DOUBLE MAP SUPPLEMENT: MIDDLE EAST

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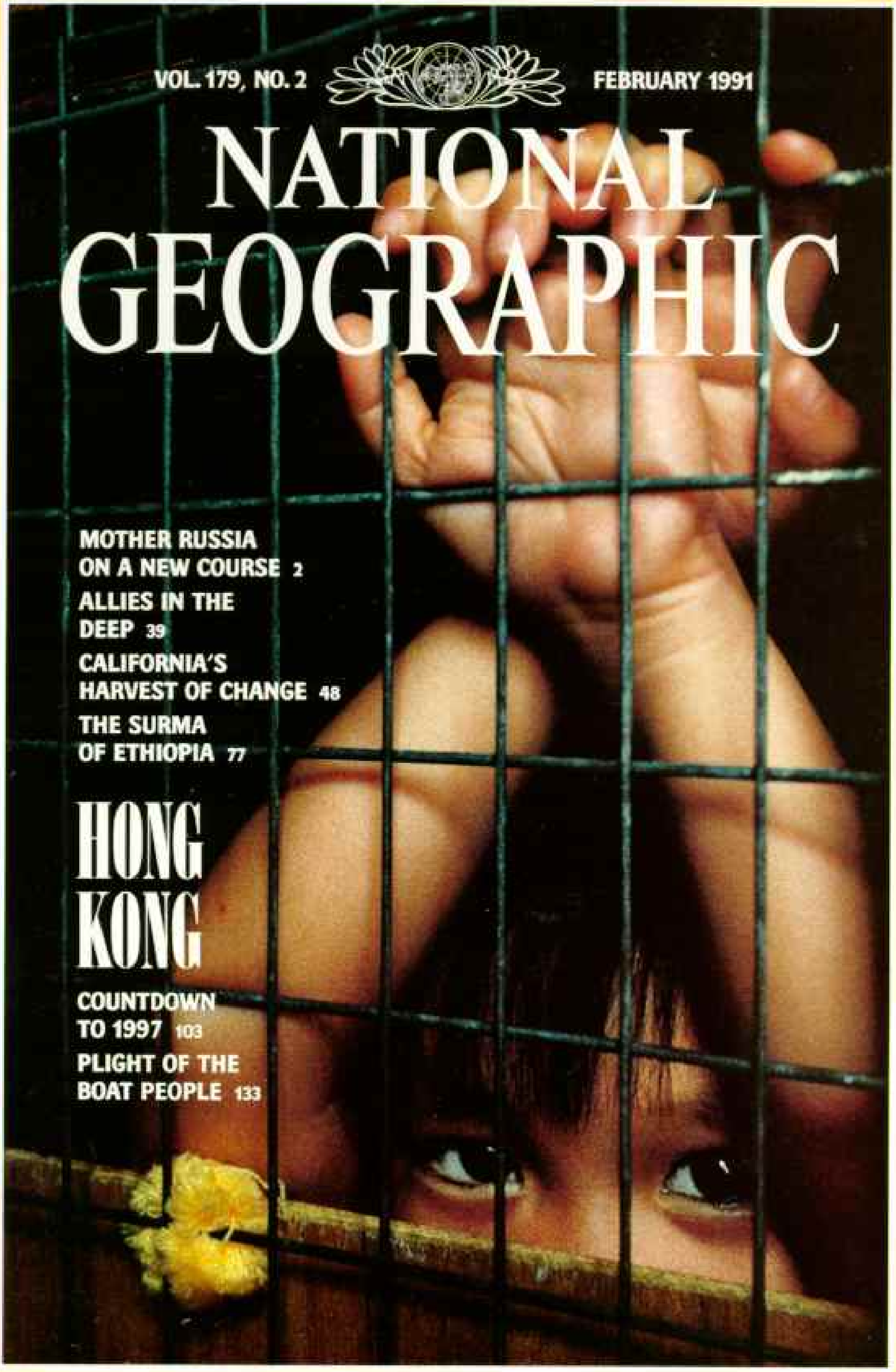

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NATIONAL GEOGRAPHIC

FEBRUARY 1991

SPECIAL MIDDLE EAST MAP: A closeup look at the nations in this troubled region

Mother Russia on a New Course

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Photographs by Steve Raymer

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MOTHER RUSSIA

ON A NEW COURSE

By MIKE EDWARDS
NATIONAL GEOGRAPHIC SENIOR WRITER

Photographs by STEVE RAYMER
NATIONAL GEOGRAPHIC PHOTOGRAPHER

We are sick and tired of such a way of living, sick and tired of being afraid.

—ANTIGOVERNMENT MARCHER, JULY 1990

ON AN ISLAND in the far Russian north stands a monastery, old and sturdy but crying for repair. It survives as a symbol of salvation and sacrilege, of hope and hopelessness. In it are mingled the legacies of great forces—religion, the tsars, communism—that figured the Russian landscape and shaped the Russian soul.

To my mind the Solovetskiy Monastery is Russia in a capsule of brick and boulder, a monument to the vicissitudes of her history.

Monks founded it in the 1400s in an elbow of the White Sea. Though far from Moscow, it grew into a vital center of the Russian Orthodox Church, with scribes issuing holy tracts and smiths sheathing icons in silver and gold. In the late 1500s it became simultaneously a jail. The first tsar to banish enemies to the cold Solovetskiy cells was Ivan IV, "the Terrible," who also murdered his son and a prelate of the church—among others.

The communists copied a page of Ivan's grisly history soon after taking power; to Solovetskiy in the early 1920s went some of their first political prisoners. In the gulag era inaugurated by the dictator Joseph Stalin in the 1930s, boat after boat plied the White Sea with victims. Few returned.

Today tourists walk the smooth cobbles and *(Continued on page 11)*

"Predatel! *Traitor!*" *Bitter words fly as a flag-waving retired Russian colonel confronts one of the thousands of demonstrators who showed up at last year's May Day celebration in Red Square to demand an end to communism.*

A TIME TAPESTRY OF THE RUSSIANS

Powerful symbols of the Russian motherland, the portraits of people, places, and objects presented here form a tapestry of images reaching back more than 1,400 years. Through the centuries the alternating struggles against foreign tyranny and homegrown despotism gave rise to a distinct Russian character.

6th to 8th century A.D. Displacing indigenous Baltic and Finnic tribes, the people who became the Russians migrated from central Europe into the great forests north of the Russian steppe. Known as the East Slavs, they evolved into three separate groups: the westerners, called Byelorussians; the southerners, or Ukrainians; and the easterners, sometimes known as Great Russians, more often just as "Russians." Little evidence of the parent culture remains other than remnants of log dwellings and simply decorated pots 1.

862 Probable founders of the first Russian state, a rugged breed of Viking traders 2 known as the Rus established their rule in Novgorod in 862. By the tenth century, when Kiev became their major center, the Rus were being assimilated by their Slavic subjects.

988-989 At Kiev, major point of contact with the Byzantine Empire, the Rus Prince Vladimir began mass conversion of his people to Orthodox Christianity — as depicted in a baptism scene from a medieval chronicle 3. Along with religion the rulers of Kievan Russia found an adoptable culture in Constantinople, including the domed cruciform architecture borrowed for early cathedrals, such as Holy Sofia in Novgorod 4. Also indebted to Byzantine models, Russian icon painting achieved the singular quality of a national art. Though commissioned in Constantinople, the 12th-century "Virgin of Vladimir" 5 became one of Russia's most revered symbols. With religion, writing came to Russia. Inscribed in the Cyrillic alphabet, beautifully embellished manuscripts, like that of Prince Sviatoslav from 1073 6, are today prime sources of medieval Russian history.

1237 Mongols 7 led by Batu Khan closed the chapter on Kievan Russia, thundering and plundering through its cities, including the young river fort of Moscow. For more than two centuries the grand princes of a fragmented Russia endured humbling vassalage to the Tatar khanate of the Golden Horde.

1462-1505 As the Tatar Yoke loosened and fell, Grand Prince Ivan III of Moscow 8 — often called Ivan the Great — expanded Muscovite Russia by annexing the neighboring princedoms as well as the once powerful Novgorod. The first Russian tsar — in practice if not in name — he adopted the two-headed eagle 9 as symbol of his throne. During his reign the Russian Orthodox religion bloomed, leaving a legacy of great cathedrals, including the Church of the Holy Spirit 10 at Zagorsk.

1533-1584 First Russian to be crowned tsar — or caesar — Ivan IV 11 earned his sobriquet, "the Terrible," during a long reign of tyranny and reform, madness and piety. For the strength and relative stability of his rule, however, he enjoys a redeeming folk image. Annexing the Tatar kingdoms to his east, he opened the door to Siberia and launched Russia on its path as a multiethnic empire. By 1555, when he ordered the building of Moscow's fantastically ornamented St. Basil's Cathedral 12, Russian architecture had acquired an unmistakable national character.

1613 Father of a dynasty — one that would rule Russia for three centuries — Mikhail Romanov 13 succeeded to the throne after the turbulent Time of Troubles, a succession crisis following the extinction of the long-ruling Rurik dynasty.

1682-1725 Robust, intelligent, and charismatic, six-foot-eight Peter the Great 14 almost single-handedly pulled Russia from the backwoods into the European community. He even forced Russian men to forfeit their beards, a drastic westernization depicted here in a woodcut cartoon 15. Obsessed with his vision of Russia as a great sea power, Peter built its first navy 16 and secured the empire's first access to the Baltic Sea — won from Sweden after a prolonged war. On the Baltic, Peter built St. Petersburg 17, his "window on the West," where Russia's first newspaper 18 was published. Gracing the city with restrained baroque architecture — like the suburban Menshikov Palace 19 — he made St. Petersburg his capital in 1712.

Peter's successors turned to rococo styles, as they continued to fill the city with great palaces and churches like Smolny Cathedral 20.

1762-1796 Devotee of the Enlightenment, friend of philosophers, Catherine II, "the Great" 21, presided over a period of both cultural and territorial growth. During her rule Russian sovereignty extended west to absorb much of the Polish-Lithuanian commonwealth. Huge numbers of Russian peasants and German immigrants were settled in Ukraine and along the Volga, and the Black Sea port of Odessa was founded.

1812 Hoping to spark a peasant uprising, Napoleon 22 invaded Russia with a French force of more than half a million, including large numbers of Poles anxious to regain independence. Only one major battle was fought, as the Russians let their enemies occupy a burning and deserted Moscow. Faced with the onset of an early winter, the French retreated across the Russian plain, pursued all the way to Paris by the Russian Army. More than 90 percent of the French forces perished along the way. In Moscow the Triumphal Arch 23 commemorates the year, also celebrated in Tchaikovsky's *1812 Overture* 24.

1825–1855 The militaristic Nicholas I 25 helped free Greece from Turkish rule early in his reign but died while his army was stalemated in its next Turkish conflict, the Crimean War. Fearful of an increasingly liberal gentry, he exercised strict censorship over Russia's intelligentsia.

1861 Responding to pressure from all strata of society, Tsar Alexander II 26 signed a historic proclamation 27 emancipating the serfs, who by then totaled more than a third of the Russian population. A wave of radical terrorism arose during his reign, peopled and sustained by anarchist and socialist members of the upper classes. One such group, Peoples' Will, was responsible for his assassination in 1881.

1820–1917 Russian literature of the 19th century produced remarkable artists able to mirror, in prose and verse, the singular qualities of Russian life. Aleksandr Pushkin (1799–1837) 28 opened the Pandora's box of contemporary society as a fit subject for fiction in his verse-novel, *Evgeni Onegin*. Nikolay Gogol (1809–1852) 29 carried the new realism further in his novel *Dead Souls*. Other aspects of Russian society were elaborated by romantic poet Mikhail Lermontov (1814–1841) 30; short story writer Ivan Turgenev (1818–1883) 31; and playwright Anton Chekhov (1860–1904) 32. Towering figures in the pantheon of world literature were novelists Fyodor Dostoyevsky (1821–1881) 33, who wrote *Crime and Punishment*, and Leo Tolstoy (1828–1910) 34, author of *War and Peace*. Revered by his countrymen for his philosophy of peasant morality, the aristocratic Tolstoy became a spiritual father to legions of followers during his long life.

1905 and 1917 Thick with resentment against reactionary Tsar Nicholas II (1894–1917) 35 and humiliated by defeats in the Russo-Japanese War, Russia was ripe for rebellion. In 1905 and 1917 revolution swept through the streets of St. Petersburg and Moscow 36. In the confusion following the abdication of the tsar in 1917, Vladimir Ilyich Lenin 37, a Marxist who had been living abroad, used the Bolshevik party to seize power from the provisional government. A bloody civil war raged until 1921. The following year the Union of Soviet Socialist Republics was formed, with Russia the largest of its republics. Lenin, as head of that regime, remained dedicated to communist world revolution until his death in 1924.

1922–1953 Groomed by Lenin for leadership, Joseph Stalin 38 became general secretary of the Central Committee of the Communist Party in 1922. Ruthlessly the native Georgian pushed aside or annihilated all perceived rivals, including Leon Trotsky, the genius behind the Red Army. By the late 1920s Stalin stood alone as dictator, wielding unlimited power to transform the Soviet Union into a modern industrial state. Key to his scheme was the forced collectivization of agriculture 39. Though long struck from official Soviet histories, the "Stalin terror" cost at least 20 million lives.

1941–1944 An act of betrayal by fellow dictator Adolf Hitler, Germany's invasion of Russia in June 1941 40 caught Stalin off guard, since Hitler had promised nonaggression and trade in the 1939 German-Soviet pact. Lifting his suppression of the Orthodox Church, Stalin appealed to old-time Russian patriotism, and the German Army was eventually turned back at a cost of some 25 million Soviet and four million German lives. From the ashes of war, however, the Soviet Union rose even stronger than before—with a hundred million East Europeans drawn into the Soviet bloc.

1980s–1991 After years of economic stagnation inherited from the Brezhnev era, Mikhail Gorbachev 41 emerged in 1985, expounding *glasnost*, or openness, and *perestroika*, or restructuring. These radically liberal principles, and the reduced global tensions that followed, won Gorbachev the Nobel Peace Prize in 1990. But they also had the effect of resurrecting long dormant feelings of ethnic pride among all Soviet peoples. The dramatic rebirth of Russian nationalism, in particular, may spell the beginning of the end for the U.S.S.R., along with the Communist Party.

(Continued from page 2) contemplate the barred doors, for Solovetskiy is saved as a national monument. A secular monument, however; no priestly chant floats from beneath the shingled domes.

Church officials dream of repossessing Solovetskiy, though in Moscow a bishop declares icily: "Perhaps communism could provide a couple of thousand monks to make repairs, since it was so good at making monks vanish."

I HAD COME BACK to Mother Russia, the old heartland from which had sprung the Russian Empire and its successor, the Union of Soviet Socialist Republics, to measure change, to seek portents of the future. This is European Russia, stretching from the Baltic shore to the Ural Mountains and from the Arctic tundra to the Black and Caspian Seas (map, page 13). It holds a territory more than half the size of the conterminous United States, and a population of 110 million. Highly industrialized, the region receives coal, oil, and other raw materials from the Soviet hinterland, producing automobiles, aircraft, heavy machinery, plastics, and chemicals. A modern land in many ways, yet profoundly tied to the past.

With domes softly agleam in the pale northern sun, monasteries like Solovetskiy were early beacons upon the Russian heartland. In 988 Christianity reached Kiev in present-day Ukraine from the Eastern Orthodox Church at Constantinople; it was enthusiastically embraced by the ancestors of today's Russians, a Slavic people ruled by warrior-traders called the Rus. Their holy citadels expanded northward into a wide and gentle realm of birch and fir—the ample bosom of Mother Russia.

In time this became the core of empire—Great Russia. The people exulted in the appellation Great Russians (versus the Little Russians of Ukraine, a name still resented there). The tsars marched across the Urals to attach Siberia, reaching the Pacific, and south to add the vast steppe. In the west they seized the former Polish and Lithuanian lands today called Byelorussia, or White Russia.

Yet no previous event in Russia's long history had the impact of the upheavals in our century. They began with the cataclysm that spawned the U.S.S.R.: the 1917 revolution and subsequent civil war in which Russia became one of 15 Soviet republics. Another earthquake proceeds swiftly today. It seems likely to shatter the Soviet Union as well as the failed communist system that for seven decades regulated everything from the content of newspapers to the production of toothpaste.

With the Soviet Union careering like a runaway troika, Russia is reemerging, wriggling out from beneath the gray leveling blanket of socialism. There is a new quest for the much trampled Russian culture, for the "soul" that writers lauded for its breadth and warmth. The old love of the gentle landscape that "spreads out evenly across half the world," as Nikolay Gogol saw it in *Dead Souls*, blooms anew—in the form of anger over polluted rivers and smoky vistas.

Staff of life for Russians, rich and poor, hot loaves of bread roll out of ovens in the medieval Solovetskiy Monastery (above), on an island in the White Sea. A world away, the Moscow McDonald's has introduced Russians to something new: the chizburger, *served up with smiles and pizzazz. Young pioneers in a new world, the 250 or so management trainees handle more than 50,000 orders a day and boast of having the best jobs in all Russia.*

And hordes return to churches reopened under the liberalizing policies of Soviet President Mikhail Gorbachev. Historically, nothing touched the Russian soul so profoundly as faith. Many worshipers doubtlessly seek divine shelter from the chaos of current events.

"I speak only of Russia now—the union is finished," declared a politician, one of the new "democrats," or "radicals," vowing to end communist rule. This is retro-revolution; Russia and other republics, proclaiming sovereignty, want the union reshaped as a loose confederation in which they manage their own affairs. Some, like the Baltics, demand total independence; zealous Ukrainian nationalists prophesy freedom by 1992.

Last year, on May Day and again on July 15, I was beside the Kremlin—it means "fortress"—in Moscow with throngs that shook the walls. "Down with the Communist Party!" they cried. For people with scant experience at uninhibited protest, they showed surprising flair. "Gorbachev to Chernobyl!" some cried. Declared the alliterative sign of one protester: "We have *partkomy* but no *portki*—We have communist committees but not even peasant's pants."

Yet again on Revolution Day, November 7, when the birth of the communist regime is massively celebrated, anger filled Red Square. Among communist marchers (some carrying banners denouncing democrats as CIA supported) were workers who hurled obscenities as they passed Gorbachev. Then came a truculent antiparty mob, bearing a huge funeral wreath that proclaimed the anniversary a day of mourning and signs equating communism with fascism.

Gorbachev's Nobel Peace Prize—however well deserved for reducing superpower tension—cut little ice with hungry and frustrated Muscovites. As he loosed the reins on speech and permitted multiparty elections, the long-stagnant economy was collapsing. The list of vanishing commodities grew to include not only sausage and vodka, long rationed, but also potatoes, eggs, bread, and cigarettes.

What to do? Torrents of rhetoric rose from halls where convened the Soviet legislature, the Russian congress, and the Communist Party. Television carried their fulminations to all the union—mercifully interrupting to present the regular 8 p.m. puppet show, *Goodnight, Kids*, featuring a hare, a dog, a bird, and a pig. All over the U.S.S.R. these creatures tuck children into bed.

President of the Russian Republic, Boris Yeltsin speaks with a reporter during a legislative break in Moscow's Grand Kremlin Palace. Far more popular at home than Soviet President Mikhail Gorbachev, who shines abroad, the former party boss from Sverdlovsk bolted the Communist Party last July. Since then he has attempted to set the agenda for economic and political change in a mounting power struggle between republic and union.

Then back stormed the politicians. Though many communists were defiant, they surrendered their right of ultimate control. Boris Yeltsin (left, at right), the popular president of the Russian Republic, proposed a crash program of staggering change. In a 500-day transition period state industries worth billions would be sold, and citizens would regain the right to own land.

Gorbachev seemed to buy in, but then, probably pressed by standpat communists, opted for more gradual change. The threat of collapse—political and/or economic—was so great that the Soviet legislature granted his request for emergency powers with which to

THE HEARTLAND

Rodina the Russians call it—"the motherland." Larger than India, the European home of the East Slavs is but one quarter of the Russian Soviet Federative Socialist Republic (R.S.F.S.R.), which spans a continent and embraces 60 nationalities.

Barents Sea
Murmansk
Kirovsk
White Sea
Solovetsky Monastery
Mezen
Arkhangelsk (Archangel)
Kholmogory
Ukhta
Pleseisk
Syktyvkar
Lake Onega
Vytegra
Kotlas
Kanosha
Leningrad (St. Petersburg)
Gulf of Finland
Baltic Sea
Tallinn
ESTONIA
Kirishi
Tikhvin
Cherepovets
Novgorod
Vologda
Kirov
Perm
Pskov
Riga
LATVIA
Pskov-Pechory Monastery
U. S. S. R.
Kotelnich
Sverdlovsk
Votkinsk
Izhevsk
Yaroslavl
Rostov
LITHUANIA
St. Sergius Trinity Monastery
Zagorsk
Gorkiy
Danilov Monastery
Borodino
Moskva (Moscow)
Kazan
Yelabuga
Ufa
Vilnius
Obninsk
Almetyevsk
Tuymazy
Minsk
BYELORUSSIA
Ulyanovsk
Saransk
Ishimbay
Tolyatti
Otradnyy
Bryansk
Penza
Syzran
Kuybyshev
Gomel
Orel
Gryazi
Ryazhsk
Tersa
Orenburg
Kursk
Voronezh
Saratov
Uralsk
Aktyubinsk
Kiyev (Kiev)
Pavorino
Kharkov
UKRAINE
KAZAKHSTAN
Volgograd (Stalingrad)
Dnieper
Don River
MOLDOVA
Taganrog
Rostov na Donu
Guryev
Odessa
Astrakhan
Sea of Azov
Tikhoretsk
Caspian Sea
Novorossiysk
Krasnodar
Tuapse
Elbrus 5642 m (18510 ft)
Grozny
Black Sea
CAUCASUS MTS.
GEORGIA
Batumi
ARMENIA
Baku
AZERBAIJAN

Vegetation
- Tundra
- Coniferous forest
- Deciduous forest
- Steppe
- Desert

- Airport
- Nuclear power plant

Industry
- Chemical
- Fish processing
- Machinery
- Motor vehicle
- Natural gas processing
- Oil refining
- Shipbuilding
- Timber

Russian-speaking majority

300 km
200 mi

NGS CARTOGRAPHIC DIVISION

SOVIET UNION AREA ENLARGED

hold the wheezing machinery together. Moscow was awash with rumors of a coup. And life got worse.

"My soul is full of fear," a Russian woman said. Russians speak of their soul as if it were as visible as a hand. Despite Soviet efforts to galvanize society into a stern-visaged, heroic mass, Russians cling to passionate emotion as if it were a given right. A mother weeps as a departing train takes away her son, though he's only leaving for a weekend. There is deep, and very touching, emotion in death; witness the flowers always laid upon graves, even upon the stones of tyrants dead for centuries.

Under communism foreigners rarely felt the hospitality that springs from the Russian soul. A few years ago such a couple as Lena and Georgii would not have dared entertain me in their flat, regaling me with jokes about the system while refreshing me with cognac they

ROBERT D. TORSING

Under pressure to deal with a disintegrating economy, members of the Russian congress scan telegrams (right) from their newly and loudly vocal constituents. Outside, near Red Square, a motley assortment of homeless persons and protesters—including 200 members of the Union of Persecuted People—camp out in tents while airing grievances directly to the passing public—a sight once unthinkable now becoming commonplace.

had scrounged with *blat*, a "connection."*

And no party *apparatchik* would have escorted me to their derelict inner-city apartment building.

"Mother Russia? *Step*mother Russia!" cried Lena, waving toward the ceiling of the living-dining room. The waterlogged plaster looked as if it might join us any moment at the dinner table. The kitchen plaster fell long ago; the bedroom plaster smashed a bureau.

The municipal housing office had promised over and over again to fix the roof of this old building—and had never come.

"We are a patient people," Russians say. Critics might argue that they have been too patient in politics. Philosophers, on the other hand, extoll patience as a Russian virtue, an ingredient of the soul. If this is true, Lena and Georgii are monumentally soulful—ignoring

*I have changed the names of some of my outspoken Russian friends, who could be hurt if the political pendulum swings back to repression.

While generals of the Red Army stand atop Lenin's Tomb to bask in the memory of a great victory, veterans of a not-so-glorious war gather in Gorky Park to celebrate nothing more than survival. Left out of the May 9 parade on the 45th anniversary of the World War II victory over Germany, veterans of the war in Afghanistan face neglect and disrespect from their countrymen. Bearing a striking resemblance to U. S. veterans of Vietnam, many are openly bitter, claiming their war was initiated to test new Soviet weapons. Today thousands more soldiers are returning from East Europe, finding neither jobs nor living space.

difficulties they can't do anything about.

"When I came to this marriage," Lena said, "I brought an oil painting, an old piano, and this flat, which had been my grandmother's. It is what we still have." Indeed the landscape is upon the wall, the piano in the corner. "One might feel shame at such a home, but artists and musicians come here, and even under this ceiling we have wonderful evenings.

"I was born here in Moscow. The new buildings out in the suburbs do not warm me. If I was offered a flat there, I would not go."

Patience, and a sense of place.

IN NOVGOROD I found Russians rediscovering roots.

This ancient city is a three-hour drive south from Leningrad on a road that hardly climbs a hill. Swedes, Poles, and Napoleon were among the invaders beckoned by the easy landscape. In roadside cemeteries shiny metal statues—a bowed soldier, a grieving mother—honor troops who died in 1943 as the Red Army pushed back German panzers. Red carnations had been placed upon the stones.

By contrast Novgorod was life and joy, with dancers in bright costumes and women with hair like ripened wheat and eyes the color of grass and sky. Novgorod is Slavic heartland.

Singers strolled in an open-air museum of wooden houses and churches. They sang old songs, like "The Kalina Is in Blossom by the Stream." Dancers executed the square-dance patterns of a quadrille called "Ksenovia."

Perhaps because life was far from easy in prerevolutionary Russia, villagers wove around themselves a rich tapestry that included festivals like this. But under the pressure of official atheism and farm collectivization, along with the government's fear of anything that hinted of "nationalist" feeling, traditions nearly vanished. "Ten years ago if the boys started playing folksongs in our House of Culture [community center], they would be taken away by the *militsiia*," remembered Tamara Alekseeva, leader of a dance group.

Old life revolved around the church calendar. Peasants plowed on St. George's Day in May and picked apples on Transfiguration Day in August.

Twenty members of Tamara's folklore troupe picnicked on the grass. Tamara filled my lap with boiled potatoes, radishes, and eggs. "When the authorities forbade religious holidays, the festivals died out," she said. But

Something new on Karl Marx Square, an encounter between a stylish Muscovite and a young Gypsy beggar dramatizes the sharpening social contrasts now evident in large Soviet cities. In the face of national economic chaos an influx of foreign currency is bringing prosperity to some, especially entrepreneurs working outside the official system.

An oasis of charm in gray Moscow, the historic Arbat district (opposite)—once home to such figures as Pushkin and Lenin—thrives with street artists and sidewalk cafés.

here it was, Trinity Sunday, the old spring festival day, with a park full of merrymakers.

It wasn't easy to resurrect village culture. Tamara and friends searched for authentic dances in remote villages. "We picked up all the old grannies who could remember anything and brought them to one place. None of them could recollect a whole dance; one remembered one part, someone else another. We restored them by fragments."

NOVGOROD HAS SUBSIDED into a middling industrial city, manufacturing fertilizer and electronics equipment. But its past is redolent with the history of the Russian people.

Within its kremlin stands Holy Sofia Cathedral, a link to Kiev, whose principal cathedral bears the same name. This is also a link to Byzantium, for Kiev adopted "Sofia" from the Greek cathedral at Constantinople.

Around Novgorod rose monasteries embellished with Byzantine art forms: domes, icons, frescoes. Later the Russians would alter the simple Greek dome to the familiar onion-bulb shape so that, according to tradition, it would shed heavy snow.

"Lord Novgorod the Great," the city styled itself. It prospered in trade with the cities of the Hanseatic League and ruled a large part of northern Russia from the 12th century until the 15th. Only then did the minor principality of Muscovy grow strong enough to reach out and bring Novgorod under its control.

In this century Novgorod's scores of medieval churches and monasteries have suffered greatly. Largely converted into warehouses in the Stalin years, they were heavily damaged in World War II. Since then many have been renovated with government funds—not as houses of worship, however, but as concert halls, exhibition halls, and museums. City officials told me they expect these to attract tourists.

Later, when I mentioned this plan to Father Anatolii Malinin, priest of one of Novgorod's three functioning churches, his response was a helpless shrug. Church-state relations have greatly improved, but not enough for a priest to be consulted on such matters.

