TRAVELER'S MAP OF THE ALPS

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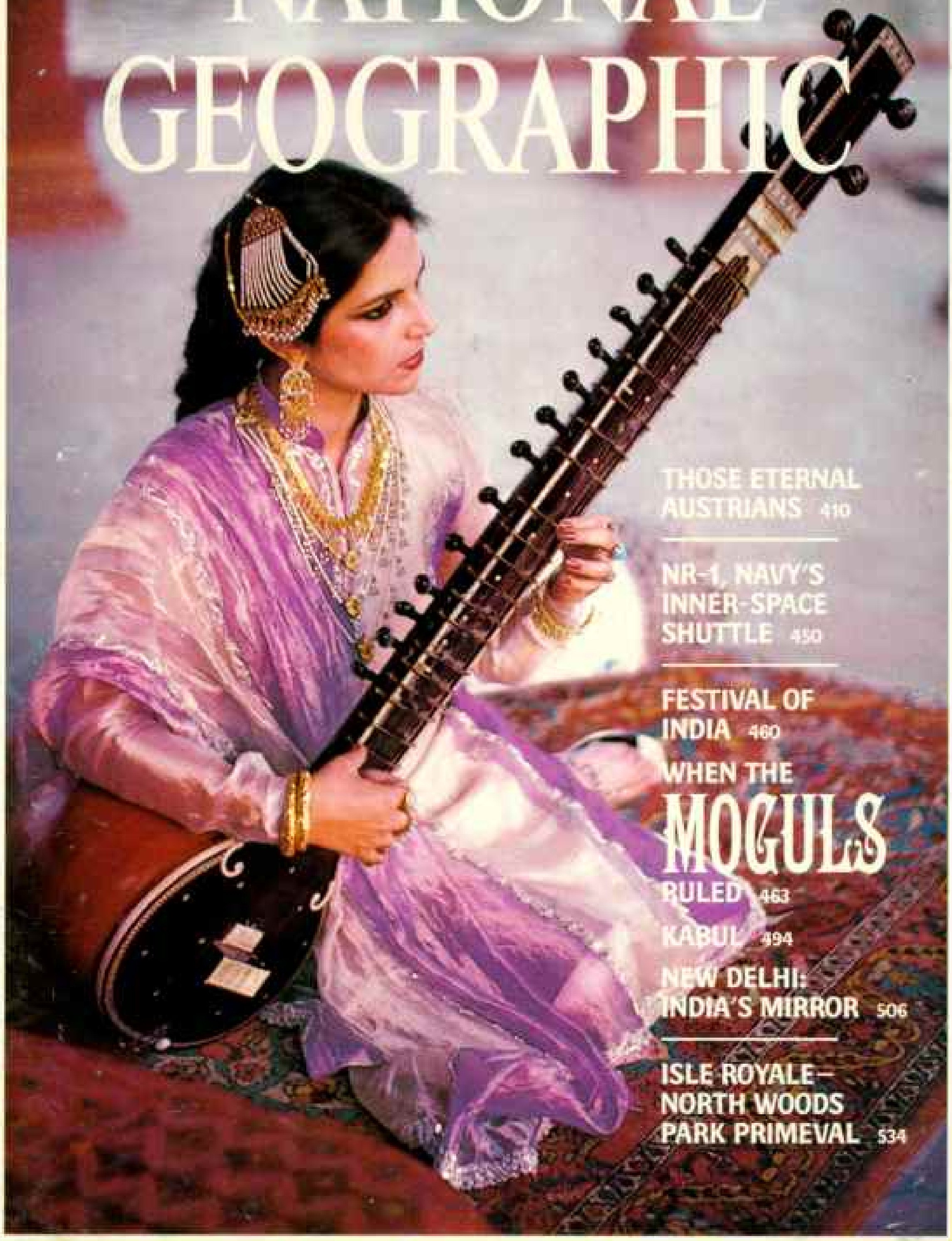
NATIONAL GEOGRAPHIC



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NATIONAL GEOGRAPHIC

April 1985

COVER: *Tones of a sitar fill a garden in Lahore, Pakistan, built by Mogul Shah Jahan. Photograph by Roland Michaud.*

THE NATIONAL GEOGRAPHIC MAGAZINE
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IT'S ONLY FITTING for an educational magazine that the most popular cover girl we have ever had is known for her brains, not for her beauty. This isn't to say the dark-haired California student who graced our January cover isn't beautiful—as gorillas go. She first gained fame 12 years ago as part of Dr. Francine "Penny" Patterson's research project at Stanford University, continued since 1976 by the Gorilla Foundation of California.

I met Koko several years ago when we shared a soft drink with two straws. The 230-pound student quickly finished most of it, then began removing my jacket and unbuttoning my shirt. Her lumberjack-like fingers moved quickly and with surprising—and a tad frightening—dexterity.

"She's very curious," Penny said, ordering Koko to stop. It seems Koko has this thing about male humans and pays little attention to Michael, her 300-pound fellow gorilla student.

Koko apparently would like to have a baby but hasn't yet permitted Michael to be her mate. Last year she asked for and received a kitten. She attempted to suckle it and carried it tucked against her thigh, as gorilla mothers carry their babies. Tragically, All Ball, as Koko named the kitten, was killed by a car. When she heard the news, Koko remained silent for about ten minutes, then began to cry—not with tears as humans do but with high-pitched soblike sounds.

ROBERT W. MADDEN, NGS STAFF

Koko, using American Sign Language, let Penny know she wanted another kitten. The cover story had generated masses of mail. But the news of All Ball's death—carried by hundreds of newspapers and television stations worldwide—brought a flood of sympathetic letters and telephone calls from as far as Japan and Italy.

As sad as the loss of the kitten has been to all concerned, the incident—carefully documented by the Gorilla Foundation—has added to the growing scientific knowledge of these amazing animals.

How often we've said, "If only animals could talk." Thanks to Penny, Koko does.

Wilbur E. Garrett

EDITOR

Those Eternal Austrians

Mute encounter *finds a passerby regarding one of some 300 mannequins set out as street art for the annual Vienna Festival. Once capital of a polyglot empire, Vienna survived two World Wars with its flamboyant fatalism intact; the mannequins in black, for instance, dance on a memorial that celebrates the end of a 17th-century plague. The city is now capital of a small republic, neutral and armed on the Swiss model, a nation that has largely escaped the cold war's long chill.*

By
JOHN J. PUTMAN
NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by
ADAM WOOLFITT

IT WAS A LARGE ROOM, a corner room, with great windows; through them at first light you could see the city emerge: church steeples, tile roofs, chimney pots, blackbirds skittering. The street below was the Kärntnerstrasse, Vienna's great central pedestrian shopping street. The sweepers were the first to arrive each morning, then the vans of the merchants, bearing fresh supplies. By midmorning the street was full. I had come to know its musicians: the organ grinder (*"Guten Morgen, Herr Doktor,"* he cried to well-dressed passersby, half flattering, half mocking); the old man who fingered a soundless accordion, but provided a tune with his voice, quavering, disturbing; the young woman who came often in the evening to stand below my windows and sing opera arias (the voice always began strongly, but also always in time failed, and so sadness mixed with the applause).

After midnight the street was deserted, save for occasional revelers. Their voices and laughter seemed to bounce back and forth from the stone street to the stone buildings on each side, gaining in volume, until they escaped into the dark sky above. Awakened, I would wonder again: Would I ever understand these Austrians? Only, I had been told, there was no Austrian character to understand, only a Viennese character, a Tirolean character, a Styrian character, and so on. "I'll tell you about the Viennese," several Viennese had told me, leaning close as if to disclose a confidence: "Every Viennese has two great ambitions. The first is to be a Vienna Choirboy, and the second—well, when one is older—is to be a Lipizzaner!" Laughter, of course, followed; but tell me, was it not half bitter? Could there be more to Austria than *Schlag, Schuss,* and smiling faces?

I had come to Austria on a thoroughly modern, straightforward mission. I was to look into that country's remarkable economic and social performance over the past 25 years: a growth rate that often outdistanced West Germany's, surprisingly low unemployment and inflation, trade unions that almost never went out on strike, a parliament that voted unanimously on 80 percent of the bills offered, a social harmony and lack of acrimony that contrasted sharply with *(Continued on page 418)*

Since the Dark Ages *a massive limestone outcropping in a mountain-ringed plain of Carinthia province* ***(right)*** *has been fortified. In the 15th century defenders manned a redoubt here against a Turkish invasion. A century later Hochosterwitz Castle rose on the site.*

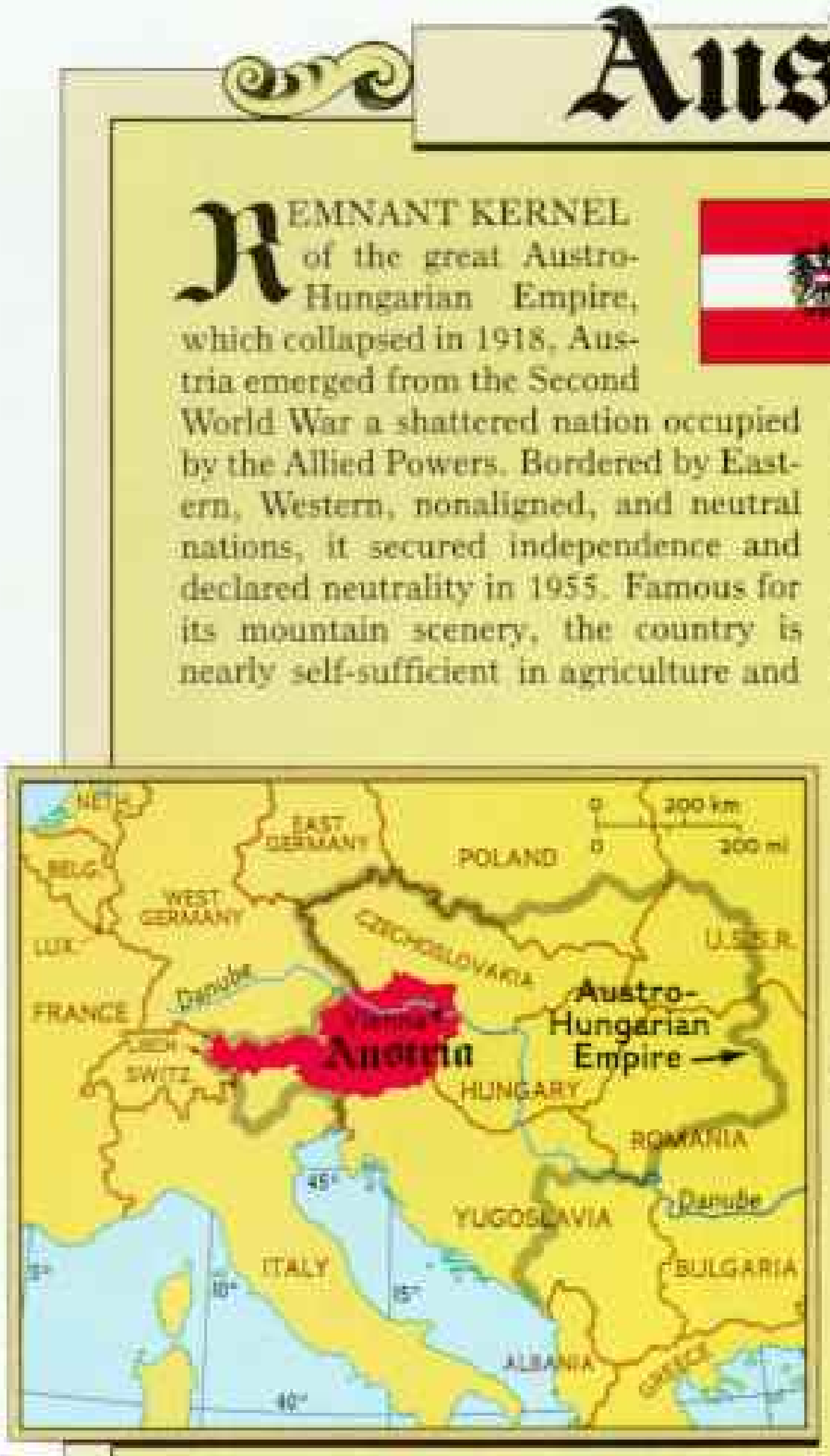
As a European power, Austria began modestly as an outpost of Charlemagne's empire, grew under the Habsburg Dynasty, and prospered in the 18th century under reform-minded Empress Maria Theresa.

In the first years of her reign the Cistercian Abbey at Wilhering ***(overleaf)****, founded in 1146, was rebuilt after a fire. Decorated in the flowing forms, gilt, and pastels of the rococo style imported from France, the abbey church makes a popular setting for weddings.*

Austria

REMNANT KERNEL of the great Austro-Hungarian Empire, which collapsed in 1918, Austria emerged from the Second World War a shattered nation occupied by the Allied Powers. Bordered by Eastern, Western, nonaligned, and neutral nations, it secured independence and declared neutrality in 1955. Famous for its mountain scenery, the country is nearly self-sufficient in agriculture and supports an extensive natural-resources and industrial economy. Provinces maintain their distinctive characters, while internationally minded Vienna is central Europe's easternmost city with a Western outlook.

AREA: 83,855 sq km (32,376 sq mi). **POPULATION:** 7,555,000. **CAPITAL:** Vienna, pop. 1,531,000. **CLIMATE:** Temperate, varies with elevation. **LANGUAGE:** German. **ECONOMY:** Metal products, chemicals, lumber, textiles, mining, tourism, hydroelectric power.



Western Europe's other democracies. But in seeking to determine how this nation of seven and a half million had achieved these goals, so out of keeping with its own past, I was thrown again and again into that past—and into the labyrinth of the Austrian mind.

"I did not know then," one Austrian wrote at the turn of the century, "that it is the living that are lost to us so often. The dead stay with us, always." While another wrote, "My watch is turned backward, never is what's past over for me."

THE PSYCHOANALYST, eminent president of the Sigmund Freud Society, had a pince-nez, a well-worn couch, a ticking grandfather clock. "If I may speak in a joking way, I would say the Viennese are very much fixated. Their interest in good food is very marked, and they have this strange relation to death and things surrounding it, graveyards and such. And you can find in the *Heurigen* songs, the songs they sing in the wine taverns, that they are always flirting with the idea of their own death. It's hard to say where it comes from. Perhaps from the turn of the century, an experience of fantasy, of something going to end. Everybody knew that the decayed monarchy would stop someday.

"In Vienna you will always find the backward look and the pride of their past. All the things they have come through, and their survival capacity, make them feel great. You may have noticed they have a

condescending way of speaking to foreigners. They don't show what they really are. Their friendliness is often a mask; deep down they are very aggressive.

"One of the difficulties of the Viennese character is that the Viennese have, for me as an analyst, an outspoken talent for negation of reality in fantasy. This can be noted in the Viennese saying that the situation is hopeless, but not serious; a German would say the situation is serious, but not hopeless. This has enabled us, however, to survive a lot: the Turks, Napoleon, the Nazis."

A fascination with death, a talent for fantasy! Well, did not the remains of 137 Habsburgs lie within a five-minute walk from my room . . . the bodies in the Capuchin church, hearts in the Augustinian church, inner organs in the towering St. Stephen's Cathedral?

And as for fantasy, were not the very stones of Vienna a testimony? The Ringstrasse, the great boulevard encircling the central city, was created in the latter half of the last century, when the city walls were torn down. Learned panels selected the buildings to decorate it: for the parliament, a Greek temple; for the city hall, a Flemish Gothic guildhall; for the university, an Italian Renaissance palace; for the State Opera House, a wedding cake on a platter. (So roundly criticized were the architects of the last that one committed suicide, but now, of course, every Viennese loves the building.)

And what is opera if not fantasy? I went one night to Mozart's *The Magic Flute*. The

bird catcher, Papageno, was played so amusingly that the musicians in the pit had to struggle against laughter. In one scene the three genies, Vienna Choirboys, floated high across the stage in a little car suspended by cables. Patently absurd, yet they produced a wondrous stilling of the house, each head bent forward to catch the small bell-like voices in their summons to life, love.

You could say even that the famous Spanish Riding School reflects the city's taste for fantasy, its capacity for survival. The major led me into the stable. It had a dreamlike quality: a Renaissance building in the heart of the city, dark-painted stalls, 20 grooms, the smell of hay and leather, 60 great Lipizzaner stallions coming and going to and from their exercises. In the half dark, with translucent skin and white hair, they seemed to glow.

The school was founded in the 16th century to provide trained horses for the imperial family. "After the end of the monarchy," the major said, "it was the idea of the riders here to survive, to make public performances to earn a little money, to buy food and all these

Sailor suits *are issued to recruits by Vienna Boys' Choir director Walter Tautschnig (**left**), himself an alumnus of the institution whose music supports an international reputation and the boys' schooling. Mounts of the Spanish Riding School (**below**) have a longer public career and training perhaps as rigorous.*

things, the uniforms and boots, because the republic tried to sell the horses and make finish with the school.

"This idea of the riders was very prosperous, and the Viennese people were coming and watched the horses every morning and paid a little bit for it. Now the money we earn gives us a good financial background."

I talked with an apprentice rider, 17, from the province of Carinthia. He lived in the palace; the stable, the riding school would be his life. "It is the most beautiful, the nicest profession," he said. The major and I watched him lead off a stallion. "He has five years to go before he becomes an assistant rider, and when he has fully trained his first own horse, he becomes a rider. That takes another 10 to 15 years. And then, between 60 and 65, he will retire. It is a moving circuit, always circulating; one goes into retirement, a young one is coming. The young man learns by an old horse, gives the feeling back on a young horse, becomes older himself, is responsible for the training of the young men, and so, and so, and so.

"It's very simple," the major said with

Viennese pride. "You only have to have a nice riding school and more than 400 years of tradition."

ON A FINE AUTUMN DAY, I strolled the Ringstrasse, admired its buildings, rode a little tandem streetcar, sat in the sun outside a coffeehouse. "You know," I recalled an artist telling me, "this is a town full of ghosts, you're always rubbing shoulders with them; and you know, this is not unpleasant."

There were friendly ghosts, like that of Beethoven, who, dying here, touchingly inquired of a friend: "I had a certain talent, hadn't I?" And more disturbing ghosts, those of men who around the turn of the

"Invitation to the Dance" *includes a Viennese waltz, and when the dance is the annual Opera Ball, it summons guests to an evening as elegant as it is expensive. Couples swirl (**below**) on a floor specially installed for that one night in the Vienna State Opera House.*

*Boxes in the sweeping tiers above the floor (**right**) are engaged for as much as $5,000 each. Gaiety is exhausting, and when the ball is over—at 5 a.m.—patrons, some as woozy as the characters in the final act of Strauss's* Die Fledermaus, *wander out to meet the day with a nightcap of goulash soup and beer.*

century began to shake apart the old ways of seeing and doing things, who began to shape our century: the artists Klimt and Kokoschka, the composers Mahler and Schönberg, the philosophers Wittgenstein and Buber, Sigmund Freud and his colleagues, and Theodor Herzl—the founder of Zionism—"Dream is not so different from deed as many believe. . . . The Jews who wish it will have their state and they will earn it."

And there was a young man from the provinces who wanted to be an artist. He found the Ringstrasse "like magic from the Arabian Nights." Of Wagner at the opera, he wrote: "When the mighty waves of sound flooded through the room and the whine of the wind gave way before the fearful rush of billows of music, one feels sublimity." He failed as an artist, but learned much that he would later find useful.

He watched socialist political speeches, propaganda, demonstrations—"Endless columns . . . four abreast. . . . the gigantic human dragon. . . ." He deduced that "the psyche of the great masses is not receptive to anything that is halfhearted and weak." He admired the city's mayor: That man knew how to "make use of all existing implements of power, to incline mighty existing institutions in his favor, drawing from these old sources of power the greatest possible profit for his own movement."

He absorbed the exhortations of one Georg Ritter von Schönerer, a member of

A little night music in Salzburg, birthplace of Mozart, is composed of

moonglow, spotlights, and stone, with variations in the Salzach River.

parliament: "Religion's only a disguise, in the blood the foulness lies." Von Schönerer's followers wore on their watch chains the insignia of the anti-Semite, a hanged Jew. "Wherever I went," the young man would write, "I began to see Jews, and the more I saw, the more sharply they became distinguished in my eyes from the rest of humanity. . . . Gradually I began to hate them." After six years, Adolf Hitler left Vienna for Germany.

Why was it, I wondered, that although Leon Zelman of the Jewish Welcome Service was not actually doing so, it seemed as if he was turning to look over his shoulder from time to time? "We have in Vienna," he said, "maybe 10,000 Jews; 110 in Salzburg, 75 in Graz, 62 in Linz. It's tragic when you are thinking that before the war there were 300,000 Jews in Austria.

"In Vienna, the biggest part of the Jews were not born here. After the war 600,000 Jews crossed Vienna from Eastern Europe. I was born in Poland, survived Auschwitz, arrived here at 16. When I recognized what had happened, that my parents were not living, I must tell you in that time to find 'yes' to life was very hard for me."

He said Vienna's Jews no longer lived only in the Second District, the traditional Jewish quarter. Still, they tended to cling to one another. "Among the old there is a terrible, problematic attitude. They live their lives in the shadow of the Holocaust. They cannot lose their memory, they are afraid."

There comes now, he said, a new generation, born here, "a very nice class of intelligentsia. In 1983, 25 finished their doctorates, the biggest number since the war." The community had now two synagogues, three houses of worship, excellent schools, an old people's home, two Jewish restaurants, "very nice." But it wanted, he said, "to have contact with the American Jewish community, to help us to be; not economic help, but to give us a feeling the Viennese Jewish community is not alone.

"Hitler like to make us finish, but we don't allow it. We must try to be, to make it so that Europe will not be a cemetery or museum about the Jews. It is not a question of religion. It is something, a feeling, we don't allow us to be finished, you know. We don't allow them, Hitler, to make finish this life."

"IT HAPPENED in Austria," the distinguished professor of history at the University of Vienna said, "as it does so often, that you actually treasure something only when you have lost it. I would say this is what happened to many Austrians." The first loss came in 1918 at the end of the First World War. The old Habsburg Empire was dismembered; from it were fashioned Czechoslovakia, Hungary, parts of Yugoslavia, Poland, Romania, Italy. Sigmund Freud caught the feelings of many in a note he scribbled to himself: "Austria-Hungary is no more. I do not want to live anywhere else. . . . I shall live on with the torso and imagine that it is the whole."

"There followed," the professor said, "a terrible crisis of confidence. Many despised this smallness. There was agitation in favor of union with Germany. It went beyond a group of German nationalists. It was very widespread."

After two decades Austria vanished, became a part of the German Reich. "After this second experience of bigness," the professor continued, "the Nazi experience and the disaster in which it ended, the virtues of smallness have been newly appreciated. And that which was lost—an identity as Austrians—was found again."

You could say that it was those years from 1918 to 1945 that stamped the Austrian mind: The memories of the first republic, the street battles between socialists and the Catholic right, the economic crises, the failure of parliament, the collapse—and the ending up of old enemies in the same Nazi concentration camps or working illegally on the outside. Among those was Anton Benya.

"I was a little active in the '30s and '40s," he said. "I was in the socialist party, I was

Built for an archbishop's not-quite-wife, *Salzburg's Mirabell Gardens offer a sheltered niche in May sunlight. Wolf Dietrich von Raitenau, as much nobleman as he was cleric, built Mirabell Palace in 1606 to house Salome Alt and their numerous children while he turned medieval Salzburg into a Renaissance town.*

arrested. There was fighting. After the war, because so many of our people on the Social Democratic side—and also the other people on the Christian Social side—had been in concentration camps and had come together there, we thought it would be unwise to fight again. Both sides realized that we had to find a common way. And you see that we were occupied by the four powers, and we tried to make Austria free, independent. So fights didn't seem very meaningful to us."

So old enemies joined together to put Austria, like Humpty-Dumpty, back together. They succeeded, and the intricate and multiple layers of lashings are embodied in Mr. Benya. He is the first president of the lower house of parliament, the president of the Trade Union Federation, a leading official in the Socialist Party. He is also, as a Tirolean put it to me, "one of our two beekeepers"—the other being Rudolf Sallinger, president of the Federal Economic Chamber and a member of parliament representing the conservative People's Party.

Both sit on the Parity Commission, a body formed 28 years ago. It has no legal standing and was intended only as a temporary measure. It considers all union requests for wage increases, all major requests for price increases. "We don't make decisions there,"

Ore Mountain, *a 1,500-meter peak of manganese-rich iron deposits (**left**), is mined for the advanced Austrian steel industry. Producing fertilizers and chemicals—as well as environmental concern—industrial works at Linz (**below**) release pollutants.*

Robot express, *guided by induction wires embedded in the floor (**right**), trundles engine blocks on demand to workers who mate them to transmissions at the Vienna General Motors plant, completed in 1982.*

With ample minerals, hydroelectric power, labor stability, and efficient agriculture, the Austrian economy, a mix of private and nationalized enterprises, has been vigorous and prosperous.

Mr. Benya said, "but we try to persuade the social partners to come to a compromise. That's the Austrian attitude. We do a lot of talking about the problems, and we have succeeded so far in this manner. We have so few strikes we count them not in minutes per year per employee, but in seconds."

Compromises are hammered out at many levels by a small army of technocrats. "This kind of system has to rely on a personal component," one told me. "Most of us have been working together for years; we know the limits, use a little Japanese face-saving. I have never attacked my counterpart personally; it's not my task to shout him down, but to convince him by arguments. Normally the climate is correct, gentle. Of course, on weekends I sometimes want to shout, to quarrel, but I realize it is to no purpose."

Another element in the economic system: In 1946 by common consent Austria nationalized much of its major industry, to prevent the Soviets from appropriating it as German-held property. The state holds those industries yet, also a great number of banking shares. The interconnections are thus further tightened. Private enterprise flourishes at the middle and small-scale level.

I FOUND that a great struggle was being waged in parliament, very quietly. In 1981 the worldwide recession had finally caught up with Austria: Growth rates fell; unemployment inched up; steel, machine making, and other industries found themselves in trouble; the national debt climbed. To meet the crisis, the socialist government proposed to increase indirect taxes and the public indebtedness. The People's Party objected; it suggested paying more attention to profits, letting the market play a freer role.

Why this quiet amid conflict? I called on Alois Mock, leader of the People's Party. "There's always a struggle to find consensus," he said. "Everybody gives in a little bit." If an issue became heated, it was discussed informally behind closed doors by the leaders of the opposing parties.

Those leaders can count on party discipline. "We decide in the party caucus how to vote," a member of parliament told me. "Then you have to vote as the majority in the caucus decides. Nobody can ever break it."

Smaller parties exist; none seems to threaten the present system. The Liberal (or Freedom) Party has won a place in the present government. The Communist Party is so small it has not been able to win a seat in parliament in years. And though a new United Green Party, based on environmental concerns, foresees entry to parliament in the next elections, its president told me it would not resemble the rambunctious Greens of West Germany: "We don't want to be a radical movement at all; we want to stay within democratic means."

IF AUSTRIANS have learned how to be gentle with one another, they also extend that gentleness to others. The scene at the old army barracks at Traiskirchen was a familiar one in Europe: rain, a wind that shook the horse chestnuts from the trees, lines of anxious people, suitcases tightly packed as if for journeys of consequence. Since 1956 Austria has accepted more than one million refugees, mainly from Eastern Europe, and sent most to new homes in the West.

There were on that day 1,500 registered at Traiskirchen: Hungarians, Afghans, Chileans, 34 nationalities. The largest number were Poles. One Czech family had arrived in a little yellow Skoda, piled with holiday gear. The parents told me that they could not take their children with them on a visit to the West but were allowed to take them on holiday to Yugoslavia. From there they crossed easily into Austria. They seemed happy, were quarreling a bit over whether to make their new life in Austria or Canada.

Not all were so fortunate. The dark-haired Polish woman kept her chin high as she left the interviewer's desk; but. . . . "She is married," the interviewer said. "Her husband stays in Poland with their two children. He didn't get a passport. She could manage to leave herself and now wants to get the family out too. She could manage it because her children stayed in Poland—and the Polish government thought they had a guarantee of her return because of that.

"When she is formally granted political asylum here, she or her relatives can ask for family reunification. The prospects are good. Most cases end positively, although it may take three years."

I drove west now, up the Danube; past castles and vineyards and towns so pretty it seemed they had been shaped by violin makers. At Steyr I ate a fisherman's lunch: soup made from the lungs and heart of a cow, stuffed veal, apple wine. Then I was in the river: a slight wind, the feel of the stones underfoot, the gentle swirl of the water around the legs. Four times the line tautened, four times I lifted a trout to release it; brown trout marked by magical circles and red dots. How beautiful this country, I thought; beauty enough for a country ten times its size. And I had not yet seen the Salzkammergut.

There was an air of repose when I entered that lovely region of mountains shaped like hooded monks; of forests and mirror-like lakes where swans slowly traced V wakes; of rolling fields and beckoning footpaths and old spa towns that wore their age and memories like musk. The summer tourist season had ended, the winter season not begun. "Now it is ours again," a young woman said.

And so it was that on Allerseelen, All Souls' Day, when a procession issued from the church in Pfandl, I was the only outsider there. It was led by the village band, tall white feathers in their caps. Then came the priest with a loudspeaker, altar boys, the faithful. It seemed a small group, considering the size of the village. But then we turned off the street and into the copse of dark firs where the cemetery lay.

I was stunned. Hundreds of candles flickered, the graves were heaped with flowers and boughs, while between the rows of graves stood rows of people, silent, motionless—it seemed Resurrection day, the dead having risen from their graves! But, of course, it was the children, the brothers and sisters, the nieces, nephews, grandchildren of those who lay there.

Help with big servings *for refugees is given at Traiskirchen, near Vienna, one of five Austrian camps where expatriates, most from the Soviet bloc, await acceptance in the West. The influx is a delicate problem for an Austria committed both to strict neutrality and to humanitarian principles.*

The priest read prayers, gave a homily, sprinkled holy water; then all departed, leaving the candles flickering in the silence. "It is a very good thing," Wolfgang, one of the young altar boys, told me later. "Because many people after a year's time think about their dead parents. Those who have gone off to Germany or elsewhere to work, they come back on this day. And so we can all thank God that we had those parents for a time, and for all the good things they did for us while they were alive. And the priest tells us, 'Be happy, people, be happy.' "

The best defense *against the constant 17th-century threat of Turkish invasions was the Zeughaus, the armory at Graz* ***(above)****, where battle gear such as body armor, muskets, and cannon was kept at the ready. The worst misfortune, Austria's absorption by Nazi Germany in 1938, is remembered with candles for the lost soldiers of the village of St. Wolfgang* ***(facing page)****.*

The city and province of Salzburg derive their names, as does the Salzkammergut, from the deposits of salt *(Salz)* that have been worked there since prehistoric times. They were bottomless treasuries for the prince-archbishops of Salzburg, who used their profits to embellish that lovely city. When I visited nearby Dürrnberg, in the mountains, I discovered that although the mines had lost much economic importance, traditions, like the salt, endured.

The mine buildings perch on a mountain, the galleries run deep into it. Some 40 workers extract 45,000 metric tons of salt each year, most for use by the chemical industries nearby. The shift had just ended when I met Johann Golser, 43. His job was "to hew out the stone, to make the deep galleries longer, with pneumatic drills. A bit noisy, certainly; that's why I am a bit hard of hearing."

We went to his house, just up the mountainside, and settled into the kitchen with its great and warm wood-burning tile stove. Mrs. Golser joined us. Two children were away, the youngest was asleep. Johann said he had gained the right to a job in the mine when he had married Katharina and moved into this house, "for the job was bound to the house." Katharina's father had been a miner, his father before, and so on.

How was the pay? "A delicate theme. There is never sufficient. Maybe 11 or 12,000 schillings a month." About $550. He supplemented his earnings by delivering things for neighbors. He had also a small farm and several cows: "perhaps 20 liters a day of milk, at four schillings a liter." He was satisfied with life, had a minimal interest in politics, only a general interest in the trade union. But he had one concern.

His son Anton was coming of age, working on the farm. "He might decide to become a miner, but he can do it only if he stays in this house. And if he marries a girl from down the mountain, he will no longer have the right, the privilege, to be a miner."

