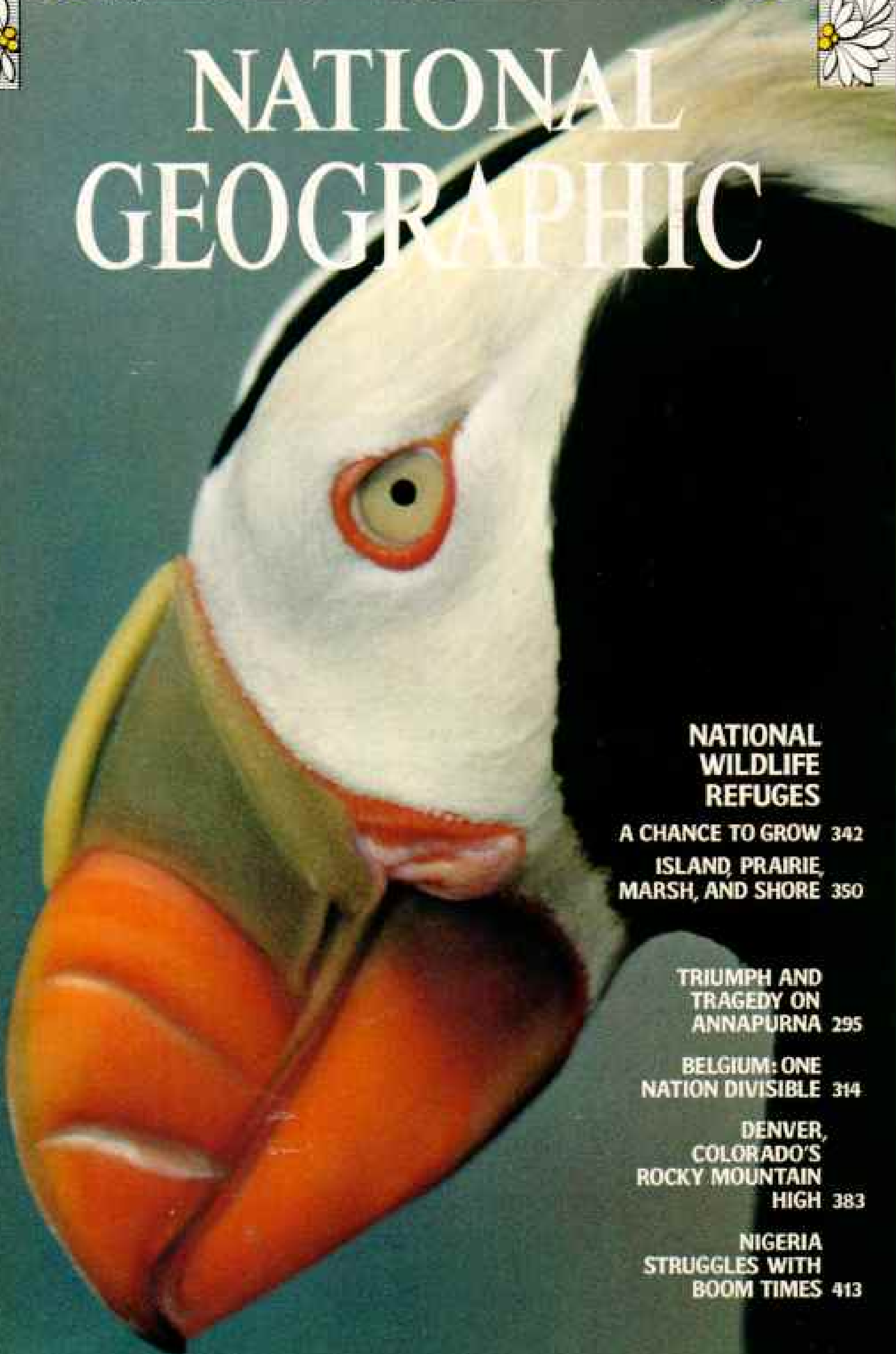


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NATIONAL GEOGRAPHIC



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SEE "LAST STAND IN EDEN" SUNDAY, MARCH 4, ON PBS TV

NATIONAL GEOGRAPHIC

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March 1979

WITH THE PROLIFERATION of satellite communication, world news moves swiftly around the globe and world opinion has become a force to be reckoned with by all nations. Among those dozens of developing nations known as the Third World, there is a growing awareness that reporting by Western journalists can enhance or tarnish their image, advance or retard their aims. Many of them do not like what is being reported about them.

The issue, long simmering, erupted at a UNESCO meeting last November in Paris. Third World nations spoke of a "new international information order" that would oversee international reporting through the means of regional offices superintended by governments. Reporters would be limited to official handouts and would submit, in effect, to supervision of their dispatches.

Proponents of the scheme maintained that the Western press fails to report enough Third World events, and when it does, publishes the sensational or the trivial while overlooking positive achievements.

Western press representatives at the meeting convinced their colleagues to modify the proposals and avert a confrontation, but the issue will not soon go away.

I was especially concerned, since no other publication travels the world more extensively than NATIONAL GEOGRAPHIC. Our writers and photographers do their best to discard the trivial and the sensational, but sometimes they are hindered in the field by suspicion and resentment of any foreigner with a notebook or camera. In those nations where the foreign journalist is closely watched by a government, the situation deteriorates, forcing us to settle for what we can get.

Our reporting is rigorously checked by experts. Further, we offer governments full opportunity to comment on the factuality of material. We constantly strive for balance, aware that what we view as good reporting may be viewed elsewhere as exploitation.

We think this method far preferable to handcuffing journalists in the field. If exclusion prevails, not only the West will be the poorer. A society that closes down exterior contact ends up stifling its own internal instruments of inquiry. That is an awesome price for a self-proclaimed good image.

Silvestre Browner

Triumph and Tragedy on Annapurna 295

An American women's team conquers the world's tenth tallest mountain. Then a fall takes the lives of two. Arlene Blum, Irene Miller, and Vera Komarkova relate their history-making Himalayan climb.

Belgium: One Nation Divisible 314

Wed politically after Waterloo, the Flemings and Walloons now plan an amicable separation—into autonomous regions under one king, flag, and constitution. Article by James Cerruti, with photographs by Martin Rogers.

Our National Wildlife Refuges— A Chance to Grow 342

At a critical juncture, writes National Geographic Society President Robert E. Doyle, clear and equitable decisions are needed to assure the future of a vast public domain.

Island, Prairie, Marsh, and Shore 350

Four distinctly different wildlife refuges show their wonders to naturalist Charlton Ogburn and photographer Bates Littlehales. A special tear-out guide details many of the 390 preserves.

Denver, Colorado's Rocky Mountain High 383

Drawing wealth and nourishment from plain and mountain, the mile-high state capital now serves as economic hub of an entire mid-continent region. John J. Putman and David Cupp report.

Nigeria Struggles With Boom Times 413

After 19 years of independence, a key African nation strives to build a strong democracy and to use its bonanza oil wealth to raise the standard of living of peoples long subjected to colonialism, corruption, and civil strife. Article by Noel Grove, photographs by Bruno Barbey.

COVER: A tufted puffin finds shelter on the Farallon Islands Refuge off San Francisco. Photograph by Bates Littlehales.



FROM MY DIARY ON OCTOBER 8, at 18,500 feet on Annapurna I: "There were so many avalanches yesterday. It gives you a scary feeling. You hear a roar, you see a cloud and watch it get bigger and realize with sickening certainty that it could reach you. You run for shelter. Then you feel the tent shake from the spray and realize you're still alive. Relief.

"I keep wondering when the next avalanche will come. I'm spooked and so is Margi. Maybe we shouldn't climb to Camp III today. I'm not going unless she goes. She's not going unless I go. I guess we'll both end up going. Risking our lives; God, it's crazy. Why? Well, in another six days someone can be on top."

When I spoke those words into my tape recorder—my way of keeping a diary—our group of women climbers had spent 43 days on the world's tenth highest mountain. After countless avalanches, I think all of us had some doubts about continuing toward the summit. Big mountain, enormous avalanches, small people. It seemed we'd done everything right except selecting the peak. We knew there was danger on Annapurna I (one of five Himalayan mountains in Nepal bearing this name, Goddess of the Harvests). We just didn't know *how much* danger. But we also knew the hardest climbing was behind us, and we still had energy and enthusiasm.

The decision that led ten women climbers to Annapurna began to take shape one day in 1972 in the Wakhan corridor of Afghanistan. At 23,000 feet on Noshag, I met a Polish climber, Wanda Rutkiewicz, who was returning from the summit. Elated at her success, she embraced me and said, "Noshag is 7,000 meters. Now we must climb an 8,000-meter peak—just us women."

At that time no woman had stood atop any of the world's fourteen 8,000-meter mountains. In 1973 Wanda and I applied to the Nepalese Government for permission to attempt Annapurna I—8,078 meters (26,504 feet). We did not get the permit. Meanwhile, a very few women climbed 8,000-meter peaks: four Japanese, one Chinese, two Poles. No American woman succeeded, and few even had the chance to try.

In 1976 I was one of two women on an American expedition to Mount Everest and reached 7,467 meters (24,500 feet). I came down feeling more strongly than ever that more women should *(Continued on page 300)*

Ten women challenge
earth's tenth
highest mountain

Triumph and Tragedy on Annapurna

By ARLENE BLUM

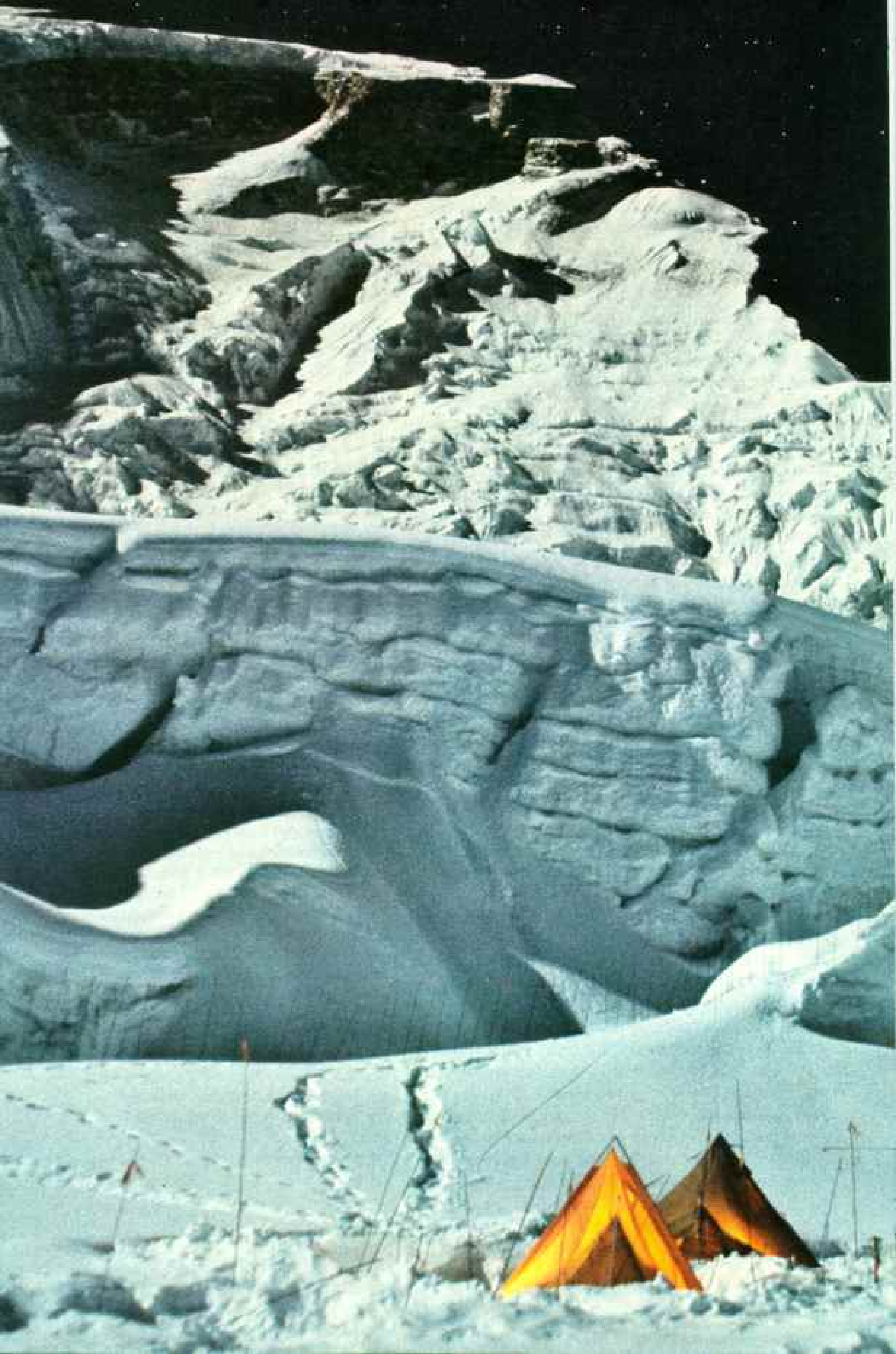
LEADER, AMERICAN WOMEN'S HIMALAYAN EXPEDITION

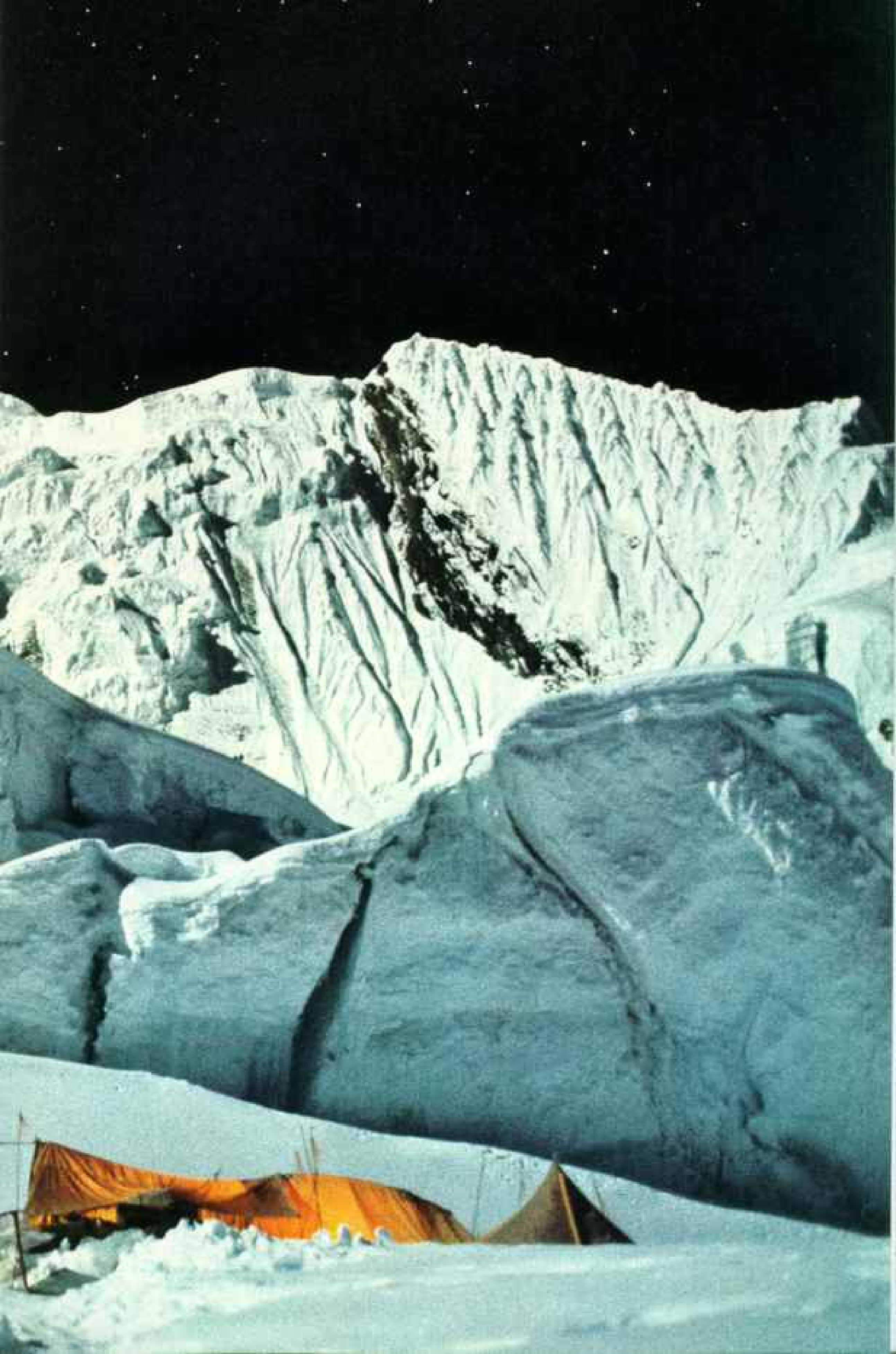
Radiant moment lifts all burdens from Annie Whitehouse, who embraces Christy Tews and her tidings: The first summit team has reached the peak of Annapurna I in the Himalayas.

Planned and financed by American women climbers, the expedition made good its slogan, "A woman's place is on top." But joy in being the first Americans to ascend Annapurna was soon shattered. The two women of the second team were killed in their attempt to reach the summit.

(Overleaf) Looming above candlelit tents of a camp at 18,500 feet, the bulk of Annapurna seems benign by moonlight. "We chose it," says author Arlene Blum, "because we thought it would be relatively safe to climb. It wasn't."

ARLENE BLUM (OPPOSITE PAGE AND OVERLEAF)







Even before the ascent, the expedition faced a major obstacle—backpacking six tons of gear to the foot of the mountain (map). The ten-day trek across broken terrain to Base Camp was made with the help of 250 Nepalese.

From Camp I the mountain revealed one implacable fact. The safest route to the top would be extremely strenuous. The strategy: to climb along a knife-edge ridge that rose above avalanche chutes. Camps were established on the route (left) to support the final summit attempt.

The ridge, the Dutch Rib, required some nearly vertical climbing and a difficult traverse (right, four climbers at lower center, and close-up, page 303), although descents could be made more directly by rappelling. Camp III was pitched at the top of the rib.

Progress up the mountain went by slow stages. A leader belayed from below would work her way carefully up a section and anchor, or fix, a length of rope. Following climbers then packed loads up to ever higher elevations (below). In her right hand the climber grasps a device that can slide up the fixed line but not down. An ice ax and crampons give additional purchase for steep sections like this one.



ARLENE BLUM (RIGHT) AND YERA KOMARKOVA





(Continued from page 295) be able to experience the challenge and reward of expeditionary mountaineering.

In January 1977 a group of like-minded San Francisco Bay area women climbers met. Among them were Irene Miller, then 41, a physicist; Vera Watson, 44, a computer scientist; and myself, a 31-year-old biochemist. We created a permanent organization, American Women's Himalayan Expeditions (AWHE), to attempt Annapurna and to provide encouragement and financial aid to women climbers.

Where to raise the \$80,000 the climb would cost? We went into the T-shirt business, with a model that proclaimed, "A woman's place is on top/Annapurna." The National Geographic Society also supported the climb. Ten thousand T-shirts later, with climbing permit in hand, we reached Nepal last August. Fittingly, Wanda Rutkiewicz was also in Nepal, the only woman member of a European Everest expedition.

In addition to Irene, Vera, and myself, our team included two women from Seattle, Joan Firey, 49, an artist and physical therapist, and Piro Kramar, 40, our doctor. Margi Rusmore, 20, a student at the University of California at Santa Cruz, and Annie Whitehouse, 21, a student at the University of Wyoming, were friends who had climbed Mount McKinley together. From Boulder, Colorado, came Vera Komarkova, 35, a high-altitude plant ecologist, whom we called Vera K. to distinguish her from Vera Watson. Our other members were Liz Klobusicky, 33, a professor from Spokane, and Alison Chadwick-Onyszkiewicz, 36, a British artist from Leeds. In 1975 Alison participated in the first ascent of Gasherbrum III, 26,090 feet, in Pakistan, thus climbing higher than any American woman.

Our group also included two filmmakers, Dyanna Taylor and Marie Ashton, and a base camp manager, Christy Tews. In Nepal we added a Nepalese liaison officer, five Sherpa high-altitude porters, a head Sherpa, a cook, two cook's assistants, four low-altitude porters, and two mail runners. To transport six tons of food, fuel, and gear 80 miles to our base camp, it was necessary to hire many other porters. We were a virtual army—13 memsahibs and nearly 250 Nepalese—moving through the countryside.

AUGUST 28 Base Camp: Up this morning to our first view of Annapurna. We are awe-struck. Our community of red and green tents perched on the edge of the moraine looks very small. We're at 14,200 feet. The summit is 12,300 feet above us: nearly two and a half vertical miles.

Near Base Camp is a memorial stone bearing the names of seven of the nine climbers who have lost their lives on Annapurna. Silently I pray that we do not add any names to this stone.

But I'm not thinking much about climbing, myself. As leader, administration and logistics are my major concerns. I'm thinking about whether we have enough rice, about whether boxes are packed securely.

Just made radio contact with Liz and Alison, who have established our first camp on the mountain, at 16,500 feet. Yay! They got there in four and a half hours, stopping to put in fixed lines [ropes anchored by pitons, ice screws, or other climbing hardware] in a couple of steep places. We can start carrying supplies up tomorrow.

I looked in Vera K. and Irene's tent today and was astounded. Vera has been collecting and pressing plants. The tent is full of plants, sheets of newspaper, and pressing apparatus. Where do they sleep?

Vera Watson has become enthralled with a puppy and feeds it half of her breakfast. The Sherpas call her "Mummy"—maybe because she sees that people are well fed too.

SEPTEMBER 2 We started toward Camp I about 8:30 a.m., carrying climbing hardware for the steep slopes farther up. We walked slowly, rhythmically, Irene, Vera K., and I, hearing only the scuff-scuff of our boots on the grassy slope. I carried 46 pounds, a bit much for me; I'm not fully acclimatized to the elevation. We got to Camp I about 2 p.m. Soon Vera, Annie, and Piro came down, having gotten almost to the planned site of Camp II at 18,500 feet before being stopped by crevasses.

SEPTEMBER 3 It snowed a lot last night. This morning Vera K., Irene, and I went up to decide on the site for Camp II. Above Camp I were parallel crevasses. We chopped steps in the ice to make the going safer. The glacier rose steeply. We cut over



EXPEDITION PHOTOGRAPHER UNKNOWN

Annapurna high, class of '78. All are likely to succeed—if anyone makes it—for the Himalayas demand absolute teamwork. The few moments at the summit come after weeks of climbing up with loads, down for more loads. For the climbers it equals ascending Annapurna nearly three times. Standing, from left: Margi Rusmore, Alison Chadwick-Onyszkiewicz, Christy Tews, Piro Kramar, Irene Miller, Joan Firey, Annie Whitehouse, Marie Ashton. Kneeling, from left: Dyanna Taylor, Vera Watson, Vera Komarkova, Liz Klobusicky, Arlene Blum.

to a rocky place and continued. The rock was pretty good, not too rotten. When we stopped for lunch, marzipan tasted really good to me, and turned out to be a favorite of the Sherpas as well.

Above the rock the route went up ice under six inches of snow. Irene broke trail carrying a heavy load and was weary at 18,500 feet. The polypropylene ropes we use for fixed lines were in 300-foot coils that snarled terribly. Three times I spent half an hour untangling rope spaghetti.

SEPTEMBER 13 We're finally getting to some of the hard climbing. And today's problem is that everyone wants to lead—to make the route. Most of the work of going up this mountain consists of carrying heavy loads day after day over the same terrain; I've gone from Base Camp to Camp I and Camp I to Camp II three times already. Though riskier, making the route is much more interesting to a climber.

I'd like to have climbing teams of four—two women and two Sherpas—on the difficult sections. Some of the women would rather we do all the lead climbing ourselves. I think it's important to include the Sherpas so that they feel part of the group.

SEPTEMBER 14 I started reading *The Thorn Birds* last night. Finished the whole thing—530 pages—about 3:30 a.m. Good escapism to be on the hot Australian plains for a few hours. All night I knocked snow off the tent. Closing my book, I heard a crash. Snow had collapsed the mess tent.

Today Margi and I tried to sack out. The sun heated the tent so that it seemed at least 110°F inside. All of a sudden clouds covered the sun, it started to snow again, and we finally fell asleep.

SEPTEMBER 15 Margi and I did a carry to Camp II. My pack was about 40 pounds, including 10 or 15 pounds of awkward

wands [bamboo sticks for marking the route]. Some places we walked on a knife blade of ice about four inches wide with gaping holes to either side. In one place a fall could have sent us spiraling a hundred feet down in a funnel of ice.

The people at Camp II got up early to study the route we will have to take up to 21,000 feet, where we will establish Camp III. We must climb a difficult rib—the



ALISON CHADWICK-DAYZRIEWICZ (ABOVE) AND IRENE MILLER (FACING PAGE)

Express descent from the Dutch Rib follows the giant icicle route (above). A mass of ice from this section fell on an equipment cache below, destroying it and exposing a fifty-foot chasm.

Going up the rib took much longer, and included a precarious traverse across its face (opposite).

Dutch Rib, as we're calling it, after a Dutch expedition that went this way in 1977. The Camp II people said it would be steep and dangerous. Avalanches come down the slope right before the rib. After crossing that slope, we'll have to climb about a thousand feet of ice and snow inclined at 50 to 60 degrees, then go along the narrow rib crest for nearly a mile. It looked hard. "Well, do you think we should try?" I asked.

They said, "Yes, there's no safer way."

The kerosene we ordered two weeks ago [to be brought to Base Camp by porters] still hasn't come. We have virtually none. I woke up realizing we did not send containers. The merchants probably don't have containers, and that's why we aren't getting kerosene. Amazing how at 4 a.m. the solution to yesterday's problem becomes obvious.

We noticed at Camp II that we're all losing weight. In particular, our bosoms are vanishing. As we move higher, my appetite decreases. Eating is a chore, and I frequently forget meals.

SEPTEMBER 19 It snowed all night. We got a radio report from Camp II that the new snow is 20 inches deep there, and they've been getting spray from avalanches since 4 a.m. Some of the climbers feel they should come down to Camp I, which the Sherpas say would be safer. Others are reluctant to come down because they feel the descent route is also threatened by avalanches. I recommended that they come down immediately. Descending, they would be exposed to avalanches for maybe half an hour; up there, they would be exposed continually.

Later: It's still snowing heavily. We must shovel every few minutes to keep the tents from collapsing. Everything inside is soggy. My camera is covered with water. What would NATIONAL GEOGRAPHIC say if they could see their equipment? The people at Camp II are finally coming down.

SEPTEMBER 20 It probably will be several days before we can climb safely. Everybody keeps talking about going to K. C.'s Pie Shop in Kathmandu.

When we dug out a collapsed tent, Mingma, one of the Sherpas, found a bottle of rum. He went through a hilarious pantomime: how he shoveled and dug and got a



big backache, and then how he found the rum and his backache was cured.

SEPTEMBER 25 Annie and I carried loads up to Camp IIIA, a temporary camp we are establishing on the Dutch Rib, six hundred feet below where Camp III will be. We walked on debris from an enormous avalanche that came down a chute to the left of the rib. I was worried because another avalanche could come at any time. I walked on, thinking fatalistically, "If I die, I die."

The first pitch [rope length] on the Dutch Rib, where Piro had been lead climber, was a 60- or 70-degree slope of ice. Very strenuous. Then it got easier, and I began to enjoy climbing this spectacular face. The view was magnificent. Finally we reached a point where we had to walk beneath huge dangling icicles. Then there was a traverse on steep ice. Annie had been the leader on this difficult section—really good work. Beyond that we went up a steep ramp and found ourselves in warm sunshine on the crest of the rib. What an exhilarating feeling! The face

of Annapurna was right across from us. Finally we slogged up the last few hundred feet to Camp IIIA.

Then down. The descent made me quite nervous. I had never used this descender [a friction device to slow downward progress]. When I put it on the rope, I got it wrong. Anxiety. Annie showed me how. Then it wasn't too bad—just a little scary peering down a thousand feet between my legs.

To avoid the traverse on ice, I took a shortcut, rappelling on a single rope. I wrapped the rope around my body, but still felt I was going too fast. I could see an overhang below. I held the rope with all my strength and went over the overhang, down through big icicles. I landed on a two-inch-wide ledge and crept along to a wider place to wait for Annie. Then Annie and I ran through the avalanche area back to camp.

SEPTEMBER 26 It's really getting scary. Yesterday morning when Vera Watson and Alison were going across the slope to the right of the Dutch Rib, they saw a big



FRANK MILLER

Bad snow and worse winds force a retreat. An all-night blizzard posed the threat; gusts whipping the tents before dawn confirmed it. Avalanches at higher altitudes were pushing blasts of wind down the mountain. Better to collapse the tents and descend in blinding snow than to stay and risk a falling wall of white oblivion.

avalanche coming and had to run to get out of the way. Last night I was awakened by a shaking of the tent and wind from an avalanche that lasted several minutes.

Still, I looked forward to getting to IIIA today. Better to do some climbing than to be hassling about loads and details on the radio. And it really is beautiful up there.

Approaching the ice face, I heard a yell: "Our cache is gone!" My heart sank. We had left a dozen pairs of crampons and all sorts of other valuable things there. Now there was a chasm about 50 feet wide and 50 feet deep, exposed when ice broke off and fell. The Sherpas found a hard hat, a foam sleeping pad, and some wands. Everything else had vanished beneath icy rubble.

Just then somebody called out, "Avalanche!" I didn't look. I just started running. The moving snow stopped just above us.

Half an hour after we got back to Camp II, Piro yelled: "Oh my God, look at that!" I looked out of the tent to see an incredibly large avalanche coming off a peak behind us. It got larger, and we suddenly realized it was going to cross the glacier and hit Camp I. A billowing cloud covered the camp. When it cleared, we saw specks getting up, moving erratically, like ants whose home had been stomped. Christy radioed that they were OK. The mass of the avalanche had stopped just short of the camp; its powerful wind had blown Dyanna twenty feet into a crevasse, but she was all right.

The magnitude and number of avalanches are incredible. I'm beginning to have severe doubts. I've never been on a mountain that's so unstable and avalanchy.

Above us on the rib Liz and Margi encountered a severe problem fixing lines. Crumbly ice made it difficult for them to anchor ropes as they worked their way up a 70-degree slope, depending on the front points of their crampons for footholds.

The next day Liz and Alison had to wade waist-deep in snow and dig through several feet to find ice that would hold anchors. Higher up they found the ice riddled with caverns and caves. Liz told me later: "It was one of the most dangerous pitches I've ever done. You'd climb a few feet and then sink into a hole almost back to your starting point." Liz got above the first caverns by hacking the ice until she reduced the holes

to platforms from which she could climb.

Then the caverns became even more frequent. "It was getting too dangerous," Liz said. She told Alison that she was going to rappel to a safer place. But to find solid ice she had to continue upward. On the crest she placed an ice screw, plus four stakes, then lowered herself. So one more piece of the route is fixed.

SEPTEMBER 28 With a 30-pound pack I started alone for Camp IIIA. I stopped before the avalanche zone to put on my crampons and climbing harness. These crampons didn't fit as well as the ones that were lost day before yesterday. Struggling with them, I looked at the avalanche-prone slopes and wondered, "Will stopping here half an hour save my life, or will it cost me my life, or will it make any difference?" Strange to realize I was about to take a simple half-mile walk that could be my last.

Still, I had to go. All the work, all the people who care—all these things led to the point where I needed to take a walk to Camp IIIA. It was my turn. I needed to go for myself as well as for the others. I had to carry loads to justify the food I was eating, the resources I was using. And so I went.

When I got back down to Camp II, the Sherpas announced they were quitting. They said the equipment was not good; the food was not good; the climbers were bad. I was tired and went into my tent and took off my boots, figuring they'd simmer down in a while. Such complaints are not unusual on expeditions.

Somebody came and told me the Sherpas were packing up and leaving. That sounded serious, so I went out. Vera Watson was saying to Ang, "You think we are bad people. Why do you think we are bad people?"

Wangel heard her and said, "You always call Sherpas bad. You call us bad always."

Vera said, "No, I never call you bad."

Ang said, "I've heard you."

It's hard for people who speak different languages to work together under trying circumstances.

It was snowing again. I said to the Sherpas: "It's bad for everybody if you leave. It will take us a long time to climb the mountain. You Sherpas cannot get a good recommendation if you desert us in a snowstorm."



Mountain mess hall finds Christy serving a favorite camp breakfast (top), hash-browns and bacon followed by strawberries. At Camp I, Liz shares a snack with Chewang (above), one of two Sherpas who reached the summit.

Plunging 6,000 feet, an avalanche sweeps past Camp II (above, right). Its leading edge roared toward Camp I. Winds flattened tents and sent the astonished film crew tumbling. This was the worst avalanche season in memory, sounding frequent yet unpredictable rumbles of dread.

They stomped off toward Base Camp, saying, "See you in Kathmandu."

After dinner Alison and I made a new logistics plan; we would climb the mountain ourselves, without Sherpas. A good feeling. We were indeed an all-women's expedition. Still, the Sherpas did increase the safety factor if anyone became frostbitten or was injured. Most expeditions employ them.

I went to bed not feeling worried, but awoke a couple of hours later. It was snowing heavily. I worried about Piro and Irene up at IIIA. They were safe up there, but to come down would be dangerous. If we had



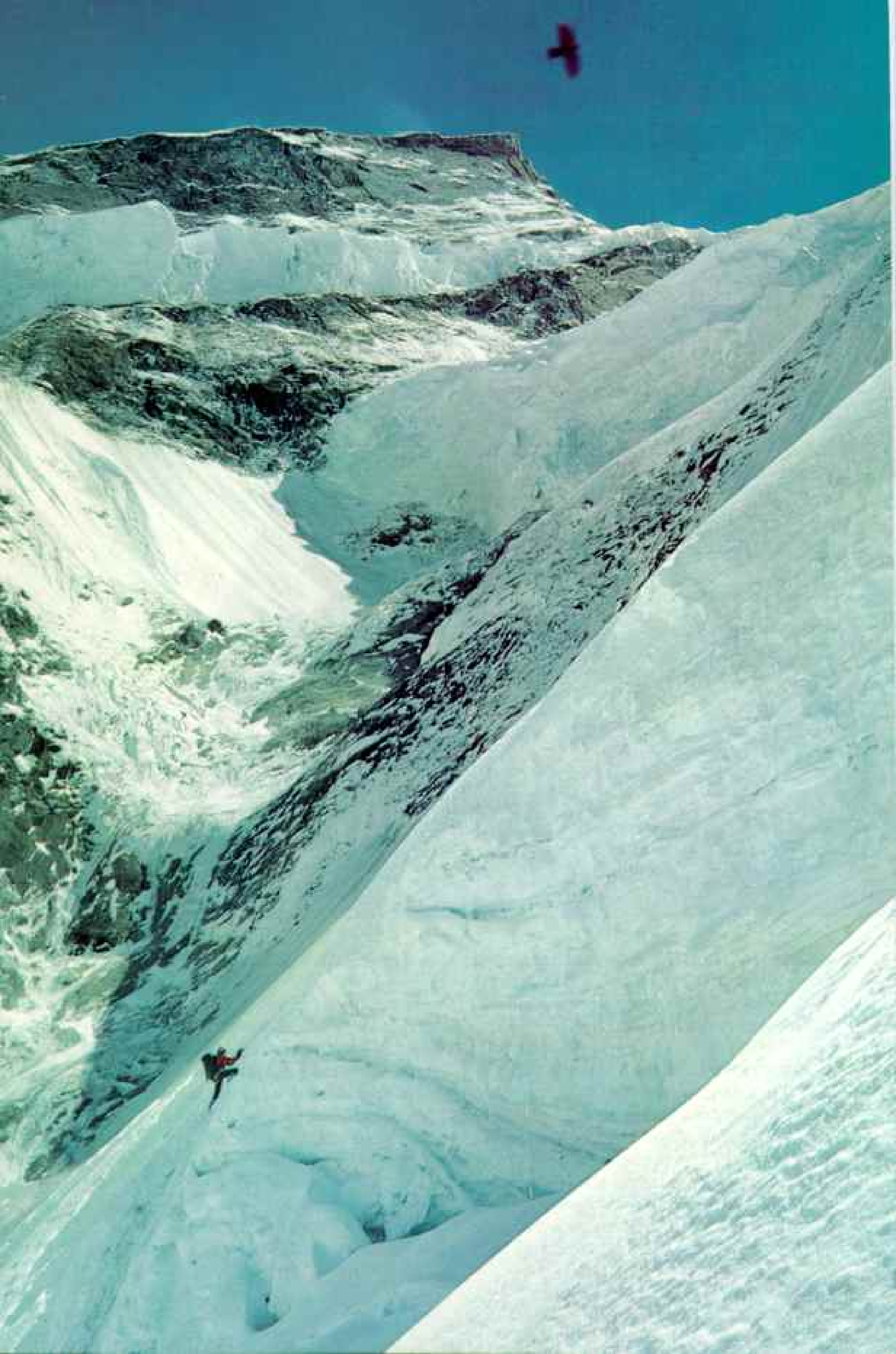
DRANNA TAYLOR (LOWER LEFT) AND ARLENE BLUM

to abandon Camp II, they would be far from help. Without the Sherpas I felt isolated in the snowstorm. The demons of the night became very intense.

SEPTEMBER 29 I went down to Base Camp to negotiate with the Sherpas. A different world: grass and flowers. I was given a list of demands, mostly for equipment. We didn't have it, but the Sherpas said they'd take money. We paid them about a hundred dollars each. The Sherpas were happy. I was not. It wasn't the money; we'd probably give them that much in tips. It was the idea

that they could desert us in a storm and still be rewarded.

As we began to eat dinner, the Sherpas came in and made elaborate speeches about working together for the common goal of climbing the mountain. I just said I was sorry there had been any misunderstanding. This went on for about 35 minutes. I got hungrier; dinner got colder. They kept saying, "Eat your dinner," but I didn't feel like eating in front of those watching eyes. Here I was on an all-women's expedition surrounded by men. Sometime I would like to do a real all-women's expedition,



perhaps with a less difficult objective.

At Camp IIIA, Irene and Piro are in good spirits but low on supplies. They had a Mounds bar for breakfast, an Almond Joy for lunch, and a Milky Way for dinner.

OCTOBER 2 Some porters brought supplies to Base Camp. We desperately need kerosene, milk, and sugar. The first porters brought 300 pounds of vegetables. The second lot brought milk, sugar, and three gallons of kerosene, enough for only four days. But they brought 150 lemons. So I guess we can have lots of cold lemonade.

OCTOBER 8 This morning Margi left for Camp III with trepidation. I commented to Irene that I wished she weren't going; people should have conviction or not climb. After taking a look at the menacing avalanche chute she would have to negotiate, Margi came back, saying she had forgotten her toothbrush. I didn't blame her.

The 6 p.m. radio transmission from Vera K. announced the establishment of Camp IV at 23,200 feet. We've had a lot of really hard climbing, but it's nearly over. A lot of people would have split by now, inventing excuses. We're not being heroic; many of us are afraid. But we're doing it.

OCTOBER 10 Joan arrived here at Camp III with a load from II—a long, hard carry. A few weeks ago she had pneumonia. An amazing recovery—and she just had her 50th birthday.

It's time to select teams for the summit. I'd like to give everyone a chance, but that's impossible. Some people must climb in support roles. It looks now like we'll try for the top in about four days, with Irene, Vera K., and Piro on the first team. Two days later we hope to send a second team, including Alison and Vera Watson.

Flocks of geese are flying over, heading south. It's good to see living things above this monotonous world of ice.

OCTOBER 13 I spent the night scrunched between Vera and Alison, but awoke looking forward to going to Camp IV. The slopes above III were steep ice. I had to kick my crampons into the ice while pulling myself up on the fixed lines. I felt insecure



ALISON CHADWICK-ORZEZEWICZ (FACING PAGE), MARIE BENTON (TOP), EXPEDITION PHOTOGRAPHER UNKNOWN (ABOVE)

"As difficult and more dangerous" is how Irene Miller (top), who reached the summit, compares the reality of Annapurna with the climbers' expectations. For difficulties, ascents up steep ice walls (facing page) ranked high. As if mocking the effort, a lone bird soars above. Climbers also had the company of migrating geese. Vera Komarkova (above) knew it was time to use oxygen in the final summit push when she muttered, "I can feel my brains going!"



BOTH BY MARIE ASHTON

Close companions on the expedition, Vera Watson (top, at left) and Alison Chadwick-Onyszkiewicz rest to share a quick snack and quiet conversation. Skillful, careful, and experienced climbers, they were roped together on their way toward the summit when they fell to their deaths.

Melancholy taps of hammer and chisel engrave the silence as the author (above) cuts the names of Vera and Alison into a memorial to those who have perished on Annapurna. The great success of the women's expedition ends in a great loss to a mountain that makes no distinctions.

unclipping from the lines and walking along the steep slope unroped.

It was blowing, just bitterly. Finally I got up to the second set of fixed lines and decided not to go farther. Irene and Piro came up, leaning against the wind. Irene told me she had left letters for her friends and family at Camp II in case she didn't come back. In two days they will be attempting the summit. I hope the wind relents.

As I descended, the snow was like marbles under my crampons. I dug my ax in and took two steps, then moved my ax. A very uncomfortable way to go downhill.

OCTOBER 14 Piro, Irene, Vera K., and three Sherpas, Mingma, Chewang, and Lakpa, went up to establish Camp V at 24,200 feet—our highest camp. The weather is perfect, though with heavy loads and little oxygen, climbing is hard work.

Last night I wore all my clothes in a heavy sleeping bag with another bag over me, two hats, and a scarf over my face. The water bottles between the two sleeping bags froze solid. It must have been 10°F inside the tent and 10 or 20 below outside.

OCTOBER 15 Our first team started for the summit today, but I couldn't follow their progress from Camp III. The only radio was taken by the second summit team, Vera Watson, Alison, and Wangel, who left for Camp IV. I decided to go down to Camp II, where I could hear news from the people at Camp I. They can see the summit.

Going down the crest of the Dutch Rib, I carried 30 pounds in a badly balanced rucksack. I tried not to look down the thousand-foot drop on either side. The crest was a foot wide and stretched interminably. Below it I suddenly found myself waist-deep in powder snow. I felt like crying. Finally I struggled out and stumbled on down to IIIA, where I sat down, caught my breath, and looked through some of the gear left there.

Then I switched on my tape recorder, which had Bach's *Brandenburg Concertos* on it, and began to feel better. I sat in the warm sun listening to Bach, looking through the gear, eating glucose, and nerving myself for the next stage of the descent.

Down below, the ropes were twisted. As I began descending through the icicles, the

tape in my rucksack ended with a loud *bzzz* a few inches from my ear. There was no way I could stop, take off my pack, and turn off the recorder. I went on with the *bzzz*.

I saw a black speck waiting above Camp II. I was within fifty feet of Christy when I stepped again into deep snow. I struggled out and yelled, "Did they make it?" She nodded her head.

I sat and cried, my tears a mixture of delight that our team had succeeded, relief that I had gotten through the avalanche zone for perhaps the last time, and exhaustion. We had climbed Annapurna. A woman's place *was* on top! Christy sobbed with me. Then she took my pack, which I usually don't let people do. I was grateful this time.

OCTOBER 16 The Sherpas came down, looking tired, Mingma very bedraggled. They'd worked hard to help us get to the summit. On one hand you can't say it was truly an all-women's effort, but on the other you can say most men employ Sherpas. We organized, financed, and carried out a major Himalayan climb—the first time American women have done this. We are the fifth expedition to reach the summit of Annapurna, the first Americans, the first women.

Another sound of an avalanche. That's the sound of Annapurna.

OCTOBER 18 Instead of being elated about the summit, I am beside myself with worry. Wangel got altitude sickness and descended to Base Camp. Continuing toward the summit, Vera Watson and Alison were seen yesterday a little below Camp V. They did not answer radio calls last night. There was no sign of movement this morning.

The people at Camp I have been scouring the slope with binoculars. If anyone came out of the tent, they would have seen her. Vera and Alison may be taking a rest day and the radio is broken. Or the radio is broken and they started climbing early and were out of sight before anybody looked. Or something happened. It is the third possibility that frightens me. I suggested just now that we should send some of the Sherpas up.

OCTOBER 20 The two Sherpas who went up to look for Alison and Vera sighted their bodies still roped together. Apparently one

of them slipped just below Camp V. They must not have been able to stop themselves, and fell 1,500 feet down a steep incline of snow and ice. It could happen to any climber, at any time. But *why* did it have to happen? I feel numb, and my thoughts go to their families. All that grief and pain—what mountain is worth it?

OCTOBER 23 Near Base Camp we stand in thick mist around the memorial stone. This morning we added Vera's and Alison's names to the seven already there. We chiseled their names so that they looked toward the summit of Annapurna—where Vera and Alison were always looking.

I gaze fondly at my companions of months of hard work. We are close—further united by the tragedy. Silently we add stones to the top of the memorial. Then we speak hesitantly of Vera and Alison, of what they meant to us, of what the mountain meant to them. The words do not come easily, for they bring us the certainty of truth: Alison and Vera will stay here with Annapurna in the abode of ice and snow.

I do not cry now. The night I realized they'd fallen, I cried all night. There seem to be no tears left.

I cannot help replaying events again and again. One foot placed a few inches differently, in a more secure place: no slip, no fall. A different world. Alison and Vera with us today. All of us rightfully triumphant after a successful climb.

Of course, we all decided to take the risk when we came here. But their families and friends made no such decision.

We sing the old Shaker hymn "Simple Gifts." *'Tis the gift to be simple, 'tis the gift to be free. . . .* And my voice breaks. Tears at last. Relief.

It has been a good year for women's climbing. Wanda Rutkiewicz reached the top of Everest. Brown University women climbed Devistan in India. Our climb has given several women the experience to organize expeditions; Vera K., Piro, and Annie already are making plans. Through the American Alpine Club, American Women's Himalayan Expeditions is setting up a memorial fund honoring Vera and Alison, which will support women's climbing. Women will continue to reach the top. * * *

On the Summit

By IRENE MILLER
with VERA KOMARKOVA

AT CAMP V, only 2,300 feet below the summit, we stir in our tents at 3 a.m. Up here it takes a long time to get ready. Just putting on boots is exhausting. I wear everything I have, seven layers: wool clothes, down jacket and pants, wind garments, felt-lined boots, insulated overboots, a wool hat inside my wool balaclava inside my



hood. Even so, I'm not too warm.

At six we laboriously strap on crampons. With mitts off Piro Kramar sees her right index finger peeking through a hole in her liner glove. The tip is white—frozen. Cursing, she dives into the tent to warm the finger against her body. Piro, who is an eye surgeon, makes a practical decision: "I'd

VERA KUMAROVA



rather lose the summit than my finger."

So there are four of us roped together and starting toward the summit just before 7 a.m.: Vera K. and I and two Sherpas, Mingma and Chewang. The sky is clear; there is almost no wind.

The first few hundred feet are steep. Then the slope eases somewhat. Our boots break through the snow crust. Desperately I want to rest. Wise Chewang encourages: "Go slow, no stop, success." I try to regulate the pace so that I breathe six times at each step. We have only a six-hour supply of oxygen and want to delay using it as long as possible.

But after three and a half hours we have slowed to a crawl. Time for oxygen. Now I am able to manage on four breaths a step.

