learning, exam-driven milieu the cram schools are a big business. The one I visited in Kwangju, the Great Success Institute, kept a guard at the gate to prevent students from leaving early. A young man I met there told me that his day at the institute ran to 11 p.m. "Then I go home and study until about 1:30 a.m. I get about four and a half hours of sleep. You should not think that demonstrations are all that there is to Korea."

WINTER was closing in. Many public buildings are unheated in South Korea, but Professor Hong Sung Chick's office in chilly Korea University was warmed by a space heater. He is director of the Asiatic Research Center. "We are surrounded by big powers," he said. "The other small countries have been absorbed by either China or Russia. But Korea has persisted throughout history. Koreans are very adjustable. When told to bow by big powers, they did. But all the time they knew that they would persevere.

"You worry about the divisiveness, but I think Koreans will overcome it. They are so proud of their culture and history, so proud of being Korean. A very optimistic people. At any party, they sing. When optimism doesn't exist, you don't have that vitality.

"For the moment, politics looks like chaos, fighting. But I think the leaders will have to learn from the people, not the reverse." □

Bending his back to the task, a farmer hauls rice stalks from a field southwest of Kwangju. So intensive has been the nation's urbanization that the government now tries to woo people back to the land with incentives. But for most young South Koreans, and for their offspring, such scenes will remain a nostalgic look at a way of life they never knew.

Perhaps with a yearning to ponder the enigmatic sky, Queen

Kyongju, Where

By CATHY NEWMAN
NATIONAL GEOGRAPHIC SENIOR STAFF

Sondok built Chomsongdae observatory in A.D. 634 in Korea's ancient capital.

Korea Began

Photographs by H. EDWARD KIM

OUT OF THE MIST came the sound of a flute, its notes drifting down the mountain path like ginkgo leaves sent swirling by an autumn breeze. I stopped and listened. Here in Korea's ancient capital, Kyongju, there's a legend about a king who played a jade flute that could make rain fall and wind blow. I half-expected to see some mythical figure materialize before me. . . .

From the mist emerged a figure playing a flute. He was silver haired, this apparition on the mountain path. His eyes sparkled with their own sunlight. In his fingers a bamboo flute seemed to have alighted like a butterfly. From it notes tumbled, skittering like gold and silver leaves.

That Yun Kyung Real and I should meet was no accident, for I had come to discover the wonders of this mystic place, and Yun, by turns a teacher, maker of ceramic masks, and crafts merchant, had even more compelling reasons.

"I came to Kyongju to find the spirit of Korean beauty," he began, offering me a thimble-size porcelain cup of *soju*, a throat-searing, mind-quickening liquor that is the time-honored Korean prerequisite for a tale.

As a child he had longed to see this city of enchantment where once upon a time a king had turned himself into a dragon to protect his country from its enemies. But Kyongju was far from his home in the north. "Besides, if your heart is *really* set on something, you don't reach for it right away. Precious things are not to be rushed."

As he grew to manhood, he went to Japan to learn doll-making. He was taught to paint Japanese features on the dolls' terra-cotta faces and kimonos on their figures instead of the high-waisted *hanbok* Korean women wore.

In 1945 he returned to Korea. But the nation was soon to endure its long agony of civil war. Mr. Yun, born in the north, could not go home again. He turned at last toward Kyongju.

When he stepped off the train, his eyes moistened at the sight of the royal tombs—grass mounds towering over tile roofs, miniatures of the far mountains. And everything golden: sun-burnished fields, gilded statues of Buddha, branches of forsythia flaming like torches.

"All that brightness," said Mr. Yun, his smile tender as a Korean sunrise. "Then I understood what it meant to be Korean, to come from all that beauty."

To be Korean is also to belong to a land invaded again and again, a land since 1910 either occupied or divided and at war with itself. Yet its people are among the purest ethnic strains in Asia. Their spirit has been abraded but never broken. Why? Because Korea is a feeling, a style, a sense. That spirit germinated in Kyongju, a small city on Korea's southeast coast, where 1,300 years ago Korea became a nation. Where, for a while, harmony reigned.

At its eighth-century peak Kyongju may have numbered a million. The king's four palaces, one for each season, basked in luxuries: Philippine tortoiseshell, Persian glass, Japanese pearls. In Kyongju, it was said, "foreigners who visit forget to return home."

The city, center of the Silla dynasty, produced silk-smooth paper coveted by the Chinese and bronze temple bells admired by the Japanese. But its niche in history was as birthplace of a nation. By 668 Silla had defeated neighboring rival kingdoms: Paekche to the west, Koguryo to the north. Then Silla repelled invasion from Tang China. Silla had unified Korea.

"ALL THAT CEMENT," sighed a woman teacher as a tour bus rumbled from downtown Kyongju to the Pomun resort complex, four miles away. The bus disgorged its passengers in front of a cluster of concrete-block souvenir shops. Kyongju's embrace of tourism was, her tone implied, a dreadful mistake.

A mistake? Absolutely not, declared Kim Seong Jin, president of the International Cultural Society of Korea. In the 1970s the Kyongju Tourism Comprehensive Team renovated temples and shrines and built the Pomun resort. The 270-million-dollar project produced three hotels, shops, and a 900-seat convention hall.

A sore point was the choice of material used in the renovation and new construction. "Critics complain about the concrete," Kim told me. "But wood is expensive and scarce here."

Those who miss the shabby gentility of old Kyongju grumble that the new complex displays all the charm of a barracks. Mr. Yun phrases it more gently: "Kyongju wears too much makeup."

So there are two Kyongjus. One is the Kyongju of tourist brochures, postcard pretty: a jumble of swaybacked, tile-roofed houses surrounded by rice fields, set at the foot of mountains silvered by mist. Take a road, any road. It leads to a pagoda, shrine, or tomb. More than five million tourists, mostly Korean, flock here annually.

The other is Kyongju the holy—more difficult to define, for it exists in the realm of the spirit.

Glimpses of the latter, the shining city, can tear the heart. My friend Hwang Taesik offered to climb Namsan with me. The mountain, three miles south of town, is studded with some 60 stone Buddhist figures. The trek leads over a rocky trail, and Hwang didn't want me to have to shoulder a heavy knapsack. Later he said he hadn't made the climb in years—not since his only son, scarcely a year old, had suddenly stopped breathing, no one knew why. Hwang carried his child up the slope and placed him in a grave mounded with earth. When

I asked why he hadn't told me, he said only that it was a lovely mountain and I had come a long way to see it.

Tucking the dead into gently sloping mounds of earth has been the Korean burial custom for centuries. The 23 tombs of Silla nobles, clustered in a downtown park, that you first see looming over the city with uncontested majesty have a comforting simplicity.

excavate than it must have taken to build," Dr. Kim said. A lacquered coffin in a wooden chamber was shielded by a layer of boulders 25 feet thick. Fifteen feet of earth covered that, preserving the tomb from robbers in later centuries.

No one offered, of course, but if I had my choice of the 11,500 artifacts found in the tomb, I would indicate a tiny gold ring resembling a tendril of vine. Kyongju's

A serenity soul deep lives in the heart of Yun Kyung Real, Kyongju artist and sage. In 668 the Silla kingdom conquered its rivals and unified the Korean Peninsula. Kyongju, then known as Sorabol, became the capital and spiritual birthplace of Korea.

Perhaps Silla rulers regarded them as just another palace to move into when the time came.

In 1973 the government decided to excavate tomb number 155, one of 200 here. Some Koreans were disturbed. They tried to stop the excavation, saying that it dishonored the dead and invited bad luck.

The solution? "We excavated with utmost respect for the dead," said Dr. Kim Choungki, former director of the National Institute of Cultural Properties. "We asked the workers not to laugh or smoke, and we burned incense.

"The tomb took longer to

National Museum displays the ring beside gold bracelets, earrings, a gold-plated harness, a gold crown, and two glass cups.

