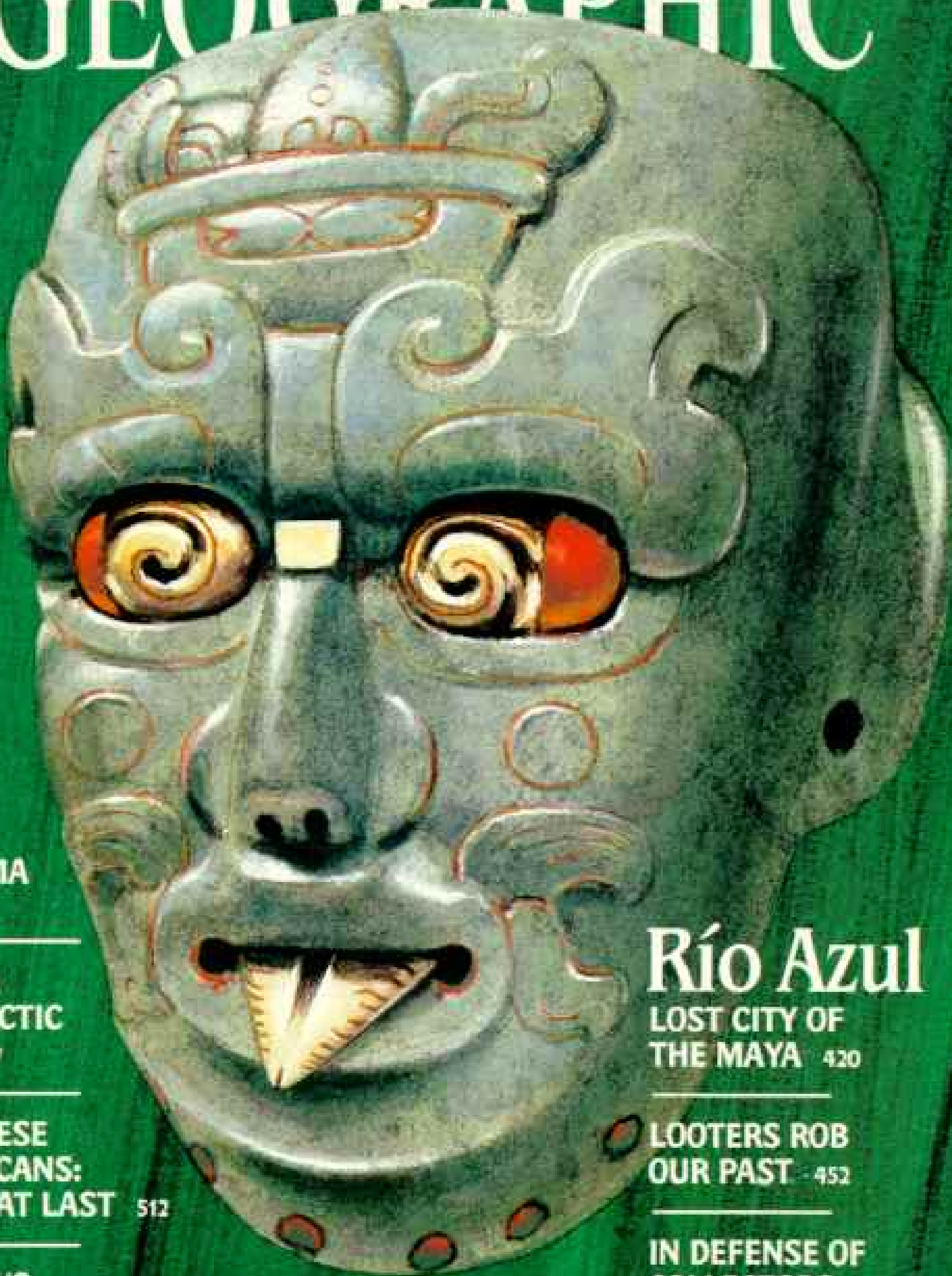


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APRIL 1986

# NATIONAL GEOGRAPHIC



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# NATIONAL GEOGRAPHIC

April 1986

LAST DECEMBER newspapers worldwide decried the brazen Christmas Eve theft of 140 pre-Columbian artifacts from Mexico's National Museum of Anthropology. Eventually the treasures may filter into one or more private collections; certainly no reputable museum would touch them.

Curator Felipe Solís said, "They robbed a piece of our history. How can we put a price on it?" Yet in recent years another theft, possibly even more significant, went virtually unnoticed. The Maya ruins at the Río Azul site in northern Guatemala, reported on in this issue, were systematically and massively robbed between 1979 and 1981.

When officials looked into the empty cases in the Mexico City museum, they must have been shocked, knowing what had been lost. When archaeologists looked into the spectacular but empty Tomb 1 at Río Azul (pages 452-3), they could only imagine what had been lost.

No one will ever know how many of its artifacts went into the underground art market. More important, we'll never know how much irretrievable history was tossed on the refuse pile as looters sorted out and kept only the objects that would bring high prices. And that was only one of 32 tombs looted at Río Azul.

Of the many artifacts that have surfaced in recent years, thought to be from Río Azul, we show two. The magnificent mask on our cover was offered for sale by a collector for a suggested price of \$470,000. The other—the vase on page 456—is in the Detroit Institute of Arts. Both are shown as paintings, since neither owner would permit us to photograph them. The institute plans to issue its own publication on the vase later this year.

Although scholars may never know their origins for sure, each contains a glyph now identified with Río Azul. In the faint hope that pictures exist, we—in collaboration with the Guatemalan Institute of Anthropology and History—will pay \$10,000 for a photograph that shows either object in the undisturbed location in which it was found.

In addition to Richard Adams's report on his work at Río Azul, Ian Graham of Harvard discusses losses from looting, and Gillett Griffin of Princeton presents the case for thoughtful collecting that contributes to man's knowledge.

## RÍO AZUL

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*Bat expert Merlin D. Tuttle extolls the beneficial role of endangered flying fox bats.*

**COVER:** This fuchsite funerary mask, now in a private U. S. collection, bears a glyph from Río Azul. Painting by William H. Bond.

*Wilbur E. Garrett*

EDITOR



## Archaeologists Explore Guatemala's Lost City of the Maya

# Río Azul

By RICHARD E. W. ADAMS

Photographs by GEORGE F. MOBLEY

NATIONAL GEOGRAPHIC PHOTOGRAPHER

**W**E WERE SEARCHING for another unlooted tomb at the ancient Maya city of Río Azul in northern Guatemala. Our 1984 season had ended with the spectacular find of Tomb 19, an Early Classic burial sealed for some 1,500 years.\* For that, we had trenched into an ancient platform jutting south from the base of a tall mound—once an elegant memorial temple.

Now our team was carefully tunneling the massive north platform, slowly removing boulders of limestone in steamy tropical heat, poor ventilation, and dim light. Frustration built as days passed without result.

In contrast, our six other research teams were already beginning to reveal a substantial amount of information on Río Azul. By mapping the hundreds of overgrown mounds of rubble and remnants of stone buildings, we were able to begin to define the city and its parts, including an agricul-

\*See the Editor's Page, August 1984 *GEOGRAPHIC*.

tural suburb. In addition we were finding what I believe to be evidence of dams in the river, fortifications, and canal systems, and excavating remains ranging from the lowest mounds—ancient residential buildings—to large palaces of carefully cut limestone. Day by day the character and functions of the ancient city were coming into focus.

A companion to Tomb 19 *had* to rest in the north platform, but we had exhausted logical places to look. Grant Hall, leader of the search team, proposed tunneling in a new direction. His Guatemalan colleague, Julián Totbol, softly disagreed, pointing in another direction. "The tomb is over there."

And it was. Two days of tunneling ended over a thick layer of chert chips, which the Maya may have placed there to warn future generations away from a sealed crypt. Beneath lay the capstones—the top of the tomb itself. Grant and Julián carefully pried out one of the great slabs; then Grant wedged his upper body

(Continued on page 430)

*Speaking from the past, a four-inch-high Maya figurine (right) is one of the oldest of its kind ever discovered. Modeled as a whistle 1,500 years ago, it was found in an undisturbed burial, Tomb 23, at Río Azul in Guatemala, and may portray the buried noble. A glyph (above) on a pot from a companion burial, Tomb 19, refers to the riverside city, subject of a five-year excavation directed by the author.*

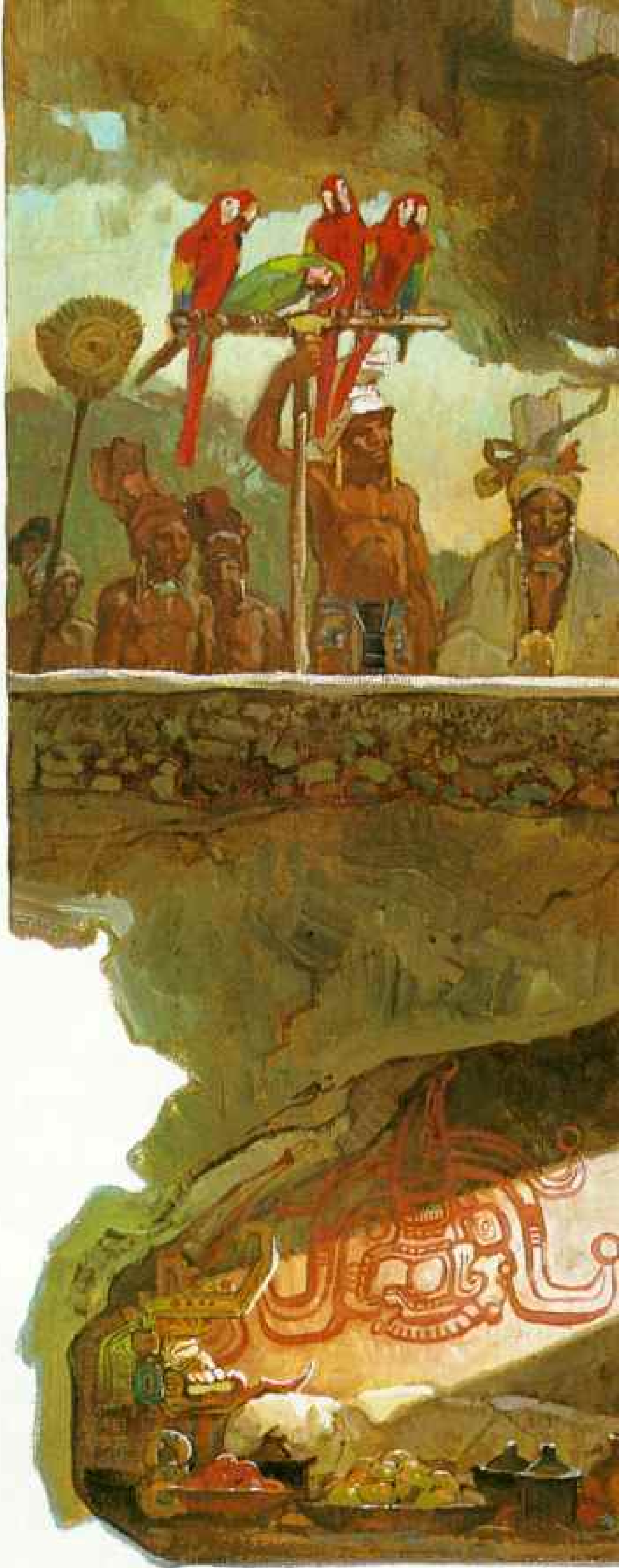




*Sending a noble on his final journey, the Maya of Rio Azul seal his crypt—what has come to be known as Tomb 19—with pomp and ritual. According to Maya belief, the deceased enters the underworld to face trials devised by the Lords of Death. If victorious, he will emerge a powerful ancestor spirit able to influence the living.*

*In artist Roy Andersen's reconstruction of the scene, a widow in white grieves above the burial with warriors and friends. A priest in symbolic jaguar skin and feathered headdress chants final incantations as a captive, bowed and bound, is sacrificed.*

*Workmen had dug through bedrock to create the tomb that they now seal. Shrouded in layers of fabric, the body lies atop a wooden litter, accompanied by food and drink for his journey. Stuccoed walls bear images of the tasseled jester god, emblem of royalty. Abstract designs adorn the entrance.*

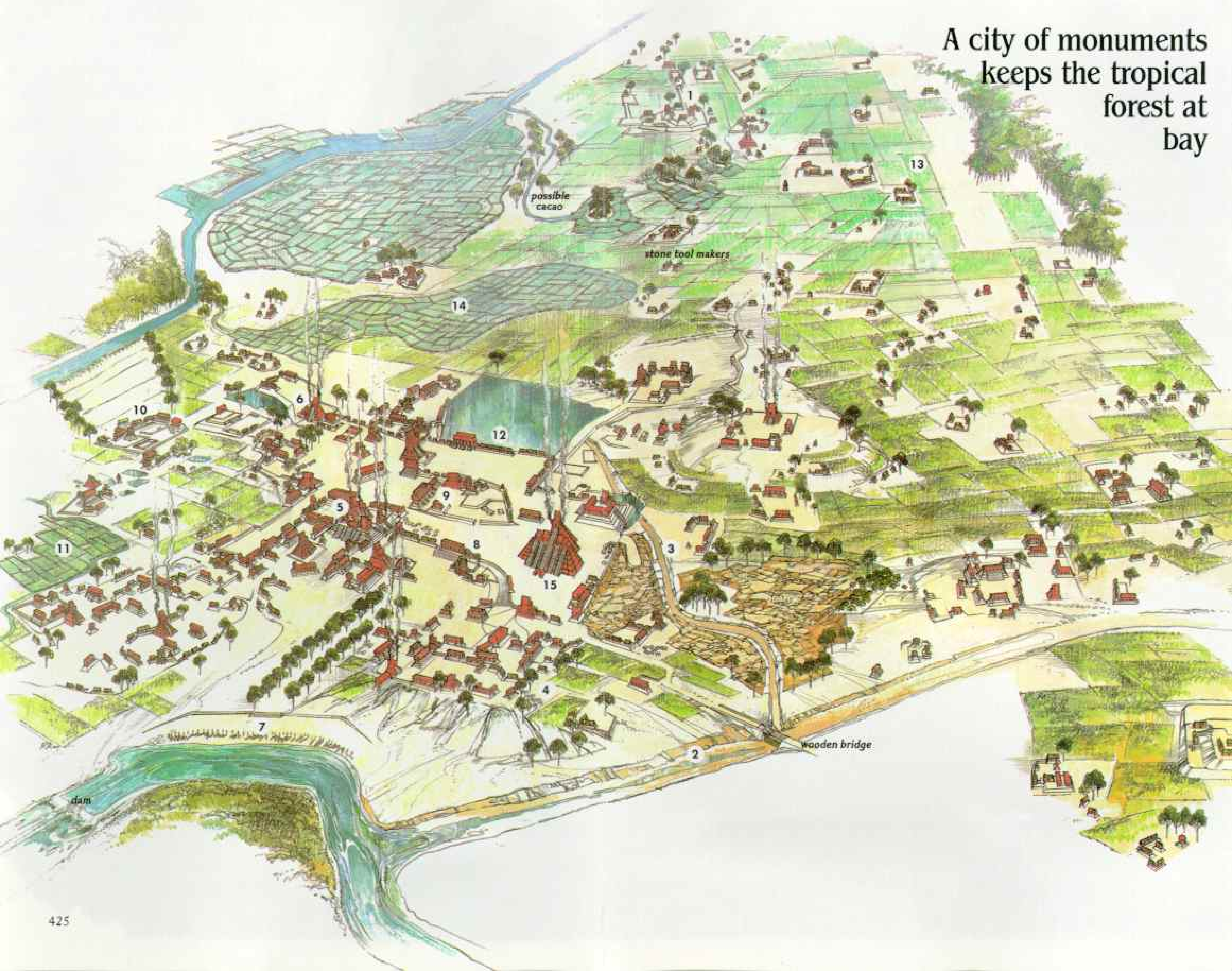




Py. Antonov



A city of monuments  
keeps the tropical  
forest at  
bay



**L**ONG LOST to history, Río Azul and its suburbs, an area of 750 acres, have been surveyed and excavated only in this decade. This painting by Roy Andersen reflects the author's speculations about its appearance at its zenith in the eighth century A.D., when the population may have reached 5,000.