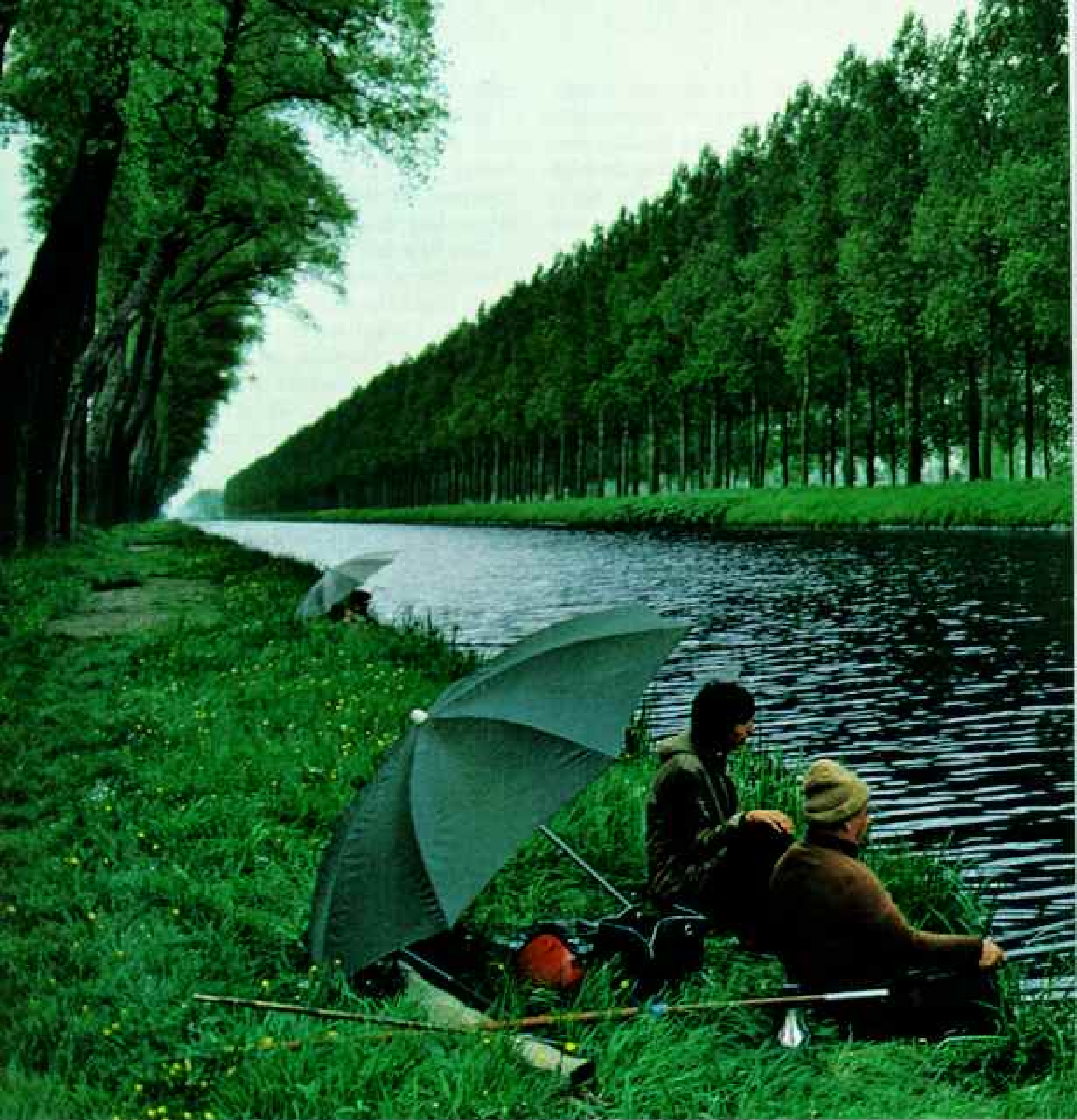
Higher. The familiar shapes that have towered over us for so many weeks alter and vanish. Only the crunch of crampons on snow and the hiss of oxygen apparatus break the silence. I think of family and friends. Their love is a steadying force, easing my way.

Below the summit pyramid we slog in snow more than knee-deep. Now Chewang is discouraged. "Maybe no success," he says. But soon the walking becomes easier. We grate across exposed rock, topping the corniced summit ridge. We are nearly there!

We ready our flags—Nepalese, American, and an expedition flag with our slogan, "A woman's place is on top." But where is the summit? We traverse west, past several small rises, finally finding the highest one. At 3:30 p.m. the flags are planted, and we congratulate each other. Vera, reflected in our sunglasses, takes the summit picture of me flanked by Chewang (far left) and Mingma.

The view is majestic. To the northwest the white pyramid of Dhaulagiri soars over lesser mountains that merge into the Tibetan plateau. To the south clouds swirl a thousand feet below us.

By now it is windy and cold. We are filled with deep feelings of camaraderie, of accomplishment, of gratitude to everyone who made our team's success possible. A full moon illuminates the final part of our descent. □



Cleft by a canal, the Belgian landscape mirrors a country historically bisected

BELGIUM

One Nation Divisible

By JAMES CERRUTI
SENIOR ASSISTANT EDITOR

Photographs by MARTIN ROGERS



by two divergent cultural and linguistic groups—the Flemings and the Walloons.

I ALWAYS THOUGHT Belgium was a nation inhabited by the Belgians. But, as the Belgians like to say of almost everything, "It's not so simple." Belgium is *not* inhabited by Belgians but by Flemings and Walloons, and it is more a broken marriage than a nation.

The Flemings live in Flanders, along the North Sea and on the northern plains, and speak Dutch. The Walloons live in Wallonia, on the southern plains and in the hills

of the Ardennes, and speak French. In a population of some 9,800,000, Flemings outnumber Walloons by about two million.

The Germanic Flemings and the Celtic-Latin Walloons were bound together, willy-nilly, 149 years ago, to form what they now decry as "an artificial state." It was a shotgun wedding sponsored by the great powers, chiefly England, which wanted a buffer nation at the heart of western Europe. Greatly agitated by the fact that they "don't even

NORTH SEA

NETHERLANDS



✕ Battle
DRAWN BY JANE WOLFE
COMPILED BY GUNNAR J. PUTTING
NATIONAL GEOGRAPHIC ART DIVISION



Belgium

AT HISTORY'S CROSSROADS, Belgium's vulnerable geography has suffered foreign intervention since Caesar pushed his conquest to the North Sea in 57 B.C. After centuries of tugging by France, Spain, and Austria and 15 years of Dutch rule, Belgium became an independent nation in 1830. The land where Napoleon met his Waterloo in 1815 also echoes with mournful names that figured in great modern battles: Bastogne, Ijzer (Yser), Ieper (Ypres). The dikes of politics may divide this water-laced land if Parliament passes a plan to set up two individually governed regions—Flanders and Wallonia—with Brussels as a semiautonomous third. A federal government would conduct foreign and fiscal affairs and control national defense.

GOVT.: Constitutional monarchy.
AREA: 30,521 sq km (11,784 sq mil).
POPULATION: 9,800,000; 60% Flemings of Germanic origin, 40% Walloons of Celtic-Latin origin. **RELIGION:** Roman Catholic.
ECONOMY: Iron and steel, chemicals, textiles, glass, cement, diamond cutting.
MAJOR CITIES: Brussels (1,050,000), capital; Antwerp (660,000); Liège (430,000); Gent, or Ghent (215,000). **CLIMATE:** Temperate; coast mild, humid; hotter summers, colder winters inland.
TOPOGRAPHY: Mostly flat, trisected by the Schelde and Meuse Rivers. In the Ardennes of the southeast the land becomes hilly and forested.

Nation of three tongues

Small-scale Babel, Belgium has a diversity of language dating to the third century A.D. when Franks swept Celts and Gauls into the south, making an early form of Dutch dominant in the north. The Constitution of 1971 confirmed four linguistic regions: Dutch-speaking Flanders in the north, French-speaking Wallonia in the south, with a small rim of German-speaking territory to the east; Brussels is a bilingual city with Dutch and French as official languages.

speak the same language," the Flemings and Walloons have never stopped bickering and are now in the process of a separation.

"It is like a very good divorce between a couple discussing as friends, and when it is over, there will be a friendship more than before," Mme Lily Boeykens told me. She is a leader of the Flemish wing of the woman's rights movement. Her opposite number, French-speaking feminist Mlle Nellie Wiener, in whose study we were chatting, capped this: "Yes, now each will be master in his own home. So a new start."

I was a little surprised that Mlle Wiener, as a feminist, hadn't phrased that: "Now each will be mistress in her own home. . . ." But I wasn't surprised that both ladies placed regional independence in a *family* perspective.

The Cherished Common Denominator

If there is any one quality that is truly Belgian, it is love of family. Flemings and Walloons may be only in-laws, but that is still family, and so their long conflict, though sometimes riotous, has never been bloody.

The family is the fulcrum of Belgian life. The family business, the family farm, even the family union allegiance continue a tradition that goes back to the medieval guilds. The family spirit can be excluding, or it can glow with humanity.

I saw a real glow in jovial begonia grower H. Everaert. After showing me through his greenhouses near Gent (Ghent), he pointed vigorously to three attractive brick buildings. "There lived my father. Here live I. And there lives the *son!*"

I was less intrigued by the family pride on the Antwerp docks. Port official Dr. Frans van Orshaegen told me, "We have here 12,000 dockers, and not a single foreign worker. The dockers think, to be a docker it is better to have a family connection."

And yet, Belgium has welcomed foreign workers. It counts almost 400,000—three times the number in the bigger Netherlands. Once admitted, foreign workers *are* forever "family," at least in the government's eyes. They can never be deported for economic reasons and are eligible for all of the country's phenomenal social-security benefits.

With 300,000 unemployed—a staggering 8 percent rate—Belgium stands by its family

obligations. Unemployed citizens and foreign workers alike draw 60 percent of their wages for at least a year. But this and other welfare benefits have put such a strain on resources that in 1979 the government anticipates a 2.5-billion-dollar deficit.

Setting the World Pace in Exports

Though the Belgian state has socialist welfare features, the Belgian economy is in the hands of private enterprise. The country exports half of its national production—almost entirely industrial—making it, on a per capita basis, the number one exporting country of the world. But this second most densely populated nation in Europe (after the Netherlands) also cherishes its farmland. Farmers, though only 3.5 percent of the work force, produce 85 percent of the nation's food, mostly on tiny family farms.

Standing cheek by jowl in their crowded land, Belgians must avoid stepping on toes, and so are especially courteous. I was in Brussels' La Bécasse café with Peter Esterhazy, a photographer who has lived in Belgium 15 years. We were drinking beer, the national beverage, and watching a very pretty barmaid as, with raincoat over arm, she shook hands with the bartender, then with three waiters, then with the proprietor.

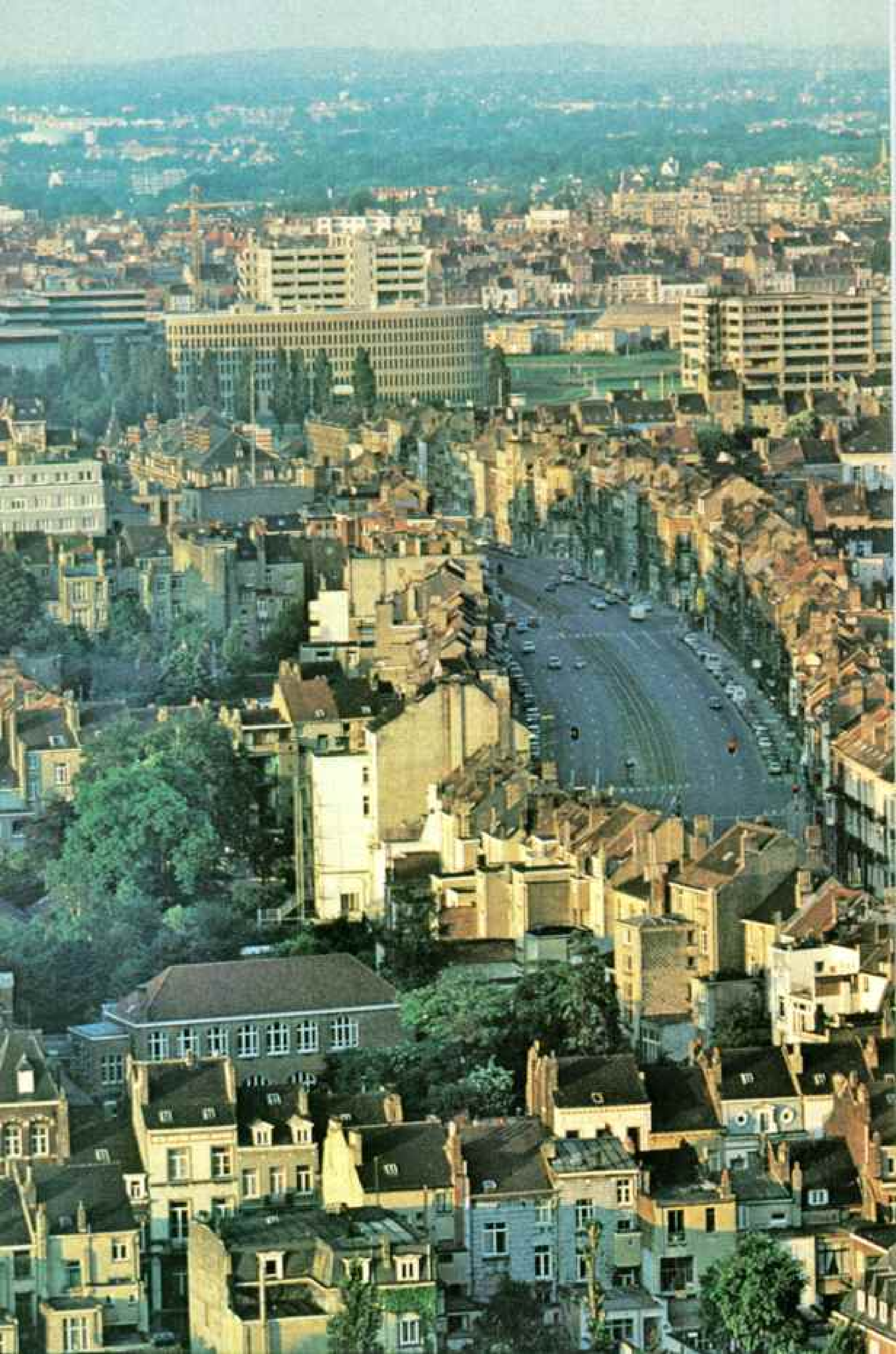
"Too bad," I said, thinking she was quitting. "The place won't be the same."

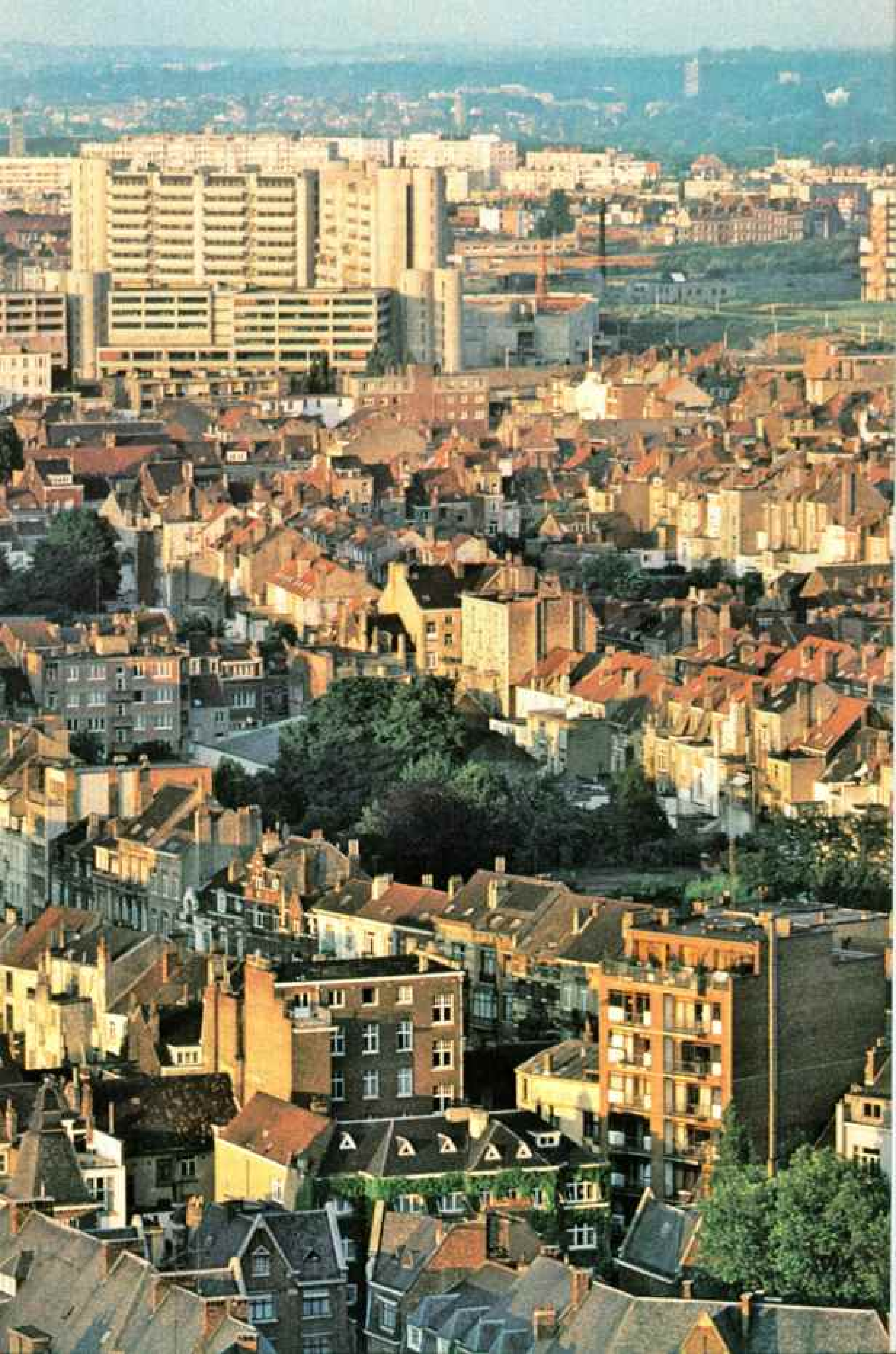
"Oh, no," said Peter. "She is only going off shift. Belgians are *always* shaking hands, especially coming on and off the job."

If the handshake is a national imperative, then so is the raincoat the young lady was carrying. The climate is temperate, but, my, how it rains in the spring. I asked a cabby, "When will it stop?" "Never." But surely the sun must shine some time? "Not at all."

Though this is an obvious exaggeration, here, I believe, is the answer to why, in such a small country, about the size of Maryland, the Belgians can't make common cause. The

Europe's headquarters, metropolitan Brussels (overleaf) lists 700 international organizations, including NATO and the Common Market. Foreigners make up 10 percent of the population. This suburban view looks toward the new campus of the Free University of Brussels.





weather makes them brood. For the past 149 years, the Flemings have been brooding so much about the Walloons, and vice versa, that, though Belgium is as renowned for engineering genius as for wet pavements, they have both neglected to invent rubbers. When they saw mine, both factions cried, "What a clever idea!"

I hope, after all that brooding, they will find regional autonomy a clever idea too. The root of dissension goes back to the first three decades of Belgium's independence, when the only official language was French. That meant Flemish children went to school in a foreign tongue. If a Fleming was taken to court, he could not "speak to the charges." If he sought a job in the government, ignorance of French disqualified him.

This was an ironic situation, for the



In ardent pursuit of the pleasures of the table, Belgians frequent the jumble of restaurants behind Brussels' Grand' Place (facing page). Their prey: irreproachable mussels redolent of garlic, silken slices of Ardennes ham, eels lovingly encased in aspic. A young boy (above) marches off with a *couque*—a rock-hard cookie indigenous to the town of Dinant.

Flemings had started out in the saddle. Their ancestors were the Franks, Germanic tribes to which Clovis and Charlemagne belonged. Beginning in the third century, the Franks overwhelmed the Celtic-Latins and pushed them southward, thus giving rise to the original language barrier, with the Germanic tongue superior.

What gave French the preference at the time of independence was that it had been the language of administration for some 450 years. From the 14th century on, the dukes of Burgundy, the Spanish, the Austrians, and Napoleon consecutively had ruled Belgium in French.

But the Flemings have now won full equality for their language. A "linguistic frontier" runs across the country; north of it Dutch is supreme; south, French. Brussels, an 80 percent French-speaking capital located in Flanders, is officially bilingual (map, page 316).

This was still not enough for the Flemings and Walloons. They put before Parliament an agreement called the Egmont Pact, which proposed that each group would elect its own government and control its own purse strings. Brussels would eventually become semiautonomous. The framework of a central government would be preserved, and of course also King Baudouin, symbolizing "national unity." After two years of haggling, the fate of the pact is in the hands of a new Parliament elected last December.

Where the "Irish" Speak French

The strange thing about the Flemings and Walloons is that they do not *look* like two distinct, irreconcilable peoples. Both tend to be dark haired and brown eyed, though Celtic or Teutonic blue eyes crop up. Their temperaments, however, are contrasting: Walloons volatile; Flemings earnest.

I saw my first Walloons in action in Malmédy, a French-speaking town reclaimed from Germany after World War I. A brass band of five pink-cheeked "boyos," one with flaming red hair, the others black haired and blue eyed, were marching across the town square. They looked fresh from County Cork, and in true Hibernian fashion marched right into the nearest pub.

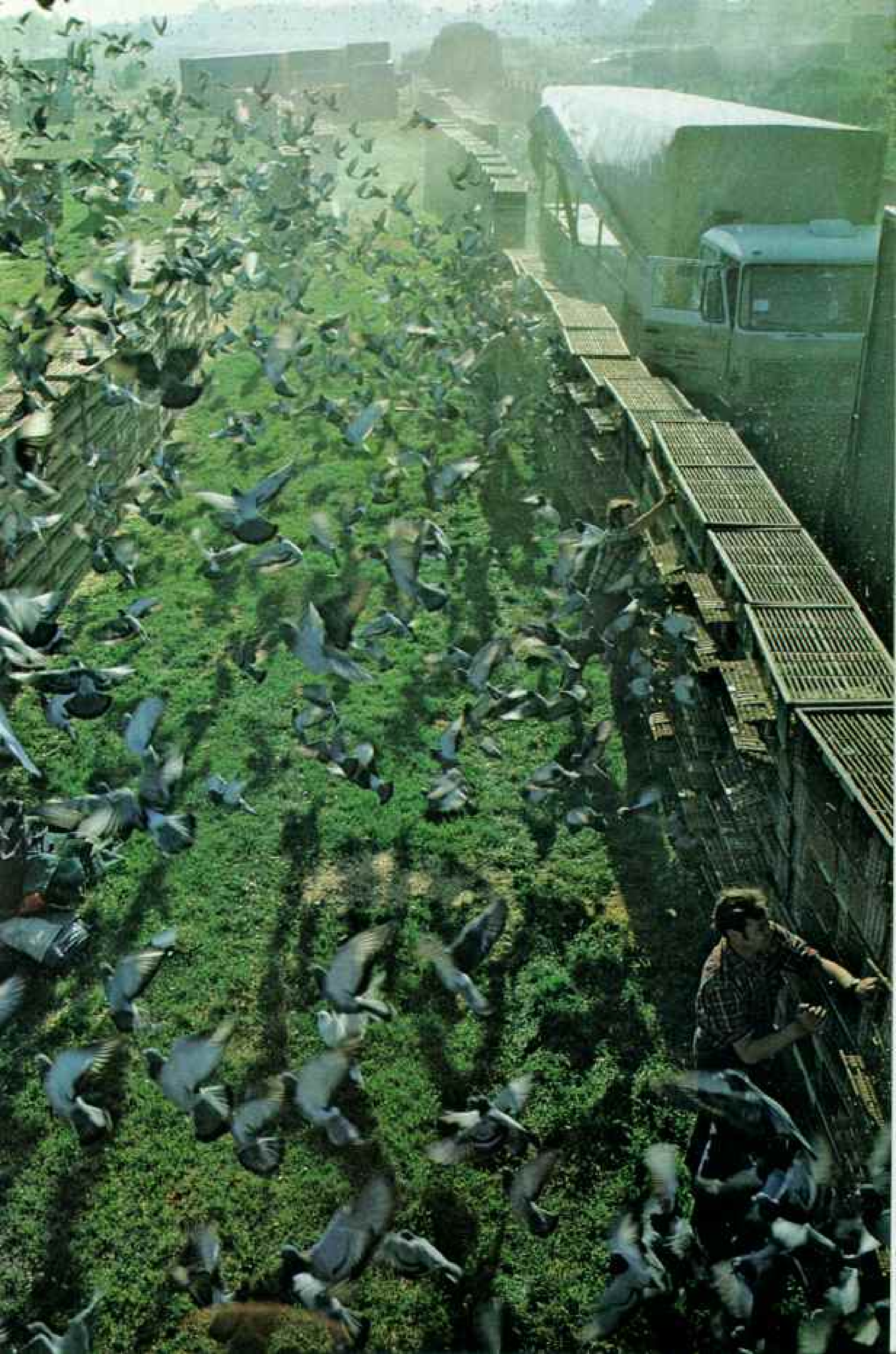
I followed them and was pasted against the wall by a (Continued on page 324)





A fine feathered frenzy of pigeons blurs the sky (right) at the start of a 45-mile race from Quiévrain northeast to Brussels, one of about 25,000 pigeon races held in the country each year. The passion for pigeons in Belgium counts 123,000 *colombophiles*, as fanciers are known, more than any other nation. Betting on the birds (above) may involve thousands of dollars. *Colombophiles* coddle their winged stock (left), with lofts ranging from a simple perch on a roof to a complete house equipped with central heating. Pigeons are trucked to the starting point and released. When a bird returns to its loft, a marked rubber ring is removed from its leg and dropped in a special clock which records the time. The route from release point to loft has been carefully calculated. Officials compute times and post results at the local "café colombophile," where winners and losers flock to quaff the heady local brew in celebration or commiseration.





terrific rendition of "When the Saints Go Marching In." I asked the leader, "What are you wild Irish boys doing here?" He laughed, "No, we are not Irish. We are Walloons from here in Malmédy, playing for our soccer team." Since I had spoken in English, the leader said, "Hey, English, listen, we play one for you," and he led the band into a majestic "Amazing Grace."

The Flemings are not so outgoing as these indomitable Celts, but they have a quiet

sense of fun, even when the joke is on themselves. Jules Waeysens, a retired Flemish schoolteacher in Gent, was explaining the Language Problem. "When I was in the army more than forty years ago, the sergeant gave all his orders in French—we didn't understand, but that was the army rule. He would always end with a bellow, 'And that goes for you Flemings too!'" A smile tweaked a corner of his mouth, but with characteristic Flemish earnestness, he

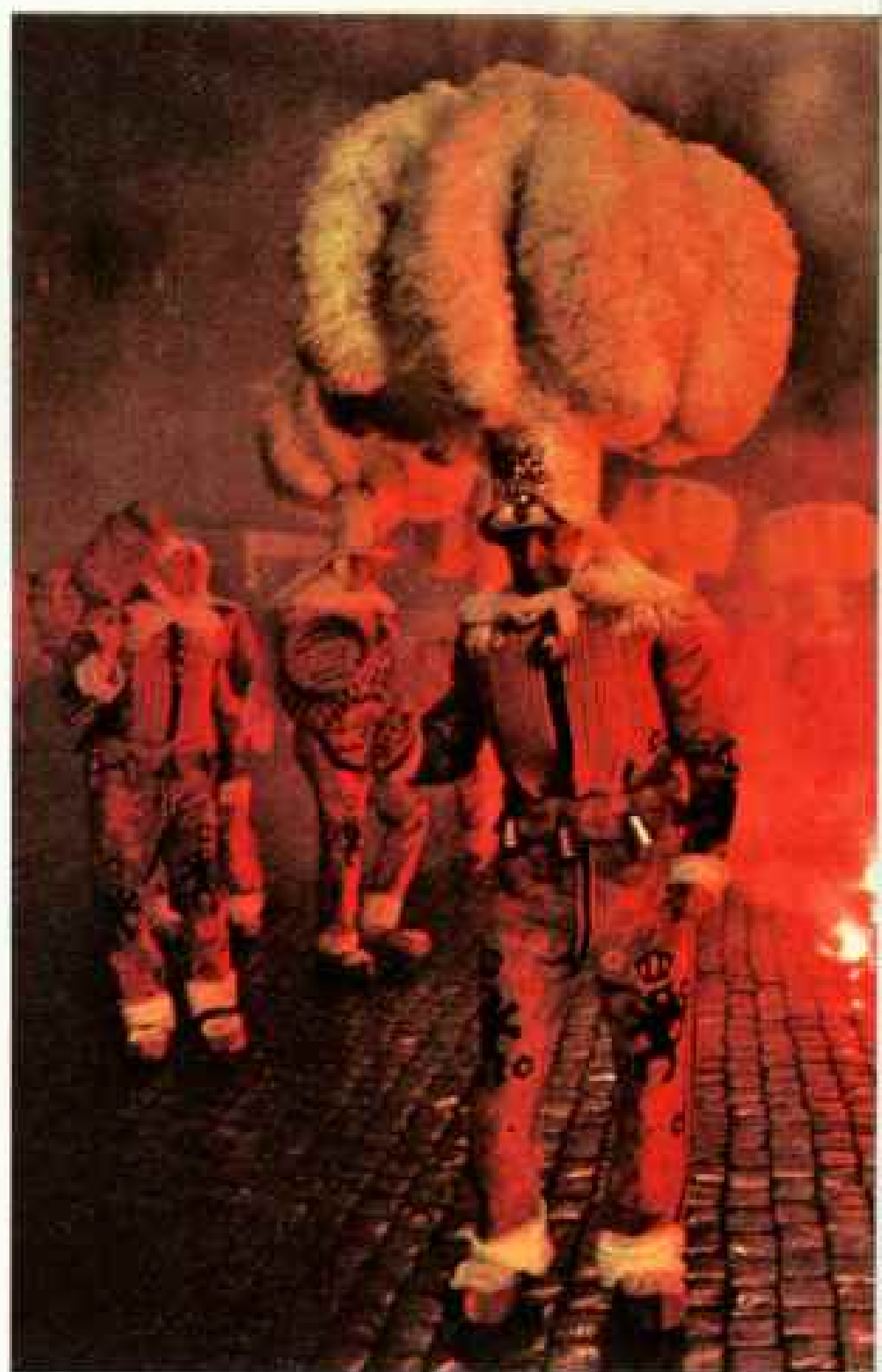


added, "Someone could get killed that way."

Armies don't arouse enthusiasm in Belgium. Too many generals have contended on the "battlefield of Europe," including Napoleon, who met his Waterloo there in 1815 and so set the scene for the first independent Belgium. After his fall, the Congress of Vienna handed Belgium over to the Dutch. For once Flemings and Walloons agreed: Both intensely Catholic, they resented being ruled by the Dutch Calvinist

William of Orange. They rose in 1830 and asked a German prince of Saxe-Coburg, favorite uncle of Victoria of England, to be their constitutional monarch.

As Leopold I, he proved a strong ruler and he produced a strong son, Leopold II, who succeeded in 1865, couldn't get the Belgians interested in expanding to Africa and so decided to do it himself. Using his own resources, he set up a personal fief and called it the Congo Free State. It made him rich,



Remembrance of kings' past fills the resplendent Grand' Place in Brussels each July with the Ommegang pageant and its re-creation of the court of Emperor Charles V (left). Costumed revelers (above) emulate the Gilles of Binche—a society of men who perform a Mardi Gras rite from the 14th century. This year Brussels celebrates its 1,000th anniversary.



The splendors of Belgium: Fine cut crystal like these goblets (left) comes from the Val St. Lambert factory outside Liège. Rough diamonds (below) will be transformed into brilliant gems in Antwerp, which handles 40 percent of the world's diamond cutting. Delicate as a spiderweb, Belgian lace (bottom), though declining as an industry, is resurging as a craft. Four schools in Brugge teach the art.



but even the Belgians charged him with exploitation and only reluctantly accepted annexation of the Congo in 1908.

In 1960 Belgium lost the Congo, which has become the independent Republic of Zaire.* Since only 2 percent of the national income came from the Congo, most Belgians were unmoved. But the big Belgian interests that operated the copper, cobalt, and uranium mines hung on, repeatedly under fire. This was literally so in May 1978, when rebels invading from Angola tried to take Zaire's ore-rich Shaba Province, and Belgium and France sent in paratroopers to evacuate terrorized white families. With exemplary Belgian caution, one refugee group refused to come out of hiding till they heard Belgian paratroopers talking in *Flemish*.

Flanders Artists Showed the Way

The wealth of the Congo is proving a will-o'-the-wisp, but one Belgian treasure stands against time: the great legacy of art. In Gent's Sint Baafskathedraal, the loveliest church in Belgium, I found a world-famous altarpiece, a huge polyptych painted on 12 wooden panels by the brothers Hubert and Jan van Eyck. Completed in 1432, this "Adoration of the Mystic Lamb" is based on "The Revelation of St. John the Divine." But it shuns his apocalyptic menace; its serene message seems to be: All's well in Heaven and on earth.

The work contains no fewer than 248 figures, and the infinite detail with which each is executed (down to the peacock "eyes" in an angel's wings) is one of its wonders. The other is its luminosity: The van Eycks developed a formula for mixing oil, pigments, and possibly egg for maximum brilliance. They showed the way to oil painters of the Italian and German Renaissance, and in combining art with engineering genius, they stand as quintessential Belgians (pages 338-9).

Outside the cathedral I met my school-teacher friend, Jules Waeytens, and we repaired for lunch to Gent's Raadskelder, where Mr. Waeytens assured me, "You will have the greatest *waterzooi* you have ever experienced." This intriguing dish turned out to be chunks of chicken and boiled potatoes in a thick broth. The serving, in true

*See "Yesterday's Congo, Today's Zaire" by John J. Putman, NATIONAL GEOGRAPHIC, March 1973.

Belgian style, was twice as much as any glutton could consume.

Only a few upper-crust restaurants follow the hallowed gourmet tradition of serving half as much for twice the price. But for an American carrying weak dollars, twice the price is a high price indeed. In the past eight years the dollar's value in Belgian francs has declined by about 40 percent.

Mr. Waeytens, a small, spare man, daintily demolished his waterzooi while explaining Gent's latest problem. (Belgians enjoy problems.) It seems that without a single person moving in, Gent had, at that time, become "overpopulated," in his view. "I used to live in a suburb," he said. "Now I live in Gent." By recent law Belgium's former 2,359 communes are being reduced to 589. As a result of absorbing suburbs, Gent now has acquired more inhabitants. The change has unemployed a lot of burgomasters and infuriated the small communes. They used to govern themselves; now the big towns can tell them to do what's good for the big towns.

For a contrast Mr. Waeytens suggested a look at something that had *not* changed, Gent's Groot Begijnhof. "Not changed, but changing fast. I think in ten years it will be finished," he said Flemishly.

The first *begijnhof* goes back to the late 12th century, a self-contained miniature village where widowed and unmarried ladies—though not nuns—could lead a religious life together. Belgium has almost all

the 35 or so *begijnhoven* left in Europe. The Groot Begijnhof, the last one lived in by genuine *begijnen*, now has only 25, and the newest sister came thirty years ago.

As the ranks thin and the *begijnen* grow old, their cherished traditions erode. At the *begijnhof* the intricately beautiful white wimples that were the time-honored *begijn* headgear have fallen by the wayside. Grande Dame Josepha Goethals, who heads the *begijnhof*, told me, "We used to save up our soiled wimples for six months. We would trample them clean with our bare feet and lay them on the grass in the sun. Then starch, then iron. But we are too old now for such trouble. Today we just wear black veils."

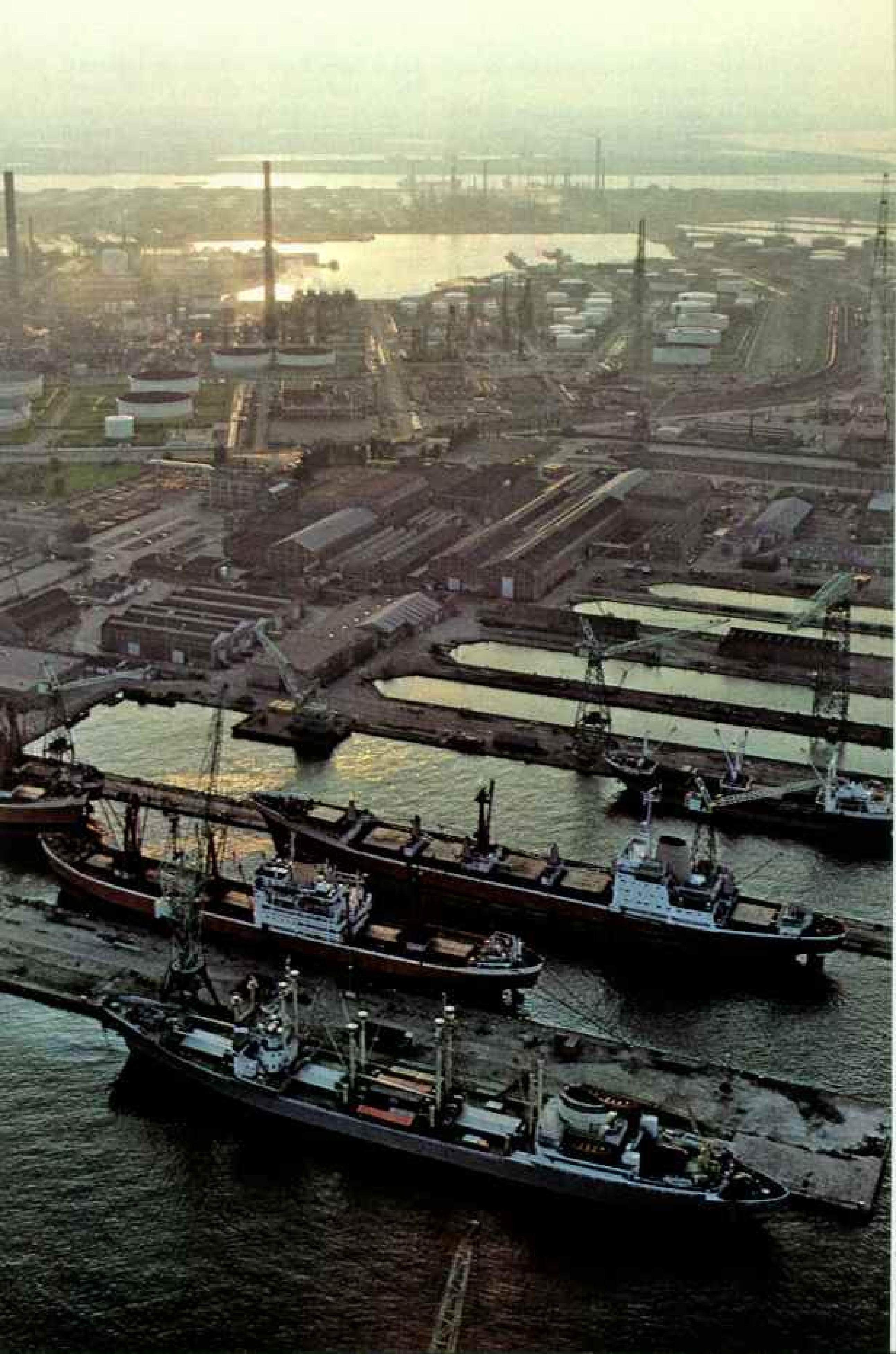
Quest for the Ideal Way of Life

I left believing the *begijnhof* was a thing of the past, but a visit to the 13th-century *begijnhof* at Brugge inclined me to think it might be a wave of the future. Brugge's is the only *begijnhof* inhabited by *nuns*, and there at the door of her little white brick cottage was youthful Mother Prioress Felicitas, wearing the *begijn*'s white wimple and a felicitous smile. "We wear the white wimple on Sundays and feast days," she said. "But the rest of the time we wear black veils."

Mother Felicitas said: "The primary ideal of the 12th century, which led to the *begijnhoven*, is coming back—living like the first Christians, sharing everything. Look at the communes. Look at the ecumenical retreats—we too invite people of other faiths to



Antwerp bustles with trade (right) and preens with the prestige of being fifth largest port in the world. Europe's richest center of commerce in the 16th century today sprawls over nearly 27,000 acres. Though a flagging steel industry and an unemployment rate of 8 percent hamper the economy, the country is a leader in export expertise; Antwerp claims the fastest turnaround time of any port in the world. Liège's Fabrique Nationale Herstal (left), supermarket of the weapons business, produces an armamentarium of war ranging from submachine guns to jet engines.



stay here for a while to contemplate in our peaceful environment."

There is much to contemplate in old Brugge (Bruges to Walloons). First, its beauty, since its Gothic elegance has been preserved almost exactly as it was when old Brugge was one of Europe's richest port cities. A nine-mile-long estuary called the Zwin joined medieval Brugge to the sea. It silted up, and the city fathers couldn't raise the money for a canal. Traders switched their business to Antwerp, and by the end of the 15th century Brugge fell asleep.

From Backwater to Booming Port

It did not wake till 1907, when the canal to the sea was finally built. Today the port of Brugge-Zeebrugge is Belgium's third largest, after Antwerp and Gent. Indeed, the port may pass these rivals if, according to current plans, it becomes Belgium's depot for liquefied Algerian gas.

But Antwerp, the world's fifth largest port, has a big head start. It is not just a port,

it is a big village—actually an industrial city, sprawling over almost 27,000 acres, where world-famous manufacturers, such as Bayer, Solvay, General Motors, instead of sending their products to the port, have sent their factories. What has drawn them here is Belgian efficiency; Antwerp has the fastest turnaround of any port in the world.

Added to all this, Antwerp has diamonds; in fact, as P. N. Ferstenberg told me like a good Belgian, "It is the diamond capital of the world." What about Amsterdam? "No, no, we became first when they declined after World War II. Now, in the whole world, we have 40 percent of the manufacturing, 60 percent of the diamond dealing."*

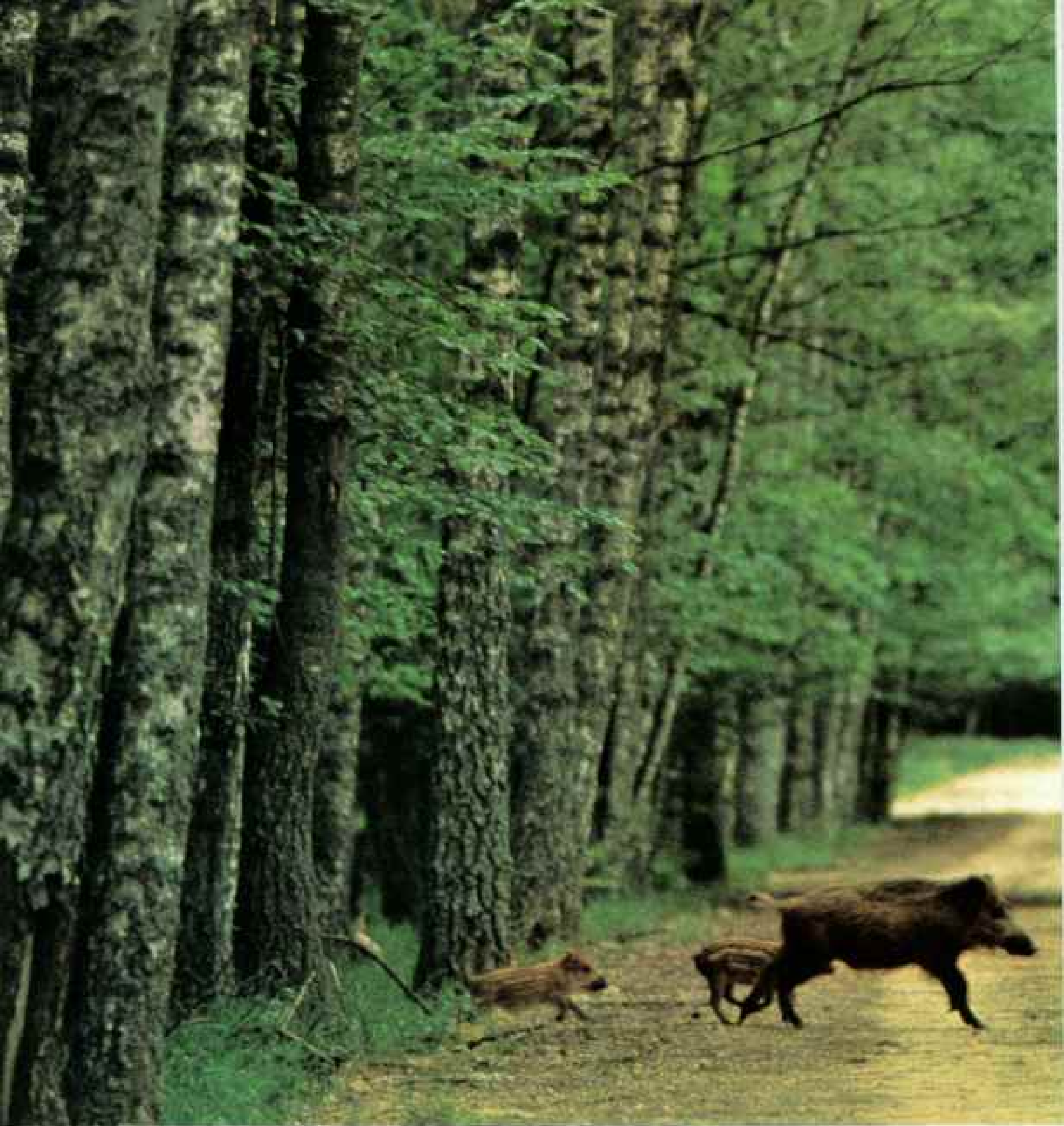
It's easy to see why Mr. Ferstenberg is "Dean of the Diamond Industry." This is an actual title bestowed on him by the Belgian Government, the diamond industry, and the diamond workers, for all of whom he mediates. Though he is obviously friends

*See "The Incredible Crystal: Diamonds," by Fred Ward, in the January 1979 NATIONAL GEOGRAPHIC.



Net profits and a delicacy as well, the tiny pearl-gray shrimp of the Belgian coast are here dredged from the sea by huge horse-drawn nets (above) in the traditional method celebrated at the shrimp festival in Oostduinkerke. The crustaceans end up basketed and borne on horses' flanks (right) to a boiling pot of water.





with everybody, Mr. Ferstenberg is not one to take chances. As he showed me out, he extracted a large automatic pistol from his baggy pants pocket and let me have a look. "With diamonds," he said, "you cannot be too careful."

Guns and Tanks, Crosses and Poppies

Caution is a Belgian axiom, but it doesn't seem to work against incautious neighbors. Neighbor Germany is remembered bitterly in Flanders for World War I and in Wallonia

for World War II. As I drove toward the Flemish city of Ieper, past the old military cemeteries, I recalled John McCrae's lines:

*In Flanders fields the poppies blow
Between the crosses, row on row. . . .*

They memorialized the valiant, but costly, stand the Belgians and British made to deny the small Ieper (or Ypres or "Wipers") salient to the Germans all through World War I.

In World War II, Wallonia bore the brunt of Hitler's final offensive in the winter of



1944. In a last-gasp effort to win, he hurled his tanks against Bastogne in the Ardennes, hoping to break through and take Antwerp, the Allies' chief port. In this Battle of the Bulge, the Germans surrounded Bastogne and demanded surrender. The American commander, Brig. Gen. Anthony McAuliffe, replied, in one immortal word, "Nuts!" The Germans lost, and Bastogne's citizens renamed the town square Place McAuliffe.