But the most important find, so fragile it requires special permission to see, rests in a locked case, in a locked room, in the National Museum in Seoul. It is a quilted piece of birch bark, a fragment of a saddle mudguard, painted with a dazzling white horse. The horse is flying, tail streaming, clouds flashing by.

Harnesses had been found in Korean tombs before, but this spoke of Central Asian influences filtering through Mongolia and Manchuria down the Korean Peninsula. The find caused the tomb to be called Chonmachong—Heavenly Horse Tomb.

"We also found eggs in the coffin," Dr. Kim added.

"Eggs?"

"Seven eggs. One or two actually intact. To nourish the dead."

Of fragments such as eggshells do we reconstruct empires.

Archaeological and literary evidence suggests that Kyongju had arcades, so citizens could walk its streets in rain without getting wet. Kyongju lacked walls; remoteness

The dreams of kings are enfolded in Kyongju's tombs, shown in a 19th-century painting (far left). Among treasures recovered are eighth-century gold Buddhist scriptures and case; a gold-and-jade crown from the fifth or sixth century; and a ceremonial ceramic vessel, also from that period.

Modeled on a grid after the Chinese capital Changan, Kyongju in the eighth century may have counted a million citizens. Chronicles describe a city with house rafters tipped in gold, its streets traversed by Japanese monks, Chinese envoys, and Muslim merchants. Kyongju today is home to 130,000. The city center (top), with its 23 tombs, is a national park.

was its chief defense. Royalty wore rare, iridescent kingfisher feathers. Hwangyongsa, the largest temple built by the Silla, housed a 24-ton Buddha covered with gold.

BECAUSE the archaeologists were of less help on the subject of the Silla soul, I sought out So Chongju, a renowned poet inspired by Silla history. "They were a large-spirited people, living in harmony with nature," he said.

Mr. So unrolled a pen-and-ink drawing of a sage seated beneath a plum tree. A poem underneath asked: "What is a scholar?" Answer: "He who regards the earth as his garden; the sun, moon, stars as his servants; and eternity as the briefest moment."

Buddhist thought, which flowed into Silla in the sixth century, seems to focus on eternity. It is the fixed point about which humanity revolves. Time is limitless. We are limitless, reborn in endless sequence.

It is 3 a.m., dark except for the faint starshine. Already day has begun at Pulguksa, Korea's best known temple in the foothills southeast of Kyongju. Completed about 780, the temple has been reconstructed 23 times.

One by one, lights flicker on behind the rice-paper doors of the monks' cells, shedding the soft glow of paper lanterns. I see the shadows of monks as they begin their chants. Paired white shoes with upturned toes form ranks outside their rooms. A barefoot monk in a gray wool robe paces the courtyard, beating a gourd, chanting sacred texts. A bronze bell rings. Next I hear drumbeats, then the hollow clack of a wooden fish

The passage to eternity begins as family and friends shepherd a coffin to rest in a gentle mound of earth not unlike those that cover Silla kings. White signifies mourning in Korea; a banner identifies the deceased.

being struck, and finally the shimmering of a brass gong. The resonance grows, each sound to its purpose: first to wake the monks, then to wake creatures of land, sea, and air.

In front of the temple a monk stops to burn incense. Smoke curls in the air like the spirit of a newly released soul. Others gather inside to begin prayers. They bow . . . low . . . lower still . . . till they lie prone before the serene, smiling image of Buddha.

When Silla unified Korea, Buddhism was the state religion. Kyongju, it was said, had as many temples as stars, as many pagodas as geese in the fall skies. Monks, men of faith and learning, traveled to China and India, returning to enrich Korea with the influence of other cultures. Buddhism still predominates in South Korea, claiming eight million devotees.

In a hotel-lobby bar I met Seo Inh, monk and chief of protocol for Pulguksa Temple. He flashed a smile, introduced me to his woman companion, and lit a cigarette.

"I am a naughty innocent," he grinned. "They call me a modern-day Wonhyo."

Wonhyo, the most influential monk of the Silla dynasty, helped popularize Buddhism. For a Buddhist monk he led an unconventional life, fathering a son.

Seo Inh also had children. That was before he became a monk, when he was a marine colonel in the Korean and Vietnam Wars.

"It was sheer horror," Seo Inh said. He told of men decapitated by the Viet Cong, the screams of civilians caught in cross fire. One day, bereft of sanity, Seo Inh shot an aide. He passed out and woke in a straitjacket. He left the military, contemplated suicide.

"I wanted to die," he said. Instead he went to a temple where candles glowed before a Buddha. The priest offered escape from pain, but he must renounce his past, his wife, his children. "I severed all ties," he said. "It was like cutting a kite string."

Now he feeds chipmunks on the temple grounds and worships, though his unconventionality baffles his peers. But who can judge? Wasn't Wonhyo scorned by those who failed to recognize his faith?

"This is what I am," Seo Inh insists. "I care for recognition only from my chipmunks."

I'll always remember our visit to Sokkuram. The shrine is a grotto built of granite blocks dragged up Mount Toham, southeast of Kyongju. The centerpiece is a 60-ton Buddha, positioned to catch the sun's first rays on a jewel in its forehead. Seo Inh bowed before the statue. "When I see this Buddha, I feel protected," he said.

In 1971 the government of South Korea moved to do some protecting of its own. The grotto had deteriorated, so a glass wall and humidity controls were installed.

That was fine, Seo Inh said, but several years later the government proposed construction of a replica Sokkuram, which the public could visit to save wear on the real one. The Buddhist community protested. "My master Wolsae said it was bad enough Korea was divided, let alone having another division with two Sokkurams."

It always returns to division. Fragmented by the tyranny of geography, Korea has ever been squeezed by bigger, aggressive neighbors. Its history is a litany of invasion: Mongols in the 13th century, Chinese rebels in the 14th century, the Japanese warlord Hideyoshi in the 16th century, Japanese occupation in the first half of the 20th century, then the Korean War, which adjudicated a line on the map at the 38th parallel. Kyongju has suffered them all.

In a meadow I spotted a siren on a pole. "For air-raid practice. Just in case . . . ," a farmer said. He glanced north.

There is an ache for North Korea too, not unlike the phantom pain of an amputated limb. "You can't turn your back on family," my interpreter Chun Hyang Yee explained when I asked, naively, why bother about reunification if the north is so hostile.

Mr. Yun spoke of his sister in North Korea. He has not seen her for 30 years. Is she still alive? "If you write about Kyongju, write about peace," he said urgently.

It is a message I hear often. Despite fear and distrust, the longing for unity eats at the soul of Kyongju. It is particularly poignant here, for here, 1,300 years ago, Korea became whole.

WHAT WAS the magic that touched the most humble object—a roof tile, a wood door—with grace? Silla pottery is gray and plain. Yet its simplicity appeals. At dinner, scholar Son Ujo explained. It is a question of line.

"American line is sharp, unyielding: the Washington Monument, the tail fins of a car." He sliced the air with a chopstick to illustrate. "Korean line," he said, "is a curve: the softness of a woman in her hanbok, the green waves of mountains surrounding Kyongju, the jade ornaments that dangle like ripe pears from the gold Silla crowns. That is the secret of Korean art."

"I can never imitate the line," Dr. Chung Yang Mo, then director of the National Museum in Kyongju, said in frustration. He drew a line, a barely pregnant bulge that mimicked the curve of the Emille Bell. The 23-ton bell was cast in one piece in A.D. 770.

Legend says a child was tossed into the molten metal as a sacrifice after earlier castings failed; the ringing bell echoes the plaintive cry of that child. *Emille* comes from the Korean word for "mama."

Dr. Chung guided my fingers over every gash on the pitted surface of the bell, which hangs outside the museum. "Koreans are like that," he said quietly. "Rough and scarred on the outside,

smooth and tough on the inside."

If the line between fact and legend kept blurring, I had to conclude it is often faint. Part of Kyongju's magic emanates from a rich legend lode, and the possibility a Buddha *could* materialize from a stone or the sound of a jade flute *just might* make rain fall. More marvelous was nature, worshiped by Silla's early shamanist kings. They considered the mountains, rivers, and forest living spirits.