The area was first settled before 900 B.C. Archaeologists have dated pottery around plastered platforms that supported thatch-roofed homes 1, evidence that pioneer farmers were clearing and planting land by then.

Eventually, an urban center rose beside the river on raised plastered foundations. Its precincts were outlined by a canal 2, perhaps used for

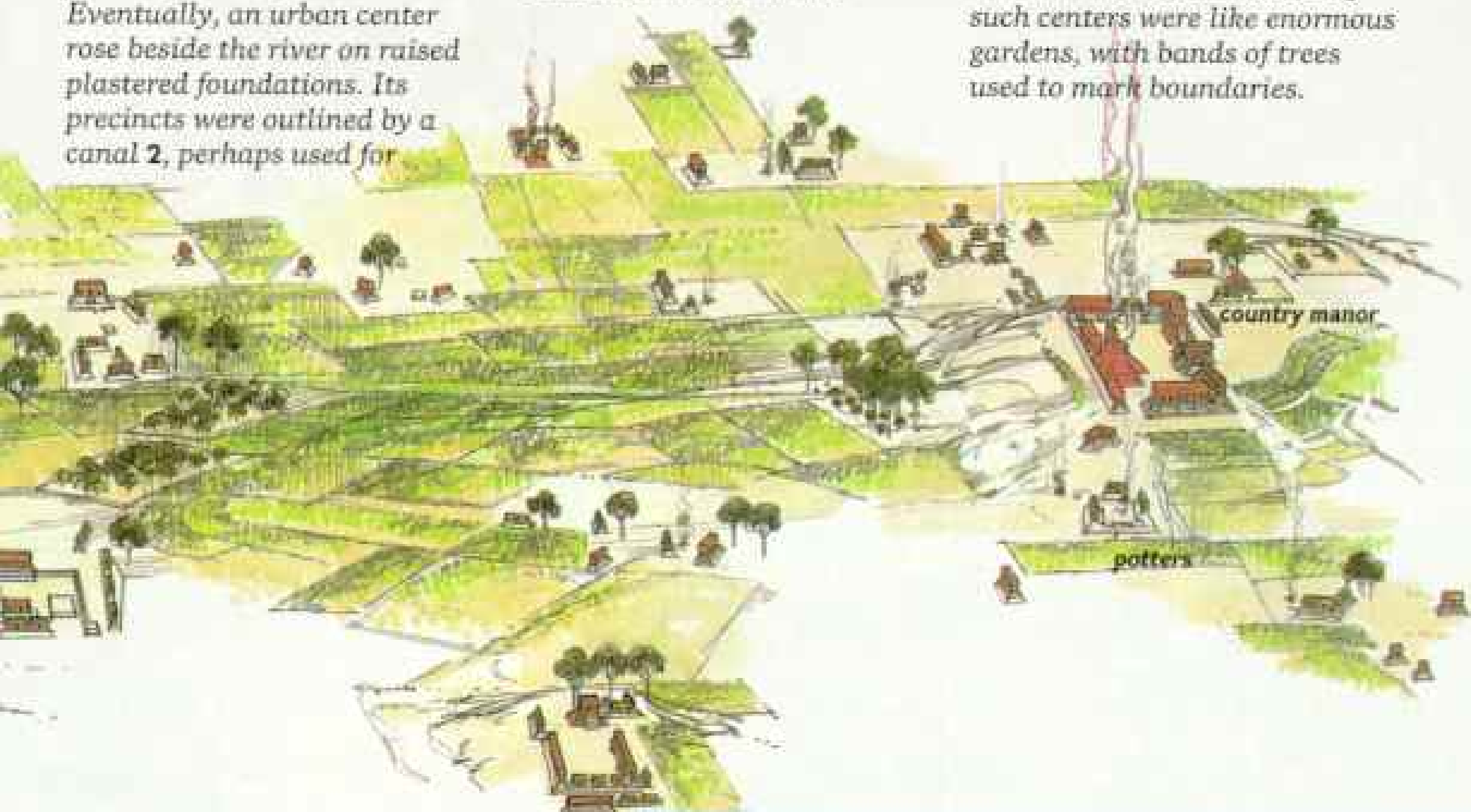
drainage and defense, and by a dry moat 3.

The city expanded at random as families built residential complexes 4. Adjoining pyramid-temples 5 covered major burials, with the most powerful persons accorded the largest monuments. Tombs 19 and 23 flanked such an important pyramid 6, built over Tomb 1. From a canoe landing 7, pedestrians walked a corridor to a narrow-doored gatehouse 8 and on to an administrative center and a ruler's palace 9. Warehouses 10 around sunken courtyards were reached

by stone stairs from a river landing.

Like most Maya centers, Río Azul was built and rebuilt on top of itself. It incorporated food plots 11 and reservoirs 12. As the population grew, more land was cleared to create open fields 13, and swamps were made productive by the construction of raised fields 14.

It is a popular misconception that in their heyday the great Maya centers rose out of dense forests like those that now cover their sites. Instead, Dr. Adams believes, the agricultural suburbs surrounding such centers were like enormous gardens, with bands of trees used to mark boundaries.



**Ancient skyscraper, 14 stories high, clears the treetops near the Mexico-Guatemala-Belize border, giving the only hint from the air of the extensive ruins of Río Azul. Measured from the ground, the fifth-century pyramid-temple 15 stands 155 feet tall, one of the highest in the Maya world.**







*Telltale mounds atop an elevated platform mark remains of the residential complex of an elite family, who may have been priests or guardians of Río Azul's most imposing temple (preceding pages, 15), only 130 feet away. An associate director of the Río Azul project, Jack D. Eaton, at left, and James Farrior, right, defined four buildings enclosing the 360-square-yard plaza. On the north side,*



*beneath their feet, lie the main rooms, built with vaulted ceilings. Sleeping benches were set into three-foot-thick masonry walls. Across the courtyard they located the smaller quarters of servants, the kitchens, and refuse piles that included pottery, stone tools, and turkey bones. A looters' trench, background, one of several, slices into remains of a stepped pyramid, but no tomb has been found.*



*For the first time since Tomb 19 was sealed, it sees sunlight, as archaeologists prepare to climb in. Eight workers had dug through rubble for five days when one suddenly put his foot through the tomb ceiling, pinpointing the location. Guatemalan security men guard against armed looters in the area.*

(Continued from page 420) through the small opening.

His floodlamp lighted a breathtaking scene that had been hidden in total darkness for 15 centuries. Before him lay the skeleton and grave offerings of a fifth-century noble. In our prosaic data book the discovery was recorded simply as Tomb 23.

Our two untouched burials were extraordinary. Each was of a large-framed man about five feet seven inches tall; the average Maya male of the period was five feet three or four. Tombs 19 and 23 lay below plat-

A research project supported in part by your Society

forms flanking a central temple that was erected sometime in the last half of the fifth century over Tomb 1, probably the most sumptuous yet found at Río Azul. Although it was sacked by looters in 1981, Tomb 1's miraculously preserved

murals remain intact (pages 452-3). They include the note of someone's birth on September 29, 417. Of him we have a hieroglyphic name and little else. Lacking its translation, we call him Ruler X.

**T**HE STORY of the Río Azul Archaeological Project really began in 1962 when my wife, Jane, and I were living in Guatemala. Among our friends were John and Pat Gatling. John, the resident geologist for Sun Oil Company and deeply interested in archaeology, instructed his exploration crews to record any prehistoric sites they might find.

One day he telephoned the discovery of a new site. "Not only does it have standing

---

Richard E. W. Adams, Professor of Anthropology at the University of Texas, San Antonio, is director of the joint U. S.-Guatemala project at Río Azul. Financial support has been provided by private individuals and by organizations, including the National Geographic Society.



buildings," he announced, "but one still has stucco glyphs on the outside. Would you like to make a visit?"

John and I spent a day and a half at the remote site in Guatemala's Petén region, which we named Río Azul—Blue River—for the adjacent waterway. Our hasty sketch map and report of the find were published in Guatemala in 1965. By then Gatling and I had gone our separate ways, and I mentally laid Río Azul aside.

In April 1981, Ian Graham, my friend and



NATIONAL GEOGRAPHIC EDITOR WILBUR E. GARRETT

colleague from the Peabody Museum of Archaeology and Ethnology at Harvard University, contacted me in some excitement. While searching out unrecorded Maya inscriptions in the Petén, Graham had heard that looters were working intensively at Río Azul. His visit there resulted in the astonishing revelation of Tomb 1, then freshly sacked. He took snapshots of the paintings and of discarded fragments of ancient Maya artworks. (Ian Graham recounts this personal experience with looters on page 452.)

The incident—and the depredation to a site of such importance—helped me resolve to renew work at Río Azul. Clearly the looters had struck a gold mine, but, equally clearly, a wealth of information remained.

We are now in the fourth season of a five-year program at the site, guided by a carefully thought-out research plan that focuses on the workings of Río Azul as a preindustrial city and on some of the “hot topics” of Maya archaeology. Our teams systematically seek data on social structure, craft specialization,





MIRIYU CONDER (ARIZONA)



## Discovering an untouched tomb





**D**USTED BY PLASTER from the pierced ceiling, Tomb 19 yields a treasury of information about the fifth-century Maya. Arranged beside a male skeleton (**above**), pottery held residues of foods and liquids, not yet analyzed. Scattered around the body, tiny faces and eerie skulls had been carved from jade beads (**upper left**), here restrung, and may have represented a warrior's battle trophies or the death-regeneration cycle envisioned by the Maya. Stingray spines found at the pelvis testify to the Maya ritual that saw a male painfully

piercing his penis with such instruments to show devotion to ancestors and gods.

A spectacular jar with a jaguar pelt painted on its handle (**far left**) puzzled archaeologist Grant Hall when he could not remove the lid. Then he twisted it. It had a lock top (**left**), a feature enabling a person to lift the covered pot with one hand. Blue stucco medallions were painted with glyphs, some never before seen by modern scholars. Pottery styles and carbon-14 analysis of a wooden litter date the find to the late fifth century A.D.

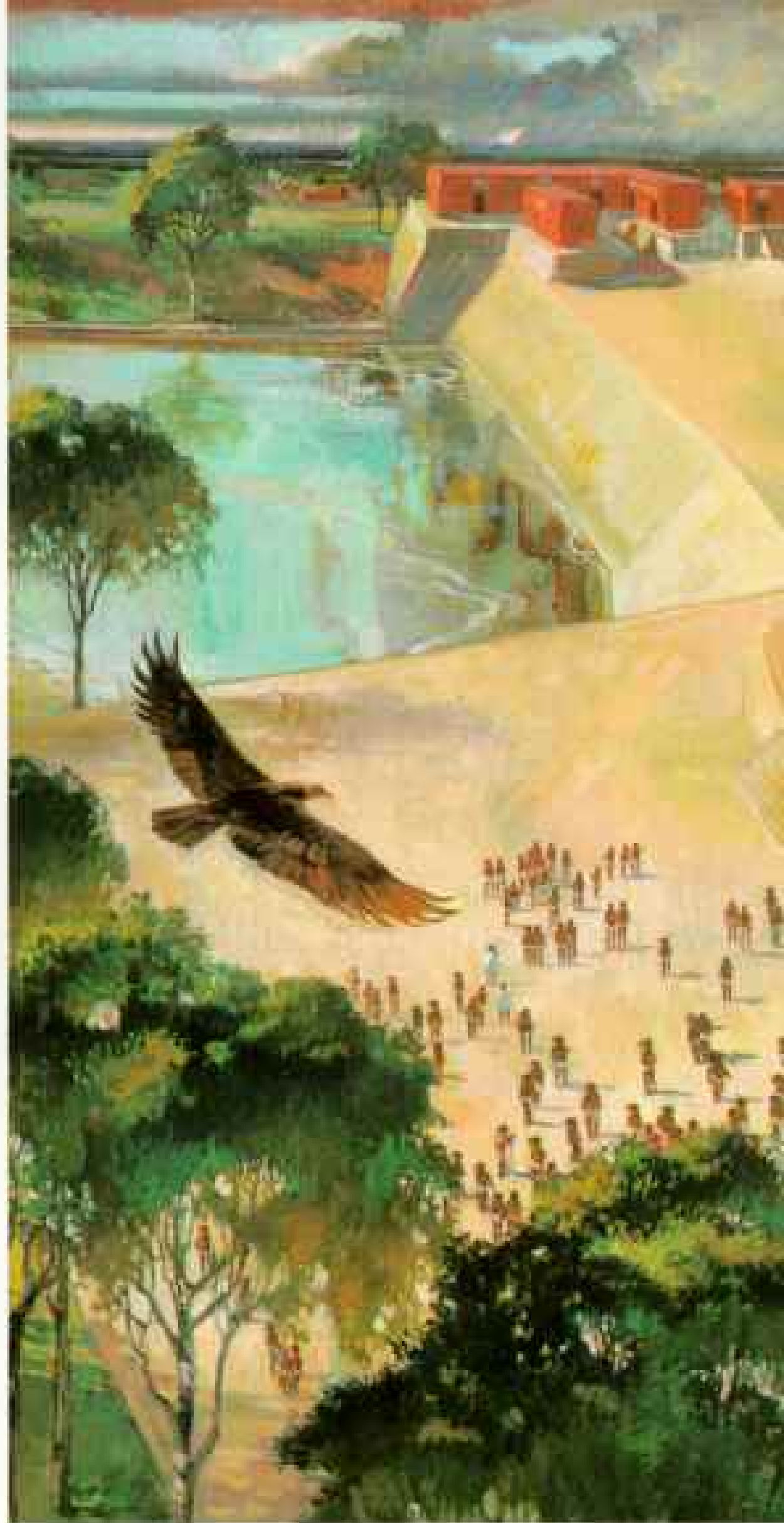
*Sacred smoke of copal floats to the gods during the funeral of a noble about to be buried in Tomb 19, at far right. The ante-room of his burial chamber will be filled with rubble and sealed with a platform and structure like that on the opposite flank covering Tomb 23. Visages of gods glare from the roof comb of the high pyramid that caps a ruler's burial, Tomb 1.*

and changes in political structure. These in turn can help us understand broader issues such as the origins and collapse of Maya civilization.