> *The way of socialism . . . is the right way, it is the correct way, and that is why it cannot be defeated.* —VLADIMIR ILYICH LENIN

As Leningrad's city hall, the elegant old Mariia Palace, built for a grand duchess,

became a bastion of communism. Not five years ago, on my first trip to the Soviet Union, I wouldn't have gotten past the guards. Now I just walked in and headed for the staircase.

The Lensoviet, the city council, was meeting beneath a row of toga-draped marble statues in the rotunda, as if this were a Roman senate. The deputies relished the chance to push the buttons of their new electronic voting system, watching tote boards flash *za*, in favor, or *protiv*, against.

"We must raise the city from its crisis," Deputy Anatolii Golov told me during a break. Besides shortages of everything from soap to flats, he cited the plight of Leningrad's 1.2 million elderly, many living on bare-subsistence pensions. "But up to now we do not have a plan for anything," he confessed.

Elections last year replaced the rock of communism with a handful of pebbles. Democrats dominate the 400-member council, but they are fissured into half a dozen parties with such names as Democratic Union and Democratic Russia. The communists also broke into factions, ranging from standpat to moderate.

Like most deputies, mathematician Golov is a political novice. These novices enthusiastically united to defeat communism in elections last March; whether they can unite to govern a city of five million is still unclear. After decades of central control "the city is not ready for a democratic system," Golov said. He hoped a strong leader would guide the deputies—"We got accustomed to this in the past."

Nevertheless, the deputies have been feuding with their chairman, Anatolii Sobchak, a strong man indeed—one of Russia's most outspoken liberals. Exasperated by the lack of cohesion, he has characterized the deputies as "street rally types . . . ready for destroying but incapable of creating." Working democracy has a long way to go in Russia.

TOO MANY CITIZENS Leningrad is still "Peter," a nickname that harks back to the city's founding in 1703 as St. Petersburg. In World War I Russia junked the German "burg," switching to the Russian equivalent, Petrograd. Since 1924 the city has honored Vladimir Ilyich Lenin—

On the cusp of a renaissance, the elders at Pskov-Pechory Monastery (above) and other Orthodox Church centers across the nation face an unprecedented problem: how to give a crash course in religion to a vast population of spiritual neophytes. Strained by the magnitude of the challenge, factions have

arisen within the church that mirror secular battles raging in the Kremlin. Reformers seek absolute separation from the state, while conservatives counsel caution, remembering the dark days of the 1920s and '30s when thousands of priests and monks were killed by government troops.

On the dark side of glasnost, members of the Pamyat National Patriotic Front meet in the Moscow apartment of their president, Dmitrii Vasiliev. A reputed admirer of fascism, Vasiliev blames Russia's ills, including 73 years of communism, on Zionists and Masons.

whose name many now want to jettison in favor of one of the old ones.

Peter's history piles up in rich layers, like a multiflavored parfait. This allusion comes easily; visually Peter is Russia's dessert, a dieter's great guilty splurge, a city balconied and becolumned, pilastered and porticoed. In creating such edifices as the huge Winter Palace (today the Hermitage art museum), the tsars borrowed the lush baroque of western Europe and the temple architecture of Greece and Rome. Though more than 600,000 people died in the 900-day siege of World War II, the elegant core escaped heavy damage.

In raising this capital by the Baltic—his "window on the West"—Peter the Great was determined to pull Russia out of isolation and backwardness. He had seen the West (few Russians had) on an 18-month odyssey, his "grand embassy." To avoid protocol, he traveled as soldier Petr Mikhailov—though everyone knew that this fellow standing six feet eight inches was the Russian tsar.

He visited factories, schools, museums. Fascinated by ships, he worked as a carpenter in Dutch and English shipyards. At home he created Russia's navy, a metallurgical industry, and a system of secular education.

And, after moving the capital from Moscow to St. Petersburg, he decided Russia must have a museum. I have walked among the exhibits from his Chamber of Curiosities—and gagged, for Peter's "curiosities" included pickled body organs and infant corpses.

The fourth tsar of the Romanov dynasty, which would rule for three centuries, he liked a beer with the commoners. He even married a peasant's daughter, Catherine, after shutting his first wife, Eudoxia, in a monastery. In statecraft he was both able and ruthless, heaping new taxes on the peasantry when he needed revenue.

Restorers today spend millions of government rubles to preserve Russia's tsarist architecture—"our heritage," one insists.

"And this is *my* heritage," said a chemist named Boris in a cracker-box suburban flat. Boris and Liuda share the single room with

"My students know nothing about being Jews," says Vladimir Zeiv, a teacher of Hebrew at the Moscow Synagogue. While the new school is a product of new freedoms, so too is a virulent revival of anti-Semitism. The majority of these students and their families plan to emigrate.

their three-year-old son, Sasha. And in truth, the room isn't even theirs. They pay a hundred rubles a month—more than half Boris's salary—to sublet this flat from its gouging owner. Boris moonlights as a cloakroom attendant to help make ends meet. "Some people are worse off than we are," he said. Indeed many families in Leningrad must share flats with others.

YET EVIDENCE ABOUNDS that Russians adore this un-Russian city. Music lovers stand in Tikhvin Cemetery as if in church. "I feel closer to him than to my own relatives," a woman said as she laid a carnation on Pyotr Tchaikovsky's grave. It's Russian tradition to place revered men together in final rest; Tchaikovsky is flanked by Mussorgsky, Rimsky-Korsakov, Glinka, and Borodin. What a necropolis! And Dostoyevsky is just around a corner, in the section for writers.

With the elegance of the 19th century—the literature of Tolstoy, the music of Tchaikovsky, the achievements of such scientists as Dmitry Mendeleyev, who devised chemistry's periodic table—would come, again and again, warnings of the gulf between Russia's 100,000 landed families and her impoverished millions. Until 1861 Russia's masses were serfs bonded to the gentry or to the state. Emancipated, they nevertheless had to pay for land to till and four decades later were still overburdened with a debt of 120 million rubles.

Russia was scourged by attempted revolution, strikes, and assassinations. Immersed in the utopian precepts of the German philosopher Karl Marx, socialists grew in number and in their determination to destroy tsarist rule.

Came finally World War I with its ghastly toll: six million Russian casualties. As Germany bored deep into the prostrate land, deserting troops swelled the masses of the cities.

In Petrograd in early 1917 a protest grew day after day until a quarter million surged in the streets. On March 15, as local army regiments joined the workers, Nicholas II abdicated. The Romanov dynasty was finished. Imperial Russia was handed over to a feeble

provisional government soon to be headed by former minister of justice Aleksandr Kerensky. He strove—too late—to restore order and stanch Russia's looming swing to the left.

COMMUNISM has no shrine more revered than the vast Smolny Institute, where girls from noble families studied French and learned the waltz. Into this domain of privilege tramped the muddy-booted founders of the Soviet state.

The American writer John Reed described them thus: "great masses of shabby soldiers, grimy workmen, peasants . . . bent and scarred in the brute struggle for existence." Their meeting hall, the ballroom, filled with tobacco smoke and "the stifling heat of unwashed human bodies."

Among the socialists of half a dozen political parties gathered here, the most radical were the Bolsheviks, the "bigger" faction of the Russian Social Democratic Labor Party, which had sundered over ideology. While other socialists hesitated, the Bolsheviks routed Kerensky's government in a night assault—the October Revolution.

In the Smolny ballroom an ovation welcomed Lenin, lawyer turned revolutionary, the Bolshevik leader. Reed caught him as a short, stocky, balding man with small, winking eyes and a snub nose. His chin bore bristles of the goatee that would become familiar in all the world, replicated by legions of communist painters and sculptors. At the podium he began: "We shall now proceed to construct the socialist order." Among the first items of business: Confiscate all property.

His words were like a signal gun. Just three days later the first skirmish was fought in what would be a four-year bloodletting, freighted with class hatred. Among the victims were Nicholas II, his wife Alexandra, and their five children—murdered by Red guards.

I went to Smolny room No. 67, the teacher's apartment that Lenin used as an office before transferring his government to more central

Cradle of the revolution, Leningrad is still Russia's most politically restive city. Built along the Neva River (above) by Russia's great westernizer, Peter the Great, the city remains a major center of Western influence. Celebrating the city's founding in 1703, actors portray Peter, his empress, and their court (below). Many Leningraders want to restore the city's name to the original St. Petersburg or the more Russian Petrograd, as it was known from 1914 to 1924.

Crime and corruption his beat, Aleksandr Nevzorov interviews an accused rapist (top) for the millions who watch his TV show, Six Hundred Seconds. *Infuriated by his aggressive style, the suspect jumped for the journalist's throat but was restrained. In December, pursuing a tip for "secret documents," Nevzorov was shot and wounded by an unknown assailant in a remote part of Leningrad.*

Moscow. On a desk is an upright typewriter, brand name Underwud —*Underwud*. Lenin's first commands were pecked by a clerk on this U. S.-made machine.

Valentina Tiutcheva, keeper of the hallowed Smolny rooms, believes that if Lenin and his colleagues were alive, they could revive the party. "Whether such people exist today, I do not know," she said wearily. "It worries me so much, not because I am a communist but because millions of people died for communist ideals."

Valentina remembers better days. "In 1965 the shops were full of sausages, cheeses, and caviar, red and black. And chocolates. And all kinds of clothes, all kinds of fabrics." Many Russians share her nostalgia.

"The guilty should be blamed for what has happened," Valentina added, acknowledging that some of the blame must be accepted by the Communist Party.

Party bosses who should have been trying to improve goods and services had turned lazy, accepting the status quo as they accepted their

special rations of sausage. The economy stagnated. When Gorbachev relaxed the system of policy, party, and penalties that held all together, it simply collapsed.

Industries ground to a halt for want of parts and supplies. Wages went up anyway. Last fall whole regions were withholding goods—and getting away with it. Karelia, in the north, stopped shipping paper and timber because it wasn't receiving food from the south. Though Gorbachev increased prices to collective farms, Leningrad's meat supply shrank by 27 percent, Moscow's food by 40 percent. Journalists divined in this agony the hand of hard-line communists determined to smother the "democratic plague" in these cities.

The truth was always spoken by dissidents. Now the whole Soviet people are dissident. —POLITICAL RALLY SPEAKER

In raucous reunion in Moscow's Gorky Park veterans of the war in Afghanistan exchanged bear hugs and passed the vodka.

Viktor fingered his campaign medal. "Gorbachev's reward to the soldier internationalists," he said sarcastically.

Though Gorbachev ended Soviet involvement in Afghanistan, he earns scant respect from the veterans, for he allowed it to continue during his first four years in power.

To another veteran, Pavel, the war, which in a decade involved perhaps a million Soviet troops, was "just a testing field for weapons—American weapons, British weapons, Russian weapons." Like the Vietnam War in the U. S., this one was unpopular at home. "Young men going into the army should know that war is dirty," Pavel added, "so they won't be fascinated by medals and uniforms."

If the army isn't sacred in Russia today, what is?

Is the Tchaikovsky piano competition sacred? When an American contestant, Kevin Kenner, started to play Tchaikovsky's Piano Concerto No. 1 in the finals last year, he heard the audience hiss. It had nothing to do with him; the serious music lovers were telling the accompanying orchestra that they knew the brasses had muffed their opening notes.

This happened contestant after contestant. All finalists must play the piano concerto. All could. The orchestra, alas, could not.

Instead of commissioning a first-class Moscow orchestra for the prestigious international contest, the arrangers hired a provincial aggregation, from Rostov. Critics suspect an old-boy network was operating. (Despite all, Kenner managed a third-place tie.)

With the collapse of the command system, the Tchaikovsky competition has become one more thing—like soap factories and vodka distilleries—afflicted with the national malaise.

Around the old Moscow of rigid regulation a new Moscow spurts chaotically. Desks and perhaps a computer transform apartments into outposts of rampant opinion, where "informal" (nongovernment) organizations issue tracts and plot the end of communism.

This is not always democracy at work. In a flat hung with icons, Dmitrii Vasiliev condemns the 1917 revolution as a Zionist plot to subvert Russia, citing such Jewish leaders as Leon Trotsky.

Vasiliev heads one of the anti-Semitic organizations called Pamyat (Memory). The boss of a more virulent Pamyat group speaks of trying Jews for "crimes." As he says this, he motions as if wielding a machine gun.

Russian anti-Semitism seems to revive in hard times or when the government needs a scapegoat—one reason that Jews are emigrating at the rate of 10,000 a month.

Then we have Sergei Iurkov-Engelhard, grandson of a tsarist army colonel, who says, "Russia has no democratic tradition. Russia cannot be ruled any way but by a monarch." Iurkov's monarchist party hopes to bring a Romanov kinsman now living in France to the throne. Quite a few Russians think a new tsarist regime would be best for Russia.

Many "informals" believe they are spied upon. "I can't tell you more about our work than the KGB already knows," Iurkov said, rolling his eyes toward the ceiling of his flat. If I looked out the window, he said, I would see a white car. "It is always there when we have visitors." I looked—and saw a white car.

SURVEILLANCE would be in keeping with the KGB's Big Brother role. And though the gulag is officially closed, many a citizen still looks nervously over his shoulder. For example, Slava, who entertained me with a night of witty conversation—and then was afraid to write his name in my notebook.

The KGB, or Committee for State Security, acknowledges an image problem. So it created a public-relations department. Anything seems possible now in Mother Russia.

Not quite Siberia, but close, the northern reaches of European Russia boast the requisite rigors of climate for Soviet penal colonies. South of Archangel, a high-heeled guard escorts her ward from one such prison to a nearby farm, where he will deliver potatoes for planting. Part of the recently reformed

system of gulags, the camps in Archangel Oblast now hold very few political dissidents. However, the Soviets are finding ready use for the old camps as they run out of space for common criminals, whose numbers are rapidly multiplying in a much publicized crime epidemic.

Black earth of central Russia underfoot, the cows come home to Tersa for milking. Once home to about 5,500 people, the village today holds only 1,500. Resident Raia Ragoshkina (bottom) cherishes visits by her granddaughter Iana from the city of Voronezh, where she and her parents moved to seek a better life. It is in villages like Tersa that Russian reformers hope to initiate a transfer of land and property from public to private ownership.

I dropped by the central KGB building, the former Lubianka Prison in downtown Moscow, to have coffee with Maj. Gen. Aleksandr Karbainov. Though he once policed minorities, the general seemed the archetypal PR man: expansive, gregarious. He wore a Western-tailored suit, smoked Marlboros, and exuded candor.

How many Soviet citizens have been caught spying for the West in the past seven years? Thirty. He was sure the United States prized the aircraft-electronics secrets that one spy provided—"His account in a foreign bank received two million dollars. You know your military wouldn't pay so much for nothing."

The general acknowledged that the KGB has paid substantial sums to American spies. "Intelligence is intelligence," he said.

Today the KGB wants to emphasize—here comes the PR message—"its humane activity and observance of laws." *Perestroika*, Gorbachev's policy of restructuring, "assures public control of the security organs so that nothing such as unfortunately happened before will ever be repeated."

Nor should we think of the security organs as bloodthirsty in those times—the Stalin years, the 1930s to 1953, when millions were executed or vanished. "There was strong opposition to this within the security system."

And, of course, in the 1960s and 1970s it wasn't the KGB's fault that dissidents were jailed for speaking out; the secret police were merely carrying out the law.

One cannot help thinking in the Lubianka's quiet corridors of all the citizens who entered its doors and never came out alive. But now, I was assured, the prison cells have been converted into office and archive space.

I departed in wonder. Was this Moscow or Madison Avenue?

AND IS THAT WALL STREET on the other side of the Moscow River from the Kremlin? The sign says Pyatnitskaya Street, but one meets here such men as Evgenii Rapoport, fierce advocate of private enterprise.

Pardon; make that public enterprise. "Our bureaucrats are very afraid of that word 'private,' " he explained.

"Public enterprise" a couple of years ago meant small cooperatives that made shoes or perhaps ran a café. Now it also means companies owned by . . . stockholders. Freebooters haven't waited for the socialist bureaucracy to be dismantled; they've already plunged into capitalism.

Rapoport is vice chairman of the Cooperative Stolichnyi Bank, established by entrepreneurs to lend rubles—usually a million or more—to other entrepreneurs. Interest rates are daunting: as high as 25 percent, depending

on the risk. Even so, several Stolichnyi customers are prospering in fields where state services lag, such as auto repair.

"Socialism, capitalism—it doesn't make any difference what the 'ism' is called," said bank customer Georgii Golubchikov, whom I met farther down Pyatnitskaya Street. "The main thing is to live better."

Boss of a construction concern that is doing well—12 million rubles in business in two years—Golubchikov pays himself 2,000 rubles a month. This is a goodly $3,600 at the official exchange rate but merely $100 on the black market. Nevertheless, that's 800 rubles more than Gorbachev gets, I noted.

"Yes—because I work harder. And the results of *my* work can be seen."

WITH PLENTY OF RUBLES burning pockets and little for sale, Moscow's economy has become a shambles. Taxi drivers in the petty mafia operating around Intourist hotels accumulate fortunes—a fortune in this case being about $30 a day. This is what my friend Misha averages in hard currency from such customers as American journalists and Japanese and German businessmen. At the black market rate, 20 rubles to the dollar, his daily take is twice the *monthly* salary of a mid-level bureaucrat. "I take my girl to nightclubs," Misha said. "I can get all the vodka I want. I'm thinking of going to Germany to buy a used Mercedes."

College kids have seen the power of the *big mak* and the *chizburger*. A McDonald's employee named Sergei earned 350 rubles a month working between school terms—more than his father, a teacher. "I think I want to be a businessman," Sergei declared.

Biznesmen used to be a bad word. Now some Russian businessmen drive foreign cars equipped with telephones. The Soviet Union has spawned tens of thousands of ruble millionaires. Much of that wealth probably came from shady deals in foreign-made VCRs or automobiles, even drugs.

Religion is the opium of the people.

—KARL MARX

Every day they come—Olga, Aleksandr, Galina, Boris, seekers of the faith. On a Sunday they stand outside the Trinity Church near Moscow State University at nine, waiting for a priest to beckon them to the baptismal urn.

A woman in pink exercise togs smiles at them as she pedals close to the church door on her bicycle. Dismounting, she bows toward the sanctuary, crosses herself, then rides on.

There will be 28 baptisms today; yesterday there were 20. Tomorrow will bring more. Many are children escorted by parents. Others grew up in homes where religion had been abandoned to comply with the government's policy of atheism. For example, Natasha, age 56, a covert believer, long afraid she would be punished at her job if anyone found out.

Now the government has put such fear to rest. Gorbachev began relaxing the government's grip on the church in 1987, returning centuries-old cathedrals that had been used as warehouses or office space. The number of Orthodox parishes in Moscow has doubled to nearly a hundred; in all the Soviet Union there are now 11,000—a fraction of the possibly 150,000 that existed before the revolution, though priests are confident the number will continue to grow.

"The state is going to make the church free, and the church is going to help the government make the people more moral," declared a bishop at the 700-year-old Danilov Monastery, recently reopened.

Forty-five miles north of Moscow, in the town of Zagorsk, the shimmer of domes announces the Trinity Monastery of St. Sergius. Founded in the 1300s, it was once one of Russia's most important ecclesiastical centers.

St. Sergius was allowed to reopen after World War II—Stalin's thank-you for Orthodoxy's patriotism. From that time, it has been one of three that prepares men for the priesthood, a modest endeavor when the number of churches was small and static. Now its academies are expanding to help meet the sudden demands for priests, choir leaders, and icon painters. Nine hundred study for the priesthood by correspondence.

"I want to serve the people," declared seminarian Mikhail Mironenko, fixing me directly with eyes of Slavic green. He believes God called him to the priesthood—"I can't look at it any other way."

The Volga is mourning; it is pleading for help.

—ENVIRONMENTALIST

Centuries before the Slavs arrived, other peoples—Bulgars and Magyars—dwelled along the middle and lower Volga River south and east of Moscow. In Kazan, a Volga port

Well clad is well met for a group of teens in Volgograd, chic in Western styles and trademarks. "It's very touching," the author says of Soviet youth and their single-minded pursuit of fashion trophies: jeans, polo shirts, and—grandest prize of all—Walkman cassette players.

450 miles from Moscow, minarets share the skyline with church domes. Some scholars believe that Islam reached here before Christianity reached Kiev. Here Mongol cavalry swept across the Volga in 1237 to hold sway over Muscovy for more than two centuries.

Ivan the Terrible captured Kazan in 1552, and the Volga became Muscovy's trade route to the Orient. Under communism it was the main stem of an industrial realm manufacturing trucks, aircraft, plastics, and chemicals.

Russians have long been passionate about their Mother Volga, a mighty blessing of a river. Reaching south to the Caspian Sea, it beckoned into far northern tributaries—2,300 miles from the sea—the wonderful sturgeon and its kin, the snout-nosed sevruga and the great beluga, prized for both flesh and caviar. A beluga at age 20 might weigh half a ton and bear eggs enough to feast a wedding party of hundreds.

Today Volga passion has turned to anger.

Not far below Kazan the river opens into a veritable inland sea, nearly 20 miles wide, backed up by one of eight Volga hydroelectric dams. I followed this string of lakes south until, at Volgograd, I was below the last dam. This is just 275 miles from the Caspian, and this is what the once great sturgeon spawning migration has come to: a hop-skip.

It is a man-managed migration now, depending largely on hatchery-produced

fingerlings. And it is nearly man-killed.

In the frothy water spilling from the Volgograd dam, fishermen hustled hundred-pound specimens onto a research boat. Technicians weighed them, checked for disease, took fin samples to reckon age. One of the five females opened that morning bore not iridescent black roe but a 25-pound egg sac of gray mush. "About a thousand dollars' worth of caviar wasted," fisheries biologist Iurii Dolidze said with disgust.

Pollution is apparently the major cause of rotten eggs, frequently seen in the caviar harvest. The river carries heavy metals such as mercury and cadmium, petroleum residues, and PCBs from factories—plus fertilizers and pesticides from farms.

Engineers had fitted the dams with elevators to hoist sturgeon upstream. But the reservoirs were heavily polluted. Females could not find their way and aborted. Or the eggs they deposited became crow food when reservoir levels were lowered to meet power demands.

Fewer and fewer fingerlings started the journey back to the Caspian, until fishery experts gave up on maintaining the migration.

"I'm not boasting of anything today," Iurii said with candor unthinkable a few years ago. "I have nothing to boast of."

With the harvest declining, few Russians see the prized caviar at all; most is exported to earn hard currency.

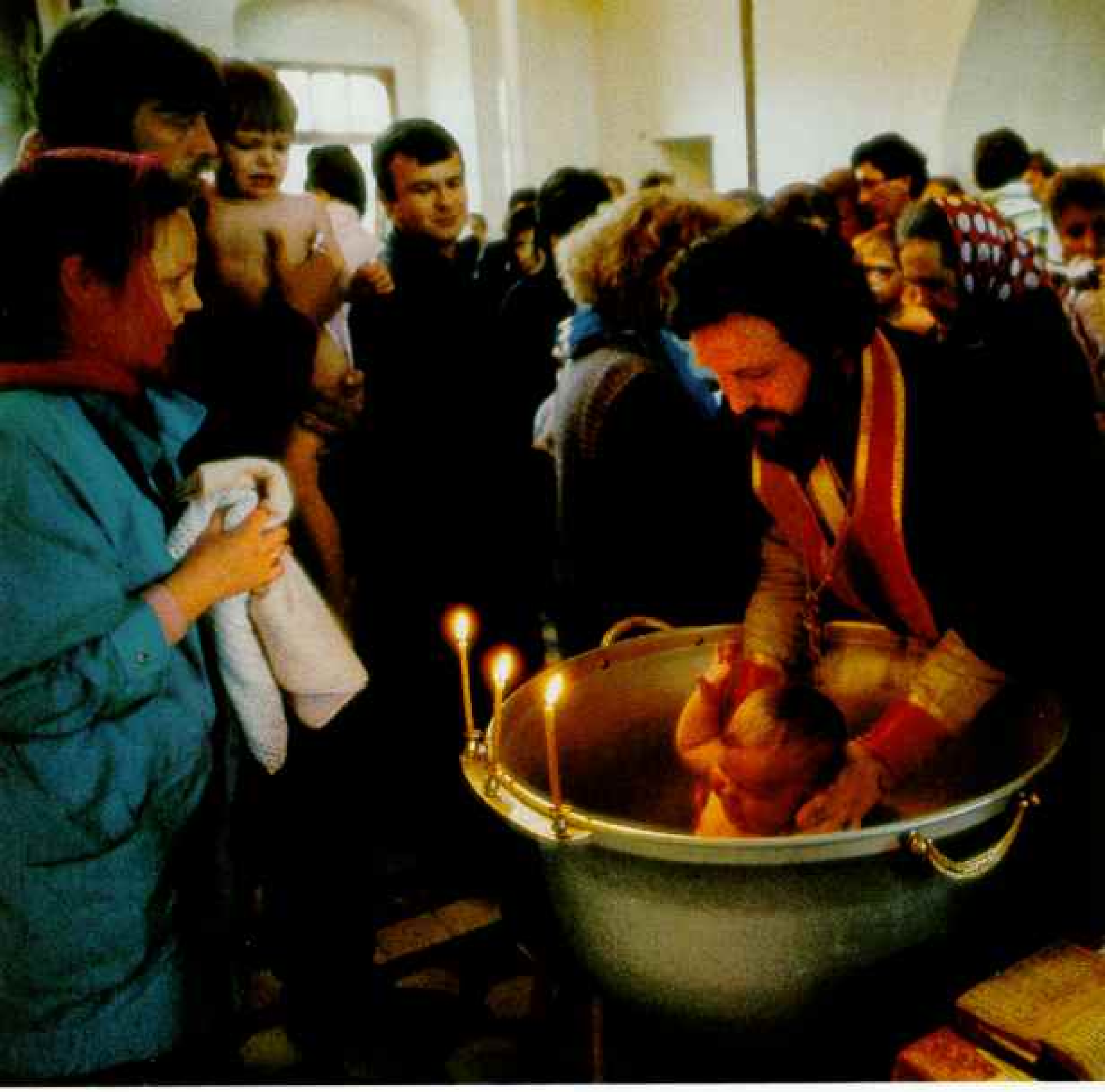
The Ideals of V. I. Lenin Live and Win.

—NEON SIGN ON THE VOLGOGRAD POST OFFICE

In Volgograd—the name was changed from Stalingrad in 1961—water and air pollution helped make the Ecology Club a political powerhouse.

"We presented our complaints to Communist Party committees, but they never did anything," club member Leonid Krupatin said. In last year's elections the club took its case to the voters. Leonid is one of 12 club members who won seats on local and regional councils; another went to Russia's Congress of People's Deputies in Moscow.

Mother Russia was still angry when her likeness was raised in the 1960s on the site of the Battle of Stalingrad. Demolished during combat with the Germans in World War II, the city—now known as Volgograd—was totally rebuilt; new factories and apartment blocks extend for 40 miles along the Volga River.



One night I quietly eased into a meeting room in the Hall of Political Enlightenment, a communist training center. Thirty men and women were demanding office space in this huge building for their own brand of enlightenment, the Democratic Platform. In the upside-down Soviet political spectrum, which labels free-enterprise advocates "leftists" and standpat communists "rightists," the Democratic Platform is in between. Some members have torn up their party cards; others want to work for change within.

"As long as we are a part of the Communist Party, we have the right to use this building!" a man cried.

Another: "I have been a member of the party for 30 years! I paid it thousands of rubles! So how do you have the right to throw me out of this building?"

The target of these shouts was a building manager, a 50ish woman who answered with equal vehemence: "You are not allowed to sit here, to be here!"

For the party to share its hall with reformers would be opening the henhouse to the fox. But I admire these activists; some had been warned that they would lose their jobs if they persisted.

I like Volgograd too. The whole city had to be rebuilt after World War II, when, as Stalingrad, it was the locus of the Red Army's heroic stand against the Germans. Tank turrets on

"They don't know why, but they know it's important," says Father Georgii Studyonov of his burgeoning congregation, who flock to his resurrected church in southwest Moscow to experience the sacraments of marriage and baptism (left). Meanwhile, the bells of St. Basil's near the Kremlin are breaking their long silence, as Russia turns back to the church.

stone pillars mark the limits of the German advance in 1942—to the old downtown—in one of the war's most decisive battles.

In the rebuilding the city was patterned with Spartan apartment blocks. But it also got parklands and plane trees that help cloak some of the sameness.