In further gratitude, the Belgian nation has erected a massive monument just

Road hogs for an instant, wild boars sprint across a wooded lane in the Ardennes. Domestically bred, they are released and hunted, and the youngest served up as tender *marcassin*. This region, the legendary magic forest where St. Hubert spotted a stag bearing a lighted cross between its antlers in A.D. 683, bore the scorching flame of the last big German offensive of World War II, in December 1944 at Bastogne.



A man's home is his hassle, particularly the Château de Belœil with 240 windows to wash and 6½ miles of hedges to clip. Owner Prince Antoine de Ligne (above, right) helps cover the cost by opening the premises to the public for a fee.

outside Bastogne. At its center, a stone slab bears a moving inscription in Latin: "To The American Liberators. The Belgian People Remember."

Today the Ardennes are the most peaceful, most beautiful part of Belgium. Though the highest point is only 2,277 feet, these hills *feel* like mountains. Intricately convoluted, they hide away almost Alpine little valleys, like the incomparable Semois, clamorous with icy rushing streams.

The Belgian Ardennes are a Walloon fastness, and I never would have known their true inwardness without Baudouin Poncelet, a Walloon living in Brussels. "There have been Poncelets in the Ardennes for four hundred and fifty years," he said, and he and his young wife, Grite, volunteered to take my wife and me exploring in the Ardennes in their four-wheel drive. "And then, of course, you will stay over with the family in their country place there."

On hidden roads, in the midst of a snowstorm, we tracked down the wild boars, deer, and roebuck. One wild boar, big as a small bear, approached us, grinding his six-inch lower tusks against his shorter upper tusks to keep them from getting too long.

"He is getting ready to dig in a potato field," Baudouin said. "After the boars come, it looks like a battlefield. But the deer do worse. They eat the shoots of the young pines grown for lumber. It is always a struggle here between the gamekeepers and the foresters, and the farmers and the hunters."

At the senior Poncelets' baronial country place on an Ardennes crest, Mrs. Henri Poncelet served us an all-game feast, featuring roast roebuck with a chestnut gravy. Henri Poncelet, relaxing through dinner in what appeared to be old U. S. Army fatigues, said that he ran a very prosperous printing firm in Liège. But what he seemed to be proudest of was a yellowed paper he showed me. It stated that he had served commendably as a volunteer in the U. S. Army during the final offensive against Germany. "I had the honor to be shouted at by Eisenhower," he said.

Armaments Industry Still Booms

A group of Henri Poncelet's near neighbors also tried to help the Americans—during the Revolution in 1778. They were Benedictine monks who established the Fourneau St. Michel and engaged to furnish armaments to the Continental Army. They

got no commendation. Their cannons blew up in action, and so did their business.

Despite this notorious exception, Walloons have been noted armament makers since the Middle Ages. Fabrique Nationale (a private company) has its main plant at Herstal, near Liège (page 328). One of the few Walloon industries still booming, FN began in 1889 with German inventor Paul Mauser's repeating rifle. Then in 1897 it took a big leap forward as the first manufacturer of the automatic pocket pistol, invented by John Moses Browning of Utah.

The firm, which sells to more than a hundred countries, not only produces machine guns and jet engines and golf clubs, but will also make to order one double-barreled shotgun with a walnut stock and hand-engraved steel plates—for \$10,000 and up.

With all the steel that goes into this thriving business, I expected to find the steel industry robust. Average wages still run around 100 dollars a day, but production is down 30 percent since 1974. At Seraing, a Liège suburb, I talked with Willy de Laminne, a director of S. A. Cockerill, founded by an Englishman in 1817 and now Belgium's largest steel producer. A very gentle white-haired gentleman, Mr. de Laminne said sadly, "The steel industry is sick all over Europe and sick in the United States too, but in Belgium, because of our heavy dependence on exports, it is the worst."

The most worrisome competitor is Japan. Its low prices have hurt all Common Market steel exporters, but Belgium gets hit hardest. Former best customers like France and Germany don't want Belgian steel when they can't find markets for their own. "It's still a business for today," Mr. de Laminne said. But many wonder about tomorrow.

The question of tomorrow has been settled for Wallonia's coal miners: no more mining. The S. A. Charbonnages Réunis de Roton, in business since 1801, is now one of only three Walloon coal-mining companies still operating. At one of its pits near Charleroi, engineer J. A. Jouniaux told me, "The economically worthwhile seams are being mined out. By the end of 1981, no more deep mines in south Belgium. The three companies here are closing at least one pit a year."

Flanders still produces coal from fresher mines in Kempenland—about eight times

Wallonia's output. "But even there they have only maybe twenty years of mining left—then good-bye to Belgian coal."

Closing just one of the Roton pits will throw 1,200 miners out of work, and they will be hard put to find jobs that pay as well. "The most skilled get 90 dollars a day—highest in Europe," Mr. Jouniaux said. "Another reason the mines are being closed—we can't afford to open low-yield seams."

Textile workers, another high-pay group (as much as 63 dollars a day), are down from 100,000 five years ago to under 80,000. Production has been cut to 65 percent of capacity because Belgium cannot compete with low-wage Asian countries. One good, and rich, customer stands by, however. The Near East countries famous for Oriental rugs continue to purchase Belgian "Orientals." To Iran alone Belgium annually exports almost 20 million dollars' worth of magic carpets to be sold to tourists—as, I presume, finest Belgian imitations.

Working Through the Looking Glass

The oil-rich sheikhs themselves are buying Belgian tapestries. Once they could have bought the famous tapestries of Arras, Tournai, and Brussels, but now only two Belgian tapestry manufacturers remain, both in Mechelen. At Braquenie's Manufacture Royale de Tapisseries, the director, Myriam Toussaint, said, "We are just starting two tapestries for Arab clients. The bigger tapestry will be 18 feet long and 12 wide. With our 12 weavers it will take 28 months. We are going crazy. Both tapestries are maps and full of Arab characters we don't understand. We are always looking in our mirrors and pulling out threads." Tape-stries are woven from the back to facilitate tying off the threads; to see whether the design is going right, the weavers must slide mirrors through the warp.

Because of all the French names in a business situated in a Flemish town, I asked whether this had been one of the many Walloon industries that had moved north. "No, we moved out of *France* in 1848. Two Belgian brothers founded the Aubusson factory there; then one came here."

The move of industry from Wallonia is plain economics. To cut shipping costs, big industries wanted to be nearer the great

seaports, all in Flanders. Wallonia must find new enterprises or modernize the old.

Prince Antoine de Ligne is trying to make a going concern of one of the oldest—the castle business. His Château de Belœil, originally built in the 16th century, is the largest of Belgium's thirty or so privately owned castles open to the public. It is known as the Belgian Versailles (page 334). The prince lives in what used to be the coach house, with his wife, sister of the Grand Duke of Luxembourg, and their children. The rest of the castle is open to the public for a fee.

The prince is past president of the European Historic Houses Association, but the castle business isn't one he can recommend. "I am by birth a lifetime caretaker," he said. "This is a national monument, but the state gives no help with everyday maintenance—I have 240 windows to be washed; I must pay eight gardeners. Every penny I earn is going down into this place. Then when I die, my son may have to sell part of it to pay death duties."

Diplomacy Is Big Business in Brussels

Despite the problems in the hinterlands, Brussels appears vibrant with prosperity and relishes its role as "capital of Europe." The Common Market, NATO, and Benelux are headquartered there, and because some countries send three ambassadors—to king, Common Market, and NATO—180 ambassadors and 2,290 deputies glut Brussels' already formidable bureaucracy.

At present it is only a symbolic capital of Europe, but it could become a real one.

Can a country that might separate into independent regions and has traditionally functioned by coalition government act as a lodestone for a United Europe? Why not? Belgium's former Prime Minister Leo Tindemans, forced to resign last fall when his coalition government split over the Egmont Pact, was author of the Common Market report in 1976 recommending the political union of Europe. "A good choice," said Common Market spokesman Martin Vasey.

"Smaller countries like Belgium want a European community that works and has a say in world affairs. France and Germany prefer to be independent."

The cosmopolitan facade that Brussels' internationalism has created—the severe skyscrapers, the expensive restaurants (poached egg on hop shoots, \$12.50)—is not typically Belgian. But I fell hard for old Brussels, and the genuine people who still inhabit it.

Retaining the Charm of the Past

The noble Grand' Place, with its gilded, 17th-century Flemish gables (pages 324-5), seems just right on Sundays when the cloth-capped, rugged-looking bird vendors move in with their songsters and racing pigeons. On weekends more sophisticated hucksters set up an antique market under striped awnings in the Place du Grand Sablon. But for the most authentic junk, the flea market, a few blocks away, takes all prizes.

Studying the people in the markets, with their beautiful plain faces, I saw where the great 16th-century Flemish painter Pieter Bruegel the Elder must have found some of his models. He lived the last six years of his life in Brussels, still painting his great landscapes with figures and his scenes of peasant merriment. He died there in 1569.

I found his house in a crowded street of shops. A plaque had been placed on it in 1924, "in homage of the people to their grand painter," but 55 years later the house is still in private hands—not open to the people.

How much better Peter Paul Rubens, another famed Belgian painter, has fared. His palatial home in Antwerp is a museum. But Rubens was not just a painter; he was rich and famous, a diplomat. And instead of those little figures Bruegel painted, Peter Paul painted as he lived: BIG—monumentally muscled men and obese women. He had size and success; so to most Belgians he, not Bruegel, is the national painter.

In Brussels' great Museum of Ancient Art, Bruegel

(Continued on page 340)

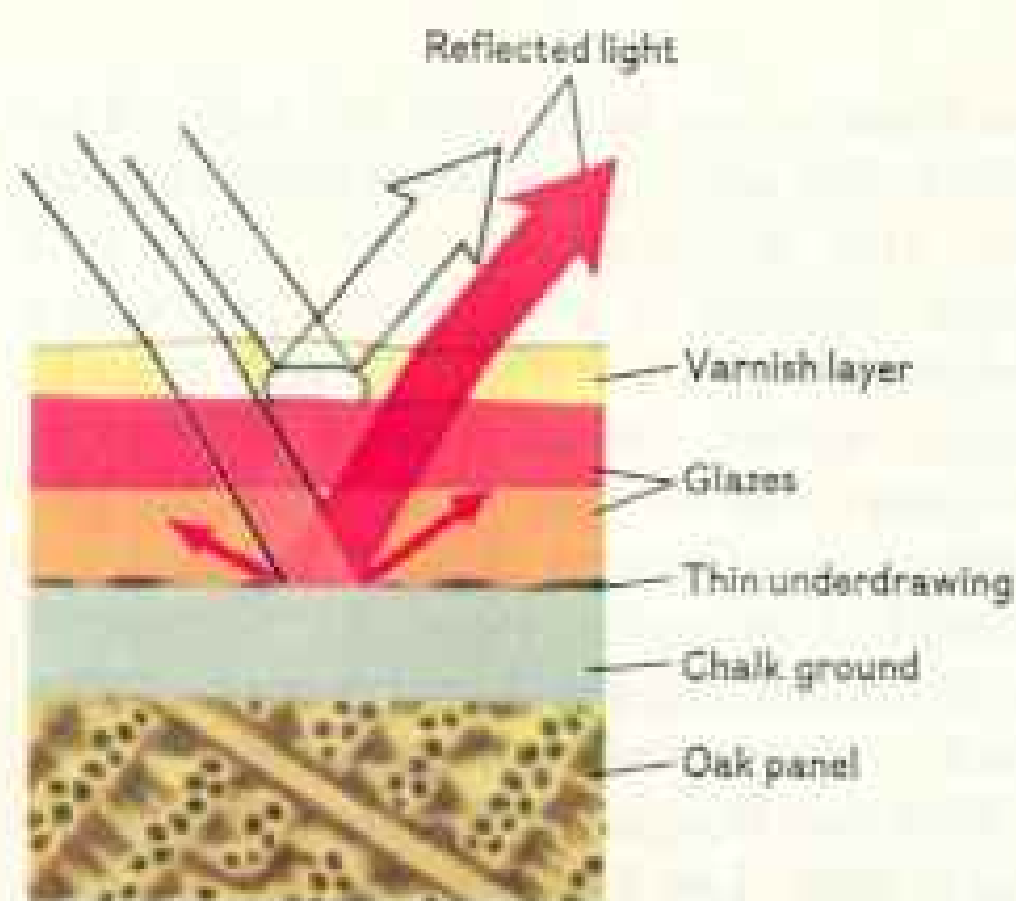
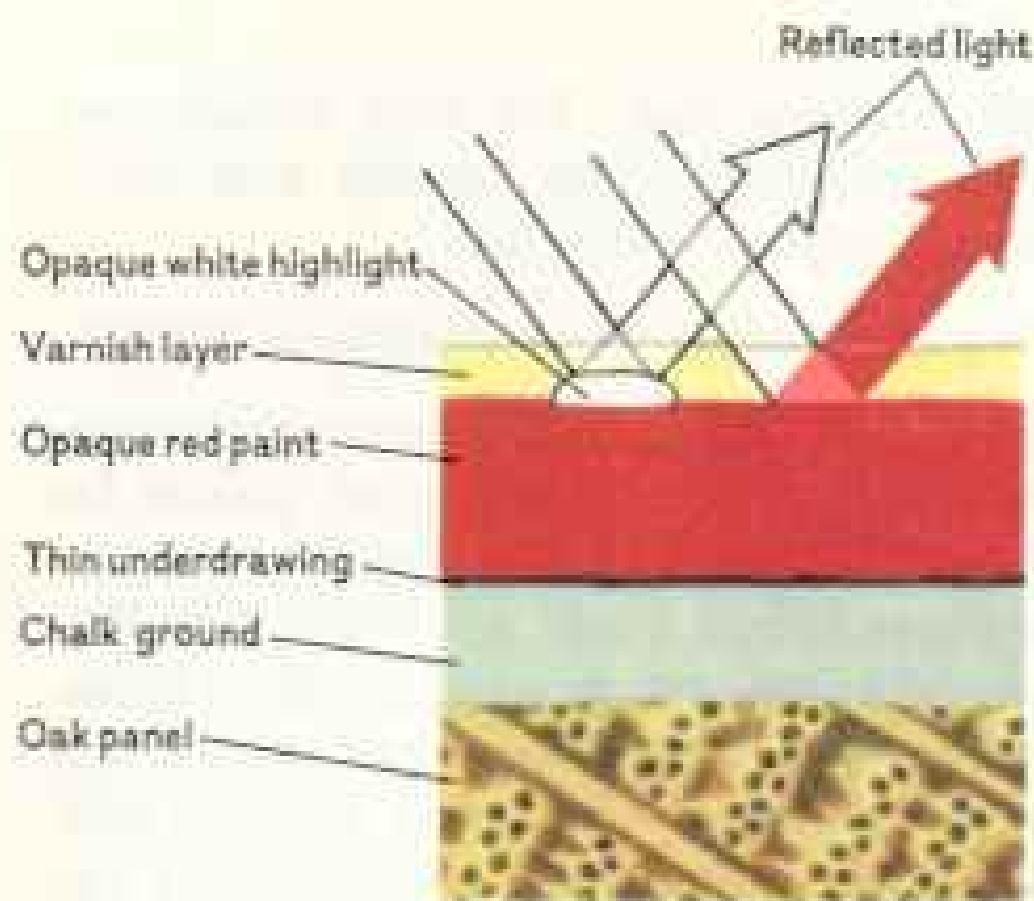
Monuments to war's sorrow, the graves at Ieper in Flanders fields mark the grim World War I years 1914-18, when recurring offensives reduced the town to ruin and left half a million dead. "It was no longer life at all," wrote German Gen. Erich Ludendorff. "It was mere unspeakable suffering."

A SOLDIER
OF THE GREAT WAR





THE MARRIAGE OF GIOVANNI ARVOLFINI AND GIOVANNA ZENANI, BY JAN VAN EYCK, COURTESY FRUITTES, THE NATIONAL GALLERY, LONDON



How the Flemings brought depth to painting

MAGICIANS OF THE BRUSH, 15th-century Flemish artists like Jan van Eyck, painter of “The Arnolfini Marriage” (left), melded art and technology to craft a bridge between the flat appearance of medieval art and the rounder, more solid forms of the Renaissance. This dramatic leap evolved from the development of oil-painting techniques. Previously, painting had been done in tempera—pigment mixed into an egg-yolk binder. The paint, applied on a ground—a mixture of chalk and size (glue and water)—built up a layer (top left) that reflected light from opaque pigment, producing a dimensionless result. The Flemings were the first to mix pigment with vegetable oils such as walnut or linseed to form a rich, translucent glaze that could be applied in thin coats or in a thick impasto layer for artistic effect. The twin results (above right): allowing light to penetrate translucent layers of glaze to create the illusion of depth and unleashing a range of tonality never before attainable—yellows brilliant enough to mock gold, vibrant reds, mesmerizing blues.

The drying process in oils permitted a more expressive topography. Texture could be emulated: The lush richness of the green velvet robe in the van Eyck became possible. One of the first Flemish painters to use this technique, van Eyck painted “The Arnolfini Marriage” as portrait and marriage certificate. The inscription “Jan van Eyck was here” appears above the mirror reflecting the artist and another witness.

The painting also reflects Renaissance man’s increasing interest in himself and his world. Painting had moved from what art

historian Erwin Panofsky called a “precious or tortured sentiment . . . to simple, strong and uninhibited veracity”—scenes of folk life, for example, in the detail from Pieter Bruegel the Elder’s “The Peasant Dance” (below). The Flemish masters had jarred into motion an influence that spread to Italy and Germany: “a reconstruction rather than a mere representation of the visible world.”



THE PEASANT DANCE, BY PIETER BRUEGEL THE ELDER, KUNSTHISTORISCHES MUSEUM, VIENNA

and Rubens can be judged and enjoyed together. But art is also a living thing in Brussels, and in surprising ways. The new Metro, opened in 1976, treats riders to a built-in art show. It vibrates with murals, mosaic scenes, abstract metal sculptures, Ardennes marble, the finest tiles. No two stations have the same design, and some are themed to the station stops. At "Schuman" the Common Market is celebrated, at "Diamant"—you guessed it, diamonds.

With that Belgian pride in marrying art to practicality, Leo Camerlynck, a Metro executive, said, "We used luxurious decorations, but they were only 2½ percent of our

total building cost. For that money, we saved industries—like marble and tile—that were almost bankrupt."

Puppet Comedy From Medieval Times

Brussels' noisiest living art is not the subway but the Toone VII puppet theater for adults. The four-foot-high wooden puppets were stentorian. I was watching *The Passion*, a Lenten feature in which the villainous Pharisees were dressed as curés. When Christ died on the Cross and the skies suddenly darkened, the awesome moment was shattered when one literal-minded Pharisee asked another, "What happened?" and

Sapphire strand of the Semois River encircles Bouillon, which fans out



received the reply, "Well, the weather bureau has missed again."

After the show, I talked with Toone VII, a Mephistophelian chap with a pepper-and-salt beard and matching checked cap. "How did you like our comedy of Christ and the Cross today? We have lots of laughs in that. Not making fun, eh?—but a parody, the Passion seen through folk eyes. This goes back to miracle plays of the Middle Ages.

"We have comedies of *Hamlet*, *Faust*, and *Carmen* too. I speak all the parts in different voices, sometimes thirty in one play. In *Carmen* I sing them all. I do not pull the puppet strings. I have six helpers for that."

Why Toone VII? "It is like the old guilds. Each master made his successor his adopted child. The new master took the name of the old. So we have all been Toone, short for Antoine, since Toone I. My real name is José Géal. I am bilingual, and I give the plays in the Bruxellois dialect, which mixes French and Dutch."

Eureka! I thought. The solution! We make the dialect the *only* official language. The country can stay as it is!

But it won't go. I checked around and got the impression that Flemings understand it but don't speak it, while Walloons speak it but don't understand it. □

from the green spine of a castle-topped knoll at the edge of the Ardennes.

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Our National Wildlife Refuges: A Chance to Grow

By ROBERT E. DOYLE
PRESIDENT,
NATIONAL GEOGRAPHIC SOCIETY

ONE OF the recurrent moments of majesty in my life is the autumnal return of vast flocks of Canada geese from the far north to Chesapeake Bay. I am fortunate enough to own a small retreat on Solomons Island, Maryland. By dawn and dusk I have watched the geese unfurling their lines of flight over the bay after the long journey.

At that golden season other sounds echo across field and marsh—the booming of guns from blinds that dot the landscape. They raise the vexsome questions of proper



Helpless but protected, a white pelican flexes the stubby wings of adolescence at

management of wildlife resources and the development of an equitable public policy.

For the past 76 years the National Wildlife Refuge System, administered by the U. S. Fish and Wildlife Service of the Department of the Interior, has worked to save vital habitat from unchecked development. The system began with a comparative speck of land—three-acre Pelican Island off Florida's east coast—set aside as a refuge for the brown pelican on March 14, 1903, by President Theodore Roosevelt.

Over the years the system has grown to



PELECANUS ERYTHORHYNCHOS; PHOTOGRAPH BY JIM BRANDENBURG

the Chase Lake Refuge in North Dakota. A nationwide network of 390 such havens, the first established 76 years ago, offers prime habitat for wildlife and quietude for man.

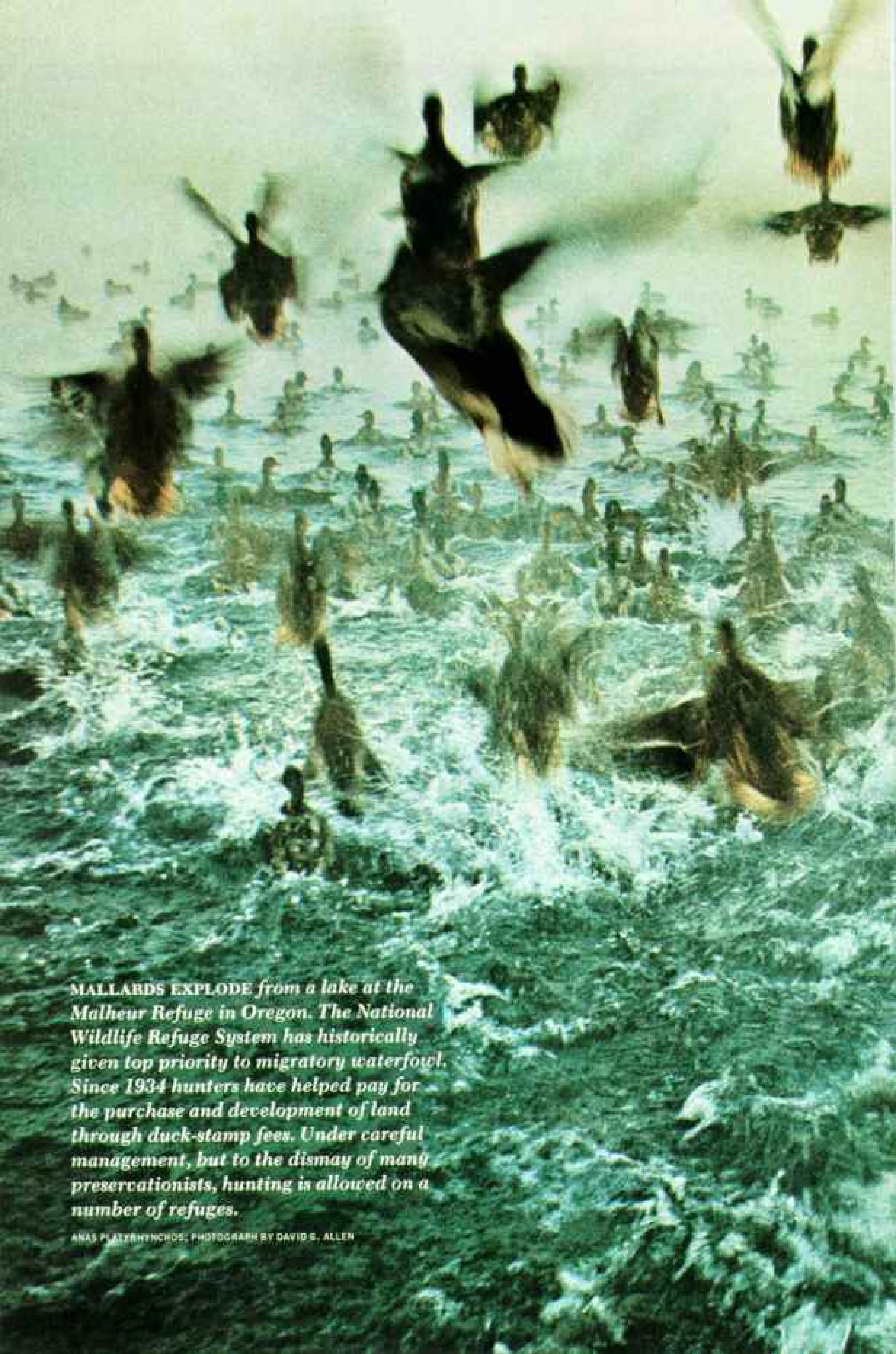
390 individual refuges, some small and some huge, at least one in every state except West Virginia, and encompassing 53,000 square miles. A guide to many of these refuges is included in this issue, pages 363-70.

On its diamond anniversary last year our refuge system was justly praised as a cause for national thanksgiving. A task force of conservationists appointed by the Government to study the refuges called the system "the world's foremost collection of wildlife habitats and wildlands." But that same task force agreed that the system is under stress

and deserves more attention than it has been getting.

In the beginning the purpose of the refuge system was clear-cut: to protect wildlife, especially migratory waterfowl, from the devastating impact of a growing, sometimes voracious industrial society. The Wichita Mountains Refuge in Oklahoma, established in 1905, gave sanctuary to survivors of the once mighty bison herds. Lower Klamath Lake Refuge in California and Oregon, set aside in 1908, was the first migratory-waterfowl

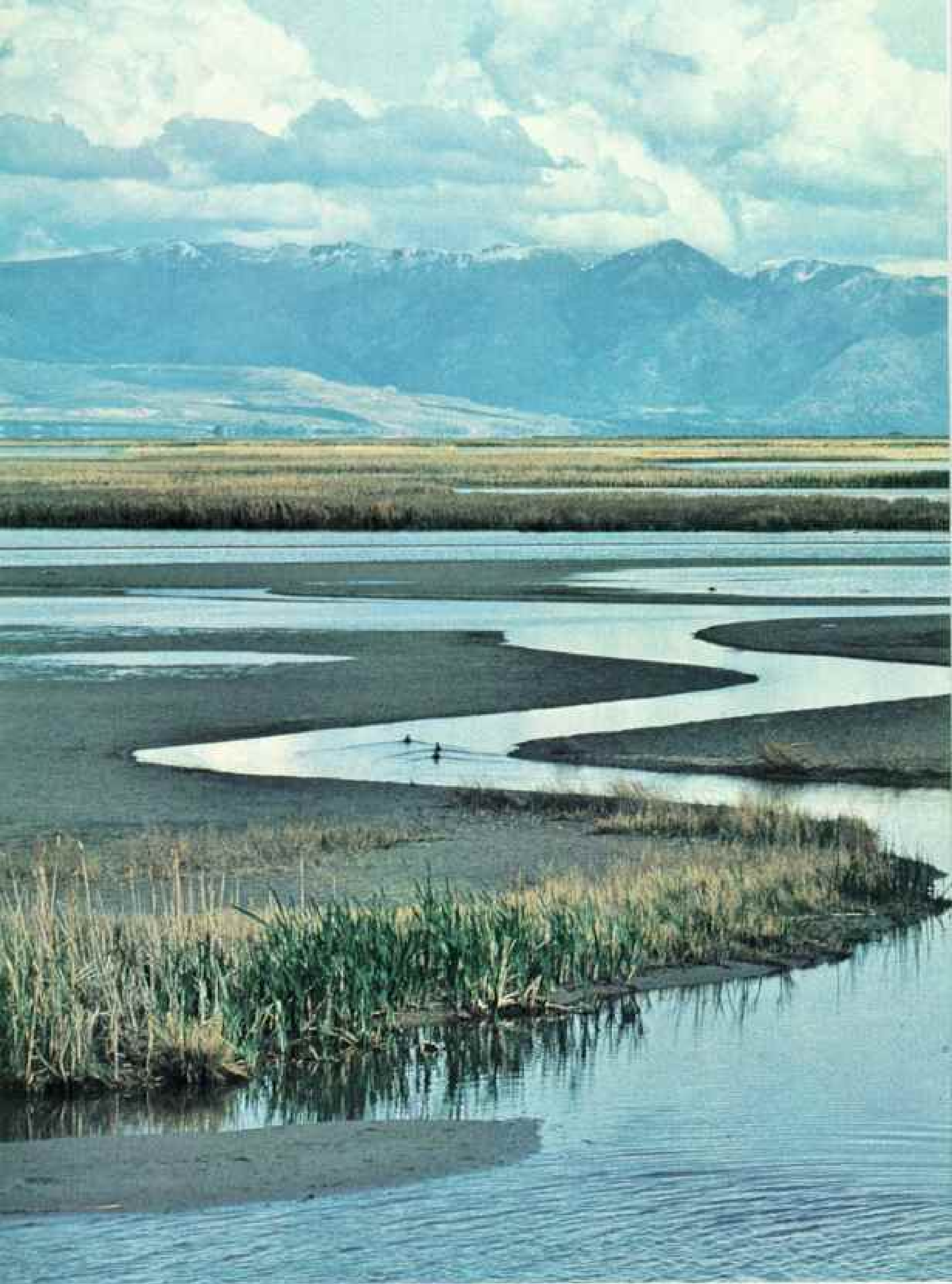
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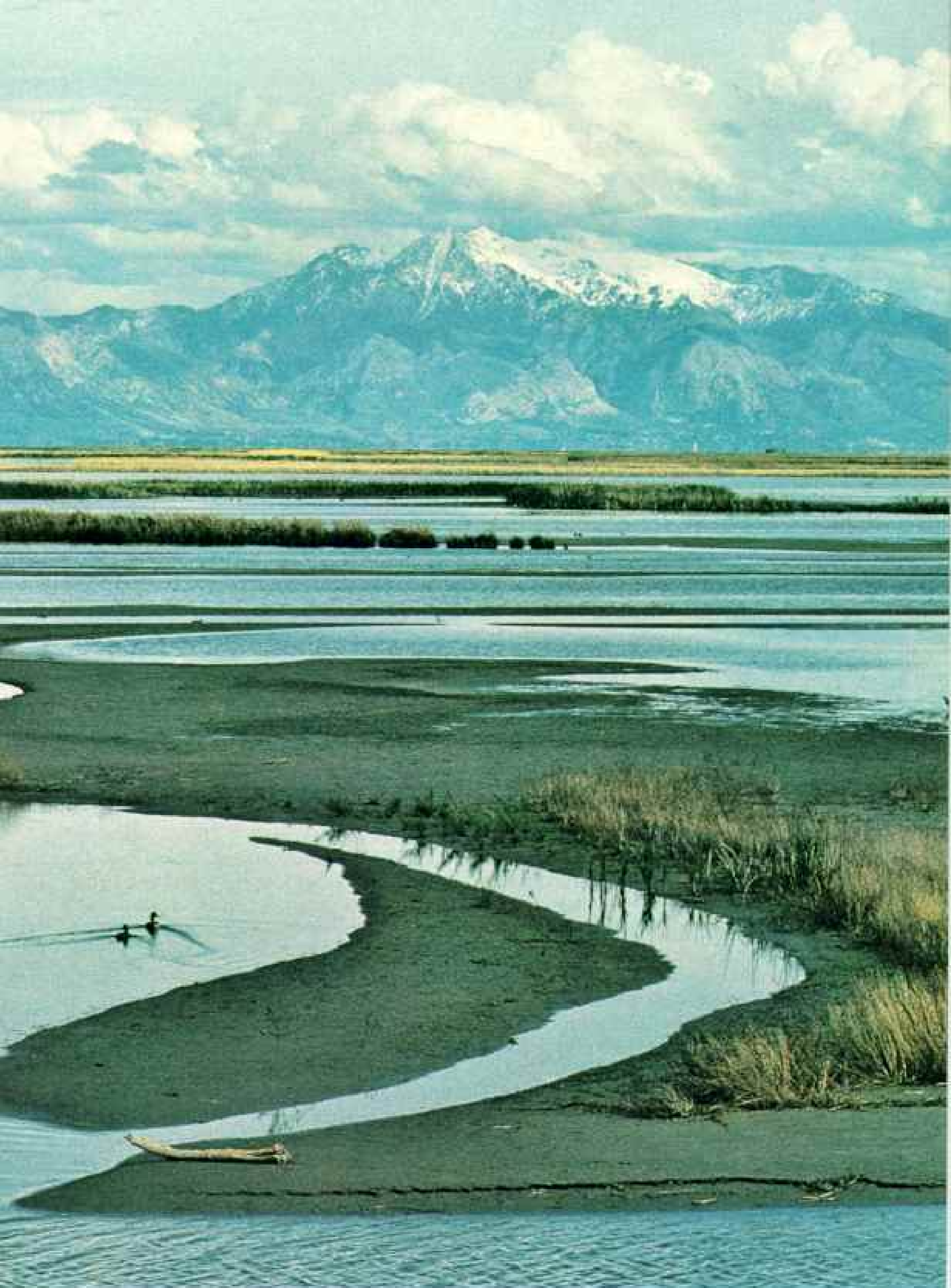
MALLARDS EXPLODE from a lake at the Malheur Refuge in Oregon. The National Wildlife Refuge System has historically given top priority to migratory waterfowl. Since 1934 hunters have helped pay for the purchase and development of land through duck-stamp fees. Under careful management, but to the dismay of many preservationists, hunting is allowed on a number of refuges.

ANAS PLATYRHYNCHOS; PHOTOGRAPH BY DAVID G. ALLEN





In summer calm before autumn's storm, the Bear River Delta, north of Great



NATIONAL GEOGRAPHIC PHOTOGRAPHER BATES LITTLEHALES

Salt Lake, awaits an influx of winged multitudes stopping over on the way south.

(Continued from page 343) preserve. The Klamath Basin now attracts more than half of the birds using the Pacific flyway.

In 1924 the idea of sanctuaries was modified when the 195,000-acre Upper Mississippi River Wild Life and Fish Refuge was brought into the system by Congress with a provision allowing hunting and fishing.

During the Great Depression most citizens of our country had more pressing concerns than wildlife. But still, in 1934, a Presidential commission of three noted naturalists—Thomas Beck, Jay N. "Ding" Darling, and Aldo Leopold—led an effort to purchase and restore habitats. In the same year the Congress passed the Migratory Bird Hunting Stamp Act. Sale of the duck stamps—in effect a tax on those who hunt migratory waterfowl—provided, until recent years, most of the funds to acquire land for the system.

NOW a wider view of the role of the refuges has gained public acceptance. The Fish and Wildlife Act of 1956 and other acts protecting endangered species have dealt not only with migratory waterfowl but with all vanishing wildlife. Special habitats have been preserved for the whooping crane, the Key deer, the bighorn sheep, the trumpeter swan, and others.

While it was acquiring more responsibility, the refuge system was suffering from insufficient funds and from the confusion caused by the need to serve several different purposes, such as protection of the wildlife and accommodation for public use, including recreation.

If the recommendations of the task force are followed, the system will be better funded and enlarged, and conflicting uses like agriculture, grazing, timbering, and mining will be curtailed or prohibited.

Land purchase is no longer almost entirely dependent on the hunters' contributions. Today the public pays most of the costs. Duck stamps should bring in 18 million dollars in 1979, but other receipts (including the sale of oil leases on the continental shelf) are expected to be twice that figure.

Still, it is not enough to meet present needs. Improving and expanding wildlife habitat are not simple matters of buying bits of pristine paradise; most often these are

overgrazed, heavily logged, drained, or burned properties requiring capital investment in dams, fences, forest restoration, and other expensive rehabilitation.

The Fish and Wildlife Service is fully aware that present provisions for wildlife habitat are inadequate.

A RESISTANCE TO HUNTING on refuges has become evident. Anti-hunting groups point out that a refuge should be what the word implies—a sanctuary from all forms of harassment.

The hunters reply that without them, there would be no system to protect today, that successful breeding ensures stable populations despite hunting, and that more than fifty years of controlled hunting on the refuges has actually been beneficial to wildlife.

The task force reported that "hunting, trapping and fishing are consistent with . . . providing habitat in refuges for healthy populations of wildlife"—as long as they are conducted solely for the purpose of managing wildlife populations.

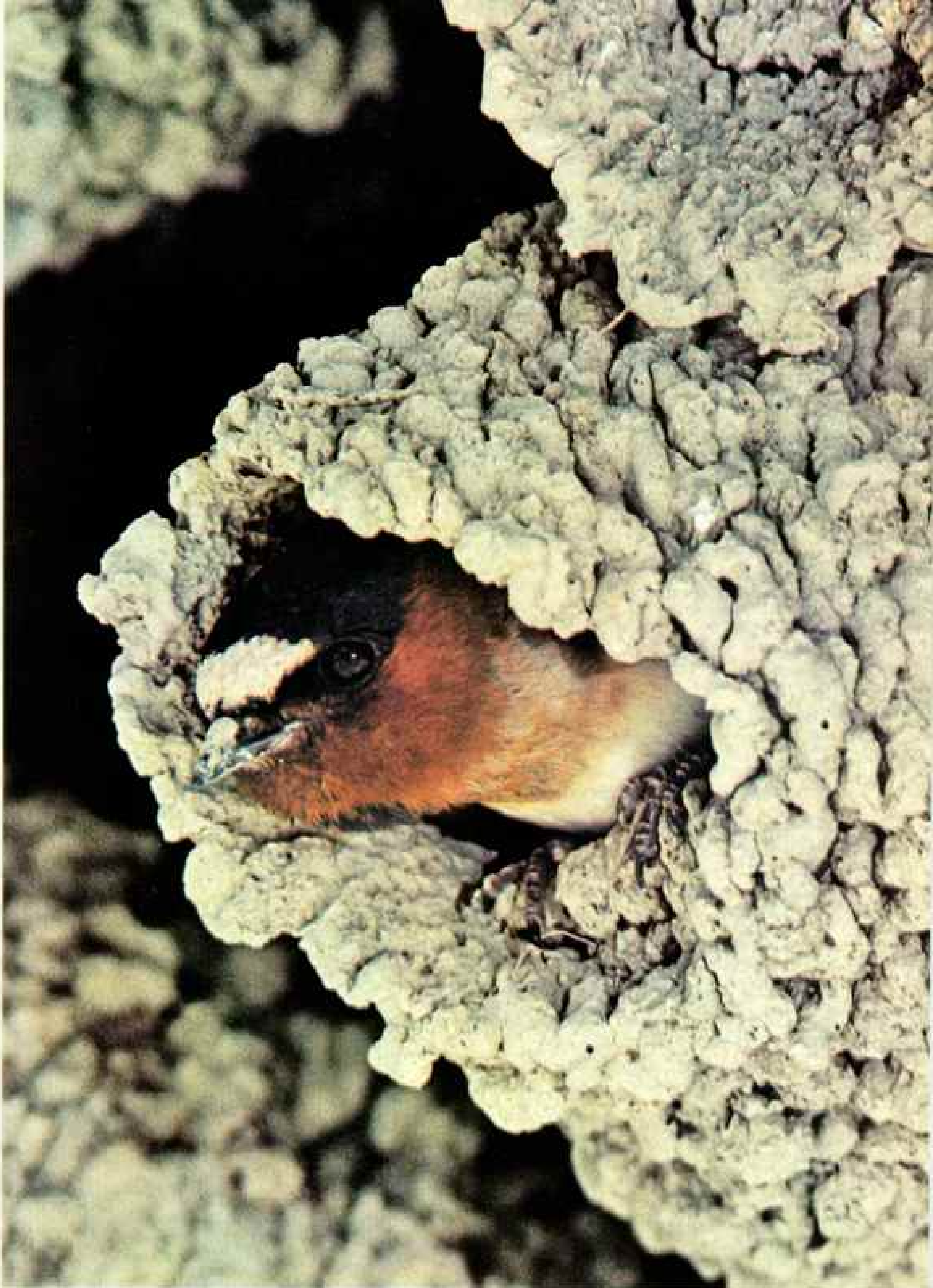
How those populations will be managed, and by what means and methods, remains grist for the mill of public discussion.

Other recommendations in the report for expanding the system and giving it a firm and enlarged budgetary base would greatly improve prospects for the the next decade.

There is a bonanza of Alaska wilderness awaiting governmental decision. Last December President Carter proclaimed 56 million Alaska acres as national monument lands; almost twelve million will be administered by the U. S. Fish and Wildlife Service. He also recommended the addition of 39 million other acres to the refuge system itself.

But the most important change is in the way our citizens view their refuges. Today, for every hunter who enters a refuge, more than two dozen others go there for hiking, for bird-watching, for the solace of nature. In the article that begins on the following pages, naturalist Chariton Ogburn describes four of our refuges in the light of these more aesthetic values.

With wildlife seriously threatened in so many parts of the world, even in the strongholds of Africa and Asia, we owe it to the future to build a sound refuge system, an enduring treasure of our nation. * * *



PETROCHELIDDI PYRKHONDIÁ, NATIONAL GEOGRAPHIC PHOTOGRAPHER BATES LITTLEHALLES

Charmed from nature's environment by man's more desirable caves, cliff swallows are now human-habituated birds. Peering from its mud-ball nest on an observation tower at Bear River, this swallow is one of the refuge's sixty nesting species. The far-ranging swallows may fly thousands of miles from deep in South America to get here.

Island, Prairie, Marsh, and Shore

By CHARLTON OGBURN

Photographs by
BATES LITTLEHALES
NATIONAL GEOGRAPHIC PHOTOGRAPHER

THROUGH a landscape of lagoon and marsh, wildlife biologist Howard Poitevint drove my wife and me along a highway in the Merritt Island Refuge and the Kennedy Space Center. Suddenly he stopped even with the tallest pine of a stand.

High in the tree, atop a mass of sticks, a dark bird of majestic mien and proportions, snowy of head and tail, waited as another like it sailed in, bearing in its talons a two-foot addition to the nest. We watched in awe at being privy to the domestic life of great, fierce-eyed bald eagles.

To choose only four national wildlife refuges that would give an idea of the richness of the whole array was not easy. But I felt I could not go far wrong to start with Merritt Island, which lies behind the barrier sand

In peaceful coexistence with the Space Age, a wood stork stands watch at Merritt Island National Wildlife Refuge, which encompasses the John F. Kennedy Space Center. Besides providing the missile-launching site with a safety buffer for the public, Merritt Island harbors many endangered and threatened species.





reefs of Florida's east coast, where the shoreline warps to form Cape Canaveral.

That bald eagles were nesting where the nation's eyes were fixed most boldly skyward would have been profoundly significant to the augury-minded Romans. It affected me no less. Merritt Island gave me the strongest impression I have had of the idealism of our nation.

On one side, making ventures into space overpoweringly real, rose the giant cube of the Vehicle Assembly Building and two 45-story launching towers from which men had ascended to the moon.

On the island's other side, among lagoons tenanted by egrets and slate-colored Louisiana herons, a dragline was restoring the habitat of an obscure bird threatened with extinction. I was reminded of Matthew 10:29 and its assurance that a sparrow shall not fall without God's will. While with its right hand our government reaches for the planets, its left champions the dusky seaside sparrow, that it may not fall.

“MERRITT ISLAND harbors more endangered and threatened species than any refuge outside Hawaii,” said manager Stephen Vehrs. “In addition to the sparrow, there are the manatee, alligator, bald eagle, brown pelican, and peregrine falcon, as well as several marine turtle species.

“Our main effort with the dusky seaside sparrow is over on the mainland, where we've got more than five thousand acres on the St. Johns River. Pelican Island, the first national wildlife refuge, is fifty miles down the coast. It also is under our jurisdiction.”

Of the thousand or more manatees left in Florida, perhaps 125 dwell around Merritt Island. Poitevint took us to a cove where some of them fed. The sirenians are the only vegetarian marine mammals. Their lips,

Charlton Ogburn is a distinguished writer of natural history and birdlife. His books include *The Adventure of Birds*, *The Southern Appalachians*, and *The Winter Beach*.

thick and bristly for grazing, give manatees the look of that World War II caricature Colonel Blimp. What we saw of them in the murky water was the top of the head and, less often, the horizontal tail fin, like a huge, weathered Ping-Pong paddle.

The opportunities at Merritt Island for succoring threatened wildlife have proved so outstanding that I was a little unnerved to think that the 139,000-acre refuge came to be quite by chance. The National Aeronautics and Space Administration wanted to expand its missile-launching site on Cape Canaveral. “We needed a large area with deep buffer zones to protect the public from the very dangerous stuff we handle,” Lee R. Scherer, director of the space center, told me. “The decision to use the area also for a wildlife refuge seems to me the best that could have been made.”

NASA retains jurisdiction over the land. Protection also extends to 26 miles of the outer beach, four-fifths of which is designated as a national seashore. What a plum fell to the cause of conservation!

But not without a struggle. Helen Cruickshank, the great lady of American birding, and her late husband, Allan, a prominent bird photographer, helped lead the way.

“NASA came in the nick of time to save the island from development,” said Helen, whose house looks out on Merritt Island from across the Indian River. “One battle was to keep an oil refinery out.”

In 1973 the Navy considered building a Trident submarine base on Mosquito Lagoon, the 33-mile-long sound separating the island on the north from the barrier dunes.

“While fighting that one,” she said, “we got such abusive calls that when Allan had to be away I pulled the telephone out of the jack.”

Almost two-thirds of the refuge is in lagoons and marshes. “This is the best place for waterfowl in Florida,” Helen said as she drove us about.

Early November was too soon for the great rafts of ducks and coots, but we found

Nature gets an assist at Merritt Island as researchers from Florida Technological University release laboratory-hatched loggerhead turtles for their fateful march to the sea, where few may be lucky enough to survive predators. But if left as eggs in their sand-buried nests, all would probably be devoured by raccoons. CARETTA CARETTA



white pelicans from the northern plains by the hundreds in a lagoon where mangroves mushroomed over the water. Others wheeled high overhead in their stately way, as did a company of wood storks. The refuge contains one of the few colonies of the storks in Florida that are increasing.

LARGE EXPANSES of the island are covered with cabbage palmetto, saw palmetto, wax myrtle, and groundsel bush—this last a shrub that displays its autumnal white feathering as far north as New England. “I shouldn’t like to have to force a way through that tangle,” I said.

“It’s just as well,” Helen answered. “There really are lots of rattlesnakes here.”

The undisturbed habitat has also been of benefit to indigo snakes, which are threatened elsewhere partly because of their popularity as pets.

“The indigos are beautiful—a glossy blue-black—and tame easily,” said Richard Seigel, a young biologist from Florida Technological University who was at work in a garagelike laboratory smelling of formaldehyde. “We had one in here this morning but let it go. Pet collectors have already captured so many that the indigo is now on the endangered species list.”

Seigel was an assistant to Llewellyn M. Ehrhart, a biologist studying the island’s fauna. NASA contracted for the study to judge the impact of its space shuttle on the creatures of the refuge. Beginning in the mid-1980’s, the shuttle will blast off from the space center forty times a year, boom through the sound barrier at 27,000 feet, and return to land on a three-mile strip.

“No attribute of the refuge is more important than the sea turtle rookery,” Dr. Ehrhart told me. The past summer he and his helpers saved the eggs from 96 turtle nests on the beach—22 of greens, the rest of loggerheads—and hatched 7,916 young for release (preceding page).

Turtles have suffered drastically from man’s disruptions of the environment. Raccoons have fared better; their handlike tracks pattern Merritt Island.