**T**HE GREAT CIVILIZATION to which Río Azul belonged crystallized in the Late Preclassic period (about 250 B.C. to A.D. 250) in the tropical lowlands of northern Guatemala and adjacent Belize. Its brilliance expanded rapidly throughout the Yucatán Peninsula, including areas of present-day Mexico, and into Honduras and El Salvador, where it endured from about A.D. 250 to 900—the span that archaeologists call the Classic period.

The five centuries of the Late Preclassic period witnessed the rise of aggressive and ambitious aristocratic families, part of whose prestige must have depended on prowess in war. In the Petén two great centers, El Mirador and Tikal, roughly equidistant from Río Azul and one another (map, page 437), were probably protagonists in this deadly game. Evidence suggests that El Mirador achieved success early on, building enormous and splendid funerary monuments for its elite, but faded as Tikal rose.

The reasons for Tikal's successful transition into the Classic period may have derived in part from an astute alliance, perhaps military as well as commercial, with distant Teotihuacán. That immense metropolis in Mexico's central highlands lay more than 600 miles northwest of Tikal, near present-day Mexico City. Despite its distance—probably closer to a thousand miles by the ancient trails—Teotihuacán, the greatest political and cultural force of its time, made its presence felt throughout Mesoamerica. In the Maya area the material trademarks of Teotihuacán—greenish obsidian for tool manufacture and a special



lidded type of tripod pottery jar—are evident both in the highlands (at Kaminaljuyú, whose mounds lie in a Guatemala City suburb) and in the lowlands, at Tikal.

**F**ROM THIS BEGINNING in turmoil and intrigue, the Classic period Maya went on to establish one of the greatest civilizations of antiquity. Master architects created massive stone temples and palaces that ranged around the open plazas and patios of the mighty political centers from Palenque in the west to distant Copán in the southeast, and northward to Uxmal, Cobá, and other centers.

During its heyday Maya civilization functioned through a network of states run by





elite families whose power derived from lineage and whose rulers claimed descent from the sun and other mythical hero gods. Many classes made up Classic Maya society. The upper classes included scribes who planned the lengthy hieroglyphic inscriptions that commemorate the deeds of the rulers. Talented sculptors and painters rendered the complex images of Maya mythology and royalty into monumental works of art that served as billboards of political propaganda.

Also among the upper classes, priests helped maintain a complex religion in which numerous capricious gods, both good and evil, inhabited the sky, earth, and underworld. The earth was envisioned as square,

with each cardinal direction possessing great ritual significance and color associations. Rites included bloodletting and sacrifice by decapitation, sometimes by heart extraction.

At lower levels of Classic Maya society the farmers, growers of corn, beans, and squash, succeeded in a marginal setting. They devised sophisticated techniques for cultivation, including the building of soil platforms that enabled them to farm seasonally flooded lowlands. They also relied on canals and terraces. Without the farmers the soaring temples would never have risen.

Research, mainly by Harvard art historian Clemency Coggins, has produced a plausible picture of Early Classic politics at



Tikal. I believe that the political history of that center had a direct bearing on Río Azul and, consequently, on what we—and the looters—have found there.

The Early Classic Tikal ruler Curl Nose—a nickname derived from his personal hieroglyph—appears to have married into one of the older ruling families, ousting the legitimate heirs. His son, Stormy Sky, was inaugurated as Tikal's ruler on January 28, 426. Apparently he expanded the boundaries of the Tikal state at the expense of his neighbors and established the frontier city of Río Azul. My theory is that a son of Stormy Sky was then placed in charge of this important city. From the painted images that fill the walls of Río Azul Tomb 1, which include prominent motifs associated with Stormy Sky himself, I conclude that our Ruler X, victim of the looters, was himself that son—a reasonable explanation of why Tomb 1 remains one of the most beautiful painted Maya tombs ever found.

**S**ADLY, TOMB 1 and the 31 other sacked burials at Río Azul cannot add fully to our story of Early Classic people and politics, because most of their contents have forever been torn out of archaeological context. For this reason we searched for untouched tombs. Should we be lucky enough to find one somehow associated with a major looted tomb, the intact one would doubtless shed some light on it. Thus our elation at finding the two pristine burials flanking Tomb 1.

Within a day after its discovery in May 1984, we were inside Tomb 19, making the necessary detailed plans and measured drawings. We were racing against time, for the rainy season was imminent. The third day after discovery brought a torrential downpour, flooding camp, soaking tents, and pounding the protective tarpaulin over the tomb opening so hard that conversation became impossible.

Examination immediately showed the burial to be a marvel of preservation. A plaster dome, layers of stucco in the entry shaft, and the massive construction of the overlying platform had sealed the chamber, itself partially hollowed out of bedrock.

The skeleton lay upon the remains of a wooden litter padded with a mattress made

of kapok. The ceiba, or *yaxche*, the sacred tree of the Maya, produces this cottony fiber, similar to that of the North American cottonwood. The body itself had been wrapped in three layers of burlap-like material, then covered with a shroud of exquisitely woven cotton cloth. Robert Carlsen of the University of Colorado Museum, who studied the latter fabric (page 445), concluded that it is similar to the open-weave white-on-white cloth still produced around Cobán, Guatemala.

Traces of red cinnabar paint and what looks like organic matter were found on the body. They may have served as embalming material or, perhaps, as deodorant.

Scattered around the body we found 16 hollow beads of a jade necklace. Five had been carved into human faces; nine, into death's-heads. Each of 15 ceramic vessels, unpainted and poorly fired, held a small amount of powder, probably organic residue. In advance of laboratory analysis of the powders, we can speculate that the six open dishes held food of some sort, perhaps fruit. Six of the vessels—jars with legs and lids, each topped by a modeled head—though possibly made at Río Azul, look distinctly Teotihuacán in style. These may have contained special substances of high prestige, such as cacao beans. A jar (page 432) with a locking flange top is the most unusual find of all.

Two other vessels, probably made of gourds, were originally placed in the tomb. Because they were so fragile and delicate, only the wonderfully painted stucco coating has survived. We carefully collected the small piles of stucco for reconstruction by Guatemalan conservators.

**W**HILE WORKING in the somber room, each of us was keenly aware of ancient Maya beliefs that are only dimly perceived today. The walls held three images of what we call the jester god, each slightly different but in a style similar to the great figures painted in Tomb 1. Art historians believe that this deity was a special patron of royalty and noble lineage. The god's images in Tomb 19 extend up and onto the ceiling as if to protect the interred nobleman.

It appears that the occupant of Tomb 19

# Realm of the Maya

NEVER a single empire, the Maya raised dozens of great centers in present-day Mexico, Guatemala, Belize, Honduras, and El Salvador. Spreading across some 100,000 square miles, the Maya lowlands

flourished during the Late Classic period, A.D. 600-900, shown here. The cities were supplied by farmers practicing complex agricultural techniques and by extensive trade networks. Goods were transported by canoe and by bearers on packed-dirt paths or sometimes on raised roads. Total population may have

numbered 12 to 16 million.

Major cities held sway over neighbors with whom they shared architecture and ceramic styles, according to Dr. Adams. His regional boundaries are based on his estimates of city size and influence. Corridors with no dense settlement fall between his assumed boundaries, like buffer zones.



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UNIVERSITY OF TEXAS







was 35 or more years old. But when was he buried? Given the birthday of the ruler in Tomb 1—A.D. 417—and a lifetime reasonable for accession and an appropriate span of rule, we guess his death date was no earlier than 450. Since Tomb 19 is plainly later, our best estimate for its date is between A.D. 450 and 500. Radiocarbon dates from the wood of the litter fall neatly into this span.

Tomb 23, our 1985 find, was similar to Tomb 19. The remains were surrounded by symbols of high status—cylindrical pots with effigy lids, plates, jades, a cotton mattress, chert chipped into eccentric shapes, and a marvelously detailed pottery figurine, which I think is a portrait of the deceased. It seems specific in its facial features.

Another figurine lay nearby. Carved of deer antler, it had deteriorated, but enough remains to suggest a male in a pose as graceful as that of a Balinese dancer (page 441). A downward-projecting stone in the center of the ceiling of the tomb had been painted with images of the moon goddess and what may be an earth monster.

**A** CLUE to the status of the two individuals accompanying Ruler X occurs among the hieroglyphs on the lock-top jar we found in Tomb 19. Epigrapher David Stuart reads one phrase as a statement of relationship between two people. One personage (probably a ruler, since his name is preceded by a royal title referring to the sun) seems to be designated the master of another person—possibly the occupant of the tomb, whose actual name may be among the other glyphs. Unfortunately two key hieroglyphs appear to have flaked off the vessel before it was placed in the tomb, for they were not present on the undisturbed floor where the jar lay.

Given the Teotihuacán-style vessels and the unusual stature of both skeletons, I think

it likely that the men in Tombs 19 and 23 were important nobles from central Mexico attached to Ruler X and thus buried near him. The physical relationship of the three burials in fact recalls the tomb of the fifth-century ruler Stormy Sky at Tikal. He was accompanied in death by two young males.

Of about the same date as the two Río Azul tombs, Tikal's Stela 31 shows Stormy Sky on its front. Flanking him on either side are male warriors holding shields that are not Maya in style, but rather like those depicted in central Mexican art of the period.

If my reconstruction is true, the most interesting questions are why the men buried in Tombs 19 and 23 were so far from home, and what role they—and Río Azul—played in the history of the Maya lowlands.

In 1985 we cleared another looted burial, Tomb 12, and found additional beautiful hieroglyphic paintings (page 456). On the



*A second bonanza, Tomb 23 was opened by Grant Hall (above), Julián Totbol, and photographer George Mobley in 1985. A clay figurine (page 421) rested inside the right arm of the adult male (facing page); flakes of chert lay near his head. A solid boulder protruding from the ceiling had been painted with an image of the moon goddess and what may be a monster head.*



## Treasures of bone and clay

**A**RTIFACTS whose meanings can only be guessed accompanied the burial in Tomb 23. A human face emerges from the skeletal jaws of a monster figure (right). While the imagery is not unknown, it had not been seen before in this form—carved from half a peccary mandible. This and its similarly carved matching half were found on the left side of the body, along with several tubular bone beads. They were apparently once strung as a necklace with a deer-antler pendant carved as a gesturing



man (right). In Maya iconography a raised pointing hand is thought to denote superior status. Stingray spines, used in bloodletting rituals, lay nearby.

Nearly identical lidded tripod vessels (below), nine in Tomb 23 and six in Tomb 19, were each decorated with an open-mouthed head wearing ear flares. Such tripod jars, though probably locally made, show the influence of Teotihuacán, the great Mexican center 600 miles to the northwest.





smooth plaster of the tomb's four walls, in thick red line, are the signs for east, south, west, and north. Although the meanings of these hieroglyphs have been known for more than a century, our discovery marked the first time they were found in actual natural context, for their appearance in Tomb 12 correctly matches the real directions. Moreover, each directional glyph was supplemented by another representing its mythical cosmic association with, respectively,

the sun, Venus, darkness, and the moon.

On the east wall of the chamber an ancient scribe had also painted a line of hieroglyphs. According to David Stuart, it reads, "[On the day] 8 Ben 16 Kayab was buried [a person called] Six Sky . . . of Río Azul."

This provided another first: The glyph for the verb "bury," earlier deciphered by Peter Mathews of Harvard's Peabody Museum, was here in the indisputable setting of the event. The date posed an interesting



*Green jade, most valuable substance to the Maya, was often sealed with their burials. One recovered incised gem (right) appears to represent the profile of a man wearing an ear flare.*

*In Tomb 23 a small jade rectangle resembling a clenched fist lay in the skeleton's mouth (above); some teeth were inset with jade. Ear flares of both jade and alabaster, at top, were also found*



*in the tomb. The body had been covered with fine cloth and an animal skin—more evidence of high status.*

*The fragile bones, deteriorated by the damp acidic environment of the tomb, were sent temporarily to the U. S. for analysis. The artifacts were turned over to the Guatemalan government's antiquities department and guards posted at the site.*



problem common in Maya archaeology. Because of the mechanics of the calendar used by the Classic Maya, the day shown in Tomb 12—8 Ben 16 Kayab—recurred every 52 years.\* Thus, given the style of the painting in Tomb 12, the choices for the burial date of Six Sky narrow down to April 2, 398; March 20, 450; or March 8, 502.

Such information, combined with that yielded by the other tombs, the few badly damaged stelae, and our field archaeology, has produced the beginning of a king list and partial history of Río Azul.

**E**VEN our incomplete excavation program gives us a rich and intriguing picture of Río Azul and its surroundings. The city apparently lay on a principal highway of river communication and trade among several centers, the Río Azul itself giving access between the Maya central lowlands and the Caribbean Sea.

Trade also seems to have been the driving force in the alliance between Tikal and Teotihuacán. The Maya lowlands produced the purest and greatest amount of salt for ancient Mesoamerica. Lacking sugarcane and beets, honey was the main sweetening agent; the Maya area produced large quantities and still does.