CROSSING THE VOLGA on a summer day, the ferry *Moskva-44* took pale passengers to a sandy beach and brought away bathers red as lobsters. Upon this island Sahara were soft, fat grandmothers straining the confines of their swimsuits and obliviously naked children. Leggy teenage girls (not yet endowed with the Russian plumpness) preened before the boys. There were boom boxes, sand castles, paper hats.

And five black goats, picking at the jetsam. They eyed a family with a watermelon and settled down to await developments.

Yes, people still swim in the Volga, and I did too. Some things are more precious than life, or so it seems at the moment. You just forget about heavy metals and the 24 smokestacks vying on the horizon with the awesome Stalingrad memorial. The love of Mother Volga is real and has priority.

It is a romance with a river great and historic. It is freedom for an afternoon, and cool water and hot sand.

There will be time enough, later on, to ponder the uncertain future. No one can foretell events in Russia, except to say that her difficulties are far from over. The irritating shortages of things like cigarettes will continue; the economy cannot be repaired overnight. And the food shortage is so severe that many experts predict riots in the cities this winter. There is the prospect of mass unemployment if inefficient factories are shut—a frightening specter for unaccustomed Russians. Whatever else the communists did, they provided jobs and paychecks. Though the party has lost tens of thousands of members, it remains strongly entrenched in the bureaucracy, in a position to throttle reform.

Many Russians believe old-line communists will indeed try to thwart the movement to democracy and the breakup of the Soviet Union. And some inevitably will applaud, recalling that the party was once good, very good, at enforcing order. In sum, Mother Russia's future is clouded by the prospect of chaos and privation, even civil war and the return of totalitarianism.

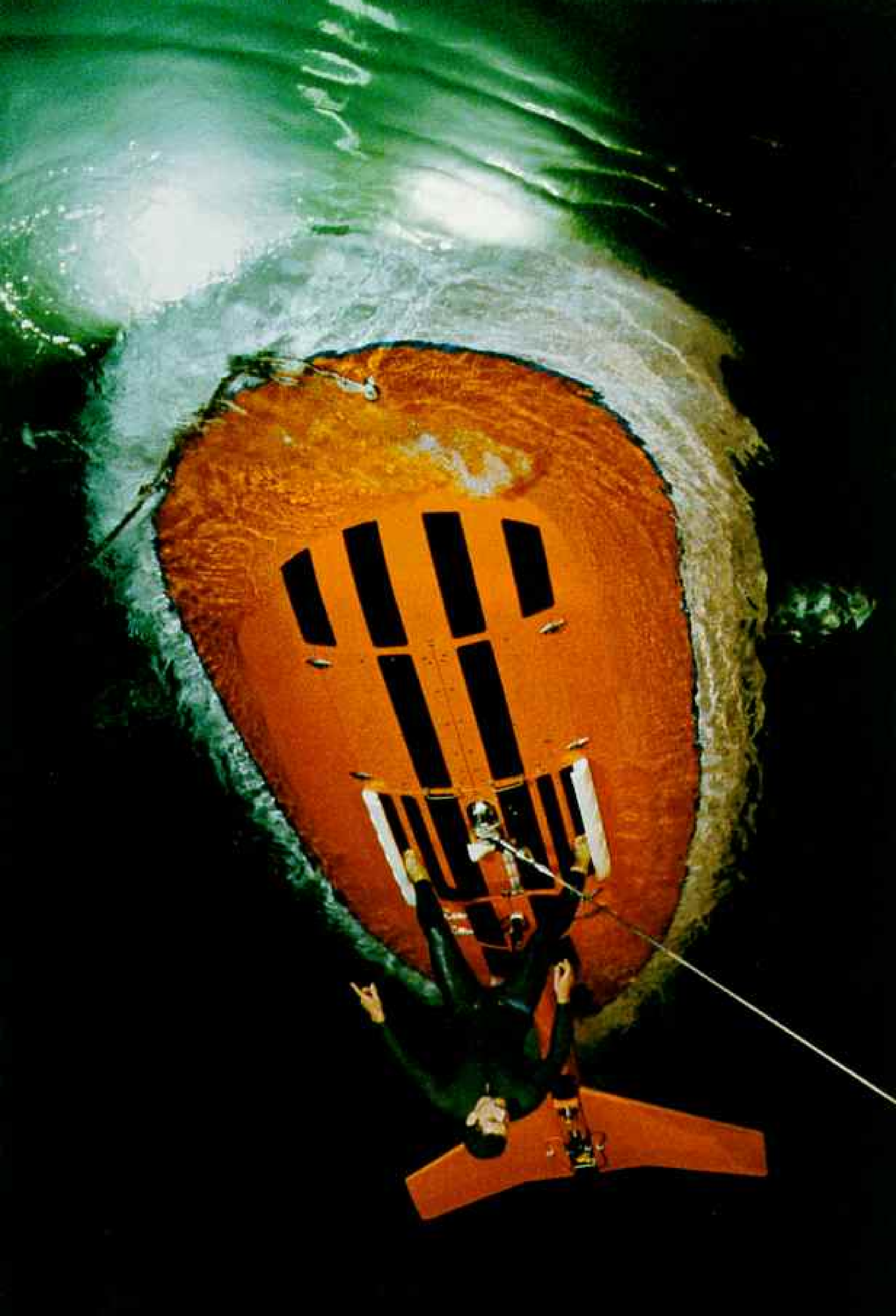
She is like the Volga: abused, cruelly abused, and loved. And though her people contemplate a future dark as this poisoned river, they have proved in their galloping revolution that they have heart. They may yet win back their soul. □

ALLIES IN THE DEEP

Flags join on a Soviet crewman's hard hat—symbol of a new spirit of cooperation. The director of Soviet manned submersibles reports on joint scientific missions with Americans, including descents to study fish 6,000 feet down in the Indian Ocean.

ANATOLY SAGALEVITCH (LEFT)

By ANATOLY SAGALEVITCH
Photographs by EMORY KRISTOF
NATIONAL GEOGRAPHIC PHOTOGRAPHER



SOVIET DEEP SUBMERSIBLES

WE SPEND 12 hours cramped together in a tiny metal sphere three miles deep in the ocean. But outside our submersible the drama of the sea holds our attention like a vise, and time goes like a snap of the fingers. I am Russian; my crew is North American. No matter. A brotherhood exists among the world's oceanographers, especially among those few of us who journey to the ocean depths.

As head of the Laboratory of Manned Submersibles for the P. P. Shirshov Institute of Oceanology in Moscow, I direct the largest fleet of deep-diving submersibles in the world, with four vessels. Our twin submersibles *Mir 1* and *Mir 2* can descend to 20,000 feet and can therefore cover 95 percent of the ocean floor; only three other subs can go as deep.

For ten years I planned with National Geographic's Emory Kristof to match our subs with his expertise in deepwater photography. Finally, in the spring of 1989, we set sail together on the Soviet research vessel *Akademik Mstislav Keldysh*, with *Mir 1* and *Mir 2* on board.

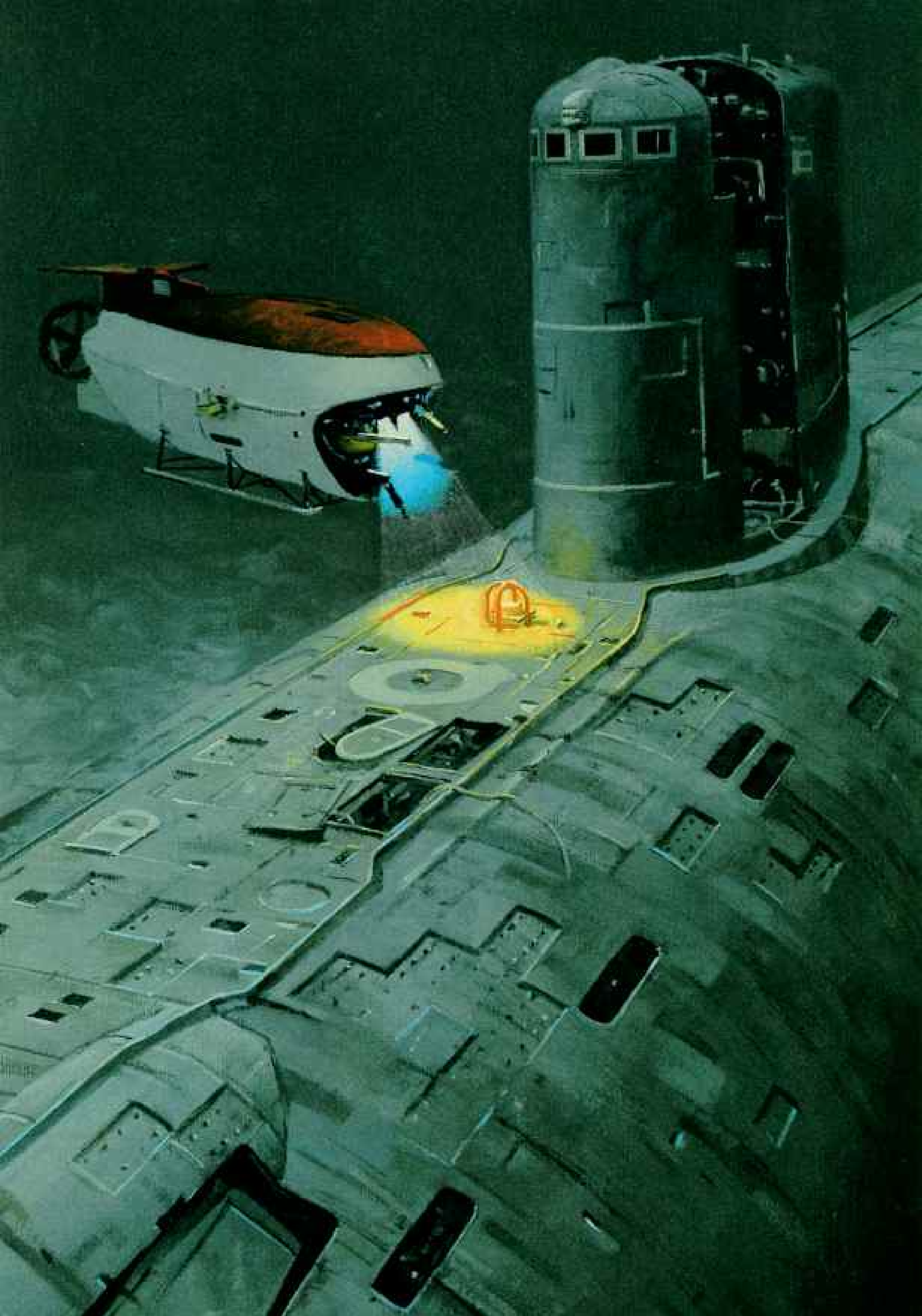
The *Mirs* are each 25 feet long and built around four spheres made of nickel-steel. One sphere holds the crew of three; the others carry seawater for ballast and trim. Power comes from ferro-nickel batteries. We can make five knots and hover at any depth. A color video camera is linked to an on-board display.

The *Mirs* are hoisted by crane to *Keldysh* with a single cable (left). Soviet pilot Andre Andreev, standing astride the hatch, coordinates the lift-up.

JOSEPH MACINNIS (ABOVE)

On March 12 we launched a trial deepwater rescue mission at the Mid-Atlantic Ridge. One submersible should be able to find the other, but this had never been attempted. *Mir 1* descended first, with me as pilot (above, at left), Emory, at right, and diving physician Joe MacInnis from Canada. After a three-hour free-fall into the unknown, we scraped bottom. *Mir 2*'s assignment was to find us—a pebble in a canyon—using transponder navigation and hydro-acoustical tracking. *Mir 2*'s crew: American photographer Ralph White and Soviet copilots Dmitry Vasilyev and Evgeny Chernyaev.

Time passed—three more hours. Bioluminescent plankton swirled around us like stars. As I peered into the darkness, two bright lights suddenly emerged (top), and our sister ship touched down 20 feet away in a cloudburst of sediment. Six men from three nations stared at one another from their mirror-image machines.



NUCLEAR SUB'S MURKY GRAVE

THE ILL-FATED Soviet nuclear-powered attack submarine *Komsomolets*, reduced to a mass coffin of titanium, rests on the lightless bottom of the Norwegian Sea. On April 7, 1989, carrying a crew of 69, it caught fire and sank; 42 men died.

Weeks later, after measurements for radiation leaks in the area proved negative, a Soviet crew set out in *Mir 1*, with heavy hearts, to find the submarine itself. But currents buffeted us, and after nine hours' searching we found nothing.

Only on the second dive, after adjustments to the transponder navigation system, did we find *Komsomolets*, at about 5,500 feet, cracked aft but upright. The inset photograph shows windows in the sail. Our bottom analysis, we were relieved to find, confirmed that radiation levels were still normal.

Later we gathered on the *Keldysh* in sorrow and lowered a wreath of red carnations into the sea. I thought: It could have been my son down there.

PAINTING BY RICHARD SCHLECHT;
INSET PHOTOGRAPH BY ANATOLY SAGALEVITCH

TITANS CLASH IN THE ABYSS

CHEEK TO JAW, two sharks tussle just seven feet from our own faces, pressed in wonder against the portholes of *Mir 1*. For 17½ hours, the longest dive yet in the submersible, marine biologist and shark expert Eugenie Clark, Emory, and pilot Evgeny Chernyaev witnessed a gathering of the deep ocean's oversize and baleful creatures, as we sat perched on a narrow oceanic ledge 3,800 feet deep off Bermuda. To attract animals, we brought down bait—hundreds of pounds of tuna filets in a steel cage and bags of blood and entrails.

These two primitive sixgill sharks, about 12 feet long, were

circling the bait cage in opposite directions and appeared to collide unwittingly. The rope, caught in the action, holds the tuna bait. Sixgills can grow to more than 20 feet; primitive sharks have changed little in the past 350 million years. Twenty-one sharks of six species, some rarely seen in shallower water, appeared from the gloom and orbited the bait cage.

The tuna also attracted large red crabs, fish, squid, and a rare black eel that would have given credence to ancient tales of sea monsters.

Emory developed this technique of using submersibles to offer a free lunch on the ocean floor in the mid-1980s as part of his long-range study of deep-ocean life called the Beebe Project. Before he began to bait, divers in submersibles saw few large animals at such depths.

"These creatures breed, live, die in the deep ocean," Emory says. "It makes you wonder what else is down there."

KNOWLEDGE FROM THE SEA

A FLOATING RUSSIAN city block, the *Akademik Mstislav Keldysh* holds 18 laboratories and 130 people, including a joint Soviet-U. S. scientific party of 65 and a crew of technicians, cooks, and bottle washers. Many of the crew are women. Off Bermuda (below), our motorized rubber dinghy maneuvers to prepare *Mir 1* for its recovery.

The *Keldysh* is the flagship of the Institute of Oceanology in Moscow, headed by Vyacheslav Yastrebov (right, at left), here monitoring operations on deck. The institute operates six research vessels of similar size and six smaller ones for the Soviet Academy of Science.

Keldysh is air-conditioned and quite luxurious. On its globe-circling voyages the same crew stays at sea for as long as six months, returning to home port in Kaliningrad only when *Keldysh* does. Port stops are few because foreign hotels and air travel mean spending precious hard currency, carefully husbanded by the Soviet government. We must depend on the Soviet airline, Aeroflot, to bring a change of scientists. In contrast, American oceanographers sail on smaller ships, with scientists and crew coming aboard at foreign ports on a brisk rotational basis.

As Moscow has shifted toward a market economy, the academy has made plans to contract research ships out for scientific use in order to earn that hard currency and keep our

operations moving ahead.

Sometimes the *Keldysh's* American and Soviet technicians had difficulties because two incompatible electric systems had to be married under the sea for the *Mirs* to handle American cameras and lights.

Party time needs no translation. On the swimming-pool deck (below), Americans and Soviets alike revel in the traditional Equator-crossing ceremony. I preside as King Neptune, with bullhorn, to recite poems written for each initiate of the crossing.

But serious issues confront us. Wrecked in the oceans are five nuclear submarines—three Soviet and two U. S.—still armed with some of mankind's most feared weapons. These are corroding, and radiation leakage is only a matter of time. Our Institute of Oceanology has made two proposals: First, there should be an international effort to clean up the nuclear waste from these accidents; second, areas such as prime fishing grounds should be off-limits to all nuclear submarines.

We have, at least, begun to work together. "*Mir*," after all, means "peace" in Russian. □

HARVEST

The low sweep of a crop duster releases fungus-killing sulfur onto a vineyard where a subdivision edges close.

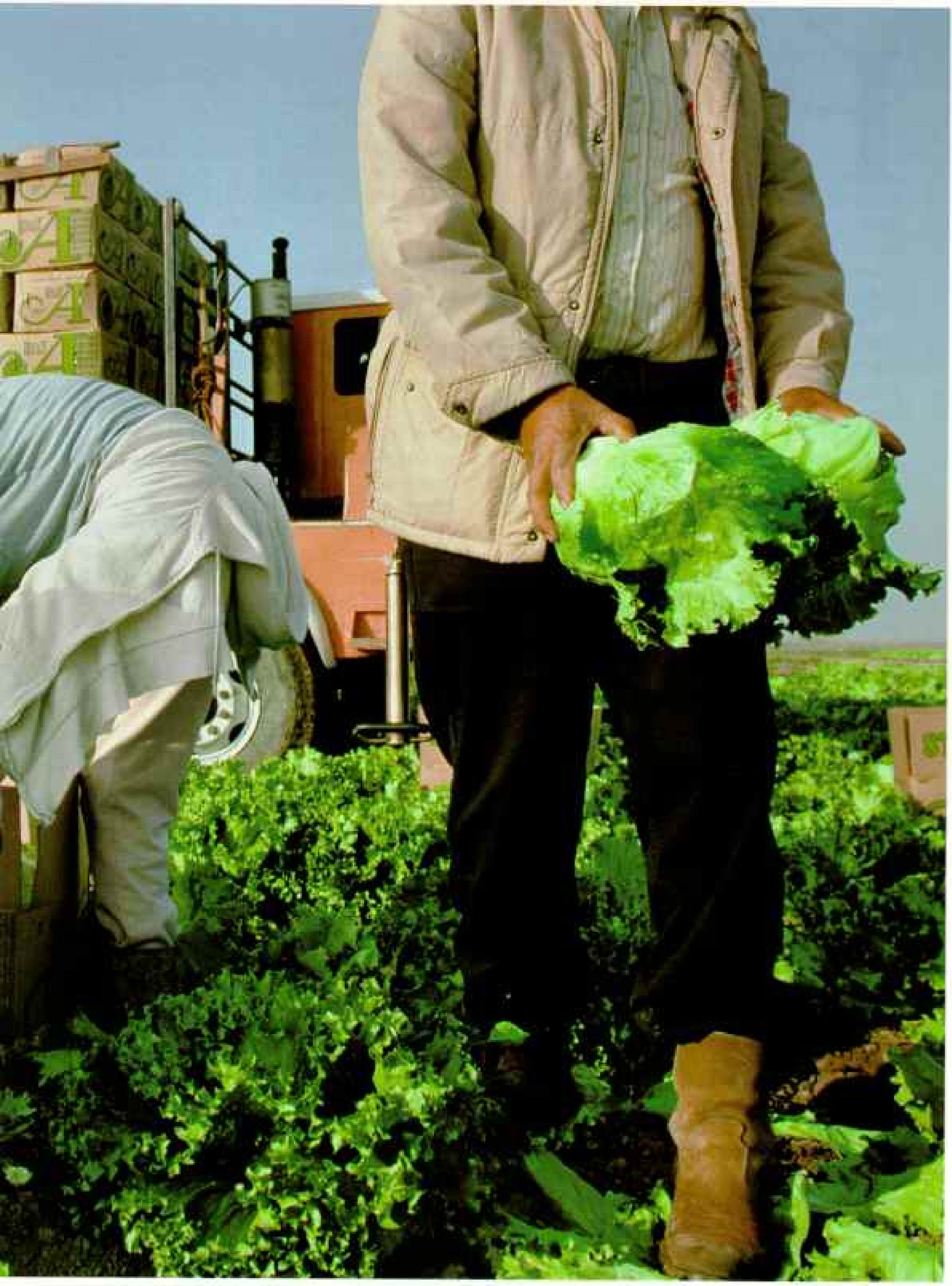
By WILLIAM S. ELLIS ASSISTANT EDITOR

# of CHANGE

Urbanization challenges agriculture in California's Central Valley, a cornucopia that feeds America.

Photographs by SARAH LEEN NATIONAL GEOGRAPHIC STAFF

Experienced hands take extra care readying iceberg lettuce for shipment from the Santiago Ranch near Bakersfield to eastern United States



markets. Lettuce, broccoli, and cauliflower are just a few of the more than 250 agricultural commodities produced in the Central Valley.

HERE, IN THIS VALLEY of sweet acres, the farmlands push right up to the shoulders of Route 99 where it runs from Red Bluff in the north to the honky-tonk south of Bakersfield, up and down the flat land in a straight line almost. Below Sacramento it is two lanes one way and two the other, and in between a barrier of oleander rises in flowering fits of scarlet, pink, and white.

The almond trees stand in rows that seem to reach to the distant mountains, and later, when they are in bloom, the color will be like a glorious benediction upon the land. There are grapes (are there grapes!) and tomatoes, oranges and cotton, and roses even—commercially grown roses covering as many as 3,000 acres in one place (and I saw not a trace of black spot in the lot)—counted among the 250 or so agricultural commodities grown here.

Plentiful water and an unfailing sunny warmth work magic in the making of food and fiber in this place in California called the Central Valley. Accounting for at least two-thirds of the state's 17.5-billion-dollar annual business in agriculture—by far the nation's largest—the valley is without equal in all the world as an irreplaceable resource for farming.

Of course, farming in the Central Valley is not to be confused with taking a load of vegetables to market in a pickup truck. Although the average farm size in the valley is less than 500 acres, there are many operations where the acres are counted in the thousands, those that have come to be known as "factories in the field." The largest producer of table grapes in the nation is here, and so is the one for almonds, and for tomatoes for processing. This is where most of the raisins come from, as well as almost all the figs and pomegranates and other such sybaritic delights.

THE CENTRAL VALLEY, consisting of the Sacramento and the San Joaquin Valleys, starts in the north around Redding, where walnut orchards claim much of the farmland. Bakersfield is at the southern end, and flanking the valley are the Sierra Nevada on the east and the Coast Ranges on the west. More than 400 miles long, the valley is less than 50 miles across in most places (map, page 57).

Rich as it is in agriculture, this 18-county region is succumbing to the pressures of a state struggling to control its excesses. In the Central Valley a harvest of profound change has begun, including

- a fast-paced spread of urbanization;
- agricultural activity nearing a peak and approaching a downturn;
- a new and sharp sensitivity to the environment, with pesticide usage declining and organically grown foods on the rise;
- a dogged pursuit of reform in the pricing and distribution of water.

Central Valley farmland is being converted to urban use at a rate approaching 20,000 acres a year. An influx of people is making cities out of the towns, out of places like Tracy, Manteca, and Ripon—even places where, more often than not, an aged setter lies in the road and snaps at bothersome bees on steamy afternoons.

Many of those moving to the valley are workers in the San Francisco Bay area or in the sprawl of Los Angeles. They drive long distances for the commute, some leaving as early as 4:30 in the morning and not returning until after sunset.

But the reward for that hardship is affordable housing, a golden grail in a state where more than 2,000 people arrive each day to take up permanent residence.

"The cost of living has increased here, but compared with the bay area we're still a bargain," said Janet Carlsen, Mayor of Newman, a valley town sitting at about the halfway point between the Sierra Nevada and the Pacific. "We're getting many new people in Newman, mostly commuters. Our population has pushed 4,000, and with completion of the seven new subdivisions now in the works or on the planning board, we will have doubled the number of houses here in five years."

At Tracy a specific program has been drawn up to guide the swell of growth and development. But it remains to be determined if the rise in population will strengthen the bonds of community, the sense of belonging.

"If you look at the pattern of commuters in California, you will find that they seldom build an alliance to the community," Michael Locke, Tracy city manager, said. "Probably 80 to 90 percent of our new homebuyers are commuters to the bay region. They're at their job site for eight or nine hours a day, and they're on the road for another three hours. They don't join the community, because they don't have time."

Almond trees wear a sunset blush under the foothills of the Sierra Nevada. U. S. almonds, grown exclusively in California, are exported to foreign markets, chiefly Japan, Germany, and the Soviet Union.

IT'S BETTER, believe it, to take not to the roads but to a field here early in the morning. For at that time, in that dew-washed place, a person can traffic in some pleasing thoughts. It is a time before the pickers have arrived, before the dust is raised, a time then to reflect on the certain goodness of this threatened valley and to wish that urbanization could be barred forever.

Otherwise, what's to become of the orchards where apricots and pears and nectarines grow in such blessed abundance? And the peaches: But for the flower of the southern magnolia, what thing borne by a tree is more beloved than the peach? Of course it would be nice if the peaches were allowed to ripen instead of being picked and sent off to stores while still hard and pale and fuzzless.

Picking green has to do with perishability, and efforts are made to get ripe produce to market before it rots or is badly bruised. Tomatoes have been genetically altered to block the gene that makes the fruit go soft, but it will take years before the new strain is available in the marketplace, pending extensive testing and approval by the Food and Drug Administration.

Meanwhile, Thomas F. DiMare and other growers continue to work to develop a tasty, but unaltered, tomato that can survive the handling and the trip to market.

"Our primary focus, our number one goal, is to find a better and more flavorful tomato, and we're making progress," said DiMare, president of the DiMare Company, a large-volume grower of fresh market tomatoes in the Central Valley. "It's just that the progress we are making is not fast enough to satisfy the expectations of the consumer.

"If I were to give you a box of tomatoes from our facility, you'd say, 'Hey, these aren't bad.' They're not as good as the ones you get out of your own backyard, but they're not bad.

"Then you go to the supermarket and buy

those same tomatoes a week or ten days from now, and they're not the same. They've been mishandled.

"The tomato is a tropical fruit, and it should not be refrigerated. Store it at a temperature below 55 degrees and it loses all flavor. That's one of the fundamental problems we face."

MORE THAN 60 YEARS have passed since the DiMare family obtained Peddler License Number 66 in Boston and started selling produce from a pushcart. Since then the company has become a multimillion-dollar agricultural giant, growing citrus, table grapes, and various vegetables, with operations in five states.

It is in the Central Valley, though, that the family operation is facing most fully the challenges of those who are calling for a new order in the conduct of agribusiness.

Concerns about the use of pesticides hang over the valley like an electrical storm, and growers are taking heed: For the first time in modern commercial agriculture in this country, there is a meaningful swing toward organic farming. And the door seems to be closing—somewhat—on the practice by the federal government of supplying water for irrigation at a highly subsidized cost.

The federal Bureau of Reclamation administers the gigantic Central Valley Project through which the arid acres of the valley are made marvelously productive by means of irrigation. Construction began in 1937, and with completion of the first phase in 1951 waters from rivers that flow in northern California became impounded in some 20 reservoirs with a total capacity of 12 million acre-feet, of which 4.5 million are controlled by the massive Shasta Dam that rises on the Sacramento River.

Today the waters course south to the farmlands of the valley through 500 miles of aqueducts and canals, and then much of that through sprinklers and other irrigation devices. And sometimes, with all that water at play in the sunlight, it seems like the valley is a crystal bowl.

The cost of the project has been enormous, largely borne by U. S. taxpayers. The law requires, however, that the federal government be reimbursed by the water users, over a long period of time.

But there is no interest being charged, and

that accounts for the highly controversial subsidy. It is because of the availability of this cheap water that cotton (a surplus commodity) can be grown in the Central Valley, with water that costs as little as $3.50 an acre-foot.

"The federal subsidy for water is obscene." Phillip Isenberg, a California assemblyman and, by his own description, an "environmental obstructionist," made it clear to me where he stands on the contentious issue of water for agriculture in the Central Valley.

"There is a smaller subsidy for irrigation water in the State Water Project," he said, "but rather than being obscene, that one is merely troublesome. One's a felony, the other

Ripe and ready for sorting, tomatoes move along conveyors at a Modesto cannery. A major processing center, Modesto handles tomatoes grown throughout the area.

a misdemeanor. It is because of these subsidies that we have had an explosion of agricultural land development, and with it have come all the attendant problems you can imagine.

"For example, because of the drain of water for irrigation, there has been massive destruction of river fisheries to the extent that many of the salmon runs no longer exist."

But there are changes in the offing, Assemblyman Isenberg concedes. "The federal government is no longer subsidizing new major water projects," he said. "Most construction costs must be paid by those who get the water and power—and that has made water projects prohibitively expensive."