NOW DIFFERENT the air of Salzburg from that of Vienna: Perhaps it was the mountains, the proximity to West Germany. One day I went to a ceremony in the palace of the old prince-archbishops: There was an award, a speech with many references to the German

5 Stehrer Johann
11. 7. 1922 5. 9. 1942

Weinbach
5. 5. 1926

5 Stehrer Leopold
16. 11. 1918 30. 1. 1942

Weinbach
16. 12. 1923

4 Strobl Josef
22. 8. 1920 1. 2. 1944

Weinbache
4. 2. 1925

5 Struber Franz
2. 8 1911 2. 9 1943

Weinbach
18. 4. 1909

4 Strubreiter Ferdinand
24. 4. 1913 11. 10. 1944

Windhage
11. 3. 1900

4 Strubreiter Heinrich
5. 1913 5. 5. 1944.

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4 löhner Anton
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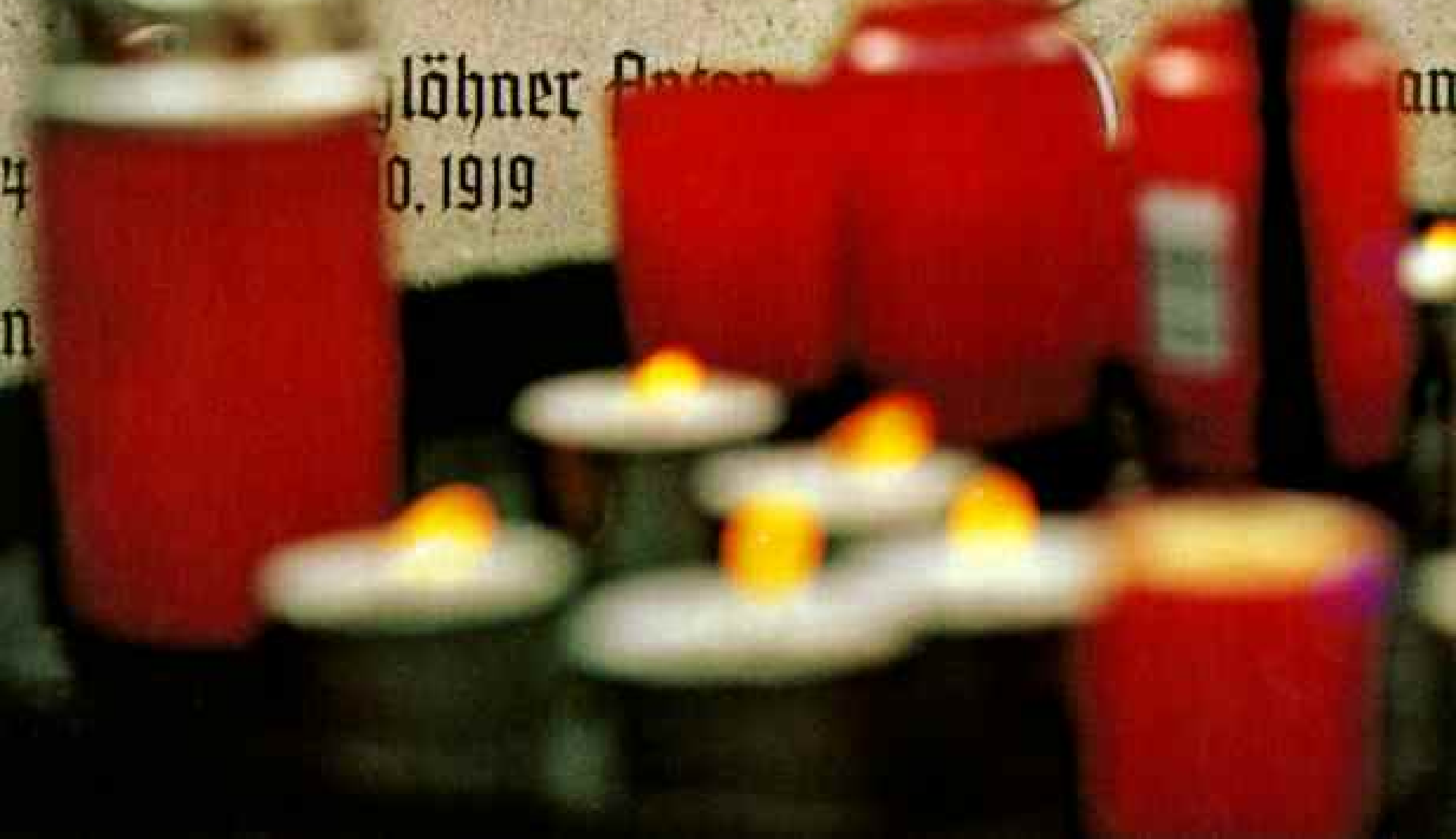

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philosopher Hegel, and strains of Schumann *Lieder*. At the reception afterward I had a chance to put the question to the *Landeshauptmann*, "captain of the land," the governor of the province of Salzburg.

"The difference," he said, "lies in the origin. So many of the Viennese people stem from the Slavic regions, Czechoslovakia, Hungary, Poland. This all goes back to the Austro-Hungarian Empire. This changes the mentality. It is not a worse mentality, just a different one.

"We in Salzburg come from the Bavarian regions. We are the more noble Bavarians. The Viennese have also slowly been nobilized by us. Regions, atmospheres, landscapes make the difference."

He said more powers should be shifted back to the provincial governments. Perhaps, I mused, Salzburg thought it had something to teach Vienna. "Although we are the fourth smallest province," the Landeshauptmann continued, "we are in economic importance the leading province. We have the highest income, the greatest tax revenues, the lowest unemployment. And we are the open door from West Germany, with our own international relationships to pursue. Aside from Vienna, we are the spiritual and cultural heart of Austria."

INDEED, Salzburg has much to be proud of, not least its beauty, its music. They inspired me to sample Austrian modern literature. I settled into the Café Glockenspiel on the Mozartplatz, ordered a coffee, opened a book of poetry. "After death, all people are equal; before death, the difference is even less." And in another: "Down in the cellar squats death on top of a wine press, drinks new wine." Not so pretty. I tried a best-seller: "And a spirit appeared from the crags of the mountains and saw her and coveted her for his nights, and he shot at a fish and hit a bird. . . ." Surreal, surely, but the author, H. C. Artmann, 62, lived just on the edge of the city. I went to see him.

He sat at a table in an old farmhouse; the window overlooked fields and the Untersberg, a large mountain. He said his books were only psychograms, atmospheres; as for his poetry, he wrote often about trees, about women. "I love trees, I describe them. Women, they are like trees, or grass, or leaves; I don't say flowers." As we talked, it seemed that women had marked his life, as trees mark a landscape.

There was the mother: "At first she supported me, she was proud of my writing. She told me, 'You do what I would have liked to do.' " And the wife, his third. She was working on a speech he was to give that evening when the city of Salzburg was to present him with a literary prize and 50,000 schillings. "It's an alibi," he said, "they don't like me."

And there was the daughter, Emily, nine. "I don't like Salzburg," he said, "or the mountains. I hate this Untersberg; it is foreboding. When you come into my home country to the east, it is hilly, wooded; behind each bush is something strange, sparkling, like an electric city. But not here." And yet he stays. "My daughter lives here, she likes to stay here, I love my daughter."

And there was the girl he had met briefly at the end of the war, the war he would be glad to forget, only in dreams it comes back: "A feeling as then, until now you are OK, but at the last minute something may. . . ." It was in eastern Austria, on the Czechoslovakian border. "I saw a girl, I saw her for one hour, in a mill, in the countryside. She was the daughter of a miller. Well, I liked her, and talked to her, and the war was over.

"The Russians were coming from the north and the east, the Americans from the west. We tried to go west; we knew it was OK when you reached the Americans. What did we talk about? I forgot. Words, words, words. Well, not about love; I was too shy. About the war is over, another time has come, the future, the blue sky. She was 15, I 21. She smiled or she grinned. She was shy too. Now I would say I was an idealist—I wasn't even holding hands.

A lionhearted insult *given Austria's Duke Leopold V by England's King Richard I on the Third Crusade was repaid when the incognito Richard was found in Vienna and held for ransom at this castle above the Danube at Dürnstein. That the troubadour Blondel discovered the English king ranks in myth with the deeds of Robin Hood.*

"She was like a vision. I wrote a small poem, seven or eight lines. The first thing I ever wrote. When I came to the Americans, they asked, 'Occupation?' I said, 'Author.' "

WHILE MR. ARTMANN told me he needed always to live on borders, to be able to jump, there are those in Austria who seem as firmly rooted as the mountains themselves. Among them are the Mayers of Alpbach in Tirol. The family has owned their farm since 1725. They have a beautiful wooden house, almost a century older than the family deed. There is a bell tower on top, to summon the men from the fields for lunch; a crucifix on the gable; a painted inscription above the door—"We appreciate the good that Jesus Christ has done for us." When I called there, Grandmother Mayer was in the kitchen making *Roggenbrot*, rye bread, enough for a fortnight. "The boys like it especially," she said, mixing rye flour, salt and caraway seeds, water, yeast, a little beer; then shaping the dough into round loaves, slipping them into the oven.

I found the father, Adolf, in a neighbor's field, helping spread manure. He was happy to jump down off the wagon and talk a bit. "Ah yesterday, Sunday, was better. I was drinking beer, playing cards, *Watten*. There were four of us. We played for beer. I won ten bottles!"

He said the *(Continued on page 442)*

Running a well-grooved ridge, *skiers at Pengelstein* ***(above)*** *need no world-class technique to enjoy the Alps of Tirol.*

One of the all-time great skiers, Austria's Franz Klammer ***(left)*** *celebrates a 1984 team victory over the Swiss in the Hahnenkamm, a downhill race infamous for the steepness, iciness, and general treachery of its course.*

For those whose winter sport includes gathering around a chalet's fireplace, Austria welcomes millions, especially West Germans, by far the largest tourist contingent.

*"**Absolute beginners, they were,"** says Sepp Margreiter of the still vertical students to whom he demonstrates the basic maneuver for stopping (**bottom**). His own career as a competition downhill racer ended when he broke a leg as a teenager. He now teaches mainly advanced skiers during the winter at the ski school in his village of Alpbach, where 70 to 80 instructors train thousands each year.*

*Doing double duty, Margreiter also plays baritone horn (**below,** at left) in the village band. He studied music with an expert for a year, but as in skiing, "Just to learn to play is not too difficult, but to get advanced—that's difficult." The band plays for local functions, church processions, and visiting statesmen who come to the village for conferences. While all Austria provides neutral ground on which officials may meet, Alpbach offers an Alpine setting that adds pleasure to the duty of international politics.*

A low-stakes game of* Watten** *occupies Sepp Margreiter and friends at an Alpbach inn on Sundays after church* ***(above)*.*

When the snows and skiers have melted away, he turns to logging, a trade he once worked for others but now does for himself.

Born and raised in Alpbach, Margreiter works a variety of jobs to stay there, as do others, whether building, farming, herding, or bus driving. Of his life with his family ***(right)****—his wife, Monika, and young sons Christoph and Thomas—he says, "It is nothing very special—just normal."*

Cashing in on tradition, the village of Alpbach has carefully husbanded

its reputation for loveliness by making new construction conform to the old.

farm had 34 hectares (85 acres) of woodlands and pasture, with six cows, ten calves, three pigs, fifteen hens. This was a slack time in the annual cycle: He made repairs, chopped wood for the stove, fashioned wood shingles to sell. Soon the snow would come. When it was gone, he would loose the soil, plant potatoes and maize. And the men would again take the cows up into the Alpine pastures.

He was content, "as long as things stay like this." He said, however, that he could not live from the income of the farm alone. His wife worked, tidying neighbors' houses. And during the tourist season they rented three rooms in their own house. "We give up the parlor, move into the kitchen." It was worth it, 40,000 schillings a year.

In Alpbach, as throughout Austria, it is tourism that often tilts the economy in a favorable way. Last year Austria welcomed 15 million visitors. (See the **Traveler's Map of the Alps**, a supplement to this issue.) In Alpbach on a fine skiing day there are as many visitors on the slopes as there are residents, about 2,000. There are five chair lifts, 13 T-bars, all owned and operated by a company with 300 shareholders, most local.

And yet the valley, dotted with chalets in the old Tirolean style, the mountains fringed with dark firs and yellowing larch, seemed little disturbed. A foresighted mayor and village council had ruled that any new house must be built in the old way, and that development was to be controlled. And the villagers, I was also pleased to learn, refer to their seasonal visitors not as *Touristen* or *Feriengäste* (holiday guests) but in the old way, as *Fremde*—"strangers."

I drove on westward, to Innsbruck, the Arlberg, and to Bregenz on Lake Constance. From Bregenz you can look across the lake north to West Germany, south to Switzerland, and there is in the air the feel of Western Europe. Then I boarded a train for a place where, I was told, there was in the air the feel of the Balkans. We rocked and swayed through the dusk and into the night: off-duty railwaymen drinking beer, telling jokes; an elderly woman returning from a visit to a sister in France; a young woman whose love affair had recently ended. "I have felt empty ever since. I will go to Venice, then I will feel better." And then we were in Graz, capital of Styria, in the southeast corner of Austria.

Gilded copper tiles *cap the famous balcony on the Herzog Friedrichstrasse in Innsbruck (***above***) where in the early 1500s Emperor Maximilian I came to view singers and dancers performing in the street below. Nearby two women (***facing page***) pause to admire a crèche.*

STYRIA FOR CENTURIES was a great border bastion against the Turks, its hills dotted with castles and watchtowers. The old armory at Graz houses 32,000 tools of war—flintlock muskets, bayonets, sabers, armor fluted and plain—well polished, ready for use should a levy be called again. But the enemy today is economics, Landeshauptmann Josef Krainer said. He spoke of the loss of jobs in the province's steel industries, of how

more jobs would be lost before those industries could be restructured and new industries introduced, of how the Styrians had not the mobility of Americans but preferred to stay rooted to their towns, their villages.

For here too traditions ran deep. The Landeshauptmann was a kind of father: "I get 350 letters a day concerning personal problems; this man wanting money for his son at the university; that man having some complicated legal problem." And although the empire was gone, Styrians felt a special mission to embrace the cultures of Yugoslavia and northern Italy, former parts of that empire, and to keep close ties. "Perhaps, in some way, we can have a beneficial effect."

Driving into the countryside, I was plunged deeper into the past. Brother Martin greeted me at the gate of the abbey of Rein. He wore the distinctive garb of the Cistercians: black scapula, white cassock, dark collar. "How did you detect us?" he asked with a smile, acknowledging that the abbey was not among the most famous, the most beautiful in Austria. But it had, like Austria, endured. One hundred German monks had founded it in 1129, at the invitation of the Holy Roman Emperor and of the Duke of Styria. Members of a reform order, they had worked hard in the fields, prayed as hard, before dawn and into the night.

"Now in our time the monks are parish priests," Brother Martin said. "We have 12 parishes that belong to us, and there are now 27 members of this house." An institution, like a person, survives by adapting. One wing of the abbey has been rebuilt and is now a public school with more than 500 students. Their voices filled the courtyard. "They are not disturbing, it is natural," Brother Martin said. He said the abbey had held on to much of the land that was granted 856 years ago. There are 1,800 hectares of forest and farmland. The farmland is leased out, the forests cut by some 20 workmen. "We sell the wood in Italy and in Hungary, but prices are falling now."

The abbey had seen hard times, he said: Turkish raids, the Reformation, the Nazi period, more recently a decline in religious vocations. But things were looking up. "The number of new monks rises again. We have new plans, for weekend meditation and recollection groups. The meditation will be for youth, and some older people, they search for recollection." I could see workmen busily repairing old buildings, refurbishing the *Weinkeller*. Clearly, guests were expected, the old abbey having found yet another role.

THE SCHLOSS at Waldstein was built for defense; it was a rectangular castle, the corners angled so as to provide better fields of vision for its defenders. Princess Elisabeth Liechtenstein, daughter of Charles, the last emperor of the Austro-Hungarian Empire, served lunch herself: a clear soup, veal, spaetzle, a sweet. "It's kind of a big property," said her husband, the prince, as we ate, "but most of it is alps, up where there are no trees. Below the tree line we have about a thousand hectares of forest, a sawmill. It's been in the family since about 1730."

After lunch we toured the schloss—the courtyard with its flowers, the galleries hung with antlers, the chapel where villagers came to Sunday Mass—then we settled in the parlor. The window overlooked an orchard of apple, plum, and cherry trees.

The talk turned to the princess' family. "We were eight—five boys, three girls. The oldest, Otto, lives now in Germany and is a member of the European Parliament; there was a sister who died; four other brothers who are in business in Switzerland, Mexico, Belgium; and my sister Charlotte von Mecklenburg, a social worker in Munich."

She recalled her childhood, the years of exile: Spain, Belgium, France, Portugal, the United States. And she spoke of her mother, the Empress Zita, 92, of good mind, almost blind, who lives now in a convent in Switzerland. "She was in those days beautiful, but always in black. She never, never, never put on something other than black. She just could not get over the death of my father. To this day, still, she is in black.

"But she was gay with us, and she always found that children shouldn't have a loss because she had a loss. But one had to obey. There were no two ways about it."

In time Elisabeth had met the prince, a cousin of the Prince of Liechtenstein, ruler of the tiny country with the family's name. "The marriage was done rather quickly." Since then, they have lived quietly here. "One sees friends who live not far away,

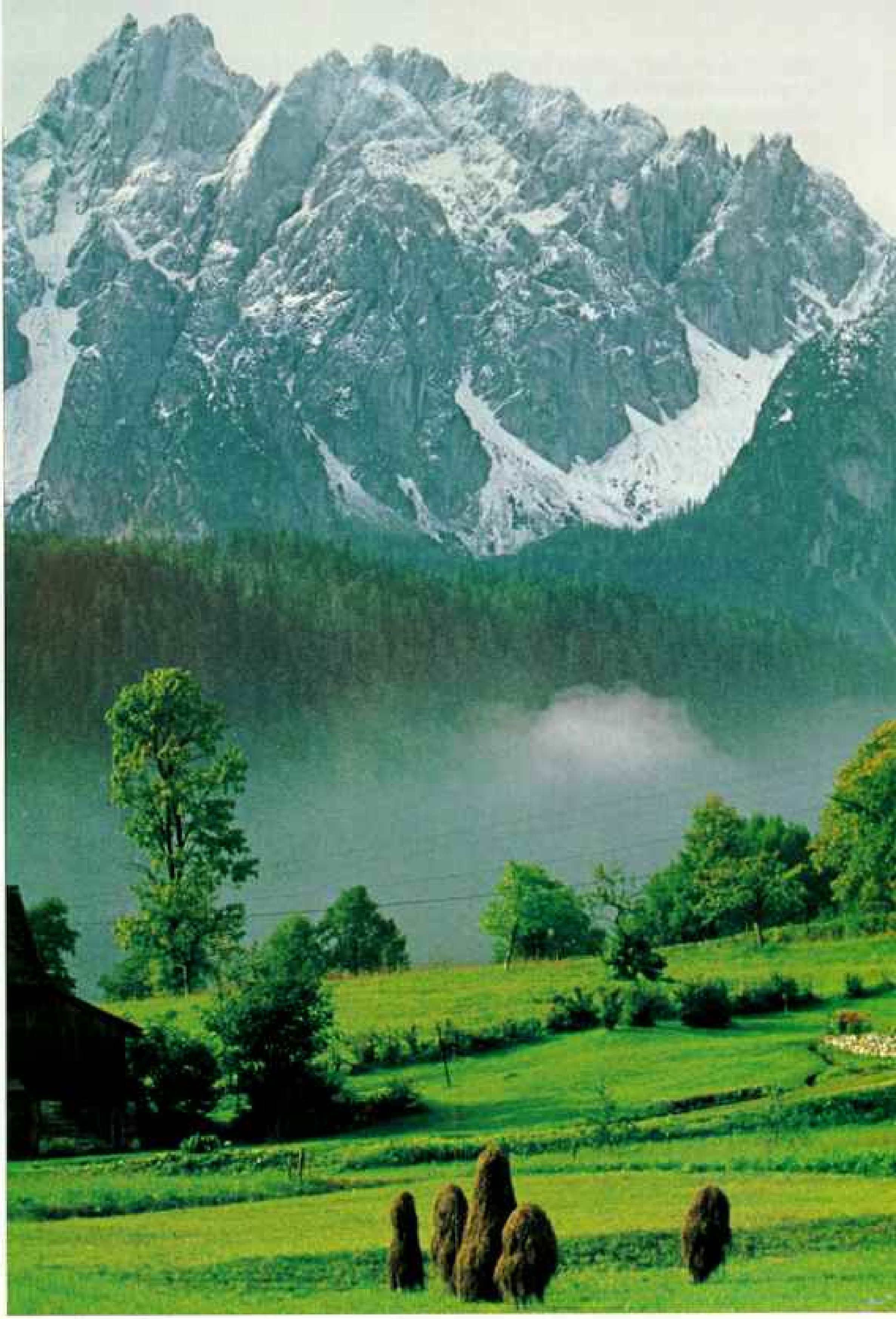
who are in the same position as we." They would like to take holidays, but the princess, who remembers the years of exile, the expropriation of so much family property, thinks "it's better to stay here, better to stay."

As for the future, there were the grandchildren. "My generation had 32 children, and now *they* have already 26!" One, a towheaded boy, had burst into the room to ask a favor. His father, it happened, was serving in a government office in Africa. I watched the boy closely. His bloodline could be traced to the early 900s and one Guntram the Rich, a German count; the family name came from the ancestral seat, the castle of Habsburg, or Habichtsburg, "hawk's castle," in what is now Switzerland. And then the boy, satisfied, bounded off, while the grandmother's eyes followed with fondness.

I WAS BACK in Vienna: There on the Kärntnerstrasse were my old friends the musicians; chimney sweeps too, all sooty black and grinning; while in the coffeehouses there were more opinions about the city. "Certainly I'm not pleased with the character of Vienna: conservative, provincial, complacent, xenophobic. What else can I add?" But I had a riddle to solve, and so went to Grinzing, a wine village on the city's northern edge.

I was admitted to 15 Armbrustergasse, introduced to the master's boxer, Goliath, and seated in the parlor. Bruno Kreisky appeared, 72, ill; he had only recently resigned after 13 years as Austria's chancellor. He had been called the Emperor Bruno; his quickness, wit, charm celebrated. But his happiest moment in public life had come in

Golden cause for celebration, *the 50th wedding anniversary of the Hartlmayers of Kirchberg, near Linz, is recorded on camera by a friend. Women in attendance wear bonnets of gold thread. Many of the traditional hats are newly woven, replacing heirlooms stolen by German troops during World War II.*



Like a group of sightseers, a quintet of poles outfitted in drying hay stands

before houses with snow-shedding roofs under the Dachstein Mountains.

1955 with the signing of the State Treaty. It had reestablished Austria's independence, led to the withdrawal of the Soviet and Western occupying armies.

How had they got the Russians out, I asked. Neighboring countries had been less successful. He remembered the flight to Moscow, the snow, the Russians being very warm. "If they want to deal, they can deal. They can be generous if it fits in their own policy. They had in mind at that time to give an example for a policy of coexistence. And they needed and used Austria as an example. There is no other explanation.

"Stalin's cold war policy had failed. The West's policy of containment had led to a lot of defeats for him, in Greece, Berlin, the Marshall Plan. So after his death, Moscow started rethinking. It was the work of Khrushchev. They tried to find out where it could be proved by example that they were really interested in a change in the situation.

"They had a long list, I guess, but Austria was the least expensive example, because here not only the Russians had to give in and withdraw, but also the others."

The population of Vienna has dwindled since the days of empire, from some two million to 1.5 million. It continues to dwindle, is expected to fall to 1.35 million by the year 2000. During the occupation many fled eastern Austria for the western part. Today there is still a hint of isolation, for Vienna and its surrounding provinces jut deep into Czechoslovakia and abut Hungary, both Warsaw Pact nations. "We are the remote corner of the West," a diplomat said. Austria's army is small, will remain so.

And so, talking with Austrian officials, I was often reminded of Leon Zelman of the Jewish Welcome Committee; like him, they badly wanted outside connections, to help their people to be, to give them a feeling they are not alone.

They sought to make Vienna an international meeting place, throwing open its palaces for parleys; they had managed to have built a large United Nations complex; they helped Hungary develop its tourism so that Vienna would not be the end of the line from the West, but a lively transit stop. And they worried about those connections.

"We are a neutral country," the present chancellor, Fred Sinowatz explained, "and we decided out of our own free will in favor of neutrality. So we have good relations with everyone. But we are, in our way of life and our institutions, definitely with the pluralistic democracies of the West. Everyone in Austria has drawn his own conclusions from the past, and that is primarily that democracy is irreplaceable, the prerequisite for freedom and any social development."

And yet Austria's future is not entirely in Austria's hands. "We understand our position perfectly," said a former diplomat, one who had also made that flight to Moscow. "It is only possible on a basis of a balance of power, a balance not only in military strength and technology, but also in moral strength, economics, education. Really, without any balance of power, our neutrality is for nothing; it's very clear."

ON MY LAST EVENING in Vienna, I went to the Volksoper to hear Donizetti's *Viva la Mama*. It seemed perfect for Vienna, an operetta mocking opera; there was good music, broad humor, the excited faces of youngsters in the audience, musicians again laughing in the pit. For the moment all questions about Austria, its past, its future, could be forgotten. I returned late to the room with the great windows.

"A nation," a historian had reminded me, "is a daily referendum; a daily renewal of the will to live together, to hold together." After the losses of the past—the dismemberment, the vanishing—Austrians seem to have found that will, as they have found an identity. If anxiety, dark memories persist, well, a nation, like a person, must live with them. I turned out the lamp: The first light, the skittering blackbirds would come soon enough. □

In a ghosts' parade, *costumed men in heavy wooden masks weave through Imst during Schemenlauf, when remembrances of pagan spirits are grafted onto pre-Lenten festivities. Modern Austria as well has taken what it wanted from other political, social, and economic systems and gone its own way.*

NR-1 The Navy's Inner-Space Shuttle

By ROBERT D. BALLARD
WOODS HOLE OCEANOGRAPHIC INSTITUTION

Photographs by EMORY KRISTOF
NATIONAL GEOGRAPHIC PHOTOGRAPHER

LIKE A MONSTER of the sea, the nuclear-powered research submarine NR-1 prowls the twilit depths off the Bahamas during a practice dive. Bow holds floodlights for observation and photography. "Nostrils" contain sonar gear, and the eyelike aperture a thruster for sideways maneuvering.

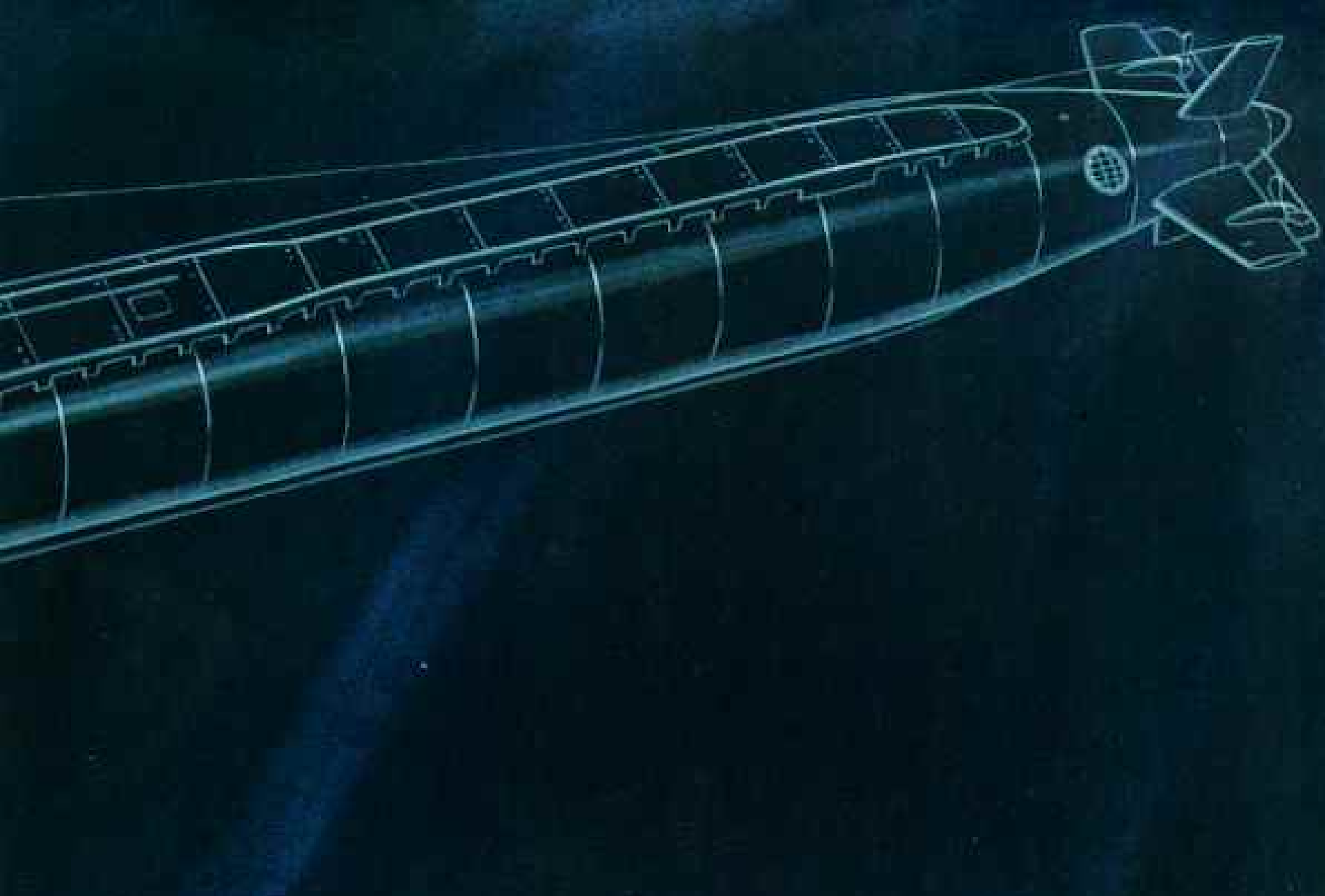
Recently I had the chance to explore the seabed off Iceland using the U. S. Navy's NR-1 (paintings, pages 454-5). With the ship's ten-man crew I spent 20 days submerged—an impossible feat for conventional underwater craft that must rely on short-lived batteries for power. I found NR-1 remarkably similar to NASA's space shuttle with its dual military and civilian research capability, its ability to install and retrieve objects across great distances, and its sense of total isolation in a remote and hostile world.

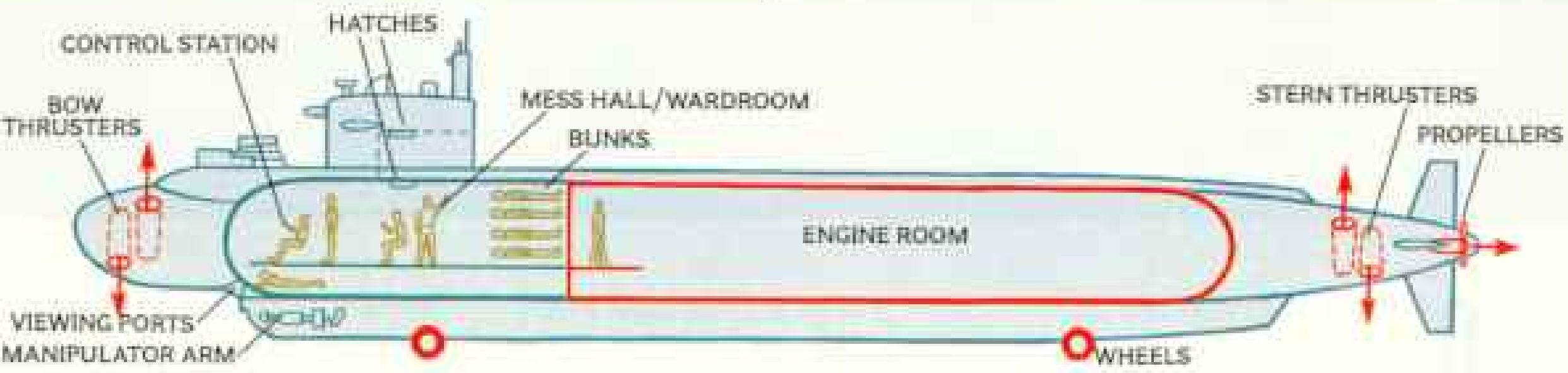
SANCTUARY afloat (***above***), the U. S. Navy's submarine base at Holy Loch, Scotland, serves as home port for NR-1 on missions in the eastern Atlantic. The base, consisting of a submarine tender and a huge floating dry dock, also services the Navy's missile and fast attack submarines between routine sea patrols.

I joined NR-1 at Holy Loch, where she was towed from port (***facing page***) by her support ship, U.S.S. *Sunbird*. Designed as a research tool rather than a warship, NR-1 has a top speed of only four knots, making it necessary to tow her to distant research sites. Orange paint on the superstructure gives the vessel greater visibility at sea.

Once clear of land (***below***), we head toward Iceland under the command of NR-1's captain, Comdr. Edmund Giambastiani, left. Crewmen Jon Kling and Chip Hurn share the watch atop the ship's sail. Officers and crew of NR-1 all must have served in the Navy's regular nuclear submarine fleet before assignment to the research sub.


ICELAND
SUBMARINE'S ROUTE
(approximately 2,000 miles
round trip)
SCOTLAND
(U.K.)
Holy Loch
NORTHERN
IRELAND (U.K.)
IRELAND
Reykjanes Ridge
Atlantic
Ocean

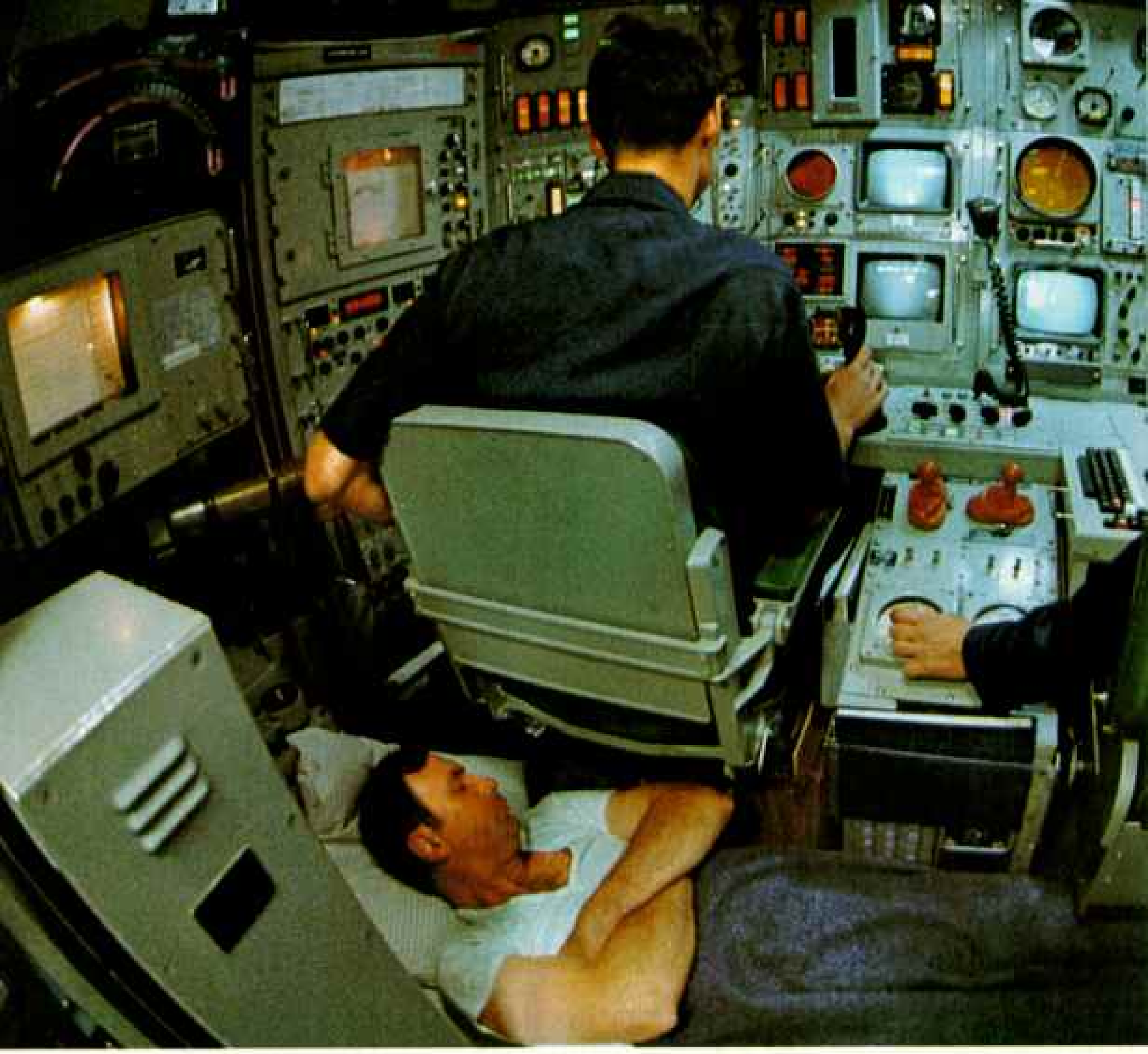




PROBING THE DEEP (***above***), NR-1 hovers beside an escarpment of the Reykjanes Ridge as a deepwater shark swims into the glare of its powerful floodlights. The escarpment of moundlike pillow lava is the solidified front of an underwater volcanic flow.