“The raccoons would get virtually every turtle egg but for us,” said Dr. Ehrhart. “From June through August I’m on the beach six nights” (Continued on page 358)



The bird that started it all: Threatened by fishermen and hatmakers, brown pelicans became beneficiaries of the first



PELICANUS OCCIDENTALIS

national wildlife refuge—Florida's Pelican Island, established by President Theodore Roosevelt in 1903. From this three-acre beginning, the network of refuges spread to include areas in every state but West Virginia.

Wildlife Refuges: Island, Prairie, Marsh, and Shore

355





LINDA CHERITAK

Mere men who would visit the Farallon Islands, 28 miles west of San Francisco, must carry special permits and be craned ashore (left). This only accessible islet in the group comprising the Farallon Refuge has the nation's largest colonies of seabirds outside Hawaii and Alaska.

Researcher Ron LeValley, from Point Reyes Bird Observatory, weighs a young western gull (below). The tufted puffin (above), like many island nesters, lives on wing or wave for most of the year.



PHOTOGRAPH BY LUTHER GOLDMAN (LEFT)



While winged wayfarers come and go, white-tailed deer and other earthbound

a week. Even then, we save only a small fraction of the nests. But the turtles have a better chance here than on most other beaches in Florida."

TO VISIT a coastal refuge about as different as possible from Merritt Island's broad strands and lagoons, I set out from San Francisco Bay in a Coast Guard cutter for the Farallon Islands.

"I would suppose the local economy is based on sheep raising," surmised a fellow passenger, a U. S. Geological Survey man going out to check on a seismograph. It was his first trip to the islands, which are closed to the public, and a shock awaited him; the

rocky cones that rise 28 miles from San Francisco are too bare to support even a goat. Only 211 total acres, they lack fresh water. Yet they once had a local economy.

Early in the past century, Russian and American sealers found it profitable to butcher the marine mammals of the islands' coves. Then, beginning with the gold rush, commercial egg collectors pillaged the islands for forty years, drastically reducing the seabird colonies. But federal protection of the wildlife, begun in 1909, was virtually complete by 1972.

As we neared Southeast Farallon, seafoam grew more plentiful. Dark-mantled western gulls easily overhauled us. Murres (rhymes



DOCODILEUS VIRGINIANUS; PHOTOGRAPH BY FARRILL UREHAN

creatures enjoy year-round asylum at the Aransas Refuge in coastal Texas.

with furs) resembled ducks on the water, bullets in the air. Single files of cormorants passed, somber as undertakers.

Atop the Farallons' only flat area—a wave-cut terrace elevated above the sea by crustal movements—wildlife biologist Stephen Morrell told me that the marine birds nesting on the islands represent the largest concentration in the continental United States south of Alaska. All around us, western gulls rose from their nests with yelping screams to protest our intrusion.

"We have to ask you to walk only where we show you," said Steve. "Otherwise you'll sink a foot in an auklet's burrow." The ground was riddled with the birds' holes.

"We've got more than a hundred thousand Cassin's auklets. Of course, they come out only at dark so the gulls won't nab them. Our 23,000 western gulls are the largest colony anywhere." Other figures I got from Steve on the islands' tenants were 45,000 common murrelets, 30,000 Brandt's cormorants, 4,000 ash-colored storm petrels, and lesser numbers of seven other saltwater birds. The highest daily count of marine mammals, made in October 1978, was 2,807, three-quarters being California sea lions.

Steve is one of two scientists of the private Point Reyes Bird Observatory who reside on Southeast Farallon in rotation, about a month at a stretch. (The smaller North





BUBULCUS IBIS (LEFT), *NYCTORHIZES STRIATUS* (ABOVE)

In one deft swoop, a green heron at Merritt Island nabs a killifish (above) while holding fast to its perch. By a canal bordering the Santa Ana Refuge in Texas, a cattle egret pauses before swallowing a frog whole (left). Grazing in the foreground is the bird's obliging meal ticket, a bull whose hooves flush out a diet of frogs, insects, and field mice for the African emigrant.

Farallons, seven miles distant, are too steep to land on.) The observatory serves as custodian under an arrangement with the Fish and Wildlife Service, carrying out studies with the aid of dedicated volunteers.

I went with Steve and an assistant, Sarah Allen, on the daily tour of auklet nests, during which fifty chicks—dark-gray balls of down—were extracted, placed in a plastic bag, and weighed. I watched Steve climb frightful cliffs to monitor the nests of the pigeon guillemot (pronounced GILLEM-ott). My favorite picture of Steve is of his stealing up on a sleeping elephant seal cow and writing the identifying name “Mung” on her flank with a squirt container of Lady Clairol bleach—a formula that would turn the letters yellow, he explained. The cow languidly lifted her head and rolled a large, dark eye at us.

WITH SUSAN STINGLE, a marine-biology student, I climbed a ridge to a cabinlike blind overlooking two hundred nesting Brandt’s cormorants. “We make a daily check on the condition of the nests, number of eggs, and activities of the parents,” she said.

A few gulls stood about and would have pounced on any unguarded eggs or chicks. A human intruder scattering a colony of nesting murrelets or cormorants could cause the loss of the entire generation to gulls.

From another blind, topping a higher cliff on which a misstep would have been regrettable, thousands of incubating murrelets were kept under observation. A visual treat was a few tufted puffins, clad all in black with white masks terminating in yellowish hairlike strands above the ears—dignified figures from comic opera, but quite splendid with the sun shining through their vermilion-colored lobster-claw bills and webbed feet.

Even more endearing to me were the guillemots, also with red feet, which they would spread to brake for a landing. Resembling sharp-billed little black ducks, they were quite trusting and had a sweet, dovelike quality. And like doves they were swift on the wing. Topping a rise into the wind, they would shoot across the sky.

Amazing to think of these gentle-seeming creatures spending much of the year far out

among the ruthless combers—but no more so, I suppose, than the little auklets and petrels pouring forth before dawn to disperse over the black waters for their living, and returning well after dark with a din like an avian machine shop.

One day a week an observer climbed Lighthouse Hill every hour to count marine mammals through a spotting scope. Sea lions hauled themselves up on the rocks by the hundreds to sleep with beatific, be-whiskered smiles. There was always much barking, however, and disdainful posturing by males with noses skyward. Bull elephant seals made the sound of a two-cycle engine starting up or stood with heads erect—“the position of dominance,” Sarah called it. In a recent winter 104 elephant seal pups had been born, most of them fathered by an 18-foot bull. At the season’s end, Steve reported, the bull had been reduced to skin and bones from chasing rivals away from his 104-cow harem.

On my trip back from the Farallons a strange, luminous ring encircled the sun. A Coast Guardsman called it “a sign from God that we should leave our evil ways.” The Ancient Mariner, I thought, would have construed it rather as a sign of God’s satisfaction that man was at last showing compassion to the creatures of the sea.

TRAVELING from the sea-besieged Farallons to a refuge only 115 miles from the geographic center of North America, I could reasonably expect a complete change of mood. But what struck me about Lostwood Wildlife Refuge in North Dakota was its marine atmosphere. Partly it was the wind, blowing relentlessly. My companion, Dr. Robert T. Gammell of nearby Kenmare, observed: “There’s a saying here that if the sun sets in the west, the next day will be windy.”

Only small islands of aspens, growing in scattered declivities, impeded the wind’s course over the prairie from horizon to horizon. Dr. Gammell explained that the area of low, broad hills was a moraine from the Ice Age, the spoil scoured by the glacier in its grinding push southward. The shape of the land was oceanic, the constantly blowing air as fresh and pure as that of the sea.

Ring-billed (Continued on page 371)



Wildlife Refuges

OF THE UNITED STATES

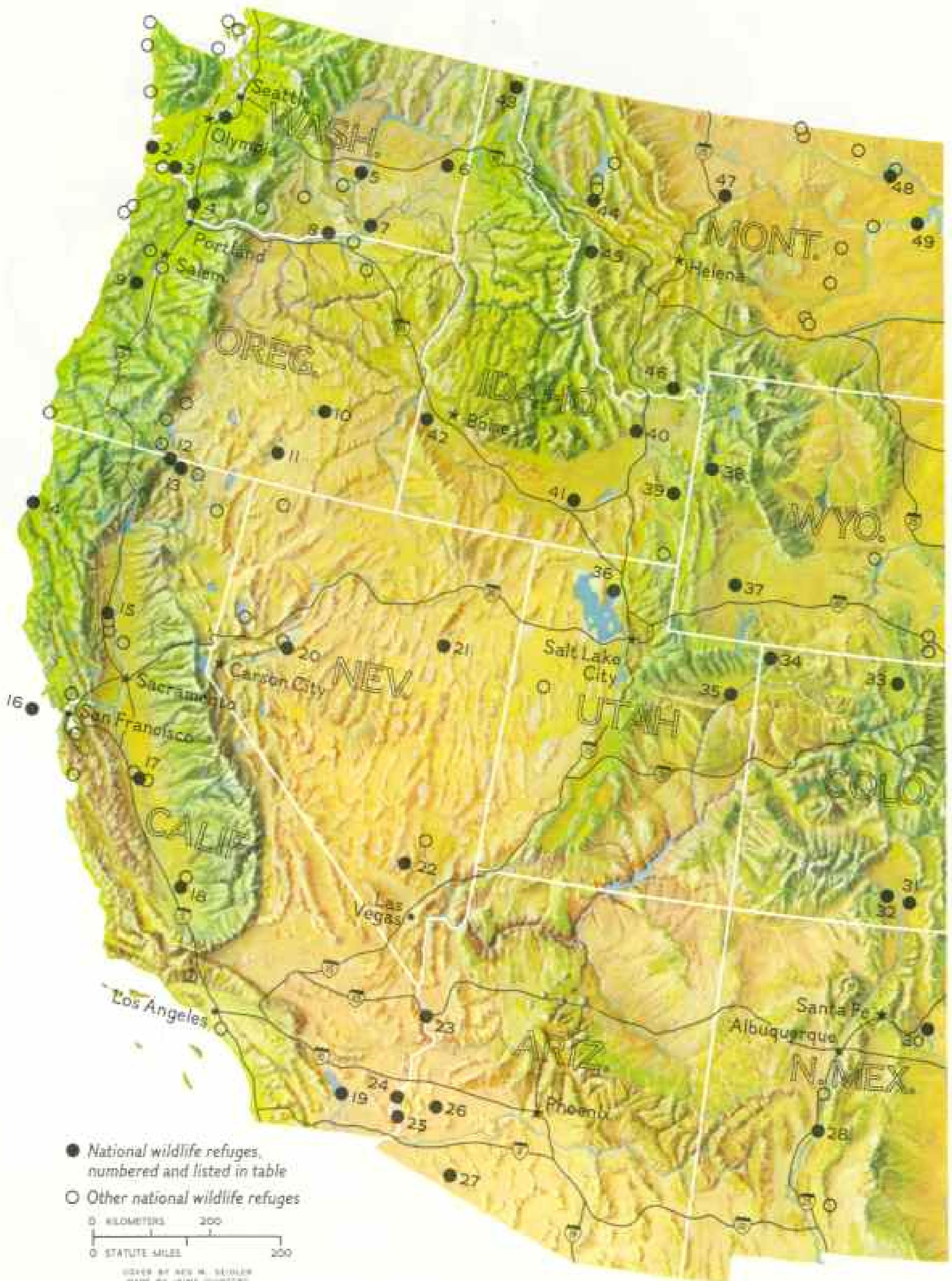
WILDERNESS TREASURES for all to enjoy, the 390 national wildlife refuges can almost all be seen by foot, boat, or car. But to get the most out of your visit, the U. S.

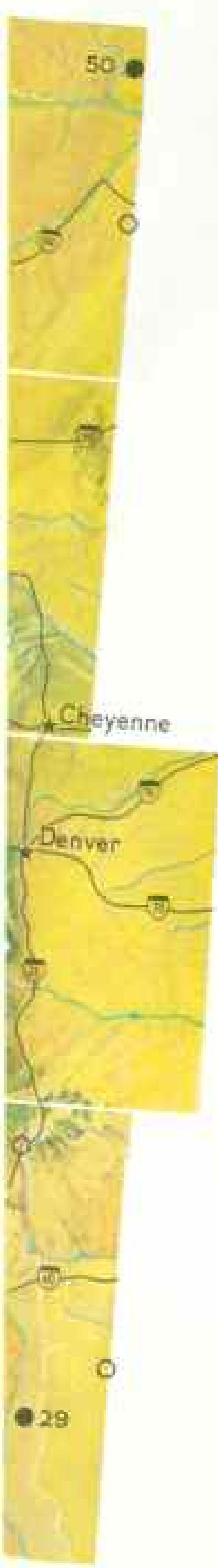
Fish and Wildlife Service advises, write first to the appropriate regional office (below) for current activities schedules and wildlife lists, where available, and other information.

- 1 U. S. Fish and Wildlife Service
Lloyd 500 Bldg., Suite 1692
500 Northeast Multnomah St.
Portland, Oregon 97232
(Includes Hawaii and Pacific Islands)
- 2 U. S. Fish and Wildlife Service
P.O. Box 1306
Albuquerque, New Mexico 87103
- 3 U. S. Fish and Wildlife Service
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111



- 4 U. S. Fish and Wildlife Service
P.O. Box 95067
Atlanta, Georgia 30347
(Includes Puerto Rico and Virgin Islands)
- 5 U. S. Fish and Wildlife Service
One Gateway Center, Suite 700
Newton Corner, Massachusetts 02158
- 6 U. S. Fish and Wildlife Service
P.O. Box 25486, Denver Federal Center
Denver, Colorado 80225





Wildlife refuges

■ Major animals present

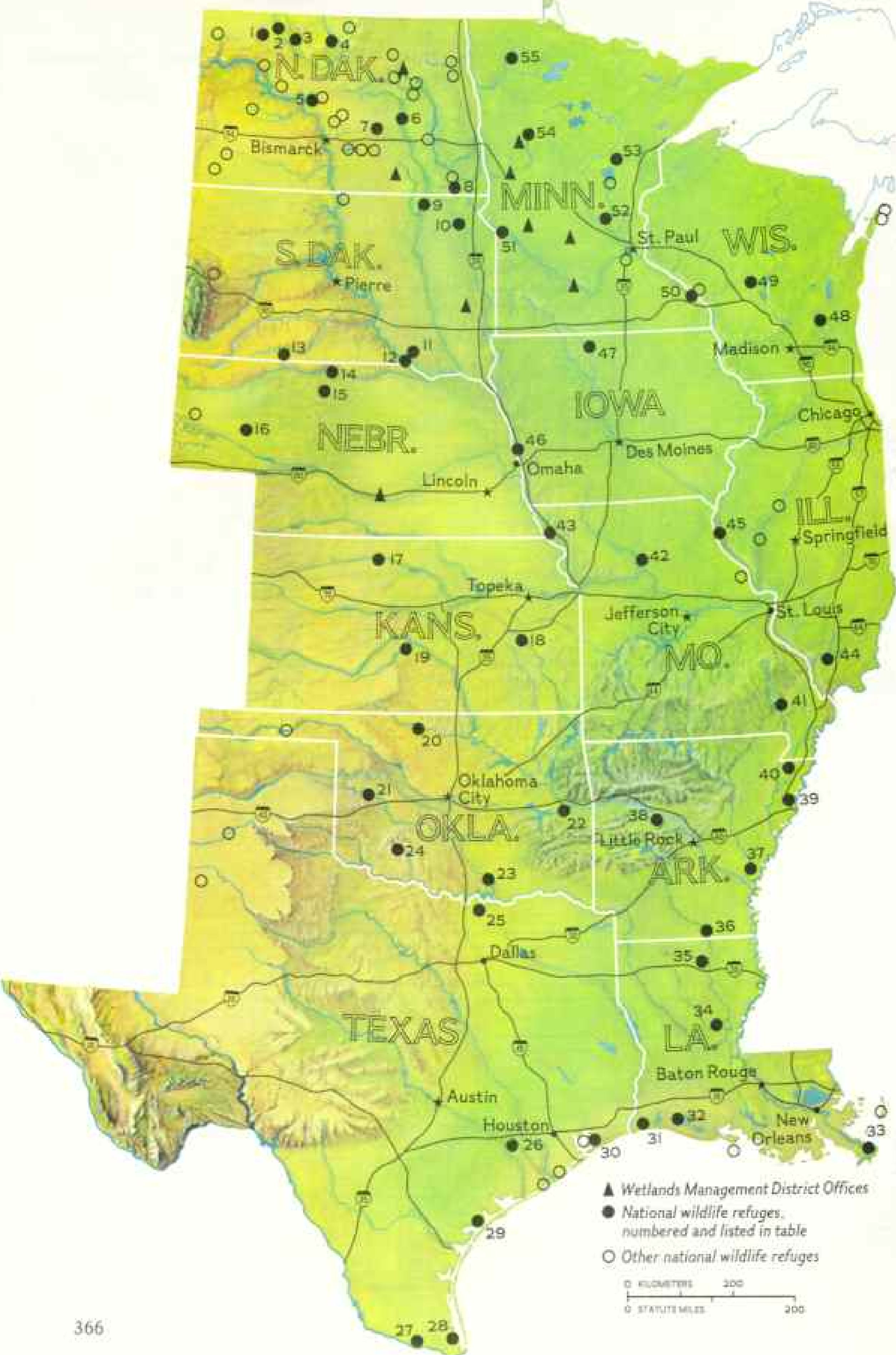
E Contains endangered species

■ Best seasons for wildlife observation

■ Recreational activities available

	Wildlife refuges	Recreational activities available													
		BIRDS	FISH	MAMMALS AMPHIBIANS & REPTILES	SPRING	SUMMER	FALL	WINTER	FOOT TRAILS	AUTO TOURS	FISHING	HUNTING		BOATING	
WASH.	1 NISQUALLY	■ E					■		■		■				1
	2 WILLAPA	■ E	■					■	■		■	■	■		2
	3 COL. WHITE-TAILED DEER	■ E	■ E		■	■	■	■	■		■	■	■		3
	4 RIDGEFIELD	■ E			■			■	■		■	■			4
	5 COLUMBIA	■			■			■	■	■	■	■	■		5
	6 TURNBULL	■ E			■		■		■	■					6
	7 McNARY	■					■	■	■		■	■			7
OREG.	8 UMATILLA	■ E			■	■					■	■	■	8	
	9 WILLIAM L. FINLEY	■ E	■		■			■			■	■	■	9	
	10 MALHEUR	■ E	■		■	■					■	■	■	10	
	11 HART MOUNTAIN	■ E	■		■	■					■	■	■	11	
CALIF.	12 LOWER KLAMATH	■ E			■	■		■	■		■			12	
	13 TULE LAKE	■ E	■		■	■				■		■		13	
	14 HUMBOLDT BAY	■ E				■					■	■		14	
	15 SACRAMENTO	■ E					■	■	■	■	■	■		15	
	16 FARALLON	■ E	■											16	
	17 SAN LUIS	■					■			■	■	■		17	
	18 KERN	■	■ E	E			■	■		■		■		18	
	19 SALTON SEA	■ E						■			■	■		19	
	NEV.	20 STILLWATER	■	■				■				■	■	■	20
21 RUBY LAKE		■ E	■		■	■		■	■	■	■	■	■	21	
22 DESERT		■	E	■	■	■						■		22	
ARIZ.	23 HAVASU	■ E	■					■			■	■	■	23	
	24 CIBOLA	■ E	■				■		■	■	■	■		24	
	25 IMPERIAL	■ E						■	■		■	■	■	25	
	26 KOFA	■ E	■					■				■		26	
	27 CABEZA PRIETA	■	■ E					■						27	
N. MEX.	28 BOSQUE DEL APACHE	■ E			■	■	■	■	■	■	■	■		28	
	29 BITTER LAKE	■ E					■	■	■	■	■	■		29	
	30 LAS VEGAS	■ E			■	■		■		■				30	
COLO.	31 ALAMOSA	■ E			■	■	■					■		31	
	32 MONTE VISTA	■ E			■	■	■	■		■	■	■		32	
	33 ARAPAHO	■ E				■	■				■			33	
	34 BROWNS PARK	■ E	E		■	■					■	■	■	34	
UTAH	35 OURAY	■ E	E		■	■					■	■	■	35	
	36 BEAR RIVER	■ E		■	■	■	■				■	■	■	36	
WYO.	37 SEEDSKADEE	■ E	■		■	■					■	■	■	37	
	38 NATIONAL ELK	■ E	■		■	■	■	■			■	■		38	
IDAHO	39 GRAYS LAKE	■ E	■		■	■						■		39	
	40 CAMAS	■ E	■		■	■						■		40	
	41 MINIDOKA	■ E			■	■					■	■	■	41	
	42 DEER FLAT	■				■	■				■	■	■	42	
	43 KOOTENAI	■ E			■	■	■				■	■	■	43	
MONT.	44 NATIONAL BISON	E	■		■	■	■		■	■	■			44	
	45 LEE METCALF	■ E			■	■					■	■		45	
	46 RED ROCK LAKES	■ E	■	■	■	■					■	■		46	
	47 BENTON LAKE	■ E			■	■	■				■	■		47	
	48 BOWDOIN	■ E	■		■	■	■		■	■	■	■		48	
	49 CHARLES M. RUSSELL	■ E	■		■	■	■			■	■	■	■	49	
	50 MEDICINE LAKE	■ E			■	■	■				■	■	■	50	

*COLUMBIAN

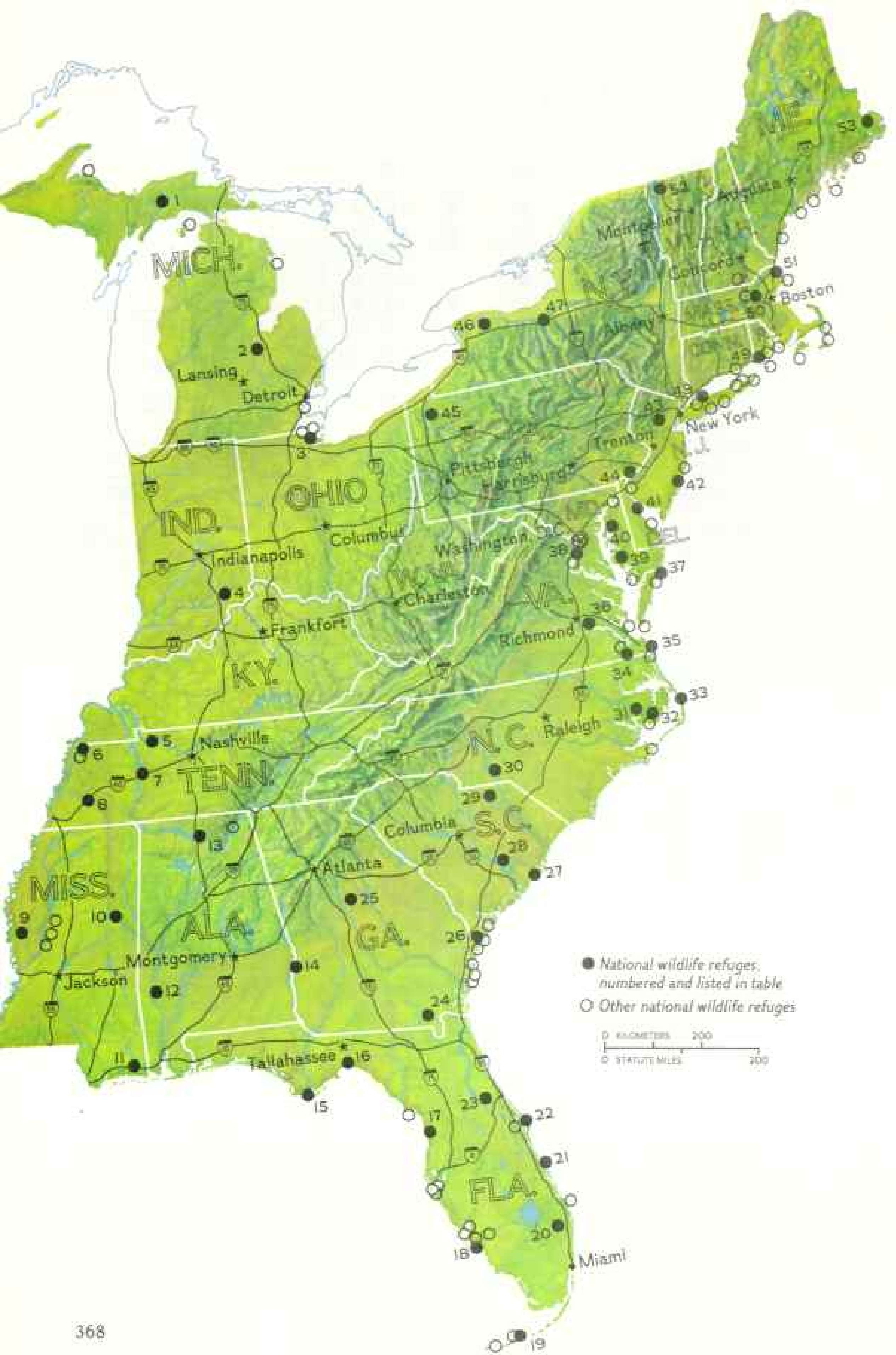


- ▲ Wetlands Management District Offices
- National wildlife refuges, numbered and listed in table
- Other national wildlife refuges



Wildlife refuges

		BIRDS	FISH	MAMMALS AMPHIBIANS & REPTILES	SPRING	SUMMER	FALL	WINTER	FOOT TRAILS	AUTO TOURS	FISHING	HUNTING	BOATING	
N. DAK.	1	LOSTWOOD	■	E	■	■	■	■	■	■	■	■	■	1
	2	DES LACS	■	E	■	■	■	■	■	■	■	■	■	2
	3	UPPER SOLRIS	■	E	■	■	■	■	■	■	■	■	■	3
	4	J. CLARK SALYER	■	E	■	■	■	■	■	■	■	■	■	4
	5	AUDUBON	■	E	■	■	■	■	■	■	■	■	■	5
	6	ARROWWOOD	■	E	■	■	■	■	■	■	■	■	■	6
	7	CHASE LAKE	■	E	■	■	■	■	■	■	■	■	■	7
	8	TEWAUKON	■	E	■	■	■	■	■	■	■	■	■	8
S. DAK.	9	SAND LAKE	■	E	■	■	■	■	■	■	■	■	■	9
	10	WAUBAY	■	E	■	■	■	■	■	■	■	■	■	10
	11	LAKE ANDES	■	E	■	■	■	■	■	■	■	■	■	11
	12	KARL E. MUNDT	■	E	■	■	■	■	■	■	■	■	■	12
	13	LACREEK	■	E	■	■	■	■	■	■	■	■	■	13
NEBR.	14	FORT NIOBRARA	■	E	■	■	■	■	■	■	■	■	■	14
	15	VALENTINE	■	E	■	■	■	■	■	■	■	■	■	15
	16	CRESCENT LAKE	■	E	■	■	■	■	■	■	■	■	■	16
KANS.	17	KIRWIN	■	E	■	■	■	■	■	■	■	■	■	17
	18	FLINT HILLS	■	E	■	■	■	■	■	■	■	■	■	18
	19	QUIVIRA	■	E	■	■	■	■	■	■	■	■	■	19
OKLA.	20	SALT PLAINS	■	E	■	■	■	■	■	■	■	■	■	20
	21	WASHITA	■	E	■	■	■	■	■	■	■	■	■	21
	22	SEQUOYAH	■	E	■	■	■	■	■	■	■	■	■	22
	23	TISHOMINGO	■	E	■	■	■	■	■	■	■	■	■	23
	24	WICHITA MOUNTAINS	■	E	■	■	■	■	■	■	■	■	■	24
TEXAS	25	HAGERMAN	■	E	■	■	■	■	■	■	■	■	■	25
	26	ATTWATER PRAIRIE CHICKEN	■	E	■	■	■	■	■	■	■	■	■	26
	27	SANTA ANA	■	E	■	■	■	■	■	■	■	■	■	27
	28	LAGUNA ATASCOSA	■	E	E	■	■	■	■	■	■	■	■	28
	29	ARANSAS	■	E	■	■	■	■	■	■	■	■	■	29
	30	ANAHUAC	■	E	■	■	■	■	■	■	■	■	■	30
LA.	31	SABINE	■	E	■	■	■	■	■	■	■	■	■	31
	32	LACASSINE	■	E	■	■	■	■	■	■	■	■	■	32
	33	DELTA	■	E	■	■	■	■	■	■	■	■	■	33
	34	CATAHOULA	■	E	■	■	■	■	■	■	■	■	■	34
	35	D'ARBONNE	■	E	■	■	■	■	■	■	■	■	■	35
ARK.	36	FELSENTHAL	■	E	■	■	■	■	■	■	■	■	■	36
	37	WHITE RIVER	■	E	■	■	■	■	■	■	■	■	■	37
	38	HOLLA BEND	■	E	■	■	■	■	■	■	■	■	■	38
	39	WAPANOCCA	■	E	■	■	■	■	■	■	■	■	■	39
	40	BIG LAKE	■	E	■	■	■	■	■	■	■	■	■	40
MO.	41	MINGO	■	E	■	■	■	■	■	■	■	■	■	41
	42	SWAN LAKE	■	E	■	■	■	■	■	■	■	■	■	42
	43	SQUAW CREEK	■	E	■	■	■	■	■	■	■	■	■	43
IOWA	44	CRAB ORCHARD	■	E	■	■	■	■	■	■	■	■	■	44
	45	MARK TWAIN	■	E	■	■	■	■	■	■	■	■	■	45
	46	DE SOTO	■	E	■	■	■	■	■	■	■	■	■	46
	47	UNION SLOUGH	■	E	■	■	■	■	■	■	■	■	■	47
WIS.	48	HORICON	■	E	■	■	■	■	■	■	■	■	■	48
	49	NECEDAH	■	E	■	■	■	■	■	■	■	■	■	49
MINN.	50	UPPER MISSISSIPPI RIVER	■	E	■	■	■	■	■	■	■	■	■	50
	51	BIG STONE	■	E	■	■	■	■	■	■	■	■	■	51
	52	SHERBURNE	■	E	■	■	■	■	■	■	■	■	■	52
	53	RICE LAKE	■	E	■	■	■	■	■	■	■	■	■	53
	54	TAMARAC	■	E	■	■	■	■	■	■	■	■	■	54
	55	AGASSIZ	■	E	■	■	■	■	■	■	■	■	■	55



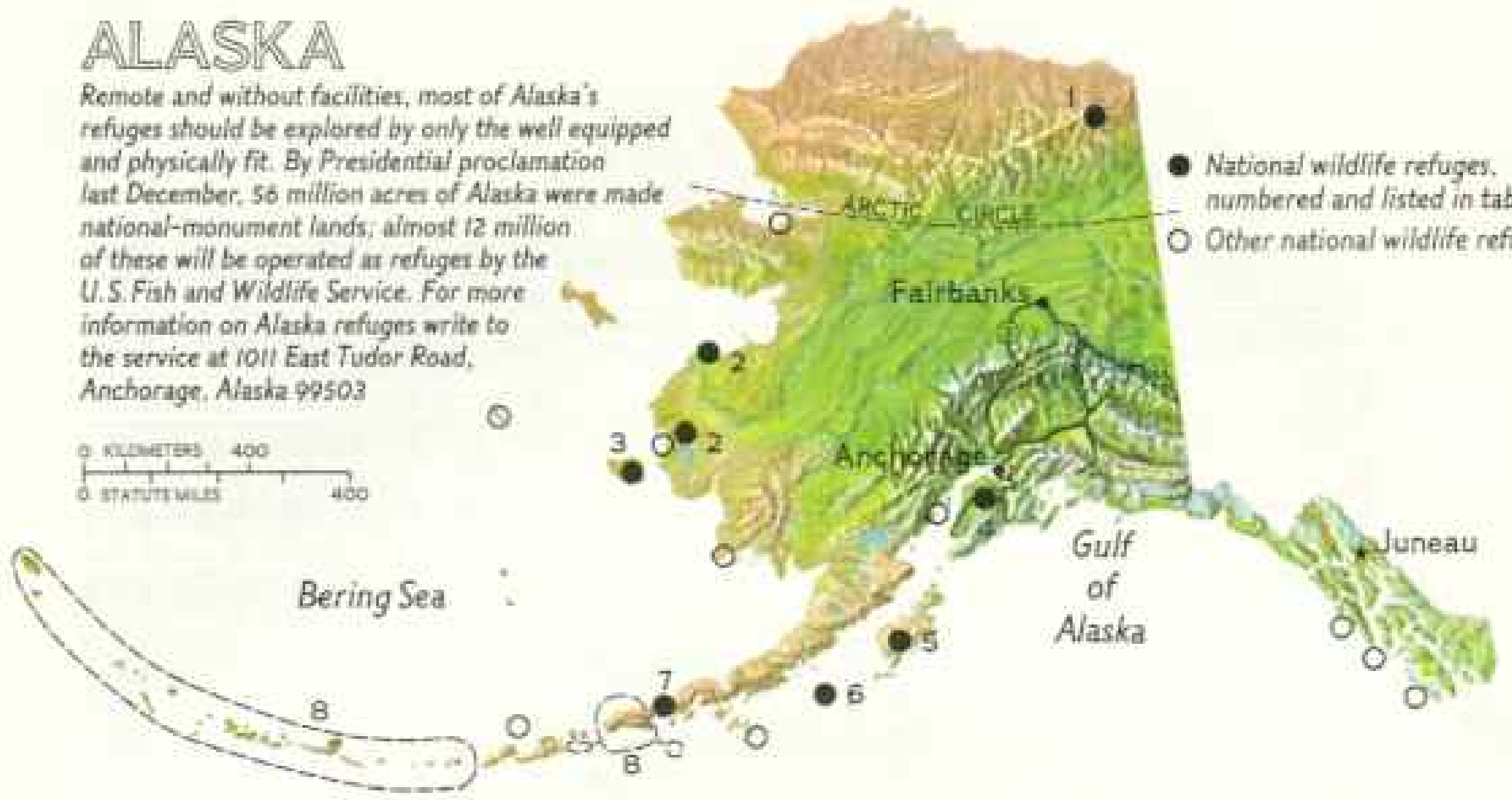
Wildlife refuges

		BIRDS	FISH	MAMMALS	AMPHIBIANS & REPTILES	SPRING	SUMMER	FALL	WINTER	FOOT TRAILS	AUTO TOURS	FISHING	HUNTING	BOATING	
OHIO	1	SENEY	■	■	■	■	■	■	■	■	■	■	■	■	1
	2	SHIAWASSEE	■	■	■	■	■	■	■	■	■	■	■	■	2
	3	OTTAWA	■	■	■	■	■	■	■	■	■	■	■	■	3
	4	MUSCATATUCK	■	■	■	■	■	■	■	■	■	■	■	■	4
TENN.	5	CROSS CREEKS	■	■	■	■	■	■	■	■	■	■	■	■	5
	6	REELFOOT	■	■	■	■	■	■	■	■	■	■	■	■	6
	7	TENNESSEE	■	■	■	■	■	■	■	■	■	■	■	■	7
	8	HATCHIE	■	■	■	■	■	■	■	■	■	■	■	■	8
MISS.	9	YAZOO	■	■	■	■	■	■	■	■	■	■	■	■	9
	10	NOXUBEE	■	■	■	■	■	■	■	■	■	■	■	■	10
	11	MISS. SANDHILL CRANE	■	■	■	■	■	■	■	■	■	■	■	■	11
ALA.	12	CHOCTAW	■	■	■	■	■	■	■	■	■	■	■	■	12
	13	WHEELER	■	■	■	■	■	■	■	■	■	■	■	■	13
	14	ELFAULA	■	■	■	■	■	■	■	■	■	■	■	■	14
FLORIDA	15	ST. VINCENT	■	■	■	■	■	■	■	■	■	■	■	■	15
	16	ST. MARKS	■	■	■	■	■	■	■	■	■	■	■	■	16
	17	CHASSAHOVITZKA	■	■	■	■	■	■	■	■	■	■	■	■	17
	18	J. N. "DING" DARLING	■	■	■	■	■	■	■	■	■	■	■	■	18
	19	NATIONAL KEY DEER	■	■	■	■	■	■	■	■	■	■	■	■	19
	20	LOXAHATCHEE	■	■	■	■	■	■	■	■	■	■	■	■	20
	21	PELICAN ISLAND	■	■	■	■	■	■	■	■	■	■	■	■	21
	22	MERRITT ISLAND	■	■	■	■	■	■	■	■	■	■	■	■	22
	23	LAKE WOODRUFF	■	■	■	■	■	■	■	■	■	■	■	■	23
GA.	24	OKEFENOKEE	■	■	■	■	■	■	■	■	■	■	■	■	24
	25	PIEDMONT	■	■	■	■	■	■	■	■	■	■	■	■	25
	26	SAVANNAH	■	■	■	■	■	■	■	■	■	■	■	■	26
S.C.	27	CAPE ROMAIN	■	■	■	■	■	■	■	■	■	■	■	■	27
	28	SANTEE	■	■	■	■	■	■	■	■	■	■	■	■	28
	29	CAROLINA SANDHILLS	■	■	■	■	■	■	■	■	■	■	■	■	29
N.C.	30	PEE DEE	■	■	■	■	■	■	■	■	■	■	■	■	30
	31	PUNGO	■	■	■	■	■	■	■	■	■	■	■	■	31
	32	MATTAMUSKEET	■	■	■	■	■	■	■	■	■	■	■	■	32
	33	PEA ISLAND	■	■	■	■	■	■	■	■	■	■	■	■	33
VA.	34	GREAT DISMAL SWAMP	■	■	■	■	■	■	■	■	■	■	■	■	34
	35	BACK BAY	■	■	■	■	■	■	■	■	■	■	■	■	35
	36	PRESQUILE	■	■	■	■	■	■	■	■	■	■	■	■	36
	37	CHINCOTEAGUE	■	■	■	■	■	■	■	■	■	■	■	■	37
	38	MASON NECK	■	■	■	■	■	■	■	■	■	■	■	■	38
MD.	39	BLACKWATER	■	■	■	■	■	■	■	■	■	■	■	■	39
	40	EASTERN NECK	■	■	■	■	■	■	■	■	■	■	■	■	40
DEL.	41	BOMBAY HOOK	■	■	■	■	■	■	■	■	■	■	■	■	41
N.J.	42	BRIGANTINE	■	■	■	■	■	■	■	■	■	■	■	■	42
	43	GREAT SWAMP	■	■	■	■	■	■	■	■	■	■	■	■	43
PA.	44	TINICUM	■	■	■	■	■	■	■	■	■	■	■	■	44
	45	ERIE	■	■	■	■	■	■	■	■	■	■	■	■	45
N.Y.	46	IROQUOIS	■	■	■	■	■	■	■	■	■	■	■	■	46
	47	MONTEZUMA	■	■	■	■	■	■	■	■	■	■	■	■	47
	48	TARGET ROCK	■	■	■	■	■	■	■	■	■	■	■	■	48
R.I.	49	NINIGRET	■	■	■	■	■	■	■	■	■	■	■	■	49
MASS.	50	GREAT MEADOWS	■	■	■	■	■	■	■	■	■	■	■	■	50
	51	PARKER RIVER	■	■	■	■	■	■	■	■	■	■	■	■	51
VT.	52	MISSISQUOI	■	■	■	■	■	■	■	■	■	■	■	■	52
ME.	53	MOOSEHORN	■	■	■	■	■	■	■	■	■	■	■	■	53

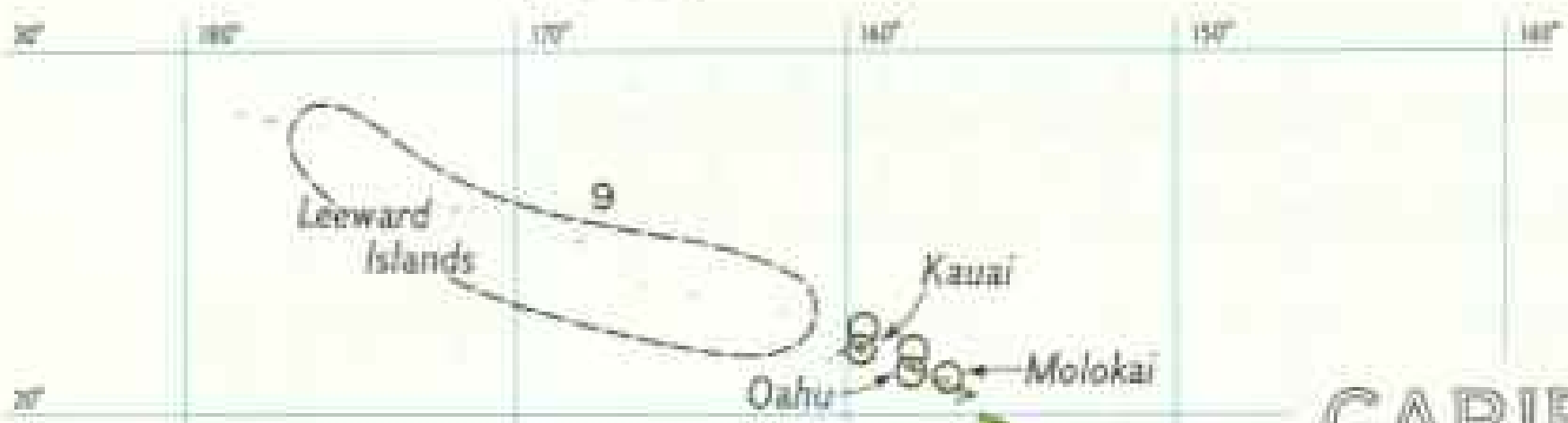
ALASKA

Remote and without facilities, most of Alaska's refuges should be explored by only the well equipped and physically fit. By Presidential proclamation last December, 56 million acres of Alaska were made national-monument lands; almost 12 million of these will be operated as refuges by the U.S. Fish and Wildlife Service. For more information on Alaska refuges write to the service at 1011 East Tudor Road, Anchorage, Alaska 99503

0 KILOMETERS 400
0 STATUTE MILES 400



● National wildlife refuges, numbered and listed in table
○ Other national wildlife refuges



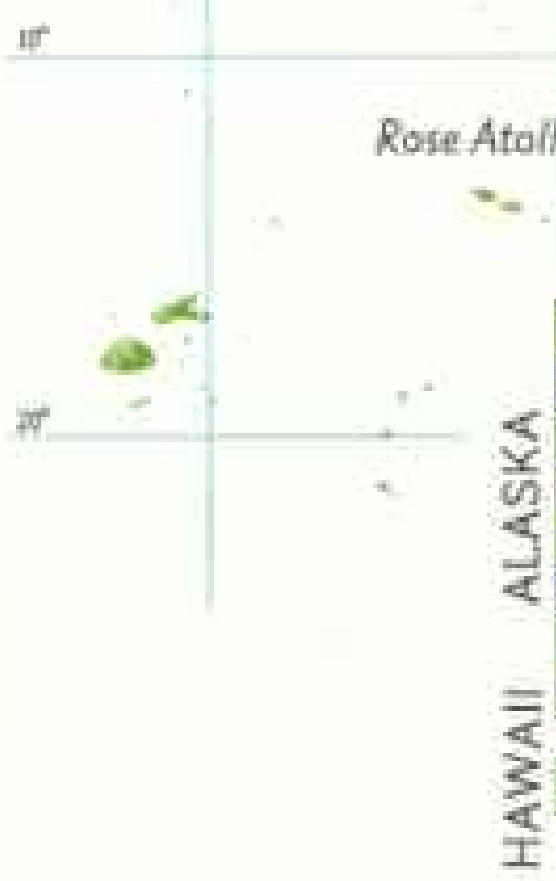
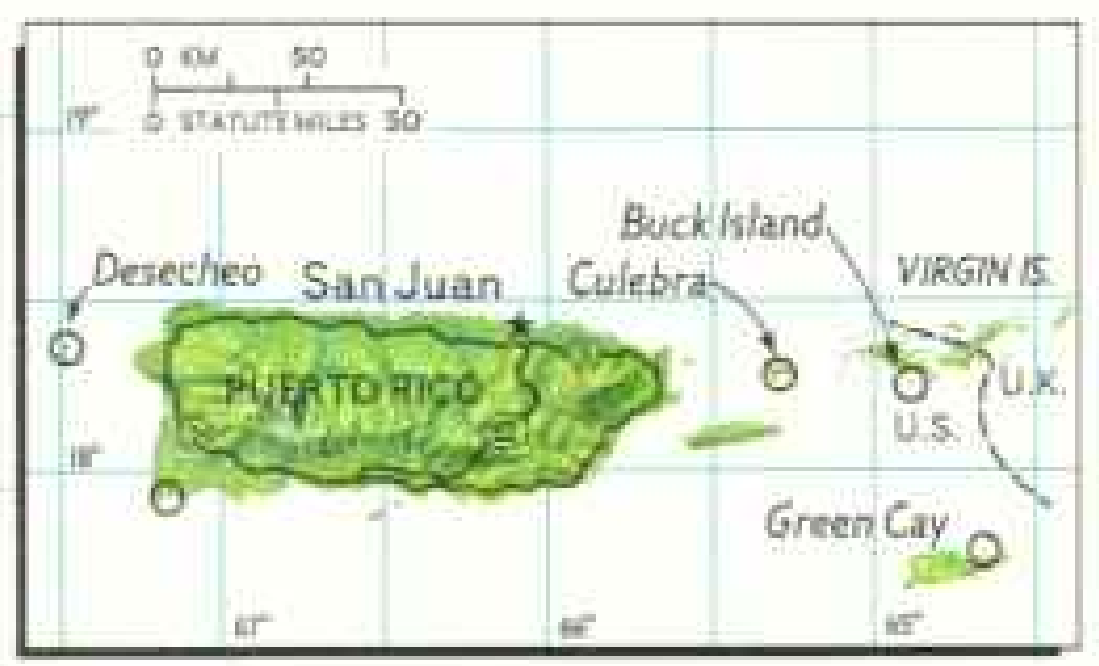
HAWAII

Three refuges in Hawaii can be visited, two on Kauai and one on Molokai. The Hawaiian Islands Refuge, spread over 960 miles in the Leeward Islands, is restricted to investigators with permits. Refuges on other U.S.-administered Pacific islands are not open to visitors.

0 KILOMETERS 800
0 STATUTE MILES AT EQUATOR 800

CARIBBEAN

Several U.S. islands in the Caribbean Sea hold true sanctuaries, which have not been developed for visitors.



Wildlife refuges

	WILDLIFE REFUGES	BIRDS				FISH				MAMMALS				AMPHIBIANS & REPTILES				SPRING				SUMMER				FALL				WINTER				FOOT TRAILS				AUTO TOURS				FISHING				HUNTING				BOATING			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4												
1	ARCTIC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
2	CLARENCE RHODE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
3	NUNIVAK	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
4	KENAI	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
5	KODIAK	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
6	SEMIDI	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
7	IZEMBEK	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
8	ALEUTIAN ISLANDS	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
9	HAWAIIAN ISLANDS	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								

(Continued from page 362) gulls—birds also found around harbors on the East Coast—circled overhead, while the wind, as if blowing over tidal flats, brought the plaintive crying of shorebirds. In mid-July the van of the southbound sandpiper host had arrived, led by lesser yellowlegs who peeped like baby chicks, only louder.

The glacier, melting back some 13,000 years ago, was succeeded by a rich grassland strewn with the sapphires of countless lakes, ponds, and potholes. The northern prairies teemed with waterfowl and grazing herds of bison and antelope. But man has been undoing the glacier's work; about 45,000 acres of wetlands are drained every year in North Dakota, mostly for farmland.