Legislation to reform federal water policies in the Central Valley has been introduced in Congress. The House of Representatives and the Senate have both passed differing bills, and a final resolution is still pending. One bill would have tightened loopholes in regulations limiting individual allotments of low-cost federal water to farms no larger than 960 acres.

Some large-scale growers have met the current requirements by breaking up their spreads into 960-acre blocks and shifting ownership to family members.

Meanwhile, for growers, the system remains one of embracing benevolence. It has added a new dimension to efficiency in farming. Ordinarily, there is a fervent wish in the valley that it not rain in the summer, for that tends to interfere with the programmed release of irrigation waters.

But the drought in California has lasted more than four years, and the empty skies are being watched with growing apprehension.

The Central Valley's agricultural acreage is watered by two main sources: the state-managed California Aqueduct (above) and the federal Central Valley Project, including the Friant Kern Canal (map, right). The latter supplies subsidized water for irrigation—adding to a national debate over water policies.

OF THE CITIES and towns in the Central Valley, none is more charged with the spirit of change than Fresno. It sits as close to the geographical center of California as any city of size, and it is a place of old Armenians and young Southeast Asians, and all those ages and nationalities in between who came across the mountains, touched by visions of a golden land.

Detractors like to point out that in a national poll taken seven years ago to determine the most desirable place in the country to live, Fresno placed dead last. And indeed there have been times when the city seemed aswirl with the ambience of a bus station.

But now, preliminary results of the 1990 census show Fresno to be the fastest growing big city in the nation, having a population increase of 61 percent since 1980. Urbanization has swept in, along with a multitude of service industries.

"It is going gangbusters here," George Kerber, the city's recently retired director of development, said to me as scores of men and women outside his office sought approval of blueprints for development. The value of construction for the year seemed certain to surpass that of 400 million dollars for 1989.

"Sixty percent of the new construction is residential," Kerber said. "As we move into agricultural land, we are encountering serious problems with groundwater contamination.

Croplands under strain

ONCE an inland sea, the Central Valley—as the Sacramento and San Joaquin Valleys together are known—gradually filled with sediment that created fertile soil. Its irrigation has made California the leading agricultural state. Yet the basin, flanked by mountain ranges, now traps air pollution from urban centers. Large areas of farmland are in danger of becoming unproductive because of salt buildup in the soil. Consumer concern about pesticides has led some farmers to reduce their use and risk declining output.

Harvested and loaded, cotton awaits a trip to the gin. About 3,000 Central Valley growers produce the high-value crop, which is reasonably tolerant of salinity in the soil.

To dispose of salty irrigation drainage water, some farmers use holding ponds. Evaporation leaves salt deposits (bottom) that would otherwise ruin the soil.

Now, before a developer can build on this agricultural land, he must prepare an environmental impact statement and tell how he intends to correct any water-contamination problem. It can be very expensive."

To bring the water to acceptable standards, the treatment most often used is carbon filtration. The city—whose population now exceeds 350,000—continues to draw its municipal water from wells, of which perhaps 20 percent have been exposed over the years to the pesticides used in agriculture.

THE MOST PRODUCTIVE FIELDS of the Central Valley are those around Fresno; indeed the county of Fresno ranks first in California, and therefore the world, for bountiful agriculture. That could not have come about without a steady stream of workers from the south, up from Mexico to labor in the fields.

It is possible to hit the breakfast bar at a Denny's restaurant in Fresno and not hear a word of English; proof, if need be, that the Central Valley and all of California could one day be predominately Spanish-speaking, perhaps even by the end of this century.

The tinkling dialects of Southeast Asia are often heard as well. There are 30,000 Hmong alone, refugees from the mountains of Laos living in and around Fresno. They started to arrive in 1980, lured by word of mouth from relatives and friends. In just one year, 1982, some 8,000 made their way to the county. It is now the largest Hmong community outside Southeast Asia.

Elsewhere in the Central Valley tens of thousands of others from that war-scarred area of the world are seeking to make a new life. At Merced, between Sacramento and Bakersfield, I spoke to Houa Vang, a local Hmong leader. "We came here because of the land, because most of our people are farmers," he told me. "But many have lost their hopes because they cannot afford to buy land or equipment here. So, if they can find a vacant lot even, they will grow something there."

In Merced I came across a family of Hmong scratching in the soil of a plot behind a church. The father, a man of no more than 30 years, spoke no English, but with gestures he told me what he hoped to harvest. His motions were trailing ones, and then he touched the tips of his fingers to his lips. Clearly he had put strawberry plants in the ground.

As rich as the Central Valley is in agricultural production, most of the counties in it face financial crisis. Merced County is especially

hard-pressed to provide services. Some 11,000 Southeast Asians live there, of whom 80 percent depend on public assistance.

"We constantly run two to three times the unemployment rate of the state or the nation," John B. Cullen said. "Additionally, out of California's 58 counties all but five have higher median incomes than Merced."

Cullen is director of the Merced County Human Services Agency, and the burden falls on him as much as anyone to come up with 18 million dollars each year to meet the cost of welfare payments to the Southeast Asian immigrants in the county. Even with matching outside funds available, the county must cut programs such as libraries, parks, and probation services.

The way out, Cullen has concluded, is to steer the refugees toward self-sufficiency through education and training. Even then Merced is not prepared to lend itself as a base upon which to build the American dream. It is hoped here that once the Hmong are prepared with skills, they will move on to other states, possibly Wisconsin, or Georgia, where there are established Hmong communities.

Elsewhere in Merced, Hmong have managed to put together a parcel of four acres, and a hundred families work it. It is a community effort, and so there are no lines drawn, no transgressions. The clan system among the Hmong in Merced is highly developed, and unlike some Vietnamese settlements elsewhere in the valley, there is little crime or gang warfare among these refugees.

ASIANS are not new to the valley, of course. In the early 1880s perhaps half of the laborers in California agriculture were Chinese. They were drawn from the goldfields and from track work on the railroad. Without that supply of cheap manpower, the development of fruit and other specialized farming in the valley would have proceeded much more slowly.

The history of the Chinese in the Central

A migrant worker goes full speed to fill his sack with 80 pounds of fruit. At workday's end many migrants bunk in dormitories provided by the growers. Farm laborers, 80 percent of whom are Hispanic, follow harvests throughout the region.

Valley and other California valleys is marked by intolerance and ugliness.

In the late 1800s, when Congress passed bills suspending Chinese immigration and allowing for the deportation of Chinese who were in the United States illegally, rural whites joined those from San Francisco in taking the matter into their own hands. There was widespread rioting against the Chinese, leading to their flight from the fields.

The Chinese were replaced by Japanese who were recruited to work in the sugar beet fields and went on to make important contributions in farming and land management. By the end of the second decade of the 20th century they too were mostly gone from the fields. And then came workers from the Philippines and India, and, of course, Mexico.

I WENT WITH LUIS MAGAÑA to a place near Stockton where men and women were standing along the roadside, screaming obscenities at others who stooped in the fields, picking tomatoes. It was a strike, and scabs had been brought in. They were all, on both sides, Hispanics. At issue was a nickel—a five-cent raise for each bucket of tomatoes picked.

"As you can see," Magaña said, raising his voice above the angry words being hurled through bullhorns, "the Gandhi philosophy doesn't work here."

An activist focusing on migrant problems, he first came to the Central Valley from Mexico with his parents in 1970. They returned each year to work in the fields and eventually elected to stay in the valley.

Magaña spoke about those years as we watched the strike-defying pickers bending from the waist and moving along the rows in the shade of wide-brim hats. "I worked like that as a child," he said, "and I hate to think of my children having to do it." He went off then to talk with a group of strikers, to offer them moral support.

Later Magaña told me, "I have some differences with the union, but I am not against it. It's just that I think it is a mistake for them to be concentrating more on boycotts than on organizing." He was speaking, of course, of the United Farm Workers and the long struggle of that group under Cesar Chavez to organize agricultural workers.

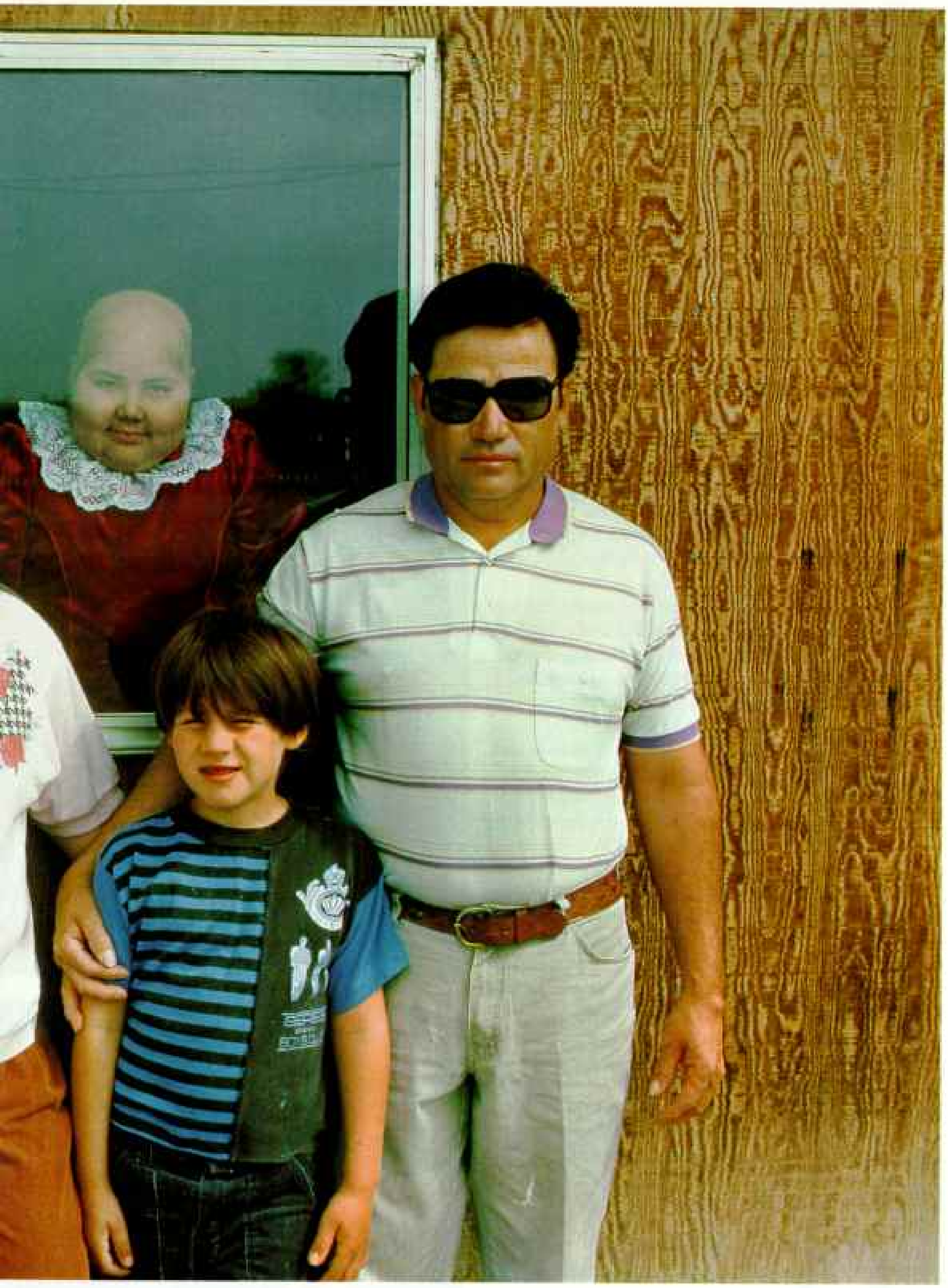
In those tomato fields there were three companies and more than a thousand strikers involved. It was not a union action: Rather, the pickers had walked out on their own. Later they would regroup on the edge of the fields, exhorting their replacements to put down their buckets. They were players in a vast vista of open space in north Stockton, and for some it was where life began and will probably end.

"I grew up right there in those fields," José Andrade, one of the strikers, said to me just before biting into a pear and ripping off a piece the size of an egg. "I've spent all my life picking tomatoes, and I guess that's what I will always do." He said he was 28 years old.

Picketing stores selling grapes treated with pesticides, protesters claim such chemicals caused cancer in some 20 children from McFarland and nearby Earlimart.

Pandol & Sons, where a foreman explains quality standards to workers, has cut chemical pesticide use by 68 percent in the past three years.

The greatest danger lies outside for Mirian Robles, just home from a bone marrow transplant that left her immune system defenseless. Her mother and



four other mothers of cancer-afflicted children in Earlimart picked pesticide-treated grapes while pregnant. Coincidence? Cause? The verdict is not in.

Beyond Zoua Yang's door is an alien world. She and her family have just come to the Central Valley from Laos. Other Hmong began arriving in the early 1980s in search of farming opportunities but found few. Some rent land to grow crops such as strawberries, here under plastic mulch (bottom, left). Families like Sia Yang's, whose children are inoculated during a measles outbreak, rely on public health services for medical care.

Andrade started in the fields when he was seven. It was not uncommon at that time for young children—even infants—to be left unattended while their parents worked nearby.

"There were lots of deaths then among children," Margie McLean said. As associate director of the Stanislaus County Department of Education she has heard the horror stories many times.

"I recall the woman who told me she left her kids in the car while she worked in the fields," Margie said. "She looked up to see the car filled with smoke. The children had started a fire with the cigarette lighter. The mother ran through the field to get there in time."

Frances Sanchez is a teacher at a county-run center where schooling is provided for children of agricultural workers. Her own parents were migrant workers, and she tries to steer youngsters toward a different life.

She tells them of the wonders of education, of a world where a person can make his or her way in the sun without having to fry in its heat. "I worked one summer with my grandmother, picking," she told me. "After that I said, 'No more.' I hope these children will not have even one summer in the fields."

The strike action continued, and in the end the pickers gained only a raise from 45 to 47½ cents for each 25-pound bucket of tomatoes. Most of them went back to picking, frisking the tomato plants like a dip working a crowd, still shooting for 125 buckets before the day ends, when they walk away, thinking about next month and the grapes.

OF COURSE, the grapes. They are growing everywhere. Among the six varieties of raisin grapes cultivated in California, the grape of choice among valley growers is the Thompson

seedless, a fruit of impeccable character and credentials, introduced in the early 1870s by William Thompson, who had come to the Central Valley from Scotland. It is a firm, crisp grape of a green like a pale emerald, and it responds to a bite with a small explosion of snapping sweetness.

In Fresno County, where some 7,000 farmers set the standard worldwide for agricultural production, grapes are the leading crop, accounting for 465 million dollars in 1989. More than half of that was for raisin grapes.

Harvest begins in late August. Picked by hand, the bunches are laid out on paper trays between the rows of vines, there to dry in the sun for several weeks. By then, if it hasn't rained, the raisin will have evolved, the eye in search of a gingerbread man.

Richard Geringer grows grapes for raisins on the 240 acres he farms on the outskirts of Fresno. At the time when the grapes are drying on the ground, a rumble in the sky, a flash of lightning, can cause his heart to race, since rain can ruin the drying process. He is a robust man who seldom has much time for himself during the growing months. There are mites and leafhopper pests to worry about, machinery to be repaired, and paperwork to be done.

He is beset with regulations enacted in the spirit of environmental awareness, and it

troubles him that his kinship with the land is being called into question by Hollywood movie stars and others who can command wide attention.

"It bothers me a great deal when people like Meryl Streep talk about pesticides when they don't know the facts," he said.

The actress has been outspoken on the use of chemicals in agriculture, which has cast her as a pariah among many of the farmers in the Central Valley. But they are aware of the growing strength and influence of environmentalists across the country, and that is enough to start the engines of change.

"We can understand the concern that the consumer has, and we do want to cut down on pesticides," Geringer said. "And we have started to do that. Farmers are going to get away from chemicals, but it will take time."

Indeed, programs of integrated pest management have been initiated from one end of the valley to the other. In these the amounts of chemicals are decreased while other, non-chemical controls are stepped up.

Oil pumps first sprouted around Bakersfield a hundred years ago. Today "grasshoppers" help Kern County produce about 65 percent of the state's crude.

Ladybugs are released to eat other, bad bugs. Some growers are planting prune trees to harbor tiny wasps that feed on leafhoppers, a pest that vexes the growers of grapes like no other.

But perhaps the most meaningful solutions lie in the outcome of research being conducted throughout the University of California system. Indeed the university is responsible to a large degree for the great agricultural advancements achieved in the state.

Scientists at the College of Agricultural and Environmental Science at Davis are working to develop crops resistant to disease and to insects.

Hundreds of research projects are also in progress at the Kearney Agricultural Center in the town of Parlier, south of Fresno. Researchers there are demonstrating how strips of vetch planted between rows of crops will repel nematodes, microscopic worms that cause massive damage to plants by attacking their roots.

Scientists at the center have also explored some pesticidal properties in the marigold, that doyen of the summer garden.

"Everyone talked about the roots of the marigold being responsible, but as a matter of fact, it's the tops too," Mike McKenry told me. A nematologist at the Kearney Center, he

has found that if marigolds are ground up and soaked in water for two days, the liquid is lethal to nematodes. The water is dripped down to the roots of plants, where it kills the pests.

"We had high hopes for this treatment, but it turns out that the liquid also poisons the plants," said McKenry.

THEY WOULD LIKELY KNOW about the challenges of farming in the valley town called Yettem, meaning "Eden" in Armenian, for it is a place where grapes are grown in great abundance. Armenians started to settle there in

Like the shiitake of the Old Winery Mushroom Company, specialty industries spring up every day in the Central Valley. Sold as a gourmet food for as much as $20 a pound, shiitake were used in China more than 2,000 years ago to treat heart disease. Their ability to enhance the immune system is now being studied as a therapy for AIDS.

Bob Fowler found his solution to the plight of the small farmer in ostrich breeding. He and his wife, Peggy, started in the industry three years ago. Their ten-acre ranch is now profitable, with three-month-old pairs selling for $5,000 and up.

A childhood interest in roses led Ralph Moore to pioneer the breeding of miniature varieties in California. At 84 he has developed more than 300 types, including Tiny Flame (above).

1901, attracted by the climate and a backdrop of mountains like their native Caucasus.

Now there are fewer than 200 families remaining in Yettem, and the men who once gathered in the coffeehouse to play backgammon and slurp the liquid from the sludge in small cups have been replaced by teenagers in shorts and tank tops who hang out at the general store.

Not far from Yettem is the town of Dinuba, and there Paul Buxman has made a clean break with chemical dependence on his farm.

"I prefer to call myself a natural farmer, because the term organic has an unfavorable buzz to it," Buxman said as we walked between rows of peach trees. "Actually I use all kinds of pesticides, but it's all environmentally safe material. That word, 'pesticide,' is misused today."

Buxman's land abuts that of a neighbor who uses chemical pesticides and fertilizers. We walked between the two farms, and it was like a stroll down a boulevard of discovery. The neighbor's fields seemed sterile, soundless. In contrast, the crickets and frogs were in concert on Buxman's side, and bugs and bees and things with lacy wings were in flight in the orchards. There were weeds on his ground, but the soil was dark and sharp, with a good smell.

With Buxman, as with most farmers in the organic movement in the Central Valley, there is deep concern over the appearance of the produce grown without the use of chemicals. Fruit, especially, is more likely to be spotted or to have a worm in residence.

Paul Buxman's reasons for turning to a natural method of farming were more than economic. "Before chemical tools were available," he said, "farming was natural, and it was fun. I wanted to get back to that, to good farming."

Also, his two-year-old son developed leukemia in 1983 (he has since fully recovered). Buxman believes that DBCP, a chemical used to kill nematodes, may have been responsible. In 1977 its use was banned in California.

"We found it at a high level in the well water," he said. "The person who came out to take a sample told us not to drink the water or bathe in it. We had been mixing the formulas for our babies with this water." The well is now equipped with a filtration system.

There are towns in the Central Valley where high incidences of cancer in children are referred to as "cancer clusters." Charges have been made that pesticides are responsible. The state says there is no conclusive evidence to support that.

Connie Rosales, however, will not be dissuaded. In 1983 her son, who was 14 at the time, was diagnosed as having cancer. She says that the water there, in the town of McFarland, may have been contaminated with pesticides and nitrates used as fertilizer.

Between 1978 and 1988 more than a dozen children in McFarland were stricken with cancer, and five of them lived in the same neighborhood. In nearby Earlimart there was a similar cluster of children whose illness was diagnosed as cancer.

Connie Rosales and others began to agitate for action, and they would not rest until the state agreed to investigate. I sat with her when the findings were revealed at a public meeting in McFarland. "On the whole," the state concluded, "the childhood cancer rate in this area is not unusual compared with rates elsewhere in the United States."

She stared down at the table where she sat, and then Connie Rosales said she would continue to fight, to have it determined once and for all whether chemicals used in the fields were killing the children. Her disappointment in the findings was softened by the news that had come to her earlier in the day: The treatment was successful, and her son was declared free of his cancer.

EARLIMART AND MCFARLAND are just north of Bakersfield, down where the Central Valley plays out on the front stoop of the Tehachapi Mountains. It has come now to this, from the broad, leafy avenues of Sacramento to Bakersfield with its battered image—Bakersfield with Buck Owens and Merle Haggard and Dwight Yoakam singing of their pleasure with the city; oil-rich Bakersfield, where they came, chased by the dust, by the tens of thousands from Oklahoma and Texas in the 1930s.

The production of oil in Kern County, where Bakersfield is located, totaled 235.8 million barrels in 1989, 65 percent of the California total. Oil and agriculture are the biggest money-makers for the county.

The oil is generally of a low grade. Much of it is used for road asphalt or blended with higher-grade crude and refined for gasoline. Whatever the quality, the oil accounts for the

Watchful eyes check dairy heifers for injuries and lost tags. Milk and cream lead the way in farm revenue for the Central Valley, and California may become the number one dairy state by 1995.

forest of pumping units around Bakersfield.

It is a difficult task for those who beat the drums for the city to boost it as an emerging magnet for tourism. Bakersfield is not likely to be that, not any time soon. It does deserve better, however, than the unflattering image it has received.

Bakersfield has none of the pretensions of most California towns with a pioneering past. Here the skies are on fire with the neon of motels, and there are Bible study classes and country blues and semis rumbling on the bypass roads.

With a metropolitan area population of more than 320,000 now, it is a robust city where a decent three-bedroom house can still be had for about $100,000. And the world's largest ice-cream plant is in Bakersfield, and the company that sells the most rose bushes in the United States grows its plants nearby.

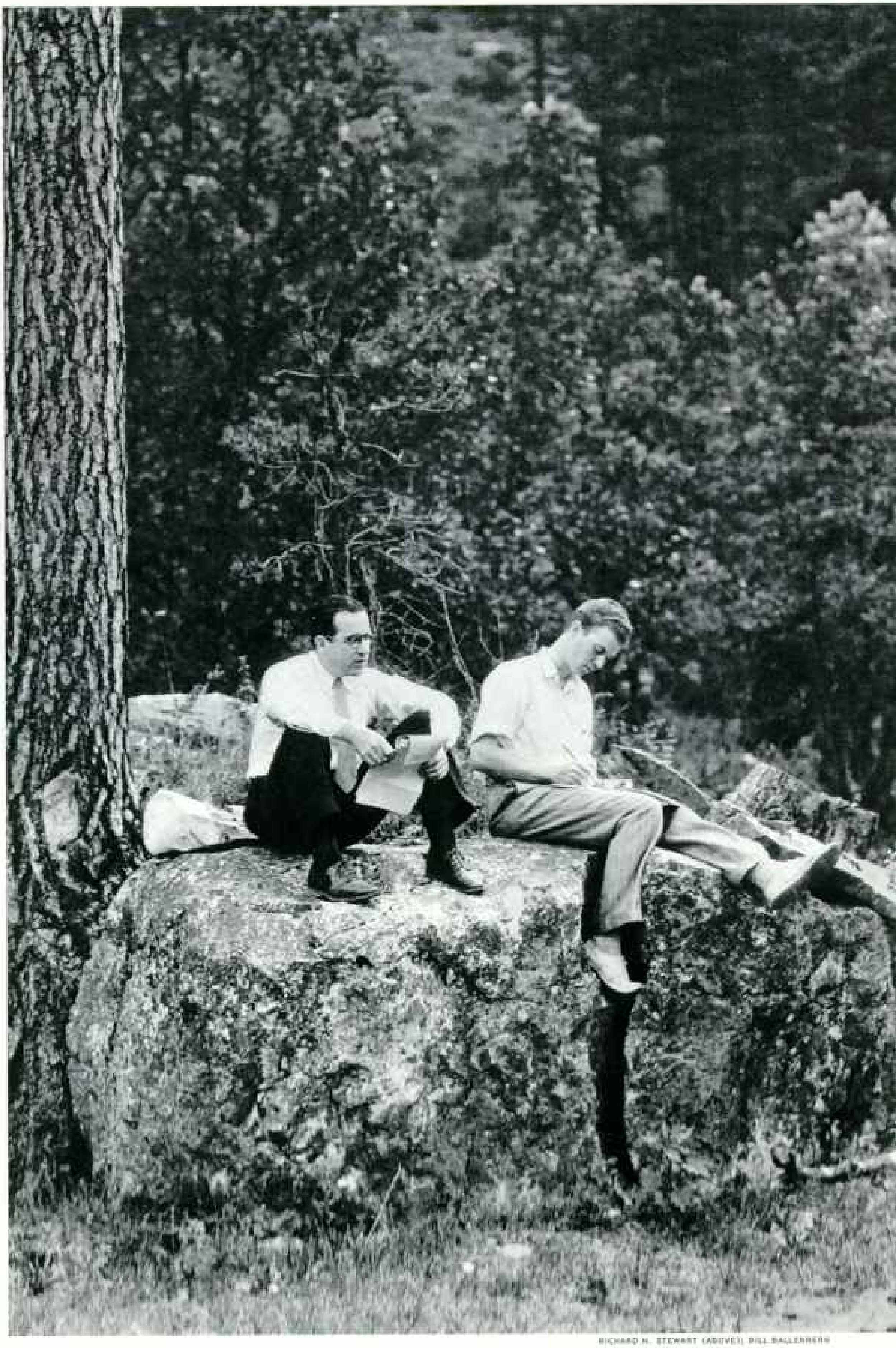
Ice cream and roses: fine grace notes for any city.

WHEREVER ONE GOES in this valley, there is someone to say that agriculture has peaked and is on the decline. And many express pleasure at the trend. They point out that in the western San Joaquin Valley more than a hundred years of irrigation have so saturated the ground that there is a serious drainage problem; salt buildup is also of major concern.

But they know too that urbanization will bring soaring living costs and greater air pollution—even now Central Valley air is bad enough to have started affecting crop yields.

The hope, then, is for a compromise, a mandate of the state that the best of the agricultural land remain in that use. The hope too is for regional cooperation in dealing with the valley's mounting problems, rather than the often conflicting actions of cities and counties.

But the hope of hopes is, simply, that there be no painful wrenching apart of this grandest of all unions between a farmer and the soil. □



RICHARD H. STEWART (ABOVE); BILL BALLENBERG

IN MEMORIAM

Thomas W. McKnew

JULY 6, 1896 — AUGUST 24, 1990

Melvin M. Payne

MAY 23, 1911 — OCTOBER 6, 1990

TWO OF THE CHIEF ARCHITECTS of the National Geographic Society's growth through half its existence are gone. The Society and its membership have sustained a heavy loss in the recent deaths of former Chairmen of the Board of Trustees Melvin M. Payne and Thomas W. McKnew. The twin tolling of the bells late last year rang out an era. Mel Payne was 79; Tom McKnew, 94.

Fate and fortune intertwined the careers of Dr. Payne and Dr. McKnew. Both attended District of Columbia public schools. Both came to the Society in 1932. Mutual respect and friendship blossomed in the Black Hills of South Dakota, where Mel Payne (left, at right) served as assistant to project officer Tom McKnew at the launching of *Explorer II*, the NGS-U. S. Army Air Corps stratosphere balloon that carried two men to the then record altitude of 13.71 miles (72,395 feet) in 1935.

GIVING A GIFT OF BOTTLED TIME, THOMAS MCKNEW (ABOVE, AT LEFT) AND MELVIN PAYNE, AT RIGHT, IN 1988 PRESENTED AN AIR SAMPLE FROM THE 1935 FLIGHT OF THE BALLOON *EXPLORER II* TO ATMOSPHERIC SCIENTIST JOSEPH O. FLETCHER.