The Reykjanes Ridge forms a northern portion of the Mid-Atlantic Ridge (***map, inset opposite***), where two enormous segments of the earth's crust are being wrenched apart about half an inch a year. This artist's rendition depicts NR-1 as it cruised at a depth of 1,800 feet along the terraced slopes of the Reykjanes Ridge (***opposite***). Robin Holcomb of the U. S. Geological Survey and I explored the great undersea mountain range for nearly two weeks, supplied with abundant power from the ship's nuclear reactor.

In addition to collecting scientific data, we proved that a nuclear submarine can maneuver indefinitely along an undersea mountain range, as easily and effectively as a helicopter can through surface mountains. The example adds a new dimension to concepts of undersea science and warfare.



ON DUTY AND OFF, shipboard routine prevails but in unusual circumstances. NR-1's crew occupies quarters so cramped that only half the men can sleep at any one time. To be available on short notice, Commander Giambastiani (***above***) sleeps on the deck behind the watch officers. Lt. Fred Litty, left, controls the submarine's movements by means of joystick and sonar scopes; Lt. Comdr. Charles Anderson handles navigation and communications. While at sea, crewmen stand watches six hours on and six off.

Every man aboard NR-1 must be able to perform the jobs of his fellow crew members, including control of the ship's nuclear reactor. Despite hardships and severe crowding—average deck space per man is less than ten square feet—NR-1's crew is an all-volunteer force, carefully screened and trained by the Navy's top schools. Temperament is a vital factor in selection: During my 20 days aboard I never heard a raised voice.

Keeping fit in tight quarters, Ed Giambastiani (***opposite, above***) runs in place in the control room half an hour every day. The Penn State T-shirt is a gift; he is a 1970 graduate of the United States Naval Academy. Now 36, Ed took command of NR-1 three years ago, the ship's sixth captain since she was launched in 1969.

From the phone-booth-size mess hall-wardroom (***right***) crewman Buckley Bailey jokes with me in my jury-rigged bunk above the main passageway.


PENN STATE

GALLERY on the undersea, NR-1's viewing ports (***above***) fascinated me for hours above the Reykjanes Ridge. I used my camera often to record unusual geology or life forms; here crewman Walter Reynolds relays my requests for maneuvers to the helmsman. My goal was to see if active geothermal vents existed on the ridge, the results of volcanism such as created the island of Surtsey off Iceland in 1963.

I was led to this area by previous research, including that of geologist Bruce C. Heezen, who died here of a heart attack aboard NR-1 in 1977. Heezen's earlier work guided the National Geographic Society's map-paintings of the world's seafloors. The first, of the Indian Ocean, appeared in 1967.

Though I found no thermal vents, I saw remarkably rich deep-sea life (***opposite, top***) in the form of corals and mollusks at depths of nearly 2,000 feet.

NR-1's versatility as a search and recovery vehicle is dramatized by photographs of a Phoenix air-to-air missile (***opposite, middle***) and a Navy F-14 fighter (***right***), both lost from a U. S. aircraft carrier off Scotland in 1976. The crew of the plane managed to eject to safety, but the plane and missile sank in 1,800 feet of water. Salvage ships pinpointed the plane's position, and the NR-1 was called in to attach lines for retrieval and to search for the highly secret missile. The submarine found it several days later and brought it to the surface. □

ROBERT D. BALLARD (ABOVE)

CAPT. A. J. HOLIFIELD, JR., U. S. NAVY (ABOVE AND BELOW)

FOCUS ON INDIA

Festivals Across U.S. Celebrate a Diverse Culture

By JOHN J. PUTMAN

NATIONAL GEOGRAPHIC
SENIOR WRITER

You and I, Arjuna,
Have lived many lives.
I remember them all:
You do not remember.

THUS LORD KRISHNA counsels the hero Arjuna on the eve of battle in the *Bhagavad Gita*, "The Song of God," one of India's greatest religious epics. Its 701 Sanskrit couplets impart religious wisdom, conjure up the din of battle—but are only part of a longer poem, the *Mahabharata*, with 90,000 couplets the longest single poem in world literature. Composed 2,000 years ago, it mixes theology, hints on statecraft, a stirring tale of dynastic struggle.

Little wonder that the culture and history of India—five millennia old, complex, diverse—baffle us so often. Fortunately this cultural gap is narrowing, and this year Americans will have an extraordinary opportunity to close the gap further.

In May the National Gallery of Art in Washington, D. C., will open an exhibition, "The Sculpture of India: 3000 B.C.-1300 A.D." This event will lead off an 18-month Festival of India in the United States, perhaps the largest program of its kind ever. The festival will bring art, music, drama, dance, film, and crafts to scores of institutions in this country, including New York's Metropolitan Museum and Lincoln Center, Washington's Smithsonian Institution and Kennedy Center, the Cleveland Museum of Art, and the Asian Art Museum of San Francisco.

Plans for the event were set during the late Prime Minister Indira Gandhi's visit to the U. S. in 1982. Among 1,500 pieces of art lent for the festival are many objects from small rural museums and temples in India whose treasures have never been seen in the West. They include paintings, textiles, arms and armor, jewels, and architectural ornaments. Two hundred and fifty performing artists will bring classical Indian music and dance to life.

The festival will also bring to this country 150 scholars and academicians, 40 films, displays of modern scientific achievements, living folk arts, puppeteers, magicians, displays of village life—all to depict the variety and richness of modern India.

The art is beautiful of itself, but it also instructs us. Sculptural motifs such as lotus flowers, fish, crocodiles echo a water cosmology older than man's memory, one that teaches: "All this world is woven warp and woof on water." The theme of an amorous couple appears in every century, reminding us that the source of life is held sacred, auspicious. Many statues hold stories. A third-century B.C. stone goddess with a fly whisk (facing page) was discovered in this century when a river changed course; villagers promptly set her in a shrine for worship. Only with great difficulty did the local museum obtain it.

The past year has seen much tragedy in India: terrorism, the bloody battle for the Sikhs' Golden Temple, the assassination of Indira Gandhi herself, the vengeful massacres that followed, even an industrial accident that claimed at least 2,500 lives. A new prime minister holds the helm, Rajiv Gandhi, son of Indira, grandson of Jawaharlal Nehru, India's first prime minister. With little experience in politics, he faces a formidable task.

We should remember that India is resilient, capable of renewal, and therefore enduring, as its 5,000-year history attests. The art and performances of the Festival of India will help us better understand the wellsprings of that endurance, the magic of its life.

Helpful too will be the three articles that follow in this issue: "When the Moguls Ruled India," which sweeps us back to a key epoch in India's history; "Afghanistan's Troubled Capital—Kabul," which takes us to an old Mogul center in the throes of a fierce modern war; and "New Delhi: Mirror of India," which provides a close look at that capital and the problems and challenges ahead for India.

If tragedy marked last year, opportunity marks this year: the chance to gain a deeper understanding of India, one of the world's oldest cultures, its second most populous nation, its most populous democracy. See you at the festival! * * *

POLISHED SANDSTONE DEITY; 5 FEET, 2 1/2 INCHES TALL; PATNA MUSEUM

"PARADISE ON EARTH"

When the Moguls Ruled India

By MIKE EDWARDS

NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by ROLAND MICHAUD

PITY BAHADUR SHAH II. A gentle man, poet and calligrapher, he had the misfortune to sit on the throne of Delhi in 1857, year of fire and storm.

On a May morning mutinying troops of the East India Company galloped to the Red Fort and cried, "Help us, oh King!" This was a rare display of confidence in the aging monarch. Though respected by many in India, his kingship was a fiction. His family, of the lineage called Mogul, had been under the British thumb for half a century.

By the evidence, he wanted no leading hand in the Sepoy Mutiny (which Indians now call a war for independence), but he could not avoid being swept along on the bloody tide.

And when the fighting was done, vengeance began. Bahadur Shah was incarcerated, accused of abetting the mutiny and of being at least an accessory to the massacre of 49 European-descended citizens.

Three and a quarter centuries of sovereignty would crash in the Mogul high temple, the *diwan-i-khas*, the private audience hall within the Red Fort. Here diplomats and courtiers had once been dazzled by the gold and jewels of the Peacock Throne.

To this sanctum Bahadur Shah was brought for trial.

On a sultry morning I walked in the fort, tracing channels that had made fountains sparkle. The elegant Mogul creations scattered about the subcontinent—palaces, gardens, mosques, tombs, even two cities—have suffered from time and greed. Gilt has been scraped from panels where frescoed flowers bloomed; precious stones have been pried from inlays. But in its perfect proportions and lustrous marble, the diwan-i-khas still echoes the grandeur that was.

And the humiliation of the end. I can see the military judges taking their seats *(Continued on page 468)*

***Thundering into history** out of the steppes of Central Asia, the Moguls changed India's fortune and the destiny of her peoples. At Panipat in 1526 (**facing page**) war elephants of the sultan of Delhi were no match for the Mogul army of Babur, at center. Outnumbered four to one, Babur's forces triumphed with rudimentary artillery, a novel barricade, and flanking tactics by the cavalry that enveloped the foe.*

Babur became the first of six emperors esteemed as Great Moguls, establishing a line that ruled in the subcontinent for more than 300 years. Art lovers, these Muslims adopted styles from the Persians such as miniature painting—here illustrating Babur's autobiography—and brought them to apotheosis.

MINIATURES FROM THE "BABUR-NAMA," NATIONAL MUSEUM, NEW DELHI

Vivid streamers *of newly dyed cotton are stretched to dry before the great sandstone wall of the Red Fort. It was completed in 1648 by Babur's great-great-grandson Shah Jahan—of Taj Mahal fame—as he built Shahjahanabad, today's*

Old Delhi. The Indian-style wall contrasts with exquisite Mogul architecture within, including the hall of private audience. There the emperor received ambassadors while seated on the gold and bejeweled Peacock Throne.

1530 Babur's empire
1605 Akbar's empire
1707 Aurangzeb's empire
Major route
X Major battle
□ Important European trading post

Map reflects modern shorelines, drainage, and international boundaries.

0 300 km
0 300 mi

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Fergana
Samarkand
Amu Darya
U. S. S. R.
Balkh
Kabul
Khyber Pass
KASHMIR
Indus
IRAN
AFGHANISTAN
Peshawar
Attock
Srinagar
Farah
Qandahar
Jhelum
Chenab
Lahore
CHINA
HIMALAYAS
PUNJAB
Sutlej
Yamuna
PANIPAT 1526 X
PAKISTAN
Delhi
Indus
SIND
NEPAL
Fatehpur Sikri
Sikandra
Agra
Jaisalmer
Makrana
Jaipur
Awadh
Pushkar
Ajmer
CHAUSA 1539
Gwalior
Jaunpur
RAJPUTANA
RANTHAMBHOR 1568
Varanasi (Banaras)
Tatta
Umarkot
X CHITOR 1568
MEWAR
INDIA
Ahmadabad
GUJARAT
GONDWANA
Narmada
Diu (Portuguese)
Surat (British)
Daman (Portuguese)
Khuldabad
Aurangabad
Bombay (British)
Godavari
Torna
DECCAN
Golconda
Hyderabad
GHATS
Bijapur
GOLCONDA
Krishna
Goa (Portuguese)
EASTERN GHATS
Pulicat (Dutch)
Madras (British)
Mangalore (Portuguese)
Pondicherry (French)
Cannanore (Dutch)
Cauvery
Cochin (Dutch)
Arabian Sea

THE MOGUL EMPIRE

"EVER INTENT on conquest," the Moguls amassed a realm of as many as 150 million subjects. Babur hailed from Central Asia, where, unable to pluck the plum of Samarkand, he turned south and from Afghanistan took northern India. His heir, Humayun, lost most footholds but regained a base for his indomitable son Akbar, who ruled from Bengal to the doorstep of Persia. Painting attained unrivaled heights under his successor Jahangir and architecture under Shah Jahan. But hostile forces from the south took their toll on the last Great Mogul, Aurangzeb, who saw inexorable dissolution set in.

BABUR 1483-1530

HUMAYUN 1508-1556

AKBAR 1542-1605

JAHANGIR 1569-1627

SHAH JAHAN 1592-1666

AURANGZEB 1618-1707

Chronology

Color bars indicate reigns of Babur, Akbar, and Aurangzeb.

1483 *Babur is born in Fergana.*

1526 *Babur defeats Ibrahim, Sultan of Delhi, at Panipat.*

1530 *Death of* **Babur**, *accession of son Humayun.*

1540 *Humayun defeated by Afghan leader Sher Shah, who rules empire.*

1555 *Humayun retakes Delhi.*

1556 *Humayun dies; son* **Akbar** *enthroned.*

1562 ***Akbar***, *a freethinking Muslim, marries a princess of the powerful Hindu province of Rajputana.*

1564 ***Akbar*** *abolishes jizya, the tax on non-Muslims.*

1605 *Death of* **Akbar**, *succession of son Jahangir.*

1617 *Jahangir's son Khurram pacifies rebellious Deccan region and receives title of Shah Jahan.*

1627 *Jahangir dies; Shah Jahan proclaimed emperor and executes five rivals.*

1631 *Queen Mumtaz Mahal dies in childbirth; the following year work begins on her tomb, the Taj Mahal.*

1657 *Rumors of Shah Jahan's imminent death trigger war among four sons. The victor,* **Aurangzeb**, *is crowned in* **1658** *and confines his father to the palace.*

1666 *Death of Shah Jahan.*

1679 *The jizya reimposed.*

1681 ***Aurangzeb*** *departs for the Deccan, remains 26 years.*

1707 ***Aurangzeb*** *dies.*

1739 *Persians massacre the people of Delhi and carry off Peacock Throne.*

1862 *Death of last of 17 succeeding Mogul rulers, Bahadur Shah II.*

PORTRAITS ARE DETAILS FROM MINIATURES.

and Bahadur Shah arriving under guard. Witnesses are called, documents presented. Sentence is pronounced: exile to Burma.

In my mind's eye the old man, as he is led away, glances up at the Persian script flowing above the pavilion's arches. The majesty of his ancestors is proclaimed thus in the chiseled characters: "If there is paradise on earth, it is this, it is this, it is this!"

Probably Bahadur Shah finds the legend mocking. But I like to think he manages a little smile within his beard, knowing that Mogul glory will endure long beyond this day.

AT THE HEIGHT of their power, in the 1500s and 1600s, the Moguls ruled as many as 150 million people in an empire that today would stretch across Afghanistan, Pakistan, and India (map, preceding pages). Akbar, whom most historians regard as the greatest Mogul—indeed, Akbar means "great"—was the most powerful ruler of his time, far exceeding, for example, his contemporary Queen Elizabeth of England in wealth and number of men under arms.

Though they originated far off, in what is now Soviet Central Asia, and were Muslim lords in a realm largely Hindu, the Moguls stamped the Indian subcontinent with a culture and style remarkably resilient.

Let me tell you about dinner at Karim's—Karim's without silverware in austere surroundings in Old Delhi, and Karim's with silver and glittering chandeliers in New Delhi. In both restaurants the cuisine is imperial: a *kofta* of peppery ground lamb tenderly embracing a boiled egg; succulent chicken roasted in a *tandoor*, a clay oven; yogurt laced with spices that burst upon the palate like star shells. Such Mogul cuisine has subverted many Indian vegetarians.

Painters perpetuate a Mogul style in miniatures, delicately stroking paper with brushes made of hair from a squirrel's tail—one hair to a brush. For millions in polyglot India and Pakistan, the tongue that surmounts regional differences is Urdu, dominantly a blend of Hindi with Persian, the language of the Mogul court. Mogul ways also survive in politics—unfortunately, for brother often fought brother.

One day I visited a living personification of the empire. Qamar Sultan, titled *begum*, or princess, is the great-granddaughter of Bahadur Shah. There is nothing that speaks of royalty in her small home among the crowded alleys of Old Delhi. For sustenance this frail woman of 80 depends upon the librarian's job held by her daughter, Pakeeza. The begum did not enter the Red Fort until she was past 50, and when she saw the diwan-i-khas, she wept. "I was thinking of my father, that he might have occupied a position there."

On those times, rare now, that the begum leaves her home, her neighbors bow. Even in poverty her line commands respect.

Historians count six rulers as Great Moguls, beginning with Babur in 1526 and continuing through Aurangzeb, who died in 1707. Though a cruel streak ran through them all, they often gave generous terms to enemy chieftains, and on the whole they were intelligent, urbane overlords.

Among their forebears was the all conquering Genghis Khan—hence the name Mogul, the Indian version of Mongol. But the forebear they most admired was another conqueror, Timur, or Tamerlane. Timur was a Turk—not a Turk of Constantinople but of their homeland in Central Asia. Though he was as much a scourge as Genghis, Timur also appreciated knowledge and embellished his capital, Samarkand, with lovely buildings.

His passions flowed through the family tree. Were they living today, you would find the Great Moguls decorative guests at a cocktail party. All save one would imbibe; Islamic abstinence was not to their taste.

Babur, whose name means Tiger, would talk of the gardens he created. A candid fellow, he confessed in his memoir, the *Babur-Nama*, a moonstruck yearning for a boy. (But he fathered at least 19 children.)

Humayun (Fortunate) might talk of books; in ignominious flight much of the time after succeeding Babur in 1530, he packed his library along. He was too easygoing. But he emerged on top, handing a fledgling empire to Akbar in 1556.

Akbar would question you about your religion—and might incorporate its tenets into one he was fashioning. As he discoursed on diverse subjects, it would never occur to you that he could not read.

Jahangir (World Seizer) also would talk of

gardens and the artists of his court. After taking the imperial reins in 1605, he surrendered to alcohol and opium; his shrewd wife ran the empire until he died in 1627.

Shah Jahan (Sovereign of the World) would expound on symmetry in architecture. His taste for grandeur had a flip side of sadness; he ended life as a prisoner gazing out at his grand creation, the Taj Mahal.

Finally Aurangzeb (Ornament of the Throne), also known after 1658 as Emperor Alamgir (Seizer of the Universe). He thought music and pomp sinful, and he'd decline a drink, thank you. Possessed of bulldozing determination, he expanded the empire to its greatest limits; but while he was off campaigning, it collapsed internally.

All in all, theirs was a remarkable 181-year run of fathers and sons. Their common failing was the inability to pass on the crown without a family fight, usually bloody.

. . . it was always in my heart to possess Hindustan . . . —BABUR IN THE "BABUR-NAMA"

NEAR PANIPAT, 50 miles north of Delhi, a young man named Om Prakash said, "Here all place battlefield." I saw only a pancake of croplands. "Babur dig a big ditch," Om said. I saw only irrigation canals.

But Om was right about that ditch. In 1526 Babur arrayed his army beside Panipat, behind a ditch and farm carts lashed together. He was about to cap a lifetime of campaigning with his greatest victory.

Babur had become a chieftain at the age of 11, after the death of his father, who ruled the region called Fergana, now part of the Uzbek and Kirghiz Republics of the Soviet Union. His father, Mirza (Prince) Umar Shaikh, had been in his pigeon house at the edge of a ravine. Apparently the foundation collapsed. Babur records: "Umar Shaikh Mirza flew, with his pigeons and their house, and became a falcon."

Fortunately there were loyal nobles to aid the young leader, for Fergana was threatened by neighbors eager for land and spoils.

Boy ruler soon became boy buccaneer, seeking spoils himself. West of Fergana gleamed rich Samarkand. It looked like an easy prize. Babur was 14 when he won it. He lost it the next year, won it again, but still could not hold on.

And while preoccupied with Samarkand, he lost Fergana. Wandering south in 1504 into present-day Afghanistan, he found the ruler of Kabul unprepared to withstand a siege. This easy victory gave him a base for future conquests. He felt secure enough to promote himself from mirza to *padshah*, "supreme lord," a title his successors also

HARRY WILKS

Wisps of memory *and heirlooms that garbed her royal ancestors surround the oldest living link to the empire, Qamar Sultan, of Delhi, still known as* begum, *or princess. Her great-grandfather Bahadur Shah II, the last Mogul ruler, died in 1862 in Burma, where the British had exiled him for his role in the Sepoy Mutiny. One of his 16 sons, the heir apparent, was fatally poisoned—an example of the intrigue that permeated the dynasty.*

adopted. He took Qandahar, the major city of the Afghan south, and four times enriched himself on raids into Hindustan. The fifth time he meant to stay.

Ibrahim, the Muslim sultan of Delhi, marched to confront him at Panipat with 100,000 men and 1,000 elephants, the tanks of the 16th century.

Padshah Babur had perhaps 25,000 troops and fast ponies—plus matchlocks and mortars, probably from the Ottoman Turks, the artillery masters of his day. These weapons had not reached northern India. On a previous expedition the matchlocks blazed at tribesmen who had not heard the report of gunpowder. They answered, Babur says, with "unseemly gestures."

Like Babur with his great ditch and carts, the cautious Ibrahim also prepared defenses. Babur goaded him, sending out raiding parties. Finally Ibrahim committed the error Babur waited for. He advanced.

Babur's bowmen rained arrows upon the horde. His guns belched a slow but probably unnerving fire. Then the Mogul cavalry clasped the enemy flank and rear. Ibrahim "fell back on his own center." Discipline dissolved in that mass of men and beasts.

It was over by noon. Ibrahim and 20,000 or more of his men were dead.

NATIONAL MUSEUM, NEW DELHI (OPPOSITE)

"*Fierce camels and fierce elephants were set to fight . . . thereafter wrestlers grappled,*" *Babur recorded of a feast in 1528* (**facing page**). *Pakistanis training in Lahore reflect the popular tradition* (**above**). *Although Babur had a pedigree for plunder as a descendant of both Genghis Khan and Timur, or Tamerlane, he sometimes restrained his troops, conciliating foes to rule them effectively.*

AGRA LONG AGO became an industrial city, place of smoke and dust. But there are reminders of elegance in Agra, and not just the Taj dome floating over the cityscape.

In a jewelry shop Ghanshyam Mathur took from a safe a necklace put up for sale by a local family. I counted nine emeralds and two rubies the size of finger joints. These were not faceted stones; they had merely been smoothed by tumbling. "I'm sure it's of the Mogul period," said Ghanshyam. "This is the kind of jewelry they had."

In quest of such booty Babur hurried his son Humayun from Panipat to Agra, which as well as Delhi had served Ibrahim as a capital. (Both cities also would serve the Moguls.) The wealth was great. Padshah Babur heaped coins upon his troops, even sent a coin to every citizen in Kabul and gifts to holy men in Samarkand.

In Babur's memoirs I can almost see him looking about and taking notes. He described monkeys, peacocks, and parrots that people "make speak words." But on the whole he was not pleased. "Hindustan is a country of few charms. Its people have no good looks . . . of genius and capacity none . . . there are no good horses, no good dogs. . . ." And the gardens! "We traversed them with a hundred disgusts and repulsions." Forthwith he laid out a better one.

Babur's years in India would not be long,

*"**Looting the pot**" takes place at Ajmer in a shrine to a Muslim saint, Khwaja Muin-ud-din Chishti, revered by the Moguls. Wealthy Muslims pay for rice, sugar, coconut, barley, and lentils to be cooked in a caldron (**left**). Followers of the saint go in with buckets, vying for the food, which will be sold for a pittance. Here the competitors, in heat-protective clothing, plunge in for the remains, as one is helped out of the vessel.*

*Fervor seems to burn in the eyes of a disciple of the holy man (**right**). Like him, this pilgrim follows Sufism, a mystical form of Islam. Akbar, who frequented the shrine, was so fascinated with religions that he created one of his own.*

and he would spend much of his time fighting other monarchs in this mosaic of competing kingdoms. In 1530 Humayun fell ill. Babur's daughter, Begum Gulbadan (Princess Rose Body), wrote that Babur offered his own life to Allah in exchange for his eldest son's. Humayun recovered, Babur fell ill. He tried to put family affairs in order, arranging marriages for his daughters. Then his lifelong campaign was finished.

The Emperor gave an order . . . "Blind Mirza Kamran in both eyes."

—BEGUM GULBADAN IN THE "HUMAYUN-NAMA"

BESIDE THE GANGES eternal India dwells. On a sunless morning that foretold the monsoon's coming, pilgrims descended the ghats, the steps cascading to Mother India's holy river at Varanasi (Banaras). In the soupy water, men and women of beatific countenance chanted mantras as they immersed themselves, washing away sin.

Mohammad Nasir filled a goatskin bag with water to cleanse a latrine. He is called Little Boy, for he barely clears five feet.

In 1539 Humayun's survival depended upon a *bhisti*—a water carrier—at Chausa, near Banaras. Surprised by a cunning adversary, Sher Shah, Humayun's army was shattered; many drowned as they fled.

"I know there was some king who was drowning," Little Boy said. "A bhisti inflated his water bag and gave it to the king to hold on to." He did not know that the ruler was Humayun. Or that no bhisti ever received grander treatment: He sat on the throne and gave orders for a short time.

Humayun had not been aided at Chausa by brother Kamran; instead Kamran had marched as if to claim the throne. Time and again Humayun's three brothers would thwart him. And time and again tolerant, forgiving Humayun would embrace them.

In 1540 he again confronted Sher Shah—again without Kamran's troops. Sher Shah rolled up the Mogul forces and proceeded to roll up the empire, crowning himself at Delhi. Humayun abandoned Agra.

Kabul was a possible refuge, but it was

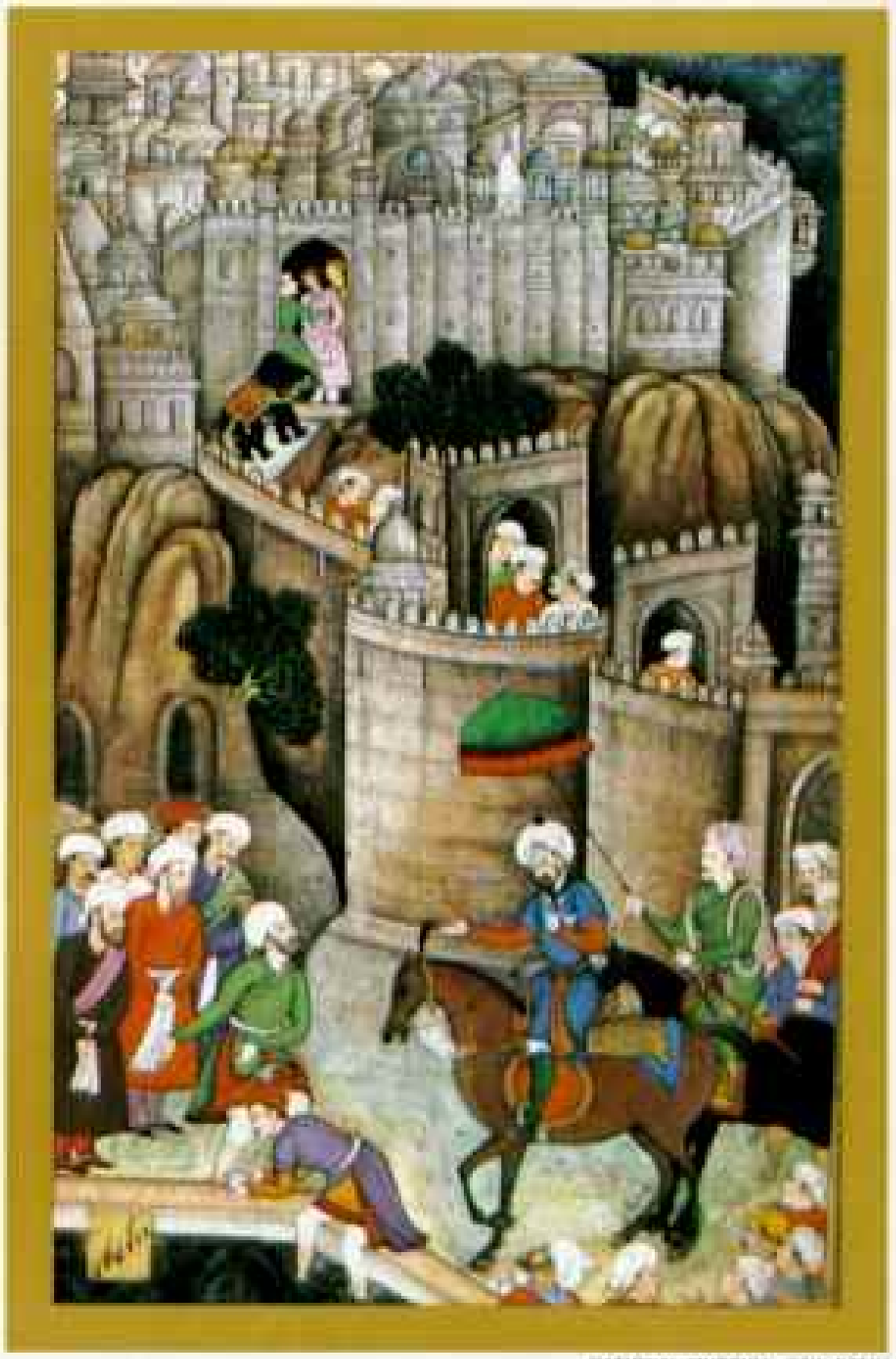
Kamran's province. Humayun was not welcome. Accompanied by a few faithful emirs, Humayun became a homeless padshah.

THE YEAR 1542 found the itinerants in the Indian Desert in torrid summer, pursued by local chieftains.

My thermometer showed 105°F the day I got to the vicinity of this odyssey of misery. South of Jaisalmer, which still wears the medieval look of a fortified town, dwell people who must be among India's most tenacious. The women fascinated me. Slender and wiry, with flashing teeth, bangled from wrist to bicep, they counterpointed the bleak sandscape in fabrics dyed vermilion and orange. I glimpsed them filling jugs at wells. "Our women," said an old man, "spend half their lives going for water."

Water. Humayun's band crossed the desert in desperate thirst. Finding wells, people flung themselves at the buckets, breaking ropes, falling in.

Humayun's teenage wife, Hamida, was pregnant, and she hungered for—a pomegranate. Humayun surely thought it a good



NATIONAL MUSEUM, NEW DELHI

*"**Wonderful buildings,**" judged Babur (**above**) in 1528 as he inspected a palace constructed by a Rajput prince, Man Singh, within the hilltop fortress of Gwalior (**left**). Babur's eye compelled him to add, "in heavy and unsymmetrical blocks however." This Hindu architecture inspired the style of Fatehpur Sikri, exquisite new capital near Agra begun by Babur's grandson Akbar in 1571.*

omen when a trader fished one from a sack. When they reached Umarkot, in today's Pakistan, Hamida delivered a son—Akbar.

By 1544 they had trekked westward all the way to Persia. The elegant Persian culture, which valued poetry and art, entranced Humayun. On departing, he took along two miniaturists—originators of the Mogul painting style.

With an army provided by Persia's shah, Humayun captured Qandahar, which was held by his brother Askari. Then he pried Kamran out of Kabul. But for eight years more the brothers fought across the Afghan countryside, the clashes interspersed with family reunions.

It was too much for Humayun's nobles. At a time when Kamran was a captive, they demanded that Humayun "put aside brotherly sentiment." He vacillated, then ordered Kamran blinded, a Central Asian way of making a royal heir ineffective. One version says his eyes were repeatedly stabbed, after which salt and lemon juice were poured in.

Meanwhile, the kingdom founded by Sher Shah had collapsed, and northern India was

ripe for reconquest. Humayun marched down from Kabul and in 1555 took Delhi.

Here he placed his precious books in what is today called the Purana Qila—Old Fort. One evening Humayun conferred with his astrologers on the roof. Descending, he tripped, struck his head, and at last knew peace. He had been back on the throne of India just six months.

He busied himself in the administration of justice, and made fitting regulations for the founding of empire and the cherishing of subjects.
—ABUL FAZL IN THE "AKBAR-NAMA"

PRACHEE ANAND, *kathak* dancer, reverently touched the feet of her guru and received, with his blessing, her ropes of ankle bells. Then, to the staccato thump of the guru's drum, her feet stamped, setting the bells ajangle. Her hands flew in crisp motions, her body spun in precise pirouettes.

I watched the two of them in practice in a studio in New Delhi. Prachee has spent most of her 24 years under the tutelage of this master, Maharaj Bansilal.

"She is very good," he said.

In Mogul times Prachee probably would have been summoned to execute her perfect pirouettes at court. Kathak dancers were Hindu temple dancers who related stories of gods and goddesses. The Moguls made them secular entertainers as well.

The 49-year reign of Akbar was a time of unprecedented cultural amalgamation. Under other Muslim rulers Hindu status was defined by the *jizya*, a tax on non-Muslims. Akbar abolished it. Among his wives (he seems to have had about seven, plus concubines) were Hindu princesses. Hindus became administrators and generals.