An important third commodity was medicinal herbs, a product that requires a knowledgeable population to exploit. The leaf of the allspice tree is still used to make a tea that soothes stomach ailments. Other culturally important items were feathers, cotton, and fine woods, such as mahogany and tropical cedar, used for buildings as well as bowls.

As I interpret the archaeological data, Río Azul was a special center, with a population made up mainly of noble military families with their aides, servants, and retainers. Its role was to secure part of the northern frontier and the main trade route. The expansion of the Tikal state into this zone about A.D. 430 had meant several things: The new center was placed on a defensible ridge within a bend of the river, and a defense system—dry moat and ramparts—was built in an arc on the east. Ruler X presumably oversaw and may have planned these developments.

Most of the remainder of the population served by the city lived in the countryside. In

a farming zone a short distance to the northeast we found many small house mounds, remains of the kind of dwellings built by lower social classes in large number at the major preindustrial city of Tikal. Large platforms dating from previous centuries continued in use as artificial elevators for housing. At its height Río Azul's total population probably numbered fewer than 3,500, with another 1,500 in the northeastern suburb.

**R**ÍO AZUL SEEMS to have served as the administrative center for a region of about 460 square miles. Covering about 750 acres, the city, as mapped by project associate director Miguel Orrego, shows an intriguing variety of buildings.

Massive memorial temples, the tallest 155 feet high, were connected by paved causeways with the sumptuous residences of the elite. These palaces were made of stone, with apartments containing built-in beds and other amenities. In nearby kitchens food was prepared for the residents. Other palace complexes were used for administration. Evidently the plan and functions of Río Azul continued essentially unchanged from its founding to its demise.

Closed courtyards with smaller palaces were grouped around the larger compounds, reflecting a social structure in which aristocrats were ranked according to ancestry. Still smaller houses and courtyards—residences of retainers, servants, and artisans belonging to noble households—were built close to the palaces. Jack D. Eaton, an associate director of the project, has demonstrated the functions of these buildings through his work.

Our mappers and the settlement-pattern research teams discovered that the countryside had been intensively cultivated and otherwise drastically modified. One of the long-standing misconceptions of Maya archaeology has been that Maya civilization existed within dense tropical forest much the same as the environment today. This now appears false. The landscape had been extensively modified by human use through at least 2,500 years of occupation prior to

\*See George E. Stuart's "The Maya: Riddle of the Glyphs," in the December 1975 *GEOGRAPHIC*.

the rise of the great Classic Maya centers.

In settled areas nearly every hillside was terraced; water holes were enlarged, new ones dug. The forest existed only in remnants. As Bishop Landa, a 16th-century prelate of the Yucatán, wrote, "They kept the land well cleared and free from weeds, and planted very good trees." Our research shows that this applies to the first century A.D. as well as to the 16th, and to the Petén as well as to the Yucatán.

There may have been belts of deliberately abandoned wasteland serving as buffer zones between the rival Maya states. There also were stands of forest left, presumably, for hunting and logging, but even these were largely composed of highly selected species of trees. Therefore, the popular idea of sophisticated Maya cities set within a primeval wilderness is a romantic fantasy. I think that the Classic Maya themselves would probably have looked upon today's chaotic



## Studying noble relics

**M**ODERN technology reveals fascinating facts about the 1,500-year-old skeleton in Tomb 19 and the artifacts buried with it.

Tall for a Maya, the reassembled male skeleton (right) measures about five feet eight inches, according to Dr. Gentry Steele of Texas A & M University, who studied the two skeletons from the recently discovered tombs.



jungle growth as a reversion to savagery.

Within this carefully controlled landscape, cultivated fields and water-filled canals were common. Swamps were drained for crops such as corn, beans, and possibly cacao. Dams conserved water for use in the dry season.

About a mile northeast of the city proper lay an agricultural suburb investigated by project archaeologists Stephen Black and Charles Suhler and their teams. They found

large zones with remains of laboriously created gardens.

Residential compounds included substantial stone-and-plaster houses with thatch roofs. The houses often sat on plaster pavements supported by extensive platforms. Each set of households had its own water tank. On the edges of several gardens Black and Suhler discovered piles of chert debris left from stone-tool manufacture. Remnants of digging and cultivating tools

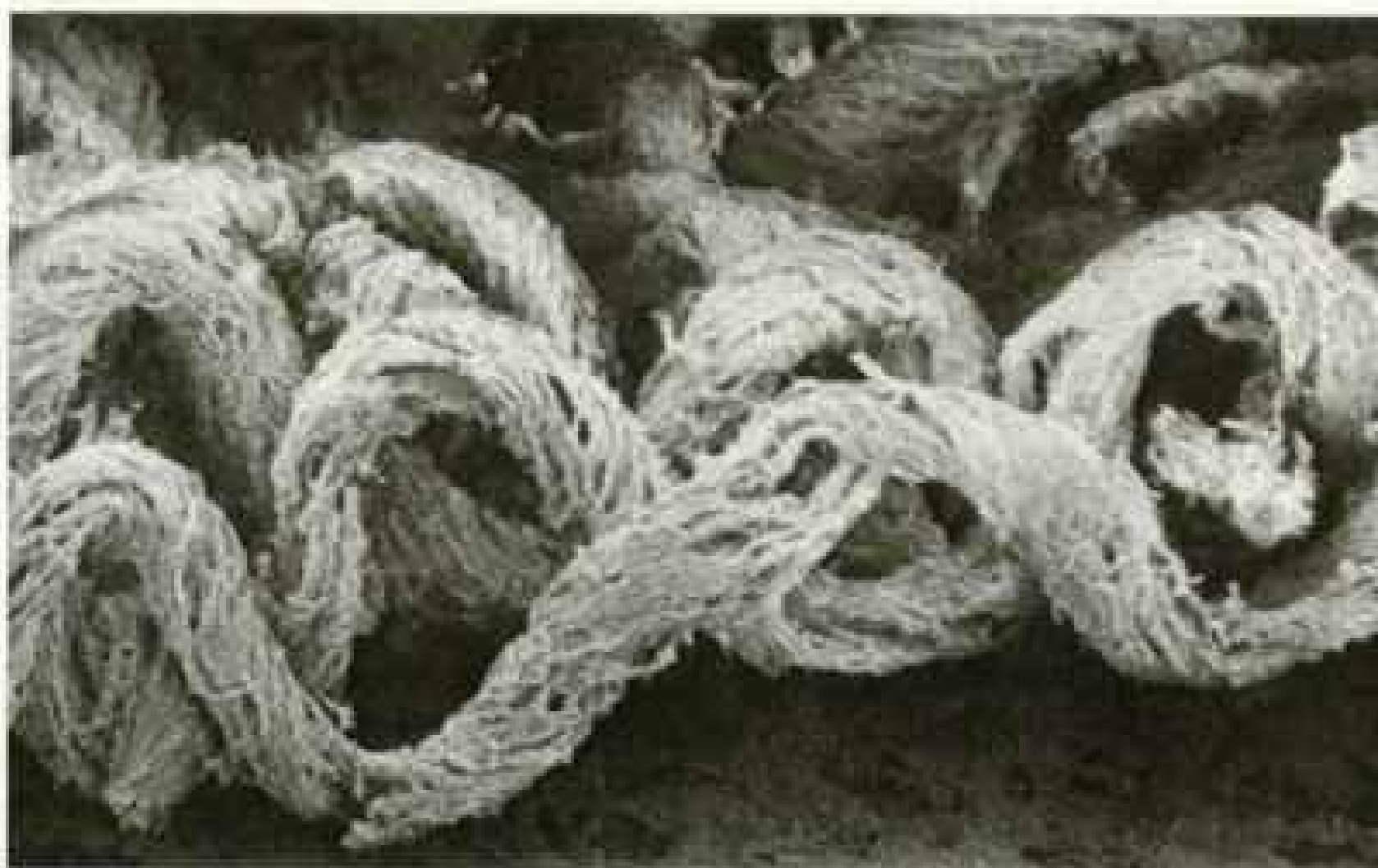
*The right sacroiliac joint is fused, as is the fourth finger of the right hand (far left, lower), shown with modern finger bones for comparison. These fusions indicate two injuries that had healed.*

*A cervical vertebra (far left, upper) shows pitting that comes with arthritis. The back of the skull in both burials had been flattened, a feature caused by intentional deformation or by lying on a cradle board in infancy.*

*When tombs are looted, bones as well as food and fiber residues are often treated as trash and lost to history. Thus archaeologists were pleased to recover partially fossilized fragments of textiles in the Río Azul tombs. They were older by nearly 1,000 years than any ancient Maya fabrics previously found.*

*Robert Carlsen of the University of Colorado Museum conducted a battery of tests on the textiles. Examination under a scanning electron microscope revealed that the body wrapping (upper right) was woven of coarse hemplike fiber. The outer shroud was a fine cotton open-weave brocade, similar to a late 19th-century Maya fabric (lower right).*

*A printout from a spectrophotometer helped archaeologists determine*



PHILLIP RUSSEL, DENVER RESEARCH INSTITUTE (ABOVE), ALL OTHERS BY LOWELL GEORGE



*what dye had been used by the ancient weavers. The 19th-century piece, its red tint derived from cochineal insects, made a distinctive curve, the upper line on the graph paper. A fragment from*

*the coarse body wrapping yielded the bottom line, different enough to prove that it was not dyed with cochineal. Other laboratory tests point to cinnabar as the colorant.*



were found in the gardens. These intensive activities date from the eighth century.

**R**ÍO AZUL appears to have been abandoned about 535, probably during a period of civil wars that seem to have broken out when the older ruling families tried to regain power after Teotihuacán withdrew. Finally, descendants of the Teotihuacán-backed Maya nobles won out and reestablished themselves firmly at Tikal and elsewhere. Reoccupied and refurbished, Río Azul resumed its function as a guardian of the Tikal frontier.

The eighth-century rulers of Río Azul seem to bear the same family name as before. By this time powerful rivals were developing to the north, and still another defensible city was established about eight miles southeast at a place called Kinal.

A surge in population occurred in the Late Classic period, especially in the seventh and eighth centuries. During this period the most extensive agricultural works were built, and far-reaching trade contacts were continued: for obsidian from the Guatemalan highlands, salt probably from northern Yucatán, jade from the Motagua River in southeastern Guatemala, and much more. A large amount of foreign pottery appears during the Late Classic, and most of it comes from northern Yucatán, especially from the Puuc Hills, location of the great Maya cities of Uxmal, Kabah, Sayil, and others.

Apparently, as so often happened in Mesoamerica, visiting merchants also acted as intelligence agents. At any rate, about A.D. 830 Río Azul was overrun in a military raid from the north, from the Puuc, and was occupied for a short time. The elite class was probably killed, the city burned and sacked, and the remnants of population in

the vicinity carried off into captivity. This could help to explain the sudden depopulation of the region and the abrupt rise in population around the Puuc cities.

A short reoccupation by the former owners closed Río Azul's history. At the conclusion of the Classic period, it ended as it began, a military outpost.

**T**HE SADDEST STORY of Río Azul lies not in its demise, for the rise and fall of cultures, civilizations, and cities has paced the human epic from its very beginning. Instead it lies in the depredations that Río Azul has suffered at the hands of modern-day greed.



*Going underground for science, Charles Suhler leans into a small vaulted tomb with a flashlight. Volunteer physician-archaeologist Edward Westphal, at left, and the author await a report.*

*To one side within was a crypt, looted in antiquity. Directly below Suhler, an undisturbed burial held a partial skeleton. Above it in the fill the presence of a severed skull suggests a sacrifice during the tomb's construction.*

About 25 years ago, stimulated by unscrupulous art and antiquity dealers, the ruthless destruction of Maya sites began. First the sculpture was removed, and later the ceramics found in burials. These artifacts were, and are, sold to wealthy collectors, some of whom buy them as investments.

We have an idea of how the depredation program at Río Azul was run. Workers were recruited locally, and an effort was made to get those who had had previous archaeological experience on legitimate projects.

More than 80 men systematically developed a set of trails within the site and settled down to exploit it, much as miners would map out and dig a mother lode. In the

process they dug more than 150 trenches, and usually extended each trench into a building by tunneling. The tunnels in the large buildings are gloomy, bat-filled networks roofed with shaky masonry and clogged with piles of debris.

Rumors persist that the looters lost at least three people in cave-ins. The laborers who did the work benefited least. Poor wages, inadequate food, dangerous conditions were their lot. The best materials—including jade masks, jade plaques, and extraordinary ceramics—were periodically airlifted out of the nearby airstrip at Dos Lagunas.

We have been able to salvage some of the tombs' contents and obtain probable dates.