Reverence for nature endures. "In Korea when a house is built," said Dr. Chung, "its scale must fit the surroundings. The wall must not be high. A low wall, preferably draped with flowering vines —all must harmonize."

EVEN DEATH demands harmony. Tradition decrees that a grave be located on a hill, a sweep of valley in front, sheltering trees in back. There should be mountains—one shaped like a tiger, one like a dragon. At such a site I attended a founder's day celebration for the Cho family.

Ancestor worship reflects the influence of Confucianism, a philosophy that stresses family relationships and relates them to government: Father is to son as state is to individual, symbol of unquestioned authority.

Joining some 5,000 Chos at the tomb, I discovered the ease of introductions when everyone belongs to the same family.

"I am Cho Chang of Seoul," said a man in the white robes and peaked hat of an official. "And this," he said, indicating a friend, "is Mr. Cho of Taegu. And Mr. Cho of Pusan."

"And here is . . . ," he began.

"Mr. Cho," I anticipated.

"Also of Pusan," he finished.

"This is my wife," he said, turning to an attractive woman.

"Mrs. Cho," I asserted.

"Mrs. Yun," she said, smiling. "In Korea married women use their family name."

"There are over 700,000 Chos in Korea," Cho Chang said. "And all from one grandfather long ago."

In front of an altar piled with pears, rice cakes, and other offerings, robed officials recited prayers. Everyone bowed.

Then each delegation moved behind the altar for a photograph —like a class reunion. "Will you have your picture taken with us?" Cho Chang asked.

"I didn't know the Chos had a foreign branch," a woman shouted. Peals of laughter rippled through the crowd. I hope Grandfather Cho enjoyed the joke.

Though modern Korea is a

Rigid custom prevails at the Cho family ancestor's day feast, where yangban, the traditional nobility, follow a strict order of ceremony. Ancestor worship reflects Confucianism, which had supplanted Buddhism as the primary social force by the 15th century, imprinting on the Korean conscience the ideal of obedience to authority.

patriarchal culture, three queens ruled during the Silla dynasty. The first, Queen Sondok, 27th ruler of Silla, was successful in war, compassionate, and wise. She built Chomsongdae, a 29-foot stone tower that bulges at bottom and narrows at top (pages 258-9). "You copied from us," my guide teased, comparing it to a Coke bottle. The tower probably functioned as an observatory, recording comets, meteors, and solar eclipses. The destiny of state and ruler were linked to such phenomena.

WHERE legend rules, any excuse serves for celebration. Twelve of us gathered one October night at Panwolsong, the royal palace site, ostensibly to honor a children's art contest held earlier at the Kyongju museum—actually to honor the harvest moon.

Yun Kyung Real, who teaches history at the museum, led off, the white sleeves of his robe flapping like a schooner's sails. I can see him still, singing to love, to the moon—and most fondly to *makkolli*, a rice wine. He fills our cups and his own. "Just the teardrops of a sparrow," he says, waving aside my protest.

Moved by the spirit of the night, or perhaps the makkolli, we join hands and dance, celebrating nature, man, eternity, and the Silla people who melded the trinity. "Who could ask for a better temple than this?" asks Mr. Yun as he pours another thimble of makkolli. Just the teardrop of a sparrow.

Passing Chomsongdae observatory a few nights later, I conjure an astronomer scanning the stars. Was it time to plant? Would there be rain? Too much? Too little?

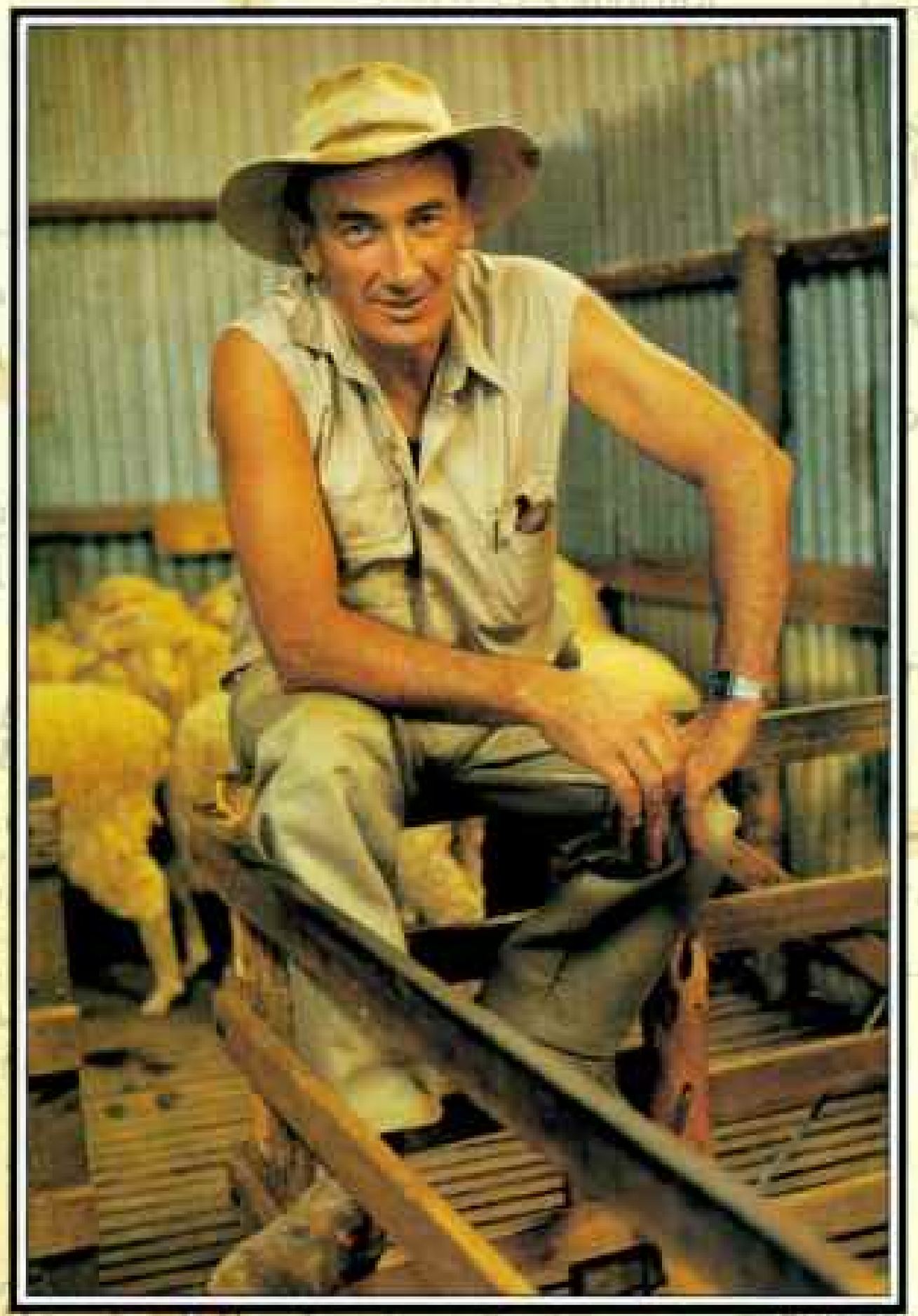
In the end Silla fell when a succession of weak rulers and uprisings broke the delicate harmony. The last king abdicated in 935. The succeeding Koryo dynasty moved the capital north.

Resigned to the uncertainty of the present, the Silla people fixed their sights on something beyond. In a sense they achieved this immortality. Their descendants keep faith with nature, living in a magical enclave bounded only by the Korean line that shimmers between reality and legend. □

Coaxed from a tomb by an archaeologist's trowel, a pot with a date corresponding to A.D. 818 was found during a preliminary excavation. But descendants objected to further digging. In Korea the balance usually tips in favor of respect for family.