"The loss is certainly substantial and severe," said Charles S. Peck, manager of Des Lacs Wildlife Refuge, which has jurisdiction over Lostwood. "You see why the refuges are needed. The pothole complex that Lostwood incorporates puts it acre for acre among the top waterfowl-breeding refuges in the 48 contiguous states." Production in 1978 was 30,000 ducks and geese. It was a fifth more than the year before.

Most of Lostwood's 26,747 acres have never been opened by a plow, the manager told me. To which Dr. Gammell added: "It probably gives a fair idea of how the land looked to the first settlers, though lightning-set fires raging across unbroken prairie would have meant less brush. Fewer aspens, too, I suspect."

PROBABLY NO COUPLE is more closely identified with any wildlife refuge than Ann and Bob Gammell are with Des Lacs and Lostwood, which are 15 miles apart. I asked what the birding highlights of their many years had been. "Banding, I think," said Ann. "We banded 200,000 birds of 189 species before we decided the time had come to quit."

Bob added: "A western sandpiper with our band was found in Guyana and a semipalmated sandpiper just south of Cuba. And a yellow warbler in Honduras."

In March and late October come the migrating water birds: mallards, gadwalls, blue-winged teals, black terns, Forster's terns, and little eared grebes with blood-red eyes and golden cheeks beneath sable crests.



AMMODRAMUS BAIRDII

Superstar in its limited range, the Baird's sparrow (above) attracts birders from many states to the Lostwood Refuge in North Dakota's pothole country. Here it proclaims its territory amid one of the nation's most productive waterfowl areas. The refuge also teems with small mammals, like the thirteen-lined ground squirrel (below) refurbishing its burrow.



CITELLUS THIRTEENLINEDUS



"But the special attractions here are the upland prairie birds," Ann said. "For example, the Baird's sparrow" (page 371).

On the road to Lostwood and a favored Baird's locale, Bob said: "We'll be greeted by a grasshopper sparrow singing from a stalk of dock. He's had so many birders looking at him that when he sees a car he combs his hair." And there he was, his insect trill too high-pitched for me at my age. Before I had heard anything but the wind-borne fluting of a western meadowlark, Ann, with her acute hearing, had located several chippity-caroling Baird's sparrows.

Three black-and-white songsters, whose prairie home lacks commanding perches for recitals, mounted on vibrant wings to pour out their ebullient melodies in flight. These were the lark bunting, the bobolink, and—specialty of the area, exhibited by Ann with pride—the chestnut-collared longspur.

The white-tailed deer we roused in the wooded coulees—flat-bottomed ravines—were of polished mahogany. The winter coat, Bob said, is a grayer brown, of hollow hairs—for insulation. It is needed. Almost nothing in our climate exceeds the icy savagery of the prairie blizzard, to which even bison have sometimes succumbed.

"**T**HE POINT is to find the cold exciting!" exclaimed Vincent Ames, a high-school biology teacher from Grand Forks who was taking his class on a five-day field trip. I hiked with some of the students and learned much, especially about the flowers that made the needlegrass prairie a garden.

Hapless avocet may pay for a perilous nest site with the loss of its eggs (right), as water released from a dam north of Bear River Refuge rises. Yet these fertile marshes face a water shortage; as the river is diverted for farms, brine invades from Great Salt Lake. A yellow-headed blackbird flaunts its plumage (left) amid rushes where it nests.

Goldenrod, prairie coneflowers, golden asters, gaillardias, and sow thistles flecked the land with yellow. Prairie roses with two-inch blossoms added hues from white to deep pink. The spikes of pure silver, soft as kittens, were fringed sage.

A badger waddled to within thirty feet of one of the boys, while a sound like the truncated honking of a goose was identified by an assistant of Ames's, Terry Brokke, as the warning bark of a red fox. Terry showed me my first Sprague's pipit, a mote against the blue, holding its place in the wind. Another of Lostwood's drawing cards, the pipit sings at such a height as to be detected only by its strange voice, likened by Bob Gammell to the sound of a twirled lariat.

Ames explained that his students were expected to know about two hundred birds and as many plants. "But above all we want them to feel at home in nature." It seemed to me a worthy use to make of a refuge.

Ames believed that bison herds helped keep brush growth in check by trampling it. Now wolfberry and silverberry are spreading, at the expense of grassland and wildlife.

Not only bison but elk, wolves, and grizzlies are gone from this prairie. The plow, bulldozer, power shovel, and grader have succeeded them. Their unchecked reign, warns Robert E. Stewart, who writes of the state's birds, could turn North Dakota into "one of the most desolate, unattractive areas in the entire country." At least we may be grateful that 289,000 acres in North Dakota are safe within the national wildlife refuges, and that almost a million additional acres of waterfowl breeding grounds are under their protection.



ANTHROCEPHALUS ANTROCEPHALUS (FACING PAGE); *RECURVIBOSTRA AMERICANA* (ABOVE)

ONE REFUGE I was determined to visit above all: the famous one incorporating the delta formed by the Bear River where it flows into the northeastern corner of Great Salt Lake in Utah.

Writing of the Bear River marshes in September 1843, the explorer John C. Frémont declared, "The water fowl made this morning a noise like thunder." By the end of the century a gun club was advertising this area as "the greatest duck-shooting resort in the world." A promoter claimed that "I shot fifty-one days, killing 4,200." Had such slaughter continued, little would have remained. As it is, Brigham City, on the edge of the delta, proclaims itself on an arch across its main street: "Gateway—World's Greatest Game Bird Refuge."

On a cold May 17 at Great Salt Lake, rain was falling. But soon the overcast broke into battleships of clouds. Snow powdered the mountains that border the Bear River Migratory Bird Refuge—the Wasatch Range, rising five thousand feet above the valley, and the Promontory Range, where the continental rails were joined in 1869.

Against the blue sky glossy ibis passed in V-formation, pairs of ducks streaked, and baying geese ascended on mighty downstrokes. Franklin's gulls, dark headed and dark mantled, winged sportively, their cries those of happily scandalized schoolgirls. The more numerous California gulls, which nest in a colony 4,000 strong on the refuge, saved the Mormons from a plague of grasshoppers in 1848.

These gave only a hint of Bear River's treasures. Twelve of the forty miles of dikes that impound fresh water from the river are open to motorists. From them, as from few other places on the continent, you can grasp something of the abundance of wildlife that met the pioneers. "We've had peaks of a million waterfowl in fall migration," said Ned Peabody, the refuge manager.

The 65,000-acre refuge is a vast oasis in the central flyway, one of the four major continental avenues of bird migration.

"The refuge serves both as a stopover and nesting ground for a number of species," said Dr. Keith L. Dixon, an ornithologist from Utah State University at Logan. "It also is a crossroads, passing thousands of ducks between the central flyway and



From the mighty jaws of an Alaska brown bear, U.S. Fish and Wildlife Service biologist Vernon Berns extracts a vestigial premolar that will aid in determining the animal's age. Anesthetized with a dart shot from a helicopter during a radio-tracking study, this 1,300-pounder is among the largest of the species for which the Kodiak Refuge was established. He will awaken groggy but unharmed.

At Bear River, a male ring-necked pheasant (right) struts through a swarm of recently hatched midges—a major food source for the refuge's birdlife. A year-round resident here, the ringneck has become a favorite American game bird since its introduction from Asia a century ago.



URSUS ARCTOS (TOP), PHOTOGRAPH BY BERRY ATWELL; PHasianUS COLCHICUS (ABOVE)



OSWIDE HOSCHARTSKI PHOTOGRAPHS BY JERRY L. HOIT

Shaggy emissaries of goodwill, young muskoxen (above) await airlift to their ancestral homeland of Siberia after being netted on the Alaskan refuge of Nunivak Island (below). An

ear-tagged calf (right) will go to another range in Alaska. Once hunted to extinction in both Siberia and Alaska, the species was transplanted from Greenland to Nunivak in the 1930's.





the Central Valley of California, in the Pacific flyway."

I asked which birds had impressed Dr. Dixon's students most. "Western grebes and ruddy ducks, probably." I could appreciate that. The grebes, like small, ruby-eyed, fine-billed swans, but dark above and with more coiffure, swam in pairs, their heads drawn up and in like proud steeds. The ruddy ducks were dumpy little fellows but appealing, especially the drakes, chestnut red in breeding plumage, with white cheek patches, tails jauntily upturned.

Leah Foerster, an officer of the Utah Nature Study Society, and her husband, Richard, observed that male ruddy ducks remained with their mates during the rearing of the young. In this they differ from most male ducks and resemble ganders.

I caught up with the Foersters at a cattail swamp resounding to the chattering songs of long-billed marsh wrens. Chill and rain had not deterred the Foersters from adding another of the weekly visits they have made to the Bear River Refuge for ten years.

The Foersters had found that to first-time visitors a great blue heron was likely to be most striking. But if it was, standing statuesquely four feet tall or rising on massive wings, what can be said of a colony of 150 pairs, to which the assistant manager of the refuge took me?

RODNEY KREY is a young man from a Kansas farm. One evening we sped along, parka clad, in an airboat, skittering over the surface of channels and lagoons a quarter of a mile wide and less than knee-deep.

We sent chubby coots running frantically over the water to gain lift. We put up gadwalls with white wing patches, and cinnamon teals, the drakes in two shades of cinnamon with sky-blue shoulders. Finally the herons, legs dangling, rose from an island of bulrushes. With a hundred of the big birds flapping about us or settling in the shallows, we seemed to have stumbled back to a primeval time, long antedating the Ice Age, when Great Salt Lake was created.

The heron nests contained top-heavy chicks that looked as if clad in fuzzy winter underwear. Avocets, stilts, and Forster's terns circled (Continued on page 381)





Sojourners from the Pacific flyway, white-fronted geese head for grainfields



AMSER ALBERTSONS

planted especially for waterfowl at the Tule Lake Refuge in northern California.



When love sweeps the prairie each spring, the male sage grouse takes the prize for sexual strategy. With each noisy deflation of his air sacs, with each step of his hours-long



CENTROCERCUS UROPHASIANUS. PHOTOGRAPH BY DON BOYFARRE

dance, he competes for the favor of a mate at Wyoming's National Elk Refuge.

with shrill and grating cries. Their own nests, grass-lined depressions, sprinkled a nearby islet.

Birds' eggs have always aroused human acquisitiveness, and some visitors to the refuge are unfortunately not immune. A raven nesting at the top of an observation tower recently lost a whole clutch of eggs and four of a later laying—though the remaining three, we found, had hatched out lusty young. Avocets and killdeers, which nest in the gravel of the dikes, are especially vulnerable. They try to draw an intruder away by hobbling off before him, dragging their wings and crying piteously.

The Foersters had exclaimed over the five thousand whistling swans that throng the refuge during spring migration. But in their absence no sight was as thrilling, I think, as that of white pelicans soaring in stately calm on wings nine feet between tips.

ABUNDANT though they seem, waterfowl using Bear River have declined drastically in numbers in recent years. The main causes probably are destruction of breeding habitat in the northern plains and conditions at Bear River, including a reduction in the amount of fresh water that sustains the marshes.

Originally the river's flow sufficed to hold back the lethal waters of Great Salt Lake. But growing demands for water for agriculture, industry, and domestic use upstream have reduced the flow. Without the dikes, thousands of acres of marsh in the river's delta would be doomed by the influx of salt water. The refuge manager believes that if the refuge is provided with its own upstream impoundment, from which water would be released to the lagoons in the dry summer, its future would look brighter.

But would it survive even then? Human demands on resources essential to other life seem likely only to grow. The time may come in the arid West when any deflection of water from human use will be fought. That would threaten the Bear River marshes.

Yet it is also true that we rejoice in the variety and charm of our fellow creatures in those marshes, which show us that we ourselves would be the losers from the monopolization of the earth's bounty by our grasping, prodigal species. □



Denver, Colorado's Rocky Mountain High

By JOHN J. PUTMAN

NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by DAVID CUPP

*And the Colorado Rocky Mountain high
I've seen it rainin' fire in the sky
You can talk to God and listen to the
casual reply
Rocky Mountain high*

© 1971 CHERRY LANE MUSIC CO.

MY HIRED HELICOPTER circled greater Denver like a skittish mosquito. It veered away from the busy flight paths of Stapleton International Airport, from the adjacent arsenal, where the United States Army stores its nerve-gas bombs, and from the sprawling Rocky Flats facility, where plutonium is machined into trigger parts for nuclear weapons.

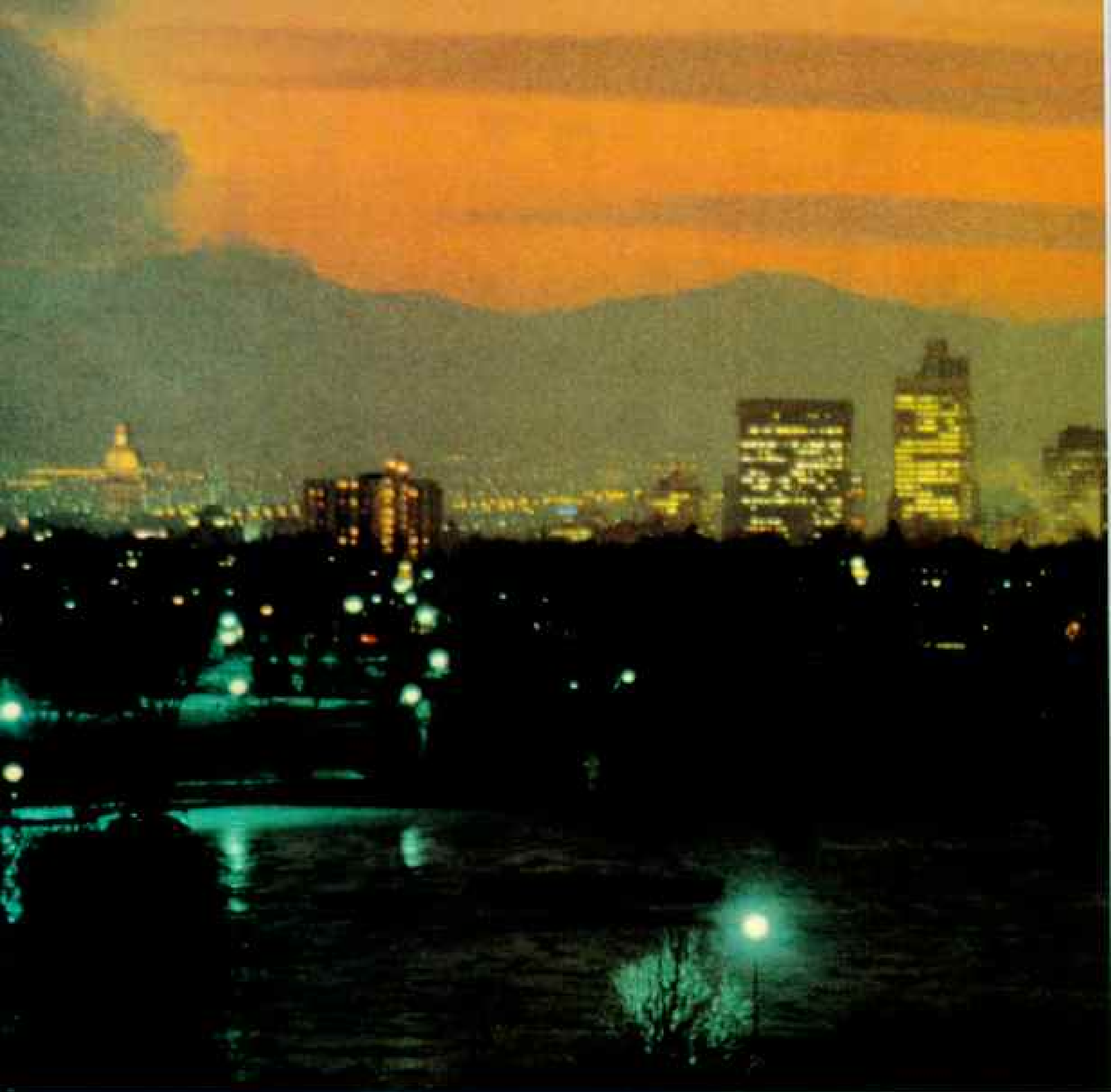
Signs of growth were everywhere. The metropolis is the fourth fastest growing in the nation, its population swollen to 1.7 million, more than twice that of 25 years ago. A dozen new skyscrapers gleamed downtown, and beside them rose the steel girders of more to come. The barnacle-like encrustation of warehouses along Interstate 70 pushed eastward, toward Kansas City.

To the west, housing developments had been notched into the foothills of the Front Range, while to the southeast and south spread a vast suburban sea. The metropolis's borders were marked, for the moment, by bulldozers scraping former ranchland, and by the tracery of street curbs set in the raw earth, outlining the shapes of the communities soon to rise there.

From a distance the city seemed to sit on land as flat as a tabletop, the mountains to the west no more awesome than the great flat plain that rolls eastward as far as the eye can see.



"We're number one!" Fans root for the "Orange Crush" Broncos, who in 1977 won the American Football Conference Championship for the first time. Denver also counts itself tops among cities. This hub of the mineral-rich Rocky Mountain region is reflected in the new headquarters of the Anaconda Company (above).



Firmly planted on the Great Plains, the capital of Colorado looks to the mountains for its wealth. A mining camp of 25 cabins in 1858, Denver grew with successive booms in gold and silver. World War II brought federal installations to this "safe" inland site, and many veterans settled here for good. Today the region's oil, coal, gas, and uranium help make Denver, with 1.7 million people, second only to Houston as an energy giant, while nearby ski slopes and hiking trails appeal to all who love the outdoor life. Here, seen from City Park Lake, the skyline and the State Capitol, left, blaze with light.

It is that great, dry plain that gives the city an aura of remoteness, of isolation. It is the mountains that lend it an aura of promise. It was thus when Denver was founded 120 years ago by a handful of gold prospectors and land speculators. It remains so today.

The promise varies: For some it is a fortune to be made, or profits; for others, a better opportunity, or the good life in the sun; and for others yet, simply a chance, or even a refuge.

Arnie Greenberg arrived at his office on 17th Street, the Wall Street of Denver, at 6:45 a.m. He wore blue jeans, a sport shirt, loafers. There was a quick cup of coffee, and



Arnie and two women assistants sat down at a large table laden with telephones, switches, and a squawk box. The equipment linked them to brokerage offices along the street and across the country.

Arnie's company wholesales over-the-counter stocks, maintaining a market in 150 to 170 of them, ranging in price from ten cents to five dollars. And 80 percent are Rocky Mountain energy stocks.

At eight the phones began to ring.

"Lexicon," one woman called out. Arnie punched in Lexicon Resources. The computer flashed the bid and quote prices.

"How many's he got?" Arnie asked.

"Ten thousand."

"Buy 'em."

The phones kept ringing.

The names flashing up on Arnie's computer screen were unfamiliar to me: American Quasar, Arapaho Petroleum, Basic Earth Science Systems, Helmet Petroleum, Chaparral Resources, Echo Oil, Rainbow Resources, Solaron. . . .

But they were names that help explain Denver's present boom, names that lie behind the nation's newest big energy play. For locked in the Rocky Mountain region is 90 percent of the United States' total uranium reserve. And vast proven and potential





All-night show on Broadway, bargain hunters snooze along the Denver thoroughfare before a Labor Day ski sale at Gart Bros., largest sporting-goods store in the world. When doors open, 10,000 customers—from as far away as Long Island and San Diego—engulf red-shirted clerks (above). Upstairs, the Ski Machine, a carpet treadmill rotating at eight miles an hour, is a year-round training slope (right). After Thanksgiving, customers and clerks alike head for mountain resorts that promise some of the finest powder snow anywhere.

Outfitter for the region for generations, Denver caters especially to millions of vacationists who pour in year round. Many goods are made in the area, from cameras to luggage to sew-your-own sleeping bags.





In a star-filled evening, Denver oilman and philanthropist Marvin Davis, center, is host at the Carousel Ball to raise money for the Children's Diabetes Foundation of Denver. The benefit drew, from right, actress Lucille Ball, Colorado Senator Gary Hart, former New York City Mayor John Lindsay, and former President Gerald R. Ford.

reserves of oil, gas, low-sulfur coal, and shale oil that comprise perhaps the greatest concentration of hydrocarbons in the world.

They've been there all along, but only a few independents were searching them out. Men like Marvin Davis (above), who came from New York City to build a multimillion-dollar fortune, and the Hamilton brothers, who took time out to make a significant oil find in the North Sea.

Oil Companies Overlooked Rockies

The major oil companies were playing the foreign scene, where the economics were better. They let their Rockies leases go. Then came 1973, the oil embargo, soaring petroleum prices, the perceived oil shortage, the need for additional energy resources. Suddenly the Rockies looked awfully good: The economics had changed.

Independents began to come south from Canada and north from Texas, Oklahoma, Louisiana. Along with them came the drilling companies and the support outfits. And back came the majors—to find out what was

going on, to make their land plays and farm-outs, to back the independents, and to buy the production.

Everyone looked for a headquarters, and Denver, with its amenities and good airline connections, was it. The energy men settled in, close together, like crows on a telephone wire. In the past four years the number of small energy companies in Denver has nearly doubled, to 1,700.

The typical Denver oilman is well-suited, college-trained, carries a briefcase, and is indistinguishable from a banker or broker. Take a look into any of his favored luncheon places—the Petroleum Club, the Palace Arms, Renie's, or the Brown Palace Club, where I talked with Brian Spillane, a vice-president of Rainbow Resources. Brian is tall, soft-spoken, a native of Detroit. Rainbow is representative of the small independent companies that drill 90 percent of the wells in the U. S.

Rainbow was started by a couple of geologists in 1969. "Back then," Brian said, "nobody was much interested in the Rockies. So

for a number of years we'd go out and lease acreage at a couple of bucks and do the geology on it. Then, when a discovery was made in the region and the land play moved toward us, we'd sell out for ten."

In time the company felt ready to go after production, to drill. Like most independents it went looking for partners to share risk (eight out of ten wildcat wells come in dry) and to supply capital.

"You sell, say, 75 percent interest to two or three partners who agree to a drilling program. You don't share in the cost of drilling the well, but you share in the production."

Brian and his Rainbow colleagues have been successful. Half of Rainbow's revenue now comes from shares in 250 to 300 producing wells. The company holds, with partners, four million leased acres. Stock that sold for fifty cents in 1969 now commands, after a corporate merger, twenty dollars.

Brian, like the other oilmen I talked with in the city, was bullish on the Rockies.

"Here there's still the opportunity to find a major field, and that attracts people."

We finished our sedate oilman's lunch—broiled salmon and a glass of wine—and Brian took his leave. He was working on a deal: "84,500 acres in Montana, a shallow gas play." All around town, men were leaving luncheon tables on similar missions.

Uranium: A Good Bet

Dealing with investors is similar for Denver's thirty or so small independent uranium companies, but the amounts of money and the time spans differ. "You're talking about twenty to forty million dollars and seven to eight years to get a mine in production," Bob Bailey, president of Power Resources, told me in his offices.

"And there's another difference. We have only one type of customer, public utilities with nuclear power plants. Today there are problems and delays with these plants. But we like uranium. We think it has to come." So too do energy majors like Conoco and Shell Oil and others. They're here, betting on the come. . . .

The long trains are already carrying Rocky Mountain coal eastward, but the coal men will tell you that they have only scratched the surface. They complain of delays: delays in getting new leases from the



Modern stampede to the Rockies brings a hundred settlers a day to the Mile High City. The Denver megalopolis may eventually reach from Fort Collins all the way to Colorado Springs.

Government, delays over environmental-impact statements, delays from a shortage of railroad cars, delays in plans to carry coal eastward in great slurry pipelines.

Still, the majors have moved in, Consolidation, Peabody, betting on the come. . . .

As for shale oil, its production has been feasible for more than a century—once the price of petroleum climbed high enough to make it economic. But every time petroleum prices have gone up, so has the price of producing shale oil. Yet, big companies like Amoco are here, pouring millions of dollars into development, betting on the come. . . .

Others, too:

Japanese looking for steam coal for the 1980's. West Germans seeking to buy partnerships in coal and uranium developments. Italians, Norwegians, and Frenchmen looking over the oil play. Iranians making inquiries about mineral and real-estate opportunities at city banks and suburban-development offices.

Mexican money is starting to pour into

condominiums at Vail, so much that this year its ski instructors are learning Spanish and trail signs will be bilingual. But by far the biggest influx of foreign investment has come from Canadians. And by far the boldest symbols of their presence are Denver's gleaming downtown skyscrapers. Many have been built by Canadian companies: the Great West Towers, put up by the Winnipeg insurance company of the same name; Denver Square, being built by U. S. and Canadian partners; and the Anaconda Tower, at forty stories Denver's tallest (page 383).

Clearly, Canada is bullish on Denver. So too are U. S. companies. Driving about the city and its environs, you'll find: Johns-Manville, its shiplike headquarters building tucked below the foothills; Martin Marietta, building Titan launch vehicles; a United Airlines facility training pilots for more than a hundred domestic and foreign lines; regional offices of Diners Club, Eastman Kodak, Pentax, and others.

Mile-high Capital of the Rockies

The swirl of new money has stimulated Denver's traditional business, serving as the marketing and distribution center of the Rocky Mountain states. "Everybody has a warehouse here now," one banker said. "All the major firms are here with something." Six railroads, 160 interstate trucking lines, hundreds of thousands of square feet of warehouse space help fill the needs of a region as large as western Europe.

Undergirding it all is a federal presence of some 33,000 jobs. Federal activities range from a U. S. Mint (22 million coins a day, mostly pennies), to the new Solar Energy Research Institute, to the Air Force accounting office, to the controversial chemical-warfare and plutonium facilities.

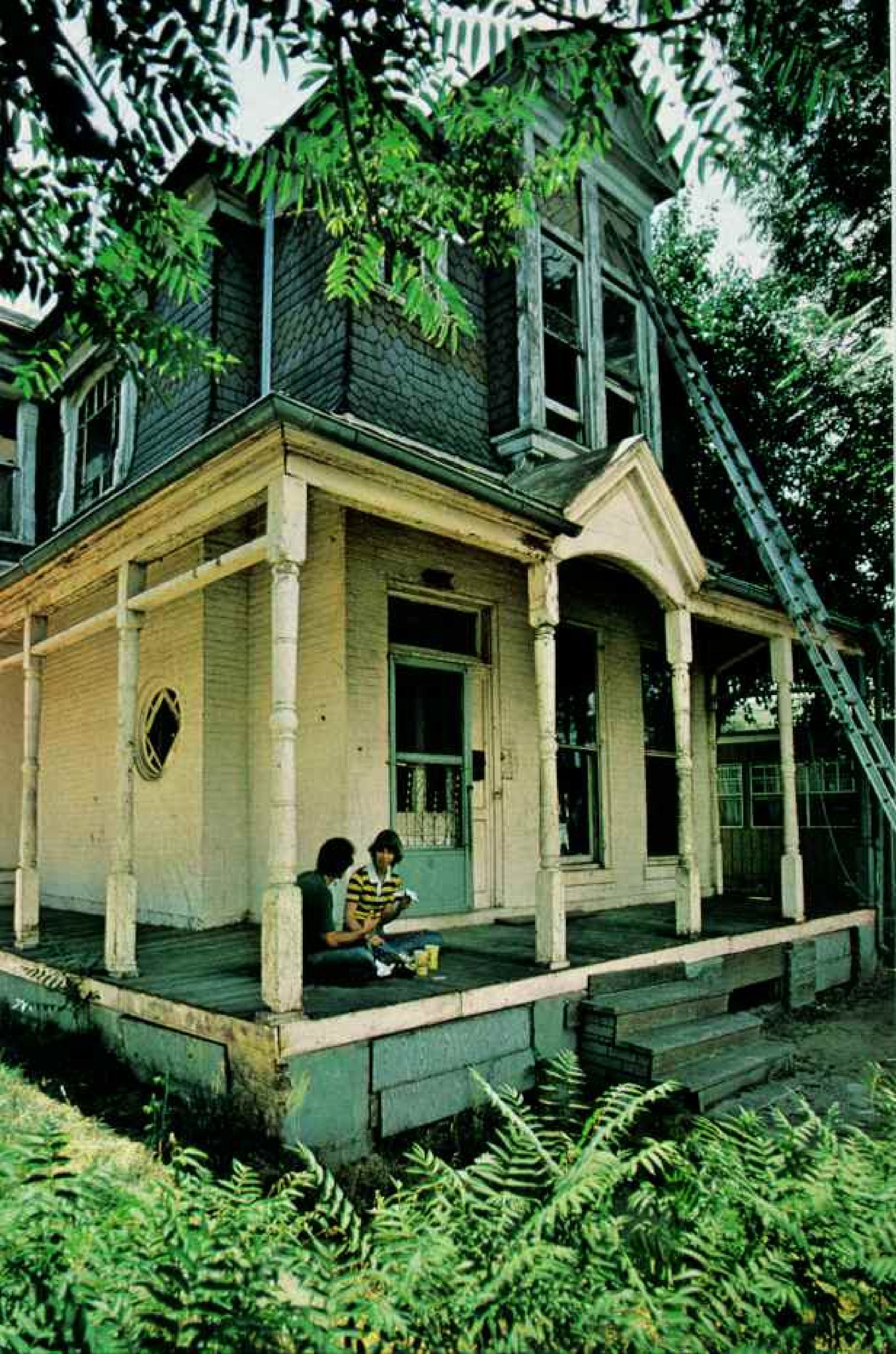
All this economic activity creates tens of thousands of new jobs each year. People come happily to fill them. Many more come, job or no job.

"The kids started arriving in the sixties," another banker told me. "A lot to attend college. The University of Denver has an enrollment of 7,500, but only half are Colorado kids. The University of Colorado at Boulder is more than 30 percent out of state. And a lot just stay on. They love the mountains, the skiing, the open-air life."

Chicano power on the rise: Denverites with Spanish surnames make up 20 percent of the city. Many trace their ancestry to Spaniards of Colorado's San Luis Valley and Mexican migrants who built the state's railroads and tilled its sugar beets. Stung by discrimination, many joined the 1960's protests and voter-registration drives organized by Rudolfo "Corky" Gonzales (right, in dark shirt). Gonzales, dissatisfied with the public schools, founded a bilingual Chicano academy where he instills pride, partly through the sport of boxing. At a baptism at Our Lady of Guadalupe Church (below), parents and godparents promise to help children reach their highest potential.







It seems as if nothing stands in the way of the once sleepy Denver area fulfilling the prophecy of demographers that its population will grow to 2.5 million by the year 2000. Nothing, except maybe water.

The great plain on which the city sits is semiarid, receiving only 14 inches of precipitation a year. Ninety-eight percent of the water comes from snowmelt in the mountains. Reservoirs collect the water in the spring, hold part of it for the summer, part of it for the dry years that come from time to time. Tunnels and canals funnel it to the metropolis.

I stood in the office of James Ogilvie, Denver Water Board manager, looking out a big window toward those mountains. "The last few years were bad. Little snow. The reservoirs were drawn down to critical levels, and we had to limit the use of water. Then we had all that snow last winter. It's as if somebody bailed us out."

I asked about the future. "We should have enough water for the projected population growth until 2000. After that I don't know. We could divert some water from marginal farm use—95 percent of Colorado's water goes to agriculture. And we're working on a project to recycle used water—to take water from sewage, reconstitute it, and filter it back into the system."

To Grow or Not to Grow

Water, the gift of the mountains, has become a matter of controversy, a part of the struggle between those who want continued growth and those who want to moderate it.

It is a lively struggle, fought in the law courts, the legislature, the voting precincts. The "no-growthers" point to the brown cloud of pollution that often hangs over the city, hiding the mountains and giving the area an air-quality index second only to Los Angeles in pollutants. As in Los Angeles, the causes are automobile emissions and temperature inversions—warm air sweeping in over the mountains and settling down over the old cold air, holding it there to absorb more and more pollutants.

The no-growthers also fear the city will become a huge megalopolis, sprawling from Fort Collins in the north to Colorado Springs to the south, smothering both the wide-open spaces and the easygoing ways



Another chance for the down-and-out: An emergency team of Marie Webb and David Culp help street alcoholics into a van headed not for jail but for a treatment center. Since Colorado decriminalized public drunkenness in 1974, the city has set up a program providing care and counseling to 500 people a month. Neglected housing finds friends in Tom and Cathy Wolff (facing page) as restoration sweeps the Curtis Park neighborhood.



From sagebrush to suburb in five years, Jefferson County's Ken-Caryl Ranch is being transformed into the largest planned community in Colorado. Owner of the 9,000-acre

that have drawn so many people. And they fear all the problems of the larger, older cities elsewhere.

While the no-growthers and the boosters struggle, others work to ensure that whatever happens, the city will not know those problems.

"Once a city goes bad, it's awfully hard to resurrect it. We've started pretty early to prevent that, and I think we've got a good chance." Philip Milstein, executive vice-president of Downtown Denver Inc., was conducting me on a walking tour of his city.

Changes Uproot Old-time Residents

The results of urban renewal and other efforts to prevent the decay of the urban heart of the city are impressive. The new towers are banked with plazas, fountains, small parks. There is a bold new six-million-dollar art museum, a glittering new Center for the

Performing Arts, costing 41 million dollars.

Developers are moving into deteriorating areas, converting whole blocks of buildings into shops, offices, homes. And young couples are moving back into the city (page 392).

If any city has a chance, Denver seems to have it. In time the downtown streets, now uncrowded after working hours and on weekends, may become alive and vibrant.

The changes are displacing some older inhabitants. As young couples begin to move into inner-city neighborhoods, buying and restoring old houses, prices and taxes shoot up. The less affluent must move, including the denizens of skid row down at the corners of 21st and Larimer, and 17th and Market. As development came, the city responded to their problem with Denver C.A.R.E.S., which stands for Comprehensive Alcoholism Rehabilitation and Evaluation Service (preceding page).



parcel, Johns-Manville Corp. develops a third of it, saving the rest for parks and a cattle ranch. Open space and good weather make Denver a favorite of hot-air balloon enthusiasts.

I rode the C.A.R.E.S. van with David Culp and Debra Klinefelter, both 22, both working their way through community college.

"We picked up 436 persons last month," David said. "A lot come in on trains. They winter in Phoenix, for the climate, or in Salt Lake City, where the Mormons have a good mission system. In spring they return."

There was Louis, asleep on the sidewalk in front of a bar; Donald, found in the middle of busy 13th Street; Muskrat, who liked to doze under the trees along Cherry Creek; and Chuck, stretched out near the entrance to the Columbia Hotel.

Chuck had been through detoxification before and willingly climbed into the van.

He talked of being an infantryman in Korea, of being wounded, of things turning bad thereafter, of the veterans disability check that enables him to live.

The van turned into the detox center.

"You're not gonna take my boots, are you?"

"No, Chuck," Debra answered. "We're not going to take your boots." Chuck relaxed. Inside there awaited a shower, medical examination, fresh hospital clothes, counseling, good food, and one more—albeit small—chance.

Concrete Keeps Buffalo Bill Down

The monuments of the city's past are, like the city itself, not very old. There is the Buffalo Bill museum, and his tomb up in the foothills (buried under a ton of concrete to prevent the citizens of Cody, Wyoming, among others, from stealing the remains). There's the Molly Brown house, recalling that brave voyager and persistent social climber. And the D&F (Daniels and Fisher) clock tower, the preeminent landmark that was saved from the same wrecker's ball that

destroyed the old 1879 department store.

But my favorite monuments are the city's churches, for they trace the different peoples who have come to Denver. In Globeville, a working-class neighborhood, there stand within three blocks of each other a Russian Orthodox church, complete with iconostasis and silver wedding crowns, and a Polish Catholic church.

There is also, not far down Interstate 25, Our Lady of Guadalupe Church.

"St. Stephen, pray for us; St. Jerome, pray for us; St. Donald, pray for us." Father Pat Valdez went along the line of parents, godparents, and grandparents that stretched all the way from the altar rail to the church door (pages 390-91). He lifted the white dresses of the infants they held, anointing chests and backs with oil.

Twenty infants had been baptized that afternoon at Guadalupe, 36 the Sunday before. During the preceding year, 1,100. Guadalupe is one of several parishes serving the fast-growing Mexican-American community, largest minority in the city of Denver. Mexican-Americans comprise 20 percent of the general population, 30 percent of the school population.

Maintaining a Strong Heritage

Guadalupe is the parish for 50,000 of those people. The church stands across the street from a sheet-metal company; Interstate 25 seals it off from downtown. Goats and sheep graze the side yard, pets for the children. There's a rich Mexican flavor in the tortillas prepared in the parish hall by the women, in the guitar and Mexican dancing lessons, in the Mariachi Mass at eleven each Sunday, when worshipers fill the aisles and flow down the steps.

It is a good place to follow the struggle of Denver's Mexican-Americans looking for a better chance.

Father José Lara, the rector, bearded, spectacled, slightly stooped, recalled his arrival in Denver in 1961. He and another young Spanish seminarian had been sent by their order to complete their studies in the United States.

"We had been two days on the train from New York, not knowing the language. Then at the railroad station here, we found a man who could speak Spanish, and with a special

flavor. So we asked: 'Are you Mexican?' Immediately there was a certain hesitancy. The priest who accompanied us took us aside, and in a gracious way said, 'You don't say that word here.'"

In time things began to change. Mexican-Americans, their numbers swelling, began to march, to demonstrate, to call on the mayor's office. They protested alleged police brutality, "liberated" the parks, picketed a newspaper that portrayed them in unflattering terms. They demanded jobs, a bilingual school program, Mexican-American teachers, and an end to discrimination.

Father Lara marched with them. And when the Chicanos began to organize themselves politically, he was in the thick of it. A member of his congregation was the first Mexican-American to win a city-council seat. It was won in classic American style, after a hard-fought battle with an Italian-American incumbent.

So when I last visited Guadalupe—on Mother's Day, when the street by the church is closed off and there is music and beer and dancing and flowers for the mothers—Father Lara could introduce me not only to restaurant and hospital and construction workers, but also to the city councilman, a state senator, and a handful of rising young businessmen.

Many of Denver's Mexican-Americans have begun to enter the system. As they do so, other newcomers arrive.

Refugees Find a New Home

Rainy day. An apartment in South Lincoln Park Housing Project. Four men sit watching the Indianapolis 500 race on television. The four—Ly Fu, Seng Lee, Ly Geu, Yang Chee—are Hmong tribesmen, lately of Laos. Ly Fu, 45, is a former major in the Royal Laotian Army.

The United States had no stauncher ally in the war in Southeast Asia than the Hmong, some three hundred and fifty thousand people dwelling in the mountains of northern Laos. The Pathet Lao, the Communists, had no stauncher enemy.

Then one day it ended: The Americans went home. When the Pathet Lao gained control of Laos, the Hmong began to flee. These men were lucky; they crossed into Thailand before crossings were restricted.



Hmong still manage to get out of Laos and into Thailand and onward. A couple had arrived in Denver only two weeks before. The city's Hmong colony now numbers 650. But countless others remain trapped in their homeland.

"We don't understand," said one of the men. "There is nothing in the newspapers here about Laos, about what is happening there. Why is there nothing?"

Outside, Ly Phoua, the major's 15-year-old daughter, stepped daintily around the mud puddles. She wore a traditional Hmong costume: black dress trimmed in blue, green, red; a tiara; a silver necklet; and a belt of coins—old French piasters—that rang like wind chimes.

The women brought other mementos: bamboo flutes, stamps, woven cloth. The major picked up one flute and began to play. It was a sweet melody: "You are your parents' daughter; you are beautiful." There was laughter and applause and the women began to talk with animation. The major

With good reason for glee, Hmong tribesman Yang Chee (above, right) plays with his Denver-born child. A school teacher in Laos, he escaped when Communists took over in 1975. Under Lutheran Church sponsorship Chee and his wife reached Denver. A dozen family members followed, including a niece (below) who wears a silver-trimmed token of home. Since 1975 more than 3,000 refugees from Southeast Asia have settled here; 25,000 were admitted to the U. S. last year.





Regardless of sex, age, or previous condition of lassitude, the people of Denver turn out for athletics in record numbers. Newcomers quickly acclimatize to the mile-high altitude that at first leaves them panting. The city provides the setting with more than 150 well-equipped parks in every part of town. Unique in the nation, Denver even owns parks and a ski resort miles away in the Rockies. In town at Bible Park, flag football holds sway; at Sloan Lake, it's waterskiing; and at Pulaski Park on weekends women's rugby reigns (upper right). Here a line turns into a maul



as a Denver team, the Scarlet Harlots, takes on the Screaming Golden Zonkers, a group begun by students at the Colorado School of Mines in Golden. On Mondays these players turn back into orderly teachers, systems analysts, forklift operators, aerospace engineers, housewives, and students.

At Robinson Park coed volleyball teams keep 12 nets in action (upper left). All over town, running gains in popularity. Of 841 people who started the Mile High Marathon last May, 751 crossed the finish line at the Brown Palace Hotel (right).



kept playing, but seemed withdrawn. In his mind's eye, I was sure, he was seeing the green hills of northern Laos, green hills he was not likely to see again.

Orphans Received With Open Arms

In the closing days of that same war, some three thousand Vietnamese orphans were rescued, flown to the United States, and adopted by U. S. families. Two hundred of those children now live in the Denver metropolitan area.

Thais and Koreans come not as refugees, but as immigrants. The Thai community

has grown swiftly. In 1977 they were able to bring three more Buddhist monks from Thailand to join the original one at their temple, a former Salvation Army building at 48th and Julian. Each morning and evening, as the rush-hour traffic roars along Interstate 70 outside the temple, the monks in their flowing saffron robes light candles and intone their prayers: "Purified is the Buddha; vast as the ocean is his all-inclusive Compassion. . . ."

When United Airlines Flight 463 arrived at Stapleton International Airport from New York, four passengers were greeted in



Russian style—with small bouquets of carnations and great hugs. The Yakubovich family—Marat, Larissa, and their children, Demetry and Alexander—ended an odyssey that had taken them from Kiev to Vienna to Rome to Denver. They were among scores of Soviet Jewish families to arrive in the city since the Soviet Union began to permit limited emigration in the early 1970's.

They were greeted by two cousins, Tamara and Ruvin, who had preceded them 16 months earlier, and by representatives of the Jewish Family and Children's Service. The agency had rented an apartment for them

bottle of Russian champagne and a carefully wrapped set of cups—only one was broken.

"To our new country," he toasted.

"To your success," I replied.

Black Senator Believes in Denver

The poster in State Senator Regis Groff's community office on Colorado Boulevard depicted a black child in tattered clothes standing in an ill-kempt yard. It read: "God made me; God doesn't make junk."

Regis switched the TV in the reception room to a basketball game and took a chair. "It's a cheap office," he said. "Ninety-nine

Sounds of controversy ring across the range at Rocky Flats outside Denver, where protesters have mounted a full-time demonstration against a federal facility manufacturing plutonium parts for nuclear weapons. Buddhist monk Katsuzo Sawada (left) chants a call for peace. Nearby towns express growing concern about possible radioactive leaks. The plant, employer of 4,000, now welcomes public discussion and tours, while improving air-filtering and water-recovery systems. In a smoke-filled room (right) masks are tested for fit.



and would shepherd them along until they could stand on their own feet.

We loaded their eight bags into two cars, stopped by the agency to pick up linens, by a Safeway to buy groceries, and then proceeded to the Avondale Apartments on the west side, just beyond Interstate 25.

It took us three trips to carry everything through the entrance and up the elevator to the sixth-floor apartment. Marat, 36, told me that he had been a soldier, a machinist, a barber. His wife is a beautician. "We will open a big beauty shop," he said. Cousin Tamara added, "And my husband and I will help them. As in the Soviet Union, one hand washes the other."

When the last of the goods was stashed, Marat dug into a suitcase. He produced a

bucks a month, thirty-five for the phone."

I had met Regis a few days earlier in the senate chamber in the capitol downtown. There was plush red carpeting; stained-glass windows depicted solons of days past, all white. Regis is the senate's only black, the second to serve in that august body.

Regis had said that Democrats were outnumbered in the senate, and that he often felt his most effective work was done at the community office.

So I joined him there.

The petitioners begin to drift in: a young man seeking funding for a plan to help juvenile offenders; an older man who wants a transfer from one federal job to another; a woman whose vocational-rehabilitation project was harassed by state authorities





who seized her files; a white insurance executive who wants Regis to discuss state insurance regulations.

Now and then, when Regis took a break, we talked about Denver's black community.

"Eighty-seven thousand people, in some ways exceptional. An unusually high level of education. There are few factories here, so the undereducated must move on.

"Housing? I have never been in another city where the total black community has housing as good as we have. In a way it's deceptive. There are a lot of poor blacks. As in most cities, unemployment is about twice that of whites."

Regis noted a recent trend among the black community: blacks moving out of the city into the suburbs. "As they move out, we're losing our old political power bases, and that's all we've ever had."

There is also the threat of reapportionment in the 1980's. Since 1970 all the surrounding counties have experienced a population growth averaging 40 percent, while the city has grown only 1.5 percent.

"My district may go up north and east into Adams County, or way down into southeast Denver. Which means the old safe seat I've always had—90 percent Democratic—will change drastically."

Aurora Outshines the Competition

When Regis's old constituents move to the suburbs, some may go to the city of Aurora, which abuts the city of Denver. Aurora is not only the fastest growing entity in the metropolis, but the fastest growing mid-size city in the nation.

Seven years ago, when Robert Semple came to take on the job of city manager, the population was 90,000; today it tops 150,000. Twenty-five thousand more are expected by 1980. The average age of its citizens is 25, the mean income \$20,000, the

Wind from the west fills a teenager's sails on Cherry Creek Lake, part of Denver's flood-control system. Though the city receives little rainfall, it can come in torrents. Once the city teetered between flood and drought. Even today the limited water supply—snowmelt from the Rockies—poses a continuing dilemma.

Reaching out to ten states, an airborne ambulance service from the Newborn Center of Denver's Children's Hospital brings emergency care to 500 sick babies a year. In an exemplary case last August, an Ogalala, Nebraska, doctor called Children's Hospital when he observed 4-hour-old Lucien Fosdick suffering respiratory distress that his hospital was not equipped to handle. Two hours later nurse Dianne McGregor and respiratory therapist Mike Hibdon were at the infant's side (facing page). They stabilized his condition and took blood samples with the help of local nurse Carol Jones, center.

As nurse in charge, Dianne



explained procedures to the new father, ranch hand Kurt Fosdick (top, wearing hat), with his friends Cliff and Vicky Benner. Then Dianne placed Lucien with his mother to foster emotional attachment, before whisking the baby to the waiting plane (above). Dianne and Mike examine X rays (right) during the flight to Denver. After six days at Children's Hospital, Lucien was released to his parents—a healthy baby.





Call up good spirits—and dance: Cleo Parker Robinson inspires an audience to join in a Fanga, a West African welcome song, at a June outdoor festival called Spree. Thus she introduces her modern-dance troupe, which has performed at Boettcher Concert Hall. Home of the Denver Symphony Orchestra, that hall-in-the-round, with movable acrylic disks to fine-tune the acoustics (right), is a new building of the Center for the Performing Arts.



average cost of a house \$58,000. "They're mostly young professionals and white-collar workers," Mr. Semple said. "Lots of Californians, lots from the East Coast. We've always had a lot from the Midwest."

Mr. Semple attributed the rapid growth to several factors: "One, we have large tracts of land out here on the eastern fringe, and the land was acquired several years back by large developers. These big companies are able to meet our requirements for providing all of the physical facilities necessary.

"Secondly, we have our own water system. We bring it down from Leadville, close to a hundred miles away."

Mr. Semple said his years had seen progress: "We're beginning to get industrial development, to provide jobs here. We've

begun to encourage high-density development; single dwellings are inefficient. There is a master plan to guide growth, to fill in the city. At the moment we are like a teenager, six feet tall but too skinny."