Akbar was just 13 when his father, Humayun, died. For several years he was dominated by the harem while Maham Anga, who had been Akbar's wet nurse, pushed her own son, Adham Khan, toward power.

Matters came to a head when Adham Khan had Akbar's chief minister stabbed. Entering the public hall just then, Akbar knocked out Adham Khan with his fist and had him thrown from a rampart. When the first fall did not kill him, Akbar had him thrown again. Petticoat rule was finished.

As a youth he was more interested in riding fighting elephants than in studying Persian literature. Being unable to read proved no handicap. He surrounded himself with scholars and had his artists make history visual. Many Mogul miniatures hanging in museums today were illustrations for the texts in his vast library.

Akbar sent his army to take Gwalior in central India. Jaunpur, in the east, was annexed. He bulldozed through Gondwana, gathering jewels and gold.

In 1567 he set out to topple the Rana of Mewar, Udai Singh. Akbar arrayed his army beneath the rana's fort, Chitor, which crowned a soaring ridge in Rajputana, today's Rajasthan. Or, as Akbar's biographer, Abul Fazl, tells it, the "world-conquering mind" deployed his "sublime army" beneath the "sky-based fortress."

Abul Fazl never missed a chance to strew his ruler's history with flowery phrases. No doubt imperial vanity was involved. But so was the Mogul love of records; conscientiously, Abul Fazl produced most of the vast *Akbar-Nama (History of Akbar)* and a vaster compendium of statistics and minutiae. We learn from him, for example, that Akbar ate one meal a day—of 40 dishes—and enjoyed ice brought from the mountains.

Of Chitor, Abul Fazl chronicled that Udai Singh, "that vagabond," decamped before the arrival of "the lord of the age," but left behind 5,000 gallant Rajputs.

The "tiger of the mighty forest" breached the walls of the fort by detonating gunpowder but failed to gain access. He then concentrated on building a *sabat*, a covered corridor, above ground level, protected from enemy gunfire and arrows by rubble and stretched hides. Once the sabat reached

Beguiling reflection *of her desert Rajput ancestors is this Muslim bride of Pakistan. The Moguls kept the daughters of proud chieftains in their harems to cement alliances. In return for limited autonomy Rajputs gave troops to Mogul armies, thus pacifying areas that were vital to communications.*

SABRINA MICHAUD

Enchantment of Kashmir *revived Moguls fleeing the heat of the Indian plains. Near Srinagar a shikara glides across Dal Lake* ***(above)****, where Jahangir built the Gardens of Shalimar—Abode of Love. As a young man, he watched the saffron harvest* ***(left)*** *with his father, Akbar, and later sighed, "The breeze in that place scented one's brain." Jahangir was a vigorous arts patron, but his queen, Nur Jahan, held the reins of state as he degenerated into a playboy of the eastern world, addicted to alcohol and opium.*

the wall, Akbar's men would open a hole.

The biographer depicts Akbar at the fore, dropping Rajputs with musket shots. Of course he credits the padshah with the decisive shot that felled Chitor's commander.

Fires were now seen in the fort. Anticipating defeat, the proud Rajputs sent 300 women to death in flames rather than allow them to be captured. Akbar raised the toll. Because the Rajput peasants had offended him in their partisanship, "the great warrior" massacred nearly 30,000.

Mogul armies continued to march, but Akbar, dealing from a position of strength, found easier ways to add dominions. It is said he sneaked into Ranthambhor, another Rajput stronghold, as a mace-bearer. Recognized, he sat on a cushion and said to the ruler, "Well, Rao Surjan, what is to be done?" Rao Surjan became an ally. Compelling the surrender of Sind, Akbar allowed its ruler to govern his dominions. But henceforth Sind paid tribute.

THE SMALL tomb of Shaikh Salim Chishti stands across a court from the great mosque at Fatehpur Sikri.

"Make a wish," urged the caretaker, who seemed as ancient as the tomb. He proffered a bit of thread and indicated a window of latticed marble. "People make a wish and tie a thread," he added. Hundreds of threads webbed the latticework.

"What do they wish for?" I asked.

"Most wish for a son."

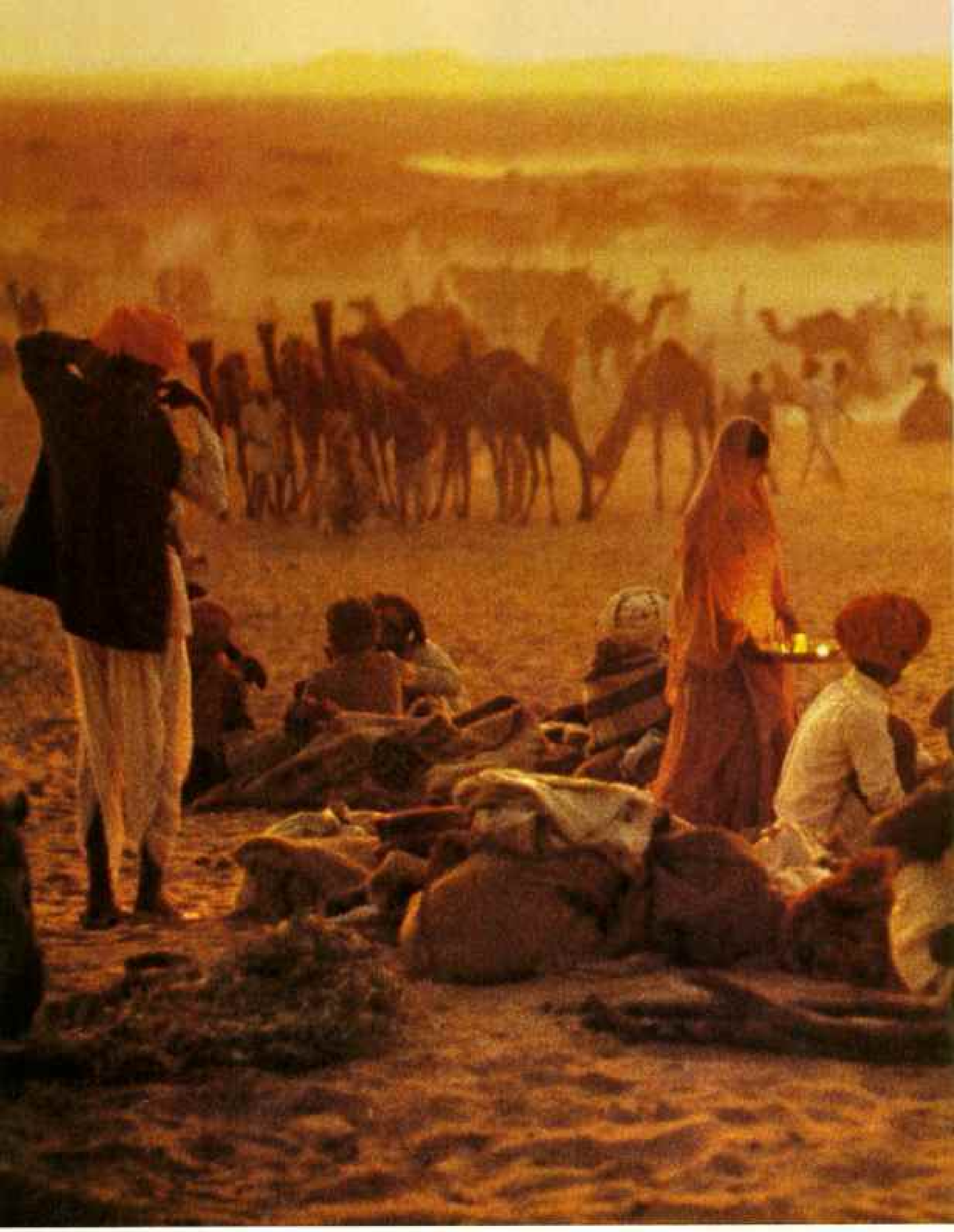
"Are Christians allowed to wish here?"

"Christian, Hindu, Muslim, it makes no difference." Akbar would have it so.

Elements of Christianity—gleaned from conversations with Jesuit priests from the Portuguese colony of Goa—were part of the new religion that Akbar fashioned. He did not offend his nobles by ordaining this as a state faith, but some historians believe that, personally, he abandoned Islam.

Wanting a son, Akbar sought the blessing of Shaikh Salim, the holy man now buried in the marble tomb. His prediction was encouraging: Akbar would have three sons.

The padshah installed his pregnant wife in the holy man's hermitage, at the village of Sikri, 23 miles from Agra; proximity might enhance the chances for an heir. She gave birth to the future emperor Jahangir. Before



Hubbub softens to a hazy murmur *as camel traders prepare to bed down at Pushkar in Rajasthan, in a scene little changed since Mogul times. In these pitiless sands Humayun was humiliated in 1542 while seeking aid from a Rajput prince. Rebuffed,*

Humayun retreated. After his men killed some sacred cattle, outraged Rajputs filled wells in their path with sand. As his animals perished, the Mogul gave his pregnant wife his horse, then took a shamefully unroyal mount—a camel.

Harmony in stone and song. *In Pakistan's Shalimar Gardens, built at Lahore by Shah Jahan about 1640, Tahira Sayyad accompanies herself on a sitar in a ghazal, the classical Persian love lyric adored by the Moguls. Here is the epitome of the Mogul passion for gardens: fountain-stirred water tumbling from terrace to*

terrace into pools arranged geometrically among flowers and fruit trees. Scalloped arches and white marble are both hallmarks of Shah Jahan's era.

long, concubines delivered two other boys, fulfilling the prophecy.

By 1571 Akbar had decided to move to this fortunate place. On an outcrop of sandstone, he began to build the capital that would be called Fatehpur Sikri. Up went palaces, an awesome gateway, administrative buildings.

He departed after 14 years, moving his base to Lahore while campaigning in the west. So the Fatehpur Sikri I saw was a glorious ghost town of vast buildings stairstepping toward the top of the ridge. As the retiring sun shot the sandstone walls with fire, I heard only the mournful cries of doves and the lonely echo of my own footsteps.

Akbar stitched his empire with roads, improving communications. He organized his officials, giving them ranks called *mansabs*, with authority weighed by number: One man might be a *mansabdar* of 1,000; a greater official might rank 2,000, even 4,000. Each was expected to maintain troops, according to his rank, for the empire's use.

For compensation each received a *jagir*, an area of land. Ownership remained in the hands of local people, but the mansabdar was permitted to extract sufficient revenue to maintain himself and his soldiers.

In the last years of the 16th century Akbar, sovereign of an empire stretching from Kabul to the mouth of the Ganges, was troubled by his sons. Murad and Daniyal died drunkards. And Jahangir chafed to rule. At one point he started toward the capital with troops. But Jahangir had only to wait. In 1605, on his deathbed, Akbar beckoned him to put on the royal robes.

The entertainment of Thursday was arranged for in that flower-land, and I was delighted at drinking my usual cups. . . .

—JAHANGIR IN THE "TUZUK-I-JAHANGIRI"

FLOWERLAND: Kashmir. Once I was a Mogul there, enjoying life in a palace.

In truth, *Maharaja's Palace* was a houseboat moored on Nagin Lake near the city of Srinagar. But a real palace it seemed, plush with carpet and fragrant with the cedary aroma of deodar.

No sooner had I moved in than Mister Marvelous arrived. Excuse me: "Mister

Mah-vel-ous," to write it as he sang it. His real name was Ghulam Hasan, and his face glowed with mirth—or with the prospect of plucking a fresh bird. He paddled up in a gondola-like *shikara* laden with carnations, dahlias, and chrysanthemums. And he sang, "They are *beau*-ti-ful, they are *glor*-i-ous! Today you buy whole shi-*kar*-a!"

"Not to-*daay*!" I warbled.

Ignoring my protest, Mister Marvelous nimbly boarded my palace, stuffed vases, and left me $27 poorer.

"The flowers of Kashmir are beyond counting and calculation," Jahangir exclaimed. His love of the Vale of Kashmir, nestled among high Himalayan outriders, shines in his memoirs.

That Jahangir could pass the summer in Kashmir admiring beauty and sipping spirits—six cups daily at this stage of his life, followed by opium—testifies to the security of the Mogul realm. Akbar had built well.

Jahangir graced a hillside with the gardens called Shalimar, Abode of Love. Like other Mogul gardens it is terraced and divided by a cascading stream. "This place," he wrote, "is one of the sights of Kashmir."

It remains so. One day I watched a couple at play on the velvety grass. She was about 22. Lying near her friend, she rolled toward him, smiled bewitchingly, and rolled away. Toward him again, then away. Each time she almost touched him—but not quite. It was a display worthy of the Abode of Love.

Last summer I checked into the Broadway Hotel in Srinagar just in time to be locked up. Or "hotel arrested," as Indian newspapers described the status of the several journalists prevented by security forces from setting foot outside the hotel.

Dominantly Muslim, Kashmir has been the cause of two wars between officially

secular India and officially Muslim Pakistan. Internally, its flower-decked image is shattered by periodic upheavals.

The trigger this time was the toppling of the state government headed by Dr. Farooq Abdullah. Mrs. Indira Gandhi, India's late prime minister—felled by Sikh assassins last October 31—had accused Dr. Abdullah of anti-Indian acts. She replaced him with his archenemy: his brother-in-law. Kashmiris took to the streets.

With the city under curfew and armed security men at the hotel door, we journalists made the best of it for a day and a half, sipping beer and dipping in the pool.

Another person confined in the city of Srinagar that same time was Mrs. Maneka Gandhi, the prime minister's daughter-in-law and widow of her son Sanjay. A politician herself, and also a bitter opponent of Mrs. Gandhi, Maneka had flown to Srinagar in support of the deposed Dr. Abdullah.

Violence and family feuds: Politics in the subcontinent echoes Mogul ways.

PONDEROUSLY DESCENDING the mountains, Jahangir's caravan of as many as 700 elephants made its way to Lahore (now a city of Pakistan). Here he built a palace with "soul-exciting sitting places." Courtiers also built palaces here and copied the imperial zeal for gardens.

In the Lahore Museum I admired magnificent specimens of calligraphy—pages from Korans illuminated, gilded, and decorated with tiny flowers. Under the Moguls, Lahore boasted weavers, carvers, tilemakers, and miniaturists. Jahangir decorated his palace with "paintings by rare artists." He knew the styles of painters in his assembly-line atelier so well that he could

As nimble as Mogul horsemen, *students at Aitchison College in Lahore train at tent pegging (**left**), aiming to spear wooden stakes and jerk them from the ground. Moguls thus gave their enemies a rude awakening by collapsing their tents upon them. Akbar's love of horses inspired a life-size sculpture, said to be of his favorite mount, near his tomb at Sikandra (**above**). He dazzled his subjects with polo, played at night with burning wooden balls. Infatuation with the sporting life kept Akbar, alone among the Great Moguls, essentially illiterate.*

tell who had painted an eye in a portrait.

Crassly, Jahangir totted up the value of the gifts his nobles showered upon him, recording, for example, that jeweled vessels, Persian robes, and elephants from a khan were worth 150,000 rupees. He kept only the best, returning the others.

Scouts searched out tigers and rounded up antelope to kill. By age 50 he had slaughtered 3,203 quadrupeds and 13,964 birds.

Animals living and dead were a passion. Amateur naturalist, he explored the innards of his prey and meticulously described the mating act of cranes in his menagerie. It distressed him to see elephants spraying themselves with cold water on cold days. He ordered the tanks in the royal elephant stables heated.

Meanwhile, his favorite wife, Nur Jahan (Light of the World), became the power behind the throne. A clever businesswoman, she also shot tigers from an elephant.

Far less is known of most of the women—wives, aunts, nieces, concubines, slave girls—cloistered in Mogul harems. Only family and a few nobles saw royal women unveiled. At court, Sir Thomas Roe, envoy of the young East India Company, observed fingers poking through a reed screen. Eyes appeared; the ladies were trying to get a better look at him. Had there been no other light, he wrote, "ther diamondes and Pearles had sufficed to show them."

For a time Prince Khurram enjoyed Nur Jahan's favor. But in 1622 he rebelled, realizing that Nur Jahan now favored another imperial son, Shahriyar. Khurram recruited nobles with their troops. For three years loyal and rebel forces marched and skirmished. A tenuous peace was restored in 1625.

Two years later a feeble, asthmatic Jahangir made one more trip to Kashmir. The caravan returning in autumn became a cortege. Khurram took the throne as Shah Jahan. Shahriyar's eyes received the lancet, and with four royal kin he was put to death.

Nur Jahan now busied herself building tombs for Jahangir and herself near Lahore. To get from one to the other, I followed a road that crossed railroad tracks; British surveyors did not think it necessary to route trains around the royal cemetery.

A sign at the crossing says, "Complaints may be entered in the book kept with the gatekeeper." I imagine the two royal ghosts scribble angrily there every night.

This Kinge is now buildinge a Sepulchre for his late deceased Queene Tage Moholl. . . . He intends it shall excell all other.

—PETER MUNDY OF THE EAST INDIA COMPANY

IN HIS PLAIN HOME in the Agra neighborhood called Taj Ganj, Mohammad Husain folded himself into a crouch before a grinding wheel on the floor. As his right hand moved a stick, an attached thong spun the wheel's axle. The fingers of his left hand—long, artistic fingers—applied a sliver of malachite to the grinding surface.

Mohammad is certain that his craft has not changed since the 1600s, when Taj Ganj was the home of artisans building the Taj Mahal. He is equally certain that his forebears helped decorate that magnificent mausoleum with bits of turquoise, lapis lazuli, jasper, malachite, coral, and carnelian. These became petals, leaves, and trailing tendrils. Inlaid in marble, the floral displays added delicacy and grace.

In Agra today three thousand men piece semiprecious stones into marble tabletops and boxes. The morning I met Mohammad he was inlaying a rose in a platter.

He has a craftsman's pride in his work, but the pay is meager—five to ten dollars a day. "There is no time for art," he said. "This has become too commercialized."

Shah Jahan had plenty of time for art. He created Shalimar Gardens of his own in Lahore. He built the Red Fort in Delhi, as well as Delhi's great mosque and a whole city, Shahjahanabad, the Old Delhi of today—as distinguished from the metropolis that came to be known as New Delhi, built by the British in the early 1900s (see article beginning on page 506). He raised an exquisite marble palace in Agra's fort.

As a prince, he took three wives, but was devoted to Arjumand Banu, titled Mumtaz Mahal (Chosen One of the Palace). By 1631 she had borne him 13 children, of whom seven were living. That year she gave birth to a daughter—but died in delivery.

Shah Jahan spent two years in mourning. But well before the end of this time he was planning a grand tomb for Mumtaz Mahal

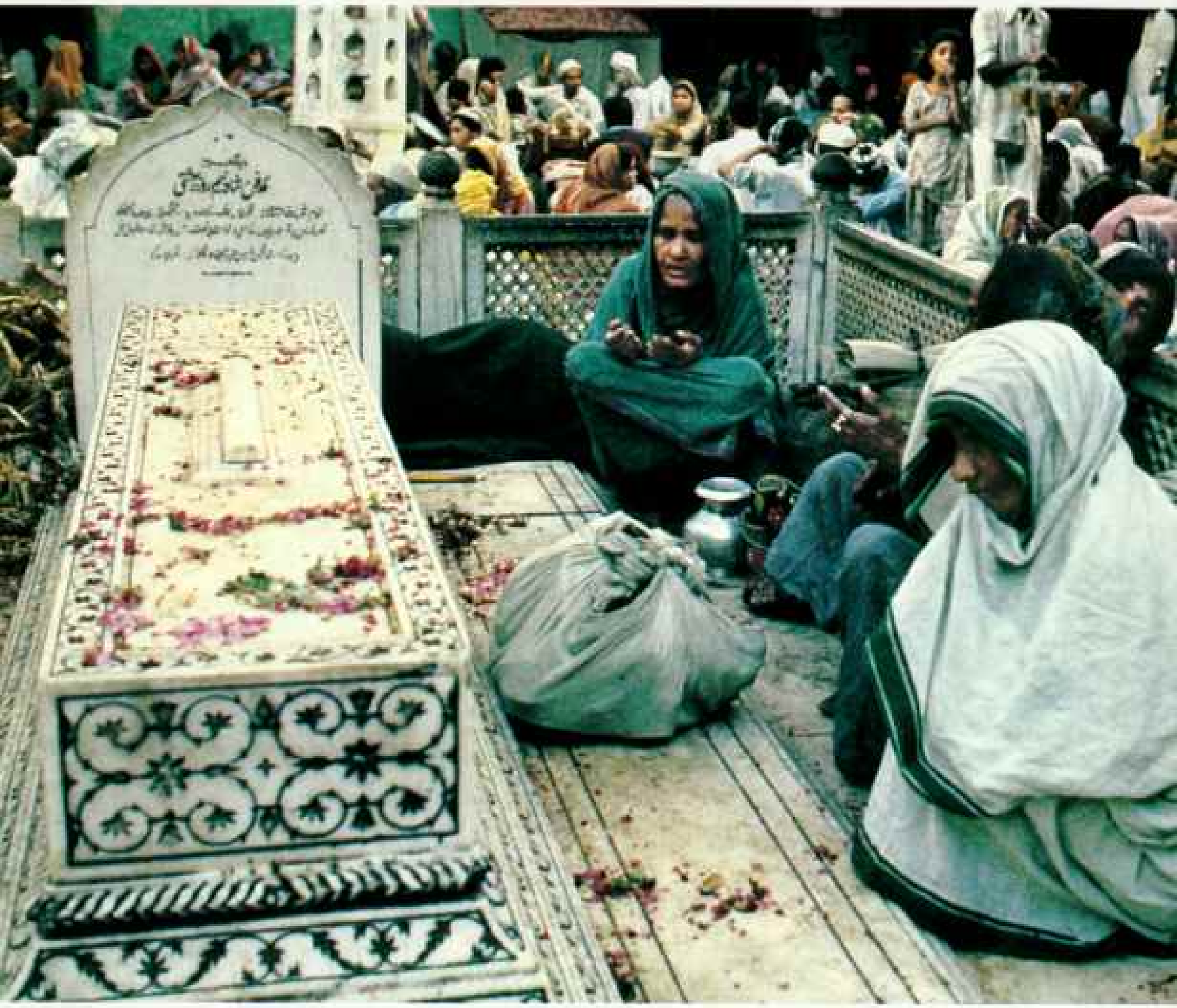
(whose title in shortened form became the name by which the tomb is known today).

Artisans were summoned: a specialist for the dome from Turkey, a master mason from Baghdad. For two decades 20,000 workers labored on the building often called the world's most beautiful.

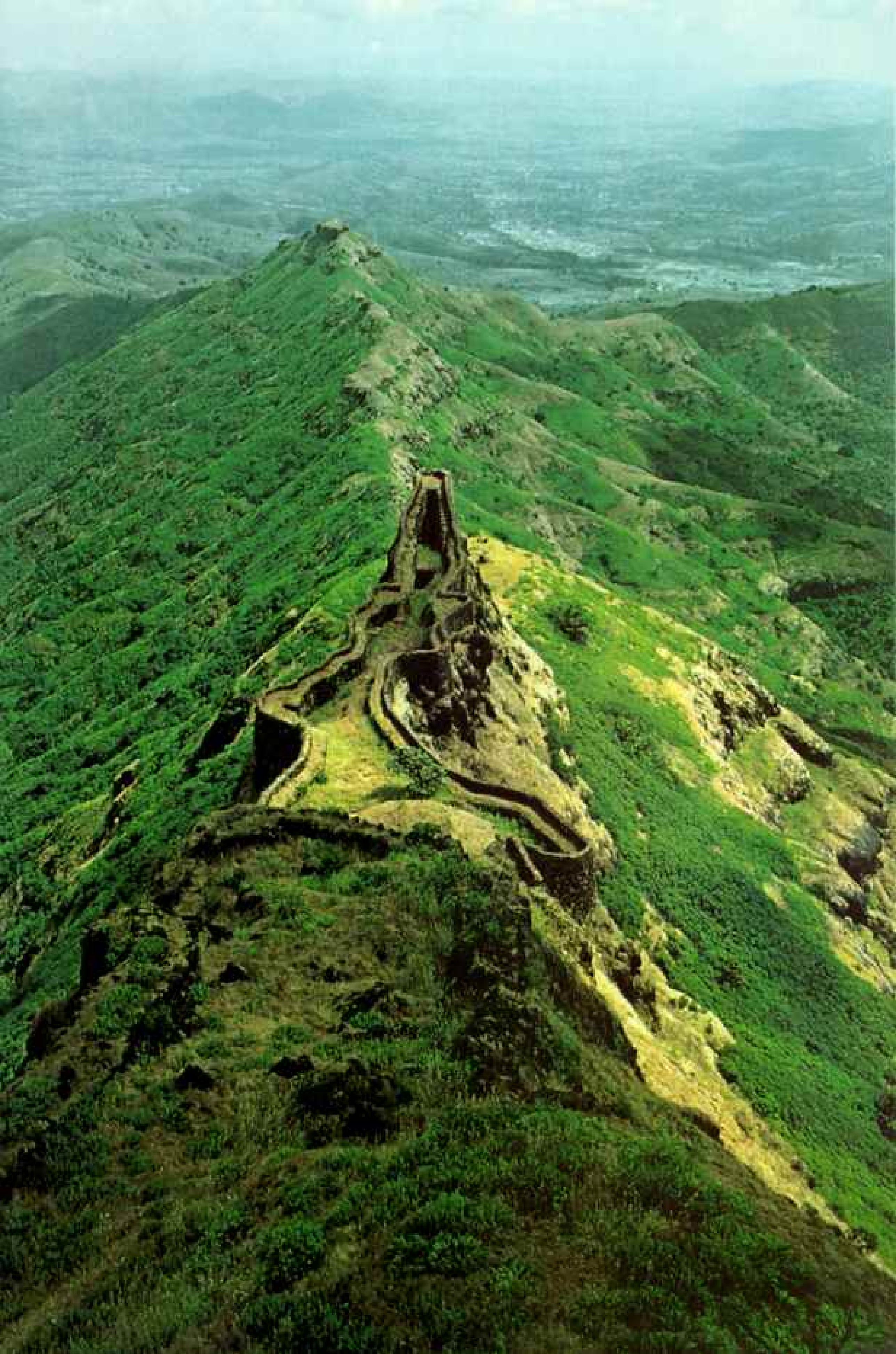
No official document survives that names a Taj architect. Some scholars assign the honor to Ustad Ahmad Lahori, architect of other of Shah Jahan's buildings. Perhaps the design was the work of a committee, with the padshah himself taking a leading hand.

In any case, the design is not original. Humayun's tomb in Delhi, built almost a century before, seems a prototype. Similar minarets had risen in Lahore, and the cupolas beside the dome—classic Indian embellishment—were to be seen everywhere. The great achievement of the Taj's architect, or architects, was the refinement of these elements into harmonious symmetry. The Taj exceeds the sum of its inspirations.

Historians have proposed that in building



Marble fit for a king *entombs at Ajmer a lowly water-bearer named Nizam, who saved the life of Emperor Humayun in 1539. Driven into the Ganges by Afghan leader Sher Shah, Humayun lost his horse and might have drowned had not Nizam rescued him with an inflated waterskin. The grateful emperor seated him briefly on the throne, where he issued decrees before a scandalized court.*



grandly Shah Jahan was determined to outshine Persia's ruler, Shah Abbas I, who had created a splendid capital at Isfahan.

As he conducted affairs from his Peacock Throne, a golden divan surmounted by bejeweled peacocks, perhaps Shah Jahan also wished to hide the cracks that were appearing around his kingship.

The number of nobles had spiraled—8,000 now claimed shares of land revenue. Emulating their rulers' love of palaces, jewels, and gardens, many complained that their jagirs were insufficient. Shah Jahan relaxed their military obligations; in fact the nobles did not maintain even a fraction of the troops they had pledged to keep.

And the armies now proved vincible. Prince Murad led 50,000 soldiers toward the Mogul homeland; to reclaim Samarkand was an imperial dream. This campaign failed, even after Prince Aurangzeb took command. And Persia grabbed Qandahar. Three times Shah Jahan attempted to win it back—and could not.

LORD HELP THE PADSHAH who has four healthy sons. Shah Jahan favored as his successor the eldest, Dara Shikoh. The three others, Shah Shuja, Murad, and Aurangzeb, were usually posted in far-off provinces.

In 1657 Shah Jahan fell ill and was thought to be dying. In Bengal, Shah Shuja declared himself emperor. In Gujarat, Murad did likewise. Aurangzeb threw in with Murad—for the time being.

Favorite son Dara Shikoh clashed with the forces of Murad and Aurangzeb eight miles from Agra. Murad was wounded, but Dara was routed. Aurangzeb now besieged the Agra fort; within, his father, now recovered from illness, fretted. He surrendered to his son after three days, becoming a prisoner in his own wonderful buildings. Aurangzeb proclaimed himself emperor in 1658.

Dara Shikoh, captured, was beheaded in prison. Murad followed him in death. Shah Jahan lived eight years more, gazing out at the Taj Mahal, the monument by which the Moguls would be best known to the world. At his death in 1666, his body was placed beside that of his beloved Mumtaz Mahal.

I myself am forlorn and destitute, and misery is my ultimate lot.

—AURANGZEB IN A LETTER TO A SON

IN THE VAST COURTYARD of the Badshahi Mosque, which Aurangzeb built at Lahore, a small, grizzled man told me a story about the sixth of the Great Moguls: "Though he was ruler of all India, his wife was preparing chapati with own hand. She complain to ruler. So he say, 'I am selling some books in bazaar and I am making caps and I am selling. You can have money to pay maid-servant.' His wife don't use any penny from government."

Do not believe that Aurangzeb's wife made bread with her own hands. But there is a kernel of truth here: Aurangzeb did write copies of the Koran and stitched caps. His will pledged the rupees from Korans to holy men; the caps were to pay for his funeral.

I heard the caps and Korans story in various forms from Muslims in both India and Pakistan. It is cited as proof of Aurangzeb's simplicity and piety—characteristics, especially the piety, that make him, in some Muslim eyes, the greatest of the Moguls.

Many Hindus have a different view. He reimposed the jizya, the tax on nonbelievers, and had new Hindu temples pulled down, shaking the communal tree that Akbar had nourished.

Some historians regard Aurangzeb not as anti-Hindu but as an orthodox Muslim following the precepts of his faith; the jizya and the destruction of temples are specified in the Koran. On the other hand, he was a pragmatic politician who employed more Hindu officials than any previous padshah; he needed their troops.

Court life became austere. Aurangzeb forbade alcohol, banned gambling and

"Specimen of hell," *a Mogul nobleman cursed the rugged Deccan. On a knifelike ridge perches Torna, one of many forts taken by Aurangzeb during his 26-year campaign against peoples such as the Marathas—a conflict aggravated by puritanical Aurangzeb's anti-Hindu policies.*

music. Miniaturists continued to paint, but their art was less appreciated.

More and more Aurangzeb became preoccupied with the Indian south, especially the rough hill country of the Deccan, where the kingdoms of Bijapur and Golconda and the fierce Marathas defied his sway.

In what is today Maharashtra, which includes Bombay, his armies confronted a master guerrilla fighter. The heavily armored Moguls were bedeviled by fleet Maratha warriors led by this regional chief—today a national hero—named Sivaji, the "ji" being a mark of respect.

In 1681 Aurangzeb himself went south to campaign. The Mogul court was no longer in Agra or Delhi or Lahore—among the greatest cities of the world—but in a modest little place that the padshah named Aurangabad. Incredibly, Aurangzeb remained in the south for 26 years.

Now a city of 300,000, Aurangabad still bears a few marks of its brief time at center stage. Where Aurangzeb dwelt, young Indians now study graphic arts. "This was

once the harem," a professor said, his gaze sweeping his office. Bath chambers are classrooms. The massive arches of the former palace are a far cry from the delicate creations of Shah Jahan.

At an intersection I gazed at a noble statue. This leader prancing on a charger in Aurangzeb's chosen capital is Sivaji. The Deccan honors its own.

Capturing Bijapur and Golconda, Aurangzeb expanded the Mogul realm to its greatest dimensions. But he was never able to wholly stamp out Maratha resistance. In the north the empire was beginning to crumble. The mansabdari system was sinking in corruption and under the demands of hordes of men for land and status. There were uprisings. The treasury was drained.

I drove out of Aurangabad on a road lined with great banyan trees, then up a spiraling highway to Khuldabad. In this town dwelt a holy man who was Aurangzeb's teacher. When death finally claimed the padshah in 1707, after 49 imperial years, rupees from the sale of caps paid for what he wished—a simple funeral. He lies beside his teacher.

The Moguls had given India six men, mostly resolute, at times towering. Now the lineage produced weaklings. When Nadir Shah of Persia invaded in 1739, the emperor's forces were no match. In the vast loot he took from Delhi was the Peacock Throne.

THE EAST INDIA COMPANY gradually absorbed almost all the empire. But Mogul ways continued on, even in those regions that came under British control.