Internal strife and invasion from the north ended the Silla dynasty in 935, shattering the harmony of centuries. Yet harmony, so prized in a country accorded so little, somehow endures in the heart and spirit of Kyongju.

NATIONAL GEOGRAPHIC (ISSN 0027-9358) IS PUBLISHED MONTHLY BY THE NATIONAL GEOGRAPHIC SOCIETY, 17TH AND M STS. N.W., WASHINGTON, D. C. 20036. $18.00 A YEAR. $2.25 A COPY. SECOND-CLASS POSTAGE PAID AT WASHINGTON, D. C., AND ELSEWHERE. POSTMASTER: SEND ADDRESS CHANGES TO NATIONAL GEOGRAPHIC, P. O. BOX 2174, WASHINGTON, D. C. 20013



★
Oodnadatta

Undaunted by the devil's heat of a remote outback sheepstation, with hundreds of miles to his next post, the sheepshearer is ever on the move: a rugged, free-spirited folk hero, long celebrated in Australian lore.

QANTAS
The Airline of Australia

Down Under. It's down home to us.

That option is a special third-party arbitration program that the people of Audi have arranged with the Better Business Bureau.

At Audi, we've been consistently producing technologically advanced automobiles of the highest quality for over fifty years. And we take great pride in our tradition of excellent service.

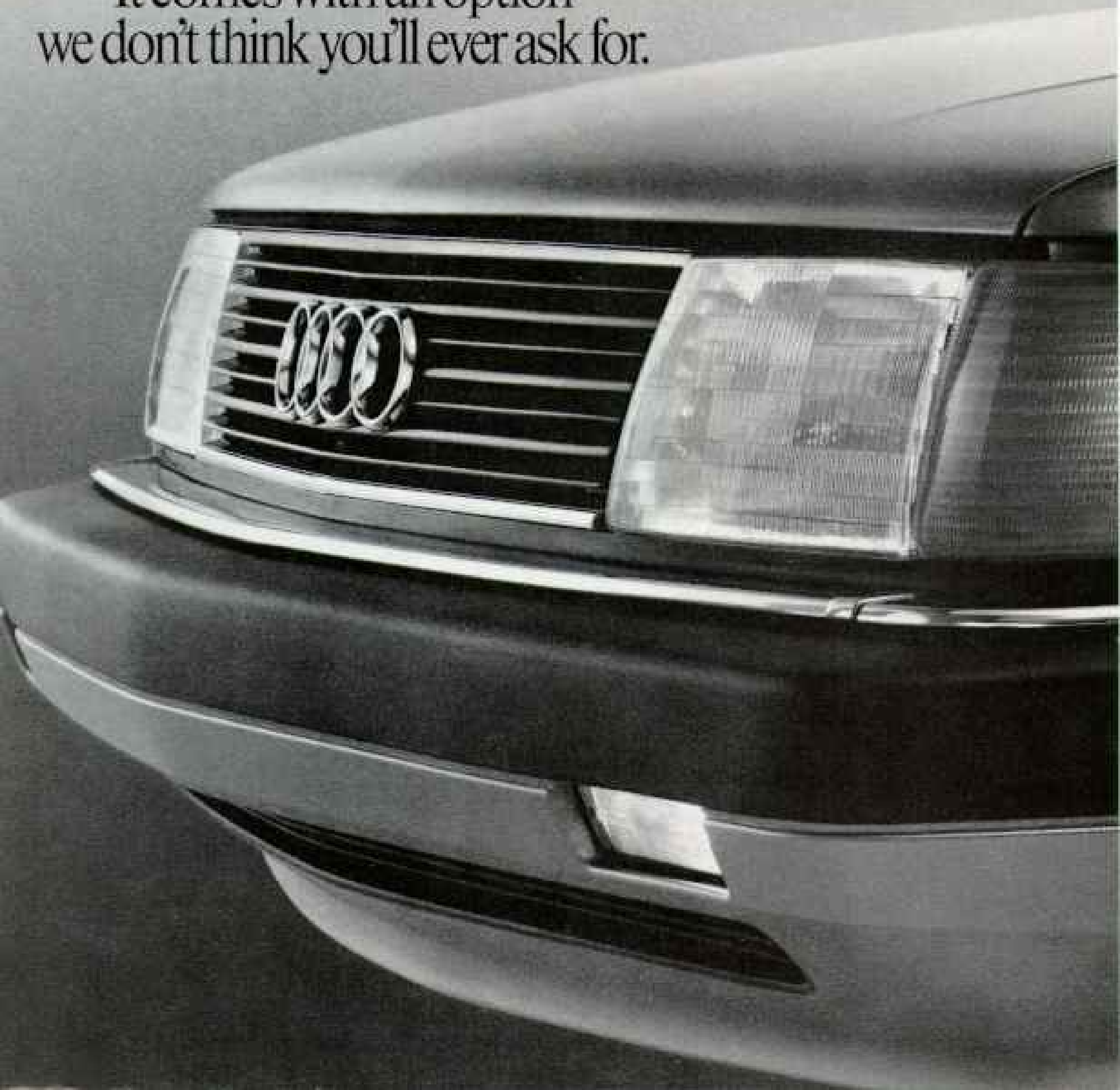
But if, for some reason, you should ever need an extra voice in solving any product-related questions, all you have to do is call toll-free 1-800-822-AUDI.

The program benefits all current and, in some cases, *former Audi owners.* Of course, the program is free. Just ask your dealer for the complete details.

Naturally, the first step in solving any problem is your owner's manual, and then your dealer.

But it never hurts to have an extra option, even if you never choose to exercise it.

It comes with an option we don't think you'll ever ask for.



Presbyopia

If you're over 40, you've got it.

Presbyopia
Is the inability of the eyes to focus sharply on things up close, such as small print.

Crystalline Lens
Presbyopia is caused by a hardening of the crystalline lens that robs the lens of its ability to properly focus light passing through the eye. Presbyopia becomes noticeable at around age 40 and grows progressively more pronounced with increasing age. Presbyopia makes the lens function like a fixed-focus camera: The eye can take sharp pictures of distant objects, but things up close to about three feet away come out dim and blurred.