Two problems have resisted solution: the lack of a sense of community identity and the lack of a downtown, a focal point. Only 9 percent of eligible citizens voted in the last city election. "People tend to identify not with the city, but with the developers. About a year ago a house caught fire in the Mission Viejo development. The family tried to call the Mission Viejo Fire Department. There isn't any.

"As for the downtown, center of the community, it will probably be the Aurora Mall. The city owns 37 adjacent acres."



A huge enclosed shopping mall as the heart of a city is an idea that takes some getting used to.

There are those who will tell you that greater Denver itself lacks a focus, a sense of community. Too many newcomers, too many varied interests. But there are rituals that provide a sense of continuity: the National Western Stock Show in January, when the men in cowboy hats and boots show up to provide a hint of the past; the Debutante Ball in December, when each girl is escorted by her father and two young men down the great staircase of the Brown Palace Hotel and into society; the opening of the Arapahoe Hunt, when riders clad in impeccable English costume pursue—in the absence of foxes—coyotes; and each and every

game of the Denver Broncos professional football team or the Denver Nuggets professional basketball team.

And there are, of course, the old families.

Brothers Keep On Brewing

On a misty day, when the clouds scurry low over the foothills around Golden, the visitor may be reminded of some small Rhineland town. Only the castle here is the nation's largest single brewery—Coors.

Brothers Bill and Joe, the third generation to run the company, share the same executive office, a single modest room. They wear sport shirts and put you on a first-name basis at once.

"As children, we had the run of the brewery," Bill said. They remembered their

grandfather, the founder, an immigrant:

"Rather stern, always in a frock coat. He spoke German at home and in the brewery. Then when World War I came, he issued an order that no German was to be spoken. He followed that order himself; it was difficult for him.

"Father worked seven days a week. He was six feet tall, and he'd wear himself down to 118 pounds, then go into the health clinic. They'd feed him up and he'd come back at 130." When Adolph Coors, Jr., yielded the reins of the brewery on May 28, 1970, the day he died, he was 86.

A business built on such struggle is not lightly yielded, and Bill and Joe were girding for a new struggle. "Just after Prohibition, there were hundreds of local beers, each with their following. There're only about forty companies left in all, and I bet not ten have a hope of long-range survival.

"They just can't match the economic power or marketing of the big breweries. Right now the two largest are fighting for the number one spot, spending millions and millions on advertising. It's hurting all the others, including us." Coors, which is distributed in 16 western states, slipped last year from fourth to fifth place.

There were other struggles: a bitter fight

with the union and criticism of Joe's support of conservative political causes.

"I feel very strongly," Joe explained, "that we should preserve the freedoms that were set up in our Constitution. Those freedoms that allow someone to come along and be able to start up a business like this, and have it as a family-controlled business, and pass it on from generation to generation."

Ranching on the City's Rim

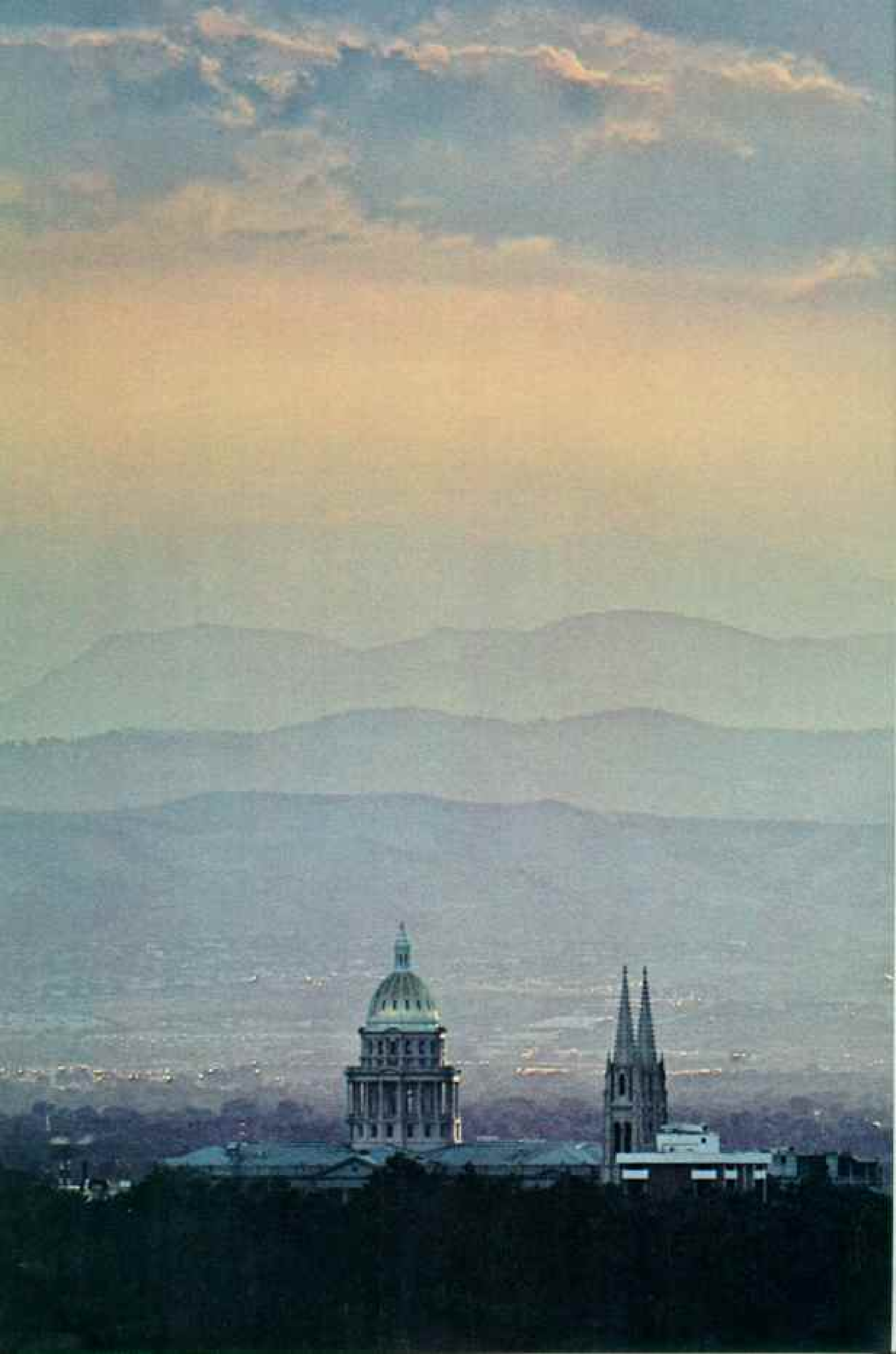
It was in Douglas County, to the south, that I finally found a place that matched my Easterner's image of the West: the Cherokee Ranch, near Castle Rock.

Tweet Kimball, clad in a green pantsuit and cowboy boots, jammed the Jeep station wagon in gear and wrestled it across one of the ridges on her 7,000-acre spread. "We've been going 25 years," she said. "Came out after I was divorced. I had two boys to raise, and I thought a ranch was a good way to bring up children. I was looking for country near a large city, so the boys could know city life too. It's worked out well."

We drove on, stopping in pastures and at pens, to see her prize breeders, Santa Gertrudis, weighing as much as 3,200 pounds. There were Galaxy, Cyclone, Adonis, Winnie. There was Sequoia—"Hello, little bitty



Whither Denver? The question arises in the minds of Coloradans, 60 percent of whom live within the metropolitan area. The city is the state's economic heart as well as its capital, whose domed state house (right) wears Colorado gold. In elegant chambers within, State Senators Paul Sandoval and Regis Groff (left) wrestle with the problems of their city districts: senior-citizen homes, a huge school system in its fifth year of busing, the declining tax base, and always the water problem. Rural colleagues seek more colleges and, of course, more water. Add to these complexities the perplexing issue of the environment. Is rapid growth destroying the beauty, open space, and clear air that made Denver so attractive to so many?





Big bird in the backyard, a 747 taxiing across Stapleton International Airport

thing. Look at that rear; he's got a lot of what it takes. When we get a new bull, and he wants to fight, we let Sequoia handle him.

"Here's Marathon, a hot breeder. He's killed two bulls. He gets to stay with the cows all winter; keeps him content."

We went on to the big house, in the style of a Scottish castle, perched high on a windy hill. It had been built by stonemasons from Cornwall in the 1920's for a wealthy man from Boston. I admired the hand-hewn beams, the stone carving, the fine old paintings, the buffalo and elk heads over the great fireplace.

Mrs. Kimball led me up circular stone steps to the top of the castle's tower. The wind moaned through the slits in the parapet. We looked across the valley, a sweep of greening grass and still gray scrub oak, toward the Front Range.

Then we looked to the north. We could see the outriders of suburbia: ordered rectangles, massed and dark; and, just over the next ridge, the tops of the downtown towers, toy small.

"That's the Phipps Ranch that way, that empty land. They just sold it to Mission Viejo." Soon enough the uniform ranks of



startles travelers on Interstate 70. United, the nation's largest airline, trains pilots here.

houses would move several miles closer.

"You going to sell, Mrs. Kimball?"

"No. No, I'll keep it. After me, it'll be up to my son Kirk to decide."

Different Voices, Different Dreams

And so the people of Denver watch their metropolis grow, some with apprehension, some with satisfaction. A Denver friend, a native, was telling me that he liked, now and then, to walk down to the confluence of the South Platte River and Cherry Creek, where the city had first begun. "You can stand down there and hear that water, and it kind

of refreshes your soul. You remember the hardships of those that came before, and the legacy they left. And you wonder: With all this growth, what will we leave for our own descendants?"

I went down to where the waters join, where it all began. The area has been turned into a park with a man-made kayak run. I listened to the waters. But in my mind's ear I could hear more clearly a cacophony of many different voices. Each bespoke a dream, a promise. Each sought to fulfill that promise here, close by the mountains whence the waters come. □



Nigeria Struggles With Boom Times

By NOEL GROVE

NATIONAL GEOGRAPHIC STAFF

Photographs by BRUNO BARBEY

THE OLD CHIEF'S DEATH became the source of a revelation to me. I attended the funeral on a day when mourners had gathered in the great one's compound in eastern Nigeria to discuss the chief's long life. What happened demonstrated to me the view that many Nigerians hold not only of themselves, but also of the world.

A masked figure appeared suddenly and, as it came toward me, I saw a smiling, benevolent face and bright, cheery clothes. Then it wheeled, and the opposite side, garbed in black, presented a hideous, fanged visage. As the figure turned one way, then the other, villagers fell back in silence, and an educated Nigerian said to me quietly, "It represents the dual nature of human character, the good and the bad in all of us."

Oil-rich Nigeria is booming, and its rapidly changing populace sees both the good and the bad in national growth. "Unless we learn to use our new wealth wisely, our oil boom may become our oil doom," intoned a scholar one day in the courtyard of Lagos's Ikoyi Hotel, a popular forum for the exchange of ideas about this West African nation.

This is the dilemma of Nigeria, one of half a dozen or so Cinderella oil nations of the seventies. Like Cinderella, she suffers the pangs of a maid unprepared for the ball. But never was one more eager to learn, to match the steps of the developed world.

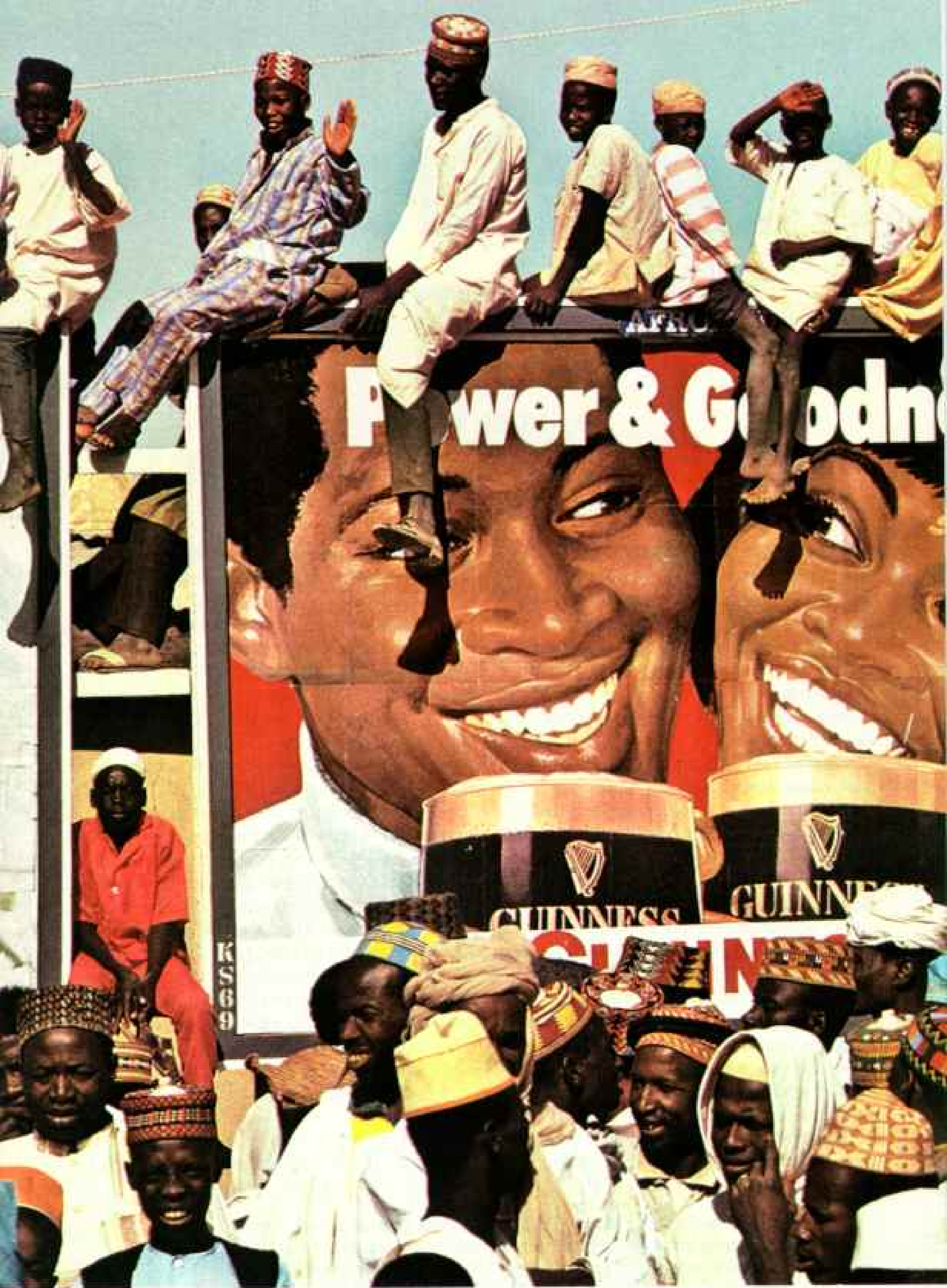
A livelier, more responsive people I have never met. I was hustled, jostled, even threatened by Nigerian citizenry, but so was I gently cared for by strangers when I lay ill. I was turned away from meetings with public officials sensitive about publicity, but I was never turned away from a home.

I saw fights break out over traffic incidents and arguments erupt in grocery lines, but most outspoken confrontations seemed to subside as suddenly as they mounted. Seared by northern heat, parboiled by coastal humidity, feelings seemed ever ready to surface into kindness or violence, charity or self-interest, human emotions turning this way and that, like the masked figure at the old chief's funeral.

Emotion is one thing, efficiency is often quite another. The experience of my friend Anthony Akinduro is a case in point.

When I first met the young United

Steeped in tradition, a palace guard in Kano still dyes his turban in prized indigo. Yet such rubrics of the past provide few answers to the questions that trouble modern Nigeria, the second largest exporter of crude oil to the United States. Despite torrents of oil, the man in the street finds his increasing income eaten up by inflation and bureaucratic inefficiency. Still, a spirit of gritty optimism prevails.



Power & Goodness

GUINNESS

GUINNESS

KS 69

All aboard for the good life. Giant smiles promise better times to come



for youngsters using a billboard as a perch to view a fair near Kano.

States-educated Nigerian on a north-south train, he had a scheme that he hoped would enrich both himself and coastal Lagos, the nation's capital. Portuguese traders five centuries earlier had established a foothold in the town for easier shipment of slaves and trade goods. Now the sale of independent Nigeria's crude oil has created a boomtown where office buildings grow like yam sprouts and automobiles clog traffic in tie-ups called "go-slows."

"I will create a system of water-buses, so that the people will not have to ride to work in their automobiles," Anthony had told me.

I accompanied Anthony in his search for the materials and permits necessary to begin his waterborne transportation system. At every turn the doors of opportunity seemed to close. A local carpenter could make a large boat, but the engine and other materials would probably have to be imported. That meant costly customs duties. A bank would not grant him a loan to finance the project, mostly because of a lack of confidence in inexperienced Nigerian entrepreneurs like Anthony, a bank officer told me candidly. Also, landing permits would be necessary for the boats to pick up passengers on the waterfront, the same officer explained, and bribes would probably be necessary to obtain them.

Money: A Problem Either Way

Inefficiency. Corruption. Inexperience. I saw the water-bus dream of Anthony begin to fade. Salaried though he was by an American oil company, his meteoric rise to affluence would be postponed.

He turned philosophical one day as we prowled a crowded waterfront slum in one of many searches for a boat maker. In the background loomed the modern high-rise skyline of the new Lagos, but here the construction was of corrugated metal shacks with wall-to-wall flies (pages 418-19).

Suddenly the human tide ahead of us parted and flowed around a dirt-encrusted figure lying flat in the dust, one hand clutching an empty beer bottle. We passed by in silence before Anthony spoke. "Money," he said suddenly. "When you don't have it, it bothers you. When you get it, it worries you." He had unwittingly summed up the story of his own young country.

In less than a decade Nigeria has risen from a struggling Third World agricultural nation to an oil-rich power.

Few countries can match the colossal economic strides of this fledgling nation—half Muslim, a third Christian—nestled in the crook of the continent's westward bulge. "Kuwait, Saudi Arabia, Venezuela—all these oil countries have made tremendous changes in the past five years," I was told by Harry Cahill, economics counselor at the U. S. Embassy in Lagos. "But they haven't come so far so fast as Nigeria."

Less than twenty years ago the nation did not even control its own purse strings. For 46 years it had labored as a British colony and protectorate, with foreign companies so enmeshed in the nation's economy that the bulk of profits from palm oil, peanuts, cacao, and cotton went outside the country. Beginning in 1958, foreign oil companies

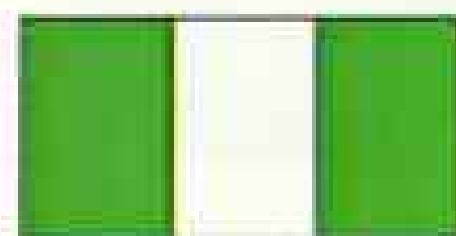
Nigeria



Growing pains beset Nigeria's drive toward economic and civic maturity. Regional enmities persist among the Hausa, Ibo, and Yoruba as the government strives to forge a democratic constitution. Federal spending fuels inflation as high as 40 percent a year.

Since independence from Britain in 1960, the country has endured a series of coups and a civil war. The present military government has pledged free elections this year. Regardless of its problems, Africa's most populous nation represents a dominant force on the continent.

AREA: 356,667 square miles. **POPULATION:** 70 to 80 million. **RELIGION:** Muslim, Christian, animist. **LANGUAGE:** Officially English, with 250 native tongues. **ECONOMY:** World's eighth largest petroleum producer, providing 90 percent of the country's foreign exchange. Accounts for 80 percent of Africa's total production of columbite, vital in making steel. Produces coal and tin as well as palm oil and peanuts. **MAJOR CITIES:** Lagos (capital), Ibadan, Kano. **CLIMATE:** Hot and humid coast; dry in the north.



extracted and sold the wealth beneath the Niger Delta, the many-fingered coastal outlet of the huge river that gave the country its name.*

Then came the oil-drenched seventies, and the quadrupling of oil prices by the Organization of Petroleum Exporting Countries (OPEC). The Nigerian Government nationalized the oil industry by taking 55 percent ownership in companies operating there. By 1975 the young nation found itself with the prospect of an annual surplus of five billion dollars in its treasury:

Rich Oil a Boon for U. S.

Few Americans know that Nigeria, where English is the official language, is second only to Saudi Arabia as the largest source of crude oil imported into the U. S. Fewer still know that Nigeria's oil, pumped from the Niger Delta, is as sweet as any in

the world. Foreign customers pay a premium for crude oil that is very low in corrosive and pollutive sulfur and high in volatility.†

Still, slums abound, and the average annual income stands at only \$380. But oil wealth has also produced the largest five-year development plan ever undertaken by an African country. The 32-billion-naira price tag (one naira equals \$1.70) will be financed entirely by the nation it is intended to benefit. Launched in 1975, the plan aims to raise the standard of living and to lift the country to the ranks of developed nations. It is attempting to diversify industry into sectors other than oil, to initiate broader education programs, and to increase agricultural production so Nigeria can feed itself.

*Georg Gerster painted a vivid portrait of this West African river in the August 1975 *GEOGRAPHIC*.

†Author Grove told of the rise of Nigeria's oil star in the June 1974 *NATIONAL GEOGRAPHIC*.



"I wish to stress that although this country has great potential, she is not yet a rich nation," the head of state, Lt. Gen. Olusegun Obasanjo, has said. "With a population of some 72 million and oil production of under two million barrels a day, our resources from oil are not enough to satisfy the aspirations and general needs of our people."

The trappings of riches and the realities of power have nevertheless shown themselves. A multimillion-dollar National Theatre resembling a jeweled crown has sprung up across the lagoon from downtown Lagos. Its biggest use has been to house events of the Second World Black and African Festival of Arts and Culture (FESTAC) in 1977 (pages 430-31). Dramatists, dancers, artists, philosophers in a symposium on black thought, and visitors from over the world jammed Lagos for a month of days and nights spent celebrating and discussing black culture. The cost: perhaps half a billion dollars. Could Nigeria afford it?

In 1975 it appeared so. But by 1978 a depressed oil market had punched holes in the nation's boom balloon, and government revenues dropped 20 percent. Priorities in spending had to be changed so the available resources could be spread more evenly, petroleum commissioner Muhammed Buhari pointed out in an interview.

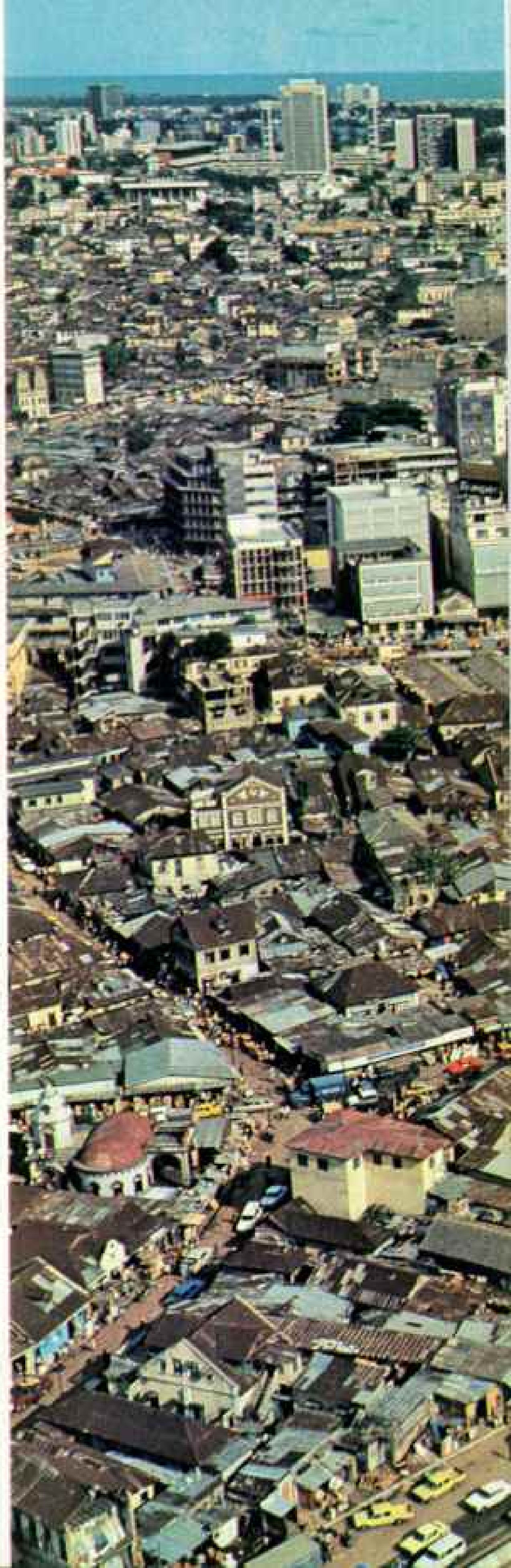
Dark at the End of the Tunnel?

Income from oil is still at a level that would be the envy of many nations. But the drop in income was alarming for a country that had invested heavily in the future. And the oil may run out within twenty years.

Money. When Nigerians didn't have it, it bothered them. Now that they have it, it worries them.

It worries many Nigerians for reasons other than fiscal soundness. Inefficiency and inexperience grip the country in a vise of frustration and darken its reputation with outsiders. In two visits a year apart, totaling

High rises shoulder out corrugated roofs in Lagos, the capital. With an exploding population, estimated to be as large as three million in the metropolitan area, comes the Nigerian version of rush hour, known as the "go-slow."







nearly four months, I completed fewer than half a dozen phone calls within Nigeria, although telephones are common in the major cities. As I traveled from the rain forests of the coast, through the midland savanna, and into the arid north, gasoline was ever in short supply—a seeming anomaly in an oil-rich nation. In one three-week spell in Lagos, the electricity went off at some point every day, and go-slow traffic in the tropical sun dampened both clothes and spirits.

Throughout my visits I talked with Nigerians who are buoyed by the new opportunities and new prestige but irritated by the problems. They accept the frustrations of an evolving society, however, with remarkable insouciance. I watched reactions one afternoon as a Lagos businessman complained that his contract for five thousand pairs of shoes had been rejected by a local firm in favor of a foreign contract. "I found a factory in the north that would make them, out of Nigerian leather," he shouted. "Instead, they bought the shoes from London."

Incredibly, other Nigerians in the room laughed to tears at the absurdity of it. "It is crazy," said one, wiping his eyes. "Someday we will learn to trust ourselves." Visions of the funeral mask danced in my head.

When in Doubt, Bribe

I was not immune to this two-sided nature of things. In Nigeria I both laughed and lost my temper more frequently than I can remember. And I admit to committing a crime while there, although a military policeman encouraged me to do it.

"Bribery is against the law," he told me over beers in a hotel lobby one day. "But sometimes it becomes necessary."

It happened after I arrived at Lagos's domestic airport terminal for a flight to Ibadan. One after another, eager young men approached and guaranteed me a seat on the plane for five naira (\$8.50). I said I had already purchased my ticket, and entered a line marked "To Ibadan."

Before I could get to the ticket window, it closed suddenly, the agent waving us to another line. Then that one closed. I joined a third line, finally arrived at the window, and was told the plane was filled—I would have to go "on request." The waiting list already included eight or ten names. When the next "helpful" young man appeared at my elbow, I paid him the five-naira bribe and within minutes received my boarding pass. It was a comfortable flight to Ibadan. There were several empty seats.

But I should tell as well of other Nigerians. Of a young man who refused money after guiding me for hours around an irrigation project. Of the woman laundry worker who returned to me the eighty naira that I left in a shirt pocket. And I should tell of the kindnesses shown to me by the man I had called stupid.

Compassion Overrides Arrogance

In Maiduguri, capital of Bornu State not far from the border with Chad, photographer Bruno Barbey and I were waiting to take a flight to Kano. The scene at the terminal was familiar: tense faces, pressing bodies, shouting. The harassed ticket agent, a round-faced man, told us to wait in another room and we would be called in turn.

"How will you know when it's our turn?" I asked. "You have written nothing down."

"I will remember your faces," he said, and turned away.

The plane arrived, the room emptied, the din subsided. Our efforts to contact the agent again were rebuffed. As the large jet taxied away, I reentered his office and vented my frustration. He was running, I told him, the most inefficient and, in fact, the stupidest operation I had ever witnessed. He stared at me in silence.

I felt queasy as we returned to a downtown hotel. By early afternoon I was quite sick and experiencing a numbness in the ends of my fingers—a sensation that I knew could signal food poisoning. We decided to

Spanning a people gap, a new bridge across the Niger at Koton Karifi will promote communication between the north and the south, thus easing ancient antagonisms. Meanwhile, a canoe ferries people across. Other kinds of gaps remain. Women still use the river as a scullery, and the government had to hire a French company to build the bridge. There's not enough skilled manpower in Nigeria to do the job.

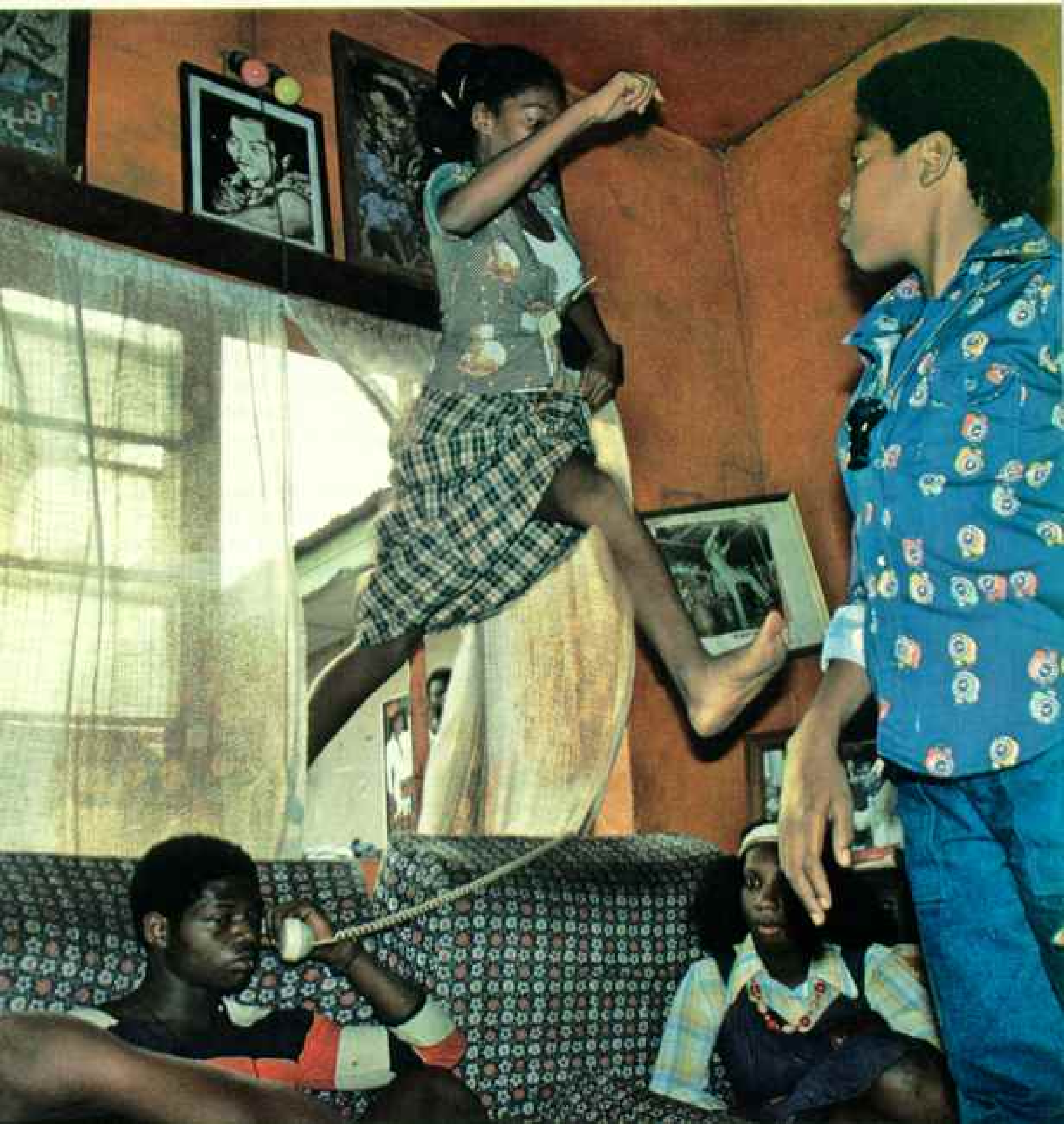
leave for Kano anyway, a larger city presumably with better medical facilities. Returning to the airport, totally miserable, I slumped into a chair and my eyes met those of the ticket agent. With dread, I wondered if my angry outburst would keep us from this second flight.

Quite the opposite was true. He took me to his office, cleared a place for me to lie down on the floor, and brought a drink for my parched throat. He radioed for an ambulance to meet us in Kano and helped me board the aircraft, where I was placed across three seats. As he stood in the aisle, I whispered weakly to Bruno, "Tell the agent,

thank you." When the word was passed on, he smiled and raised his hand in farewell, a man as yet inexperienced in travel logistics, but well versed in compassion. I recovered in Kano and never learned his name.

War Talk Raises Ire

Foreigners with cameras and questions arouse a variety of responses from Nigerians. We stopped at a small village near Jos in the middle of Nigeria, where we received a warm welcome and were led to the chief. For half an hour, with an English-speaking villager named Da Jugu acting as interpreter, I asked about local customs and



farming methods, as a congenial crowd listened at the doorway. Although English is the official language, many rural people speak only African tongues.

The atmosphere was friendly, so I decided to broach one of the most sensitive issues in Nigeria, the question of national unity. I mentioned the 1967-70 civil war (or Biafran war, as most outsiders know it) and asked if Nigeria was now "one country." Friendliness turned quickly to suspicion.

In the awkward silence Da Jugu reached for my last copy of the *GEOGRAPHIC*, and said that I must give a gift to the chief. I hung on to it and, rebuffed, he glared at me.

Angry murmurs arose. Desperate to salvage some friendship, I asked Da Jugu if he was a farmer like the others. "Yes," he barked. "And I can farm better than you!"

Pride in the produce of my own small acreage outside Washington, D. C., welled up, and I responded. "I wouldn't say that. I am a farmer too."

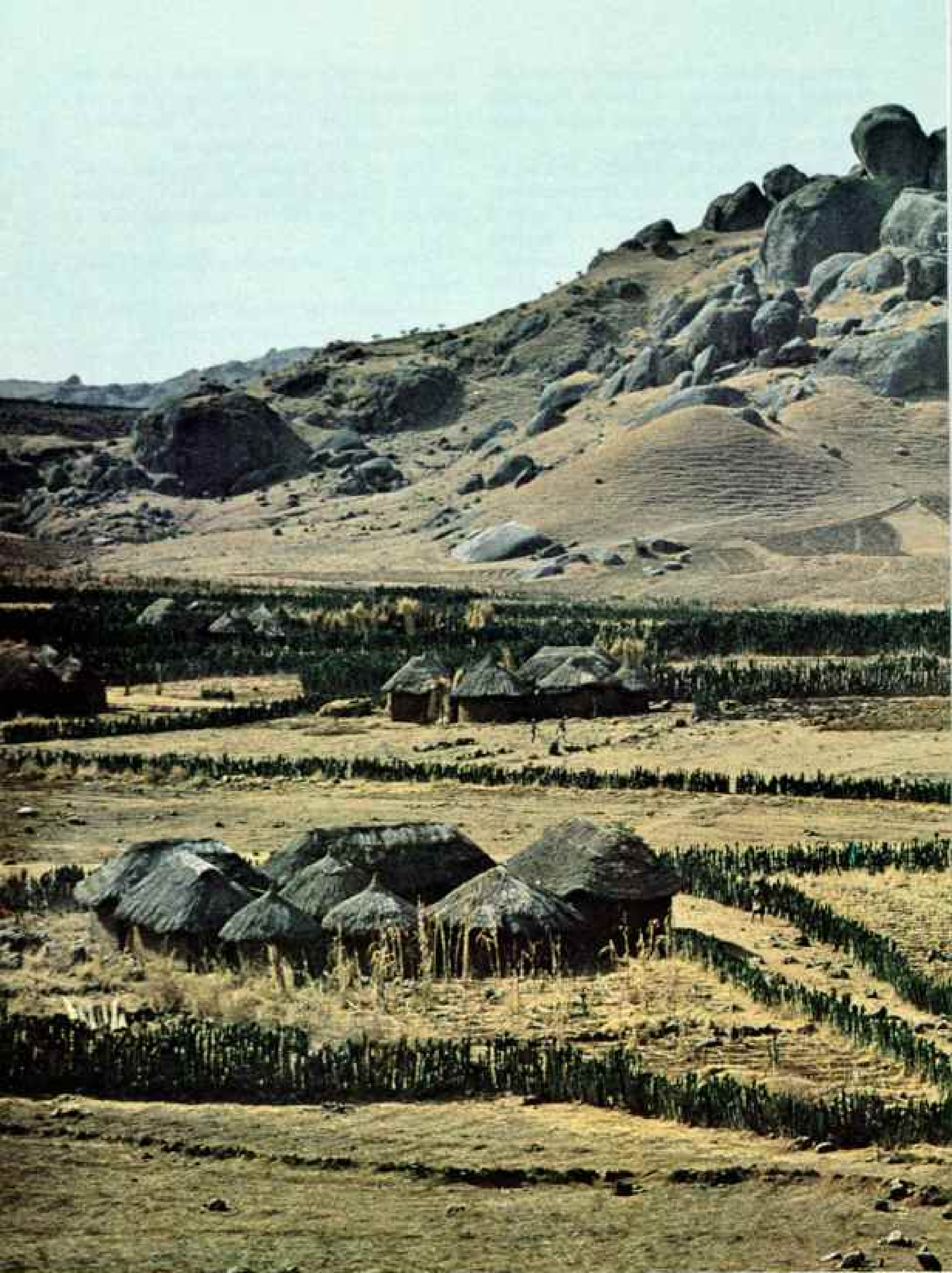
"What do you raise?" asked Da Jugu, sullenly.

I had grown two of their crops. "Corn," I replied. "And groundnuts [peanuts]."

Da Jugu stared in silence. Suddenly his face lit up in a smile. "You are a fine fellow," he said expansively. We drove off amid



Exploding through a window, a fan vaults into the Lagos home (left) of singer Fela Ransome Anikulapo-Kuti, whose biting criticism has earned him the ire of officialdom. Fela (above) prepares for one of the acts in which he lampoons everything from go-slows to heavy-handed policemen.irate soldiers later burned his house.



Boulders bigger than houses overlook farmland near Jos, bone-dry until the rains of April coax forth a crop of yams, peanuts, and corn. Self-sufficient in



agriculture before the oil boom, Nigeria must now import foodstuffs. Many of the farmers have fled to the cities and to the oil rigs, looking for high pay.

Mourning mingles with joy as villagers of Ibusa pay final tribute to their clan chief, the Obi Ijeh of Idumuoghu (right). The dead leader is daubed with chalk to symbolize purity. He is seated upright to indicate respect, a chin strap supporting his head. His eldest son wears a feather in his red hat to show the honor he holds for his father.

Outside, a younger son (below) leads members of the clan in lively dancing, believing that the spirit of the obi should depart in joy. The coming of centralized government to Nigeria has diminished the authority of the obis, who once had the power of life and death over their clans.

After an audience with another obi, author Noel Grove rose before the obi did. "You must sit down, Noel," a Nigerian friend quietly advised. "In the old days he could have had your head for that."



waves and smiles, having experienced welcome, suspicion, hostility, and friendship, within less than an hour.

The question of national unity festers in the Nigerian subconscious. Its origins are rooted in colonialism. No country called Nigeria existed until the British subdued many cultures and defined the boundaries of a colony. In the north, Arab-like Hausa horsemen had carved out huge empires. In the southwest, artistic Yoruba had built

powerful city-states of more than twenty thousand population. In the southeast, Ibo lived quiet pastoral lives with close family ties (map, page 417).*

The forcible melding of divergent cultures has often been cited as Nigeria's nation-rending dilemma. At the center of the country, however, may lie evidence of a

*The December 1971 issue's double-map supplement illustrates Africa's present-day inhabitants on one side and its fascinating history on the reverse.



common heritage that could help forge national pride.

In 1936 open-cut tin miners discovered pieces of pottery and fragments of sculpture near a village called Nok. A laborer was found using a stylized terra-cotta head in his garden as a scarecrow. In 1960 came the biggest find of all: a village site that included 13 furnaces for iron smelting. Dating of items from the site placed them as early as 500 B.C. The mysterious and surprisingly

sophisticated society was called the Nok culture, after the village of the first discoveries (page 436).

"It was a well-established civilization that existed in the center of Nigeria," I was told at the Jos Museum by J. F. Jemkur, who has helped excavate and catalog the items since 1974. "Their iron culture was contemporary with that in Carthage, and also with that of Meroe in the Sudan."

The origins, and the fate, of the Nok



A flood tide of fishermen pursues hundred-pound perch during an annual



fishing festival near Argungu. Calabashes serve as floats for the nets.



culture remain clouded in mystery, but its influence and technology doubtless spread to other areas within the present country's boundaries. When the Portuguese arrived in 1472—the first Europeans on record to set foot on Nigeria's southern coast—they were astonished at the sophistication of art in the mighty city-states of Benin and Ife. Later the German ethnologist Leo Frobenius announced he had found the lost civilization of Atlantis, based on bronze heads he believed to be of classical Greek design.

"It is important to our sense of pride as a nation, and our sense of pride as a people, to know that the inspiration for such art may have come from the center of our own country," said Mr. Jemkur.

It was human flesh, not images, that helped mold the history of colonialism.

Slaving had long been an accepted practice among the early Nigerian kingdoms. The first Europeans traded for ivory, gold, palm oil, and pepper, but business soon turned to human cargo, to meet the work demands of the newly colonized Americas. I visited one of the main export terminals at Badagri, a town some forty miles west of Lagos. Time and rot have destroyed the huts that once housed the unfortunates awaiting the long and often fatal voyage to the New World, but the irons remain. A caretaker led me to a trunk holding the grim artifacts. Under his hand, chains and handcuffs rose clanking from the box, ringing up a harsh dirge of dark history.

There appeared an anklet with a spike attached for driving through the foot of persistent escapees. For the vocally defiant, there



was an oval ring through which the lips were pulled and a small spike driven through them from the outside. It was called *itenu* in Yoruba, or "shut your mouth." A length of smaller, pencil-size links and handcuffs puzzled me until the caretaker explained: chains for children. Harsh men, those West African kings who lined their treasuries and those Europeans who lined their pockets by traffic in human beings.

Independence Brought Bloodshed

Word of the harshness reached England, and cries of protest mounted against the slavers. Conscience, plus the need for raw materials to feed the industrial revolution, led Parliament to pass an act abolishing slave traffic in 1807; trade eventually went back to palm oil and pepper. In 1900 Britain

In a mirthful mood, canoeists wave their paddles like batons (above) as drums throb across the Lagos lagoon during FESTAC '77, the Second World Black and African Festival of Arts and Culture. The crew of a toy canoe paddles in more orthodox fashion atop a woman's head (upper left). Hundreds of thousands of visitors arrived for FESTAC's month-long, country-wide celebration of black dance, music, art, and thought. Wole Soyinka, Nigerian dramatist, advised participants that the world will judge black nations by what they do, not by what they say.

"The tiger does not declare his tigritude before he pounces," he explained. "He declares it in the elegance of his leap."

achieved an absolute dominance over the country that lasted sixty years. In 1960, with all Africa brimming with nationalistic fervor, the British granted Nigeria a bloodless independence.

The blood came later. Threads of power pulled variously from the Hausa in the north, Yoruba in the southwest, and Ibo in the southeast. The first republic ended in 1966, after two coups and massacres of thousands of Ibo. In 1967 the east seceded, calling itself the Republic of Biafra. North and west allied against it, and the thirty-month civil war ended in Biafra's defeat.

But unity did not come. When nine years had passed without a return to civilian rule, another military coup displaced Maj. Gen. Yakubu Gowon as head of state and installed Murtala Muhammed. Like the messianic prophet whose name he carried, Muhammed seemed destined to lead his people back from the abyss of corruption and inefficiency. Combining idealism with humility and charisma, he became a Nigerian Abraham Lincoln—with the same tragic end. As his car stalled in a go-slow one day, he was gunned down in a countercoup after less than a year in office.

The coup failed, the plotters were executed, and the second-in-command, General Obasanjo, continued Muhammed's march back to civilian government, slated for October 1979. A new constitution was drafted, providing for legislative, executive, and judicial systems patterned in part after those of the United States.

Some Old Ways Survive

Can the differences of the past be resolved in a new republic?

To find the answers, Bruno Barbey and I began a counterclockwise swing around the country in search of a sense of nationhood, where a nation did not even exist a century earlier. Everywhere we found evidence of a people in the throes of change. Modern highways looping past villages of conical mud huts. Trucks loaded with machinery roaring past a cattle drive that was like a scene out of America's Old West. Modern plumbing fixtures that often yielded no water. And, always, phones that were little more than ornaments.

Our first stop was Benin City, site of the

last powerful city-state to succumb to the British, around the turn of this century. Automobiles now flood the broad avenues that existed in the 1600's, but on Igun Street in the center of the city, little has changed since then. "Our family has been making bronzes for as long as anyone can remember," said Johnbull Ihama, a wiry young journeyman in the art.

As we talked, a patriarch emerged from the mud-brick house, wearing a flowered cloth fastened at the waist. A mold for a new statue was half buried upright in the cool earth, and neighbors gathered to watch as the patriarch shouted instructions to young artisans. Molten bronze was poured into a hole at the top of the mold in a fiery orange stream, filling the contoured spaces left by beeswax that had been melted away earlier.

I asked Johnbull about buying one of the castings, and he said quietly, "Of course, but we must discuss it later. The bronzes were once made only to commemorate ancestors and divine rulers; people here would be upset to see you carrying one away."

"But this is a business now, they know that," I said in surprise.

"Yes, they do," he replied. "But they can't change the way they feel."

That quick step between past and present, between tradition and modernity, confronts the majority of Nigerians, confusing the machinery of society as well as the mind.

"Our technical infrastructure is nonexistent," I had been told in Lagos by Chief J. O. Udoji, whose Nigerian Tobacco Company has become a model of efficiency and local enterprise. "There are just not enough machinists, mechanics, plumbers. Many trade skills in Nigeria are in short supply."

With the influx of oil wealth, Nigeria has leapfrogged the usual steps to industrialization. Machines, communications, and luxuries have been imported without the backup skills to service them.

"That is why I have moved back to the village level," explained Professor Chike Onwuachi as we drove the potholed streets of Ibusa, about 250 miles east of Lagos. "We must start by making improvements at the grass roots."

Scholar and instructor in U. S. universities for 24 years and former director of Nigeria's Institute for International Affairs,

"Prof" now plans to develop a Pan African Center in Ibusa. "The center will become a testing ground," he explained. "It will be a self-supporting community with a farm, farm market, and bakery. I hope to create a think tank of ideas about how Nigerians and all Africans can live more efficiently, combining our skills of the past with the technology of the present."

Backcountry Wants a Bigger Share

In a nearby village, change and tradition zigzagged like butterflies when I stepped through the portal of His Highness Obi Ofulue II's mud-walled compound. The traditional kings, or obis (called obas in the west and emirs in the north), once ruled huge realms with absolute authority. Now Obi Ofulue reigns as reverential leader and adjudicator over some 40,000 subjects. His Highness, educated in Europe, sat at the head of his council of chiefs on a porch open to a courtyard. He was clothed in white

robes topped by a coral necklace first worn by a predecessor 300 years earlier.