## Voices of gods and glyphs

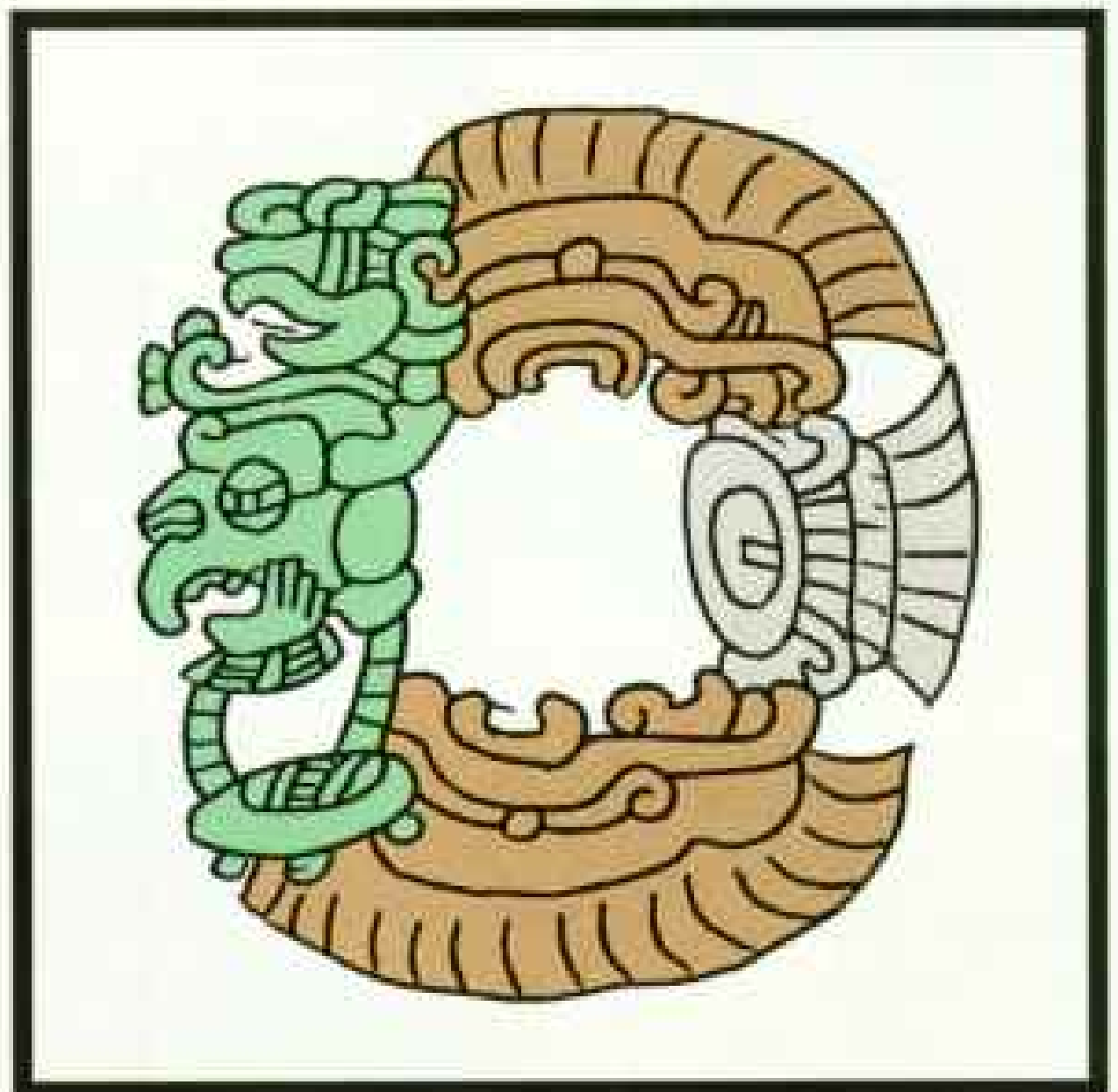
**P**RECIOUS ITEMS were often buried in dedicatory caches during the constant refurbishing of the city. Excavator George Deaton (right) counted 28 artifacts in this cylindrical jar, one of 13 caches found under the floor of a temple (pages 425-7, 5). The prize was a large incised ear flare daubed with cinnabar (below).



BURRILL CONGER (ABOVE)



JADE EAR FLARE BEARS THE IMAGE OF A BIRD (DIAGRAM AT RIGHT) WITH HEAD (GREEN), WINGS (TAN), AND TAIL (GRAY) CIRCLING THE CENTER. A HUMAN HAND FORMS ITS LOWER JAW; ABOVE ITS FACE A SECOND HEAD HAS A KNOT THROUGH THE EYE. THE BIRD IS THE SYMBOL OF THE BAKTUN, THE 144,000-DAY PERIOD OF THE MAYA CALENDAR.







DIAGRAMS BY GEORGE E. STUART, NATIONAL GEOGRAPHIC STAFF

In another cache an image of a deity worked in jade was uncovered (facing page, upper left). He is one of the extremely powerful gods in the so-called Palenque triad, named for the Maya city where the trio was first identified.

A piece of shell from the distant Caribbean shore was beautifully cut and incised into a two-inch-long pendant (above). The carving (diagram, left) probably represents a long beaked cormorant, its body curving around the face of a man. Over the human's head lies a cluster of three glyphs whose meaning is unclear.

Archaeologists who have studied Maya pottery—such as the cylindrical jar here—for years, are able to recognize small modifications that took place in each generation and sometimes in each region. Dating these stylistic changes, Dr. Adams has worked out time sequences for five sites, including Río Azul. This analysis permits the identification of sherds from trash heaps and looters' debris as to period and locale.

We can record the murals (many are looter damaged) and note associated architecture. What we cannot do is record burial offerings in place or note names and places in Maya history as set forth in the texts on the vases. Nor can we reconstruct social standing, political networks, and all the other important ephemera of human history provided by properly recorded burials.

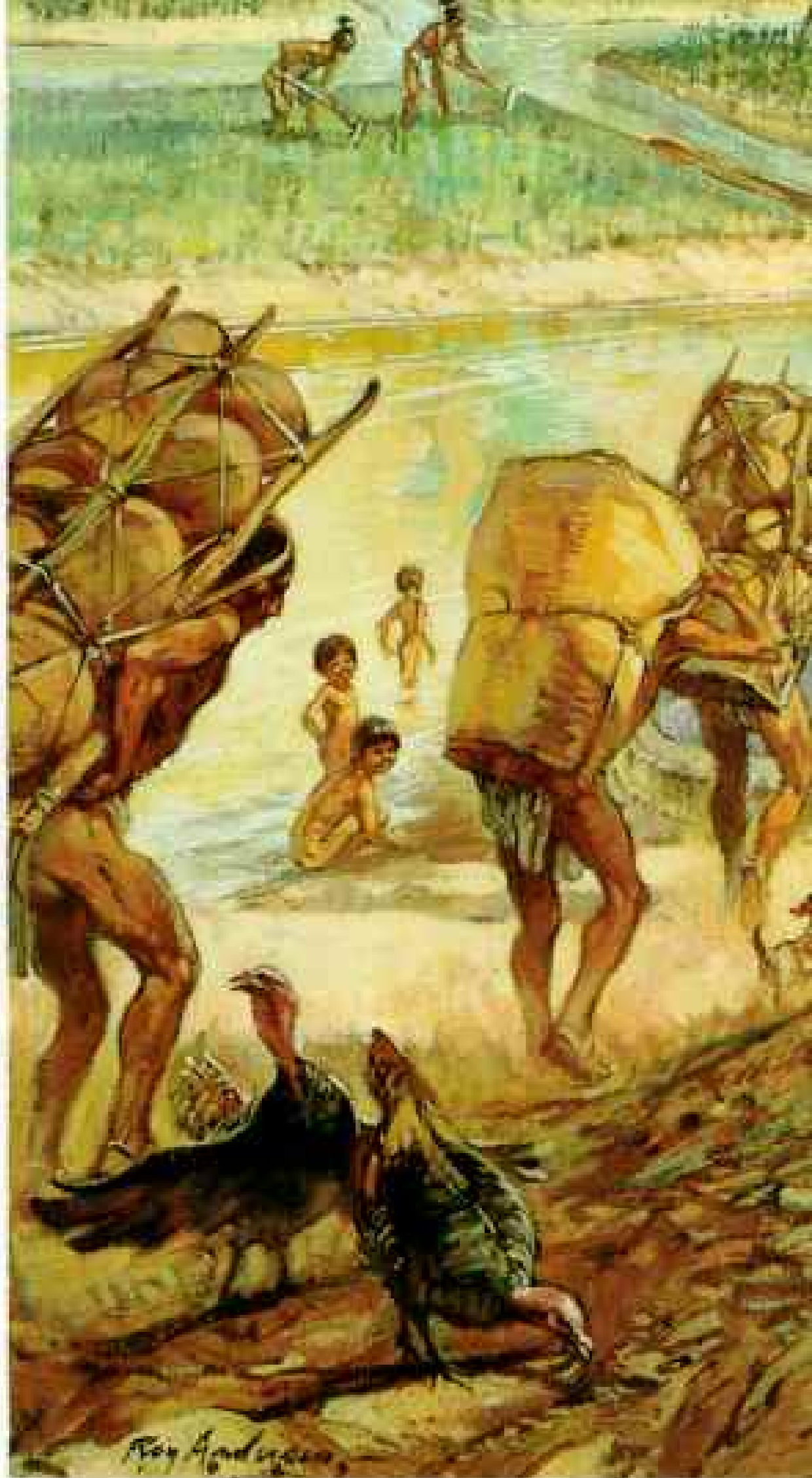
**M**EANWHILE we pose as best we can such questions as, "What was the major focus of religion in the Early Classic at Río Azul?" The task list each season calls for excavations designed to produce information on the questions. Our 1985 digging in Structure B-56, the burial complex of a minor noble family, was partly oriented by this interest in Maya religion; our work confirms that the Maya were deeply involved in a form of ancestor worship.

By these means we are able not only to work out the kind of evolutionary trends beloved by scientists, but also to make Maya civilization more accessible to nonarchaeologists. We begin to see dim outlines of personality, specific events, and turning points of culture history.

We deal with the most common and ordinary items of human use, but from them we extract questions, leads, and answers of importance. This past season, associate director Miguel Orrego found a small group of buildings from which he collected 26 polychrome potsherds. Remarkably, they comprise 24 distinct kinds—and yet all were made at the same time. The puzzle to be investigated is whether we have discovered a workshop, a warehouse, a merchant's shop, or a combination of these.

Río Azul is now protected by government guards on permanent duty. Guatemalan Army patrols occasionally sweep the zone. We of the project are analyzing the data in hand, trying to make sense of the patterns in it, and gathering more with this year's excavations.

Archaeological discovery often consists of tedious work rather than spectacular breakthroughs, but the final story is perhaps more interesting for its detail and persuasiveness. We have no doubt that more knowledge of the shadowy Maya of Río Azul—and more surprises—lie in store.      \* \* \*

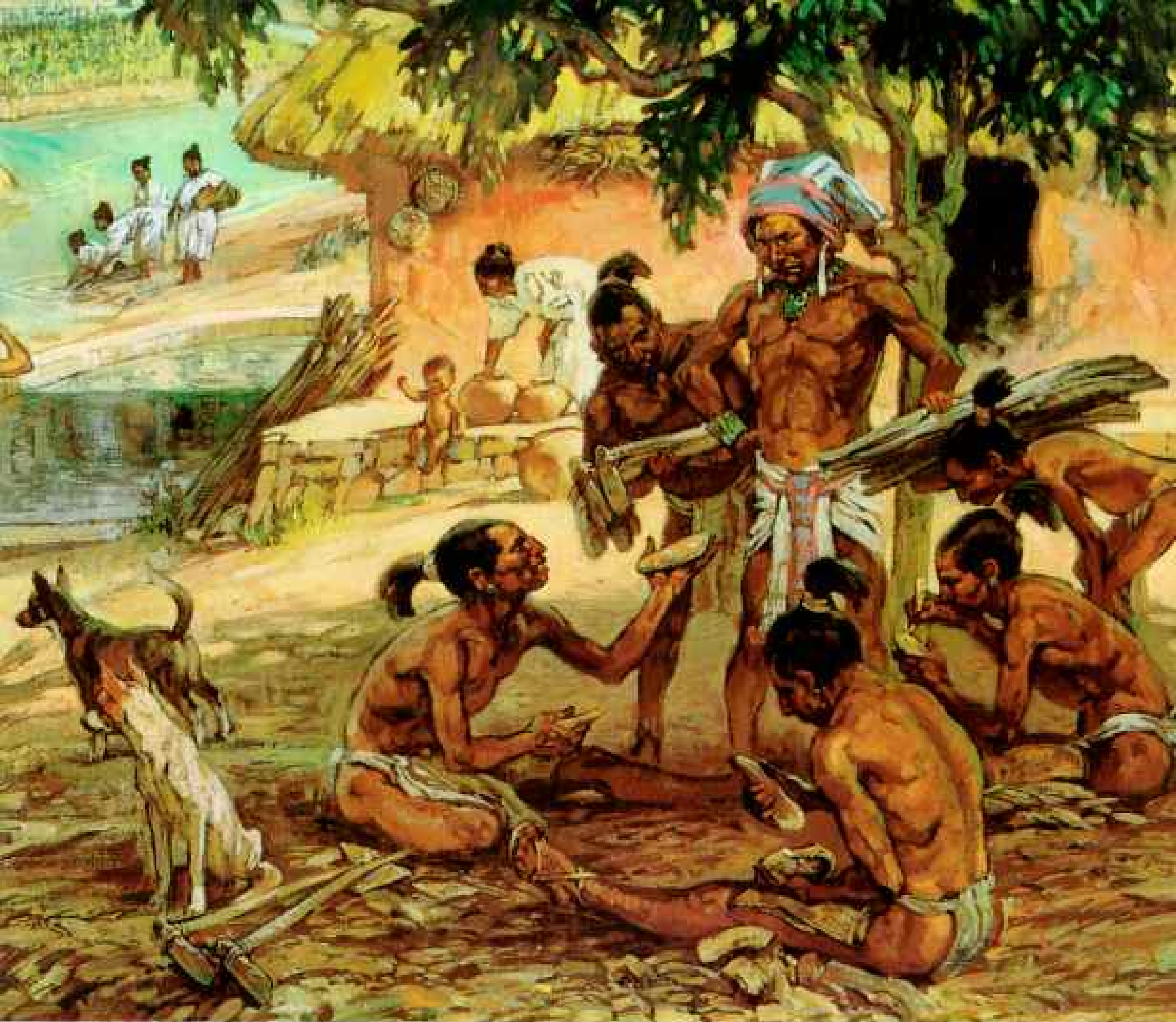


*On the city's outskirts skilled craftsmen (above) shape fine tools by the thousands, though they possess only coarse chert. Their implements*

STEVE BRIMMER







sculpture carvings, work wood, dig drainage canals, and clear fields. A five-inch broken celt (below left) was probably once hafted to a wooden handle and used as an ax. Five tool workshops have been identified by immense piles of discarded chips. Charles Suhler (below) measured one such mound five feet high and 30 feet across.



# Looters Rob Graves

*Its elaborate paintings almost intact, Tomb 1 stands bare after looters broke in several years ago, before guards were posted at Río Azul. Knowledgeable about the treasures they sought, the hardworking thieves dug deep trenches and tunnels, risking cave-ins that are rumored to have claimed several lives. The skeletal remains and grave goods were*





# and History

By IAN GRAHAM

Photographs by

GEORGE F. MOBLEY

NATIONAL GEOGRAPHIC PHOTOGRAPHER

tossed out with the rubbish. The “treasures,” which usually find their way to private collections, are seldom available to scholars, such as Dr. Richard Adams (below), for study. But the glyphs yield important information. The rear panel refers to the birth on September 29, A.D. 417, of someone from Río Azul whom Dr. Adams calls Ruler X.

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**I**T WAS MID-APRIL and the beginning of the hottest time of year in Guatemala's Petén region. With Justo as guide, Anatolio, my valued assistant from many an archaeological expedition, and a pack mule, I slogged along an overgrown oil-company track, almost unshaded by the leafless and scrubby trees.