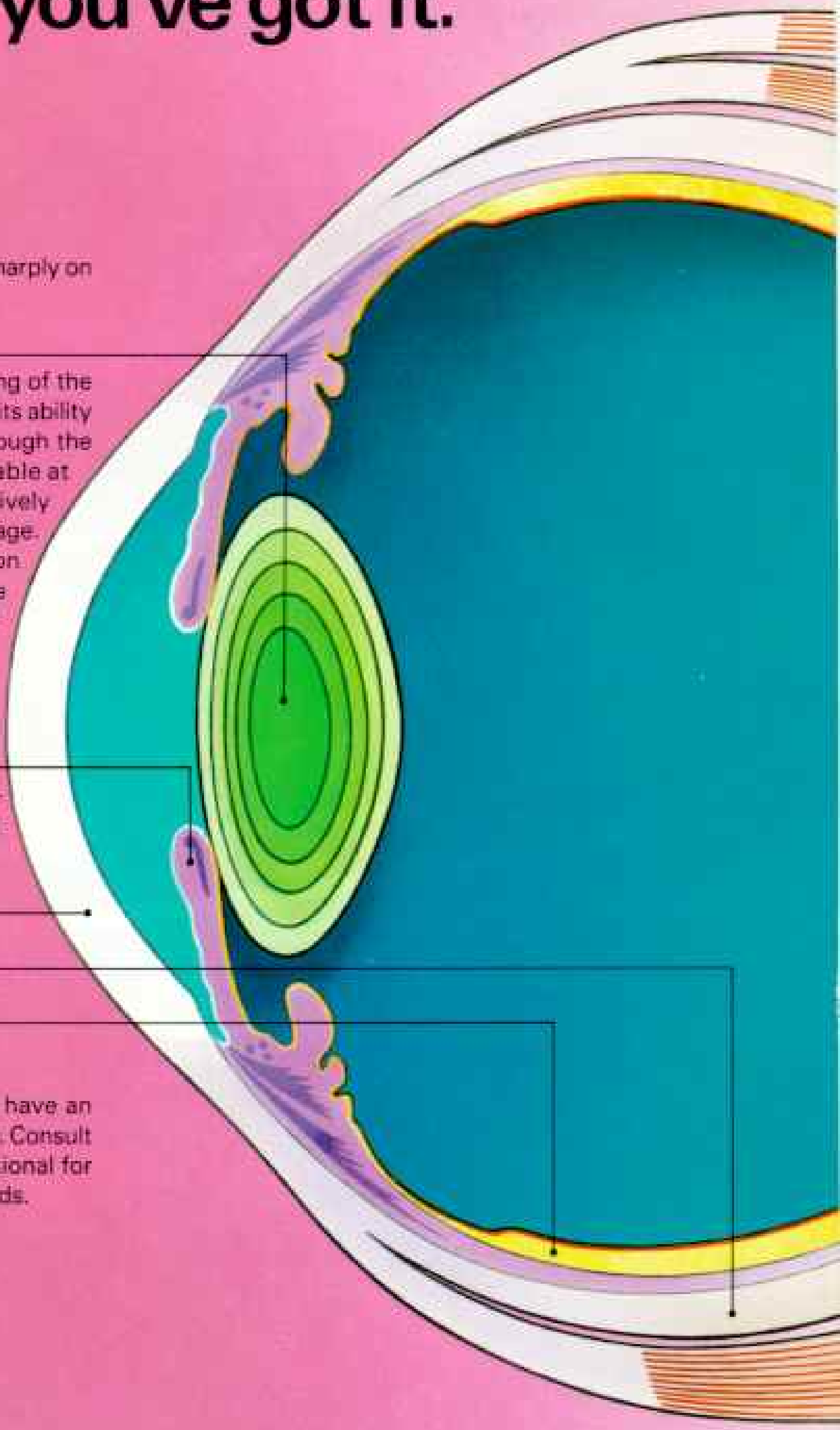
The Iris
Regulates the amount of light admitted to the crystalline lens and gives the eye its color.

Cornea

Sclera

Retina

Eye Care
It is recommended that everyone have an eye examination at least once a year. Consult your independent eye care professional for advice on your specific eye care needs.



Why VARILUX®, not bifocals, are the best answer to presbyopia.

How to tell if you are presbyopic.
The first symptom most people notice is trouble reading the phone book, or the menu in a dimly lit restaurant. Later, many experience difficulty focusing sharply on things in the "intermediate" range, about an arm's length away. Like prices on the supermarket shelf, or the instruments on your car's dashboard.

What about bifocals?
Bifocals have two major drawbacks. First, of course, is the obvious, annoying segment line. Secondly, while bifocals do correct for near and far, they can't help at all in the critical intermediate vision range.

VARILUX, the proven, "lineless" alternative to bifocals.
Millions of presbyopes all over the world are now wearing a new kind of lens that makes bifocals obsolete.

These lenses are called "progressive addition lenses," and they are manufactured by VARILUX, the world leader in progressive lens technology.

Unlike bifocals, Varilux lenses let you see clearly at all distances. That's because Varilux contain not just two, but an almost infinite number of corrections, each flowing smoothly and invisibly, one into the other. So with Varilux your vision flows naturally and clearly from near, to intermediate, to far away. Without disconcerting image "jumps" caused by bifocal lines.

★ Good Housekeeping

For the location of the Varilux professional nearest you, write or call toll-free

1-800-223-1000 ext. 936.

363-E Vintage Park Drive, Foster City, CA 94404

VARILUX®

The clear choice over bifocals

A lady who has graced our lives

SHE HAS GRACED our Board of Trustees for the past 14 years with her wise counsel and infectious optimism, embodying, in the words of a friend, the "touch of velvet and the stamina of steel." And now, having celebrated her 75th birthday, Mrs. Lyndon B. Johnson is retiring from the board to become a trustee emeritus.

I am most pleased, however, that Lady Bird will remain active in Society affairs. I prefer to think the board is not losing Lady Bird at all, but simply gaining Nathaniel P. Reed, the respected Florida conservationist. A former Assistant Secretary of the Interior for Fish and Wildlife and Parks, Nat brings to the Society the same concern for our natural resources that Mrs. Johnson so aptly expresses.

Indeed, we have been fortunate to have shared a small part of Lady Bird's lively public career. As an advocate for the environment—both during her years in the White House and later on—she has championed the idea that beautiful surroundings create a better sense of balance in all our lives.

We don't need convincing of this in Washington, D. C., where programs launched under her leadership surround us each spring with a refreshing sea of daffodils and tulips. Nor do Texans, when fields of bluebonnets and Indian paintbrush emblazon that state's parks and highways.

In recognition of her achievements, President Ronald Reagan bestowed upon Mrs. Johnson in April a congressional gold medal for "leaving an indelible imprint of loveliness on the American landscape."

THE FIRST LADY'S COMMITTEE FOR A MORE BEAUTIFUL CAPITAL IN 1968 HEARS ARCHITECT NATHANIEL A. OWINGS, AT RIGHT, AND SECRETARY OF THE INTERIOR STEWART L. UDALL DESCRIBE PROPOSED CHANGES TO PENNSYLVANIA AVENUE AND THE MALL. PHOTOGRAPH BY JAMES P. BLAIR, NGS

LADY BIRD RELAXES ON HER TEXAS RANCH. PHOTOGRAPH BY DAVID KENNEDY

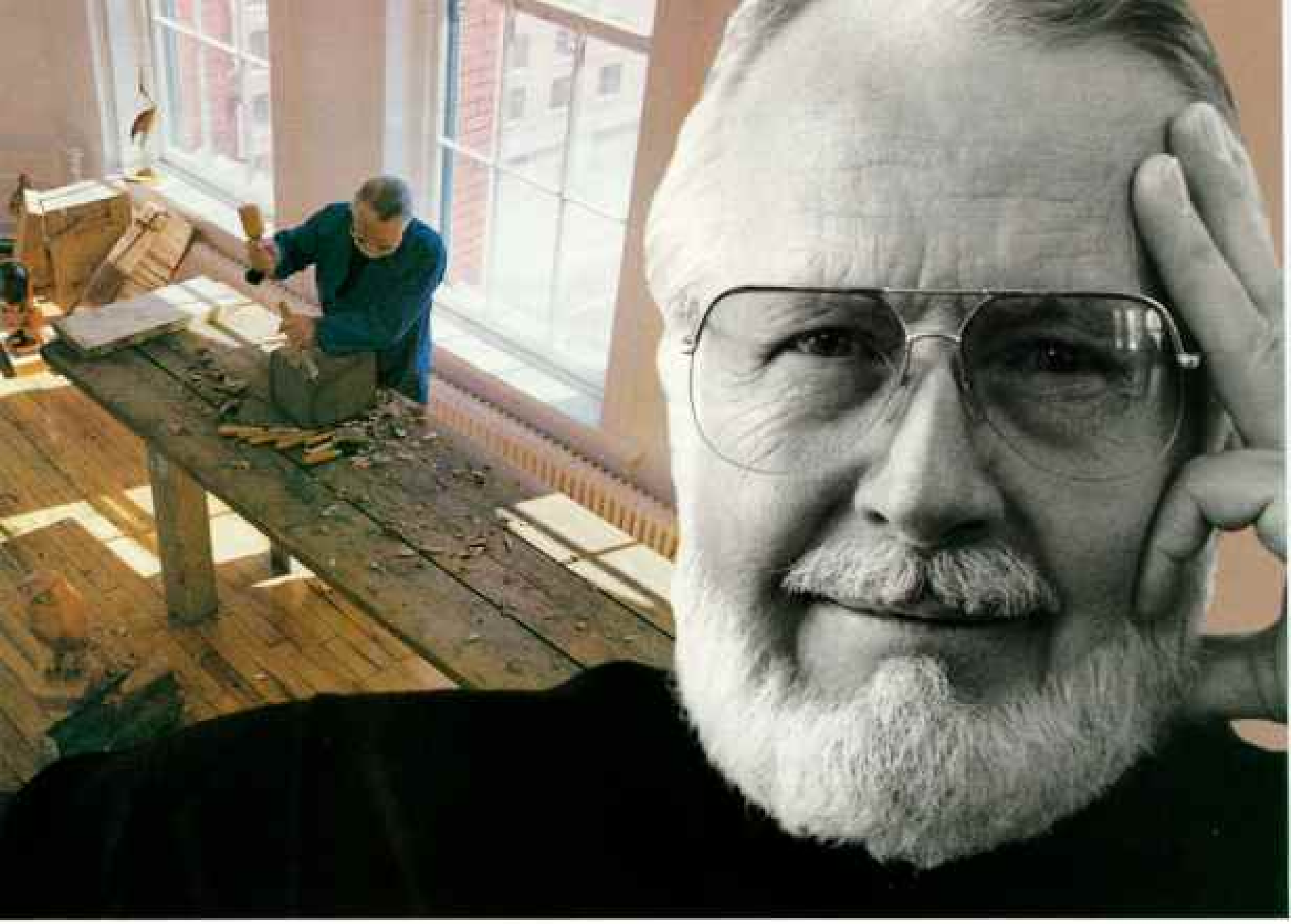
Lady Bird's most recent campaign, of course, has been to promote wildflower conservation. As she wrote in her article "Texas in Bloom," in our April issue, "I feel a sense of urgency when I see the fields and wild meadows of yesteryear turning into a grid of shopping malls, a spaghetti network of highways, and houses chockablock in subdivisions." To counter this trend, she established the National Wildflower Research Center near Austin in 1982 to probe the mysteries of many of our 20,000 plant species.