"The national income accruing from oil is not reaching the people in the countryside," the obi said. One by one the chiefs, clad in loose robes, rose to add their opinions.

"We have no hospital, not even a clinic, in a kingdom of 40,000 people," said one.

A former army major stood rigidly and spoke in clipped syllables: "We have potentials here that have not been tapped—timber, coal, lignite. There is too much emphasis on oil."

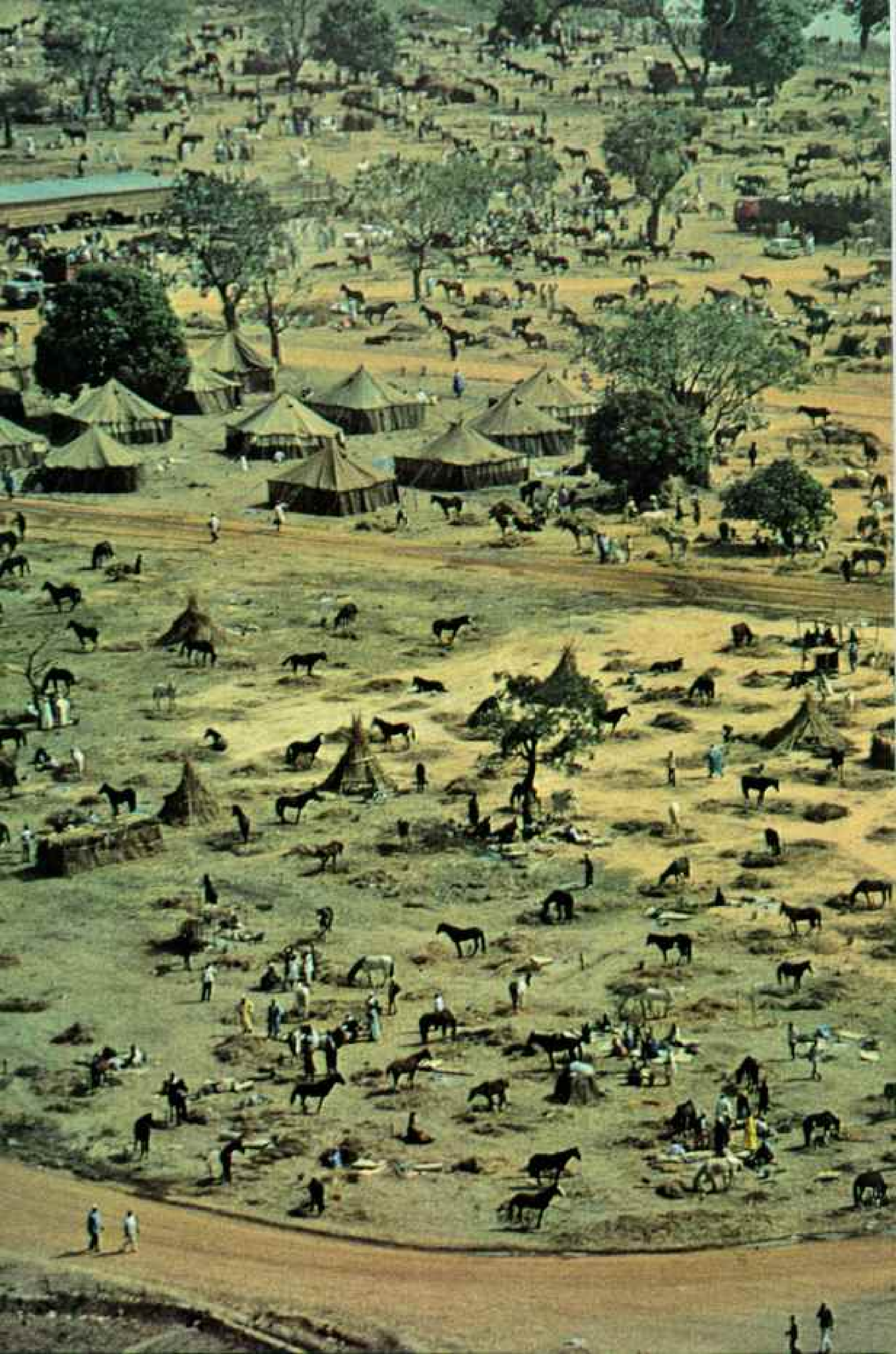
"We need electricity, good water, medical care," said an old chief who wore a black derby with solemn dignity.

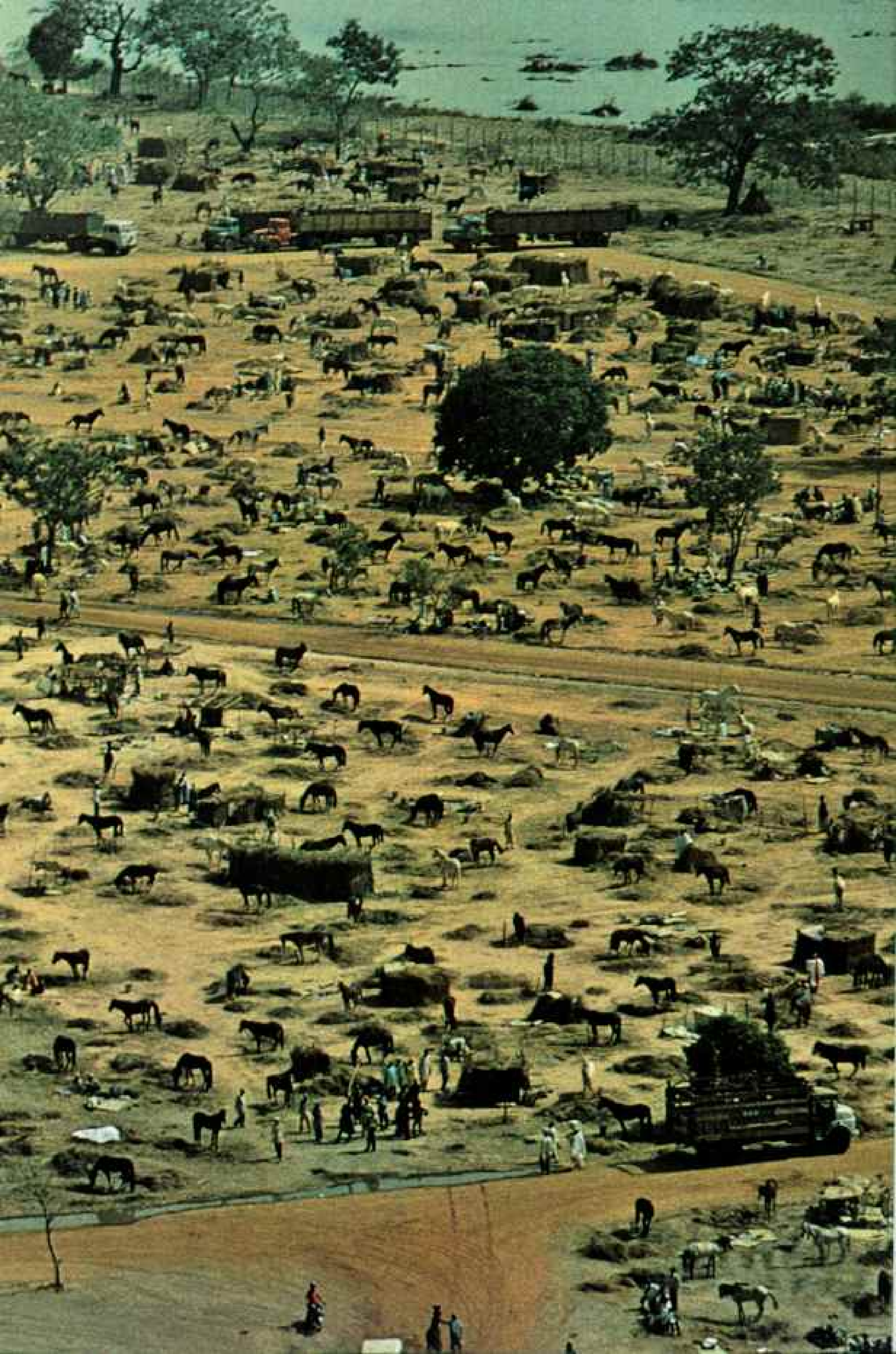
"Culturally, we find ourselves betwixt and between," added their obi. "We Africans embraced the white man's culture but are reluctant to give up our own. So should we abandon it, or embrace it? I suspect we should bring together the best of both."

What qualities of African culture, I asked



The pomp of office, as well as the dust of its trappings, surrounds the Sultan of Sokoto. The north's Muslim leader viewed three days of equine events at Kaduna, including old-time cavalry charges, part of FESTAC's program. Quartered in a nearby field (overleaf), hundreds of tribesmen's horses munch their feed.





the obi, would he especially like to retain? He cupped his chin in his hand and thought. "I would not like to see us lose," he said finally, "our capability for self-expression."

"In my country," I said, "we call it soul."

"Yes, yes," he smiled. "I believe you do."

Sadness Quick-shifts to Joy

I saw the capability used in a most therapeutic way a short time later at the funeral of the chief, where I beheld the two-sided mask. As Prof and I returned to Ibusa, we were met by a line of smiling women dancing in the street. "Come," said Prof, "let's go with them to the chief's compound."

I would have thought myself at a festival. Men, women, and children were gathered in several clusters, dancing, singing, drinking a local brew, telling stories about the dead man's life. "The mourning took place earlier," explained Prof. "Now they want his spirit to depart for the next world in joy, not in sadness."

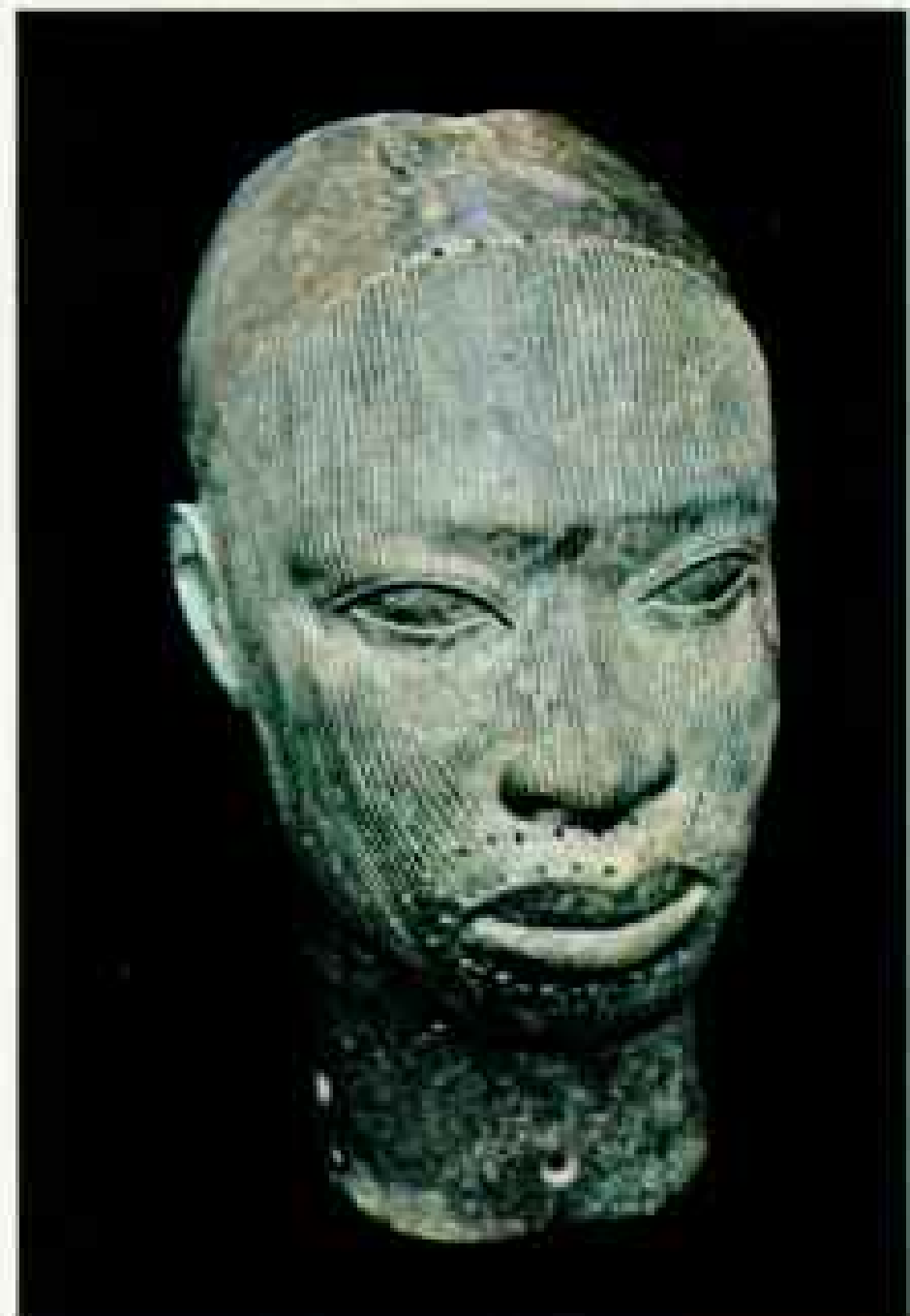
The only somber note occurred in the hut containing the corpse (pages 426-7), where the eldest son knelt. "It is serious here because of the awesome responsibility that now rests on the son's shoulders," said Prof.

We emerged from the hut to watch the dancing. Men and women responded to the beat of drums with movements that were plainly sensual—a reaffirmation of life in the midst of death.

Crossing the Niger River at Onitsha, we entered the corner of Nigeria that had been the short-lived Republic of Biafra, which collapsed after the victory by federal troops in 1970. Rusting war matériel could be seen through the foliage. One Biafran armored car looked as if it had been made from a tractor. After federal road blockades cut off the poorly equipped Biafrans' arms and food supplies, shipments were flown round the clock to Uli airstrip between Onitsha and Owerri, but it was not enough. Thousands of children starved, and the rebels often fought with homemade weapons.

Our driver, noting our comments on the war, stopped the car unexpectedly and pointed to a group of faded, propeller-driven airplanes. "Uli," he said, pointing. The once famous airstrip was now a level patch of weeds.

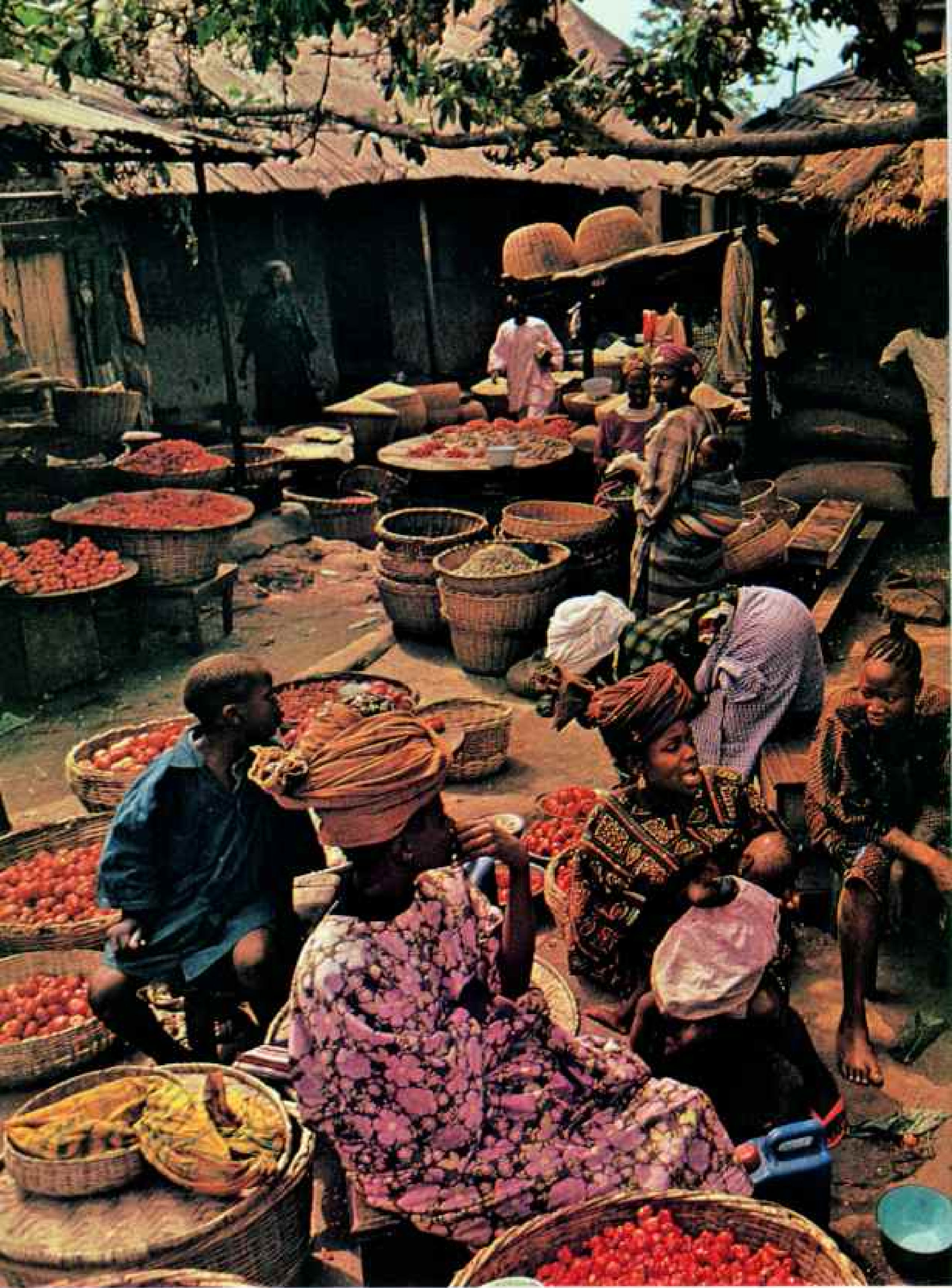
Suddenly *(Continued on page 440)*





Crouched for combat, a steel soldier peers over a stylized machine gun on the campus of the university at Zaria (above). The sculpture recalls the civil war that erupted when eastern Nigeria, under the name Biafra, seceded in 1967. The bloody conflict ended three years later. More-peaceful examples of art include a modern skin-covered wooden likeness of

an elaborately coiffured woman (top left). The classic bronze head (center), presumably representing a ruler, was cast by an artist of the Ife culture, which began around A.D. 1200. A terra-cotta statue of a woman (left) was probably used by Nok farmers to ensure the harvest. The little-known Nok culture arose in central Nigeria five centuries before the time of Christ.



No crowded supermarket aisles here. Nigerian cities still have neighborhood



markets offering plenty of fresh food and fresh air, like this one in Ibadan.

soldiers with automatic rifles stood at the window, demanding to know why we had stopped. Seeing Bruno's cameras and lenses, they detained us and sent for their officers. In nearly an hour of emotional questions, we were accused of stirring up reminders of the war, thus promoting national discord. Finally we were released, with a warning from a lieutenant: "No discussion of the war from now on, you hear? No pictures. We are one Nigeria now."

Such sensitivities only point up the nation's continuing fear of disunity, I was told by a faithful chronicler of modern Nigeria. Chinua Achebe's novels have dramatized the trauma of colonialism, the disruption of tradition, and their effects on the Nigerian psyche. "But the country can pull itself

together," he said in his office at the University of Nigeria at Nsukka, northernmost major city in Iboland. "And it can do so without changing the virtues of diversity. This, after all, is what the rest of the world is moving toward, development of regional character. Why should we try to destroy ours, as long as we can be one country?"

Like the fog in Carl Sandburg's poem, a sense of nationhood may be creeping into Nigeria on little cat feet. Perhaps a nation is truly born when its citizenry speaks of it as one, and of what they can do for it.

Chu-chu Onwuachi, for example. Born in England, she grew up in the U. S. and now attends the Lagos University College of Medicine. "I may practice in the States for a while to learn," she told me, "but



I will return to Nigeria. It is my home."

My seatmate on a plane during one north-south flight was a well-dressed businessman studying Hausa. "Is it difficult?" I asked.

"No, not very difficult," he answered with a smile.

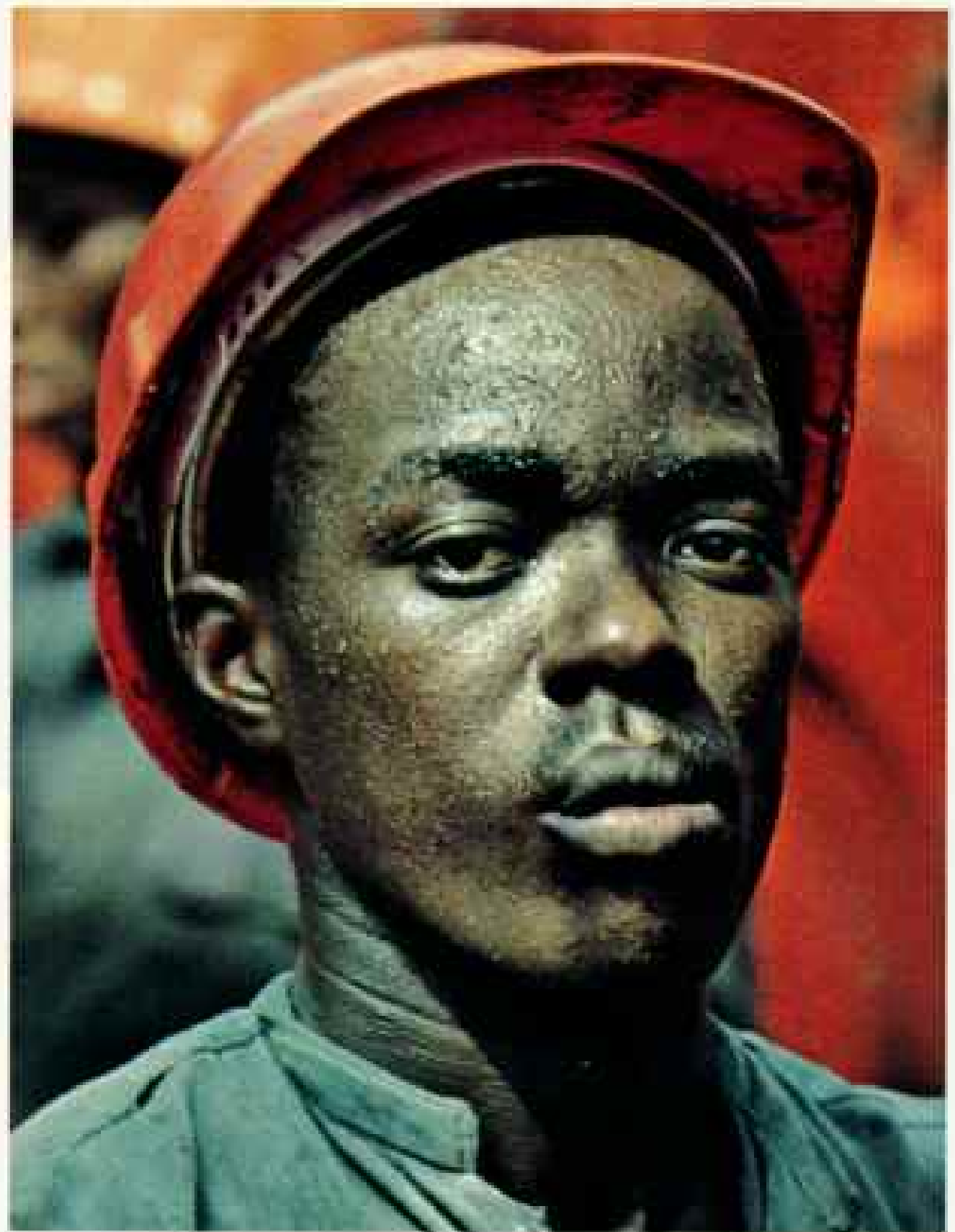
"Where are you from?" I asked, wondering if he was Yoruba or Ibo. Resenting even the implication of regionalism, he gave me a sudden sharp glance. "I am Nigerian," he snapped. Then, noting my discomfiture, he added gently, "I come from Ibadan."

Lions Roam as in Yesteryear

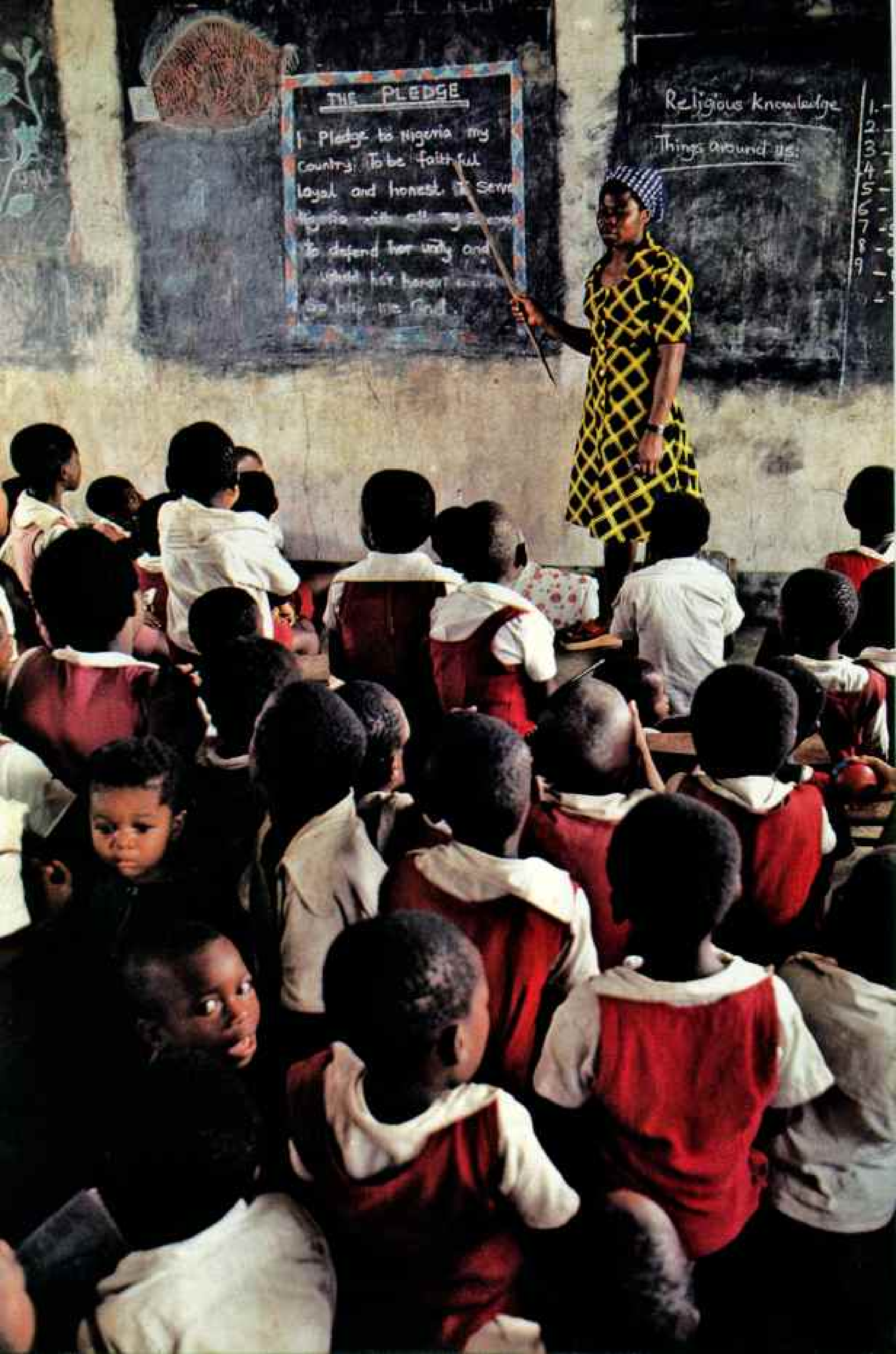
Palm trees and rain forest yield to savanna, thornbush, and acacia as one moves away from the coast. The land rises like a fat pancake, with the city of Jos at the puffy

center in what is appropriately called the Plateau State. Grazing animals concentrated centuries ago in these northern grasslands, and predators, both two-legged and four, stayed with them. Both remain, although the people now far outnumber the lions. Nigeria has set aside two game reserves, where animals roam free and the two-legged predators carry cameras.

As we motored down a dusty track in the 840-square-mile Yankari Game Reserve, east of Jos, the only traffic jam we encountered was caused by elephants. Waterbuck, bushbuck, roan antelope, and buffalo stared at us from respectable distances. A warthog, living gargoyle with scimitar tusks, scooted across the road, tail straight up like a periscope. That evening we washed



Priming the pump of progress, a Gulf Oil rig looms above a mangrove swamp in the Niger Delta (left). The low-sulfur crude it harvests will yield nearly twice as much gasoline as the oil tapped from most other countries. By government decree, foreign companies that have been granted leases must employ a quota of Nigerians; this worker swelters in the delta heat (above).



THE PLEDGE

I Pledge to Nigeria my
Country, To be faithful
loyal and honest, To serve
Nigeria with all my strength
To defend her unity and
uphold her honor and
So help me God.

Religious Knowledge

Things around us:

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the dust away in Yankari Spring, near the visitors' quarters, as a troop of thirsty baboons sat restlessly fifty yards away, the big males barking their annoyance.

We couldn't find the lions, but they found us. We had discovered their kill the first evening, a full-grown hartebeest with its head turned back on itself as though staring sadly at its own half-eaten hindquarters. We returned the next day at first light, but the big cats had finished their feast during the night and were gone again. Disappointed, we drove on.

Minutes later a lioness and a young male came out of the brush toward us in a half-hearted, full-bellied charge. "They have young ones," explained our Hausa guide, Jabri. "They are simply warning us." The rest of the pride could be seen in the brush, cubs staring curiously and adults panting in the heat. They turned finally and sauntered away, long tails switching indolently, reminding us that this enclave, at least, was still lion country.

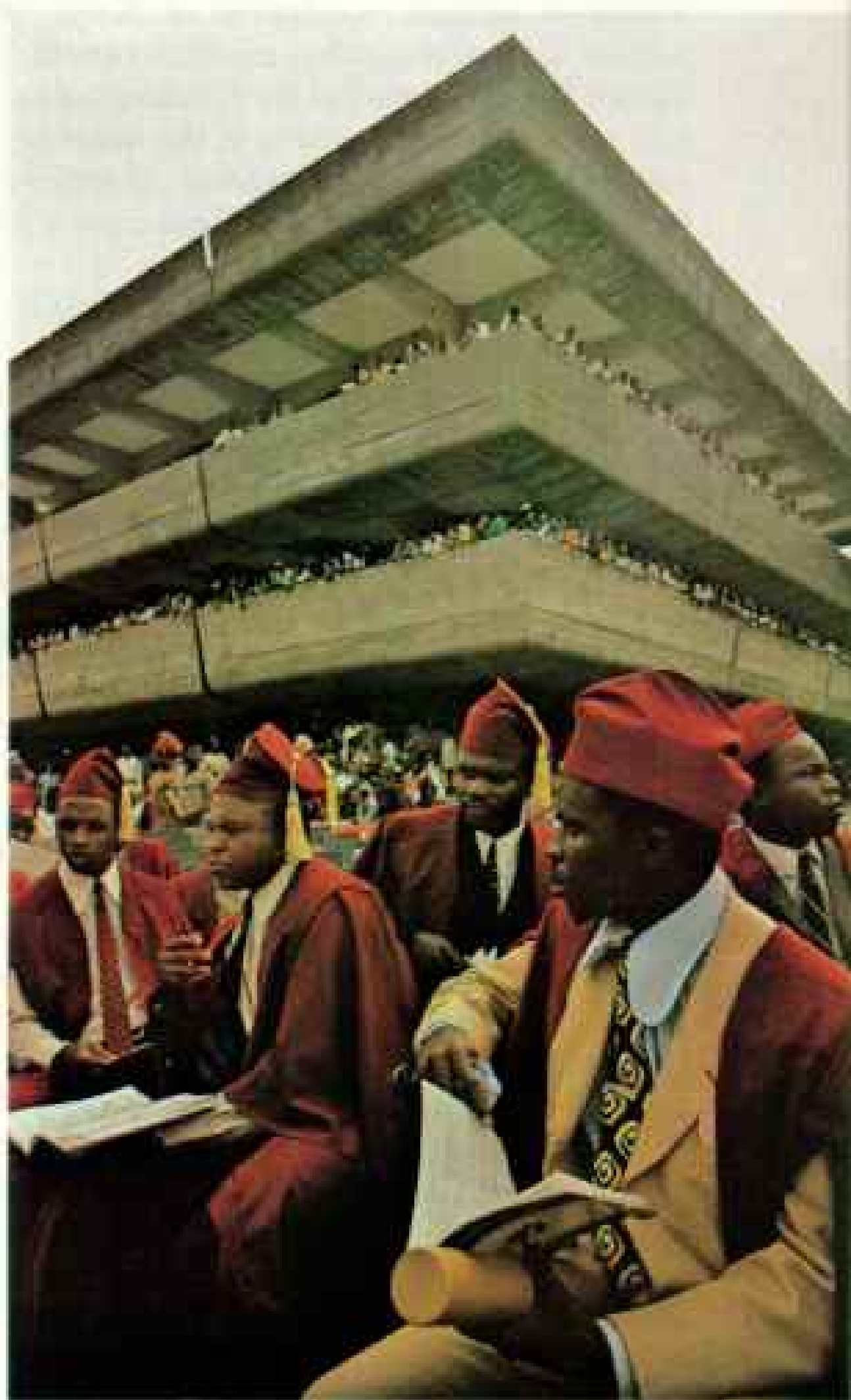
New Wealth Lures Farmers From Land

Beyond Jos, the country grows increasingly drier. The brush thins out, and the occasional trees are usually baobabs, twisted of limb and bottom-heavy in the trunk, like aging gnomes whose weight has gone to their legs. I watched a thirsty herd of hump-backed Fulani cattle using their straight long horns to tear up the soft soil of a dried wash to get the moist earth beneath, as their young herdsman raised his canteen overhead to drain a final drop.

Lack of water, lack of services, lack of profit—all are stumbling blocks to the resurgence of Nigerian agriculture. Oil wealth buys food from abroad, but it also has lured thousands of young Nigerians away from the farm. Much of the tillable land remains uncultivated. The development plan earmarked 2.2 billion naira for the agricultural sector before 1980, and posters urge a return to the land and the dignity of farming. Yet a large proportion of the agriculturalists are subsistence farmers who have little left over for market beyond what they consume.

Dignity is hard to sell to a man like Dongo, whom I met as I walked a footpath between fields in Plateau State. He was digging rows for a new yam planting when I hailed him.

Down payment on the future, Nigeria's free primary-education plan aims to put all youngsters, like these Ibo in Aba (facing page), in school by 1980. Students at Lagos University, one of 13 in the country, receive degrees (below). Thousands of other Nigerians study abroad.



His tool was a shovel with a J-shaped appendage halfway down the long handle. With feet far apart, he bent and swung the implement between his legs, capturing a shovelful of dirt and creating a neat trench for the new crop. I asked for a turn, and with my clumsy efforts soon left both my dignity and my sweat on the loamy soil. The few yams left over from a year of such labors, Dongo explained, may bring enough naira to buy some salt and palm oil for cooking.

"People will not start moving back to the land until they see that it can be profitable," I was told by A. N. Eze, who works with the Ministry of Agriculture's "Operation Feed the Nation." Mr. Eze manages a staff of extension workers who assist farmers in the search for improved methods.

At the government-funded Tiga dam and irrigation project southwest of Kano, a northern city of more than a million people, I visited farmers growing corn, millet, tomatoes, and wheat year round in the bone-dry sub-Sahara. When completed sometime within the next decade, the Tiga dam will irrigate about 120,000 acres.

To a group of tomato farmers standing by an irrigation canal, I mentioned hearing of many Nigerians who had left their farms for city life. "If there were more projects like this, nobody would leave the land," said one, and the others chorused their agreement.

A New Breed Is Coming of Age

Food from giant projects like Tiga. Oil from the Niger's swampy outlets to the sea. I boarded the plane at Kano for a return to Lagos, wondering if Nigeria's several parts could provide the glue to make a nation whole. I met not one Nigerian who considered any of the problems insurmountable. "You must remember that Nigeria is young, just as the United States once was young," said Bayo Kuku, a Nigerian director of Mobil Oil. "You went through similar times. You fought a civil war, and so did we. Because of it you lost a President by assassination, and so did we. You had your time of acquisitiveness, your proliferation of business tycoons, and we are going through that now. It will level off. I am certain that a period of sunshine awaits us."

I glimpsed that sunshine in a Lagos schoolroom. The desks were old and the concrete floor was chipped and kicked into a fine dust, but Mrs. Obi Okonta's social-studies class hummed with excitement. The teacher asked if I had any questions for the 11-to-14-year-olds.

"What product does Nigeria export most?" I began. A girl with pigtails pointing in all directions rose and stood beside her desk. "Petroleum."

"Why does Nigeria sell petroleum?"

Another student shot to his feet. "So we can buy the machines and engines to run our country."

"What kind of country do you want Nigeria to become?"

A boy named Amadi stood up, his shoulders back, his chest out. His eyes, as he spoke, opened wide with excitement about every fourth word, exposing brilliant white against ebony skin. "I want Nigeria to become a country that *makes* the things we now have to import," he said, eyes flashing now white, now dark, like neon signs of youthful optimism.

One of the school's administrators, Mr. Adedeji, nodded when I told him the story. "The young will be the redemption of Nigeria," he said. "Our children want to learn."

Toward a More Thoughtful Future

Office skyscrapers and government buildings elsewhere in the city had been air-conditioned, but here Mr. Adedeji's tie was loosened against the heat, and perspiration beaded his brow above the heavy horn-rimmed glasses. Like most educators, he complained of insufficient money and outdated facilities. "But the worst crime," he said, "is that our clumsy system frustrates people who want to think." His fist pounded on the desk. "We must be allowed to think for ourselves," he said, voice mounting. "We must not be afraid to criticize."

He had once worked abroad, I pointed out. Why did he come back?

"To help my country," he shouted, his passion now high.

Was it his opinion that there were many others who felt the same way?

"Yes!" he thundered, and his fist crashed again on the desk top, bouncing pencils into the air, striking a blow for hope in a nation struggling with success. □

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The index to Volume 154 (July-December 1978) is now ready.

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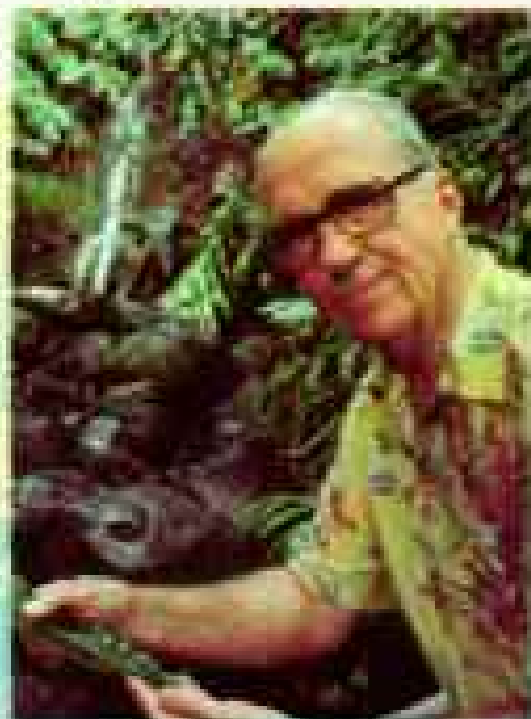
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James A. Michener



On Kauai, the westernmost of all the islands, are the twin falls at Waialeale. With its lush vegetation and cobalt blue water, it's no wonder they call Kauai "The Garden Isle."

Hawaii is a very personal place. Take the time to explore it. And you can find a paradise you can call your own.



The Banzai Pipeline, where the surf's up off the north coast of Oahu, it looks just like a pipe of water, rolling towards land. Only experts dare venture inside.

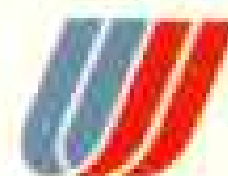
Kilauea Crater on the Big Island is spectacular. It is said that Pele, the ancient volcano goddess, now calls its fire pit her home.



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Part of the network status board, where NOC personnel watch for possible jam-ups.



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Burning buildings for science

WHAT COULD BE LEARNED by setting fire to a wattle-and-daub Yugoslavian farm building? With National Geographic Society support to study prehistoric cultures in Serbia, Dr. H. Arthur Bankoff (right, at left) and Frederick A. Winter, both of Brooklyn College, set the stage for their "accident" in a Bronze Age-type building. Remains of bones and artifacts left on the floor will be studied later, along with baked daub—a key archeological clue. While the thatched roof burned quickly, most of the structure survived. Thus we learn that ancient mud dwellings were fire retardant, and discover the amount of baked daub and other archeological traces produced by fires. Help kindle such research by nominating friends for membership.



BOTH BY H. ARTHUR BANKOFF

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**TWO OF OUR MOST LUXURIOUS PONTIACS
HAPPEN TO BE WAGONS.**



Mid-size luxury! Grand LeMans Safari's available 60/40 seats.



This richly appointed dash features simulated woodgrain applique.



Grand LeMans Safari's spacious cargo area holds 72.4* cu. ft.



Our luxurious full-size Bonneville Safari's available 60/40 seats, luxury cushion steering wheel, power windows and fold-down third seat.



Std. 3-way gate opens to 88.7* cu. ft. for cargo. Plus hidden storage!

THE 1979 PONTIACS  OUR BEST GET BETTER

*Load space with rear seats folded down.



Ralph B. Wilson



"My insurance company? New England Life, of course. Why?"

Of course, the lower net cost of our new Vanguard Series is a breakthrough, too.

How a phone call solved the mystery of the sandy teacups.

Based on an actual call made to the toll-free 24-hour Whirlpool Cool-Line® service.

(Telephone Rings)

Cool-Line Consultant: Whirlpool Cool-Line. May I help you?

Woman: I just bought a Whirlpool dishwasher and I keep finding sand in my teacups. Can you help me?

Consultant: That's why I'm here. Now, about the sand. Are the rest of your dishes clean?

Woman: They're fine. My husband's a Mexican food freak. Even pans with baked-on refried beans get clean. But where did the sand come from?

Consultant: What does the sand look like?

Woman: Like... sand. In a puddle of water that didn't drain out of the teacup.

Consultant: If you're seeing "sand," it could be your dishwasher detergent hasn't dissolved. Do you have a cup with some "sand" in it now?

Woman: Right here by the phone.

Consultant: Does the "sand" look like detergent?

Woman: You mean this is detergent?!?

Consultant: Look closer.

Woman: It does look like detergent. So why didn't it dissolve?

Consultant: Check your water temperature. At your dishwasher, it should be at least 140°. If it's okay, then I suggest you buy a fresh box of detergent. Dishwasher detergent sometimes has a very short shelf life and doesn't dissolve completely when it's old. And make sure you load your teacups properly, so all the water drains out.

Woman: Wow. You really helped. Sorry I bothered you, but at least I didn't have to call a repairman. Thanks for your time.

Consultant: Glad I could help.

This is the kind of two-way communication we've been having with our Whirlpool Cool-Line service for the past eleven years. It's just one example of the continuing concern we have for customers who purchase quality Whirlpool appliances.

If you ever have a question or problem with your Whirlpool appliance, call our toll-free 24-hour Cool-Line service at 800-253-1301. In Alaska and Hawaii, dial 800-253-1121. In Michigan, call 800-632-2243. If our Cool-Line service can't help, we have Whirlpool franchised Tech-Care® service representatives all over the country who can.



Whirlpool
Home Appliances
Quality. Our way of life.



"The highway trust fund promotes overspending."

Each year about \$7 billion from use taxes goes to the Highway Trust Fund. Some think it's wasteful. Others say, "inadequate!"

Highway Trust Fund money comes from special taxes on oil, tires, batteries and 4¢ a gallon on motor fuel. It's used exclusively to bolster state money for road projects. In 1957 \$1.4 billion was collected and every penny spent. This year \$7 billion will come in. And go out. It's understandable some would say, "They spend what they get regardless of need. Another government waste!"

Others view the fund as an excellent pay-as-you-go system. Taxes are related directly to use. Commercial users, trucks and buses, 17% of all vehicles, pay 43% of the tax. When vehicle population increases, highway use revenues go up to offset increased wear and tear on roadways. "It puts the cost on those who benefit," say proponents. "Keep the Trust Fund as is."

Thoughtless spending is always a danger. One way to guard against waste is through needs-based planning. Roads are essential. Needs are pressing. Highway use is up 50% in 10 years. Traffic and weather cause rapid deterioration. Roads require continuous maintaining, upgrading, rebuilding. The Trust Fund brings organization and long-range planning to the road support effort. The public benefits through efficiencies coming with an orderly management approach.

Caterpillar engines power highway trucks. Our machines build roads. We see use taxes dispersed through a Trust Fund as a key to our nation's over-the-road transportation requirements.

There are no simple solutions. Only intelligent choices.



CATERPILLAR

Caterpillar, Cat and  are Trademarks of Caterpillar Tractor Co.

"The trust fund is an ideal way to finance roads."





On her birthday,
I always serve her breakfast in bed.

A diamond is forever.

The pin shown (enlarged for detail) is available for about \$3500. The price may change substantially due to differences in diamond quality and market conditions. Your jeweler can show you other diamond jewelry starting at about \$300. De Beers.



For the price of a stamp, we'll send you the West!

We've prepared a 34-page, full-color vacation planner just for you. It's packed with color photographs and informative information to enable you to get an armchair preview of the really special vacation you can have in The Foremost West.