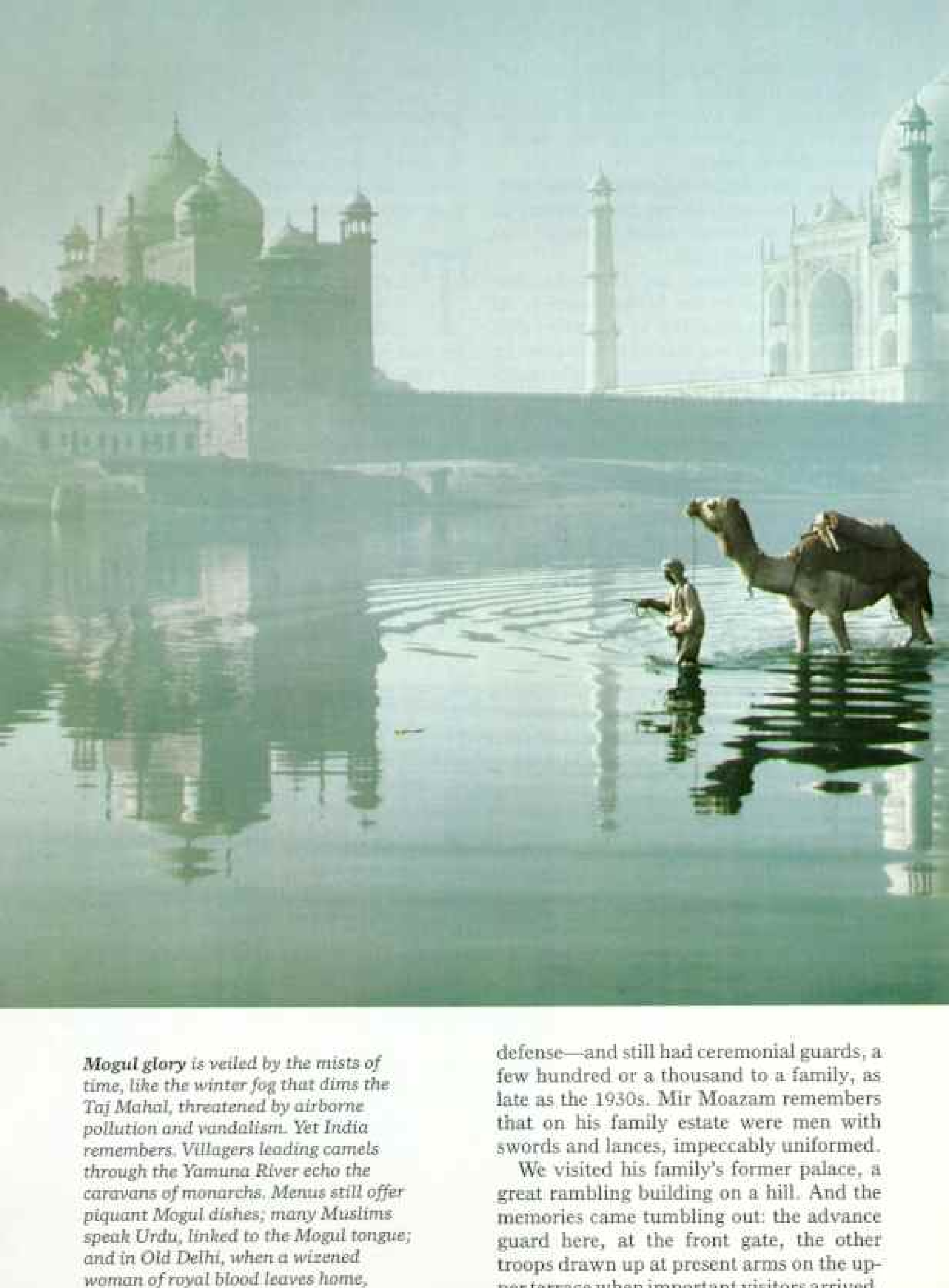
"I think our family's jagir was about 700 or 800 villages," said Moazam Husain, an erudite man of 70 years. Like all males of his lineage, he still bears the noble title "mir." I met him in Hyderabad in southern India.

Abandoning the sinking ship, a Mogul minister established his own dynasty in Hyderabad in the 18th century. Among the nobles he brought to his kingdom was a forebear of Mir Moazam. Like the nobility of Agra or Delhi, the first families of Hyderabad maintained troops for the kingdom's

***Renowned white marble** from Makrana that inspired Mogul chisels is still quarried (**above left**) and hauled by bullock cart (**left**). Thus the huge slabs crept the 200 miles to Agra to join the perfect lines of the Taj Mahal, named for Mumtaz Mahal, Shah Jahan's beloved queen. After her death during childbirth in 1631, the grief-stricken ruler created for her the quintessential Mogul tomb, where he joined her in 1666.*

*Above their crypts a penitent kneels beside the rulers' candlelit cenotaphs (**right**), the floral arabesques inlaid with agate, lapis lazuli, and carnelian, some sadly gouged away by vandals. Fretted marble screens set in inlaid frames surround the cenotaphs in an octagon that alone took a decade to sculpture.*

After Shah Jahan's death it was rumored that he had desired as his own tomb a black marble replica of the Taj across the river, connected with his wife's by a bridge, a request supposedly scotched by his remorseless son Aurangzeb.



Mogul glory *is veiled by the mists of time, like the winter fog that dims the Taj Mahal, threatened by airborne pollution and vandalism. Yet India remembers. Villagers leading camels through the Yamuna River echo the caravans of monarchs. Menus still offer piquant Mogul dishes; many Muslims speak Urdu, linked to the Mogul tongue; and in Old Delhi, when a wizened woman of royal blood leaves home, passersby still bow.*

defense—and still had ceremonial guards, a few hundred or a thousand to a family, as late as the 1930s. Mir Moazam remembers that on his family estate were men with swords and lances, impeccably uniformed.

We visited his family's former palace, a great rambling building on a hill. And the memories came tumbling out: the advance guard here, at the front gate, the other troops drawn up at present arms on the upper terrace when important visitors arrived.

On one side of the hill were the tracks of a

small railroad. "My uncles and my grandfather used to practice here before going tiger shooting," Mir Moazam said. "A full-size tiger, stuffed, would go down the hill on the tracks, and they'd let fly: *bang! bang! bang!*" The tiger would be hauled up, patched up, then sent careening down again.

When Hyderabad was absorbed into India, after independence in 1947, jagirs were abolished. Mir Moazam's family sold its palace, which has become government office space.

A reedy wistfulness crept into his voice as we came on what was once a garden. He remembered bands playing here. The pool held stagnant water, half solid; motorbikes were parked amid straggling bougainvillea. "It wasn't ugly like this," he said.

Times change. Gardens become bedraggled, precious stones disappear from inlays. But the Mogul legacy has not vanished. It remains as an aura, a state of mind, a tongue, a taste—and one man's memory of his family's palace guard. □

Show of arms *illuminates Kabul as searchlights probe for Afghan guerrillas, known as mujahidin, who fire a rocket toward Soviet and Afghan military posts. By day the capital resumes business under an uneasy peace.*

Afghanistan's Troubled Capital

KABUL

By MIKE EDWARDS

Photographs by STEVE RAYMER

BOTH NATIONAL GEOGRAPHIC STAFF

FROM THE BALCONY of my hotel room in Kabul I watch hot coals arc across the night sky. Then bouquets bloom bright pink near the airport. These night flowers are thunderous; seconds after they appear, a heavy *thud-thud* rattles the hotel's windows.

Babur, the first Mogul emperor, would have been fascinated by this pyrotechnic display in the city that was his favorite. He took a keen interest in "modern" weaponry, augmenting the tools of his trade, sword and bow, with crude matchlocks and mortars.

Kabul was his home from 1504, when he captured it, until 1526, when he launched the Mogul Empire in Hindustan. Sixteen of his children (he had at least seven wives) were born Kabulis. Some years after his death in Agra in 1530 his remains were removed, as was his wish, to a garden he had laid out on Kabul's fringe.

Babur's favorite city has long been a favorite of mine. I can't tell you how scared, plain scared, I was when I arrived in 1966 to be deputy director of the Peace Corps program in Afghanistan. I had never seen fiercer-looking men than the swarthy, turbaned denizens of Kabul's bazaars. Presently I discovered that Afghans can be as hospitable as they are, at times, violent. I grew to love this antique city, its panoramic mountainscape and sparkling light, the creation of dust sifted in the bright sun of 6,000 feet.

I returned last year to see Babur's city as it

is today, enmeshed in a nasty war that began soon after Marxists seized power in 1978. The regime has been massively bolstered by Soviet troops since late 1979. For a Western journalist, this was a rare opportunity; few have been granted visas to see Communist Kabul. I was allowed a ten-day visit.

EVERY NIGHT brought to my balcony at Hotel Inter-Continental Kabul (200 rooms, 8 guests) the sounds of war. From rocky ridges shouldering the city, resistance fighters—the *mujahidin*, "holy warriors"—sometimes launched a dozen rockets toward Soviet and Afghan military installations near the airport. In response, troops shot off flares and probed with searchlights so powerful that the ridges seemed dusted with snow.

I'm sure that Waheedullah, the young official who supervised my time in Kabul, did not have nights in mind when he said only an hour or so after I arrived, "You can see that life in Kabul is very normal."

By day, and on first glance, Kabul did seem to be following its ageless course. I saw few damaged buildings downtown. Several structures of five or six stories lent touches of modernity, but Kabul remained as I had known it, a low-rise city of shops and dwellings made of concrete or mud, some painted white but most not painted at all, spreading across valleys and climbing ridges.

The bazaars were wonderfully familiar: awash with grapes, groaning under melons, smelling richly of excrement—and sweat. Hazara, a Mongol-featured people from central Afghanistan, are still the beasts of burden, plodding the labyrinthine streets with crates on their backs. The Kabul River, curling through the core, remains the car wash. And, for some, the Laundromat.

On a Friday, the Muslim Sabbath, the war seemed far from the terraced garden where Babur is buried. It would delight him to see whole families enjoying themselves among the roses and geraniums, sitting on carpets brought from home (pages 498-9).

A few young men were getting very drunk there. In his time Babur might have joined them; he partied often in Kabul's gardens. But for me these public drunks were a surprise; the Kabul I knew had been too conservative for public imbibing. A citizen suggested that uncertain times propel young men toward the bottle.

Waheedullah—I give him credit—did not try to hide the obvious fact that Kabul is at war. But it was left to me to discover the deeper truth: In this city that on the surface seems normal, almost everything is abnormal. Consider the local fount of the elixir of which it is said in Dari, "*Hama cheez ba Coke behtar meshawad*—Everything goes better with Coke."

Coca-Cola syrup reaches the Kabul bottling plant from Pakistan. Capitalist refreshment, however, no longer leaves the plant in trucks painted Coca-Cola red. A few months after the coup, explained the plant manager, "people rose against everything red." Coke now goes out in trucks painted Islamic green. And sometimes there is none to go out, after the mujahidin have severed electric power lines.

Beside the Kabul River a man tried to sell me a carpet. His family came three years ago from the Afghan north "to make a living, to make some food," he said. Warfare in the countryside has been vicious: suspected mujahidin villages bombed, crops burned. Kabul's population has possibly tripled, to two million, since the Marxist takeover.

EARLY in that upheaval President Noor Mohammad Taraki, coming to power after the slaying of President Mohammad Daoud on April 28, 1978, announced sweeping reforms, such as land redistribution. While flooding villages with socialist rhetoric, the regime sought to curb the power of religious leaders. This was too much too fast for Afghans, a people mired in a peasant, tribal society.

Suspected opponents, including educated men and religious leaders, were jailed or

A volley of leaves *decorates the vintage rifle of a village militiaman near Kabul, a far cry from the arms used by the regular Afghan Army. Conscription sends 16-year-olds to the army, whose ranks have been halved to 40,000 by desertion since Soviet forces entered the country in late 1979 to support its Marxist government.* MIKE EDWARDS

slain. Much of the butchery is credited to Hafizullah Amin, Taraki's prime minister, who usurped power in the new regime, then took over—having Taraki suffocated under a pillow, according to one account.

Afghanistan was torn by riots and insurgency. Amin ruled less than four months. He was killed as the Soviet Army, Mogul-like, flowed down from the north in December 1979. Babrak Karmal was installed as president. He insists that the Soviet troops—more than 100,000 now—were invited. Most of the world's governments hold that Afghanistan was invaded. After the Soviet intervention, the exodus of refugees became a torrent; an estimated four million now dwell in Pakistan and Iran.

With the 1978 coup came a massive campaign to win hearts and minds to Communism. In public buildings I saw cartoons of Uncle Sam handing money to mujahidin and instructing them to blow up Afghan mosques. (Some sources in Washington, D. C., say the United States has spent 325 million dollars to aid the resistance.) Courses in Marxist ideology have become staples in Kabul University.

A major instrument of the campaign is the Democratic Youth Organization, whose leader, Farid Mazdak, just 26, is the youngest member of the central committee of the People's Democratic Party of Afghanistan.

In his office Farid ticked off the many youth organization programs: athletics, youngsters caring for war orphans, brigades working in textile factories, even brigades sent to coal mines. For the Pioneers Organization, copy of a Soviet youth league, Farid claimed 35,000 members. For the paramilitary Brigades for Social Order, 15,000.

Many youth organization members are in the army; conscription begins at 16. Straining for manpower, Kabul has reduced the school career from 12 years to 10. Among the

FROM THE "BABUR-NAMA," NATIONAL MUSEUM, NEW DELHI

To his most beloved city *the first Mogul emperor, Babur* ***(left,*** *at left), bequeathed a legacy of gardens still blooming today. On Friday, the Muslim Sabbath, Kabulis relax in the ruler's favorite garden* ***(right)****, where he was buried* ***(above)*** *after his death in India in 1530. Easily capturing Kabul in 1504, Babur became one of the many rulers who have fought for control of Afghanistan, a strategic Central Asian crossroads.*

thousands sent to the Soviet Union as students are some barely in their teens.

More candid than most officials I met, Farid acknowledged problems in the Afghan Army—"there are soldiers running from the armed forces." Mujahidin leaders say desertion has halved the ranks.

At the Ministry of Mines and Industry building I heard Abdul Salam read from a text on the virtues of labor. He intoned: "We are seeing the nations of the world going ahead and ahead, going to the moon, going to the deep seas. These are things we can accomplish only with labor."

A small man, 56 years old, Abdul echoes the boyhood of most older Afghans when he says, "I had no opportunity to go to school."

In the room where he read, 50 other men were being taught in literacy classes. Abdul added dutifully: "I thank the revolutionary government for teachers and books."

Not every government endeavor seems wholly political. A United Nations consultant said he is impressed by Kabul's efforts in public health. The regime knows it must deliver services to win the people, he said, "but I believe they are doing so not because they have to, but because they want to."

I visited Ahmad Joyenda, who directs the Afghan Institute of Archaeology. Afghanistan abounds in sites of ancient dynasties: Greco-Bactrian, Kushan, Sassanian, Hephthalite. "In the past, archaeological work was largely done by foreigners," Mr. Joyenda said. "But since the revolution we have set out to be self-sufficient in exploration." These efforts are limited; most of the nation is not under Kabul's control.

Moscow supplies Kabul with fuel, sugar, and wheat, but goods from other nations are plentiful in Kochai Mandayee, the "street where you can buy anything." A lad of 12 offered toothpastes that I would find at home.

I looked at piles of suit coats. One bore the

label of a store in Hickory, North Carolina. Afghan traders still come to the United States to buy bales of used clothes. The government has not deemed it good politics to deprive such traders of their livelihood.

For the average Afghan, however, staples are dear. Flour sometimes costs four times as much as before the coup. Firewood is also more expensive; it must be hauled from areas where the war has disrupted life.

CHICKEN STREET. Official name, Zarghuna Maidan. But Chicken Street to almost everyone. Once the poultry market, it became the hub of a bazaar that was a joy to tourists—when there were tourists in Kabul. I remember the gleam of samovars and jewelry, the fine carpets, the sensuous blankets of fox fur.

This time I found Chicken Street flush with Russian rubles. Not new ones but

pre-1917 Revolution notes, from some family's hoard. Boys hawked them for small change.

New rubles do not pour into Chicken Street; Russians have little money for luxuries. Chicken Street's gleam has become a glimmer, and many shops are closed.

Ahead of me were rifle-toting soldiers with blond hair and fair skin. They wore shapeless fatigues, and their boots were dusty; spit and polish is not the Soviet way.

Soviet armored personnel carriers and trucks, shuttling to and from military installations, are a common sight. But most guard duty downtown is performed by Afghan troops. Soviet soldiers afoot were a tip-off to the presence of Soviet civilians, who dare not venture out without an armed escort.

I spoke a bit of Dari in the bazaars but always switched to English, which many

Modern but still modest *in dress, Kabul women* ***(above)*** *stroll past an Afghan Army truck. Since 1959, when women were permitted in public without the head-to-heel garment called the chadri, they have gradually received broader education, and some have entered the work force. But, like many Muslim women, a pair bargaining with a grain merchant* ***(left)*** *keep to the veil.*

Kabulis understand—thanks in part to the Peace Corps teachers who once worked there. Government officials I met were shrill in their denunciation of the United States, but on the street Afghans were as cordial as I remembered them. The inevitable first question to me: "Where are you from?" The inevitable astonished response to my answer: "*Amrika!*" Then, enthusiastically: "I have a brother in California!" Or: "The United States was great in the Olympics!"

My movements were circumscribed by government rules and a government guide, but some nights I slipped out of the Inter-Continental and met citizens privately. I heard: "We wish the Russians would go home." Another said: "We would not have problems if there were not some people who want to sit in the big chair"—meaning President Karmal and party stalwarts.

Of nightlife Kabul has none now. Curfew begins at 10:00, sometimes earlier, and everyone wants to be off the street well before.

Mujahidin who infiltrate from Pakistan say they are able to move freely in the city by night or day. While I was there, guerrillas left a suitcase of explosives in the airport terminal, which was crowded with families seeing students off to the Soviet Union. Toll: 13 or 30 killed, depending upon whom you believe, and 200 or 300 injured. But the mujahidin do not have the strength to engage the thousands of Afghan and Soviet troops quartered all around—and some guerrillas have been captured, even executed.

"FEW VILLAGES match Istalif, with vineyards and fine orchards . . . with waters needing no ice, cold and, mostly, pure." Thus did Babur praise a town 34 miles from Kabul. I remember pleasant afternoons in Istalif, where I bought the wares of local potters.

I wanted to go there again. Waheedullah said it was too dangerous. Nor was I able to visit other places I knew in the area. Kabul is isolated from its countryside.

Finally I was offered a look at Yakatut, a nearby village where government organizers have invested much effort. In a mud-walled dwelling I saw a forest of gun barrels. The faces mingled with these weapons were of boys and older men.

Comrade Nabi, a government official, said the people were members of the Defenders of the Revolution, a militia corps. "Of 37 villages in this district, 34 are in our hands. In only two or three can the counter-revolutionaries do their evil acts."

Gray-bearded Ghulam Mortaza was introduced to me as the militia leader. He said the mujahidin "come in the night and kill families when they deny them money, and burn harvests and the schools."

Urban port in a rural storm, *Kabul has possibly tripled its population since 1978 to two million as villagers flee heavy fighting that has destroyed homes, crops, and livestock. Perhaps four million Afghan refugees now live in Pakistan and Iran. Farming on Kabul's fringes* ***(above)*** *augments the city's food supply, sustained by imports from the Soviet Union. Self-reliant nomadic herders* ***(left)*** *dry lamb on tent lines beside a new apartment complex.*

As passionate in friendship *as in fighting, Afghans greet one another in a Kabul market. Their country, once a buffer between Russian and British imperial ambitions, is now embroiled in a conflict attracting world concern.*

A few minutes later I asked Ghulam Mortaza a question. My guide translated it, but the old man was not listening. Another villager scolded, "Why don't you answer? You're our leader." Someone snickered.

The militia obviously did not take their leader seriously. I wondered: Should I?

The Kabul regime has showered propaganda, promises, and, no doubt, money upon such people as these villagers. But it is by no means clear that success will crown this effort—just as it is not clear that the mujahidin will emerge victorious.

PRESIDENT KARMAL, concedes the ambassador of a nation friendly to Afghanistan, has "an unfortunate albatross" around his neck—he came to power with Soviet support. Some mujahidin have said they would accept a moderate government in Kabul but never Soviet control. Other mujahidin would return to the ways of conservative Islam.

The many resistance groups are not unified, though coordination is improving. Some have shown great bravery; others seldom fight. One leader fears that the Afghan people, worn down by the intensifying war, will go over to the government.

The scars of seven years of conflict are raw. I remember Rahim, whom I saw in Pakistan. He walked with testing steps, as if trying on new shoes. But Rahim was testing a steel shank and a hard rubber foot. His right leg ends below the knee; he lost it to a bomb—Soviet or Afghan—dropped on his home. Rahim is eight years old.

There are many like him in Pakistan, and revenge is a tenet of many Afghans. Even if no other nation were involved, it is likely that Afghans would be fighting Afghans.

So it is hard to know what lies ahead for the people of this antique land, for those who dwell in the city Babur loved. But it probably is not good. □

Mirror of India

NEW DELHI

By BRYAN HODGSON

Congestion sets the pace at a slow crawl along an avenue of grain merchants in an old section of Delhi. Dependent on its immense reservoir of manual labor as well as modern computer technology, India's burgeoning capital epitomizes the nation's problems and potential.

The air we breathe is full of the dust and fragrance of the past, as also of the fresh and piercing winds of the present. We face the good and bad of India in Delhi. . . .

—JAWAHARLAL NEHRU

THE FRAGRANCE of burning sandalwood drifted over New Delhi as flames consumed the body of Indira Gandhi. Through the smoke I glimpsed the somber face of her son, Rajiv, presiding by Hindu custom over the cremation of his assassinated mother.

Soon he would turn to the duties she had bequeathed to him—to preside as prime minister over a nation that seemed to be tearing itself apart.

India's capital reeked of death. Troops cordoned off streets where, only hours before, 600 Sikhs had been burned or beaten to death by *(Continued on page 512)*

Photographs by STEVE RAYMER

BOTH NATIONAL GEOGRAPHIC STAFF

DILIP MEHTA, CONTACT PRESS IMAGES

Overwhelming vote *of confidence endorsed 40-year-old Rajiv Gandhi* ***(above)*** *as prime minister in late December when his Congress (I) Party won more seats in parliament than it had held at any time during the 37 years of India's independence. The election followed by eight weeks the assassination of his mother and predecessor, Indira Gandhi. As a candidate, Rajiv Gandhi campaigned the length of India—with more than 700 million people, the world's largest democracy. Using television for the first time, he preached national unity and promised a cleanup of political corruption and government inefficiency.*

Yet the Gandhi name probably meant more than the message, for Rajiv is heir to a dynasty that has run India for all but five years since 1947. His grandfather, Jawaharlal Nehru, the anointed of the revered Mohandas K. Gandhi, served as India's first prime minister. After Nehru's death in 1964, his only child, Indira (widow of Feroze Gandhi, unrelated to Mohandas), set out to rule the Congress Party and became prime minister in 1966. She dominated so totally—rewarding party loyalty, jailing opponents, and toppling state regimes controlled by the opposition—that her era was called Indira raj. The sobriquet recalls the British raj, or reign, when colonials implanted their language, government, and even architecture, as seen in the Secretariat in New Delhi ***(above right)****. Heart of the bureaucracy, the complex overlooks pools where city dwellers*

enjoy a late afternoon row.

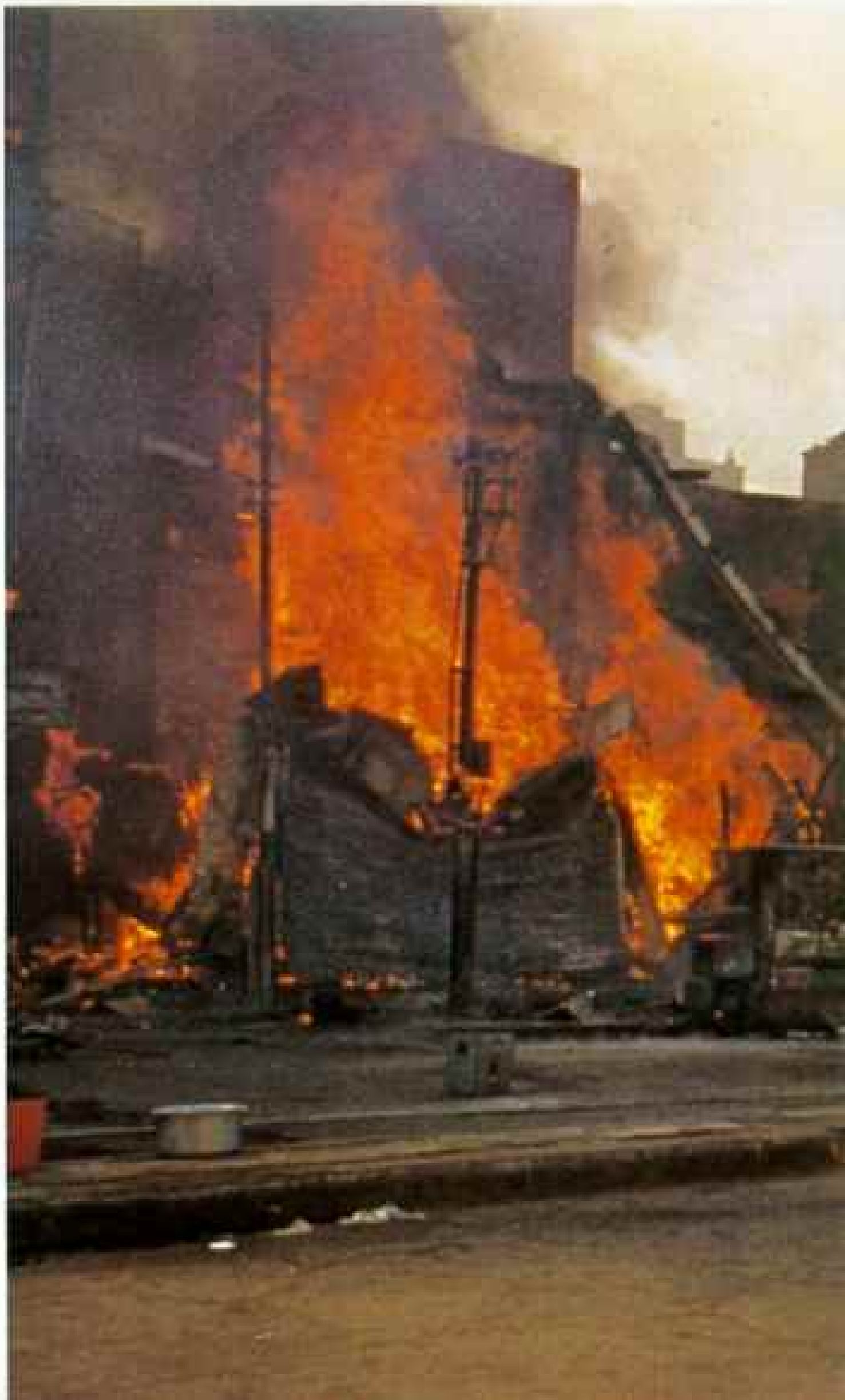
*Even as Rajiv assumed power, he faced a long-simmering family feud with Maneka Gandhi (**left**, with son Feroze Varun), widow of his brother, Sanjay. Groomed to succeed Indira, Sanjay died in an air crash in 1980. Thereafter, to help his mother, Rajiv gave up his job as a pilot to win a seat in parliament.*

Maneka, who had been ousted from Indira's official residence, formed the National Sanjay Platform party in 1983, appealing to women and youth. At 28 the youngest of India's political leaders, she ran against Rajiv for his parliamentary seat and in defeat declared, "We will go on fighting." Her party is among many in a nation that has never developed a strong opposition party as an alternative to the Nehru dynasty.

STEVE MCCURRY

The assassination *of Indira Gandhi rocked the capital last October 31. The killers—two of her own Sikh bodyguards—were retaliating for the government storming of the Golden Temple in Amritsar, which had been barricaded by armed Sikh separatists. With news of her death, Hindu gangs set fire to Sikh shops along Chandni Chauk, a main street in the old city (**right**), and to many homes. The turban, beard, and use of the name Singh make Sikh men easy to recognize; 600 people died in the capital alone. Later some 1,900 people were arrested for anti-Sikh violence amid charges that police and Congress (I) Party loyalists incited the rioters.*

*In the Gandhi funeral procession through New Delhi, attended by a quiet crowd estimated at a million, units of the armed services (**above**) ceremonially pull her flower-strewn bier, actually drawn by a truck, to a cremation site near the Yamuna River. There, with a long staff, her son Rajiv (**upper right**) circles the pyre after igniting its sandalwood with a sacred flame. The Hindu ceremony is intended to set the soul free by returning the body to air, fire, water, and earth. Afterward her ashes were scattered over a pilgrim's shrine and the source of the Ganges in the Himalayas.*



TONY HEIDEBER, WOODFIN CAMP (ABOVE); RAGHU RAI, MAGNUM (BELOW)

purposeful mobs in revenge for Mrs. Gandhi's murder by two trusted Sikh guards.

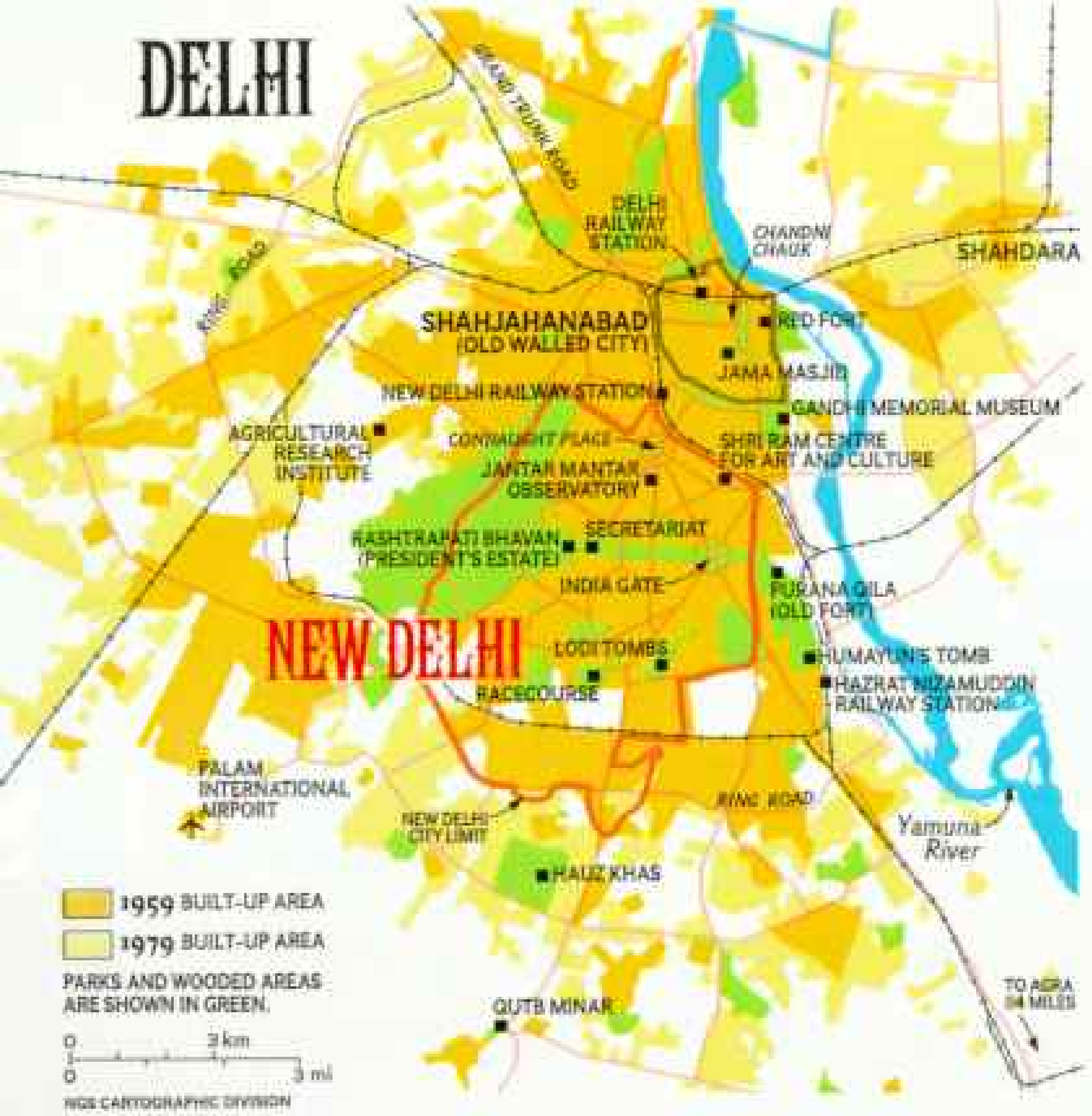
The fanatical separatists who killed her were relative newcomers to religious and racial hatreds that had bloodied India's unity for decades. These ancient conflicts inflamed modern economic, social, and political issues that had reached a crisis in the months before Indira Gandhi's tragic death.

In visits spanning three years I had found New Delhi to be the focus of all these issues. It was headquarters for the massive government bureaucracies that have helped put India among the top ten industrial powers, builder of space satellites, master of the technology to build a nuclear bomb, and winner of an incredible struggle to grow enough wheat and rice for an exploding population exceeding 700 million.

But I had found a less triumphant capital as well. It was made of ramshackle squatter colonies where 40 percent of Delhi's citizens struggled for a handhold on a juggernaut of prosperity. Most were migrants from rural India. From them I heard tales of a land where 300 million people live in poverty, many of them illiterate, landless, jobless, and afflicted by disease from bacteria-laden water. Here was the vanguard of an old and almost invisible society, coming to camp on the doorsteps of the new. And between them flashed powerful energies of idealism, ambition, and discontent.

Those energies had been galvanized in 1947 by India's charismatic first prime minister, Jawaharlal Nehru, father of Indira Gandhi, who proclaimed a new India where education, health care, food production, and industrialization would flourish in a caring and dedicated socialist state. Delhi had become the center of enormous economic and political power, and now it echoed with fierce debate on how that power was being used. Almost daily I read press and government reports that gave wildly conflicting accounts.

The national economy was growing at an average rate of 4.5 percent a year. But chaotic mismanagement of state-run coal and electricity corporations had crippled many



Mogul capital, *Delhi became British India's capital in 1912, succeeding Calcutta. Three miles south of the old city, the subcontinent's rulers began to build New Delhi, laying out boulevards and parks for some 65,000 residents. Since independence in 1947, Greater Delhi has rocketed to seven million and may double by the year 2000. Hub of northern India, Delhi is the nation's third largest city, after Calcutta and Bombay.*

industries, cutting potential growth in half. Farmers had produced a record 151 million metric tons of food grains in 1984, but almost half the population lived below a poverty line measured at 2,400 calories a day. The nation's 111 medical schools were graduating 12,500 professionals a year, but rural expenditures on medical care averaged less than five cents per citizen per day.

DESPITE SUCH CONCERNS, Delhi had its charms. One of them was Delhi Railway Station, where belching steam locomotives and grimy carriages deposit hordes of travelers from the arid plains of the south.* With their baskets and bundles, they spilled into the old walled city called Shahjahanabad, for the Mogul emperor who caused it to be built in 1638.