Make no mistake about it, she will succeed in this campaign, as she has in so many before. "She's always had a positive enthusiasm," said Melvin Payne, Chairman Emeritus of the Society. "When she goes into something, she goes all the way."

A testimonial resolution by the Society's board put it this way: "For you, kind Lady Bird, our admiration and affection know no bounds. It pleasures us to see you in the mind's eye strolling beneath the great live oaks at your 'heart's home,' the old ranch beside the Pedernales." I would add only this, Lady Bird: It warms my spirit to know that, in the future as in the past, you will share with us your formidable talents as you follow your own good advice to do "just whatever makes your heart sing."

Gilbert M. Grosvenor

PRESIDENT, NATIONAL GEOGRAPHIC SOCIETY



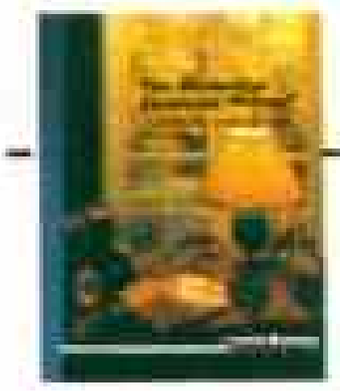
At 62, Donald Henness discovers a sculpture in each piece of wood and an opportunity in a variable annuity from The Prudential.

"Every piece of wood is a challenge. You have to treat it like an individual. So when your idea finally takes shape, the satisfaction is great. I like challenges. Like turning my retirement money into the income I need for my lifestyle. I did a lot of research, and, well, the Prudential agent was the only one with the knowledge and background I wanted. He seemed to be interested in me as an individual. He made no rash promises. He suggested a variable annuity. With The Prudential, I've got very little to worry about."

Donald Henness

Let The Prudential help you discover the financial opportunities that best suit your needs. For Donald, that also included a Prudential guaranteed CD, a variable life policy, and a mutual fund. For our free brochure about The Prudential's financial products and services, call 1-800-422-9001, extension 487, or write to The Prudential, Department 487, P.O. Box 5222, Clifton, NJ 07015-9819.

CDs are issued by The Prudential Bank and Trust Company. Investment products are available through Prusco Securities Corporation, Newark, NJ. These companies are subsidiaries of The Prudential.



Please send me a free copy of *The Prudential Financial Primer: Making the Most of Your Prime Years.*

Name _____
Please Print

Address _____

City, State, Zip _____

Phone (____) _____ Home ☐ Office ☐

Mail to: The Prudential, Department 487,
P.O. Box 5222, Clifton, NJ 07015-9819

The Prudential
ABOVE AND BEYOND℠

Members Forum

Ghosts of War

The article in the April issue about the war in the South Pacific has cleared a 44-year mystery for me—the fate of the B-17F *Black Jack* (page 426). I was its original crew chief, and it was still flying combat missions when I was rotated back to the States. I did not know its final mission. I have a model B-17F hanging in my living room. To me *Black Jack* is still flying.

ANTHONY J. DEANGELIS
Satellite Beach, Florida

The photograph of the Japanese ships escaping the attack in Simpson Harbor, Rabaul (page 434), was taken by Photographers Mate First Class Paul T. Barnett, who was the air group commander's rear-seat gunner in a torpedo plane. He was killed seconds after the picture was taken.

ROBERT B. STAHL, COMDR. USN
Fairfax, Virginia

COLLECTION OF ROY LEE GROVER

The B-25 wreck described on page 436 was shot down on August 5, 1943, by antiaircraft fire. With his left engine on fire, the pilot, Capt. Robert L. Herry, was forced to ditch. This picture was taken from an accompanying B-25. The crew was seen swimming around the wreck. Only one came home; four others, including Bob, were never heard from after they were captured. He was one of the oldest pilots in our squadron—at least 23 years old. He was my friend.

ROY LEE GROVER
Santa Maria, California

The caption on page 434 incorrectly credits the sinking of the *Hakkai Maru* to B-25s. It was one of five ships sunk by Marine torpedo bombers from VMTB-232. I was one of the 18 TBFs of the famous Marine Red Devil squadron. Together we scored 15 hits that day. I hope you will give credit where it is due—to the Red Devils.

CARL F. CRUMPTON
Topeka, Kansas

We were thrilled to see David Doubilet's photographs, most of which were taken during a voyage aboard our charter motor yacht *Telita*. The impression Peter Benchley creates that it is hazardous to eat fresh fish caught in Papua New Guinea is totally false. Fish with ciguatera toxin are rare here. Our crew and coastal villagers are well aware which fish can be eaten safely, and these include several species that are considered dangerous elsewhere in the South Pacific. We have served thousands of fresh fish meals over the past ten years without a single incident of poisoning.

BOB AND DINAH HALSTEAD
Milne Bay, Papua New Guinea

Early in the Pacific campaign Gen. George C. Kenney's priority was to restrict Japanese naval and troop transport movements. He instituted "skip bombing" with B-17 heavy bombers but found the runs were ineffective because the planes lacked fire power. He decided to modify B-25 bombers with expanded gun power and assigned the task to my father-in-law, Col. Paul (Pappy) Irvin Gunn. When Pappy finished the project, he had four 50-caliber guns in the nose of the plane, a pair of guns on each side of the fuselage, and three more underneath. Dubious, the general asked about the center of gravity. Pappy responded, "Hell, General, we threw that away to save weight." Actually he installed fuel tanks for balance. The modifications proved successful in the Battle of the Bismarck Sea.

VIC BONANNO
Arlington, Virginia

I served with the 13th Anti-Aircraft Artillery Group in the Russell Islands and helped put some of those planes in the briny deep. A NATIONAL GEOGRAPHIC map of the area was in my pack.

JAMES H. JENSEN, COL. USA
San Mateo, California

Uganda

Robert Caputo's extraordinary detailed look at Uganda (April 1988) took me on a journey unequaled in any other magazine. It was full of hard news and humanizing photographs. For the first time I feel I understand the dimension of the tragedy there. You are to be applauded for bringing us a deeper understanding of a region that desperately needs the world's attention and help. I'd like to see more aggressive journalism and less "happy read."