Serving the Geographic for a combined total of 116 years, Mel and Tom both rose to become Secretary of the Society. Mel succeeded Tom as Executive Vice President and later became President. They were two of only five recipients of the Society's coveted Grosvenor Medal.

When I walked into a Society trustees meeting recently, I realized painfully that it was the first time in over 40 years that neither Tom McKnew nor Mel Payne was present: The changing of the guard had indeed become a sad reality.

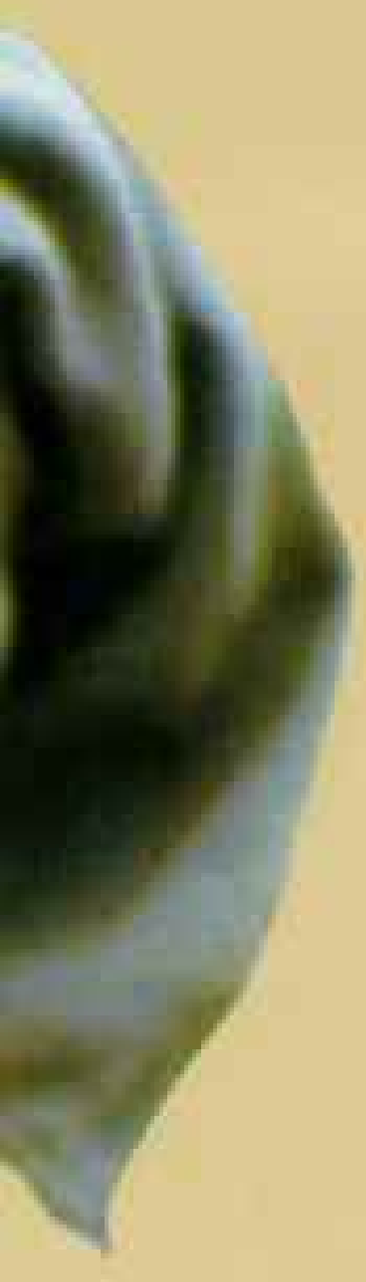
Both left a legacy of leadership. Trained as a lawyer, Mel displayed a genial, easygoing manner that somewhat belied the vigor and precision of his mind. He was bold yet thorough in decision. In a disagreement, if he proved right, any hint of "I told you so" was foreign to his nature.

Mel vastly increased the international impact of the Society's Committee for Research and Exploration. As its chairman for 14 years—Tom McKnew was an influential committee member also—Mel directed more than 50 million dollars to some 2,500 grantees, a mighty force in worldwide scientific investigation. Adding to that, Mel steered the Geographic to award-winning rank in network television.

Tom McKnew seemed always to do the right thing at the right time. An unflappable man of great discretion and worldly wisdom, he sealed fast friendships with distinguished Americans in many fields. He won the Air Force's Exceptional Service Award and twice won the Navy's Distinguished Public Service Award. Tom died just weeks before the dedication of his beloved Washington Cathedral, where as a boy in 1907 he watched the cornerstone being laid and 15 years later became superintendent of construction. This talent greatly benefited the Society: Tom threw his full zest and expertise into expansion of our original headquarters and the erection of striking new buildings.

As time and events test our custody of the Geographic's traditions and goals, the mirror of memory will hearten and inspire us with its reflections of these true and worthy friends, Melvin M. Payne and Thomas W. McKnew.

Gilbert M. Grosvenor



His name is Muradit. He is mischievous, with an impish smile. We counted him among our closest friends. If one of us was resting, Muradit would steal up close, rub her arm, and say, "I would love to marry you"—his two wives and eight children notwithstanding.

Likewise expressive, Muradit's face (left) and spidery frame often are painted to emphasize beauty, prowess, or to say, "I am Surma." Many of his people adorn their bodies and maintain other striking traditions, as

The Eloquent Surma of Ethiopia

we learned while living for portions of the past five years with the Surma of mountainous southwestern Ethiopia.

Little known even to anthropologists, the seminomadic Surma of this region are part of a larger Surma language group. Their tranquil life-style of raising cattle and crops is often disrupted by war with neighboring peoples, particularly their archenemies, the Bumi. As important to Muradit as his body artistry is a permanent adornment, a scar on his arm caused by a Bumi bullet. It reminds him that, in return, he killed one enemy and wounded another.

In contrast, hostilities within Surma society are channeled into an annual ritual—the donga, *a wild stick-fighting duel that releases emotional tensions. The Surma cannot imagine life without it, nor without a tradition that measures their women's beauty and worth, the wearing of lip plates (following pages).*

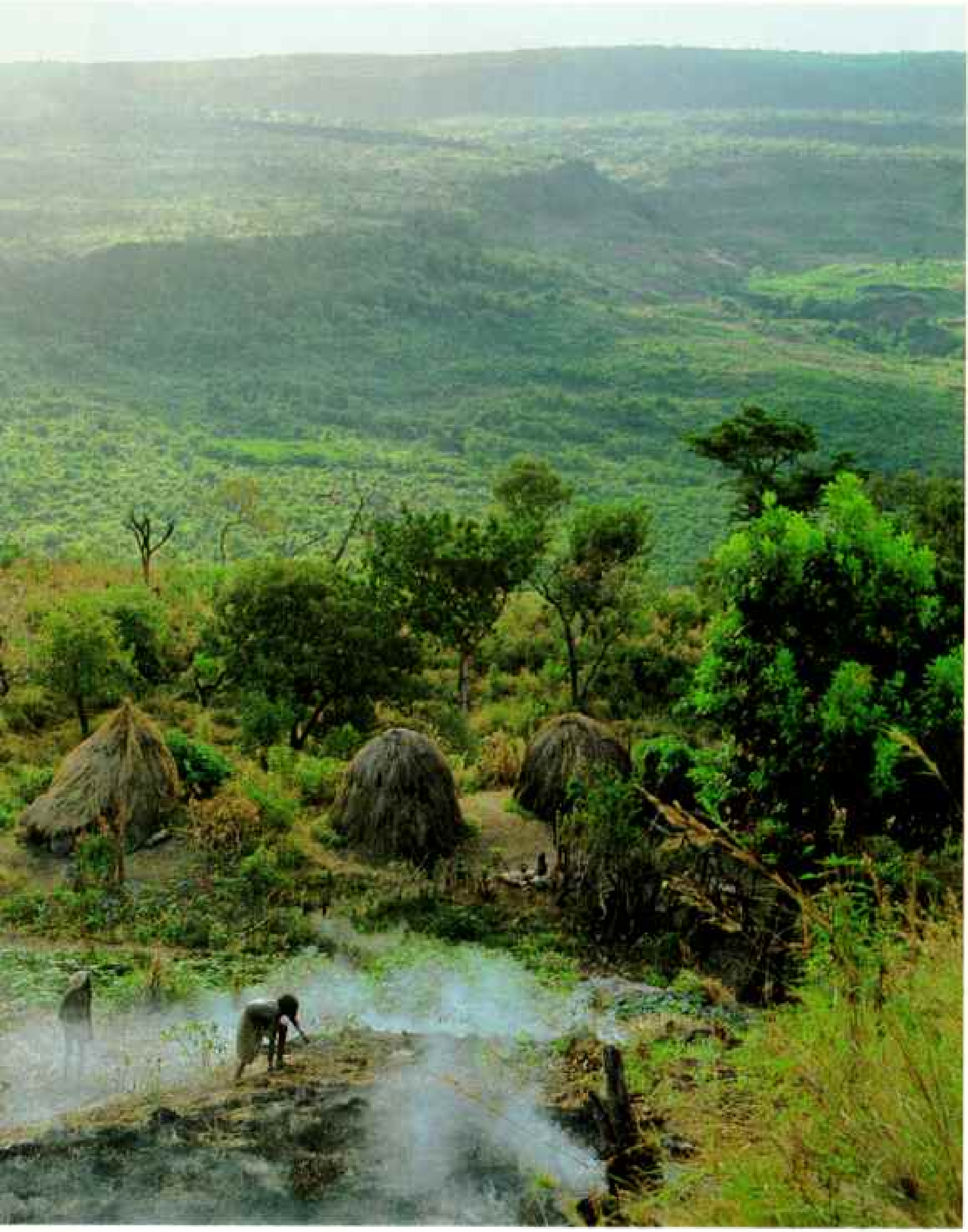
Text and photographs by
CAROL BECKWITH and ANGELA FISHER

While chatting together, women may remove their lip plates, but usually not in the presence of men. The Surma are nearly alone in keeping the practice, done by piercing the lower lip and gradually stretching it by

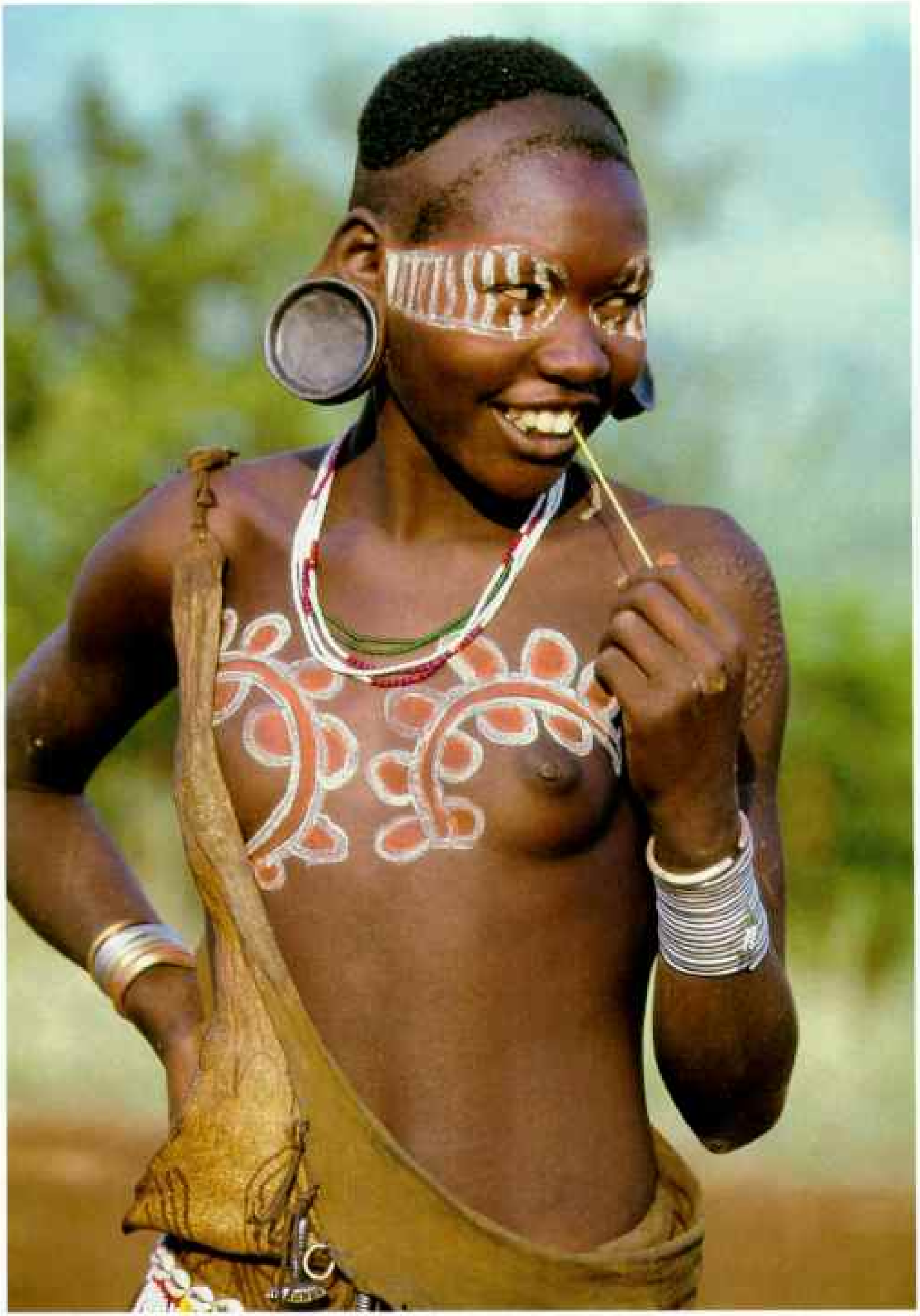
inserting ever larger plates. The size fixes the number of cattle asked by a bride's parents for her hand in marriage. None of the Surma we asked knew the origin of the custom. These women are wearing special fur headdresses for a ceremonial dance.

Isolated by 7,000-foot mountains and desolate lowlands along Ethiopia's border with Sudan, about 30,000 Surma coexist uneasily with a host of pastoralists and subsistence farmers west of the Omo River. Intertribal skirmishes flare continually, with the Surma—whose guns are mostly relics—caught between better armed Bumi enemies to the south and Dizi foes to the north. A government agent occasionally visits to mediate such disputes.

Villagers clear more and more land for corn, millet, and sorghum in Kormu Valley near our camp. Cultivation only supplements the Surma's main diet of milk and blood from their precious cattle. But many cattle were lost about seven years ago to the Bumi, who drove the Surma from their homeland south of here.



The new land is not as good for cattle, so Muradit has become a gold prospector. He needs gold to replace cattle lost to the Bumi, so he can buy more wives. He also needs gold to buy a gun. Of the Bumi, he says, "Many come at night during the full moon. Immediately we kill them. If they see us first, they will kill us." He spoke of his former home: "My happiest days were there. Now I consider it a rainy day."



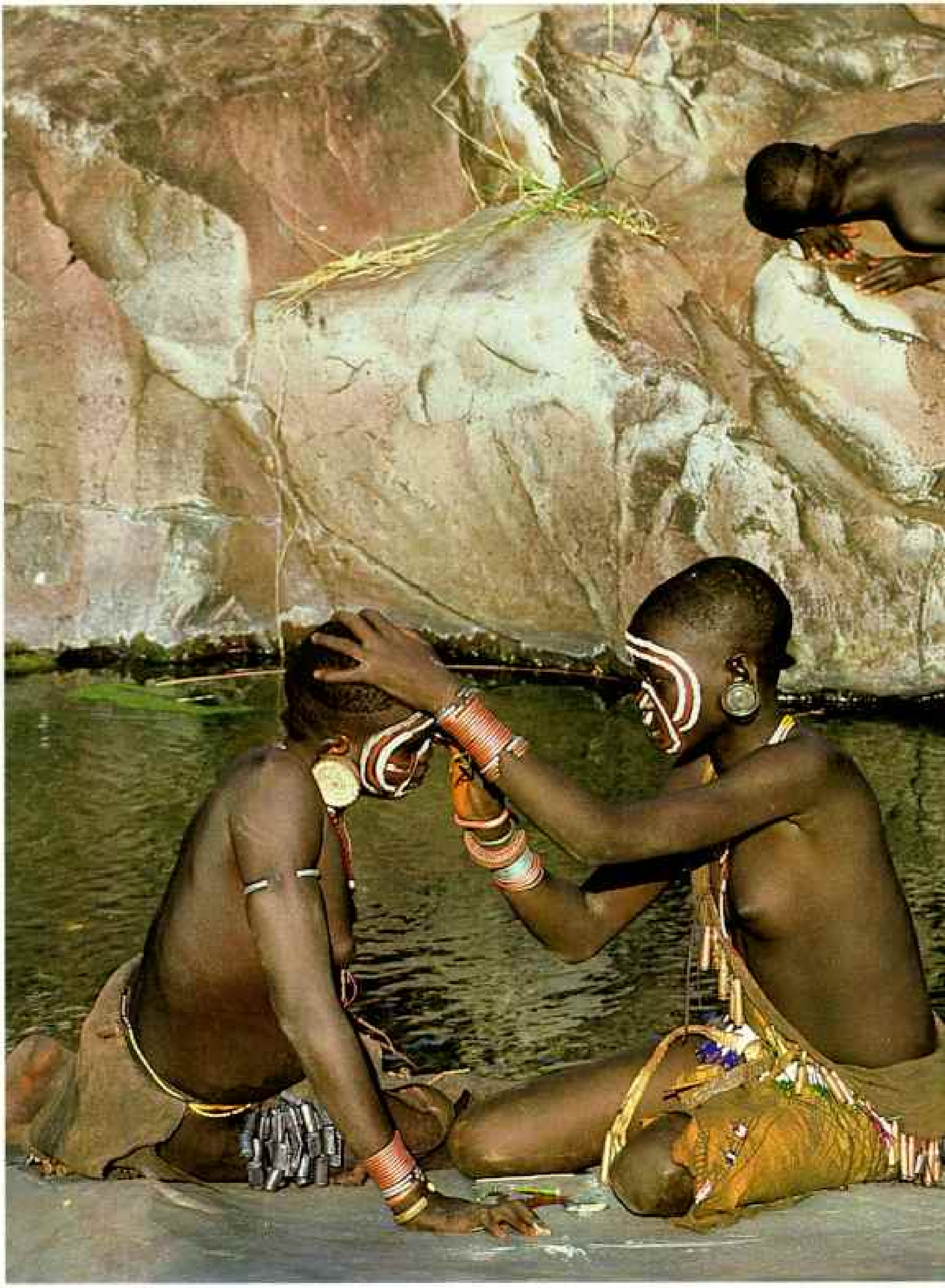
With an artist's touch Kolaholi, famed as a painter, decorates Chinoi, a renowned stick fighter (facing page). To create these art forms, the skin is covered with a chalk-and-water mixture, sometimes highlighted by ocher. Fingertips partially remove the paint in contrasting patterns. The designs impress women or intimidate opponents. To attract men, women paint only their faces and breasts; this young woman's earplugs are part of her everyday adornment.

Inspired fingers turn bodies of the Surma into mobile canvases. Kolaholi, decorated with a vertical and horizontal pattern (right), and a friend, Ole Regay, bearing a snake motif (center), painted each other. Kolaholi created a diagonal design on Ole Loo (left). Following the harvest in October, leisure time increases, and the Surma devote more and more time to body painting. The most gifted artists tend to be men, but women and children also paint.

Muradit, Kolaholi, and Chinoi were all special to us. Elegant yet playful, Kolaholi

is renowned for his singing and dancing as well as his painting. When we asked him how the Surma felt about themselves, he responded, "We are better than anyone because we enjoy freedom in the forest, we don't have masters, the land is ours, and we can drink milk freely."

Chinoi, a big, wild-looking fellow, was gentle and sweet with us. Angela healed his sore knee with hot water and an ointment. His body is covered with scars from stick fights, of which he has won 63 and lost only three.

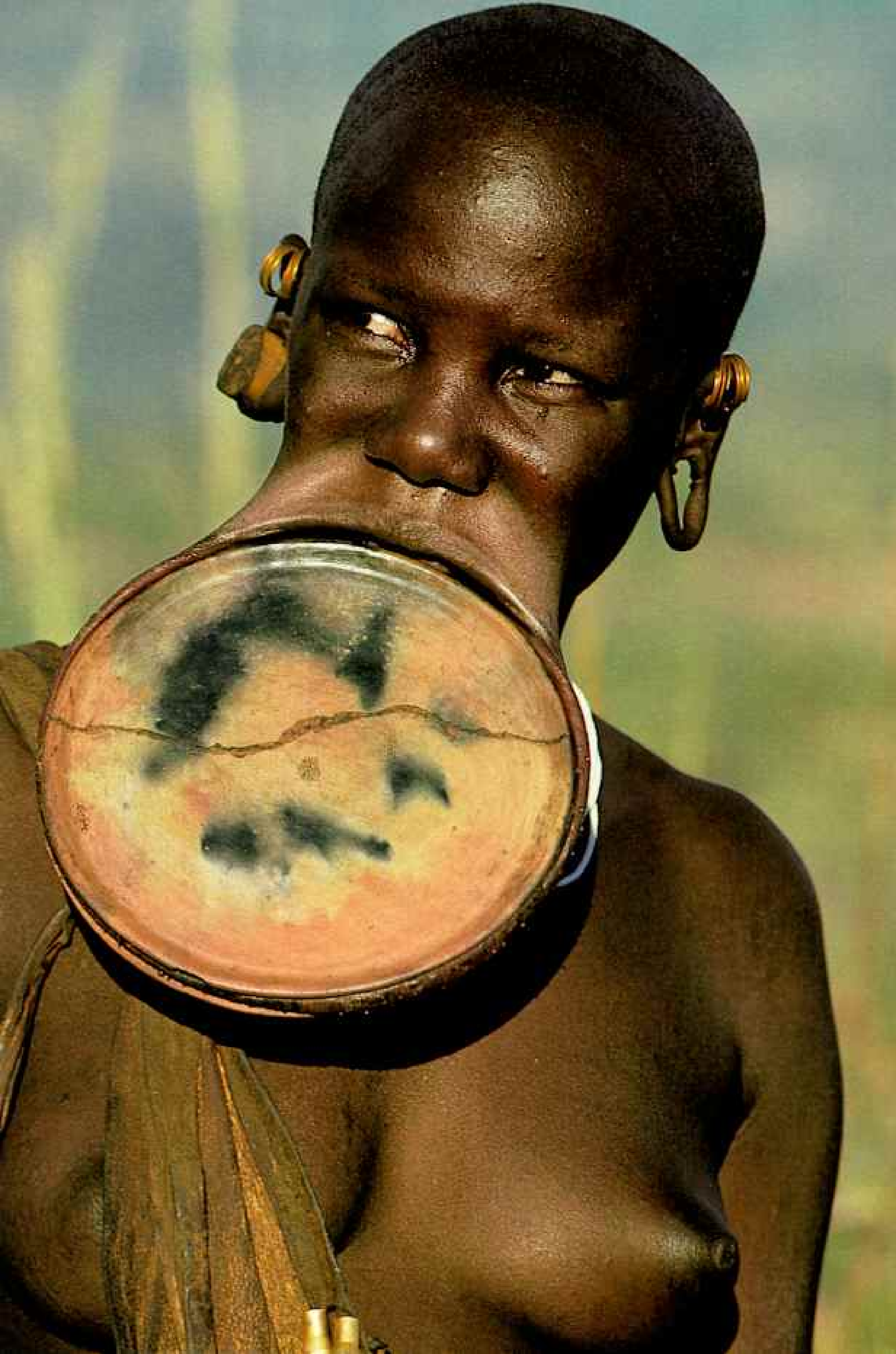


On the rocky banks of the Dama River a boy bakes in the sun after a chilly dip as girls develop their painting skills. Their heads are already partly shaved, a mark of beauty for both sexes. Spent rifle cartridges adorn

the two skirts at center. When quite small, girls begin helping with domestic chores, grinding and sifting grain and cultivating the fields. Young boys look after goats and learn to stay alert for Bumi raiders while tending cattle.

"It is a means of giving wealth to our parents," said one girl—the ultimate rationale for the lip plate tradition. The largest example we saw (right) required this woman's husband to pay more than 50 cattle to her family. An older woman whose plate probably fetched about 30 cattle makes a new, smaller clay disk (left). Red and black powders add color, and after drying the plate will be fire-baked for 20 minutes.

At about age 20, a woman's lower lip is pierced, a painful process that can lead to infection. A very small disk is inserted and gradually replaced by larger plates over the course of a year. Today's modern round clay plates replace more traditional trapezoidal versions made of wood (below left). One day one of Kolaholi's wives, with her plate removed, kissed Carol, who experienced an extraordinary warm, wet sensation from her cheekbone to her chin.



Emotions are charged during a three-day funeral for Nakada Logi, mother of a village headman. Circling the grave, women bear the body, wrapped in hides. Milk was then poured into the woman's ears. Knees drawn up, she was positioned vertically in the grave. A lip plate and other possessions were buried with her, but the hides were removed. An earthen lid, placed by her son-in-law, sealed the grave. With moving, eerie chants an elder told the story of her life.

A horn made from an elephant tusk accented the rituals (above). One wizened woman from a distant village wore an innovative headband.

The sound and fury of all-male stick fighting rages from November until February. Wielding a six-foot-long staff with a carved phallus tip, top combatants from each village compete one on one, trying to knock down their

opponents. Thus manhood is proved, quarrels over women are settled, and village honor is defended. While official contestants wear padding and guards, nothing protects these fighters, who risk injury in a spontaneous preliminary bout.

A bloody scalp, the price paid by a warm-up contestant, is seldom seen among main challengers, whose heads, necks, ribs, and arms are wrapped with cotton cloth (facing page). Nevertheless, plenty of bare skin remains to receive blows (above). Most bouts last only minutes, with but one rule: A fighter may not kill his opponent. If that occurs, the offender and his family are banished, their property is confiscated, and a daughter may be given to the victim's family.

The tournament winner is borne on a platform of fighting sticks to a group of young women, who decide which of them will offer herself in marriage to the champion.

Hopping together in a long, snaking line, Surma children sing a paean to nature, "Our mother, our fruit." Such games are usually played late in the day when the youngsters' chores in the fields and cattle compounds are finished. Once work is done, Surma parents allow their children a great deal of freedom. Many games and dances begin after dark and continue until the wee hours of the morning. Play for boys also includes miniature stick fighting as they emulate their heroes.

For girls, innocence disappears at puberty when they must begin wearing an apron of iron beads weighing about ten pounds (right) to discourage

sex. They must bear the burden continuously until marriage; in fact, an elaborate apron helps attract a husband. If a girl becomes pregnant out of wedlock, she suffers the humiliation of being forbidden to wear a lip plate, even though her lover will be forced to marry her and give cattle to her parents.

Two young girls find kinship in twinkling makeup, for best friends delight in painting themselves as near twins. Children are taught to value, above all, their time-honored traditions. Although the Ethiopian government

discourages some practices, the Surma vow to keep them. As Muradit says, "We don't want to give up body painting, stick fighting, or lip plates. This is our way of life. We want to keep it and pass it on to our children." □

Glorious remnant of the British Empire, Hong Kong ignited with color when its 5.8 million inhabitants, mostly Chinese, celebrated Lunar New Year in January 1990. During this time of feasts and bonuses Hong Kongers say to each other, "May you be blessed with prosperity." And so they have, earning incomes approaching those in Britain.

HONG KONG Countdown

By ROSS TERRILL

Photographs by JODI COBB
NATIONAL GEOGRAPHIC PHOTOGRAPHER

The customized perks of fortune attest to the power of free enterprise in Britain's last Asian territory. Six years from reunification with communist China, Hong Kongers are learning to live with anxiety.

TO LOOK AT HONG KONG, you would never know that anyone is worried about its future. Its blue harbor buzzes with boats, its white skyscrapers shoot into the green hills beyond, and its workers wrestle with pneumatic drills, demolishing the old to make way for the new.

Despite the uncertainties of 1997—the year this British crown colony becomes part of the People's Republic of China—Hong Kong zooms ahead as if it intends to maneuver its way past any obstacle fate sets before it.

Hong Kong has announced ambitious plans for a new airport and a fivefold expansion of its container-shipping port—the world's second busiest—at a total cost of 127 billion Hong Kong dollars (16 billion U. S. dollars). A dozen new hotels are under construction, luxury apartments are being built and sold for handsome sums, and a third university rises—at a cost of two billion dollars—in the hills of the New Territories.

Phillip Bruce, spokesman for the new airport, grew impatient at doubts expressed about it. " 'What if China doesn't like it?' people say. What if this, what if that!" Bruce reasoned: "Hong Kong would never exist if anybody had asked 'what if' questions—right from 1841. What if there's a revolution in China? What if there's a customs blockade? What if the dynasty fails? What if the Japanese assault? What if the Americans try to give the place to Chiang Kai-shek? You

to 1997

Fearing the worst from reunification, students protest the Tiananmen Square massacre by playing dead on a Chinese flag. Though China has pledged to retain the structure of Britain's capitalist system for 50 years, Hong Kongers cannot forget the 1989 violence in Beijing. Many are also angry because their fate has been decided without their participation.

know, you can't work on that basis."

And Hong Kong is a place that thrives on work. It stays busy making and spending money. Still the tourists laden with shopping bags trudge down Nathan Road, the red double-decker buses belch fumes as they weave among the colony's 17,000 taxis, and even at midnight weary vendors sell roast ducks that glisten as if coated with brown varnish.

People cut deals in ten-minute ferry rides or using the latest status symbol, a cellular telephone, while waiting at bus stops. They hammer and saw and drill through the night to construct a new family shop. Even the escalators of the underground train system, I found, move at almost twice the speed of those in Boston. If you are not nimble on the streets of Hong Kong, pity help you.

On a recent visit I proffered a hundred dollars for exchange at a currency window. As the young clerk crisply processed the transaction, he threw me a question: "How long are you in Hong Kong?"

Mildly surprised that a bustling currency salesman would have time for light conversation, I said, "Three days."