We had set out from the village of Dos Lagunas, hoping to locate a painted tomb that, according to rumor, had been discovered not long before by looters at ruins locally called Las Gardenias. Finding a guide to this place had not been easy—no one likes to admit having knowledge of a recently looted site—but at last I found devil-may-care old Justo, who was not too concerned about any conclusions we might draw.

Twenty miles on and desperate for water, we reached a pool and adjacent campsite called Ixcanrío. From there we headed north, and at that point I began to suspect that Las Gardenias might just be another name for Río Azul, ruins known to me only from Richard Adams and John Gatling's brief published report of the mid-1960s. I also began to wonder whether the looters might not still be at work—I wouldn't want to disturb them! Several years earlier, at a site not far away, I had unwittingly inter-

rupted a gang of looters, and one of my assistants was fatally shot.

We walked stealthily, stopping often to listen, as there were signs that people had used the trail recently. But luck was with us: The looters' camp was empty, the cooking fire evidently dead several days. Poking about in the camp, we found various little piles of ancient artifacts among the cans and bottles and discarded flashlight batteries. Then on we went to examine the ruins.

Exploring the many huge trenches that had been cut into mounds, we found at first only one small tomb with painted walls. But our guide had it all planned out: He would "happen" to find the mound containing the great tomb late in the day, and that would convince us he hadn't known of it before.

Never to be forgotten was that first sight of the tomb (now known as Tomb 1), seen upside down as I stuck my head through the breach made in its roof by the looters. So clear was the hieroglyphic inscription at the far end that I could read it without difficulty even in that position.

But curses on the looters who had emptied out the tomb! Who could tell now what may

**Ian Graham** is an assistant curator at Harvard University's Peabody Museum of Archaeology and Ethnology.



*Twice violated by looters, Tomb 1 (left) shows a break in the stone wall that originally sealed it. The woven-mat designs at the entrance symbolize royalty.*

*Archaeologists first studied the tomb in 1981. Three years later they discovered that, despite guards posted at the site, looters had once again entered the tomb. Before being frightened away, they had started to remove the rear wall (far right), looking for another tomb beyond. With a flashlight, archaeologist Richard Bronson examines deterioration that has set in since the tomb was opened.*

*Such a tomb may have held this fuchsite mask (right), inlaid with shell and colored with cinnabar. Nearly eight inches*

have remained of the dead ruler's skeleton and cerements and bier, with what carved or inscribed jades he had been buried and what highly finished pottery vessels—some of them perhaps still containing the dried-up vestiges of offerings that could have been analyzed. That the grave goods had been rich was confirmed by the discovery of a little square wafer of jade, clearly from a vessel once embellished with a mosaic veneer of the precious stone. Such vessels have been reconstructed from undisturbed burials at Tikal, the great Maya center about 50 miles to the southwest.

Worried that the looters intended to return to remove the layer of painted plaster from the tomb's walls, I hurried back to Guatemala City to report the discovery and to beg the Guatemalan Institute of Anthropology and History to install guards as soon as possible.

Less than two days after learning of the tomb, the head of the Prehispanic Monuments Department set off for Río Azul accompanied by a posse of armed guards. And when I got back to the site a day after their arrival, I learned that during my absence looters had moved in again, and there had been an exchange of gunfire between them and the arriving guards. The looters fled,

abandoning hammocks, boots, and other gear. One of them possibly was wounded.

**S**UCH A TALE OUGHT to be something out of the past. In Egypt in the 19th century a similar problem arose and was resolved once and for all, or so everyone hoped. The parallel is close enough to be instructive.

In that country ancient tombs had been looted of their rich ornaments and gold from early times, but destruction of a new kind began soon after Napoleon's antiquarians published their reports in the early 1800s. Coincidentally, the era of steamship travel had begun. Large numbers of travelers started to arrive from abroad. Many carried off spoil, such as fragments of carved stones. Museums were also able to arrange the shipment of larger pieces of sculpture—those at least would be preserved, and did come with some information on provenience.

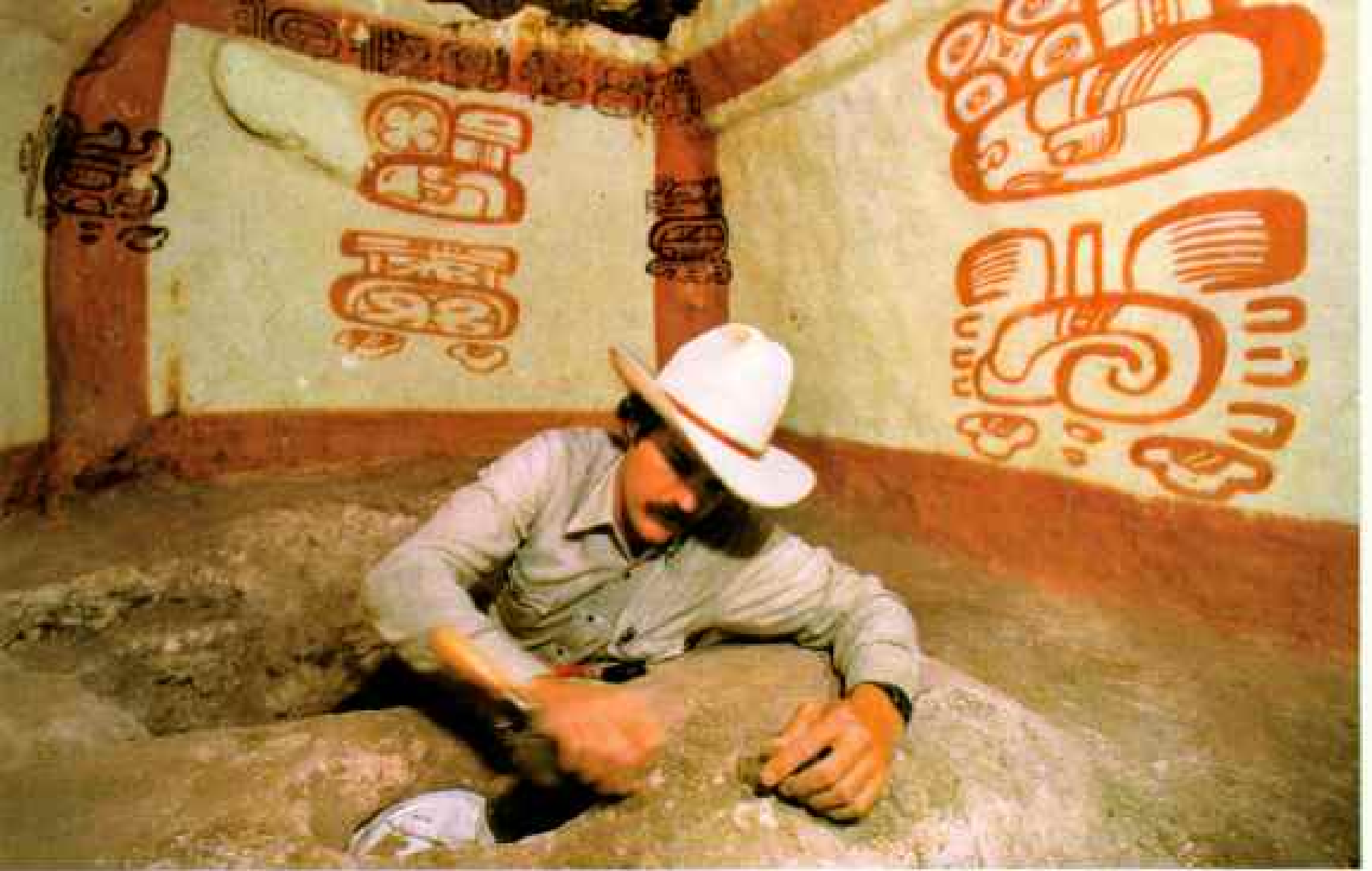
With tragic irony this new epoch of destruction developed just as Jean-François Champollion was refining his decipherment of the hieroglyphic writing, thus pushing the frontiers of history back several thousand years. On expeditions to gather texts, he was appalled to see the damage being done, and he successfully petitioned the Egyptian



PAINTING BY WILLIAM M. BOND,  
NATIONAL GEOGRAPHIC ARTIST

high, the piece represents G-1, an underworld deity of the Palenque triad. Now in a private collection, the mask bears on its back a glyph referring to Río Azul, like the one shown on page 420.





Beneath the highest temple complex at Río Azul, Tomb 12 was sacked and then used as a dump by looters tunneling into another area. Volunteer excavator Dr. John Faggard (top) cleared the debris, exposing murals that are the first to show the glyphs for the four cardinal directions in correct orientation. Glyphs on the rear wall refer to the east and its association with the sun, and those at right to the south and Venus. A row of glyphs near the ceiling (redrawn, above) translates, "[On the day] 8 Ben 16 Kayab was buried 'Six Sky' . . . of Río Azul." The year is most likely A.D. 450.

An artist's rendition of a fine polychrome tripod vase (left) shows at lower right a glyph referring to the same ruler; the glyph designating Río Azul (far right in drawing above) appears on the vase's other side. The vessel, now in the Detroit Institute of Arts, may have been a grave gift in Tomb 12 or a gift from Six Sky to a burial elsewhere. But the world may never know for sure, since looters keep no records.

GLYPHS (ABOVE): DRAWN BY DAVID STUART; PAINTING BY WILLIAM H. BOND



authorities to issue laws to control the traffic in antiquities.

Decades passed before the traveling and collecting public came to understand the harmful consequences of such collecting, and longer still before curators of all the great national museums were ready to accept regulation. They argued that the artifacts acquired by them would be safer in their museums than in Egypt. But accept it they did, in time.

**M**ORE THAN A CENTURY after Champollion's time, in the 1960s, the ruined cities of Mesoamerican and Andean high cultures became the target of a new and unprecedented outburst of looting. This time the traveler wanting to bring home a trophy played no important role; nor was that of the art museum a direct one as before. The dirty work was done, and is being done, by gangs who pass their finds to agents who in turn forward them to dealers in Miami, New York, Zurich, Brussels, and other cities.

Not only portable artifacts but also large stone sculptures, sliced into slabs a mule can carry, came on the market in a steady flow and, though bearing all the marks of clandestine pillage, have been eagerly bought by private collectors and art museums.

The demand for stolen pre-Columbian archaeological treasures reached its zenith in our own time last Christmas Eve, when thieves tapped a new source of supply—and shocked the world. Robbers looted 140 small, readily transportable objects of gold, jade, obsidian, and turquoise from the National Museum of Anthropology in Mexico City. Many are beyond the word "priceless"—such as the obsidian monkey jar from Texcoco and the jade-and-shell funerary mask from Palenque.

Because these pieces are documented and obviously stolen, no legitimate collector or institution will buy them. Why then were they taken? Opinions vary. Some experts believe they will be held for ransom. More likely, I think, is that they will find their way into the international black market, whose potential buyers are willing to hoard such treasures in secret for many, many years.

Why was there such a ready market in the '60s for the undocumented artifacts turning

up in the hands of unscrupulous dealers? How could the lessons of Egypt have been forgotten? The short answer is, the collectors and museum directors were of a different breed: go-go directors, more entrepreneurs than scholars, and collectors mostly ignorant of history and motivated by the profit to be turned when after a few years their treasures could be donated to a museum in return for a tax deduction based on inflated appraisals.