RICHARD R. LEGER
Kentfield, California

"It's time to call Southeast."

You never know when you'll turn a page and turn a lot wealthier. When prosperity strikes, first pick yourself up off the floor, then pick up the phone and call Southeast.

Your Southeast Banker can present you with an entire portfolio of safe, secure, deposit options. Including savings accounts, high-yield money market accounts, certificates of deposit, and trust and investment accounts. And we can put them together in a program that makes good sense for you and your goals.

So when that favorite stock of yours skyrockets or you come into money for any happy reason, give us a call. And let us help you buy something you've always wanted: A little peace of mind.

Southeast Bank

Was there not even one Ugandan who said that his country was better off under British rule?

RANDY LIEB
Swift Current, Newfoundland

Your article "Land Beyond Sorrow" made me so depressed. When I first went to teach geography in the Sir Samuel Baker School in the bush of northern Uganda in 1954, Uganda was still a British protectorate, a lovely country with happy, intelligent peoples of many ethnic groups. During 12 years off and on, I served many masters—from the British protectorate to Milton Obote's and Idi Amin's governments. I am almost ashamed of being British and of my own failure to make a more useful contribution to a country that had everything going for it until politicians, power seekers, and commercial exploiters of all ethnic groups were given too free a hand to work their wiles.

R. L. SHERWOOD
Peterborough, Cambs., U.K.

Wildflowers

The photograph of two Uganda blacks using their bicycles as a hearse for an AIDS corpse closely followed by the shot of well-nourished white kiddies in expensive clothes hunting Easter eggs in the article on wildflowers of Texas goes a long way toward showing what is wrong in this world.

TIMOTHY L. MORAN
Detroit, Michigan

You neglect to give the scientific names of plants described, a source of great frustration to readers outside the U. S. and, I suspect, to many U. S. residents. Common names are of strictly local meaning. Many are applied in different areas to different plants—mayflower is one. Drummond's phlox is obviously *Phlox drummondii*, but what are bluebonnets and Indian blankets?

SYDNEY ELLERTON
Maldon, Essex, U.K.

In West Germany it has become popular to reserve part of the lawn as a "wild meadow" (*Wildwiese*).

GARA SPIEGELHAUER-PEABODY
Dormitz, West Germany

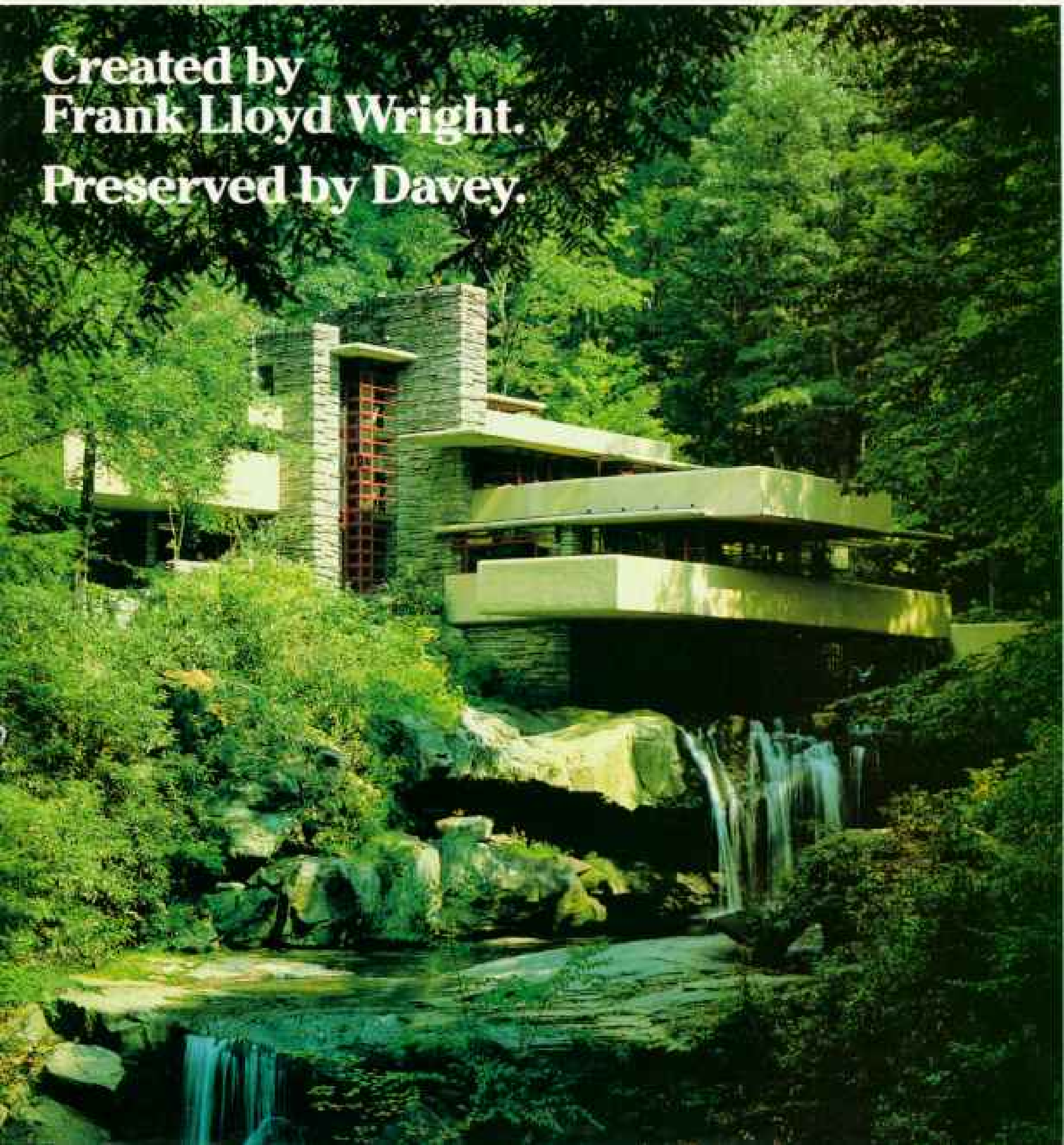
Thank you for spotlighting the wonderful sweeps of color that grace Texas roadsides each year. Perhaps with national exposure the interest in native plants for landscape use will really "bloom." Texas has such a diverse group of flowering plants, in part because it sits at the confluence of the continent's eastern and western biotic provinces. Also the state's north-south

Frank Lloyd Wright designed Fallingwater to be a beautiful part of the natural environment. Each majestic tree enhanced its setting. When a rare old oak developed problems, Davey experts were called to the rescue. Skillfully. Carefully. We restored this strategically positioned old tree to complete health. That's our distinction. We do it right.

Davey provides tree, lawn and grounds care services for residential, commercial and utility properties. We're employee-owned, 4,000 strong. And we've been custom-designing affordable programs for some of the best known family trees, and lawns, coast-to-coast and in Canada for over 75 years.
Where most tree and lawn care companies stop...we begin.

DAVEY
TREE AND LAWN BEAUTY

1500 N. Mantua Street
Kent, Ohio 44240



extent allows a diversity of plantings from cold-tolerant to tropical. One small error: The individuals on page 497 are not pressing a bluebonnet (family Fabaceae) but examining a plant from the Asteraceae [daisy] family.

JOHN S. SNOWDEN
College Station, Texas

The article and sketches brought back vivid memories of my cross-country bicycle trip when I gazed upon the beauty of wildflowers daily. With the continued appreciation and dedication of people like Lady Bird Johnson, America's wildflowers will bloom forever.

LINDA COYNE
Weymouth, Massachusetts

Pharaoh's Funeral Bark

I was moved by your superb foldout of the pharaonic boat (April 1988), but alarmed to see the apparent disinterest with which you treated the conservation of the first ship. Its reassembly was brilliant, but preservation has proven inadequate and arouses fears for the second ship if excavation ever proceeds.