It is a vivid, chaotic, exhausting, and exhilarating place. Beneath the towering walls of the Red Fort, my ears rang with British tunes of empire as half a dozen motley brass bands drummed up trade for the wedding parades that were their livelihood. Opposite the fort I plunged into the broad thoroughfare called Chandni Chauk. Once the Mogul lords had made grand procession here along treelined waterways. Today it is choked with the traffic of the cloth and garment industry, a major source of India's foreign earnings. Here, in a warren of tiny shops, I watched prospective brides murmur over lustrous saris of silk and gold.

I didn't visit the street of brothels, where, according to police reports, teenage country girls were still sometimes sold into bondage for $200—half the price of a bullock. Instead I sampled my way down the Street of Stuffed Chapati, wandered impecuniously in the Street of Silver and Gold, and dizzied my imagination in perfume shops redolent of patchouli, sandalwood, and oily musk.

I found traffic of the spirit as well. Muslim pilgrims surged up the steps of Jama Masjid, India's greatest mosque, to utter prayers worth a thousand said elsewhere (pages 524-5). Nearby was a bird hospital operated by the Jains, members of a 2,500-year-old religion that teaches reverence for all life.

Today some 450,000 people jam Old Delhi's twisting streets and narrow "gullies," where grimy doors shield airy, balconied courtyards designed centuries ago for summer comfort. Despite catastrophic neglect and overcrowding, it is still a textbook example of urban design, according to Sayed S. Shafi, a Delhi town planner in the late 1950s and later chief planner for India.

"The ideal Indian community combines housing, shops, schools, and workplaces in a space that can be traveled on foot or bicycle," he said. "We tried to incorporate that idea in Delhi's first Master Plan.

"It was a magnificent opportunity. We planned 15 district centers around Delhi's core, each with full facilities for between 300,000 and 500,000 people. And we recommended similar development of existing towns within a 100-mile radius of Delhi to prevent a population influx here.

"Unfortunately, we were only planners. Most of the district centers were never built. Prime residential land went to the high bidder. Public housing went where it was cheapest—and least convenient to jobs.

"Perhaps the final blow was Asiad, the Asian Games of 1982. We built four giant stadiums, five luxury hotels, an Olympic swimming pool. We spent millions of dollars on highway overpasses—in a city with only 60,000 cars. We wanted a pontoon bridge and special pathways for our 600,000 bicyclists. Instead we got an indoor track for bicycle racers, fully air-conditioned!

"Will this make Delhi more livable? I think not!"

Mr. Shafi is now retired. The city's future livability is the responsibility of planning commissioner Edgar Ribeiro of the Delhi Development Authority. For him the job means looking far beyond the city limits: "India will have one billion people in the year 2001. One-third will be urban dwellers. There's a constant move from villages and smaller towns to big cities. Unless we start now to make smaller towns more attractive, Delhi will be swamped with 15 million people. We simply cannot supply water, sanitation, electricity, and transport for that many. So we are planning for 12 million—almost double today's population."

Although the government has built or helped finance more than 300,000 housing units in Delhi, it is still 285,000 units short of needs. Meanwhile, squatters have built 612

*See "By Rail Across the Indian Subcontinent," by Paul Theroux, in the June 1984 GEOGRAPHIC.

ROLAND MICHAUD (RIGHT)

Lively as a village bazaar, *a street corner on Chandni Chauk* ***(right)*** *offers diverse wares in buildings that could collapse in the next monsoon. The small entrepreneurs who sell stationery and books, cigarettes and candy, tinsel garlands, fried breads, antique reproductions, and silver often live in the neighborhood. Clerks and pedicab drivers are likely to go home to slums that shelter 40 percent of Delhi-ites.*

In a neighborhood specializing in auto parts and repair near Jama Masjid mosque, a mechanic ***(above)*** *builds a car from spare parts. Such recycling helps the industrious win the game of urban survival in a developing country.*


KHUSH DIL HOTEL

illegal colonies on more than 2,000 hectares (5,000 acres) of government land, and authorities have bowed to a democratic reality.

"We realized we couldn't beat the squatters. Instead, we've joined them by providing minimum sanitation and services and registering the colonies as a legal part of our housing stock," Mr. Ribeiro said.

"The truth is that we have been forced to confront a two-circuit society. The upper one enjoys adequate wages and access to credit. That we can plan for. But the lower circuit includes 40 percent of Delhi's people, who cannot afford any housing the government can build. They simply try to survive."

FOR MOST Delhi-ites, survival means entering a shadowy world called the "black economy," a polite term for the corruption that afflicts Indian society high and low. Migrant workers routinely kick back two or three rupees a day to labor contractors. An estimated one million counterfeit ration cards enable middle-class citizens to patronize government "fair-price shops" designed to help the poor. In private shops more than 12 percent of food samples have been found to be adulterated. Almost every public service carries a private price in the form of tips to minor bureaucrats, utility servicemen, and police who somehow overlook the 35,000 unlicensed pedicabs that roam the city. Even mourners at the public cremation ground have been overcharged for municipal firewood.

For the upper circuit this underground economy is big business indeed—a complex system of bribery, tax evasion, secret bank accounts, and foreign-exchange manipulations that some economists say may equal as much as 50 percent of India's official gross national product. Much of the secret cash winds up in political slush funds that have been used to purchase wholesale defections of state legislators from parties opposed to the dominant Congress (I)—"I" for Indira.

One of the keenest students of the subject is Dr. Arun Shourie, a former World Bank economist turned investigative reporter. In 1982, as executive editor of the *Indian Express*, he forced the resignation of the chief minister of Maharashtra state, A. R. Antulay, by documenting his acceptance of five million dollars in "charitable contributions" from Bombay building contractors in return for government allocations of cement. Much of the cash wound up in a trust fund named for Prime Minister Indira Gandhi, who denounced the exposé as a political smear.

"There's an old saying that a dog with a bone in its mouth can't bark," said Dr. Shourie, whose talent for exposés ultimately cost him his job. "If you remove the bone, you must risk the bite."

Delhi's journalists still wear the scars of the rigid press censorship imposed in 1975, when Prime Minister Gandhi declared a national emergency, suspended India's civil liberties, and jailed thousands of opposition leaders and "anti-social elements."

Since then, the press has developed formidable teeth. Last August it took a journalistic death grip when the Gandhi-selected state governor of Andhra Pradesh deposed the elected opposition government of Chief Minister N. T. Rama Rao, blandly declaring his opinion that Mr. Rama Rao had lost his legislative majority through massive defections to Congress (I). English-language papers like the *Times of India*, the *Hindustan Times*, the *Indian Express*, and the *Statesman* rapidly uncovered a political snakepit, reporting that bribes as high as a million rupees ($80,000) had been offered to defectors.

Relentless press scrutiny made N. T. Rama Rao a national opposition hero. After six weeks he triumphantly resumed his post.

Some of the toughest reportage of the scandal appeared in a fortnightly news magazine called *India Today*, whose offices lie tucked obscurely above the once elegant shops of Connaught Place. I found a motto on the reception room wall that read "News Is What Someone Somewhere Wants Suppressing; Everything Else Is Advertising."

In charge I found Cambridge-educated managing editor Suman Dubey, whose fierce beard and furrowed brow masked a thoughtful and optimistic nature.

"We don't discuss issues. We don't take sides," he said. "We cover news. We're aiming quite consciously at the elite who control this country. They can no longer plead ignorance of what's going on.

"It can be very depressing," he said. "Politics seems all consuming, and it seems now to operate on no particular principles. The

socialism and idealism of Nehru have been lost in bureaucracy, which has become an end and a power in itself.

"The important thing to remember is that India has a free press, a rarity in southern Asia. With accurate information, the society is changing almost despite the politics."

For Delhi-ites the press stimulates maximum imagination on Sundays, when visions of youth and beauty spill through thousands of classified advertisements seeking brides and grooms for arranged marriages.

One in particular caught my eye:

WANTED: highly educated beautiful bride for handsome, smart, modern only son, 25 years, B.Com., income Rs. 2000. Dowry, caste no bar.

The last line intrigued me. I took my question to Mrs. Gouri Choudhury, a founder of a women's resource center called Saheli.

"Dowry seeking is banned by law," she told me. "Technically he could be jailed for six months if he asked for one. But with his degree and salary he'll probably get 50,000 rupees. And his 'no caste barrier' may sound liberated, but it could just mean he'll take a lower-caste bride if the price is right."

Today marriage for profit flourishes at every level of Delhi's striving society, Mrs. Choudhury said. "More and more, bride-grooms are demanding huge dowries, and not just in cash. They want TV sets and motor scooters, or gas connections to their homes—an easy way to get all the things

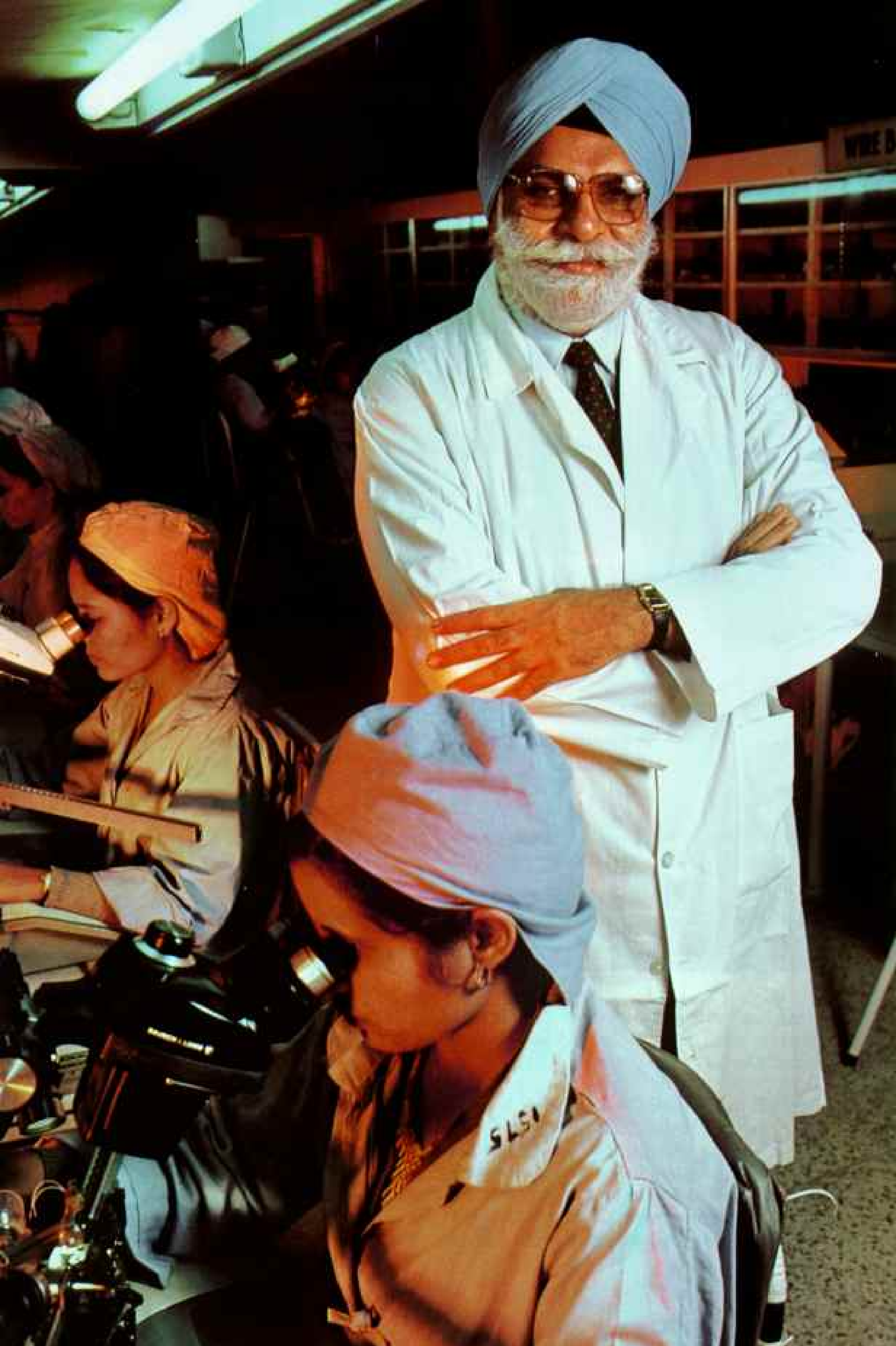
Taking a cue *from American merchandising, Nirula's 21 Ice Creams draws crowds to the owners' complex of food shops in Connaught Circus. The Nirula brothers often return to the U. S., where they were educated, for ideas to cater to Delhi-ites, who at $330 a year earn India's highest per capita income.*

ALL BY DILIP MEHTA, CONTACT PRESS IMAGES

Electronics pioneer *Gurpreet Singh* ***(right)*** *owns the first company to make microchips and semiconductors locally. With 850 employees, Continental Device India Ltd. does a $16,000,000 business that includes export to the U. S.*

In the automobile field, Maruti Udyog Ltd.—a state-owned company started by Sanjay Gandhi—is assembling small fuel-efficient cars ***(left)*** *under license from Suzuki of Japan. Eventually manufacture will be all Indian.*

In 1982, color television was introduced for the Asian Games in Delhi. Now Weston Electroniks Ltd. assembles sets from Hitachi components ***(below)*** *at an industrial estate of small and mid-size companies on Delhi's outskirts.*



they can't earn for themselves. The bride's parents often must go heavily into debt to purchase a favorable match."

FOR MANY BRIDES the price is murderously high. "Each year, in Delhi alone, an average of 400 brides burn to death, supposedly as suicides, or accidentally while cooking on kerosene stoves," Mrs. Choudhury said. "But in case after case we learn that the groom's family has tried unsuccessfully to extort additional dowry from the bride's parents. Of course, the bereaved husband keeps his profits and is free to marry again."

Women have other fatal handicaps in India, which is one of the few nations with a preponderance of males—51.8 percent versus 48.2 percent, according to the 1981 census. Sociologists believe that female children get less food and medical care than their brothers; some suspect that female

infanticide is still practiced in rural areas.

"It is simply economics—the myth that sons bring wealth, daughters take it away," according to Mrs. Nalini Singh, who reports on women's concerns for several Delhi papers. "So we are raised to be good *bahus*—literally, daughters-in-law—trivial creatures who must be easily amused, sensual, obsessed with early marriage and motherhood.

"Inflation has been our great friend. It has forced women into the workplace and

Faced with a housing crisis, *the city has acquired empty land in south Delhi and, along with private developers, has strewn it with blocks of flats, where cows, protected by India's constitution, share the streets. The thousands of units built so far scarcely meet the overwhelming need; some 600 villagers arrive in Delhi each day. Although planners dream of a subway system, an adequate water supply, and a ring of outlying new towns, success in relieving congestion grows ever distant.*

"**Music is a vehicle** *for reaching God," says Amjad Ali Khan, a renowned sarod player, here practicing the 19-string instrument with his sons beneath a portrait of his late father, Ustad Hafiz Ali Khan, also a noted classical musician.*

*In a style derived from Hindu temple performances (**right**), Leela Samson guides a black-gowned pupil through the bharata natya, a classical dance form of southern India.*

won us recognition of our economic worth."

Mrs. Savitri Singh knows little of such problems. I met her on the outskirts of New Delhi, where she labors along with scores of thousands of migrants in the stone quarries, sandpits, and brick kilns that provide the raw material of the city's growth (page 529).

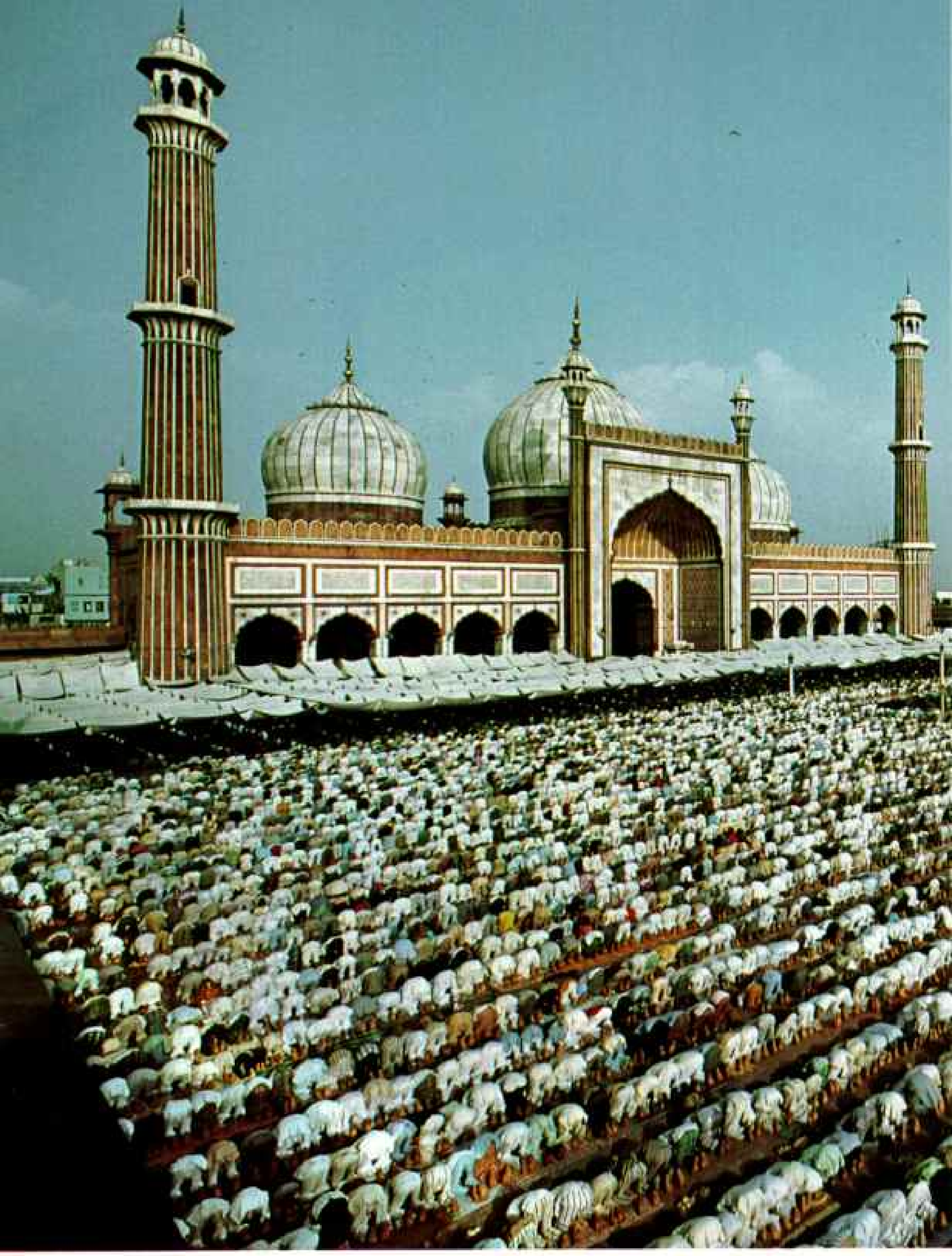
I watched as her husband, Hari, pried huge boulders from the quarry face. Far below, Savitri swung a sledgehammer to break the boulders into smaller chunks. Her three children placed them neatly in a pile. Every three days a truck collects the rocks, and the Singhs collect 60 rupees ($4.75)—minus a three-rupee tip to the driver and a 20-rupee

RAGHUBIR SINGH

payment to the contractor who loaned them 2,000 rupees at 60 percent interest for transport from their poverty-stricken village in Rajasthan. What's left barely equals the legal minimum wage for a single laborer—enough to buy flour, onions, and a little salt from a government ration shop. After work Savitri has another chore. She trudges six kilometers to fetch water. She knows there's a village well much closer, but she isn't welcome there. Neither are her children welcome in the government-run village school.

The Singhs are untouchables.

I saw nothing in their eyes or color of skin to distinguish these Harijans—"children of God" as Mahatma Gandhi named them—from other citizens. Nevertheless, the differences are profound. There are an estimated 100 million of them. Together with some 50 million tribespeople, they are defined as "weaker sections" of society. All are officially protected by laws that guarantee them 22.5 percent of all government jobs, including those in national banks and public-sector industries. Other laws guarantee them 119 of India's 544 parliamentary constituencies and some 30 percent of university placements. And they are entitled to minimum wages ranging between 75 cents and a dollar a day.



Prostrate in reverence at Id ul-Zuha, the Festival of Sacrifice, 20,000 Muslims pray in unison at Jama Masjid, India's largest mosque, built by Shah Jahan in 1650. While Hindus make up 83 percent of Indian society, the nation's Muslims

(11 percent) and Sikhs (2 percent) represent important minorities whose religious freedom is guaranteed by India's constitution. Of Delhi's Muslims, many run shops and restaurants; its Sikhs are prominent in government and the army.

Reality is somewhat different. A recent Home Ministry study revealed that 80 percent of Harijan men and 95 percent of women are illiterate. They predominate among the 2.6 million workers trapped in an agricultural system of bonded labor, and millions more are similarly bonded to brick-kiln owners, quarry masters, and contractors in Delhi and other urban centers, cheated of legal wages that would enable them to pay off loans made to them for food or travel.

Racing the clock, *legal gamblers thrust cash at a harried bookie at the Delhi racecourse. Similarly but illegally, a steady stream of rupees also passes under the counter in all segments of the economy. College entrance, repair service, jobs, and even getting one's mail—all may carry an illicit price tag in a society that increasingly confers status by wealth rather than birth.*

Recently, in a landmark case, India's Supreme Court ordered the Madhya Pradesh state government to secure freedom for 693 bonded laborers in 55 villages, observing that they were virtual slaves for whom the constitutional promise of equality and egalitarianism had remained "an empty dream."

FOR MANY, pursuing the dream creates a nightmare. In 1980, when an untouchable community in Bihar pressed for minimum wages and access to farmland, a gang of landlords burned their homes and killed 146 men, women, and children. A government report revealed that in 1979 some 15,000 similar attacks occurred throughout India, including an estimated 400 lynchings.

Today groups of young Indians are working to end this ancient system of discrimination in every state, according to Inder Mohan, president of the Delhi branch of the People's Union for Civil Liberties.

"They don't believe in violent protest," he told me. "They simply go out to the villages to teach people their constitutional rights. Like Mahatma Gandhi, they believe that India must be reborn from the bottom up."

One of them is a quiet young man named Mahant Ram Tiwari. I met him one night near the quarry where Hari and Savitri Singh live. He crouched by lamplight in a tiny mud schoolhouse, and around him were gathered 68 untouchable children whom he was teaching to read and write. They followed his words with a fierce and joyful intensity that took my breath away. As I entered, they chanted what I took to be a greeting: *"Jai Hind! Jai Hind!"*

"It means 'All Hail to India,'" Mahant explained afterward. "It was the cry of the Freedom Movement that fought the British before World War II. It is a suitable cry for children who must fight their way into their own society."

Mahant is a Brahman, descendant of a 3,000-year-old line of priests and scholars who formed Hinduism's highest caste. Not so long ago he would have been required to wash six times to erase the stain of an untouchable's shadow. "That would be a bit awkward nowadays," he told me. "I wouldn't have time to do anything else. And besides, I am not an upper-crust Brahman.

My family owns five acres in eastern Uttar Pradesh, but the land would only feed us, nothing more, and there were no jobs."

Mahant came to Delhi in 1976, slept on the streets, and sold newspapers. Now he works with the Gandhi Peace Foundation. After work he travels 90 minutes by bus to the quarry schoolhouse.

"I had never understood poverty until I became poor myself," he said. "I began to study the teachings of Mahatma Gandhi. He urged Brahmans to embrace Harijans and all of India's poor. What else could I do?"

MAHANT'S profound commitment is echoed by members of Delhi's upper crust, who believe that reform must also come from the top down.

"In the Third World an elite is growing that has a stake only in its own prosperity," says Romesh Thapar, editor of scholarly *Seminar* magazine. "In India that elite numbers about ten million, with perhaps another 200 million who benefit. But our society effectively bars the remaining 500 million from real progress."

The barriers cut across some of India's proudest accomplishments. Though universities and colleges are turning out the world's third largest pool of technically trained manpower, the Fourth All-India Educational Survey of 1982 reported that some 75 percent of all students—including most girls—drop out of school by age 14. Fifteen to 18 percent of the nation's children never attend school. An estimated 410 million Indians cannot read or write.

Youngsters who survive secondary school enter a world of sudden-death examinations in which failing a single subject means failure in all. This has produced a national epidemic of cheating and corruption.

"For most students, failing a final exam is a failure for life. So they'll succeed by hook or by crook—mostly by crook," according to Dr. Shib K. Mitra, whom I met as he was about to retire as head of the National Council of Educational Research and Training.

"We still follow educational standards designed to produce clerks for the British Empire. They bear little relation to rural needs. Our students have very little awareness that their education is meant for national development—which in India can be achieved only through rural development.

"To me, that still seems a distant goal."

Awareness of rural stagnation is also changing ideas about the direction of India's green revolution. Massive irrigation schemes and new seed varieties have raised wheat and rice production to all-time records, creating vast wealth in northern states. But experts point out that little has been done to increase yields of lentils, beans, and other legumes, which have always been critical sources of protein for India's primarily vegetarian population. Neglect of oilseeds such as sesame averages 600 million dollars a year for imported edible oils.

For B. B. Vohra, until April 1983 chairman of India's National Committee on Environmental Planning, the neglect runs far deeper: "There has been so much emphasis on irrigation, but now we find that it presents serious problems," he told me. "Already, seven million hectares [17.3 million acres] of newly irrigated land are out of production due to poor drainage, and another ten million hectares are threatened in the next decade. This is a conservative estimate.

"Also, as many as 88 million hectares are lying almost useless, without trees or grasses. Trees have been cut, pastures overgrazed. This has caused erosion and flooding and prevents replenishment of the underground water supplies on which so much of our irrigation depends. If we don't tackle this neglect of land resources, all other problems will become academic."

India's heritage of solving problems is often overshadowed by centuries of colonialism and conquest. Outside Delhi I visited one of the oldest monuments to that history—a spectacular 234-foot minaret called Qutb Minar, begun in A.D. 1199 by northern India's first Muslim conquerors. Nearby I found a more eloquent monument to Indian genius. It is a 24-foot pillar of iron alloy, smelted by Indian metallurgists with such skill that it has remained rustless for 1,500 years (page 533).

These superb technicians were brethren of Indian thinkers who originated the concepts of zero and infinity and devised the inaccurately named Arabic numeral system, giving the science of mathematics to a world drenched in superstitious ignorance.

T. Ranganathan is of that brotherhood.

He is general manager for the computer branch of Delhi Cloth and General Mills Co. Ltd. (DCM), the city's oldest private firm, which has become a leader in India's burgeoning computer industry.

"There are about 20 companies in India producing 3,000 to 4,000 units a year," Mr. Ranganathan said. "At DCM we manufacture Tandy machines, but we design a lot of our own hardware and software to adapt U. S. technology to Indian needs. Machines are scarce and expensive, so they're used at least ten hours a day.

"Computer science now attracts the top 10 percent of our engineering students," Mr. Ranganathan said. "The best of them can earn as much as 100,000 rupees a year in India. But overseas jobs pay more.

"There has been great fear of computers here, but that is changing. In three years we will have complete electronic banking.

"More important, we may finally get a picture of how the economy really works. Indian statistics have always been extremely hard to get—and interpret. With computers we will be able to use new ways of thinking, decision making. We'll be forced to ask questions we never asked before.

"But the big problem will be to combat the people who don't want real data or who have a vested interest in the wrong data."

RAGHUBIR SINGH (RIGHT)

People on the fringe *of society labor on the city's outskirts to keep Delhi growing. Many are Harijans, the untouchables under the Hindu caste system, who migrate on borrowed money from poverty-stricken villages to fuel Delhi's burgeoning construction industry. For about a dollar a day families work at the roughest tasks* ***(facing page)****—many directed by an overseer* ***(above)*** *who may also be their bondsman.*

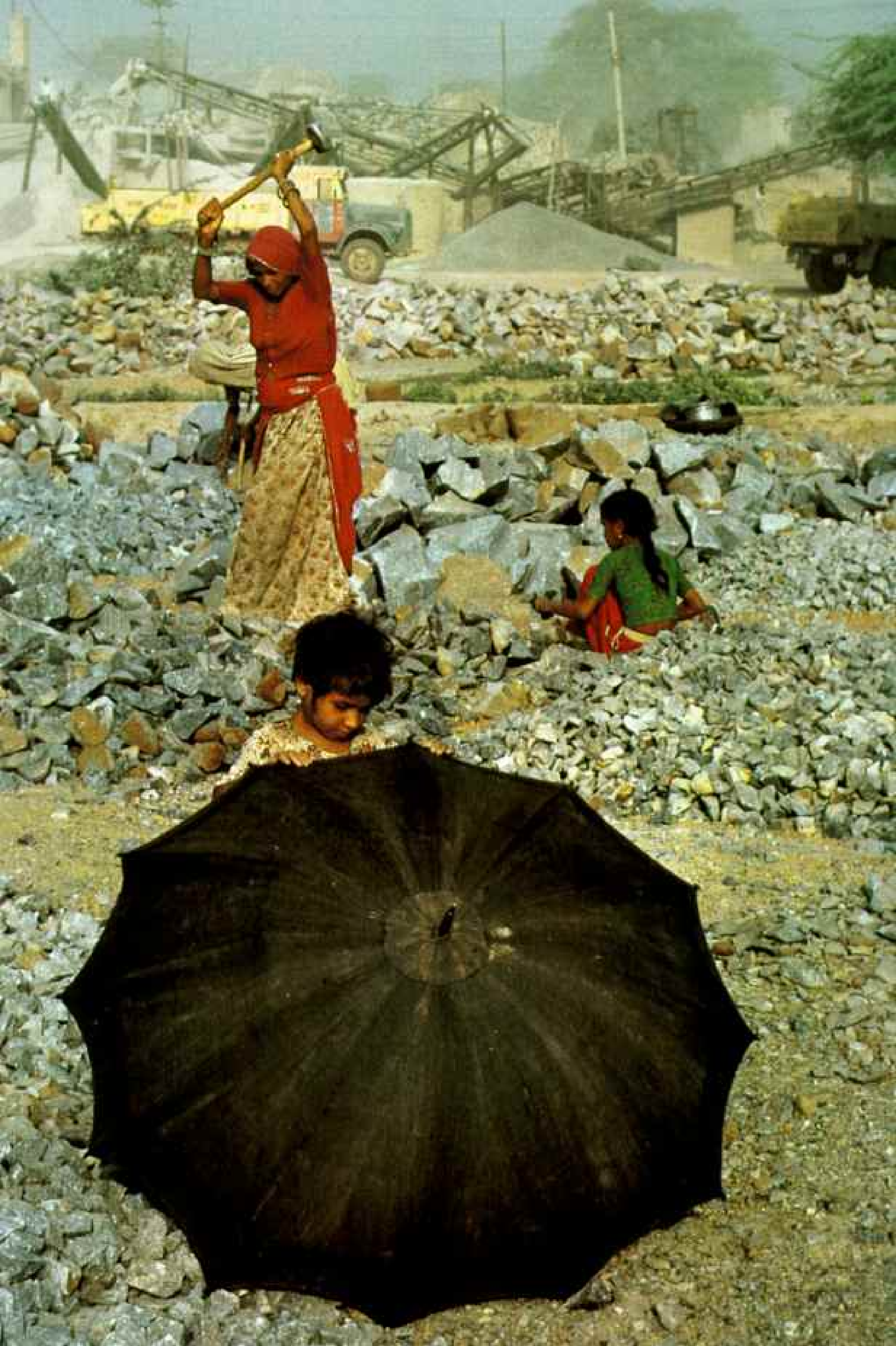
FOR BETTER OR WORSE, India now faces a revolution in electronic data transmission.

With the U. S.-assisted launching of the INSAT-1B communications satellite in 1983, the government-owned All India Radio began a crash program to build 180 low-powered television transmitters and 94 network radio stations, all of which will be broadcasting to rural areas in 1985.

But the high-flying communications system hasn't escaped earthly criticism. At Bangalore, space scientists who are designing a new satellite for launching in 1989 have questioned using the sophisticated new system to broadcast cheap movies, American TV comedies, and commercials for luxury goods. Other critics worry that state control will mean suppression of ideas.

Dadi D. Pudumjee already knows about such problems. He is a 33-year-old puppet master who has turned one of India's oldest entertainments into a gentle war on some of India's newest woes.

"In 1975 I participated in SITE, the Satellite Instructional Television Experiment, to broadcast educational programs to villages using a leased U. S. satellite," he said. "With puppets we found we could use humor to disarm the most sensitive issues, such as the caste system, crooked landlords, family quarrels, and local bureaucrats. The audiences loved it, even though the village TV



sets were sometimes disabled by politicians who didn't like what we were saying."

I met Mr. Pudumjee at Delhi's Shri Ram Centre for Art and Culture. With a boisterous group of college students, he had just run through the "Adventures of a Shoe," the story of a young villager's confrontation with city life. Using only shoes for characters, the hidden puppeteers created a world of crooked cops, greedy merchants, sleek politicians, and querulous Muslims and Hindus that brought howls of laughter from a full-house audience of adults and children.

"They are really laughing at themselves," he said. "But they're very shrewd. They know when they're being manipulated. That is something the new communicators will have to face."

Before leaving Delhi, I was fortunate enough to hear a kind of communication

that was very old. It came during a private concert by Amjad Ali Khan, 38, who has become internationally famous for mastery of a 19-string instrument called the *sarod*.

The first notes were electrifying, slow and sensuous, riding on the muttered rhythms of the *tabla*, a pair of small drums. Gradually the music became more passionate and intricate, with bursts of notes ringing like shards of crystal, and then it seemed the sarod and tabla were joined in a jubilant dance of syncopated challenge and response.

Suddenly I realized that every passage was a brilliant improvisation on the opening theme—improvisations that seemed related to the infinite variations of American jazz.