"You're not changing enough money for three days," he declared. "Sir! How about a thousand dollars?"

HONG KONG has the zip and toughness and cacophony of a Chinese Manhattan, in a 413-square-mile territory consisting of Hong Kong Island, Kowloon Peninsula, and the New Territories. Descending to tiny Kai Tak Airport—doorway to Asia's number one tourist destination—is like coming down a hotel's glass elevator, so closely do buildings glide by, with faces visible through office and apartment windows. This cramped community of 5.8 million is the world's third largest financial center and its eleventh largest trading economy. Its per capita income ($89,700 [$11,500 U. S.]) is second, after Japan, in

The clamor of competition fills Nathan Road in the heart of Kowloon, a thicket of small businesses selling everything from watches and cameras to antiques and silk. For hordes of other shoppers endless networks of air-conditioned malls snake under and around Hong Kong's large hotels.


粵華行
夏國瑋
錄影
香港
MILD SEVEN Lights
13
Tony

"Albert is so amused," wrote Queen Victoria in 1841, "at my having got the island of Hong Kong." Less amused than her husband was her foreign minister, who thought that title to the "barren island" was no prize at all. A hundred and fifty years later, the island glistens with glass and concrete, from the towers at the base of Victoria Peak to the massive apartment blocks along North Point.

East Asia. Its life expectancy is higher than that of Britain or the U. S. Its children weigh more than their American counterparts.

As 1997 approaches, the miracle of Hong Kong is called into question. Will the communist dinosaur swallow this capitalist jewel? While officials in Beijing have promised that Hong Kong's social and economic system will "remain unchanged for 50 years," that assurance is not widely trusted in the colony.

Martin Lee, Hong Kong's most prominent liberal, is worried. "The date of 1997 is looked upon as doomsday," he said. "The Chinese are more concerned with control than with prosperity. They don't seem to care whether the goose will continue to lay golden eggs. They just want to control the goose."

David Chen, veteran journalist at the *South China Morning Post*, is skeptical too. Chen, who fled to Hong Kong when Mao Zedong's communists took control of Shanghai more than 40 years ago, believes that his new home's success is inextricably linked to its status as a British colony.

"It's because we had the Union Jack," Chen growled, "and now the Union Jack is in tatters all over the Far East. I saw how Shanghai fell, and it could happen to Hong Kong."

OTHERS, aware that Hong Kong has been written off prematurely in the past, are more hopeful, recalling previous clouds that floated low over the colony, only to disperse. During Mao's Cultural Revolution of the 1960s, Hong Kong trembled at the prospect of being overrun by young Red Guards who had driven China's president from power, deposed senior party members, and unseated key ministry officials in China. The colony not only weathered that tumultuous period

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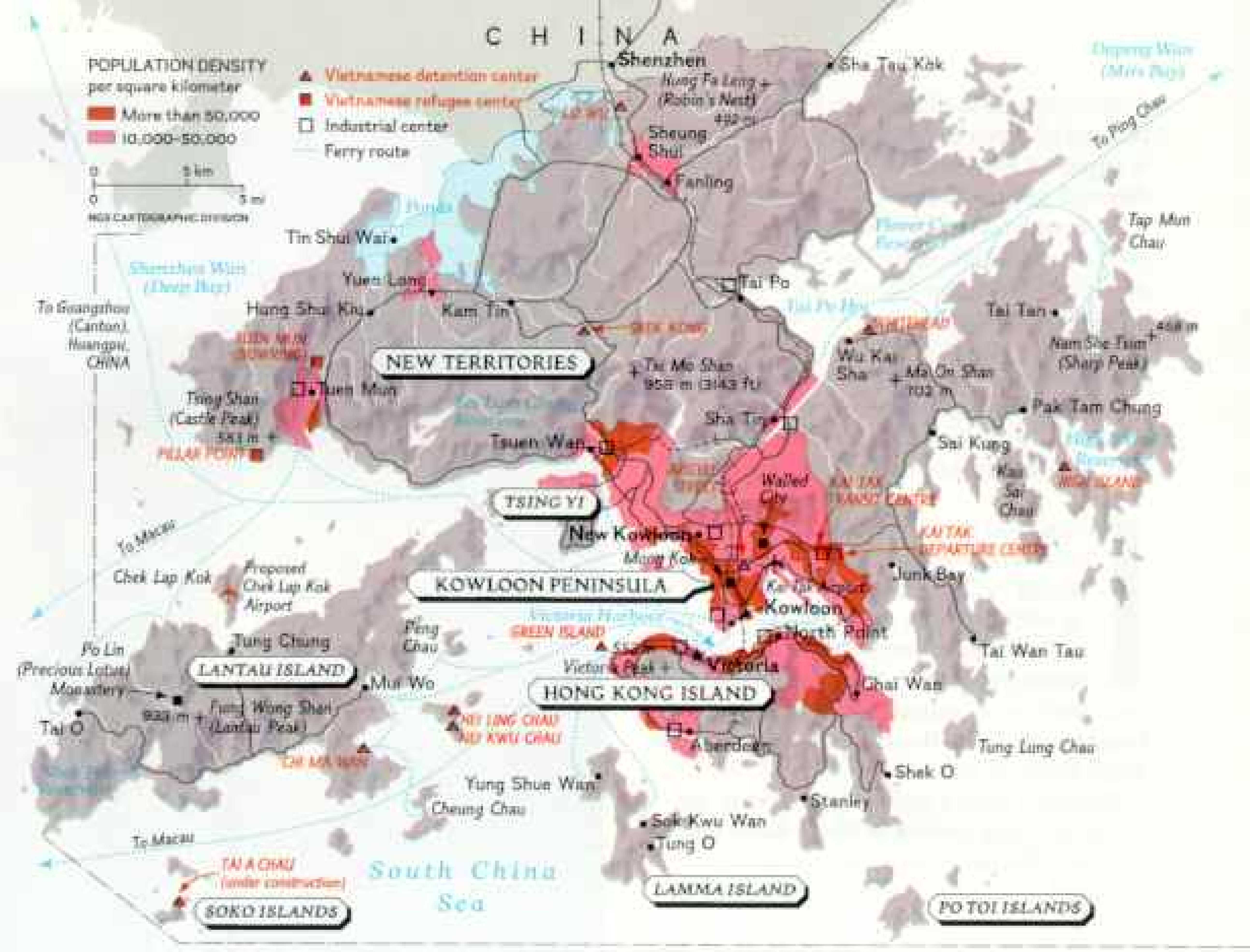
Author ROSS TERRILL, a research associate at Harvard University's John K. Fairbank Center for East Asian Research, has been visiting China since 1964 and is a regular contributor to NATIONAL GEOGRAPHIC. His "Australia at 200" was published in the February 1988 issue.



HONG KONG

With less land and a greater population than Los Angeles, Hong Kong is more than just a city. Occupying only 10 percent of their 413 square miles, 5.8 million people fill the flats and nooks of the rugged terrain with numerous towns and the twin cities of Victoria and Kowloon. Overshadowed by Shanghai for its first century, the colony began to prosper after the 1949 communist victory in China—and the consequent flood of refugees and money.

but also thrived in its aftermath. Hong Kongers have a way of landing on their feet, as Barrie Wiggham, a white-haired government veteran, recalled.

"When I came in 1961, I thought it was the end of Hong Kong," said Wiggham. "The colonial period was ending," he said of that era when empire was under siege from Africa to Asia. "Little did I know that I had come at the beginning of modern Hong Kong," Wiggham went on. "Today's Hong Kong started in the late 1950s, went through its industrial revolution very quickly, and now leads the world in so many aspects."

Although a monarch's representative heads the colony, it is a free-for-all of enterprise far removed from empire's stuffiness. Public life reflects Hong Kong's money-mindedness.

A justice in the Court of Appeal recently permitted a Japanese businessman found guilty of bribery to invest his four-million-dollar cash bail in an interest-bearing account. Only 820,000 of the colony's citizens are required to pay income tax. The

maximum rate is 15 percent. Even the pattern of crime suggests Hong Kong's preoccupation with money, as more crimes are directed against property than people.

Although the colony has its seamy side—with drug addicts, homeless people, and pockets of poverty—I found the Hong Kong of 1990 transformed from the raw-edged place I first saw in 1964. The modern colony has found success in electronics, finance, re-export trade, manufacturing services, and tourism. Its middle class blossoms as yesterday's messenger becomes today's manager.

INSTEAD of throwing themselves into politics—a path of public expression long denied to Hong Kongers—many just pile up extraordinary possessions. The colony's fax-machine sales are among the fastest growing in the world. Hong Kong consumes more cognac, per capita, and boasts more Rolls-Royces, per acre, than any other place on earth.

Brenda Chau, a lawyer who lives in the luxurious Peak section of Hong Kong Island, has *three* Rollses, one of them pink.

"I had a pink fur," Brenda explained to me one afternoon at her hillside home, "so we got a pink Rolls to match it."

Just then a Sri Lankan servant in a pink suit and hat arrived. He sat in the driver's seat of the pink Rolls as Brenda posed for photographs in her pink mink. As the camera whirred in the brilliant sun, Brenda pursed her mouth in pleasure, her eyes gleamed, and the fingers of her hands tensed in and out.

"It was sunset when we found this house after searching for many years," Brenda explained, "and the water of the harbor below sparkled gold. We bought the house, called it Villa d'Oro, made gold the theme color, and threw a little housewarming party for 500," she said.

The home of Brenda and her husband, Kai Bong, is a cross between an Egyptian tomb and a Hollywood set. A chandelier from Venice consists of 7,000 separate glass pieces, gold leaf shines on the walls, and a toilet seat is inlaid with gold coins.

"It's not that I like money," Brenda explained. "But I'm practical. Possessions are important. The Chinese communists like to make money too—that's why they opened China up."

Kai Bong Chau talked about the future.

A steamy night in crowded Kowloon finds locals grabbing a quick bite from food stalls along Temple Street (above). Nearby, the district of Mong Kok has a density of 362,000 souls a square mile—reputedly the world's most tightly packed mass of humanity. Here, minuscule apartments are the norm, while at the extreme some elderly and destitute men pay $150 ($19 U. S.) a month for "cage apartments," like these stacked three high (right).

"If life gets unbearable after 1997," he said, "if there is no freedom, we'll go." Where? "Summers in the United Kingdom, winters in Southeast Asia," Kai Bong replied with a shrug.

Moving is not one of the options for the men at 26 Fuk Tsun Street. They live in a smelly boardinghouse, sleeping in cramped cages that hold all their belongings and bedding because they cannot afford anything better. The cages—which measure 6 feet long, 30 inches deep, and 30 inches tall—are stacked three high and rent for an average of $150 a month.

"The top cage is cheapest," said Mr. Cho, a 57-year-old living up top. "It's the hardest to climb into. The bottom is second cheapest—you're easily disturbed. The middle level is the expensive one."

Cho came from China to Hong Kong in 1949. He is one of some 5,000 citizens who live in such cages—the sick with the well, the snorers with the quiet, the few who go out to work with the many who do not.

Cho, who has never been married, earns a disability pension of $780 a month. I asked about the pros and cons of living here.

"It's not what is good and bad about it," he replied evenly. "The important thing is to adapt to the environment you're faced with."

All around us, men in shorts watched cartoons on a communal television and played cards or chess as Chinese opera blared from a radio. Mr. Kwan, the superintendent of the place, said fights are rare, despite the crowded conditions. "The men are old, and older people can think and are more reasonable than young hotheads," he said.

FROM A HELICOPTER you can survey the whole of Hong Kong in an hour. I saw an urban industrial agglomeration, pleasingly interspersed with islands—Hong Kong has 236 of them—dotting the turquoise rug of the South China Sea. I saw thousands of small boats lined up at inlets like ballet shoes in neat rows and green hills with clouds swirling over them like steam atop a bowl of Chinese spinach. Miniature waterfalls tumbled from hillsides where Chinese characters were visible on weathered gravestones. I saw the largest island, Lantau, with its huge Buddha at the Po Lin ("precious lotus") Monastery. To the northeast were the silver roofs of the Whitehead detention center crammed with unhappy Vietnamese refugees. In the north of the New Territories, less than 90 miles from the Chinese city of Guangzhou (Canton), I saw the barbed-wire barrier that separates Hong Kong from the backward land of its ancestors.

Millions of Hong Kong's people arrived from China with nothing more than the clothes on their backs. Even today many willing new hands come from China seeking work. In the busy port of Aberdeen, I met fishermen from the mainland who hire out as deckhands for trawlers, sleeping in tiny bunks and smoking pipes fashioned from bamboo and a Coca-Cola can. At the Unitex clothing factory in the New Territories, I met a woman named Ai, who moved here in the 1980s to do piecework, sewing portions of brightly colored garments six days a week for a monthly wage of $5,000, $7,000 with overtime.

"In one month here we earn what we would in one year in China," said Ms. Ai. When she first came south from China, she was surprised to find that the more she worked, the more money she raked in. Now she takes all the overtime she can get and eagerly awaits the day her permanent residence papers come through.

From the start Hong Kong beckoned the restless and the hopeless, the bold and the penniless, not only from China but also from beyond. Farmers, opium traders, sailors, pirates, and fishermen came on foot and by sea, seeking to make money or a fresh start beside the "fragrant harbor." Hardheaded Scottish merchants, backed by the muscle of British gunships, came in the 1840s and stayed.

The skirl of bagpipes pierced the evening air as the governor of Hong Kong, dressed in a kilt and long woolen socks, paused on the marble staircase. Sir David Wilson flashed a benign smile at NATIONAL GEOGRAPHIC photographer Jodi Cobb. "Are you seeking shots of minority peoples with odd customs?" he asked.

We were. Jodi and I had come to the annual ball of the St. Andrew's Society to see how a few hundred Scots sustain their heritage far from home amid a populace that is 98 percent Chinese.

The pipers heralded the arrival of the haggis—a mixture of mutton, oatmeal, sheep hearts, and spices cooked in the stomach of a

Hong Kong's elite celebrate every manner of event in opulent hotel ballrooms. At the Regent, Alvin Ma and his bride, Helen, move from table to table toasting guests. Though Hong Kong has the highest per capita consumption of cognac in the world, the Mas have prudently chosen tea for two in their brandy glasses.

sheep. Looking like a cannonball, the haggis was conducted into the banquet hall on a silver tray. The chieftain recited a Robert Burns poem, then took a dagger from his sock and cut the haggis. Sir David took a fancy silver cup of whiskey in his two hands and drained it dry.

Ceremony done, the merriment began, with people feasting and drinking and springing about the dance floor until 3 a.m. I could have sworn I was in Scotland.

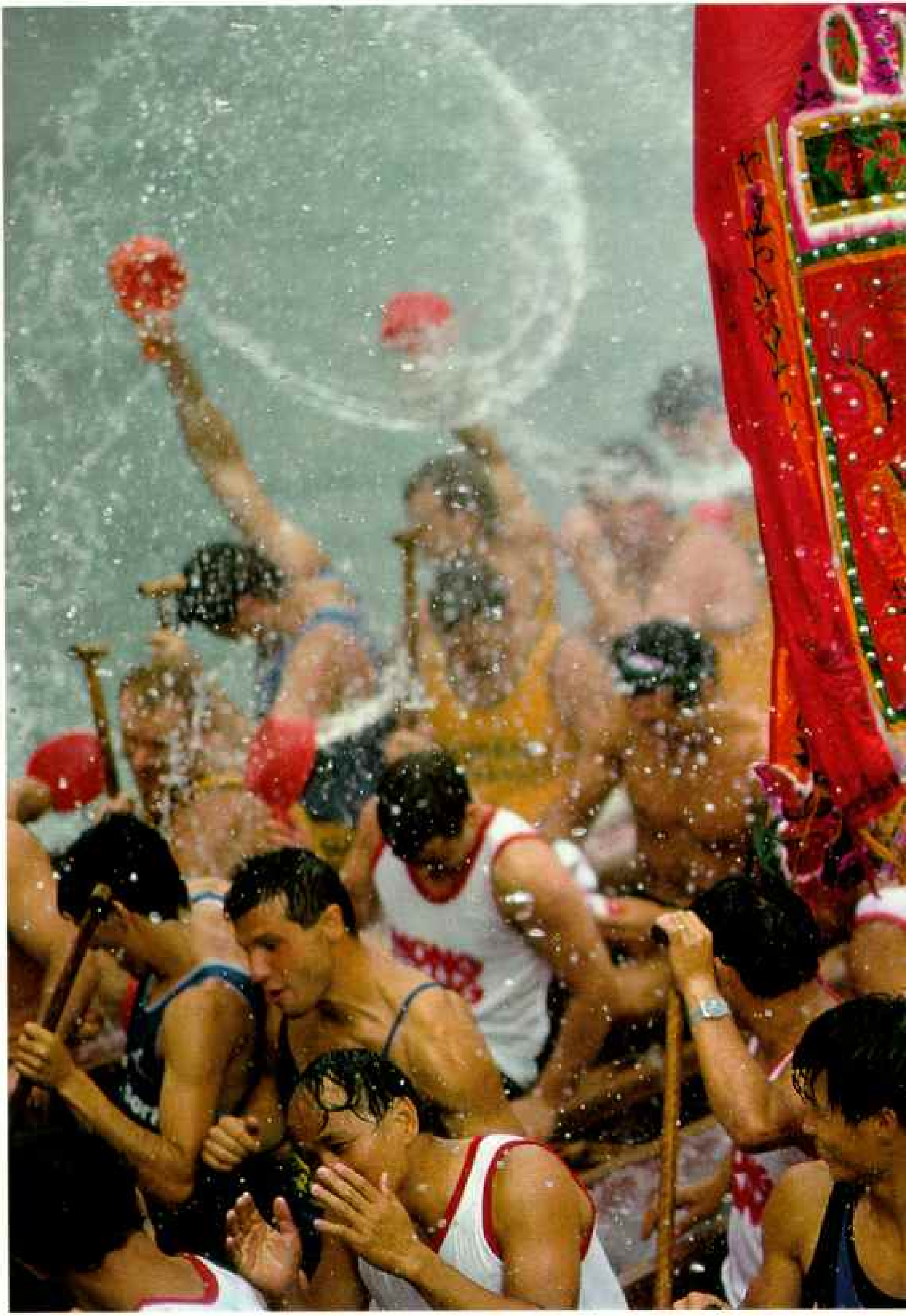
A few mornings later the governor spoke about the Hong Kong he and fellow colonials have grown to love.

"What characterizes people who have come to Hong Kong is that they want to make something better of their lives," Sir David said. "Whether from Scotland or China, the people here are get-up-and-go people."

You meet such citizens all over Hong Kong, and each one brings something of his old home to this new one. At Jimmy's Kitchen in Wyndham Street, the waiters bustle around in starched white jackets and slicked-down hair, with napkins tossed over their shoulders, Shanghai style. Modern Hong Kong, in fact, was built on the ruins of Shanghai, as capitalists fled down the China coast when the communists took over the mainland's most populous city.

HONG KONG has always been a place of coming and going. Refugees and famous fugitives—Sun Yat-sen, Zhou Enlai, and other leaders of Chinese revolutions—have found haven here. After Mao's triumph in 1949, one million came within a year. Russians fleeing China, Chinese fleeing Indonesia, Uygurs from Xinjiang in western China—Hong Kong accepted them all. Not until the 1980s, with the continued arrival of boat people from Vietnam, did an affluent, preoccupied Hong Kong frown at newcomers (see story beginning on page 133).

Hong Kong regulates its crowded social existence according to British law with a punctiliousness that belies any panic about



Making the biggest splash in town, the winning teams in Hong Kong's International Dragon Boat Races celebrate in Victoria Harbour with a massive water

fight. Twenty-two teams, from as far away as Italy, paddled their long boats, with dragon-head prows, in the June event.

the future. In one recent week, 714 litterbugs were prosecuted—418 for littering in public, 174 for obstructing cleansing, 99 for spitting, and 23 for miscellaneous offenses—a total of more than $140,000 for government coffers.

An interior decorator lost his temper at the noise of pigeons outside, shot at them eight times with an air gun, and shattered the windows in a nearby office building. He got six months in jail. A hearing before the Court of Appeal hinged on whether three jurors had "habitually" slept and snored during a fraud trial, as alleged by six executives the drooping jurors had convicted. The jurors claimed to have closed their eyes to meditate and the better to concentrate.

For the price of a phone call you can cross from Victoria to Kowloon on the Star Ferry, which offers a wave's-eye view of the best deepwater port on the China coast. Sentry over the waterfront of Kowloon is the red-brick and cream-sandstone clock tower that once was part of the train station, where countless Cantonese emerged to set foot upon free soil for the first time. Just up the street in Nathan Road, the spine of Kowloon, you find enough tailors to clothe half the world, Japanese tour groups following leaders with flags and bullhorns, Chinese communist emporiums hauling in hard currency from jade, silk, and herbs, Australian tourists snapping photographs of Chinese advertisements for French perfume, and sailors from California and Marseille looking for a massage done by nimble Chinese girls.

Beyond Kowloon is a surprising Hong Kong, the more rural and traditional New Territories. This is a place of monkeys and birds, camellias and azaleas, temples and ancestral tablets.

I FOUND CATHEDRAL MA, a dance student, in a rehearsal room at the Hong Kong Academy for Performing Arts, stretching his legs in preparation for a Royal Hong Kong Jockey Club scholarship competition. (Nearby, trees were being moved around for a coming production of Shakespeare's *As You Like It*—set in Mongolia with Cantonese dialogue.)

Did this young dancer's name suggest that he is a mixture of East and West?

"Seventy percent East, 30 percent West," Cathedral Ma replied. "Because I'm a Chinese—deeply affected by Buddhism and Confucianism—though I'm a Christian."

And was Hong Kong itself a similar mixture?

"In Hong Kong you can't tell which is East and which is West," he replied thoughtfully, "the two are so mixed together."

The young seem less worried and pessimistic about 1997 than their elders. And Hong Kong is, in fact, a young community, with two-thirds of the populace born after communist rule began to the north in 1949.

"They don't really know enough about China to be afraid of China," said Elizabeth

Sinn, a historian at the University of Hong Kong, "and they're passive. Their parents decide what the family is going to do."

Round-faced, cheerful Lok Chi Ming, who sells men's clothes in a department store, is 23. He expressed the present-mindedness and fatalism of many Hong Kongers of his generation. I met them in coffee shops and on ferries late at night, men in dark suits and silk ties and women in loose gray or brown garments that reflect the influence of Japanese fashion, talking earnestly of their own futures but often detached about Hong Kong's.

Destined for a bed of rice, a recently slaughtered pig is hand-delivered to a customer in Kowloon, where freshness is highly prized by cooks. A host of cuisines, including Cantonese, Sichuan, and Peking, make Hong Kong a gourmand's paradise. Though a few farms remain in the New Territories, Hong Kong imports much of its food from China, including nearly three million pigs a year.

Kowloon's Walled City, which was long claimed by both Britain and China, harbors hundreds of unregulated shops and services—like cut-rate dentistry—whose wares are sold from street-level shops. The crowded tenements have been a pool of cheap labor, today found just as easily across the border in China, where these masks (below) are made.

Lok Chi Ming expects that the communists will clamp down on the colony's freewheeling night life and ever popular Canto-rock music (more sentimental than Western rock and reminiscent of Western pop music of two or three decades ago). His favorite disco is called Nineteen 97—the choice of name perhaps expressing Hong Kong's clear-eyed enjoyment of today in full realization that tomorrow is a question mark. "Some people are scared of 1997," Lok said. "I'm not—nothing can stop it. I don't have the money to leave, so what can I do about it?"

The Hung family won't leave either. With their eldest son and two younger children, Mr. and Mrs. Hung run a one-room factory, manufacturing dried meat within the Walled City of Kowloon. A slum that the government has started to dismantle, the neighborhood is a honeycomb of damp alleys, airless hovels, sweated labor, scurrying rats, and people eking out a living from making wontons, rulers, puppets, plastic flowers, pancakes, and soles for shoes. Because the sovereignty of the Walled City was long disputed, Hong Kong's health regulations and licensing rules were never applied here. Prices were low, quality at times poor.

I shooed away a cat as I sat on a tiny stool and sampled the Hungs' dried beef, which is sold mainly in school canteens. "We have a lot of cats because they catch the rats," said Mr. Hung, an impassive man in a white undershirt. Overhead the family's clothes dangled from a pole. Mrs. Hung spoke of her hopes of moving the factory to China when the Walled City is no more.

"Labor is cheaper there," Mrs. Hung explained. "Besides, we get all our beef and pork from there already."

In a haze of flour dust, a noodle maker tries to keep cool during the last days of the Walled City, whose planned demise will draw a collective sigh of relief from all

Hong Kong. Teeming with open sewers and refuse, the "city" will be remembered for its legendary vices, such as child prostitution and murderous drug rings.

So for the Hungs, who were born in China and married in Hong Kong four decades ago, the wheel turns full circle. They push back into China, this time as mini-capitalists, while still residing in Hong Kong.

Had they considered moving to the West?

"Those people going to Australia or Canada have a lot of money," said Mrs. Hung, who like others in her neighborhood speaks no English and cannot read Chinese. "We have to work to earn a living. We are Chinese people, we don't know other languages, other places are not suitable for us."

Like the Hungs, most Hong Kong folk are fatalists, agreeing that the colony needs luck as well as ingenuity in dealing with China, but there are two varieties of fatalism. The cheerful fatalists say there is "nothing we can do"—and Hong Kong will work out its tie to the communists without disaster. The gloomy fatalists say there is "nothing we can do"—and anything Beijing touches, it will spoil.

CHINA'S STUDENT DEMOCRACY movement in April and May 1989 thrilled Hong Kong, bridging the political gap between the territory and the mainland. Unforgettable was the moment during the "Concert for Democracy in China" at the Happy Valley Racecourse on May 27, 1989, when the vast video screen lit up with the words, "Chinese of the World Unite."

In Beijing soon after, I retreated from gunfire and acrid smoke near Tiananmen Square. Making my way past barricades of buses and wrecked trucks, I hurried into the Beijing Hotel. I joined four Hong Kong businessmen on a 12th-floor balcony. We could see fighting below and hear gunfire crackling to the south. The men spoke emotionally in Cantonese. Two choked back tears.

Finally one of the men burst out in English: "It's the last straw! China is finished!"

The next day, June 5, 1989, the Hong Kong stock exchange crashed, losing 22 percent of its value, which it would take more than three months to regain. After Tiananmen, all the doubts about 1997 gathered like a bunched thread at the eye of a needle. Spring's new sense of identification with the mainland turned into summer's despair at Hong Kong's ultimate helplessness.

A mini-constitution for the future governance of Hong Kong known as the Basic Law, drafted by 33 representatives of China assisted by 18 from Hong Kong, gives the communist government wide latitude after 1997. The Basic Law, published in 1990, states that Beijing may station the Chinese Army in Hong Kong and declare "emergency decrees" for the territory.

In Beijing, I asked a senior government spokesman if this meant that Hong Kong might be treated as China has treated Tibet. Li Hou, deputy director of the Hong Kong and Macau Affairs Office, said that Tibet, which Beijing subdued by military force in

1959, had been punished for misbehaving.

"When we liberated Tibet peacefully in the 1950s," he said, "we reached an agreement that we would not practice democratic [socialist] reform there, but since the Dalai Lama later led a rebellion in Tibet, that disrupted the agreement." So Beijing ignored the agreement and wrenched Tibet toward socialism.

The communists' top man in Hong Kong, Zhou Nan, heads a staff of 600 at the New China News Agency. He warned that no one should tell the Chinese how to treat the

Showing their colors, Scottish expatriates whoop it up at the annual St. Andrew's Ball. Scots have played a vital role in Hong Kong's commercial growth, often as taipans, chief executives, of many of the colony's largest companies. Some employees of the trading giant Jardine Matheson, founded in 1832, are third and fourth generation. Hedging its bets against 1997, the firm has moved its legal headquarters to Bermuda.

With his French-born wife, Cristal, Alan Li, a steward of the Royal Hong Kong Jockey Club, follows his favorite at the Sha Tin Racecourse, one of two racing venues where bettors gamble the equivalent of $7,500 a year for every citizen.

colony. "China is China. In order to keep Hong Kong's stability and prosperity, one must not harm, intentionally or otherwise, the stability and solidarity of the mainland," he said. He opposes any basic change in Hong Kong before 1997.