RUTH NICHOLS
Toronto, Ontario

After a lifetime in woodworking, I was enthralled by the ancient bark. I can almost hear her creak as she plies the Nile and see her wafting

far into the cosmos with her exalted burden. But I am extremely curious about an object at the lower left on page 527 bearing English letters.

KEITH L. SIMONS
Littleton, Colorado

Team members wrote the initials for the Egyptian Antiquities Organization and their names on a stone that was dropped through the air lock to see to what extent gas layers were disturbed. However, no layers were present since outside air had permeated the chamber in the past.

I am fascinated by James Blair's marvelous pictures taken at the boat pit and around the pyramid. I was on tour in Egypt in 1985 and heartsick we weren't taken to see the first boat in its museum. It took me 17 years to save enough money to see what I could of Egypt in 12 days on a budget. It was the experience of a lifetime for me; I wish more people could see what I did at age 65.

DELLY ROBERTSON
New Richmond, Ohio

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

Yellow-eyed Penguin **Genus:** *Megadyptes* **Species:** *antipodes* **Adult size:** 620mm tall
Adult weight: 5.4kg **Habitat:** Coastal forests and cliffs of southeastern New Zealand, Stewart Island, and the Auckland and Campbell Island groups in the subantarctic
Surviving number: 1,200 — 1,500 breeding pairs Photographed by Rod Morris

Wildlife as Canon sees it

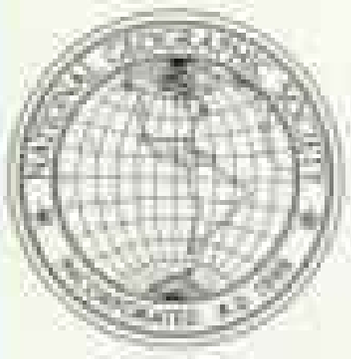
One of the greatest roles of photography is to record and preserve images of the world around us worthy to be handed down as a heritage for all generations. A photograph of the yellow-eyed penguin provides a glimpse of this rare and reclusive bird as it rests after a day of feeding at sea.

Unlike other penguins that nest in huge colonies close to water, the yellow-eyed penguin travels inland to its solitary nest hidden in the lush forest. Dramatic changes for the species came when extensive tracts of New Zealand's coastal forests were lost to farming and development. The penguin has also suffered from the introduction of predators and the depletion of its food chain from commercial fishing. The species' remaining habitat needs to be protected if the yellow-eyed penguin is to survive. Like most endangered species, its future depends on mankind's ability to live in harmony with the natural world.

An invaluable research tool, photography can help promote a greater awareness and understanding of the yellow-eyed penguin and its urgent need for a secure nesting habitat.

And understanding is perhaps the single most important factor in saving the yellow-eyed penguin and all of wildlife.

NATIONAL GEOGRAPHIC MAGAZINE



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 3,400 explorations and research projects, adding to knowledge of earth, sea, and sky.

Nuclear energy, not foreign oil, is the best way to prevent electricity shortages

Electricity is so vital to our economy and our way of life that a shortage of electricity is unthinkable. Yet some parts of the country are already experiencing brownouts during peak periods of demand. The question is not "Will we run out?" The question is "What price will we have to pay?"

Our electricity demand will outgrow our present supply. It is only a matter of time. Federal planners believe that our current generating capacity may not be enough to supply our peak electrical demand in the 1990s.

America's electricity use has steadily increased for the last 50 years, and has grown over 45% since the 1973 Arab oil embargo. This growing electricity demand is already forcing us to turn to oil.

Imported oil: a dangerous fix

The longer we wait to build new coal and nuclear plants, the more we will have to depend on oil. Using more oil plants would increase our foreign oil imports, worsen our trade deficit, and make America even more dangerously dependent on foreign countries for crucial energy.

More nuclear plants needed

Nuclear energy is already America's second largest source of electricity after coal. By reducing the use of foreign oil to make electricity, nuclear plants have saved America $105 billion in foreign oil payments since 1973. Nuclear plants have also helped cut consumer electric bills by over $60 billion.

Nuclear energy reduces America's dependence on foreign oil, not only at electric power plants, but wherever electricity replaces oil. It supplies a large part of the electricity that our economy needs to prosper.

If you'd like more information on making America more energy independent, write to the U.S. Council for Energy Awareness, P.O. Box 66103, Dept. SH04, Washington, D.C. 20035.

Information about energy America can count on

U.S. COUNCIL FOR ENERGY AWARENESS

TOYOTA CAMRY V6

HOT NEW NUMBER.
153 horsepower four cams, 24 valves make for fast company. The new V6-equipped Camry Sedans or Wagons own the passing lane to a new world of driving pleasure.

UNSURPASSED COMFORT.
Behind the power: plush, satisfying comfort for five in a stylish, contemporary interior environment. Optional automatic transmission available.

NEW CAMRY V6 POWER.

PASSES ALL EXPECTATIONS.

The new Toyota Camry V6 will blur recent memories of ordinary sedans . . . especially if they're in the right-hand lane. A 25% boost in horsepower speeds up the process of putting fun behind four doors . . . putting traffic, hills and miles behind you. Down the road, you'll find Camry's resale value* as impressive as its power.

You might expect such good fortune to cost a small one, yet it's the *lowest-priced V6 import car going.*** And it arrives with all the reliability, comfort and sleekness youd expect from a car bearing the Camry name—it just arrives more swiftly these days.

Camry Deluxe V6 Sedan. Not just some passing fancy. Get More From Life . . . Buckle Up!

*The 1986 Toyota Camry 4-Door Deluxe Sedan retained 95.6% of its value, based on retail sales listed in the March-April, 1988 *Kelley Blue Book Auto Market Report* for used car values, Western Edition. Actual resale value may vary, depending on optional equipment, geographic location, condition of vehicle and mileage.

**Based on manufacturers' suggested retail prices. *Kelley Blue Book New Car Price Manual*, 4th Edition, 1988.

TOYOTA QUALITY
WHO COULD ASK FOR ANYTHING MORE!

On Assignment

CLOSE TO HIS OWN nest—a creekside cottage in Annapolis, Maryland—photographer KEVIN FLEMING, with young neighbor Jay Smith, rigs a camera to an osprey-occupied navigation marker in the Severn River. Using remote control from a nearby boat, he captured the birds in closeup action for the article on his home of the past six years.

One of the GEOGRAPHIC's most peripatetic contract photographers, Fleming has pursued his stories through mine fields in the Somalia desert and by dogsled across the Canadian Arctic in minus 40°F cold. A licensed flier, he sometimes shoots aerials from the pilot's seat of single-engine planes. Retracing the odyssey of Ulysses, Fleming sailed the Mediterranean for seven weeks in a replica of a Late Bronze Age galley.

With the possibility of more far-flung travel, why would Fleming jump at the chance to photograph home turf? "I volunteered so I could take a baby break," the new father says, referring to the birth of his son, Jay Penn Fleming, in May 1987. "In the bargain, I discovered Annapolis too."

PHOTOGRAPHS BY CARLA FLEMING (ABOVE) AND H. EDWARD KIM

THE DOCTOR WAS IN when NATIONAL GEOGRAPHIC writer CATHY NEWMAN—here with museum director Chung Yang Mo—explored Kyongju, Korea, with native-born photographer Ed Kim. While interviewing Dr. Cho Kyong Ku, a practitioner of traditional Oriental medicine, she was offered an unexpected consultation.

"Married?" he asked.

"Yes," she replied.

"Children?"

"No."

Dr. Cho filled a prescription (40 ingredients, including ox gall), claiming it would help her to conceive a son, a Korean woman's dearest wish. A year later Newman gave birth to son Jeb Arthur Fain. Regarding the medicine's role she says, "Who knows?"

Newman's first writing job was as the eight-year-old correspondent for the *Newman Family News*. Circulation: four. Much later she joined the *Miami News*, working up to features editor before trading daily deadlines for the GEOGRAPHIC's monthly pace in 1978.