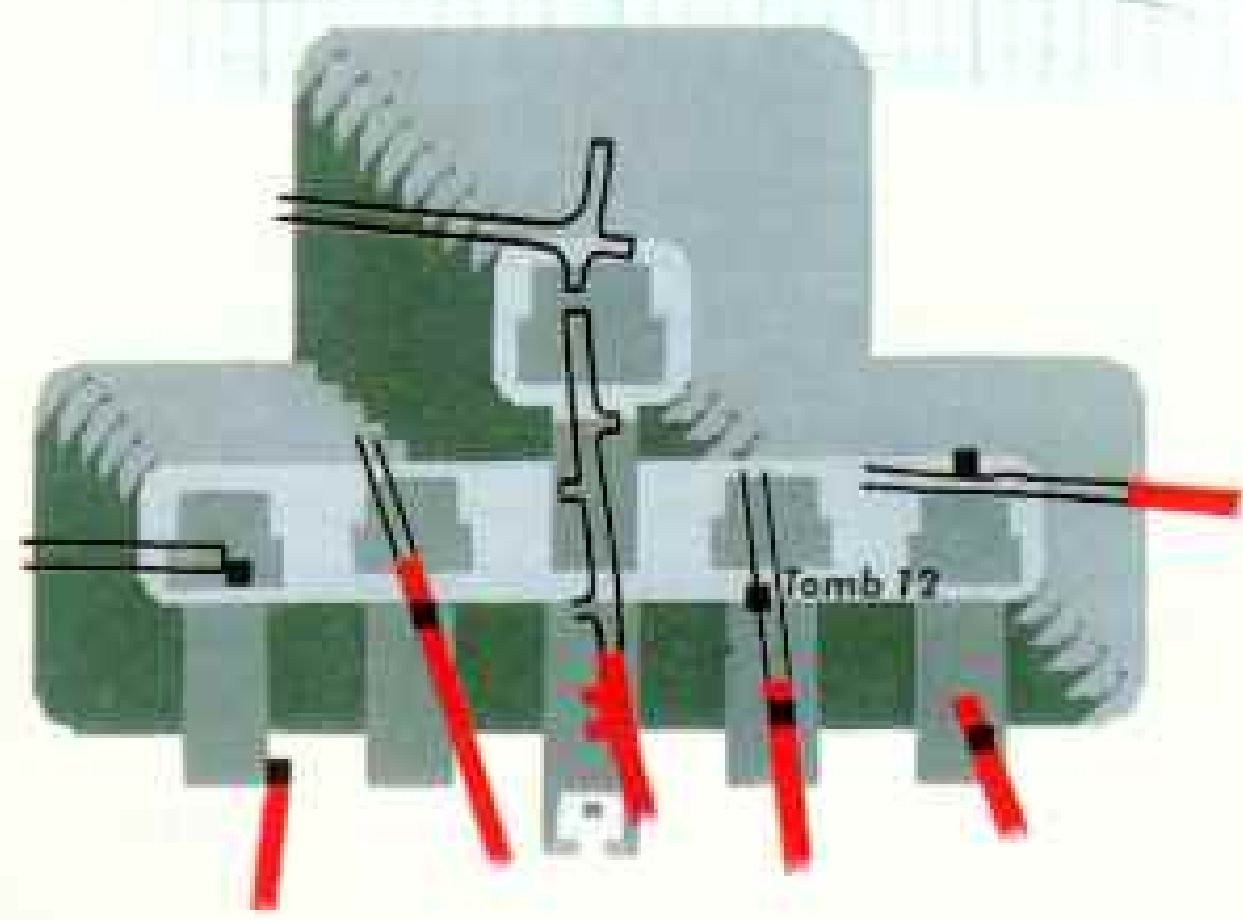
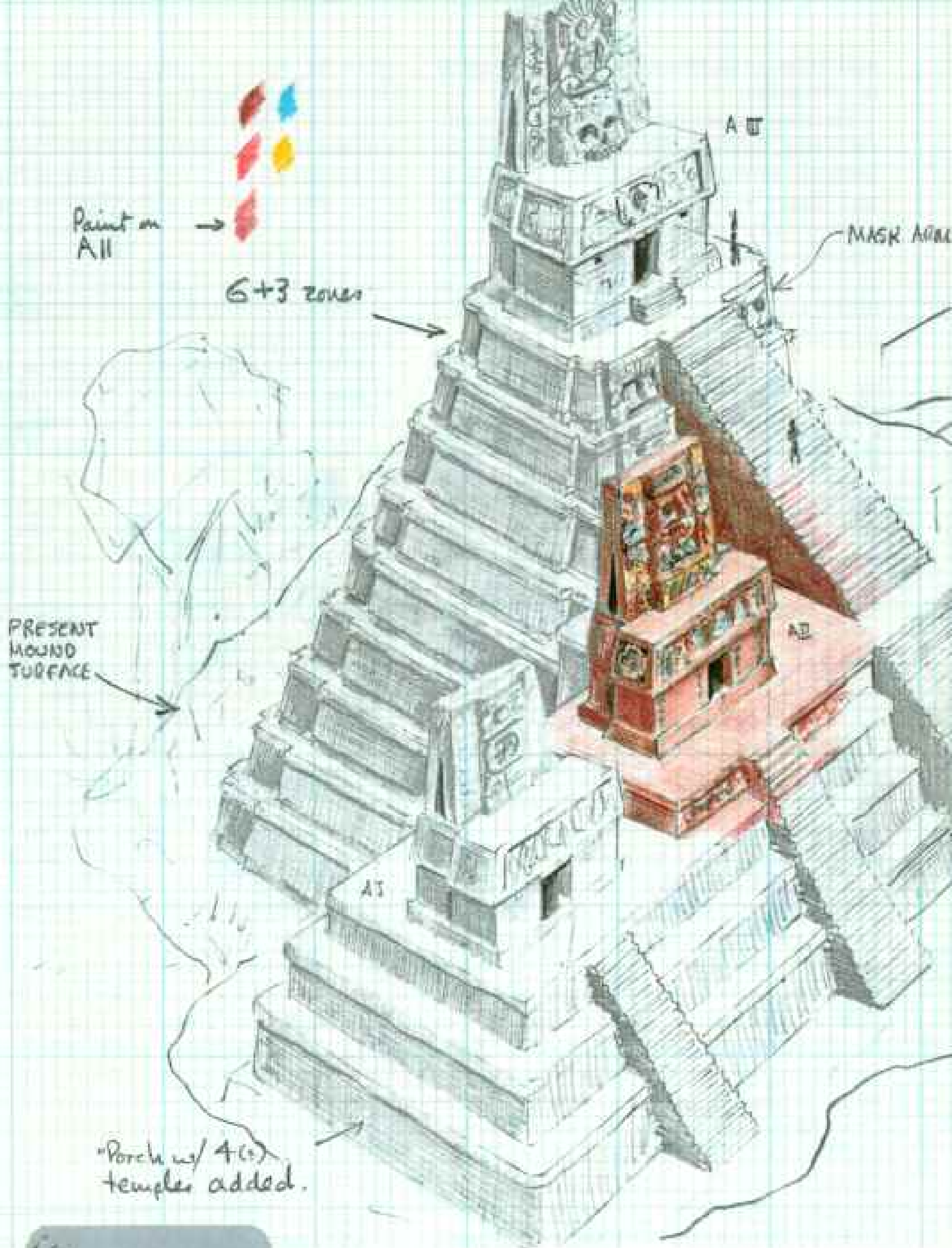
In the United States, tax laws allow credit for a donation even of art that was illegally obtained. Recent law and applications of old law have now made it more difficult to import and sell stolen artifacts—a U. S.-Guatemalan treaty signed in 1984 forbids entry of stolen cultural artifacts from that country. But the deduction is still allowed.

The parallel with the Egyptian experience was sadly strengthened in 1960 when a great advance toward the decipherment of Maya hieroglyphs was made by the late Tatiana Proskouriakoff. She proved the inscriptions to be dynastic records, capable of pushing back history just as Champollion's had. Discovery of new inscriptions suddenly became more important, and more feasible as those areas were being opened up, yet it was just then that this wave of looting hit the heartland of the Maya civilization.

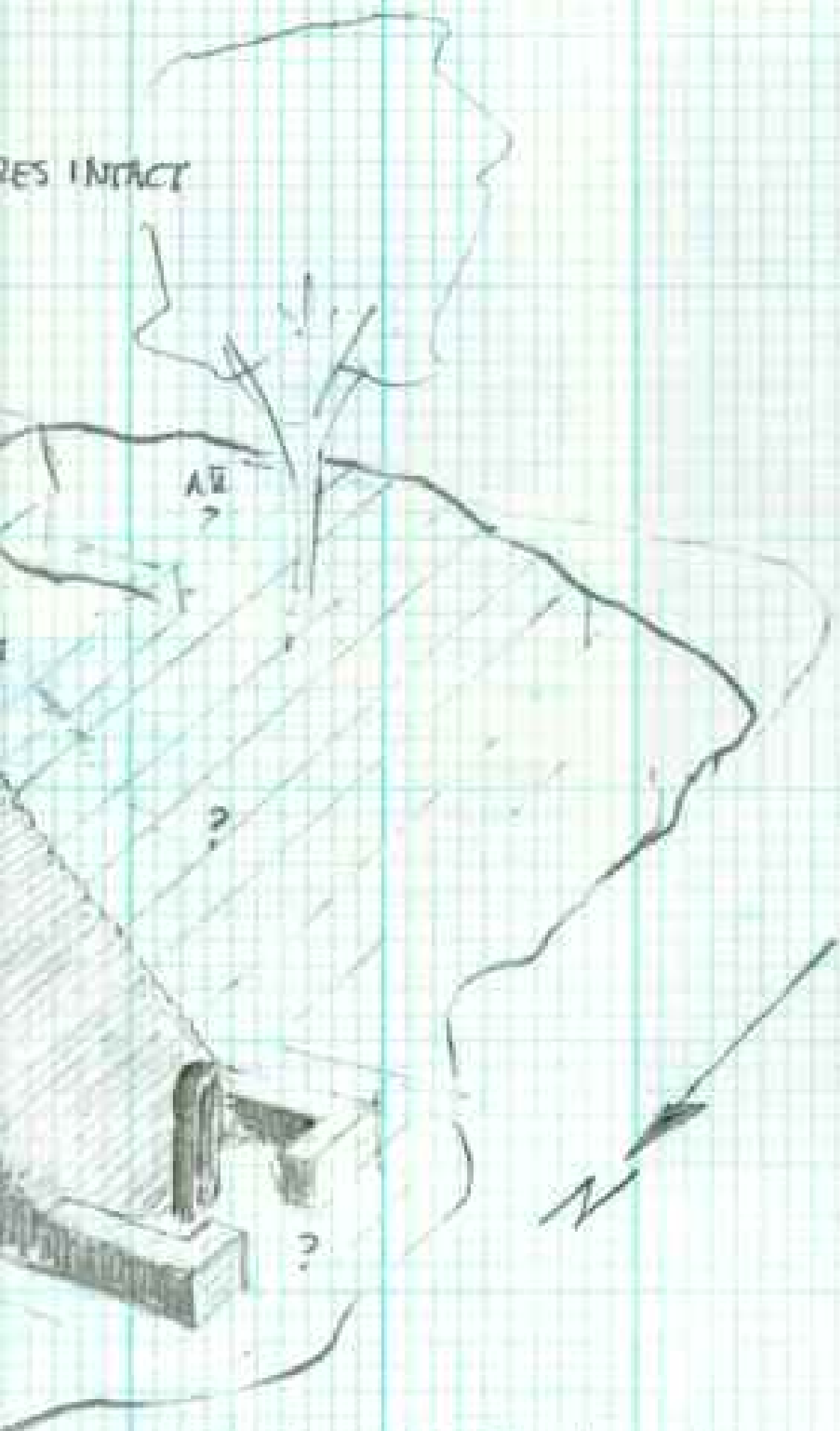
My own work, and that of anyone else who collects hieroglyphic inscriptions for study, has been permanently impaired and greatly slowed by the plundering of monuments. However, when faced with a pile of debris that a few years earlier was a stela, one can sometimes very laboriously piece the remains together sufficiently to prove that a certain sculpture of unknown provenience in a museum was cut from that very stela. In this way an accurate provenience is established, often with the added benefit of restoring areas of carving left abandoned by the looters.

The success achieved in a number of cases by such means undoubtedly justifies the study of sculptures of uncertain origin; it would be a mistake simply to ignore them. Far more difficult is the problem of portable objects looted from tombs—painted or carved pottery vessels, jades, greenstone masks, even, occasionally, wooden objects.

Whereas the flow of carved monuments



Yet to be excavated, the Temple AIII complex (pages 425-7, 15) likely honored Río Azul's most prominent rulers. Most stairs and terraces have crumbled, but when National Geographic Society archaeologist George Stuart sketched the complex (above), he reconstructed in color the probable appearance of the best preserved area, based on paint fragments still clinging to stucco surfaces. Before archaeologists arrived, looters had



Río Azul, Petén, Guatemala

"A" Group

A I, A II, A III restored - A II in color.

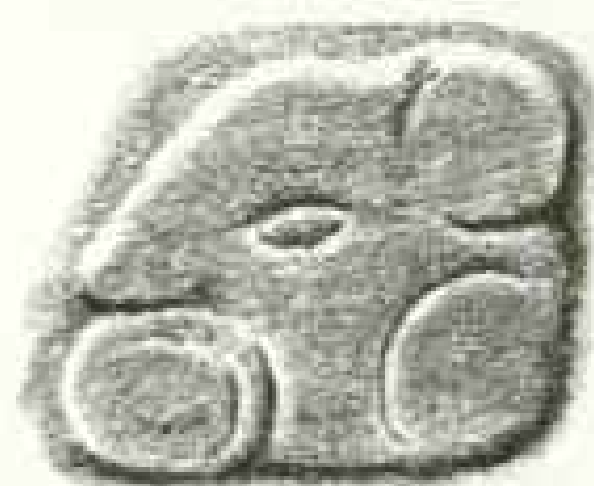
G STUART  
16 Mayo 1984

penetrated the interior (drawing, left), emptying seven crypts, including Tomb 12. With an abundance of manpower, they dug subway-like tunnels and open-air trenches (red on the drawing) such as the 60-foot-high cut examined by Dr. Adams (right) that slices toward Temple AII. Ironically, archaeologists can use these cuts as cross sections to study building sequence and materials and to obtain datable ceramic sherds.



NATIONAL GEOGRAPHIC EDITOR WILBUR E. GARRETT





GLYPH DRAWING BY GEORGE E. STUART

*Racing looters and the ravages of time, archaeologists record the information visible on the roof comb of Temple AII (right). On one side of this structure they found glyphs (left) formed in stucco and then painted, including the symbol for Río Azul or its dynasty (box and drawing, above). Looters with machetes apparently hacked off some glyphs to sell.*

has almost ended, those smaller artifacts are now the principal objective of looters. The high prices obtained for the best specimens justify the staggering effort they put into trenching large pyramids or driving tunnels into them in search of tombs. These finds, being small, are easy to smuggle; their importation is not so rigorously controlled; and because their origins are harder to prove from internal evidence, they are not so easily claimed by one of the five countries that compose the Maya area.

**S**OON AFTER RÍO AZUL and the discovery of its rich tombs received wide media coverage, two splendid jade pendants came to light—or half-light, as their present location has never been publicly disclosed. Rumor connects them with Río Azul, but there is nothing in their hieroglyphic texts, as understood at present, to confirm the attribution.

We are on firmer ground with two pieces that have been exhibited in New York City.

One is a mask of greenish blue stone (cover and page 455) with a hieroglyphic text on the back. The owner has been reluctant to let this inscription be seen by epigraphers, but it is now known to contain the glyph most frequently associated with Río Azul. The other, a lidded tripod vessel (page 456), carved and stuccoed, is embellished with two glyphs that likewise link it to the site.

Much blame attaches to those who destroyed so much in those tombs, and it is the dealers and buyers who are most to blame. Still, the few pieces that can confidently be identified with the site—and the number may grow—are valued for enlarging the body of Río Azul inscriptions and for providing comparative material.

As a final note it is worth mentioning that it is now possible, by neutron activation analysis, to determine the source of pottery vessels. This will help not only the archaeologist but also those whose job it is to enforce the laws against traffic in antiquities. \* \* \*





# In Defense of the

**C**OLLECTING HAS ALWAYS been a vital instrument in the assembling of knowledge. Whether collecting words for a dictionary or an encyclopedia, collecting plants or insects for biological research, collecting the works of one artist or author, or collecting artifacts that tell of cultural history, ancient or modern, collecting is the backbone of scholarship.

I am both a collector and a teacher. I have had the privilege of teaching with original artifacts, and I believe that whenever possible the student should learn by hands-on experience the material he is working with. Illustrations in books or projected transparencies fail to show scale, tactile nature, subtleties of surface, or three-dimensional qualities inherent in works of art. No matter how imaginatively handled, the video camera can provide no substitute for an original.

A year ago a show on the ancient Maya opened in New York City. It devoted much of its space to an exposé of looters' crimes, yet undocumented material accounted for about 20 percent of the artifacts displayed. Well-known Maya scholars had prepared the descriptions in the catalog, working from photographs in some instances when there was no opportunity to see the actual pieces beforehand. Several collectors, archaeologists, and art historians—all experienced with a wide range of original material—quickly challenged the authenticity of 11 of the 239 items illustrated, and four pieces were acknowledged by the exhibit's organizers to be modern forgeries. I believe that any scholar with similar experience could have detected these forgeries, even from photographs. The shame of it is that this catalog, intended to be an important scholarly work, launched these 11 pieces into the literature as genuine.