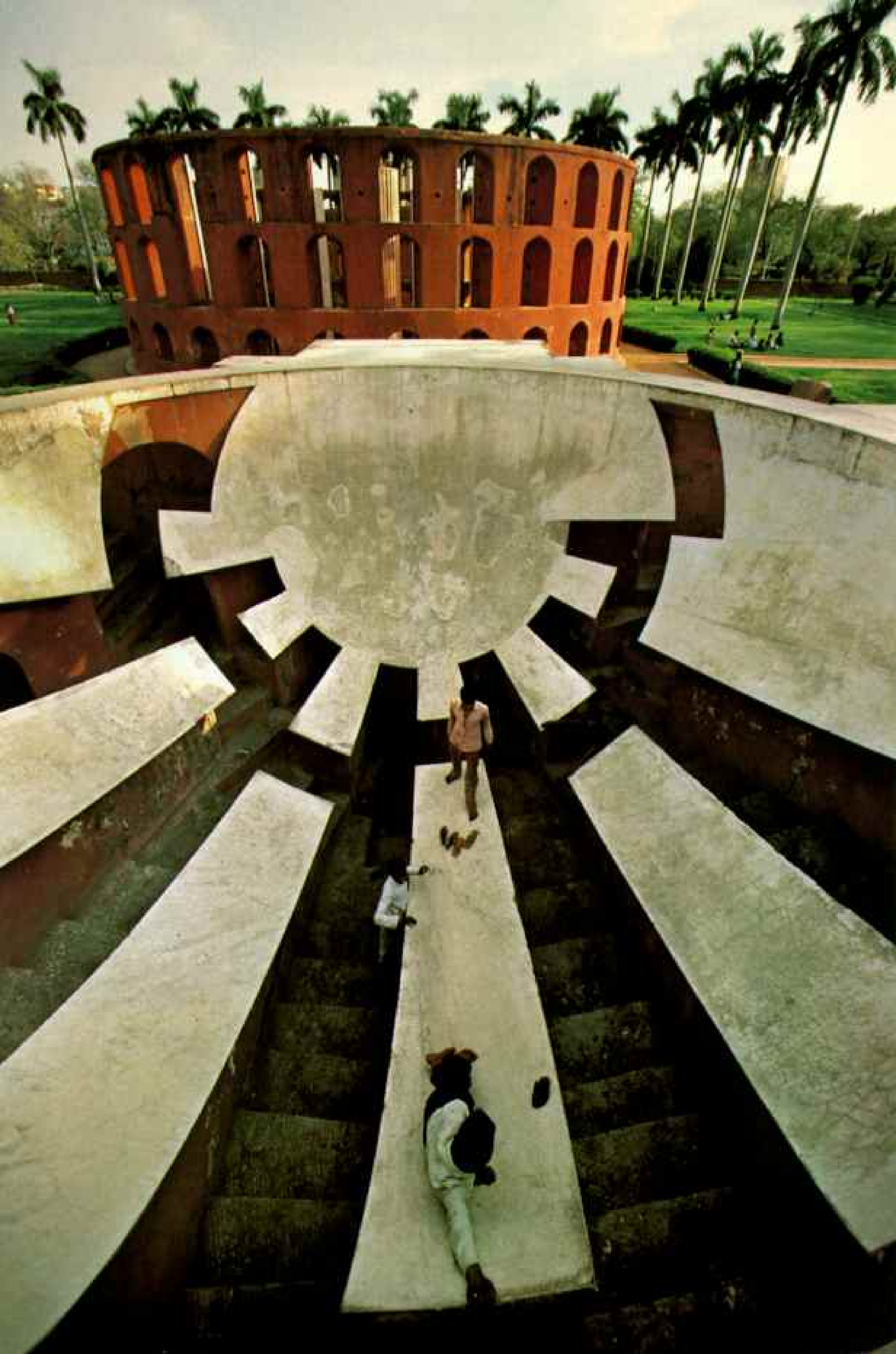
It was not an irrelevant thought.

"When Charlie Byrd, your great jazz guitarist, gave a concert here, we met afterward and played together," Amjad told

RAJVEER SINGH (ABOVE)

Women's right to life *is the issue for Rita Karat* ***(above)****, who decries the dowry, an outlawed but entrenched tradition that can trigger murder. Some greedy grooms kill their mates to marry again—and gain another dowry. In Delhi young wives die at the rate of one a day of suspicious kitchen fires or suicide.*

Change is also sought by volunteers ***(left)*** *who teach children of Harijan quarry workers to read and write.*



*Testimony to Indian ingenuity, the massive Jantar Mantar observatory (**left**), built in the 1720s by Raja Jai Singh, helped astronomers map celestial movements. Within this great bowl, white strips between stairs are fixed sight lines under a changing sky.*

*Dedicated to the Hindu god Vishnu, the Iron Pillar (**right**) has proved rust free for 1,500 years. In the 12th century it was surrounded by the Muslim monument Qutb Minar, whose surfaces are inscribed with Koranic sayings, indicative of the amalgam of Delhi.*

me later. "We made a tape. I treasure it."

He explained that classical Indian music is rooted in folk tunes and religious songs that still are sung in villages. I understood then why taxi drivers and ragged laborers had gathered outside to listen raptly to a concert staged for Delhi's elite. In the music was a bond. Perhaps it explained why so many people I had met in this town of migrants felt so deeply about the quality of life in places they had left. In many ways New Delhi reminded me of my hometown of Washington, D. C. It resounded with debate on the unfinished business of a nation—and that was a variation on a very familiar theme.

In the weeks following my final visit, I read exciting news from India. In his election campaign Rajiv Gandhi pledged an end to corruption, a renewed emphasis on industrial efficiency, education, and public health, and a sweeping effort to better the condition of women and the poor. He had won a mandate greater than his grandfather, Jawaharlal Nehru. Within days he had ordered the arrest of more than 1,900 suspects in the anti-Sikh carnage. Almost daily came reports of wholesale changes in state bureaucracies. There were signs of a new approach to relations with the United States.

More than ever, I was grateful to the dedicated men and women I had met. They had given me an agenda for India's renewal, not merely a hopeless catalog of old woes.

One message stuck in my mind. I'd heard it first in a mud schoolhouse, and now I wondered if I might be allowed to say it myself:

"Jai Hind!" □

A NORTH WOODS PARK PRIMEVAL

Isle Royale

By JOHN L. ELIOT NATIONAL GEOGRAPHIC SENIOR STAFF Photographs by MITCH KEZAR

Holdfast for life, a 210-square-mile archipelago greens Lake Superior's cold blue void. No roads lead to the wealth of flora and fauna here, but most visitors who go the extra mile find one of the premier wilderness experiences of the National Park System. 535

A prime bull strips a birch branch downed by a beaver. Moose arrived on Isle Royale around 1900, probably swimming in from Canada. By 1930 their unchecked numbers approached 3,000, ravaging vegetation. In 1949, across an ice bridge from Ontario, came a predator—the wolf. Since 1958 the longest study of its kind still seeks to define a complete cycle in the ebb and flow of predator and prey populations, with wolves fluctuating from 14 to 50 and moose from 500 to 1,400.

Echoing with the laughter of the loon—part of its diverse birdlife—the island also harbors beavers, red foxes, snowshoe hares, and—master pack thieves—red squirrels.

Unstirred by footfall, leaves of paper birch and aspen herald autumnal changes in a changing forest. Destined to succeed these pioneer trees, spruce and fir seedlings are shooting up. Linchpins of the boreal forest, the evergreens rise unequally — while moose eschew spruce, they nibble fir to the nub.

Warmer slopes harbor hardwood forests of sugar maple and yellow birch, usually in the thickest of the dirt-poor deposits left by melting glaciers. The thin soil attracts opportunists such as wild mushrooms called fading scarlet waxy cups, below, which seem to radiate an inner fire.

BOTH BY BOB FIRTH; MUSHROOMS: *HYGROPHORUS*

THE BEACH was red, the water a deep, intense blue. Grains of sandstone pulverized by Lake Superior lay in a thick, coarse blanket. And upon it was written a tale of predator and prey, a signature of the wilderness.

From the woods, shallow bowls made by a moose's hooves ran down into the wavelets. Intersecting them, a patter of wolf tracks jotted across the beach. Thirty feet from the first moose trail, a second line seemed to emerge from the water.

Had there been a testing? Or had they simply passed at different times? Only the ubiquitous herring gulls, spiraling high above the lake, could have judged.

A gull's-eye view of this unusual wilderness reveals a long, narrow island stretched from southwest to northeast, corrugated by parallel ridges and valleys, encompassing more than 200 square miles, adorned with scores of lakes, and surrounded by some 200 tiny-to-large islets. Fjordlike embayments enhance this archipelago's air of Grieg and *Peer Gynt*, more appropriate than its Gallic christening by 17th-century missionaries in honor of King Louis XIV—Isle Royale.

Today this U. S. national park also proudly bears the designation by the United Nations of Biosphere Reserve. Ringing the shorelines, nurtured by the lake's cold breath, thrives a classic north woods, the white spruce, balsam fir, paper birch, and aspen of a boreal forest. Inland, on warmer ridges, grows a hardwood forest of sugar maple and yellow birch.

For its strong representation of those biota, the island was chosen by the UN to provide baseline data against which similar ecosystems can be measured, and to perpetuate a gene pool to assure continuation of species that could become extinct in unprotected environments. It also is the locale of a world-famous study of wolf-moose ecology.

As a park, Isle Royale demands a hardy species of visitor. More than 40 miles of water isolates it from the state of Michigan, to which it belongs. The nearest shore, in Ontario, Canada, is 15 miles away.

The park is open only from mid-April to late October. Most people take commercial boats across during the best weather window, from late June to September. And since Superior waters seldom exceed 50°F and most inland lakes harbor leeches, carefree swimmers do not abound—although a small but enthusiastic corps of scuba divers explores a graveyard of shipwrecks.

Not surprisingly, only 11,900 people visited Isle Royale in 1984, fewer than any other national park outside Alaska. More telling was their length of visit. Nationwide, most park visitors are day-trippers. In 1983 the average time spent per person for all 48 national parks was four and a half hours.

At Isle Royale it was *four days*.

MOST VISITORS debark at a small pocket of development called Rock Harbor. Shouldering their backpacks and heading for one of the park's 31 campgrounds, the young and hardy bypass a commercial lodge offering 60 rooms.

On a June day near Lake Richie one of these determined pilgrims materialized before me on the trail. She seemed a child of the woods, almost elfin, dressed in browns and greens, ambling along in absolutely no hurry. Her name was Terry Young. She had stars in her eyes and wolves in her heart.

"Did you camp at Moskey Basin last night? Oh, you missed a group howl!" she said, enthusiastically sympathetic. "They started at dusk, first one, then one by one others joined in, and finally we could hear pups barking with them."

We idled along, now chatting, now apart in individual discovery of beaver-gnawed aspens doomed with the next high wind, or a black-and-white warbler creeping amid the canopy. That this was also a portage to connect lakes for canoeists and anglers was confirmed by the head of a northern pike left grinning on the trail.

Naked to attack *by wolves, a cow moose and her calf stand trapped on glare ice too smooth for their hooves to grip. A late winter thaw of snow atop a frozen basin caused their dilemma. But it was soon solved by new snowfall. Such are the boons of winter, when leaf-thinned woods and a trackable surface help airborne researchers follow, currently, some 23 wolves and about 800 moose.* ROLF PETERSON

Chickenbone Lake developed as our common destination for the night. After supper I took a shortcut toward her camp through a patch of hazelnut—and nearly barreled smack into a cow moose with twin calves.

Terry, an epidemiologist from Madison, Wisconsin, seemed far too young to be the mother of two strapping sons, Tim and Eric. The four of us sat by the darkening lake, beneath flitting nighthawks.

"I think we all were immediately hooked during our first trip in 1980," Terry said. "You never know what you'll come upon. The wolves, of course, are the underlying thing that makes it so special." The chances of even glimpsing one, she realizes, are astronomical. "But knowing that it could happen . . . ," she said, longingly. "Just the knowledge—that's enough."

A swimming beaver drew a long black V that rippled past in the dusk. "And the loons," she continued. "There's always a conflict among us whether or not to stay up all night for the loons and the stars."

Not everyone has such a conflict. I cheerfully left it to them and stole away to my tent. But around 11 p.m., flashlight swinging, Terry charged up the trail. "Come down to the water," she hollered—"the aurora!"

Yonder it shone near the northern horizon, a gauzy curtain of chartreuse. By and by it faded to a glimmer, leaving an afterglow in the dreams of its watchers.

The next morning she asked brightly, "It came back out at three—did you see?"

FORERUNNER of the wilderness ideal of today at Isle Royale, a genteel cottager-vacationer tradition especially appealing to midwestern hay-fever sufferers took root in the late 1800s. Half a dozen resorts offered gracious accommodations. At Belle Isle, a little slip of an island, there was even a nine-hole, 653-yard, par-30 golf course, advertised to "test your skill and keep you in fighting trim," doubtless by way of hazards aplenty.

In 1940 the federal government acquired title to the last private tract, making Isle Royale the first national park free of inholdings. However, the Park Service granted life leases to longtime vacationers as well as to another, less urbane group, most of whom never owned a single acre of the land

***Peril to mariners** but divers' delight, Isle Royale's notorious shoals hold ten major shipwrecks, dating from 1877. Several hundred sport divers a year explore the vessels—nearly stripped of brass portholes, gauges, and other artifacts. Unequipped in the past to deal with such vandalism, the Park Service now stresses preservation, and rangers patrol in scuba gear. Members of the Submerged Cultural Resources Unit, who have nominated all ten sites to the National Register of Historic Places, survey the Chester A. Congdon (**below left**), a freighter sunk in 1918. Just below the surface the America (**below**), lost in 1928, claimed one of the three divers killed in park wrecks since 1976.*

they occupied—the commercial fishermen.

Of perhaps 75 families that worked the water during fishing's heyday, one is still based on the northeast tip of Amygdaloid Island at Crystal Cove. Here, says the lake chart for Isle Royale, lie "ruins." Curious boaters once approached the collection of weathered houses, cabins, and sheds cloaked by spruce and fir and encountered a lean, lively woman with curly white hair. They inquired about the ruins.

"I told 'em, 'That's me,'" recalled Myrtle Johnson.

Laughter filled the kitchen, stoked by Myrtle's stories and the coffee she kept flowing for her visiting neighbors from the other end of Amygdaloid, park ranger Ken Vrana and maintenance worker Bill Coponen, as well as Scott Smith and his nephew Pat Smith. She employed Scott and Pat, from her mainland home of Two Harbors, Minnesota, to fish under her commercial license, one of only three now issued for Isle Royale.

"When we first came here, nobody ever locked their doors," Myrtle recalled. "Then one day we'd been out on the lake, and we came back, and here was a house full of people! They could certainly see that somebody lived here. Mel blew his stack."

"Mel" was Milford Johnson, Myrtle's late husband, one of Isle Royale's legendary fishermen. He caught his first fish here in 1908. After their seven children were grown, Myrtle, daughter of an immigrant Norwegian fisherman, went out with Milford for more than 25 years, rowing the skiff and helping to clean the catch of lake trout, herring, and whitefish. In 1927, on a handline, she landed a 47½-pound monster of a trout, mounted but now moldering.

"Years ago," said Myrtle, "the steamer *America* picked up our fish and took them to Duluth. Mother and Dad were on the *America* when she hit a rock and sank in 1928. They got off safely, even though Dad had a cast on his leg at the time."

Ken Vrana and I later explored that bit of history in a channel called North Gap in Washington Harbor at Isle Royale's southwestern end. Encased in high-insulation dry suits, we plunged from Ken's unlikeliest of dive boats, a venerable Great Lakes fishing tug named the *Robert Lee*, into the frigid water and encountered, just four feet down, the bow of the steamer *America*.

We descended her starboard side, swimming along algae-covered steel plates. In the exposed cargo hold rested a forlorn Ford Model T truck that never made it to Ontario's Nipigon River, destination of two passengers who had brought it aboard, full of fishing tackle and $500 in cash to boot.

In the belly of the 183-foot vessel lay her triple-expansion steam engine. Painted on its surface, the red, white, and blue of the Stars and Stripes still shone clearly. Outside again, Ken pointed to a small hole punched through the hull below the boiler room by the shoal she struck on June 7, 1928, causing her to strand and eventually sink.

This little package freighter speaks volumes about the island's maritime history. Three times a week for 26 seasons she made the run between Duluth-Superior and Fort William-Port Arthur (renamed Thunder Bay) in Ontario, with numerous whistle-stops at Isle Royale. Over the side would go mail, groceries, fuel, squawking chickens. Aboard would come a mess of lake trout.

BUT THE AMERICA and nine other major shipwrecks in Isle Royale waters offer more than nostalgia. To scholars they present an excellent cross section of Great Lakes maritime history; to an alarming number of sport divers, a treasure hunt; and to the Park Service, a challenge to preserve them from looting and destruction.

The northeastern end of Isle Royale cuts like a knife across the straight-line course for Lake Superior shipping between the Soo Canals at Sault Ste. Marie and the major port of Thunder Bay. Around the island's treacherous reefs lie vessels that took nearly 70 people down with them. They range from the *Cumberland*, a 204-foot wooden sidewheeler sunk in 1877, to the *Emperor*, a 525-foot steel ore freighter lost in 1947.

The wrecks, rediscovered in the 1960s by a trickle of landlocked midwestern divers, now attract several hundred a year—an increasing visitation that was evident during our inspection of the *America*, when Ken had pointed out some things that were conspicuous by their absence.

Only steel rims remained where brass portholes had been. The Model T looked naked; even the steering wheel was gone. Nary

a gauge remained in the engine room. And he had peered into the "forbidden room," a dark pantry or storage area. There, 48 years after the sinking, the wreck claimed its first human victim, a diver alone and low on air who entered that room, kicked up clouds of silt, panicked, and died.

Whose responsibility was all this? "This wreck has been pretty well scrounged," Ken said. "The Park Service didn't care in the 1960s. They looked at the wrecks and the divers as nuisances."

After the 1976 tragedy, then superintendent Jack Morehead took a stand, now followed up by his successor, Don Brown. Ken began getting to know the local diving community. Gradually he and others tried to instill a preservation ethic, an idea whose time has come. At Isle Royale it is now backed by federal law. Several notorious offenders apparently have changed their ways and are helping to spread the word.

The situation caught the eye of some aggressive young diving archaeologists who are rapidly extending Park Service frontiers underwater in 27 locales from Florida to Guam. The Submerged Cultural Resources Unit (dubbed the SCRU team) has now completed study and mapping of all ten Isle Royale wrecks as part of their nomination to the National Register of Historic Places.

What of the wrecks' remaining artifacts? "My belief is that divers here are generally all educated in the preservation ethic, either through our diving concessioners or through registration with us," Ken said. Now divers caught with artifacts may well face arrest.

WHILE underwater archaeologists investigate this relatively new frontier, Isle Royale biologists continue to comb its more familiar habitat as they have for some 80 years.

Only about a third of the mammals present on mainland shores have managed to breach that icy blue barrier of lake water and colonize the island. This lean ecosystem where essentials are bared has been called the world's finest living laboratory. For 27 years the spotlight of research has most rewardingly illuminated the two species at center stage—the gray wolf and the moose.*

Probably by swimming across from Canada, the moose arrived in the early 1900s. As an experiment to control their vigorous proliferation, four wolves were introduced in 1952. Reared in captivity and fearless of man, they tore up fishing gear, raided campsites, and terrified visitors. Conceding failure, rangers eliminated all but one, which escaped to live on in legend as Big Jim.

Meanwhile, nature succeeded. The following year the presence of four wild

*Funds from the National Geographic Society helped to support the study for five years after its inception.

***Fishing for science** as well as a livelihood, Stanley Sivertson holds a rare commercial license for Isle Royale, a sportfishing zone. His annual quota includes 600 lake trout, shown here. Officials working with him collected eggs and sperm from the trout—still recovering from decimation by lampreys that began in the 1950s—to re-introduce the fish off Minnesota's shore. From there Sivertson also ferries passengers to Isle Royale, where he and other old-timers have life leases for facilities built before the park was established in 1940.*

wolves on the island was confirmed; by 1956 there were at least 22. The pioneers had probably crossed an ice bridge that had formed between Ontario and Isle Royale during the bitter winter of 1949.

HERE WAS an unparalleled opportunity, seized by biologist Durward L. Allen of Purdue University in 1958.* His successor, Rolf Peterson, has stalked the island since 1970. He figures that he's covered about 3,000 miles, primarily seeking bones of wolf-killed moose. Therefore he is not easily surprised. But one June morning on the bank of a nameless creek that flows into Conglomerate Bay, he was plainly puzzled.

"I'd love to know what happened down here," he said with a sigh. Near marsh marigolds, two huge racks of antlers lay 21 feet apart. The skeletons of the bull moose to which each belonged remained intact.

"This is not related to wolves," Rolf said. "I'd have to guess that this older bull finally met his match, that he and the younger one fought it out during the fall rut, and both died of their wounds."

We plunged on, straight cross-country. "Trails bore me," he joked as he searched for more clues to take back to the old cabin with the huge boneyard out back on Moskey Basin, where he, his wife, Candy, and young sons Jeremy and Trevor spend most of the warm season.

"In summer we look for the aftermath of winter," he explained succinctly. Where canoeists glide past verdant lakeshores, Rolf and his Michigan Technological University students look for signs of death and dismemberment. The wolves now number 23, running in three packs known as West Pack II, East Pack II, and, heavily pressured between them, the Harvey Lake Pack, with some 800 moose as potential prey.

Wolves rely on beaver for much of their nourishment from April through October. For adult moose it is a time of advantage. When the gales of autumn blow, then comes the time of testing.

In late February the island had been transformed from green camouflage to a

*Durward L. Allen and L. David Mech reported on "Wolves Versus Moose on Isle Royale," in the February 1963 NATIONAL GEOGRAPHIC.

ROLF PETERSON, FACING PAGE

The end is near *for a moose bloodied by the largest of the island's three wolf packs* ***(facing page)****. A fearless fox competes for another moose carcass with Rolf Peterson* ***(below)****, study leader since 1975. He displays chilling documentation, a fox-scavenged wolf* ***(above)*** *killed by a rival pack.*

Art of a breeze, *pollen swirls from timothy grass* ***(above right)****, probably introduced from hay once imported to feed horses during the resort era around 1900. A sundew's sticky tentacles have trapped a meal* ***(above)*** *in an island bog. Isle Royale's cool, moist climate nurtures 32 orchid species, such as the calypso* ***(top)****. This diversity, best enjoyed stretched out in the sunshine, enhances a place where an adult can learn a lot about being a child again.*

naked white canvas. Near Lane Cove, Rolf led the way over two feet of crusted snow to trail's end for an old bull moose. On an adjacent ridge, he said, five wolves of East Pack II had first wounded the bull in early January. Incredibly, he had lasted six weeks.

The wolves had eaten their fill, but would return. Meanwhile the carcass was in the possession of a fox that refused to relinquish its prize to Rolf, ski-plane pilot Don Glaser, and park superintendent Don Brown.

Chewing lustily, the fox growled at Rolf, who made it a deal: "If you're going to work

the front half, I'll work the back half," and began to hack with a hatchet at the pelvis.

Leg bones were taken to determine the fat content of the marrow, a gauge of nutrition at death. "He's got an arthritic lower back," Rolf called. Arthritis is the moose's number one handicap, he said. "It can deteriorate bone until the leg is just literally hanging on by a mass of tissue. And wolves are pretty good at spotting these things."

Destined for the boiling pot, the bones flew with us 30 miles back to winter headquarters at Windigo. This is the core of Isle Royale's renowned winter study: two men in the sky, flying every flyable moment for seven weeks to track, count, and identify as many animals as they can find.

On February 18 they had zeroed in on something electrifying on the shore of Moskey Basin. From a cabin at Windigo, Rolf withdrew a plastic garbage bag. He opened it. On one end of a naked spine was a head, jaws grimacing in death, throat torn out. On the other end were the legs and tail.

And that was all that remained of the lead she-wolf of the Harvey Lake Pack.

Just finding the fox-scavenged carcass, only the sixth recovered since 1980, was triumph enough. But Rolf feels that he knew this wolf, knew her well. In 1983 the ten wolves of West Pack II began encroaching on the five-member Harvey Lake Pack. On March 1 Rolf and Glaser, airborne, watched the interlopers chase the smaller group off a moose kill. West Pack's dominant wolves, termed the alpha male and alpha female, led a mile-long chase of the Harvey Lake Pack's alpha female. They caught her, attacked—then mysteriously let her go.

With that nagging at the back of his mind, Rolf came out in January of 1984, checked the packs' status, and the following month discovered that in Harvey Lake Pack a new female had assumed the alpha role. The old she-wolf had vanished. A week later they found the carcass.

"There were five miles of running tracks left by West Pack II during this attack," Rolf said. "It was probably within half a mile of where they got her last year. It is probable that it was the same wolf."

TO SORT ALL THIS OUT after a hard day's flying, the Park Service men's dormitory at Windigo makes a reasonably comfortable bivouac. Permanent winter fixtures in the backyard, tame foxes await table scraps from Glaser or moose tidbits from Rolf. Inside, the kitchen doubles as command post. On a wall a map bristles with pins denoting suspected and confirmed moose kills. Counters are crammed with radios, chargers, flashlights, boxes of syringes, batteries, a centrifuge.

A crucial item, a sort of coat of arms for the winter study, usually hangs above the oil heater. It is a toilet seat. It is made of wood. The outhouse seat, upon which it is mercifully superimposed, is made of cold steel.

Around the table nightly "pokes"—the generic nickname for cocktails such as Tang and brandy—accompany a chewing-over of the day's events. One evening Rolf summed up the long-range fluctuations of the moose and wolf populations.

"We're finally beginning to make sense of this relationship," he told me. "By 1986 we should have a pretty fair test of what the cycle is. If the wolf numbers stay pretty much as they are, the moose should take off again and continue their recovery."

When the study began, wolves numbered 20, a level they maintained as moose soared from about 600 to 1,400 by 1971. Then came record snow depths, burying their browse, and population plummeted. Wolves proliferated, furthering a moose decline that bottomed out at about 500 in 1977.

In 1980 the wolves peaked at a record 50, in five packs. Something had to give.

"The wolves dropped from 50 to 14 by 1982. In two years at least 53 died, including pups from spring litters," said Rolf tersely. "We know that wolves were killing other wolves; a lot of little wars were going on. Many starved. I thought the crash would take years. It happened overnight."

He cautioned: "People apply what happens here to systems where moose are hunted. The big management controversy stems from realizing that you can produce more animals to hunt if you get rid of the wolves."

Serious Isle Royale controversies are rare for Don Brown. He sees an insidious threat in the detection of airborne PCBs (polychlorinated biphenyls) and toxaphene, an insecticide, in Siskiwit Lake in the early 1980s; recently dioxins also were found.

"I was surprised and amazed," he said. "This is one of the most protected areas in the United States—and suddenly, pollution. Where does it come from? It comes from the sky. And that's all we know so far."

Such vexations are best pondered in the winter study's glorious substitution for nonexistent running water, the sauna. Ah, wilderness. After a thorough cleansing, five naked men trooped over the crusted snow. Steaming under the stars, they gazed up at a world-class aurora. Its incandescent pale green fire nearly spanned the horizon.

In the hush of the spellbinding moment, Glaser whispered to Rolf, "Let's see if we can get that loner to answer."

And then the biologist and the pilot began to howl, an inhuman quavering harmony that seemed to begin in the bowels of the earth and leap to the aurora. The night was filled with spine-tingling music that no canine within earshot could have ignored.

We held our breath. There was no response. Yet, as Terry Young had said, on Isle Royale just the knowledge that they were there was enough. □

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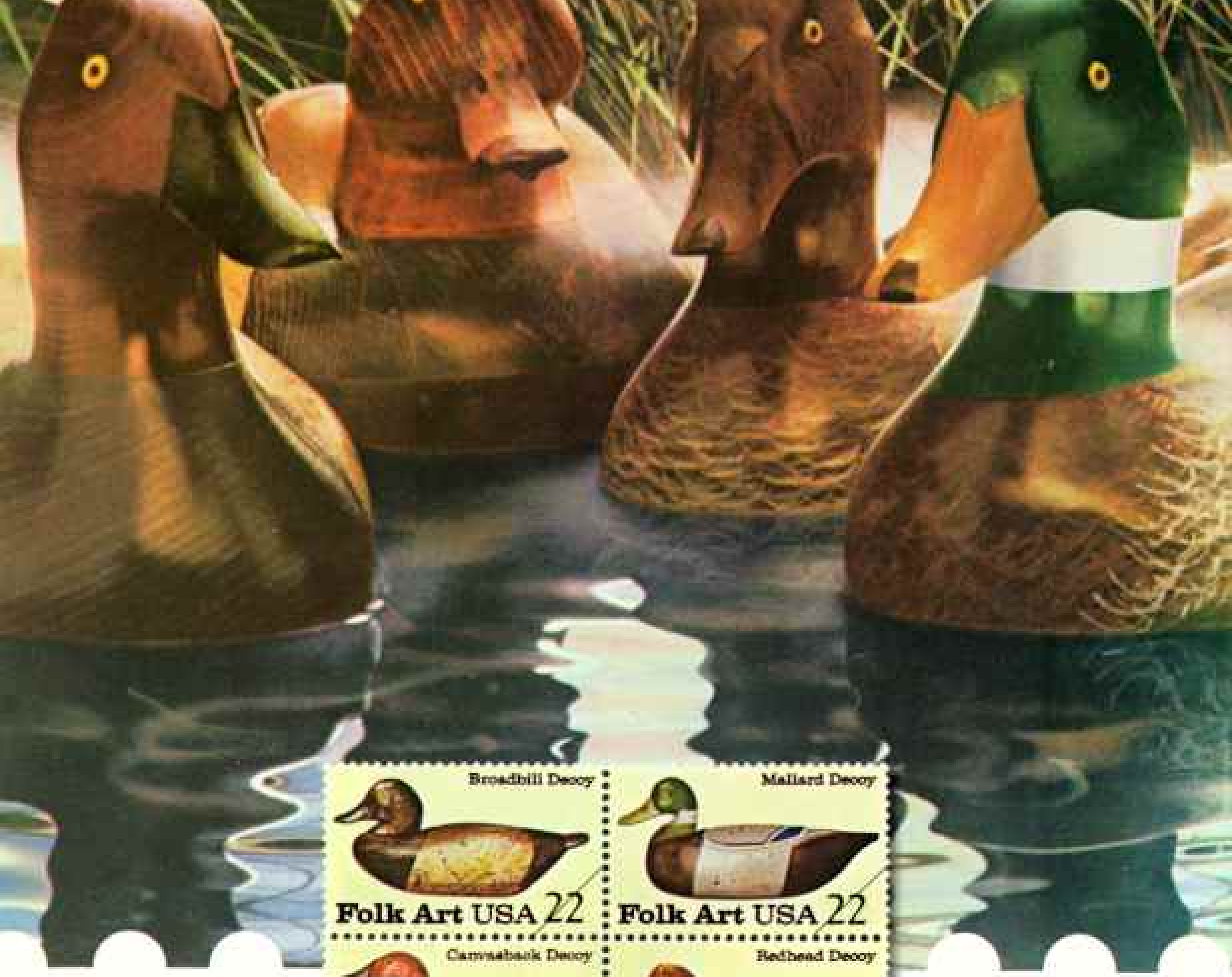

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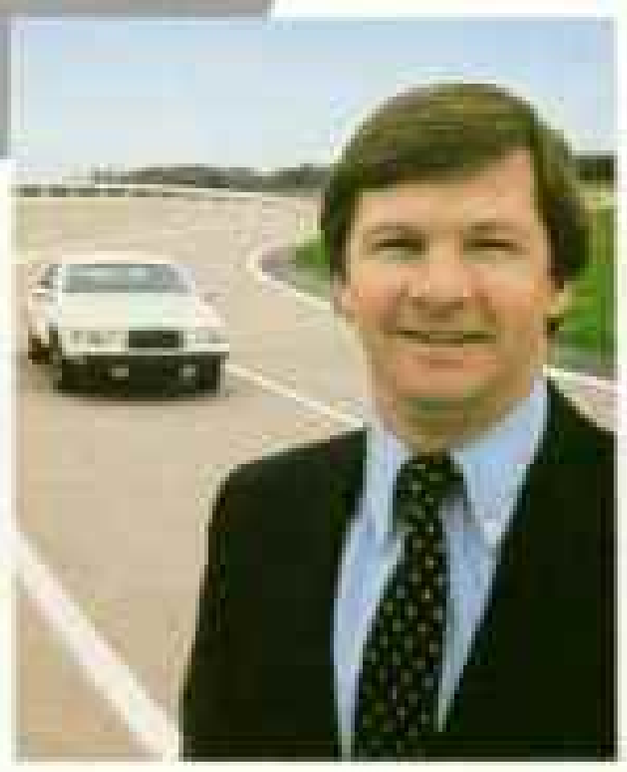

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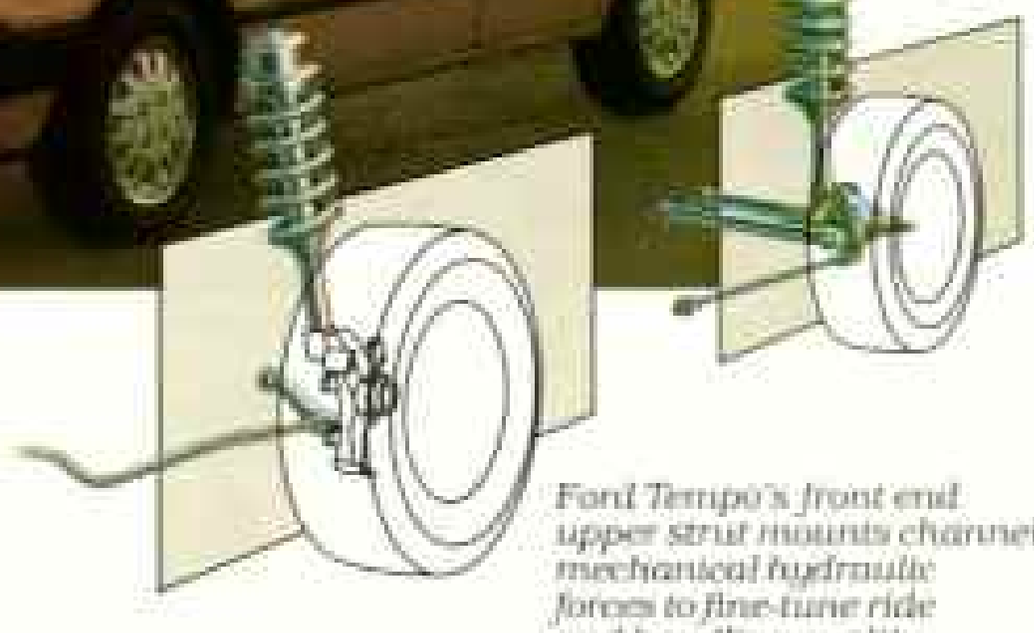

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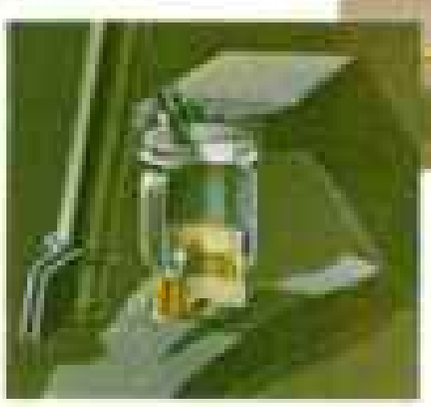

On Mark VII, nitrogen gas-pressure front struts and rear shock absorbers are matched to variable rate air springs illustrated here, to provide a unique blend of ride and road handling.