"Standing still," said the governor, Sir David Wilson, "is a recipe for a dead society." He wants to set the colony, which has never known an elected government, on the path to democracy before handing it over. Wilson's government pushes for liberties never enjoyed in Hong Kong, including an ambitious bill of rights, decriminalization of homosexual acts, and a legislature partly elected on the basis of universal suffrage. A territory famous for its apolitical style is learning politics, as parties form for the first time, unions take political stands, and conversations turn as often to politics as to business. Some see this as a risky departure, since speaking up for democracy at home might be construed by Beijing as "interference by Hong Kong in China's affairs," giving the mainland an excuse to depart from its assurance that Hong Kong can be an "autonomous" part of the motherland.

The Hong Kong government, seeking a bit of democracy, is squeezed between China, which wants as little democracy as possible, and ardent democrats like Martin Lee, who want maximum democracy put in place now as a shield against Beijing. Wilson hopes the Martin Lees will avoid rocking the boat with a large agenda for change, but many ordinary people think the boat will rock anyway.

WARY OF THE FUTURE, some leading Hong Kong firms have taken steps to leave. Jardine Matheson, one of Hong Kong's oldest and most famous companies, created a stir by shifting its legal headquarters to Bermuda in 1984 (while keeping many of its operations in the colony). Since then dozens of companies listed on the Hong Kong stock exchange have shifted offshore, most to the tax haven of Bermuda.

A veneer over strongly held local traditions, symbols of Western affluence are seen everywhere. In Victoria, Cheng King Yiu passes a Rolls-Royce showroom as he takes for repairs the print that has adorned his one-room flat for 19 years.

The ebb of talent takes its toll on the economy. So do inflation and the slowing of China's economy since the Beijing violence of 1989. The colony's gross domestic product grew only 2.5 percent in 1989, down from 7.2 percent in 1988; the 1990 figure seemed unlikely to exceed 3 percent.

In 1989 and 1990 the human drain from Hong Kong increased dramatically, with more than 100,000 citizens leaving to live elsewhere, up from the yearly emigration figure of 20,000 that was normal in the early 1980s. Many of those leaving are the best and brightest—well-educated people age 25 to 45. There will be more, judging from the look of things.

At the Star Ferry docks, a glass case displays dolls for sale, each with the message of 1990 printed on its chest: "I would like to get out of here."

A thriving monthly magazine, the *Emigrant*, is devoted to the concerns of those who are leaving Hong Kong to resettle elsewhere. Bilingual, bought unblushingly, the magazine profiles an emigrant in every issue. Recent articles covered "Australian Child Care Options," "Properties in Portugal," "Highest Ranking MBA Schools in U.S.A.," "Finland as an Immigration Option," and "Knowing the Tax Implications of Moving to New Zealand."

With typical resourcefulness a few citizens have mastered the arcana of international immigration policy. They have learned, for instance, that a baby one day old needs a visa, but a fetus does not. Scores of pregnant Hong Kong women traveled to North America to give birth during 1990. Each baby automatically became a citizen of the country the mother was visiting as a tourist—and the family got a foot in the door for immigration.

The human side of the exodus often is poignant, as colleagues compete for emigration opportunities, lovers go in different directions, elderly parents are left behind, and families with handicapped children are sometimes weeded out because Australia and Canada reserve the right to decline immigrants

who are likely to be a burden on the state.

Just as the desire to abandon Hong Kong grew in the late 1980s, the three main recipient countries—Canada, Australia, and the U. S.—eased their immigration policies.

"It was like a match and petrol," said Mike Rowse, emigration supervisor in the office of Hong Kong's Chief Secretary, "the loosening up of the three policies and the desire to get out of Hong Kong."

Had Rowse ever heard of Hong Kong people emigrating to China?

"After they're dead," he said. "The coffins go up to Guangdong—burial plots are cheaper in China. Some of the elderly also go back."

WILD SCHEMES have been proposed for the colony by the nervous and the ambitious. Invite the UN to come in and take over. Move Hong Kong lock, stock, and barrel to the northern tip of Australia, paying rent to the Australians. Buy another island out of China's reach and re-create Hong Kong there—Prince Edward Road, Queen's Road, Star Ferry, and all.

Meanwhile, undaunted by such speculation, practical Hong Kong gets on with life. Buildings rise and fall, children in uniform go dutifully to school, old ladies buy fresh vegetables at neighborhood food stands, huge audiences watch Cantonese movies full of romance and martial arts, people flock to Buddhist temples on festival days to placate gods and ghosts with paper money, food, and wine. And this predominantly Cantonese colony indulges its enthusiasm for gambling.

On a recent Sunday I joined 30,000 people at the Royal Hong Kong Jockey Club, set against the soft green hills of Sha Tin in the New Territories. Here was a classless fellowship of businessmen, politicians, plumbers, shopkeepers, and taxi drivers, held together by the lure of betting on the Champions and Chater Cup and other races.

By 1 p.m., before the first horse set hoof on the track, 19 million dollars had been wagered; on the last race alone, more than a hundred million dollars was bet.

"The amazing thing about the Chinese," said a man I met in the public stands, "is that they'll bet $10,000 or $20,000, lose, and still be very happy."

The man is one of those Hong Kong

Barbed barrier against human tides from the north, a 16-foot-high fence—completed in 1980 when illegal entries were exceeding 150,000 a year—guards Hong Kong's 26-mile border with China.

The fence is manned largely by the Gurkha Brigade, Britain's famed troops from Nepal. A soldier searches a detainee (right) before he is sent back to China. Faced with dog teams, ground sensors, and tough judicial constraints—like three-year jail sentences—the number crossing has dropped in recent years, and arrests now average about 25 a night.


40

success stories. Originally from Sri Lanka, he immigrated to Hong Kong, established a profitable business as a jeweler, lost it all in the worldwide stock exchange crash of 1987, and scraped together more money for a profitable new business—in pest control. He is not anxious about 1997. "The communists will have as many roaches and rats as the capitalists," he reasons.

Jockeys came and went, looking like tiny children dressed in orange and green and purple silks. Across the way in the Hong Kong Golf Club box, Frank Knight, a businessman and keen gambler, ordered champagne to celebrate his latest winnings.

"Do you win all the time?" I asked.

"Nobody wins all the time," he shot back, "otherwise you wouldn't gamble." Knight, a large man in a natty beige suit, looked beyond the club tables—laden with chicken and oysters and caviar—and spoke affectionately of the spectators in the public stands.

"Those people are the real Hong Kong citizens, workers and blue-collar types, not computer specialists," he said. "They're not going to leave Hong Kong. They don't moan about things. They put their shoulder to the wheel."

Later, as the horses galloped by, I ran across an American diplomat.

"It's an absolute money machine, this place," he said, looking around at the bubbling sea of happy people. He left me wondering whether he meant the Jockey Club or Hong Kong itself.

ANOTHER HALF A MILLION Hong Kong people may well have left by 1997, but most ordinary folk will still be here, and they will accommodate. The choice is to emigrate or acquiesce, and since the vast majority do not possess the first option, Beijing may find the tide of reality flowing in its favor.

Montreal-bound, Edward Ma and his daughter Jenny say good-bye to their apartment in the New Territories. Many Hong Kongers don't trust the Chinese and their promise of "one country, two systems." With an emigration rate of about a thousand a week, the colony is fast losing many of its most skilled and educated citizens. Canada, Australia, and the U. S. are prime destinations.


HONG

Colors of waning empire, the White Ensign flies astern the royal yacht Britannia as it departs Hong Kong after a visit by Prince Charles. In its wake a modernized junk, more Chinese in form than substance, suggests the colony Britain will leave behind, the fates willing.

We cannot know for certain what 1997 will bring, if only because China itself is so volatile. Will Beijing follow the flexible line of the mid-1980s or the hard line of 1989 and 1990? What happens after China's leading communist, Deng Xiaoping, dies? Will communist rule eventually unravel, as in Eastern Europe?

Baroness Dunn, a director of Swire Pacific Ltd., takes a wait-and-see attitude. Like many in Hong Kong, she is a pragmatist. "China is in a strange mood at the moment," she said. "We mustn't take that as the China of tomorrow. A week is a long time in politics, and we still have seven years," she told me in 1990.

Given Chinese policies and the mood of the Hong Kong populace, the present prospect is that the dynamism of Hong Kong will decline, economic standards will continue slipping, contentiousness will grow as confidence declines, and social troubles will proliferate as a market economy moves under the shadow of a paternalist regime.

Yet the only certainty is that Hong Kong is changing and—once again—a "new" Hong Kong will edge out the familiar one. Lawyer T. S. Lo feels it is emotionally impossible for people rooted in Hong Kong to abandon the hope that China, in its own best interest, will handle the colony sensitively.

I put it to Lo that the man in the street doesn't care about the technicalities of the transition—the Joint Declaration of 1984 (which announced how Britain's lease on the colony would end) and the Basic Law of 1990. Doesn't the man in the street feel he knows the Chinese communists better than the British do? Doesn't the man in the street doubt that the Joint Declaration and Basic Law are worth the paper they were written on?

"I agree with you that that's what the man in the street thinks," Lo responded. "There's always a chance that he's right—but our survival depends on his being wrong. We have to work on that basis."

Is Lo hopeful that the agreement with China can work?

"Well, it certainly can't work if we are not hopeful," the lawyer responded with a sigh.

SHOULD TOMORROW'S CHANGE be sharp, I know that I would miss many things about the endearing Hong Kong I have known for a quarter of a century: tea in the lobby of the Peninsula Hotel, where empire seems permanent and where guests are called to the phone by a penguin-size boy in a white suit who parades

around the tables. I would miss the brilliant lights of Victoria on the black water of the harbor. I would miss the ripe smells and the human theater of the lanes, where a lady with a chair and a sewing machine makes a tailor shop out of thin air. I would miss the clack of mah-jongg pieces on sultry nights, the hiss of fritters frying in a wok, the smell of salted squid, the wail of the boat sirens as I sit with a newspaper on the Star Ferry.

I would miss faces with a story to tell, like that of one cheerful, wizened shoeshine man who rubbed the dust from my shoes with his bright cloth. I could not understand his Cantonese, nor he my English or my Mandarin, but it didn't matter. He found a green plastic "7" of the type used on a door or mailbox and held it up to signal the price. As I paid him, I looked into a face that was wary yet open. The piercing eyes, which must have seen Hong Kong before modernity and prosperity, under the Japanese heel in the 1940s, when Mao overran the mainland, and as the Cultural Revolution spilled into the colony, seemed to say that everything that is going to happen has already happened. □

HONG KONG

Plight of the Boat People

DESPERATE to come ashore, a boatload of Vietnamese are apprehended off Lantau Island by Hong Kong police. One passenger soon produced a crumbling letter, which he hoped would establish his ties to French colonial Vietnam in the 1950s and his credentials as a political refugee afraid of persecution should he be returned. Though many produce such documents, most of today's boat people are regarded, after screening, as economic refugees fleeing Vietnam's poverty. As such, they can remain in detention centers or return to their country.

These new migrants claim to have crossed hundreds of miles of open sea from Vietnam. British authorities, however, assert that most now cross China by land, boarding boats not far from Hong Kong.

Photographs by JODI COBB
NATIONAL GEOGRAPHIC PHOTOGRAPHER

SQUEEZED in wherever there is room in land-poor Hong Kong, detention and refugee centers for Vietnamese boat people occupy scraps of real estate like that next to the High Island Reservoir (above). Currently 14 camps harbor an estimated 55,000 people awaiting classification, repatriation, or resettlement. Inside huge concrete-and-metal dormitories whole families sleep together in shelf-like bunks (right). Under the strain, tensions among Vietnamese factions sporadically erupt into violence. Forbidden to leave the detention centers, detainees are at least allowed outdoors, where they line up for lunch (below) under close scrutiny.

PRISONERS innocent of crime, children of the boat people pay an especially heavy price for their captivity—even in "open" refugee centers. At Sham Shui Po, which has since closed, a young girl endures restraint by chain—possibly shackled by working parents to keep her from wandering.

Unlike their compatriots in the detention centers, the 9,000 or so approved political refugees in these camps are free to come and go while they await resettlement. Many hold jobs in Hong Kong.

From 1976 until mid-1988, when screening was initiated, more than 100,000 Vietnamese boat people were processed through Hong Kong, a favorite port of first asylum. Now, however, Western nations have tightened their immigration policies after a decade of generally receptive treatment.

Hong Kong, with the acquiescence of the UN High Commissioner for Refugees, felt constrained to adopt a policy of repatriation for economic migrants. About 4,500 have returned voluntarily. Only 51 have been returned against their will—a procedure halted by international opposition.


35K

PEERING through the wire-mesh wall of her cubicle, a young Vietnamese whose parents hold refugee status awaits passage to a free life in the West. Meanwhile thousands of other Vietnamese youngsters languish in the hellish limbo of detention centers with their parents until their status is resolved or they are repatriated.

With few exceptions, Vietnamese are not accepted for resettlement in Hong Kong.

Why should they be, Hong Kongers ask, when politics and population pressures have forced them to close their doors to fellow Chinese? Feeling trapped between contradictory forces, many in the colony have grown intolerant.

They have become impatient with the burden of caring for destitute Vietnamese—even as the approach of 1997 forces them to consider whether they themselves should remain in their Hong Kong homeland or emigrate to the West. □

—LARRY KOHL

Report from the President

Holding a flag of Iraq, a woman takes part in a government-sponsored demonstration in Baghdad.

DAVID C. TURNLEY,
DETROIT FREE PRESS/BLACK STAR

Meeting the Need: A New Middle East Map

In the weeks following Iraq's invasion of Kuwait last summer, we received hundreds of requests for maps of the Middle East. Some of the requests came from doctors and nurses and other reservists being sent to the region, some from parents of sons and daughters in the armed forces, and others from teachers beginning the new school year with students full of questions. One call came from a woman who had just been released from occupied Kuwait.

"The Iraqis had taken away her husband, and she had been hiding in an attic with other wives for weeks," says Amy R. Weaver, a staff member who spoke with her. "She wanted a map so that she could visualize where her husband was being held—if he got word to her."

To all those who asked, we rushed an up-to-date political map of the region. In this issue of NATIONAL GEOGRAPHIC you will find that same map combined with a concise summary of historical conditions behind the current crisis—50,000 copies of which we are donating to the armed forces for distribution both here in the U. S. and on station in the Middle East.

Americans, unfortunately, know too little about this vital area.

"We assume that all people in the region are Arabs, that all Arabs are alike, that all Muslims are alike," says Middle East expert Christine Helms, our adviser for the map text. Most nations in the region are conglomerations of various ethnic groups, and adherents of Islam can be as different as a Jordanian Bedouin and an Iranian oil engineer.

We shake our heads at the instability of the Middle East. But Americans forget, Helms says, that today's borders were imposed by foreign powers less than 80 years ago, that oil wealth has completely rearranged relations among Arab nations in the past three decades, and that the future belongs to the 60 percent of the population who are under 20 years old—a group less likely to accept the political arrangements of the past.

At the height of the war between Iran and Iraq a few years ago, a Gallup survey commissioned by the Society discovered that 75 percent of all Americans could not find the Persian Gulf on a world map. We are committed to reversing that trend—not only through special maps such as this one but also through our many Geography Education programs. As part of our tradition of public service, for example, we are giving 5,000 copies of the new sixth edition of the *National Geographic Atlas of the World* to needy schools across the country.

I hope this map of the Middle East is just what you've been looking for to help you understand this region of continuing importance.

Gilbert M. Grosvenor

National Geographic, February 1991

Forum

Is Our World Warming?

"Under the Sun" (October 1990) by Samuel W. Matthews and photographer James A. Sugar was most enlightening. I finally have an understanding of the amount of destruction done by the human race. An article like this may be just what is needed to open the eyes of people. Maybe we can get everyone to do their part in slowing the process. You can count on me doing mine.

LISA C. PETERMAN
Sunnyvale, California

You ask, "What can be done to safeguard our future?" We answer: a wholehearted commitment to stopping world population growth. United Nations projections show that world population, now at 5.3 billion, could stabilize at 8 billion by the year 2050. Or, if current trends continue, global numbers could nearly triple. Much attention has been focused on the need to conserve energy and preserve our forests, but policymakers are too slow in their willingness to confront the wild card—population growth. With 40 percent of the world's population entering their reproductive years in the 1990s, action is needed now.

SUSAN WEBER
Zero Population Growth
Washington, D. C.

The idea of global warming has gone from a modeler's dream to popular environmental wisdom and is about to take the expensive last step: government appropriations to avoid the "crisis." Politicians are preparing to save us by introducing legislation to spend plenty of money or pass complicated restrictions on one thing or another. Overreaction to environmental ideas that are not well-founded can result in huge economic costs.

GEORGE E. RIBBLE
Bakersfield, California

The article is a valuable summary of information not readily available even to those with scientific backgrounds. I wish to comment on the interpretation of ancient ice core sampling used to establish the historic carbon dioxide content of the atmosphere. There are strong grounds for concluding that the greenhouse effect played a major role in the mechanics of ending the Ice Age. Considerable quantities of CO_2 continuously emanate from earth's crust. During an ice age there is less fixing of that gas by living organisms. Therefore the CO_2 content would increase during an ice age.

P. J. HOUSELEY
Havant, England

Ice core analysis clearly reveals reduced CO_2 levels during an ice age.

I question the validity of the CO_2 measurements in ice sheets as proving that global warming is increasing. CO_2 is quite soluble in water and ice and surely would have been lost by migration over long time periods.

MELLER SWANEY
Spring Hill, Florida

Yes, CO_2 is soluble in water but not in extremely cold ice. The air trapped as bubbles in ice cannot migrate and is considered by scientists to be a very reliable indicator of fossil air content.

Sea level has been higher and the earth warmer within the span of human culture than it is now. Earth's climate has and undoubtedly will continue to change for reasons dimly perceived and usually wholly beyond human control. Wouldn't it be better to learn to live with some of the changes instead of trying to manipulate nature to suit ourselves?

RALPH H. ESPACH, JR.
Oklahoma City, Oklahoma

Cajuns

Congratulations on your superb "The Cajuns: Still Loving Life." True, my generation (1940s) will be the last to speak "Cajun." Otherwise well-intentioned teachers cajoled and spanked a measure of Cajun out of my father's generation; ignoramus outsiders ridiculed away another portion; and, finally, faced with indifference from Anglos, our parents failed to force us to use Cajun. If we as a nation learn a lesson from the loss of Cajun and do not force other colorful languages into extinction, then the Cajuns will have contributed another ingredient to the gumbo that is America.

VIC COUVILLION
Southeastern Louisiana University
Hammond, Louisiana

While it is difficult to find a southern Louisianian under 40 who can speak fluent 17th-century French—or any French for that matter—Cajun French can be heard in neighborhoods, at church functions, in lounges, and on very-high-frequency radio channels on fishing boats and tugs.

ANTHONY R. MILLS
FPO San Francisco, California

Why doesn't the article feature the great Cajun women: our mothers, like mine, Audrey Broussard, who makes the best hen and oyster gumbo . . . or Bobbie Denais, the accordion player who performs the old-time Cajun tunes by ear . . . or

Nell Prejean, at 80 plus years still going strong, dancing two or three times a week, exemplifying Cajun joie de vivre. The energy and "centeredness," the essence of Cajun spirit, come from the women. The story is only half told.

BRENDA BROUSSARD
Corrales, New Mexico

As an Acadian from Grand-Sault (Grand Falls), New Brunswick, I was disturbed by the unfavorable impression Mr. Smith gives of our life-style compared with that of the Cajuns. La joie de vivre is alive and well with us, the Acadians, as well as with our cousins the Cajuns.

CLAUDINE GODBOUT LAVOIE
Montreal, Quebec

Suruga Bay

Never have I been transported to another place so well as in the article on Suruga Bay. I actually felt I was looking at the underwater world David Doubilet described. Even without the photographs, which were beautiful, I would have been able to picture exactly what he was saying.

DEBORAH J. LAMB
Little Falls, New York

Mali's Dogon People

I found the article by David Roberts on Mali's Dogon people a most admirable piece of reportage: the good taste with which the author approached people and their surroundings, the way he looked at things, the selection he made for his article, and the way he presented it are all perfect.

H. J. BECKER
Vienna, Austria

The photograph on pages 102-103 portrays well the mood of the harmattan, a wind from the Sahara. But its arrival means that the dry season has just begun. The sight of rain clouds is possibly six months distant. In West Africa rain comes from the Atlantic, borne by winds from the southwest that do not blow until April, when the Northern Hemisphere begins to warm up.

JOHN A. ASHCRAFT
Fallon, Nevada

Treetop Raft

In the fascinating article on treetop rafting by dirigible for biological research in the French Guiana rain forest, the comment was made that "some spiders resembled ants, apparently a way to fool such predators as birds, which generally avoid eating ants because of their bad taste." An equally plausible explanation of this mimicry is that some spiders resembling ants are deceiving those ants upon which they prey.

JOHN A. WEST
Professor of Plant Biology
University of California, Berkeley

Earth Almanac

The piece on the reuse of old tires was of interest since we in cement production are able to introduce tires directly into the cement kiln to provide about 10 percent of our energy needs. In the 2800°F kiln, tires undergo complete combustion. This provides an excellent example of the coupling of industrial and environmental concerns.

D. KEITH MCFAUL
BoxCrow Cement Company
Midlothian, Texas

The old-tire feature mentions useful and novel ideas but fails to indicate the economic stopper: transportation costs. A truckload of tires is mostly air. For any of the ideas to make an impact on the massive number of old tires, a cheap, effective, and locally applied chopping or compressing method is needed—not an easy task with today's steel-belted radials.

W. TRAVIS WALTON
Engineering Research Center
University of Maryland, College Park

Geographica

Regarding the piece about wolves, the killing of radio-transmitter-collared wildlife is not always a coincidence, especially within the short period of a week. Researchers studying bears in the Smokies found that poachers used radio receivers to track the helpless animals. The large area of the forest is not a deterrent to a poacher with a first-class radio receiver. In fact, the very devices intended to save those creatures now lead to their demise.

CHARLES LANE
Charlottesville, Virginia

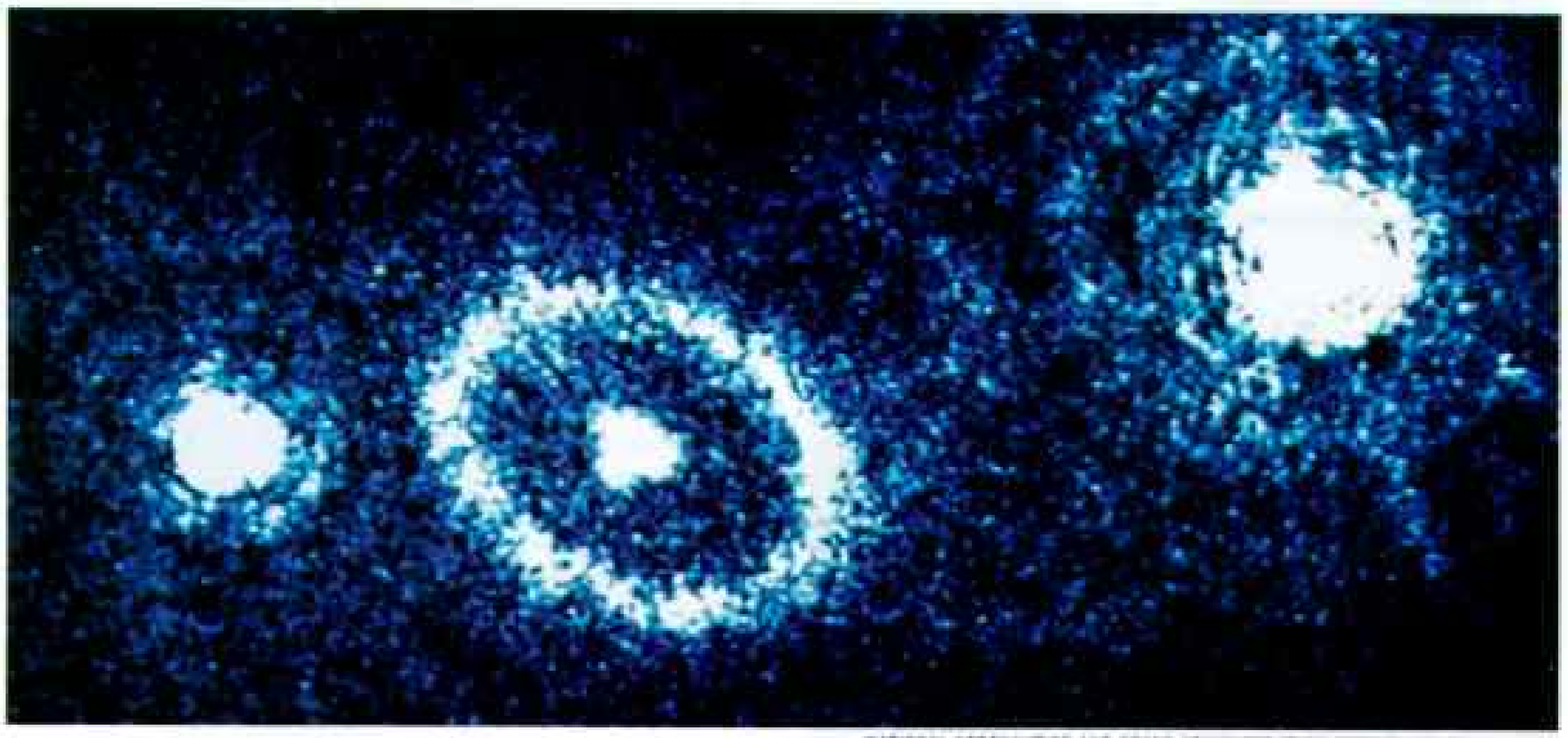
In the item on early lightning detection, I was amazed at the absence of a caption. If I had not been to Perth last year, I would never have recognized that Mikhail Pierce's photograph is of that Australian city.

ALEXANDRA J. CORNWELL
Brunswick Heads, New South Wales

Residents of Tumbler Ridge in eastern British Columbia can identify with the piece on the Board on Geographic Names. Since its incorporation in 1981 as the province's newest resource town, based on open-pit coal mining, our town of 5,000 has received mail addressed to Thunder, Tumbling, Tubler, Timber, Tubling, Tumble, and a variety of other names. "Ridge" poses no problem, but the part named after tumbling rocks does.

ANNE LEBLANC
Tumbler Ridge, British Columbia

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

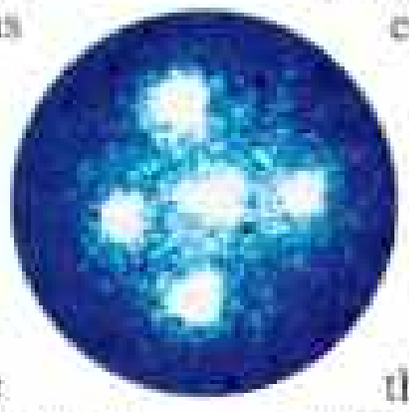


NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (ABOVE AND BELOW LEFT)

Troubled Hubble Still Dazzles Astronomers

The Hubble Space Telescope, its observational powers diminished by a defective mirror, nevertheless has racked up surprising discoveries.

"Despite the engineering flaws, we've pulled down an embarrassment of riches," says Eric Chaisson, an astrophysicist at the Space Telescope Science Institute in Baltimore.



The Hubble telescope zoomed in on a luminescent ring of gas 1.3 light-years across that surrounds the remnant of a supernova, or exploding star (above, flanked by two stars), first observed in 1987 (NATIONAL GEOGRAPHIC, May 1988). The ring, formed by stellar wind, had also encircled the supernova's predecessor, a red supergiant star that existed 10,000 years before the explosion.

Another Hubble image vastly increases knowledge of a galaxy called NGC 7457. The image shows a greater concentration of stars at the galaxy's center than expected, suggesting that the core may be a black hole. The gravitational force of black holes, whose existence so far is theoretical, is thought to be so powerful that it pulls in surrounding stars; not even light can escape.

Hubble also showed how a galaxy 400 million light-years from earth distorts the light from a faraway quasar—a star-like object that emits huge quantities of light and radio waves. In a Hubble view (left) it appears as multiple images that form a cross. The light was bent by the galaxy's gravity, just as Albert Einstein had theorized early in this century.