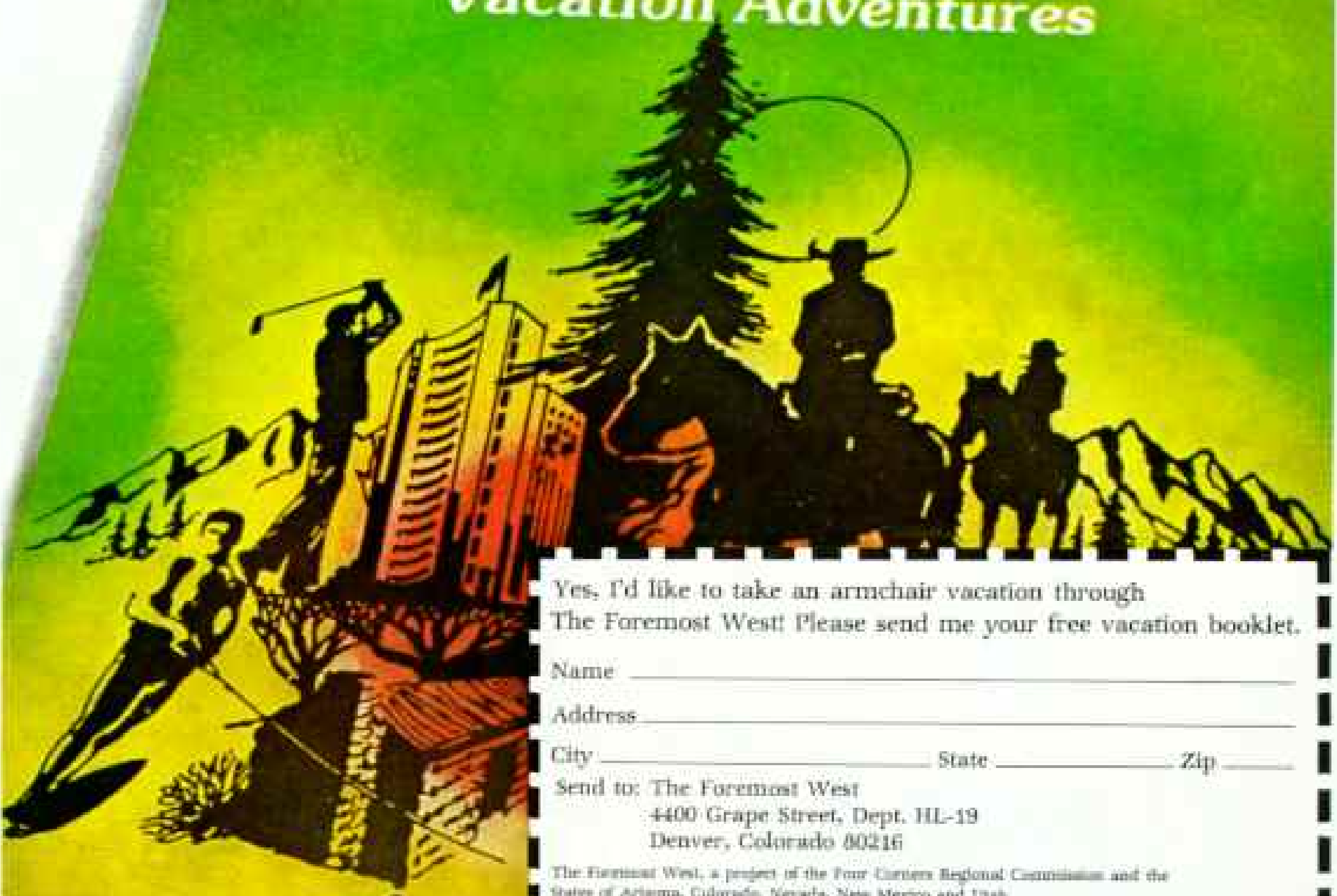
Sit back and let your mind wander through our land of national parks, monuments and forests. Scale the majestic mountain peaks. Roam lush meadows and pristine deserts. Enjoy breathtaking canyons, lakes, ghost towns, modern resorts and cosmopolitan cities. Explore the land of cowboys and Indians. Whisk your cares away in the clean, fresh air.

We're content to provide an *armchair* vacation, because we're convinced that once you've *read* about us, you won't be content until you've *experienced* our lands.

It's so easy to do! All major airlines, buses and railroads serve our area. Interstates and well-kept highways, hotels, motels and modern campgrounds make family vacationing a pleasure. Additionally, there are many planned and escorted vacations which enable you to sit back and enjoy this unique part of the world.

THE FOREMOST WEST... where the West began, and lives today. We're out to get you—here!

THE FOREMOST WEST Vacation Adventures



Yes, I'd like to take an armchair vacation through The Foremost West! Please send me your free vacation booklet.

Name _____

Address _____

City _____ State _____ Zip _____

Send to: The Foremost West
4400 Grape Street, Dept. HL-19
Denver, Colorado 80216

The Foremost West, a project of the Four Corners Regional Commission and the States of Arizona, Colorado, Nevada, New Mexico and Utah.

* Use the estimated mile-per-gallon number for comparison purposes. Your mileage may differ depending upon speed, weather and trip length. Actual highway mileage will probably be lower than the highway estimate. California mileage lower and automatic transmission is required.

18 EPA*
EST
MPG

28 EST.
HWY



LeBARON TOWN & COUNTRY. THE MOST DISTINCTIVE WAGON IN AMERICA TODAY.

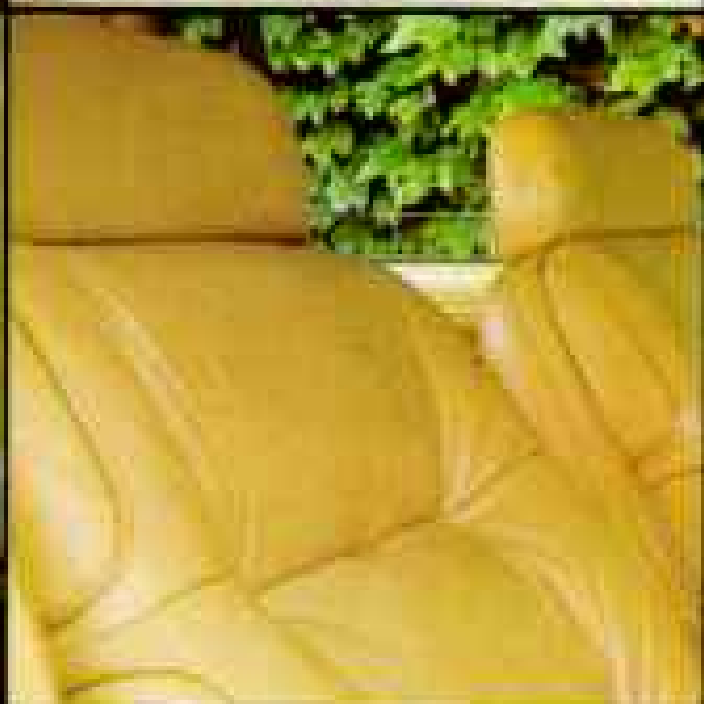
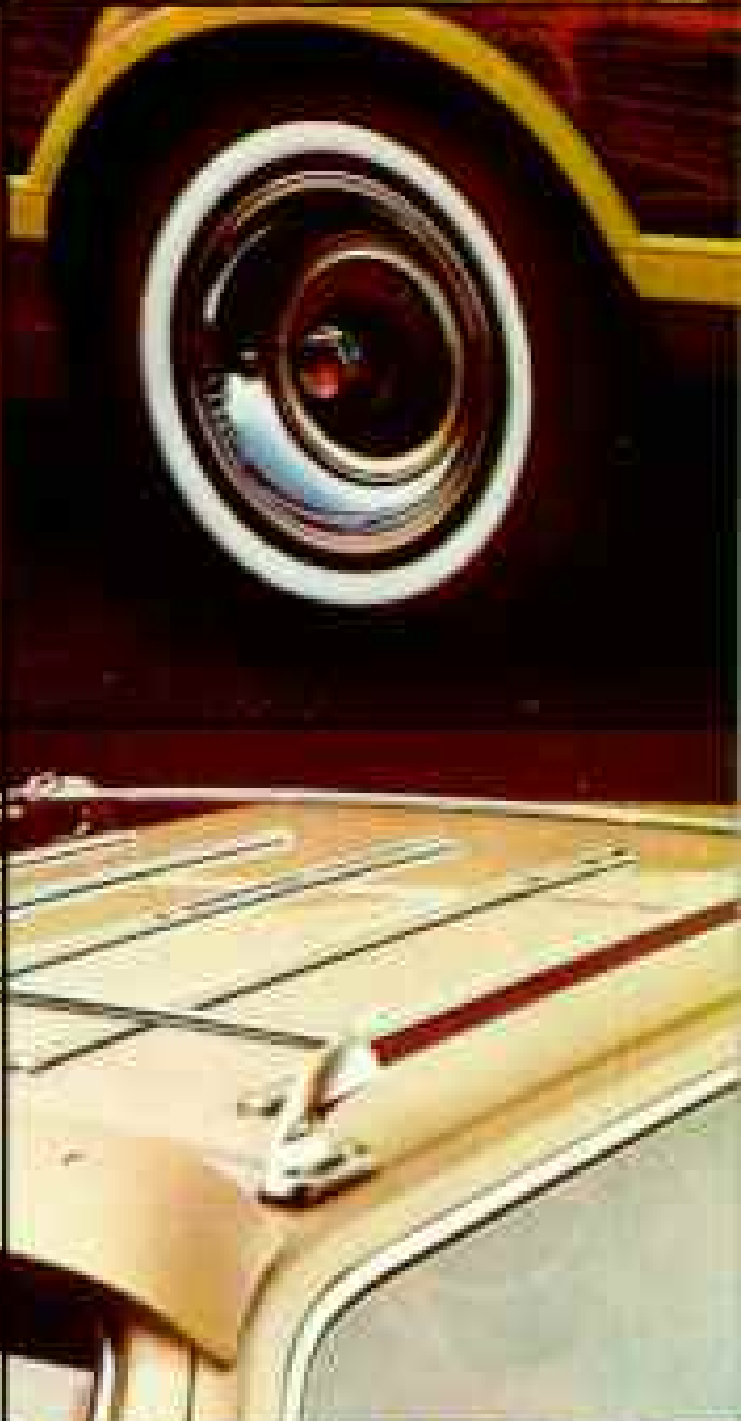
No other wagon stands out on the road quite like a LeBaron Town & Country. With the classic Town & Country look, reminiscent of handcrafted mountain ash and mahogany woodwork.


A distinctive size. Versatile. Ready to handle either a trip to the antique shop or the country club in style.

Town & Country is a wagon rich in Chrysler detail. With the finest Chrysler options available. Like genuine leather seating, made specially soft to the touch. A 4-speaker digital stereo system. And most every other power-assisted feature you can imagine.

The classic look, the modern convenience, the traditional Chrysler luxury. It all makes LeBaron Town & Country the most distinctive wagon in America today. And no other wagon even comes close. *Add a little life to your style*

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*The Franklin Mint Record Society presents
the ultimate private library of recorded music*

The 100 Greatest Recordings of all time

A unique collection of the greatest performances ever recorded,
selected by an international panel of music authorities
and presented on 100 records of superb proof quality.



For the first time in history, the world's greatest works of music—and the greatest recorded performances of those works—are being brought together in one unique collection of distinctively high-quality records. Truly the ultimate collection of fine recorded music.

These are the supreme masterpieces of man's musical genius, performed by the most outstanding artists of the century. Together, they form a record library unprecedented—and unsurpassed—in the history of music. *The 100 Greatest Recordings of All Time.*

The greatest music—the greatest performances

An international panel of renowned music authorities was appointed to participate in the selection of these great recordings. This distinguished panel considered



countless recordings of each of the greatest works of music—a momentous task.

For instance, members of the panel reviewed 24 recordings of Beethoven's 7th Symphony and chose the *one* they considered superior to all others: Toscanini with the New York Philharmonic. From 30 recordings of the Nutcracker Suite, the panel selected the *one* greatest performance: Fiedler and the Boston Pops.

Similarly, the recordings of other great symphonies, concertos, sonatas, rhapsodies, ballet and vocal music were carefully reviewed and the most outstanding recorded performance in each instance recommended.

The creation of this definitive collection has been made possible through the cooperation of leading record companies both here and abroad.

Among the works chosen for the collection are immortal masterpieces by Beethoven, Brahms, Mozart, Tchaikovsky, Schubert, Rachmaninoff, Debussy, Verdi—performed by Vladimir Horowitz, Jascha Heifetz, Enrico Caruso, Van Cliburn, Isaac Stern, Artur Schnabel, Leontyne Price—with the world's great orchestras under the direction of Toscanini, Ormandy, Bernstein, Stokowski, von Karajan.

In every sense, the ultimate private library of recorded music—to be cherished for a lifetime.

Superb proof-quality recordings

Each record is exceptional for its clarity and tonal quality—capturing the beauty of today's finest performances *and* of the historic performances of the past. Indeed, the recordings of legendary greats such as Caruso and Ponselle have been remarkably *improved* by electronically removing imperfections in the earlier recordings.

A superior vinyl material, containing its own anti-static element, is used in the production of these records. This special material, and the process by which the pressing is made, results in a record that is more rigid, durable and resistant to dust. A record that has true fidelity, clearer sound quality and a long life.

To further assure their quality, the records are pressed in a special "clean room," similar to the facility in which flawless proof-quality coins and medals are produced. In this atmosphere-controlled clean room, the most meticulous attention is paid to the pressing of the records. And the records are carefully inspected to make certain that the full quality of the original recordings are faithfully preserved. Together, these features enable the Society to create a collection of proof-quality records—records that offer greater clarity of sound, and are quieter and clearer.

Library cases of exceptional luxury

To match the quality of the recordings, custom-designed library cases are provided for all 100 records. Each case holds two long-playing 12" records. The fifty library cases have been specially designed to complement the beautiful recordings they protect. Each case is sturdily hardbound and attractively designed. And the spine of each case is stamped with the identification of the type of music inside.

These library cases also include specially written and illustrated commentaries discussing the great masterpieces and their composers, and providing fascinating background on the conductors and soloists.

Created solely for subscribers to this series

The 100 Greatest Recordings of All Time is being produced *exclusively* for those who enter subscriptions to this series. And the collection may be acquired *only* by direct subscription from The Franklin Mint Record Society. To begin building your private library of the world's greatest performances on proof-quality records, mail your application by April 30, 1979.



Records are inspected in an atmosphere-controlled "clean room."

SUBSCRIPTION APPLICATION

The 100 Greatest Recordings of all time

The Franklin Mint Record Society
Franklin Center, Pennsylvania 19091

Please enter my subscription for *The 100 Greatest Recordings of All Time*, consisting of one hundred proof-quality records in custom-designed library cases. I understand that I may discontinue my subscription at any time upon thirty days' written notice.

No payment is required at this time. I will be billed for each record in advance of shipment at \$9.75* plus \$1.75 for packaging, shipping and handling. My records will be sent to me at the rate of two per month.

*Plus my state sales tax

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Mr. _____

Mrs. _____

Miss _____

Address _____

City _____

State, Zip _____

Canadian residents will be billed for each record in advance of shipment at \$12.75 plus \$1.75 for packaging, shipping and handling.

Please mail by April 30, 1979.
Limit: One collection per subscriber.



Custom-designed library cases house the records, and specially written, illustrated commentaries provide background on the music and performers.



The Advisory Panel

MARTIN BOOKSPAN, music critic, commentator of New York Philharmonic radio concerts

SCHUYLER G. CHAPIN, Dean of the School of the Arts, Columbia University

FRANCO FERRARA, member of the faculty of the Accademia di Santa Cecilia, Rome

E. GALLOIS MONTBRUN, Directeur, the Conservatoire National Supérieur de Musique, Paris

IRVING KOLDDIN, music editor of *The Saturday Review*, faculty member, the Juilliard School

WILLIAM MANN, senior music critic of *The London Times*, author of books on Mozart, Bach, Wagner

MARCEL PRAWY, Professor, Vienna Academy of Music

ANDRÉ PREVIN, Principal Conductor of the London Symphony Orchestra

WILLIAM SCHUMAN, composer, first winner of Pulitzer Prize for music

H.H. STUCKENSCHMIDT, member of the Akademie der Kuenste, West Berlin

WHAT "STICKER PRICES" REALLY MEAN

HOW TO GET THE BEST BUY ON THE CAR THAT'S BEST FOR YOU.

Every GM dealer is an independent businessman. No one can tell him what to charge. Not the government, and not the manufacturer.

But the government can and does require that manufacturers post a suggested retail price, or "sticker price," on every new car we build. It's a good idea, because it makes it easier for you to compare one car against another.

Remember, the "sticker price" is only the suggested price. The actual selling price may be different. That's because the law of supply and demand affects the prices of cars, just as it affects most other prices. And market conditions change all the time.

For example: a very popular model may sell at the suggested price, but frequently cars will sell for less, because the automobile business is highly competitive.

The difference between the "sticker price" and the wholesale price—that's what the dealer pays us—is called the markup, or dealer's discount. This changes from time to

time, but as a general rule the markup on small cars is lower than on full-size cars.

The dealer's markup helps to pay his rent, taxes, salaries, utility bills—all that it costs to run a business. And he also has to make a profit, or he can't stay in business. Last year, GM dealers reported about two cents profit on each dollar of sales. As you can see, competition doesn't leave the average dealer a very big margin of profit.

You can affect the price you pay. It depends on the marketplace, for one thing. You may get a bigger break if you choose a slower-selling model or a car the dealer already has in stock. The latest sales figures published in many newspapers will give you some idea of how cars are selling, although the demand for a particular model may be greater or less in your area.

How much optional equipment you order on your car also makes a big difference in its price. Go over the list carefully, and equip the car just the way you want it. Then it will have most value for you, and you'll enjoy it more. You shouldn't buy what you won't use, although much of the equipment you add to your

new car will make it worth more when you decide it's time to trade it in.

Most buyers trade in a used car when they buy a new one. And the value of used cars varies according to demand as well as to their condition. Performance and appearance count, so it's a good idea to maintain your car and keep it clean. The more you can get for your old car, the less will be your out-of-pocket cost to replace it with a new one.

But whichever car you choose, the price should never be your only consideration. The dealer's reputation and his service capability are also important.

Our interest is in helping both you and the dealer to get a fair deal. We want you to be satisfied with your car. That's good for you, good for the dealer, and good for us.

This advertisement is part of our continuing effort to give customers useful information about their cars and trucks and the company that builds them.

General Motors

People building transportation to serve people



TEXAS



Where the Great Outdoors Meets the Great Indoors

Pleasantly-exhausting trail rides to stretch your muscles. Sublime art collections to stretch your mind. Texas is a remarkable study in contrasts. From its lakeside fishing resorts to its innovative opera companies. From the pristine grandeur of its national parks to its world-famous specialty shops. All of it bound together by a common heritage that has made hospitality an art form.

There's never been a better time to treat yourself to everything Texas has to offer. You'll find surprisingly moderate prices. Accommodations that range from superb campgrounds to complete resorts. And people with hearts as big as all outdoors.

Come sample the diversity of Texas. And take home some of the spirit that holds it all together.

TREAT YOURSELF TO TEXAS

Send for your free 160-page State of Texas guidebook filled with things to see and do in Texas—America's most diverse vacation bargain.

Write to: **TEXAS**, Dept. NG4
Box 5084, Austin, Texas 78763

Name _____

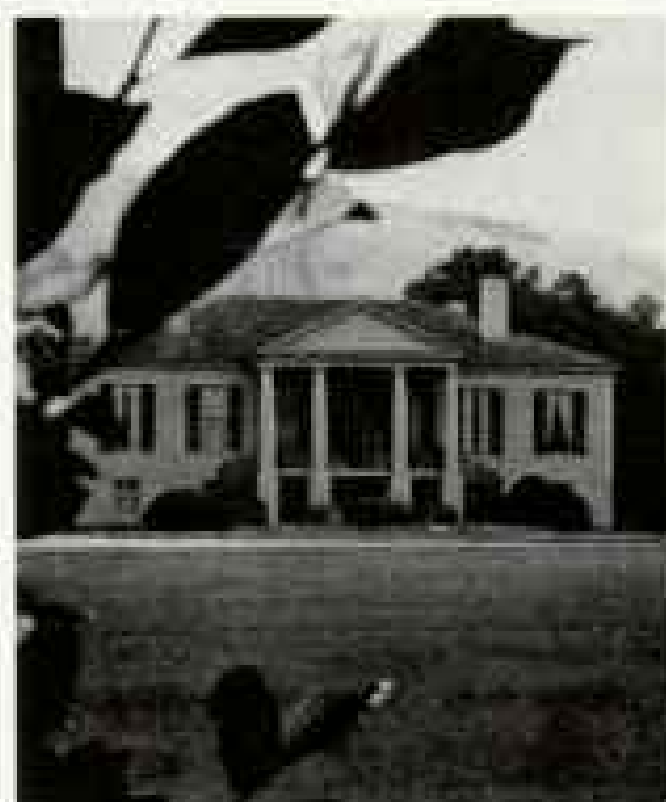
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More Than An Overnight Stop.



Explore outdoor pleasures such as boating, hiking, golf and tennis. Spend an afternoon strolling thru a 19th Century Southern Plantation or take an exciting excursion on a Full-gage Steam Train.

Treat yourself to a sumptuous buffet dinner. Soar past the world's largest carving to the top of the world's largest granite mountain aboard a Swiss Skylift. Take a peaceful sunset cruise on a Paddle-wheel Riverboat and listen to the haunting music of the world's largest Carillon.

Motel and Campground facilities available. For a day or for a week.

Georgia's Stone Mountain Park *Open Year Round*

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(or chain or pulley or shaft you!)

Get a tough Case Garden Tractor with hydraulic drive.

No troublesome belts, chains, pulleys, shafts in this drive train. One lever controls direction and speed.

Nobody else has hydraulic drive—nobody. Get tough. Get a Case. For a free copy of "Outstanding Yards and Gardens" planning guide and the name of your nearest Case Dealer, call toll-free 800-447-4700.

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doing something about it.





THE BEST VACATIONS TO WALT DISNEY WORLD START WITH THE AIRLINE THAT KNOWS IT BEST.



ways to give you the time of your life there than anyone else. At surprisingly low prices.

Eastern is the official airline of the Walt Disney World Vacation Kingdom. And because we're a member of the Walt Disney World family, it's like our second home. So it isn't surprising that we have more

SAVE GETTING THERE.

Our Super Saver fares are still available. So take advantage of them and get super savings, whether you're going for a long weekend or a week.

MORE VACATION CHOICES THAN ANYONE ELSE.

With almost 100 Walt Disney World vacations, and a variety of discount fares, we can help plan a trip that's just right for you.

We have vacations for families. Honey-mooners. Golfers. Tennis players. We even have

vacations that take in other parts of Florida, or the Bahamas.

Prices range from \$104 to \$227* plus airfare for a family of four, for 4 days and 3 nights at a selected hotel, and Eastern's exclusive Walt Disney World Ticket Books, each good for one day's admission as well as 9 fabulous attractions.

MORE FLIGHTS THAN ANYONE ELSE.

Besides having the most vacations at the best possible prices, we also have more flights, from more cities, to Orlando than anyone else. In fact, last year alone, we flew over one million people there.

If you've been thinking about a Walt Disney World vacation, call your travel agent. Or us. A vacation to a fantasy world isn't something you do every day. So it makes sense to talk to the people with the most experience.



EASTERN. THE OFFICIAL AIRLINE OF WALT DISNEY WORLD.



EASTERN

WE HAVE TO EARN OUR WINGS EVERY DAY

*Prices do not include airfare, meals, transfers or local taxes and are subject to change. Prices and hotel space are subject to availability and apply to family with 2 children under 17 all sharing a room. Valid 12/15/78-4/15/79.



A scrap of wood—crude epitaph to South Pole struggle

1910. The date is clearly marked on the scarred piece of packing crate. Some mittened hand pried loose the board and flung it aside. And there it lay in the Antarctic until another hand, years later, picked it up and entrusted it to the Society to preserve, a memento of polar exploration's heroic age.

The heroes of that age bore the names of Robert E. Peary, Roald Amundsen, Ernest Shackleton, and Robert Falcon Scott. Struggling on foot through uncharted miles of ice and snow, they broke trail for future explorers, who would come in Sno-Cats, jet planes, and nuclear submarines.

In 1910 Scott sailed for Antarctica. His objective: "to reach the South Pole, and to secure for the British Empire the honour of this achievement."

Shackleton had tried to win the honor the year before, but the bull-strong Irishman fell 112 miles short. That same year Peary had planted the Stars and Stripes at the North Pole. Would he now aim for a polar grand slam? Scott heard that

"the Americans are going."

Instead, it was the Norwegians who challenged him. Amundsen tersely cabled: "Am going south."

Amundsen! Scott underlined the name in his diary.

First to sail the icebound Northwest Passage, Amundsen had set his sights on the North Pole. Peary beat him to it. "This was a blow indeed!" the Norwegian wrote. "I resolved upon a coup." The race for the South Pole began.

Amundsen—like Peary—traveled on the ice with dogs, using them for dog food as well as for transport. "I figured out," Amundsen stated, "the precise day on which I planned to kill each dog. . . ."

On December 14, 1911, eight weeks after leaving base camp at the Bay of Whales, he unfurled Norway's flag over the South Pole.

Scott also used dogs. But he relied mainly on unproven tractors and ponies to haul supplies over the ice. Both failed. Many of his dogs died. So men strapped on harnesses and pulled sledges up tortuous Beardmore Glacier.

On January 17, 1912, after a

strength-sapping march of 78 days, Scott and four companions reached the Pole. They saw sledge tracks and paw prints in the snow, the Norwegian flag flying.

"Great God!"

Scott's diary shouts his disappointment. "This is an awful place and terrible enough for us to have laboured to it without the reward of priority. . . . Now for the run home."

Run? It was a crawl—slow, painful, desperate. One man, "nearly broken down in brain," died. Another, frostbitten, disappeared in a blizzard. A blinding gale pinned down the others. Helpless, their food and fuel gone, they holed up in a tent and awaited the end.

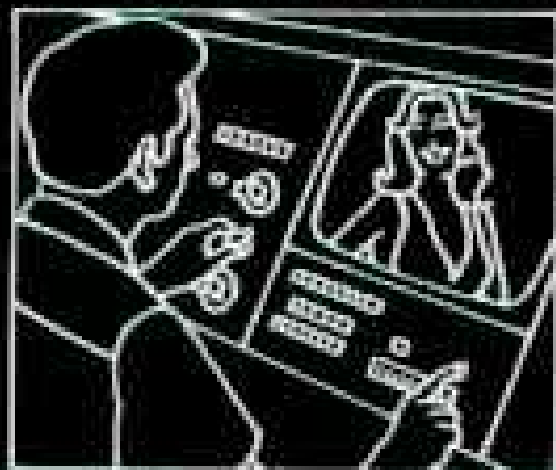
Scott poured his remaining strength into letters and his diary.

His last words: "For God's sake, look after our people."

Inspired by the heroism of Scott, men continue to seek new heights of valor—in Antarctica, on Mount Everest, in space, undersea. Readers discover their deeds unforgettably chronicled in the pages of NATIONAL GEOGRAPHIC.

GENERAL ELECTRIC TELEVISION TECHNOLOGY IS CHANGING THE WAY AMERICA ADJUSTS COLOR.

1. The broadcaster transmits a VIR signal with the color picture through the communication system.



2. This VIR signal lets the broadcaster monitor and maintain realistic color while transmitting the picture.



3. GE VIR sets use this signal to automatically adjust the color picture in your home.



Cabinet of genuine hardwood solids, distressed oak veneers and simulated wood accents.

In 1977 General Electric won an Emmy for being the first to use the broadcaster's VIR color signal in home television. The GE VIR set uses the signal, broadcast with many programs, to adjust color distortions which may occur as the color signal passes from the broadcaster, through TV communication systems, to your home.

Flesh tones, backgrounds, blue skies and green grass are automatically adjusted for you by the computer-like circuitry in your GE VIR set.

An incredible sixty times a second, giving you vivid lifelike colors.

And all GE VIR sets have a 100% solid-state modular chassis and the In-Line picture tube system pioneered by GE.

See a demonstration of GE VIR television technology today. We're changing the way America adjusts color.



VIR
BROADCAST
CONTROLLED
COLOR

This is GE Performance Television.

GENERAL  ELECTRIC

You won't get crabgrass this summer if you stop the seeds now.

food for up to two months, just when it needs it to get good and thick. Now, Halts works fine for annual grassy weeds like crabgrass, but it won't do anything for broad-

leaf and vine-type weeds like dandelions and chickweed. You have to get them after they come up, and our Turf Builder Plus 2® will do that job for you.

We sell Turf Builder Plus Halts with the plainest guarantee we know: "If for any reason you are not satisfied with results after using this product, you are entitled to get your money back. Simply send us evidence of purchase and we will mail you a refund check promptly."

Are you still pulling up crabgrass? We put a "Halt" to this 13 years ago.

If you can't tell one weed from another, your nearest Scotts Lawn Pro™ can help. He knows what's growing in your neighborhood and doesn't charge for advice. You only pay for what you buy. For his address call us toll-free in the Continental U.S.: east of the Mississippi 800-543-1415; west

of the Mississippi 800-543-0091; and in Ohio 800-762-4010.

If you want our address, it's Marysville, Ohio 43040. Don't worry about the street. We don't have that many.

They used to call this fingergrass because it reached out like a lot of fingers and everywhere it went it put down more roots. Pulling it up was awful. It was tied to the ground.

Anyway, some thirteen years ago we came up with an easy way to get rid of it. You just keep it from ever coming up. Crabgrass is an annual that dies every fall. That's when it spreads its seeds – up to 90,000 from just one plant. Those seeds will start to sprout about the middle of spring and by late summer you'll have regular mats of the stuff choking your good grass. (Good grass loves cool weather, crabgrass loves hot weather.)

Our Turf Builder Plus Halts® keeps those seeds from sprouting. All it takes is half an hour with your spreader in early spring before the seeds get started. The "Halts" part is the crabgrass preventer. The "Turf Builder" part is Scotts® lawn fertilizer. So you'll be giving your good grass an early feeding at the same time you prevent the crabgrass.

We make Turf Builder® with our special kind of slow-release nitrogen so that your lawn will go on getting



Free. The kit that has shown hundreds of companies new ways to control travel time and costs.

Chances are, last year you travelled less but spent more. It's a simple fact: business travel costs are getting out of hand.

But help is just around the corner.

It's the Beechcraft Business Flying Kit. And it's already helped hundreds of successful companies find new ways to put a lid on the skyrocketing cost of business travel.

This straight-forward and easy-to-read kit is designed to do one thing. Help you, step-by-step, realistically evaluate whether a company airplane can help solve your travel problems.

Inside the kit, you'll find up-front answers to the real questions you have about owning a company



airplane. How do you determine the need for one? Will it be a good investment? Who will fly it?

And this year, the kit has been up dated and expanded with new information that makes objectively evaluating a company airplane even easier.

You'll also get a look at dozens of creative ways many companies use business airplanes, like the

Beechcraft Bonanza shown here, to reduce their travel costs—while doing more business in more places.

Get some help with the vexing problems of business travel.

Send for the Beechcraft Business Flying Kit today.

Write on your company letterhead to: Beech Aircraft Corporation, Dept. A, Wichita, Kansas 67201. Ask for our free Business Flying Kit, and please mention if you're a pilot. If you'd rather call, make it collect and ask for Dick Schowalter, Jr. 316-681-7072.

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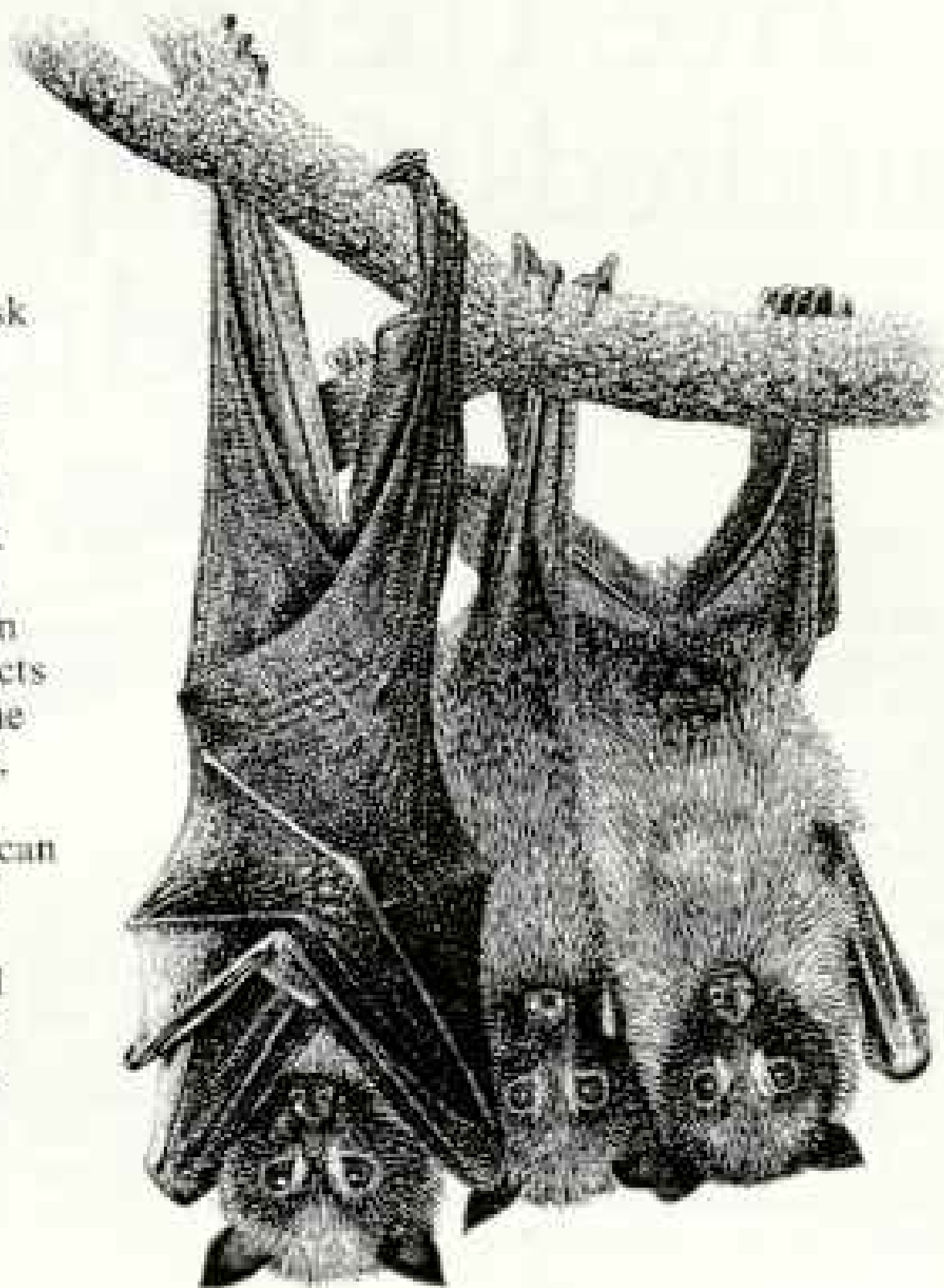


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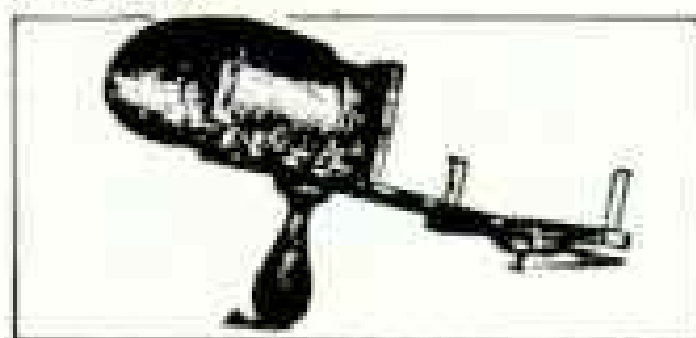
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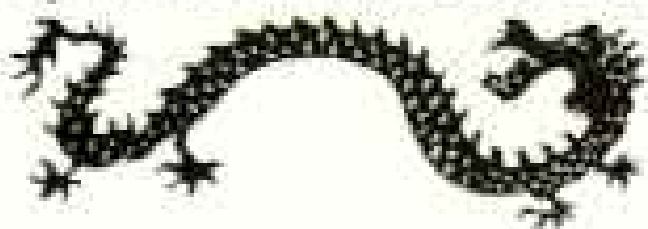

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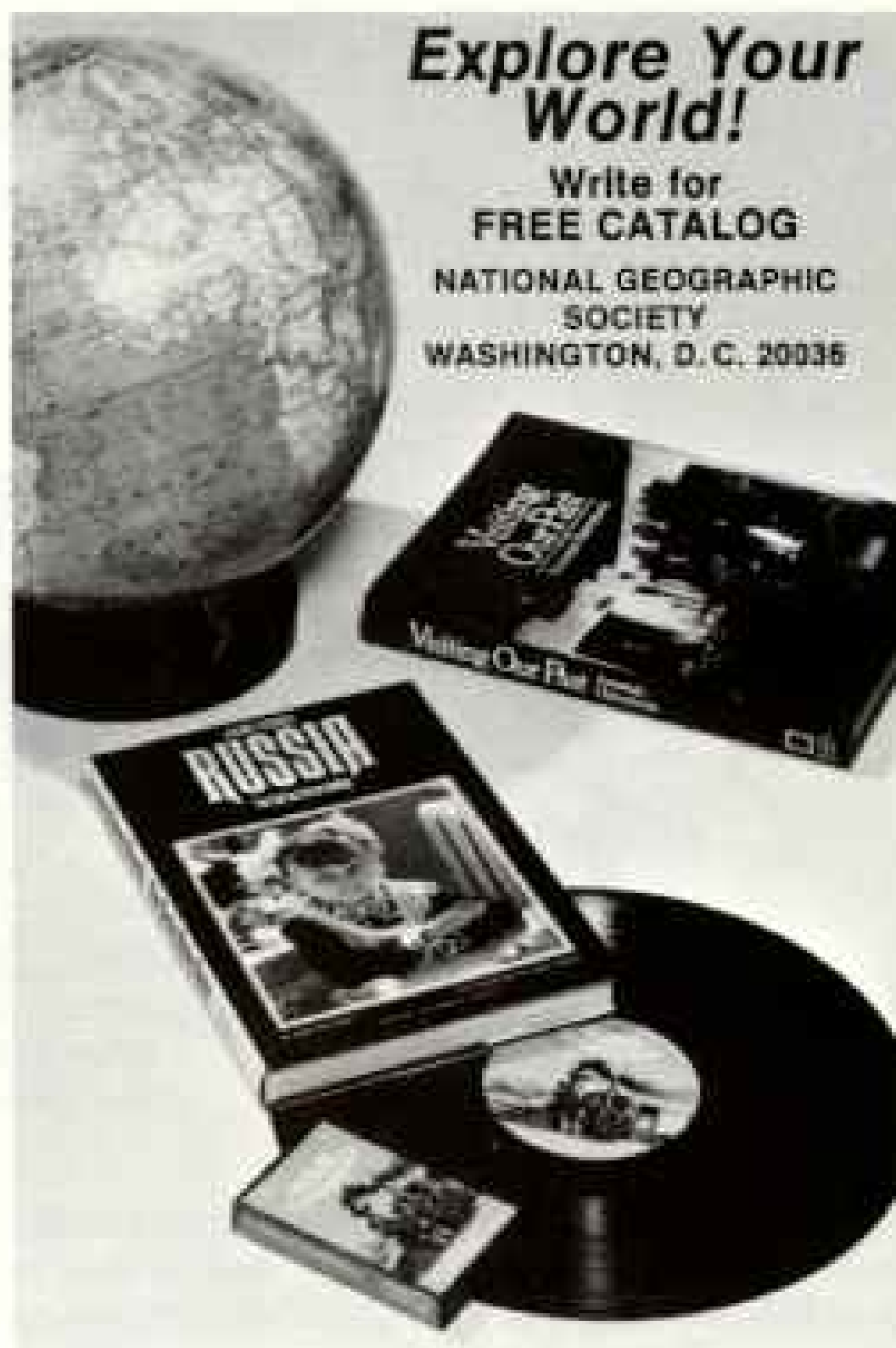


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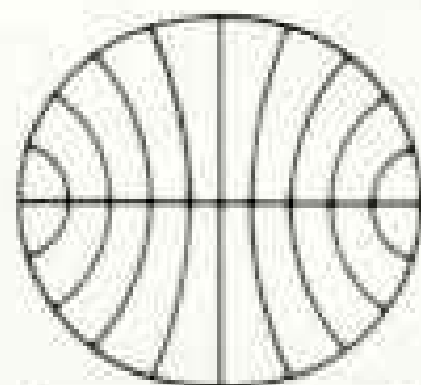
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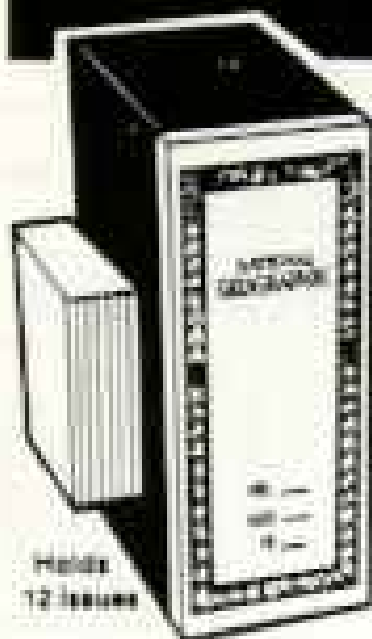
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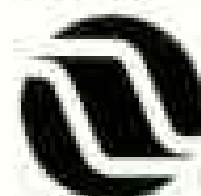
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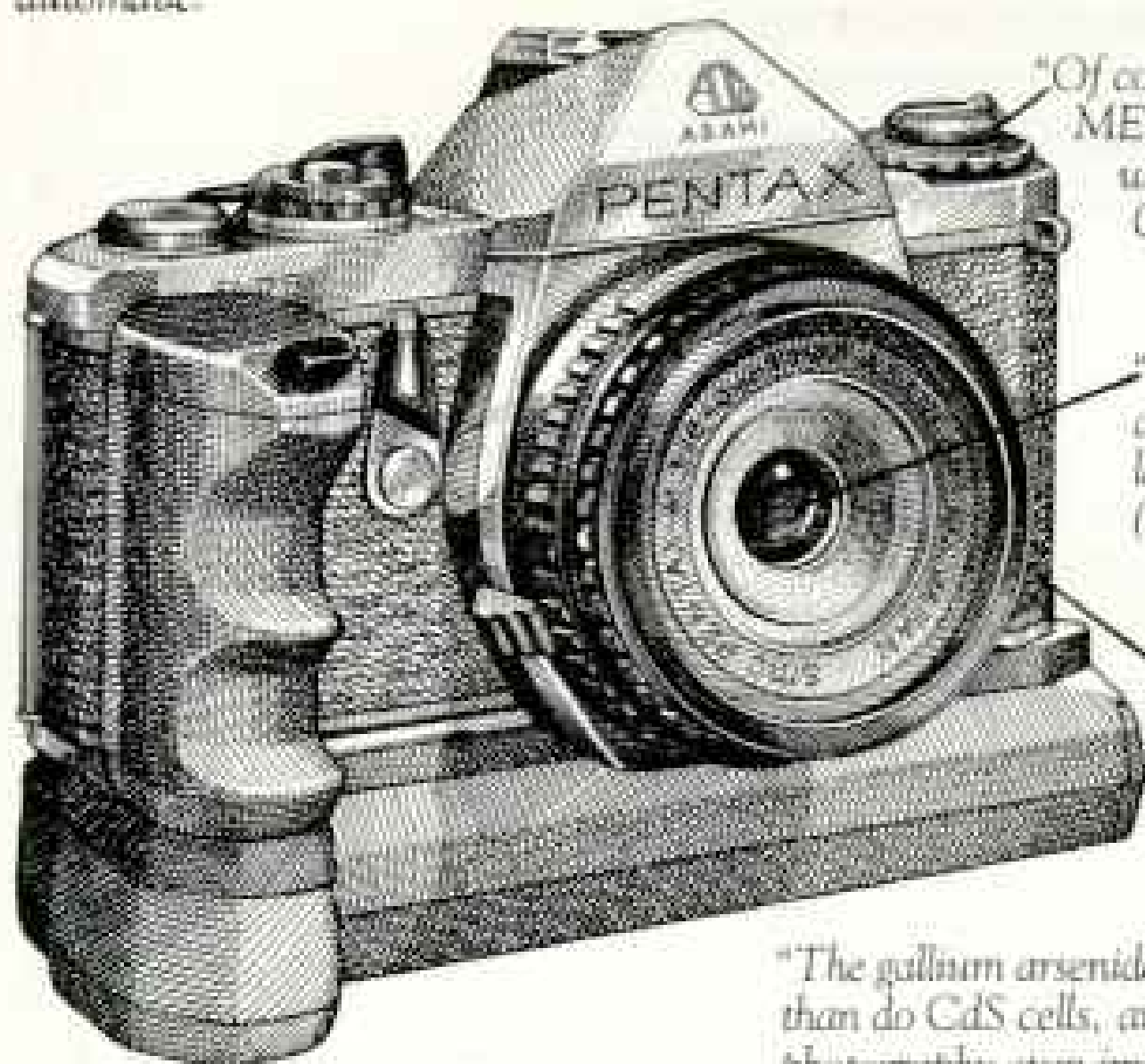
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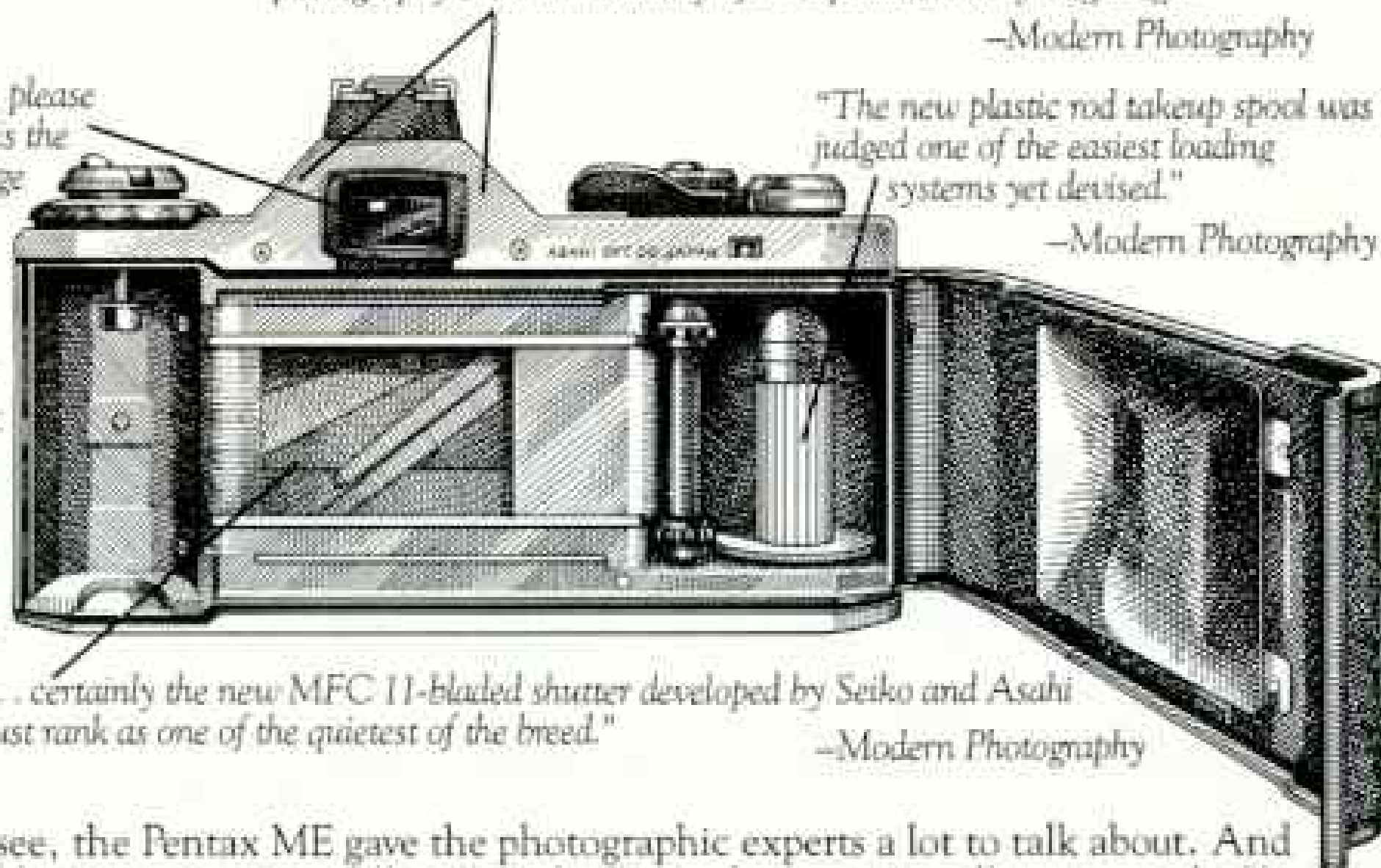
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