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National Geographic Explorer—a new series on cable TV

SUNDAY, APRIL 7, from 5 to 8 p.m. National Geographic EXPLORER will premiere on cable television's Nickelodeon network. That day and each Sunday thereafter, EXPLORER will broadcast for three hours the best in scientific, natural history, travel, adventure, and historical documentaries.

EXPLORER will break new ground, both for the Society and for Nickelodeon, a network that now reaches some 25,000,000 American households and is growing at the rate of 400,000 a month. The programming will be informative, entertaining, and of interest to the whole family.

While we will continue broadcasting hour-long National Geographic Specials on Public Television, EXPLORER will allow us to extend our mission in a different format with greater frequency and flexibility. EXPLORER will have the variety of an electronic magazine and present programs of varying lengths, some perhaps as brief as 10 to 15 minutes, the whole tied together by hosts who will briefly introduce the segments.

The Society will exercise overall editorial control of EXPLORER's content. Many of the segments, however, will be produced by independent filmmakers or by such distinguished sources of documentaries as the British Broadcasting Corporation and the Australian Film Commission. In fact, one of the motivating ideas behind EXPLORER is the worldwide availability of fascinating documentary programs never before seen in the United States.

In addition, more than 30 educational nonprofit institutions from museums to zoos to universities have joined with us in a consortium that will be a source of TV programs or material for them. These will be produced by those institutions, or in coproduction with the Society, or by independents for showing on EXPLORER.

Of course, our own Society-produced programs will be prominent. New material will be featured, such as a report on ancient Herculaneum, the Roman town buried in the fallout of Mount Vesuvius's famous eruption in A.D. 79, as well as classic National Geographic Specials, such as "Siberia: The Endless Horizon." A regular segment, "On Assignment," will bring you updates on many exciting scientific projects and expeditions the Society is involved in around the world. For example, in April viewers will travel to Japan and join undersea photographer David Doubilet on a dive in Izu Oceanic

EXPLORER

Park; to Texas for some "bat-watching" deep in Bracken Cave; and to England for an unusual competition between human-powered vehicles.

To say that I am excited about all this is an overwhelming understatement. Perhaps you the Society members can share my feelings by looking at our first month's program guide in this issue, and by tuning in on Sunday, April 7. The curtain is about to go up. We hope your reaction will be applause, but whatever it is, please write to let us know what you think. Your opinion is important to us.

Gilbert M. Grosvenor

PRESIDENT, NATIONAL GEOGRAPHIC SOCIETY

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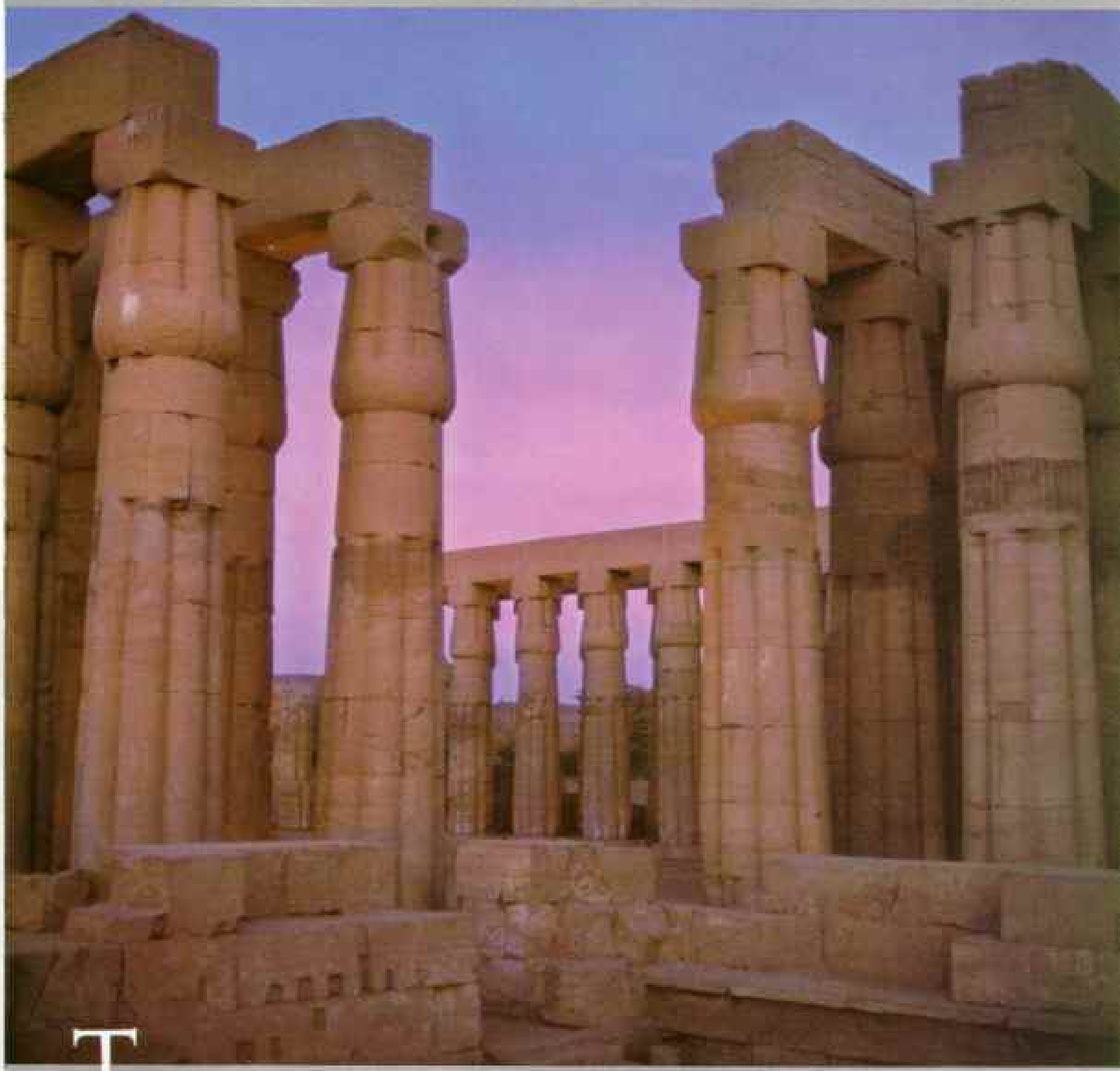

The ancient columns of the Temple of Luxor. Columns of troops slashing across Europe. One, a symbol of the Egyptians' endless quest for eternity. And a key to understanding an enduring trait in ourselves.

The other, a symbol of the grim evolution of modern warfare. And of our own terrible fascination with war. Both brought to you on public television.

Clearly, each of these programs deals with the world around us from a different perspective. The National Geographic Specials—exploring man's relationship with his natural and cultural worlds. Bill Moyers' A Walk Through the 20th Century—man's relationship with his society and his times.

THE · NATIONAL · GEOGRAPHIC · SPECIALS

AND THERE ARE COLUMNS.

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Members Forum

Koko's Kitten

As an exhibited photographer, I hereby vote for the photograph of Koko the gorilla and the tiny kitten (cover, January 1985) as, both artistically and symbolically, the "human interest" photograph of the year.

George I. Polakov
New York, New York

About Koko's kitten—please keep your readers apprised of any new developments in this strange and wonderful relationship.

Rona Claire Greenfield
Alexandria, Virginia

As many learned through news accounts, All Ball was killed by a car around Christmastime. Sympathy letters have poured in, along with offers of kittens. By the time you read this, Koko almost surely will have a new kitten, probably from All Ball's mother, whose offspring often are tailless—Koko's preference. We will keep you informed.

As one of the first nursing-mother prototypes for Koko, I was pleased to learn that the mothering lessons led to Koko's interest in nurturing. When my six-week-old son, Odysseus, and I met Koko for the first time, she immediately showed interest. As I nursed my son, she fetched her favorite doll and imitated the procedure with great accuracy. Toward the end of our first session together, Koko signed her desire to trade doll for baby, and when I refused the offer, she ran into her sleeping quarters and pouted.

Diane H. Posner Mastro
Albany, California

Baghdad

In "The New Face of Baghdad" (January 1985) Mr. Ellis tells us that Dr. Bahija Khalil Ismail is the first woman to hold the position of director of the Iraq Museum. The museum was created by a woman, Miss Gertrude Bell, who also drafted a "law of excavations" to curb the rapacity of diggers and eventually halt the century-old expropriation of archaeological treasures of Iraq. King Faisal suggested that one of the principal rooms in the museum be named the Gertrude Bell Room, but a group of her friends decided to associate her name with the whole museum by putting a brass plaque with a suitable inscription in a prominent position.

John Cox
Ludlow, Massachusetts

Yosemite

We visited Yosemite (January 1985) last June. I was disturbed to read in the article what I had long suspected: Namely, the Park Service encourages monopoly suppliers. What this boils down to is that I am paying the same monopoly premium twice: first as a taxpayer to support the Park Service, and second to the Yosemite Park and Curry Co. for use of facilities that are uniquely valuable because they are on land that I as a taxpayer in effect already own.

Dean S. Ammer
Lexington, Massachusetts

Monsoons

As a shipmaster, fisheries scientist, and oceanographer, I read with lively interest the presentation on world monsoons in the December 1984 issue. On page 725 you say that the Somali jet stream is "bent right by the Coriolis force, caused by the spin of the earth" and "veers off the Kenya Highlands as it crosses the Equator." Such a deflection would be negligible near the Equator but would progressively increase as it gains higher northern latitudes.

Jean Fréchet
Ottawa, Ontario

The Kenya Highlands do first deflect the airflow, which is intensified by the Coriolis force as it moves northward.

Your cover on the December issue has got to be a

classic graphic on how to cope. Here is a man up to his chin in monsoon floodwaters, and yet obviously delighted with his good fortune in retrieving his old sewing machine.

Edson W. Trumbull
West Newton, Massachusetts

Genetic Engineering

Far better than any current textbook or scientific periodical, your December 1984 article on genetic engineering explains in clear, concise steps the response of tissue cells to antigens and techniques to change the genetic blueprints. The artwork accompanying this article is equally imaginative and exciting. In fact it has upgraded my knowledge of this topic immeasurably.

John M. Keshishian, M.D.
Washington, D. C.

In your article about genetic engineering, you included a picture of two genetically identical twin calves. If they are identical, then why are the color patterns on their heads and legs different?

James Zumbro
Charleston, South Carolina

The hair pattern for twin calves is genetically carried but not the instruction for each individual hair; therefore, slight variations will exist.

You give 1869 as the date of Mendel's classic publication, instead of the correct date, 1866.

Garrett Hardin
Santa Barbara, California

Having just turned 30, I am part of that generation for whom the threat of world destruction through nuclear holocaust has been an ever present reality. I thank you, therefore, for articles such as "Beyond Supermouse" that offer hope in the battle against disease, starvation, and other worldly ills. This is not the first time that your magazine has caused this pessimist to think, "I can't wait for the future!"

Denise Pinell
Redondo Beach, California

U. S. Route 1

The story of old U. S. 1 (December 1984) made me think about just how much the old road is a part of my life. If you had not used the photograph of John Meek of Key West, I would have paid no attention to his obituary, which reported that performers who crowd Mallory Square at sunset conducted a special tribute to Mr. Meek. "Tonight we make some noise," said street performer Will Soto. "We're gonna spread a little joy . . . Key West style, in John's name."

Mrs. Thomas Vaughn
Ft. Lauderdale, Florida

The visual cacophony you present of U. S. 1 in Columbia, South Carolina, is a highly condensed and distorted perspective. Inappropriate signs and utility lines do exist, but the accordion-like view totally conceals notable improvements of the past decade. These include the establishment of three flanking National Register Historic Districts, sensitive redevelopment of the never despoiled banks of the Congaree River, and below-grade relocation of bisecting rail lines.

Nancy C. Fox
Columbia, South Carolina

Tiger

"Tiger! Lord of the Indian Jungle" (December 1984) by Stanley Breeden, with photographs by Belinda Wright, was probably the most exciting article ever to appear in the GEOGRAPHIC. Since the tiger is a member of the cat family, why are young tigers called cubs instead of kittens?

LeRoy Netts
Beloit, Wisconsin

Kittens, whelps, and juveniles are also acceptable terms, but cubs is the most commonly used.

Your article was excellent. However, in the map entitled "The shrinking range of the tiger," the Siberian tiger is not included.

Thomas K. Sharp
Moorestown, New Jersey

The Siberian or Amur tiger, as we designate it on the map, lives in the Amur River basin in both China and the U.S.S.R. The Chinese call it the North Chinese tiger.

The recent tragedy in Bhopal appeared to be close to the Kanha National Park, where most of the research on the tiger was done. I am concerned with what effect (if any) the dangerous gas leak that killed so many people may have had on the animal population.

Rick Haithcox
Stanley, North Carolina

The animals were not affected. The gas spread over 25 square miles; Kanha is 200 miles away.

North American Waterfowl

We were delighted to see the GEOGRAPHIC give prominent attention to America's imperiled waterfowl and wetlands (November 1984). The Nature Conservancy has safeguarded more than 2.3 million acres of ecologically significant land. About 40 percent of this total acreage is waterfowl habitat. The Conservancy has purchased almost 70,000 acres along the waterfowl-rich Texas coast, arranged for donation of 118,000 wetland acres on North Carolina's Albemarle-Pamlico peninsula, assisted in protecting some 4,200 acres around Nebraska's Platte River, and protected more than 100,000 acres of the Southeast's hardwood bottomland swamps. Preserving wetlands is now the Conservancy's highest protection priority for the coming decade.

William D. Blair, Jr.
President, The Nature Conservancy
Arlington, Virginia

I wanted to drop you a note to thank you for being the first publication I can think of to portray hunters in an objective, balanced light rather than as the thoughtless butchers so often portrayed in the media.

Thomas W. Tripp
Strongsville, Ohio

As with all articles on man's desecration of the wildlife kingdom, "North American Waterfowl" was heart wrenching. Until man evolves, no longer hunting for pleasure, the wildlife of the world may not survive.

Diana M. Hurst
Kerrville, Texas

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

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But there's more technology to this Z car than meets the eye. No less than four on-board microcomputers watch over everything from your air-fuel mixture to the signal your radio receives.

For instance, an Electronic Concentrated Engine Control System (ECCS) will control your idling, spark timing and air mixture for peak performance and efficiency. A microcomputer on your automatic transmission guides your shifting between gears. While a computerized electronic control system gives you the most efficient transmission of power at any speed.

Inside, computers even watch over the comfort of your luxurious 300 ZX. Your air conditioner makes sure you enjoy a perfect temperature because microcomputers respond to your setting while monitoring conditions outdoors.

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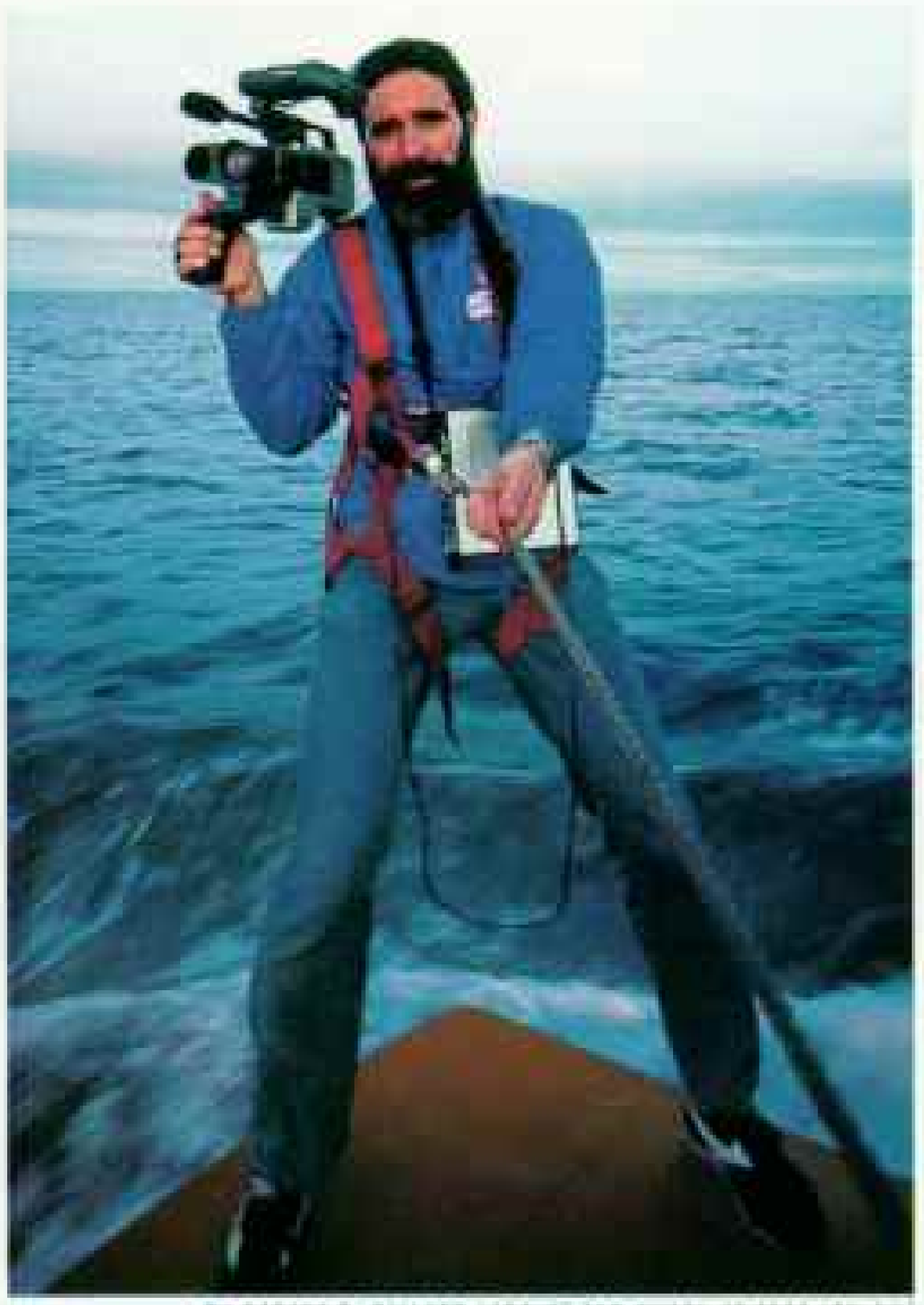
On Assignment

AQUANAUTS on a mission to inner space, staff photographer ***Emory Kristof*** (***right***) and author-geologist ***Robert D. Ballard*** of the Woods Hole Oceanographic Institution (***below***) teamed up last summer in mid-Atlantic for their fifth NATIONAL GEOGRAPHIC collaboration in ten years. Their shuttle: a small nuclear submarine, the NR-1 (pages 450-59). The U. S. Navy built the craft in 1969 as a research vessel capable of prolonged deep dives.

A pioneer in the use of submersibles for deep-sea research and a veteran of nearly 200 dives, Ballard and Robin Holcomb of the U. S. Geological Survey delighted in the unprecedented opportunity to observe great stretches of sea bottom uninterrupted by unproductive and tedious "elevator time." Previous dives in the small submersible *Alvin* required surfacing after only five hours or so on the bottom to recharge batteries. Aboard NR-1 "you are only limited by the amount of food and water you can carry, since the sub supplies virtually unlimited power," Dr. Ballard says. As a result, he was able in 20 days to traverse the same amount of seafloor that he had explored in all the previous ten years.

Ballard gave members of the ten-man crew an impromptu lecture on plate tectonics, his special area of interest. His highly acclaimed book on the subject, *Exploring Our Living Planet*, has become a best-selling Geographic publication—and is the first major National Geographic Society book to be printed in Japanese.

In the Irish Sea, headed for port, Kristof went topside to shoot stills and video footage from the sub's diving plane. Designing cameras to operate in the ocean depths is a Kristof specialty. "I often draw diagrams on napkins and send them to the Geographic's master machinist, Al Chandler, who fabricates the equipment," he explains. Their high-tech products have photographed giant tube worms more than 8,000 feet down in the Galapagos Rift and recorded the British bark *Breadalbane* deep under Arctic ice.



BY ROBERT D. BALLARD (ABOVE) AND EMORY KRISTOF (BELOW)

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You've got to drive it to believe it.

Front-wheel drive magic.

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Voyager. America's most versatile front-wheel drive wagon.

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Plymouth. Best built. Best backed.*

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*Requires opt. 2.5 engine and auto. trans. **Some options not available on all models. †27 hwy. est. mpg[27] city est. mpg with 2.5 engine and 5 speed manual. Use these EPA mpg ests. to compare. Actual mpg will vary with options, driving conditions and habits and vehicle condition. ††Whichever comes first. Limited warranties on powertrain and outer body rust through. Deductible applies. Excludes fleet buyers. Dealer has details. †Lowest percent of NHTSA recalls for '82 and '83 sales model years for vehicles designed and built in North America. Base backed based on warranty comparisons of competitive vehicles.

Sundays on Nickelodeon Cable TV: National Geographic EXPLORER

April 7
Iceland Breakthrough

A daring team of 12 men run a wild Icelandic river, the Jökulsá á Fjöllum, from its source under a huge glacier, Vatnajökull, to its mouth on the Arctic Ocean. For this first-time-ever expedition, they use foot power, skis, kayaks, inflatable rafts, and ultralight aircraft equipped with detachable floats, wheels, and skis for landing on water, tundra, or snow. Attempting to cross the glacier, the adventurers endure snow storms and violent gales. Coursing the river's 128 miles, they survive life-threatening mishaps as they brave dangerous rapids and major waterfalls.

April 14
Herculaneum: Voices of the Past

Lost lives, snuffed out in terror, speak after 2,000 years of silence. At Italy's ancient Herculaneum, excavations reveal that the eruption of Mount Vesuvius that entombed it (and a sister city, Pompeii) in A.D. 79 preserved 150 human skeletons as well as jewelry, a sword, and carpenter tools. Mosaic-adorned buildings and public baths, often with furnishings, works of art, and books of papyrus, had come to light during earlier digging. With the new discoveries, scholars retouch the picture of Herculaneum life—gracious with beauty for the rich, wretched for the poor. For many, doom.

April 21
Water, Birth, Planet Earth

"Water is the river on which evolution has charted its course." With this theme, EXPLORER takes you on a long, long journey. It begins with the simplest of drifting organisms, moves on to the more complex marine life of tube worms, mollusks, and arthropods, to fish, reptiles, amphibians, and thence to mammals. The journey is fraught with violence, as each form of life struggles to stay alive—at the expense of other life. In predator-prey kinship, an octopus feeds on a crab, a big fish attacks a school of small fish, a snake feeds on a frog. But without water, all would perish.

April 28
Irving Johnson, High-Seas Adventurer

Lifetime love affair with the sea made a happy wanderer of Irving Johnson, who as a youth climbed utility poles pretending they were the masts of tall ships. He first shipped out in 1929 aboard the *Peking*, a four-masted bark, one of the last great sailing cargo vessels—and he recorded the adventure on film. His career went on to span six decades and more than seven voyages around the world, his wife, Electa, at his side. On the global voyages, Johnson skippered crews of young people with no seagoing experience so that he might teach and share his love of the sea.

NEXT PAGE: FULL PROGRAM LISTING OF EACH WEEK'S EXPLORER

IT'S NEW and exciting, a major event coming to television: Beginning April 7, National Geographic EXPLORER will air every Sunday from 5 to 8 p.m. on the Nickelodeon cable TV channel.

For three hours each week, EXPLORER will offer a mix of the most entertaining and fascinating programs from around the world—five or more each Sunday. Subjects will range from archaeology and adventure to science, wildlife, and travel.

To the left are only the highlights of our April schedule.

A regular Sunday feature called "On Assignment" will bring you the work of National Geographic scientists and adventurers as they travel and study this amazing world.

Tune in National Geographic EXPLORER, a TV journal covering the earth.

THIS PAGE TEARS OUT

Three hours every Sunday: Your April guide to EXPLORER

Sunday, April 7

5:00 ON ASSIGNMENT
Dive with photographer David Doubilet deep in Japan's Izu Oceanic Park as he captures images of beautiful and rarely seen marine life.

5:15 SPECIAL FEATURE: ICELAND BREAKTHROUGH
(See front of guide.)

6:15 PANTANAL
Howler monkeys, jaguars, anteaters, thousands of birds, and even deer with webbed feet make their home in Brazil's Pantanal—a land of drought and flood.

7:15 DENALI WILDERNESS
Alaska's Denali, also known as Mount McKinley, towers over one of the wildest regions on earth. See grizzlies, wolves, and caribou filmed there over four seasons.

7:45 ON ASSIGNMENT
It's not a bird or a plane; it's a human-powered vehicle—a shell-enclosed bike whose pedaler may ride prone. In England, see whose design is flashiest and fastest.

Sunday, April 14

5:00 ON ASSIGNMENT
Join Tan Brunet, Cajun decoy carver and poet, as he seeks a perfect tupelo tree and transforms its wood into replicas of birds, many of which populate the Louisiana bayous.

5:15 ELUSIVE DEPTHS OF MEXICO
Searching for the world's deepest caves, a team of international spelunkers penetrates the limestone shafts of Chiapas, Mexico.

6:15 SPECIAL FEATURE: HERCULANEUM: VOICES OF THE PAST
(See front of guide.)

6:45 BEYOND THE WALL
An ancient way of life is practiced by China's Mongolian people.

7:10 AMATEUR NATURALIST: UPSTREAM, DOWNSTREAM
First in a series. Self-trained naturalist Gerald Durrell explores the River Wye in Wales, examining its creatures.

7:45 ON ASSIGNMENT
Bats aren't bad, according to Dr. Merlin Tuttle, who unlocks their secret life deep in Texas caves. See baby bats in their nursery, and watch the young learning to fly.

Sunday, April 21

5:00 ON ASSIGNMENT
Journey to the heart of Italy's marble country with American artist Helaine Blumenfeld, who discovers a sculptor's paradise in the remote village of Pietrasanta.

5:15 ARCTIC PARADISE
A family of modern-day pioneers creates a living built on self-sufficiency and a strong love of the land, deep in Canada's Yukon.

6:00 SPECIAL FEATURE: WATER, BIRTH, THE PLANET EARTH
(See front of guide.)

7:10 BITE FOR SURVIVAL
Behold the ubiquitous mosquito, the insect responsible for more human deaths than any other. A fascinating look at the life cycle of this dangerous pest.

7:45 ON ASSIGNMENT
Emory Kristof and his high-tech crew probe mid-ocean depths off Bermuda, revealing bizarre, fluorescent life-forms.

Sunday, April 28

5:00 ON ASSIGNMENT
In small theaters throughout Italy, the puppets of Palermo wage bloodless battles. Carvers, impresarios, and puppeteers, the Cutticchio family carries on a four-generation tradition.

5:15 IN PURSUIT OF THE BOAR
Survivors of a bygone age, feral pigs still range the wooded countryside of France, where the bear, lynx, and wolf vanished long ago. Tough and intelligent, the noble boar still proves elusive game for mounted hunters armed with swords.

5:50 SPECIAL FEATURE: IRVING JOHNSON, HIGH-SEAS ADVENTURER
(See front of guide.)

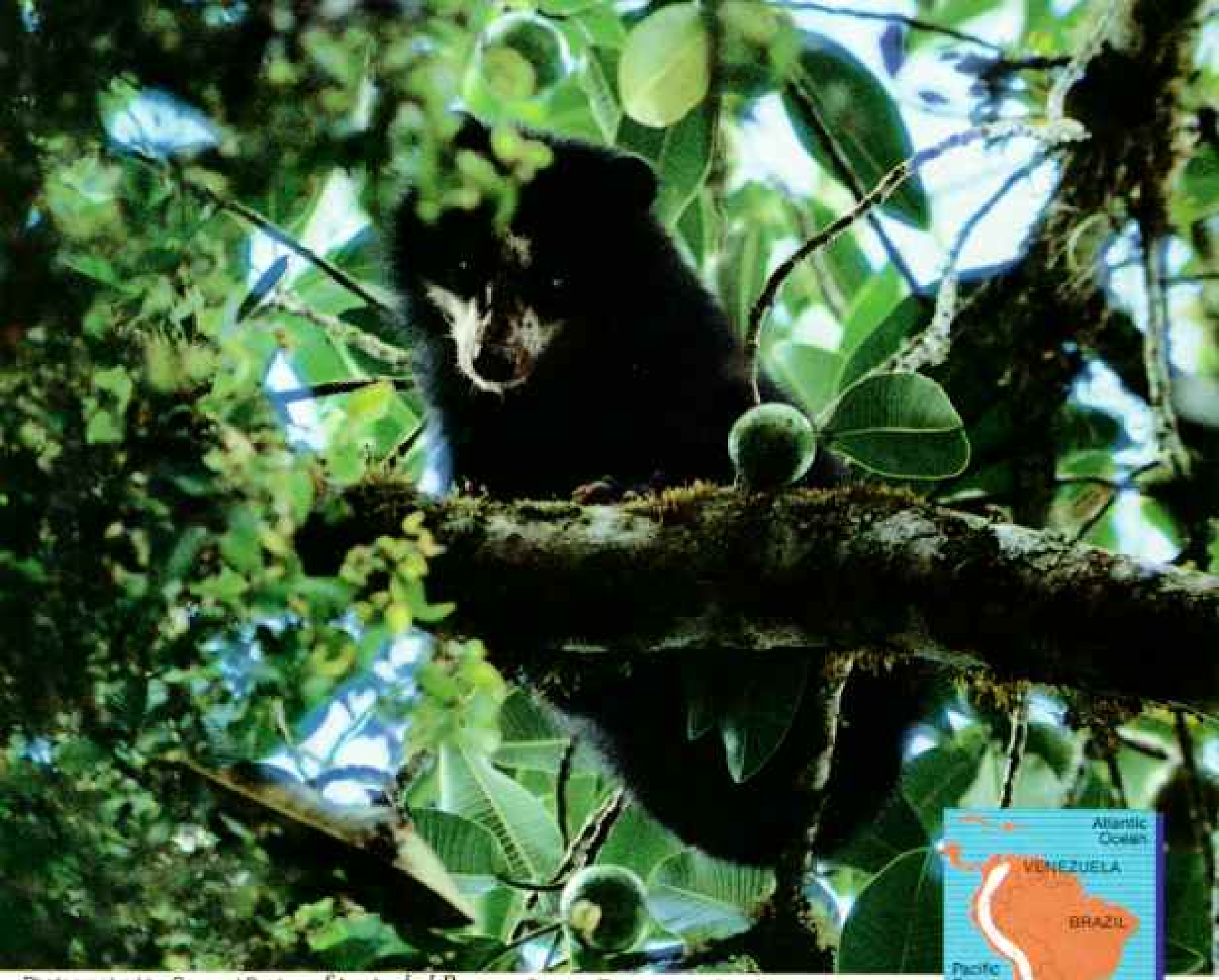
6:45 SIBERIA: THE ENDLESS HORIZON
Take the Trans-Siberian Express across the Soviet Union's frozen frontier in this classic National Geographic Special.

7:45 ON ASSIGNMENT
Visit Bucks County, Pennsylvania, and a craftsman named George Nakashima. The 79-year-old woodworker claims he "releases the spirit of the tree" as he builds his unique furniture.

Watch National Geographic EXPLORER every Sunday evening on your Nickelodeon channel. Nickelodeon is available in most systems as part of the basic cable package. Please consult your local listings to find Nickelodeon, or call your local cable television operator. Times may vary; please consult local listings.

THE ANNIVERSARY SEASON

Don't forget to watch the National Geographic Special on PBS, "Miraculous Machines." A dazzling overview features the computers and robots that have created today's technological revolution. Wednesday, April 10.



Photographed by Bernard Peyton *Spectacled Bear:* *Genus: Tremarctos* *Species: ornatus*
Adult size: *Length, 120—180cm; 7cm tail* ***Adult weight:*** *Average female, 60kg; male, 140kg*
Habitat: *Forests, grasslands and deserts ranging from Venezuela to northern Argentina*
Surviving number: *Unknown; occurs in isolated patches throughout its range*

Wildlife as Canon sees it: A photographic heritage for all generations.

This young spectacled bear has climbed nearly 60 feet up a fig tree in order to reach the plump fruit that is so desirable to these South American bears. The spectacled bear derives its name from the light-colored spots around its muzzle and the bands that often surround its eyes like spectacles. Rarely seen by people, these shy and nonaggressive bears are declining in number due to the rapid loss of their natural habitat.

The spectacled bear could never be brought back should it vanish completely. And while photography can record it for posterity, more importantly photography can help save it and the rest of wildlife.

As the spectacled bear becomes scarcer throughout its Andean range, the preservation of its habitat becomes increasingly critical to the survival of this sole native bear of South America. Photography is an invaluable research tool and an effective means of communication that can help people understand the urgency of saving the spectacled bear and the diverse natural environments it inhabits.

And understanding is perhaps the single most important factor in saving the spectacled bear and all of wildlife.

Canon
Images for all time