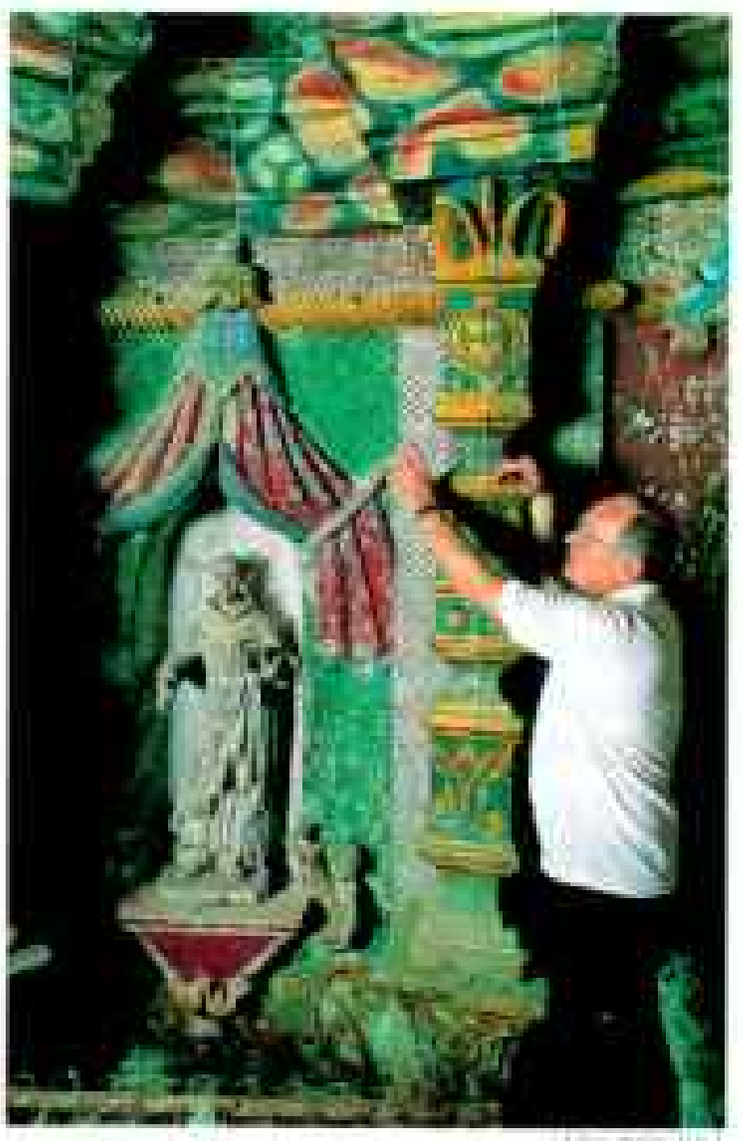
A Battle to Restore a Church's Priceless Art

Paul Schwartzbaum is a fresco specialist advising on the restoration of the Sistine Chapel (GEOGRAPHIC, December 1989). So he draws on experience when he says that the 200-year-old wall paintings and sculptures in the church at Arizona's Mission San Xavier del Bac can and should be restored.

"The San Xavier paintings are the finest in the United States," he says. "But they are covered with dust, smoke, soot, and bird droppings."

Schwartzbaum was called to the church by Bernard Fontana, an anthropologist active in a drive to preserve the church, a national historic landmark on the San Xavier Indian Reservation near Tucson.

The paintings and sculptures were created by unknown artists when Spanish Franciscan missionaries built the church in the late 1700s. Today Franciscan Father Michael Dallmeier (below) is in charge of the mission.



JACK DYKINGA

National Geographic, February 1991

Geographica

COURTESY TUSKEGEE UNIVERSITY ARCHIVES (ABOVE AND RIGHT)

A Lifetime Recording the Black Spirit

For more than half a century Prentice Herman Polk's camera documented the lives of blacks in his native Alabama. By the time he died in 1984 at the age of 86, he was a legend.

Like his counterpart James Van Der Zee, who photographed blacks in Harlem (GEOGRAPHIC, February 1977), Polk concentrated on a specific region. "He was rooted in Alabama soil," says Louise Daniel Hutchinson, a historian who has been researching Polk's life and work. He recorded black life in Macon County, from an unknown sharecropper (right) to George Washington Carver (left), from family portraits to the civil rights movement. "He captured the spirit of the people," says Hutchinson.

She examined 15,000 of Polk's negatives at Tuskegee University, where he was official photographer from 1939 until his death. Polk's health and the quality of his work declined in the 1940s and 1950s. Then came the civil rights movement, and Polk was "recharged," Hutchinson says. "Everything just came into focus."

A New Dating Clue: Ostrich Eggshells

Scientists studying sites that contain evidence of human ancestors face a "dating gap." Radiocarbon dating works only on organic material less than 40,000 years old, and the potassium-argon method is most accurate when material is more than 200,000 years old. Now there may be a new tool to plug the gap: ostrich eggshells.

Such shells are commonly found on sites in dry areas of Africa and Asia. The large ostrich eggs attracted our human ancestors, says Alison Brooks of George Washington University. The eggs served as food, the dense shells as containers for carrying water and, eventually, as material for ornaments.

Brooks and her colleagues found that certain amino acids in the shells decay at a constant, predictable, and very slow rate. Brooks, whose work has been supported by the National Geographic Society, says that scientists can use this decay rate to calculate a shell's age. "We have lots of sites in Africa with nothing but stone tools and ostrich eggshells," she says. "Using this technique, we can determine sequences of human development or the ages of the tools." She and her group tested the process on shell from Africa, Israel, and China. "It works," she says.

Fossil Whale Feet, Not Made for Walking

Most mammals live on land and have feet. But whales are mammals that live in the water and don't have feet. Did whales once live on land? Scientists believe they did, and now, for the first time, a scientific team has found fossilized bones from hind limbs and feet (right).

But the discovery of whales that lived 40 million years ago—in a sea that is now an Egyptian desert—raises a new question: Since the limbs were so tiny, what purpose did they serve?

The bones were found by a team headed by Philip Gingerich of the University of Michigan, whose work was supported in part by the National Geographic Society. The team located the skeletal remains of 243 large archaic whales in a "paleontologist's paradise" southwest of Cairo.

"The legs were weak and the feet too small for walking or swimming or to support the whale," Gingerich says. He thinks that since they extended from the pelvic region, they were used to help guide the whale during mating. Other experts are not convinced, and the matter remains unsettled.

NGS STAFF

NATIONAL GEOGRAPHIC MAGAZINE

Keep A Great Thing Growing America, Tree City USA

You can help make your town a Tree City USA, make your neighborhood more beautiful, and make your home more valuable when you prune and care for your trees.

A free, easy-to-follow "How To Prune" guide has been prepared by The National Arbor Day Foundation to show you how.

You'll learn how to shape and guide a shade tree when it's young so that it will grow straight, strong, and healthy.

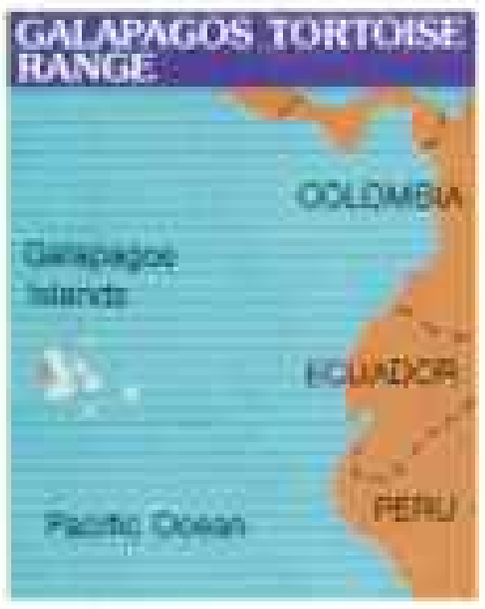
This valuable booklet is filled with illustrations showing you how to make a pruning cut . . . how to prune for desired form . . . how to strengthen your tree by removing certain branches . . . how to select and care for pruning tools . . . how to prune according to the tree's function.

Keep a great thing growing. Write for your free booklet today. Send your name and address to: How To Prune, National Arbor Day Foundation, Nebraska City, NE 68410.

TREE CITY USA

The National Arbor Day Foundation

WILDLIFE AS CANON SEES IT



Galapagos Tortoise

Genus: *Geochelone*
Species: *nigra*
Adult size: Length, up to 122 cm
Adult weight: Up to 227 kg
Habitat: Volcanic islands of the Galapagos archipelago
Surviving number: Estimated at 10,000—15,000
Photographed by Frans Lanting

Galapagos tortoises were so abundant that early explorers named the islands Galapagos, Spanish for tortoises. But by the late 19th century, hundreds of thousands of tortoises had been killed by whalers for food. Island ecosystems are especially vulnerable, but with careful protection, the giant tortoises will continue to enhance their unique natural environment. To save endangered species, it is essential to protect their habitats and understand the vital role of each species within the earth's ecosystems. Photography, both as a scientific research tool and as a means of communication, can help promote a greater awareness and understanding of the Galapagos tortoise and our entire wildlife heritage.

Earth Almanac

GORDON W. GAHAN

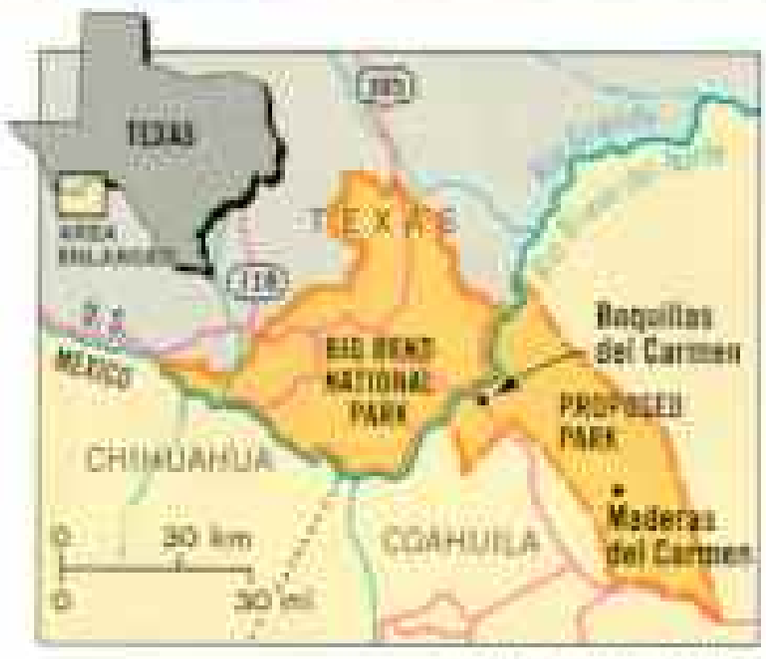
Border Would Disappear at U.S.-Mexican Park

It could be called the ultimate "Tex-Mex project." Conservationists will recognize it as the biggest international park in the world—if the U. S. and Mexico can agree on cooperative management of more than two million acres straddling the Rio Grande (above).

Already protected on the U. S. side are more than a million acres, including 802,541 in Big Bend National Park. Now Mexico plans an equivalent sanctuary directly across the river in rugged Coahuila state.

Desert species, some hard-pressed by human development, share both sides of the river. They include the mountain lion, peregrine falcon, black bear, and an endangered songbird, the black-capped vireo. Each nation would administer its reserve but exchange information and technology, as do the U. S. and Canada at Waterton-Glacier International Peace Park.

"Our combined parks might operate as a free zone where visitors could cross borders without going through customs," said Jim Carrico, superintendent at Big Bend. "To them it would be one park."



NGS CARTOGRAPHIC DIVISION

The High Cost of Rescuing Otters

Capturing, cleaning, and treating 357 otters stricken by the oil spill in Prince William Sound, Alaska, nearly two years ago cost 18.3 million dollars in salaries, capture boats, helicopter time, and the construction of three emergency facilities. That works out to $51,260 per otter. But scientists believe the high cost of rescue was justified, even though the population of 10,000 sea otters in the sound was never seriously threatened. "We learned how to build emergency centers quickly, and we improved veterinary techniques that will help animals recover from future oil spills," said Dr. Randall Davis, head of the rescue.

The bill was paid by the Exxon Company USA, whose tanker spilled 10.9 million gallons of crude oil on March 24, 1989. About a third of the captured otters died, many from ingesting oil. Of the 225 survivors 197 were returned to the wild, and 28 pups and disabled adults went to aquariums.

KAREN JETTMAR, ALLSTOCK

National Geographic, February 1991

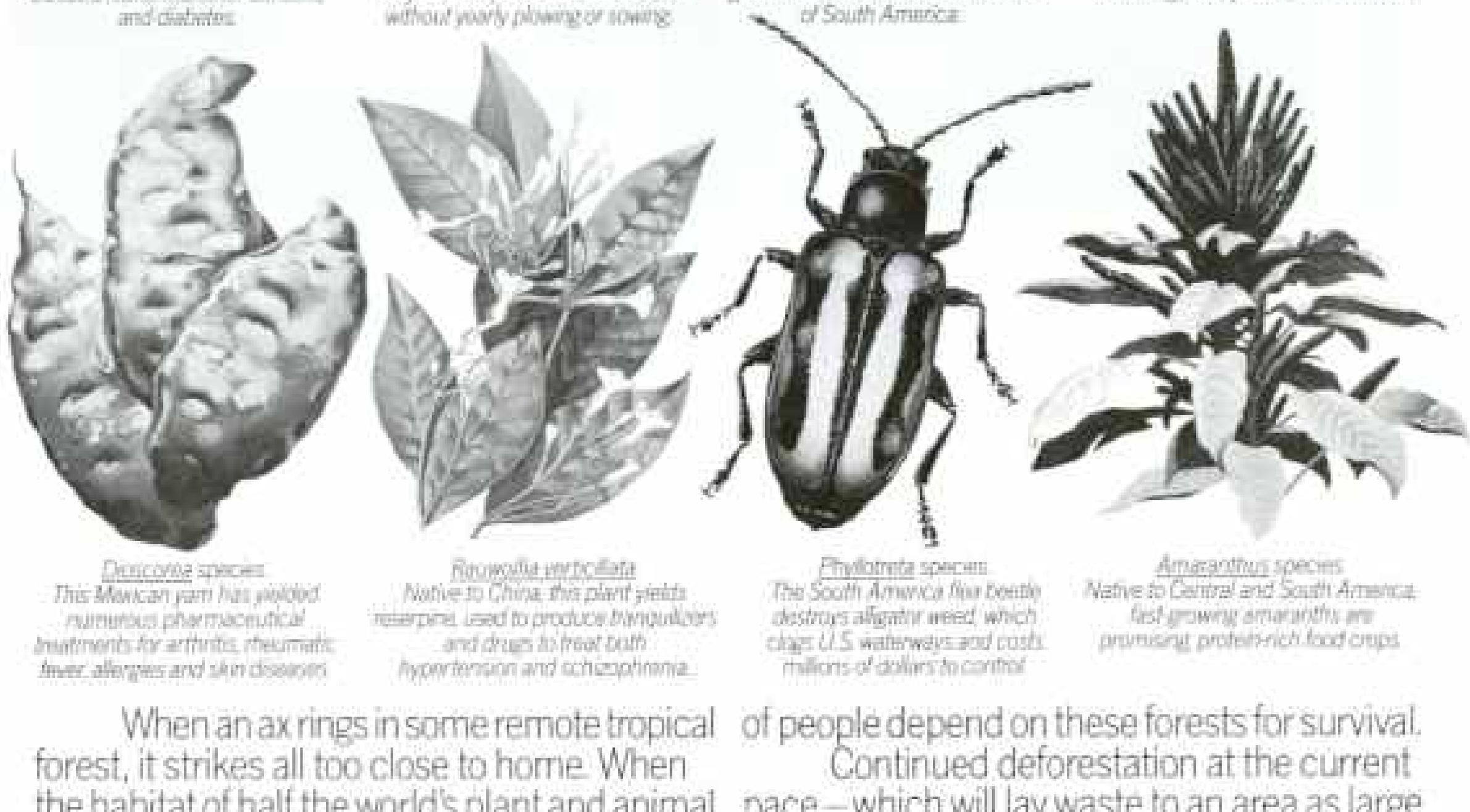
Some Of The Reasons For Saving Tropical Forests Are Disappearing.

Catharanthus roseus
Rosy periwinkle, of Madagascar, is used to treat Hodgkins disease, leukemia, other cancers, and diabetes.

Zea diploperennis
Teosinte of Mexico is a perennial disease resistant wild corn that may make it possible to raise corn without yearly plowing or sowing.

Cacao species
Wild cocoa plants, (on which the future of chocolate depends) grow in the threatened rain forests of South America.

Vermivora chrysoptera
Golden-Winged Warbler, which writers in Cuba and the Bahamas, is now dangerously close to extinction.



Dioscorea species
This Mexican yam has yielded numerous pharmaceutical treatments for arthritis, rheumatic fever, allergies and skin diseases.

Rauwolfia verticillata
Native to China, this plant yields reserpine, used to produce tranquilizers and drugs to treat both hypertension and schizophrenia.

Phyllotreta species
The South America flea beetle destroys alligator weed, which clogs U.S. waterways and costs millions of dollars to control.

Amaranthus species
Native to Central and South America, fast growing amaranths are promising protein-rich food crops.

When an ax rings in some remote tropical forest, it strikes all too close to home. When the habitat of half the world's plant and animal species is destroyed at a rate of 50 acres every minute, we all pay the price.

Tropical forests have yielded precious medicines, food crop varieties and much more. They are habitat for many rare birds and other wildlife. And the lives of hundreds of millions of people depend on these forests for survival.

Continued deforestation at the current pace—which will lay waste to an area as large as one third of the continental U.S. by the year 2000—will rob us of these and other as yet undiscovered benefits.

But it need not continue. Write in order to find out how you can help keep tropical forests alive, before the reasons disappear.

Keep Tropical Forests Alive.

Tropical Forest Project, World Resources Institute, 1735 New York Avenue, N.W. Washington, D.C. 20006/Prepared by Richardson, Myers & Donofrio, Inc.

Earth Almanac

Nuts to Ivory, Carved Seeds Help Save Forest

Ivory-like tagua nuts, made into buttons, may help keep Ecuador green. Two U. S. clothing companies are buying hundreds of thousands of cream-colored fasteners made from the golf-ball-size tree seed. Villagers in Rio Santiago Comuna who pick the nuts are hoping to prosper, thereby demonstrating that rain forests are more valuable standing than cut for lumber.

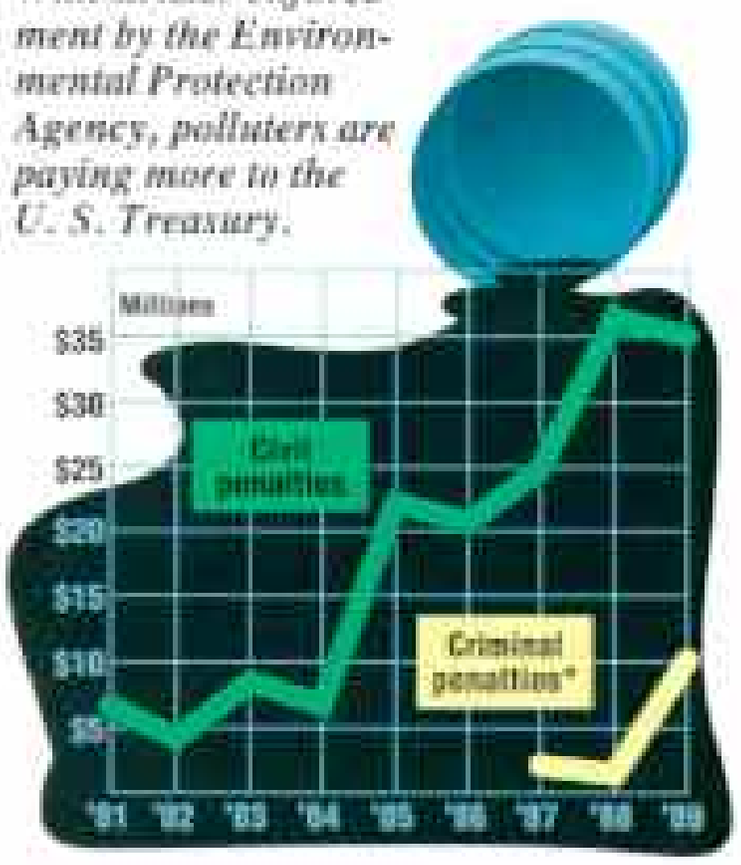
Fashioned into jewelry and figurines, the rock-hard nuts also offer a substitute for ivory, now banned from international trade. Evidence of a 250-year-old tagua-carving tradition in South America was found by researchers for Conservation International (CI), which initiated the button project. This marks a comeback for tagua, used for buttons before plastic largely replaced it in the 1930s.

Marketing tagua buttons is only the first phase of a CI plan to increase the use of some 2,000 rain forest products, including medicines, furniture, and baskets. "It's one thing to wear a button that says 'Save the Earth,'" said outdoor-clothing manufacturer Bill Scranton, "and another thing to wear a button that does save the earth."

VICTOR R. BOSWELL, JR., NGS (ABOVE AND TOP)

Higher EPA Fines Make Pollution Costly

With stricter enforcement by the Environmental Protection Agency, polluters are paying more to the U. S. Treasury.



* ACCURATE DATA NOT AVAILABLE BEFORE 1987
SOURCE: EPA; ART BY MARK HOLMES, NGS STAFF

Bonus in the Search for Energy: Food

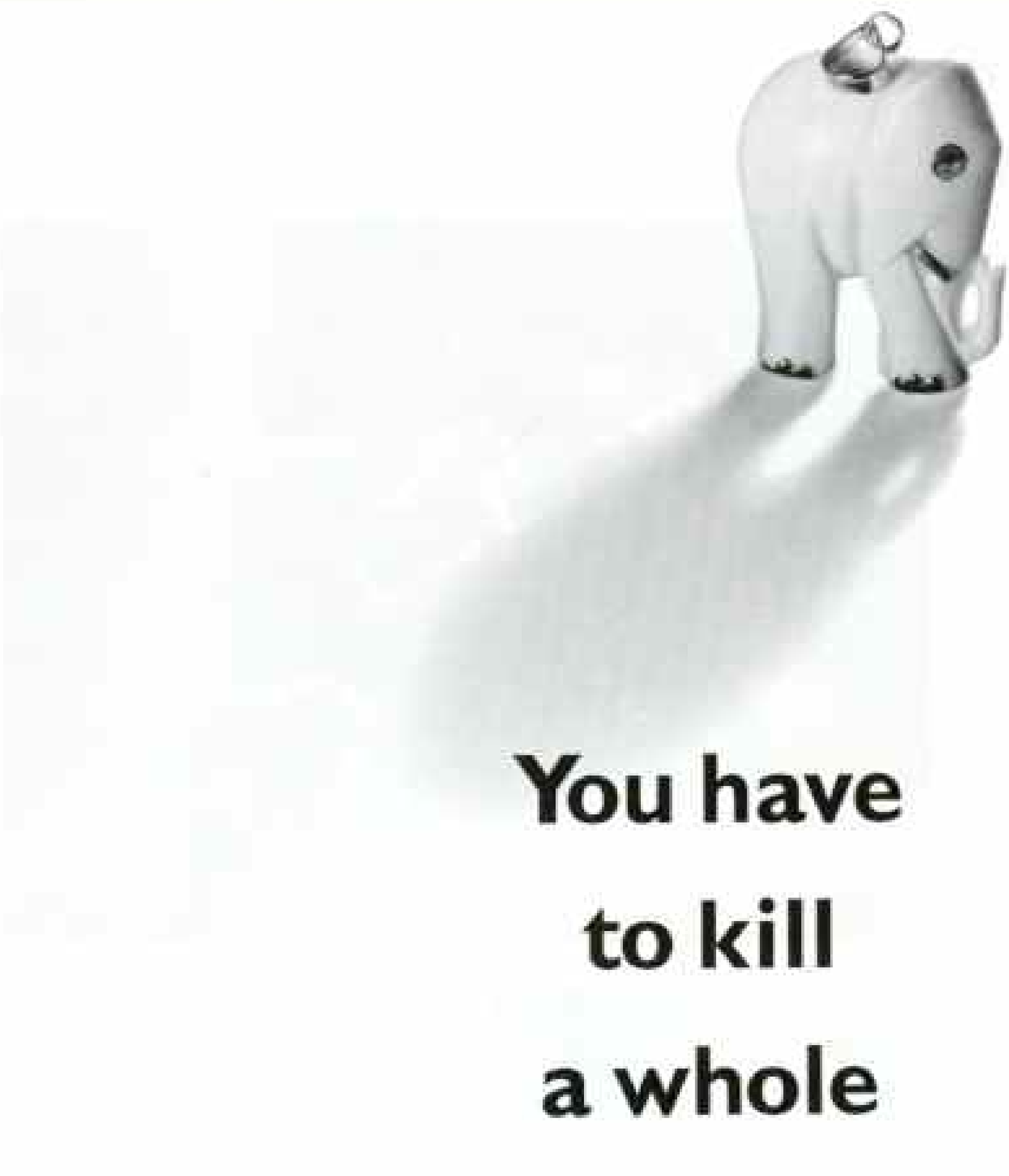
Reaching deep into the sea to make electricity, researchers on the island of Hawaii came up with strawberries, lobsters, and edible seaweed.

Experiments in producing power from temperature variations in seawater began 11 years ago at the Natural Energy Laboratory on Keahole Point. Warmth from surface water is used to vaporize ammonia, driving a turbo-generator. Then 43°F water pumped from 2,200 feet deep chills the vapor, condensing it for reuse.

Sharing the seawater with aquaculture, however, has proved more cost effective. The clean cold water contains phosphates, nitrates, and silicates that nurture algae processed for food supplements and seaweed for sushi wrapping. In commercial ponds the water supports salmon, lobsters, oysters, sea urchins, and abalone (below). On land, piped through the soil, it fools cool-weather crops—lettuce, strawberries, and asparagus—into growing in hot climates.

GREG VAUGHN

National Geographic, February 1991



You have to kill a whole elephant to get a little ivory.

The road to extinction is paved with ivory bracelets, rings and carvings. All beautiful. All deadly.

Every day in Africa, 143 elephants are slaughtered. At this rate, they'll be wiped out in 25 years. Unless you help now. First, don't buy ivory, new or old. And alert everyone you know.

Then, support World Wildlife Fund's elephant action campaign. We are the only group actively working with local people across Africa to stop poaching and save elephant lands.

Help us hire more rangers, buy more jeeps, equip more patrols and save more elephants. Send for more information now. And help keep ivory where it belongs.

WWF

SAVE ELEPHANTS. DON'T BUY IVORY.

WORLD WILDLIFE FUND Dept. ZA1, 1250 24th St. NW, Washington, D.C. 20037

Prepared as a public service by Ogilvy & Mather. Photo by Charles Gold.

On Assignment

DAVID BRADNUM

Intrepid pair, photojournalists ANGELA FISHER, left, and CAROL BECKWITH, who challenged the rugged isolation of southwestern Ethiopia to make friends with the Surma, date their collaboration to 1978 in Nairobi.

In 1970 Angela had traveled from her native Australia to Kenya, inspired by a film on the Serengeti. She became fascinated with the Masai—as did American-born Carol, upon her arrival later from Boston. Angela's brother, Simon, engineered a meeting between the two after taking Carol on a balloon flight over a game park and realizing that she and his sister were kindred spirits with a deep love for Africa.

"We became fast friends," Angela recalls. Often traveling together, Angela finished her book, *Africa Adorned*, on jewelry and body decoration (GEOGRAPHIC, November 1984), as Carol completed books on the Masai and on Niger's Wodaabe people (GEOGRAPHIC, October 1983).

In 1985 the two embarked on an ambitious five-year joint project: to document the major cultures of the Horn of Africa. Just published, *African Ark* (Harry N. Abrams, Inc., New York, 1990) includes discussion of the seminomadic Surma.

Carol and Angela rode by mule train for three days to reach the remote Surma, whose creative expression includes body painting. The artist Kolaholi, left, ranks among the best. Chinoi, in hat, is revered as a battle-scarred champion of violent stick-fighting contests known as *donga*. Thronged by hundreds of frenzied onlookers, Surma men flail at one another with long poles to prove their manhood and win wives.

"As we photographed, donga sticks crashed above our heads," recalls Carol. "Our Surma friends, who were terrified for our safety, once lifted us into nearby trees." The crowds bristled with antiquated rifles. At one fight when a quarrel erupted, threatening a shoot-out, everyone fell to the ground.

Surma women still proudly wear large plates in their lower lips. Carol and Angela became so involved with their subjects that at the end of their final visit, some of their friends asked them to stay permanently—no lip plates required.

But among other Surma, who felt excluded by the photographers, trouble was brewing. "We were told these angry Surma were going to ambush us when we tried to leave," says Angela. "So the day before, we invited the chief and his family to our camp for a big meal. Would they escort us in a procession? They did, and it worked, although we did see some Surma hidden in the trees—probably with guns."

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