Most teachers cannot command original works of art for their students. That is the role of the museum. Today the United States is blessed with fine museums in the spirit of Thomas Jefferson, himself an avid collector.

Jefferson's good friends the Peale family

were among the first North Americans to collect Maya clay figurines, which they exhibited in their museum in Philadelphia in the early 19th century. One of the first great collectors to acquire ancient American art seriously was Robert Woods Bliss, who bought his first piece in 1912. He proudly donated his collection and Dumbarton Oaks mansion in Washington, D. C., to Harvard University for the benefit of future scholars.

Other collectors who made important contributions to pre-Columbian scholarship were the pioneers of Maya studies, John Lloyd Stephens and his artist collaborator, Frederick Catherwood, who from 1839 until 1842 collected artifacts and studied and illustrated the ancient Maya world. At the end of the 19th century Alfred P. Maudslay photographed and assembled splendid examples of architectural carving for the



*Miracle of survival, this bark-paper Maya manuscript—the Madrid Codex—was saved by one or more early collectors in the New World, perhaps at the time of the conquistadores. Coated in white plaster, the book unfolds like a screen*



# Collector

By GILLETT G. GRIFFIN

British Museum. The first great Latin American scholar to study ancient American art and its symbolism was Miguel Covarrubias, a Mexican artist-anthropologist who, working in the 1940s and '50s, intensively studied and collected and encouraged others to collect pre-Columbian art.

For all these pioneers, collecting was a way of conserving and making available artworks that were little appreciated—if not endangered—in their country of origin.

**T**HE ARCHAEOLOGIST has become a sort of romantic hero in this century. As such, he undergoes all sorts of privations to salvage traces of lost civilizations. Yet few realize how many modern archaeological findings have never been adequately written up and how remarkably little is published. Most of the material from

Tikal, one of the most important sites in the Classic Maya world, was kept largely under wraps—out of bounds to most scholars—for more than 20 years. And when such material is not published or made available to scholars, it is useless.

In fact, when the archaeologist digs, he must be so thorough that at least part of the site is effectively destroyed. Some of the major Maya sites have been excavated and reconstructed for tourism without ever having been completely mapped.

As there are archaeologists who damage sites without publishing their findings, so are there collectors who collect primarily for profit, inflating the market and encouraging

Gillett G. Griffin's collections have ranged in subject matter from early New England children's books to ancient Maya art. He acquired his first pre-Columbian artifact 36 years ago.



NATIONAL GEOGRAPHIC PHOTOGRAPHERS OTIS IMBODEN AND VICTOR R. BOSWELL, JR.; MUSEUM OF THE AMERICAS, MADRID

and stretches 22 feet. An unknown number, perhaps thousands, of such codices were destroyed by Spanish priests inspired by the Inquisition, or by the humidity of the Mesoamerican lowland forests. Preserved in Europe in two fragments, the Madrid Codex, one of only four known, has been invaluable in helping scholars interpret glyphs, calendrics, and iconography—a compelling argument for the role of the collector in the preservation of antiquities.

*A vase is a page of a book, according to a revolutionary new concept developed by Maya scholar-collector and well-known Charlotte, North Carolina, heart surgeon Francis Robicsek. Based on Yale University archaeologist Michael D. Coe's observation that the artistic style of many Maya funerary vessels resembled that of the codex artists, Dr. Robicsek examined 186 vases and showed that such vessels, put in proper sequence, can themselves be read like codices. The artists had used pottery—a material far more durable than bark—*



THE ART MUSEUM, PRINCETON UNIVERSITY;  
GIFT OF HANS AND DOROTHY WIGENMANN FOUNDATION

*to portray the complex Maya mythology, which, like Greek mythology, is filled with stories about a pantheon of gods. On this eight-inch-high vase, the hook-nosed underworld god L sits on his throne surrounded by beautiful women, one of whom kneels before him. A rabbit serves as scribe.*

*This vase, among the finest from Maya times, was given to Princeton University's Art Museum by a private foundation.*

looters. A decade after archaeologists left Río Azul unexplored, it was found by looters backed by powerful business interests. It was then that objects from the site began to appear on the world market.

A UNESCO treaty on world art has not been ratified by most European countries. These countries insist that they will never ratify such a treaty. This means that nations such as Switzerland, Britain, and France still eagerly acquire antiquities from Third World countries. On the face of it, it is a deplorable situation. In our country, as a reaction, there are some who brand all pieces not officially excavated by archaeologists as suspect and attempt to prohibit their use in scholarship and research. This amounts to suppression of information.

An answer to this self-righteous attitude may be found in the Far East, in Japan's exemplary antiquities law. The Japanese have a rich artistic heritage of more than 6,000 years. Important works of art must remain in Japan. The rarest and most precious constitute national treasures; rare but not unique works may be privately owned. A jury of expert scholars decides which may not be sold outside the country. It is impossible to buy the integrity of these Japanese scholars, who also feel that works of fine quality serve as cultural ambassadors to the world. It would be a simple solution to the patrimony problem if all peoples of the world felt the same secure sense of heritage and were as morally unassailable as the Japanese, but, alas, this is not the case.

In our hemisphere we have the opportunity to study the effects of a new antiquities law in Costa Rica. That country experimented for 40 years with what I believe was an enlightened approach, its National Museum reserving the right to buy unique artifacts from private owners for its collection or to tax the owners on the value of less important pieces, after which the owners were free to do with the material what they wished. Such a policy enabled the people to partake of their national patrimony through private collections.

But the "enlightened" approach was never adequately enforced, and Costa Rica strengthened the law in 1981. Now no artifacts may leave the country. All collections must be registered with the government,

and the museum may borrow privately owned material at will. Today Costa Rican cultural treasures are appearing on the world market because poor campesinos are willing to risk stiff penalties for the profit they can gain. But many other treasures—commercially less valuable—are left lying where they are found, unclaimed and unreported because there is no longer any incentive to salvage them.

**T**HE LOOTING of sites is deplorable, but it is an ironic twist of circumstance that plundered pots of unknown provenience have opened up for us a rich world of iconography and glyphs that we could not have conceived of a decade ago. It is tragic to lose the specific archaeological context of a tomb freshly unearthed; yet archaeologists have sometimes been simply unable to read what they have uncovered. They have often ignored or discarded materials that might prove invaluable to epigraphers or art historians. In their quest for scientific absolutes they have ignored the ephemeral carriers of cultural information. In their search for the prosaic they have overlooked clues to history, religion, and myth. It has been pointed out that the Rosetta stone was not found in context by archaeologists, but nonetheless it served to open Egyptian hieroglyphs for all scholars.

A true collector collects to share. I repeat: Collectors and scholars must work together to reassemble scattered information. We in this country were long apathetic to the looting of our own ancient sites. Looting must be stopped by solid laws and the enforcement of those laws in the countries where it happens. Once artworks have been cast into the world, they must be conserved and used. It has historically been the role of the collector, the museum, and the teacher to do this. □

*A stone tablet tells another tale. Maya artists at Palenque chose this five-foot piece of limestone to recount the story of the ruler Kan-Xul, who, flanked by his kneeling mother and father, dances out of Xibalbá, the underworld, where he defeated death. This piece, a key to understanding Maya genealogy and their concept of the afterlife, is part of the Robert Woods Bliss Collection of Pre-Columbian Art at Harvard University's Dumbarton Oaks museum in Washington, D. C.*



DUMBARTON OAKS

Four outstanding collections of Maya works of art are now touring the U. S. and Canada. They are listed below with locations and dates as they were scheduled at press time.

**CENOTE OF SACRIFICE: MAYA TREASURES FROM THE SACRED WELL AT CHICHÉN ITZÁ**  
 Denver Museum of Natural History 3/7-5/18/86;  
 Vancouver Museum 6/20-8/17/86; Louisiana  
 Nature and Science Center, New Orleans  
 9/12-11/23/86; National Geographic Society Ex-  
 plorers Hall, Washington, D. C. 12/19/86-2/15/87;

Milwaukee Public Museum 3/20-5/17/87.

**THE BLOOD OF KINGS: A NEW INTERPRETATION OF MAYA ART**  
 Kimbell Art Museum, Fort Worth 5/17-8/24/86;  
 Cleveland Museum of Art 10/8-12/14/86.

**MAYA: TREASURES OF AN ANCIENT CIVILIZATION**  
 Royal Ontario Museum, Toronto 3/22-6/15/86;  
 Nelson-Atkins Museum of Art, Kansas City 7/19-  
 9/7/86; Albuquerque Museum 11/16/86-2/8/87.

**NOVEMBER COLLECTION**  
 Denver Art Museum 3/1-5/25/86.



*The countryside of Panama, long overshadowed by the urban corridor flanking its famous canal, is typified by a campesino family in Colón Province, where homesteads are fast displacing the tropical forest. Meanwhile, the transit zone is also changing, as the country moves from a one-service economy into banking and commerce. Nine years after the historic treaties that will give them full control over the canal by the year 2000, Panamanians are well on their way to forging a national identity.*



# PANAMA



# Ever at the Crossroads

By CHARLES E. COBB, JR.  
NATIONAL GEOGRAPHIC EDITORIAL STAFF

Photographs by  
DANNY LEHMAN





**T**HE DRY SEASON WAS coming to an end. All over Panama, campesinos were clearing land, setting their farm plots afire, preparing for April planting.

Beneath an early evening orange-red sun blurred by smoke, Antonio Rodríguez panned for gold along the banks of the Río Boquerón near the headwaters of the Chagres, main water source for the Panama Canal. Looking up with a smile from where he squatted with his wooden pan, he paused to talk to me of gold. "It's the devil's metal," Antonio said. "He can capture you with it."

I asked if he felt endangered. No, Antonio responded, because he is a farmer, not a gold miner. On a good day Antonio might pan a few grams of gold. He also farms a few acres nearby. While that provides corn and beans for his family, it provides little cash. And even this subsistence is threatened by *roza*—the soil-depleting slash-and-burn method most campesinos use.

The land is producing less and less. So Antonio is thinking about moving. He's heard there is more gold and virgin land in the Darién forest along the Panama-Colombia border. "Maybe I will go there next year."

I met Antonio Rodríguez in the complex social terrain that has grown up along with the Panama Canal. Gold midwived this Panama. It is a child of the Old World and the New, born nearly 500 years ago when Spanish conquistadores followed Indian routes across the isthmus here with mule trains of treasure plundered from the Inca Empire. Then called Castilla del Oro—Golden Castile—by the Spaniards, it was a land of sword and gun and seizure. In 1671 Henry Morgan and his pirates sacked the original Panama City, founded in 1519.

Some say the name Panama comes from an Indian word meaning "land of many fish." Others believe it stems from the Cuna Indian phrase "*panna mai*." When Spanish soldiers met a Cuna and asked where they could find gold, the reply was "*panna mai*—far away," in the hope, according to the tale, that the soldiers too would go far away.

But if greed for gold birthed Panama, unique geography nursed its growth. Shaped like a recumbent letter S, Panama stretches east and west for 400 miles, connecting South and Central America. It

varies in width from 30 to 120 miles, bathed by the Caribbean Sea on the north and the Pacific Ocean on the south. This gives Panama a kind of upside-down effect. Here I could watch the sun *rise* over the Pacific and set in the Atlantic. Indeed, ships passing through the Panama Canal from the Atlantic end up 25 miles east of where they entered.

Partly because the isthmus is narrowest here, Panama became, and still is, an international shortcut. Some 400,000 gold rushers en route to California crossed here. "A beaten track in civilization," Senator Mark Hanna said in 1902, arguing that a canal



*Rekindling memories, 90-year-old Edward Dixon displays his 1914 wedding photograph. In 1947, when he worked for the Panama Canal Company, university students first rioted against U. S. control of the canal (facing page). Here a freighter on the 51-mile waterway approaches Gatun Lake.*



should be built here instead of one proposed through Nicaragua. Its vital and historic role as an international transfer point has been an important contributor to Panama's well-being. The gross national product is more than four billion dollars. For the most part, Panamanians have clean water, good health services, ample food, ready transportation, and disposable income. The effect of this: greater social stability in an area of the world associated with turmoil.

Yet the familiar problems are here also. Created as a transit zone, Panama is incompletely formed as a nation. There are social and economic imbalances, a mounting debt, and, most important, a military that for much of this century has manipulated or turned out civilian governments at will.

With the election of Nicolás Ardito Barletta as president in 1984, Panama ended 16

years of military rule and officially returned to civilian authority. But Ardito Barletta was ousted after just 11 months in office and replaced by his first vice president, Eric Arturo Delvalle. It was effectively a military coup, "constitutional," but a coup nonetheless. However, that tangled tale must wait until we've seen some more and understand some more of Panama.

**A** ROAD, a railroad, or a canal; they didn't concern themselves with the rest. That's been the story here for hundreds of years," Panamanian anthropologist Stanley Heckadon Moreno

*New presidente, Eric Arturo Delvalle appears at the 1985 Independence Day parade in Panama City—five weeks after his predecessor was forced to resign.*



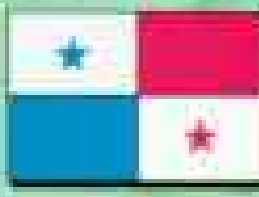
Staunch custodians of a pristine mainland rain forest and their own cultural identity, the Cuna Indians inhabit 50 of the more than 300 San Blas Islands.

Domain of snakes and caimans, the Darien wilderness serves Panama as a natural barrier against cattle disease and illegal immigrants. At present neither Panama nor Colombia has the funds to undertake the long-stalled completion of the Pan American Highway across the region.



# PANAMA

**S**PAIN's principal conduit for New World gold in the 16th century, Panama saw its fortunes ebb as the Spanish Empire waned. New vigor came with travelers to the California gold rush and a trans-isthmus railroad in 1855. Independence from Colombia in 1903 and construction of the canal resurrected the isthmus as a crossroads for world wealth.



**AREA:** 77,082 sq km (29,762 sq mi) **POP:** 2,000,000  
**CITIES:** Panama City (capital), 389,000; Colón, 60,000  
**LANGUAGES:** Spanish (official), English, several Indian languages. **ECONOMY:** Services, agriculture, industry. Per capita income: \$2,970.





remarked one day as we talked near the ruins of Panamá Viejo, the original Panama City, now engulfed by urban sprawl.

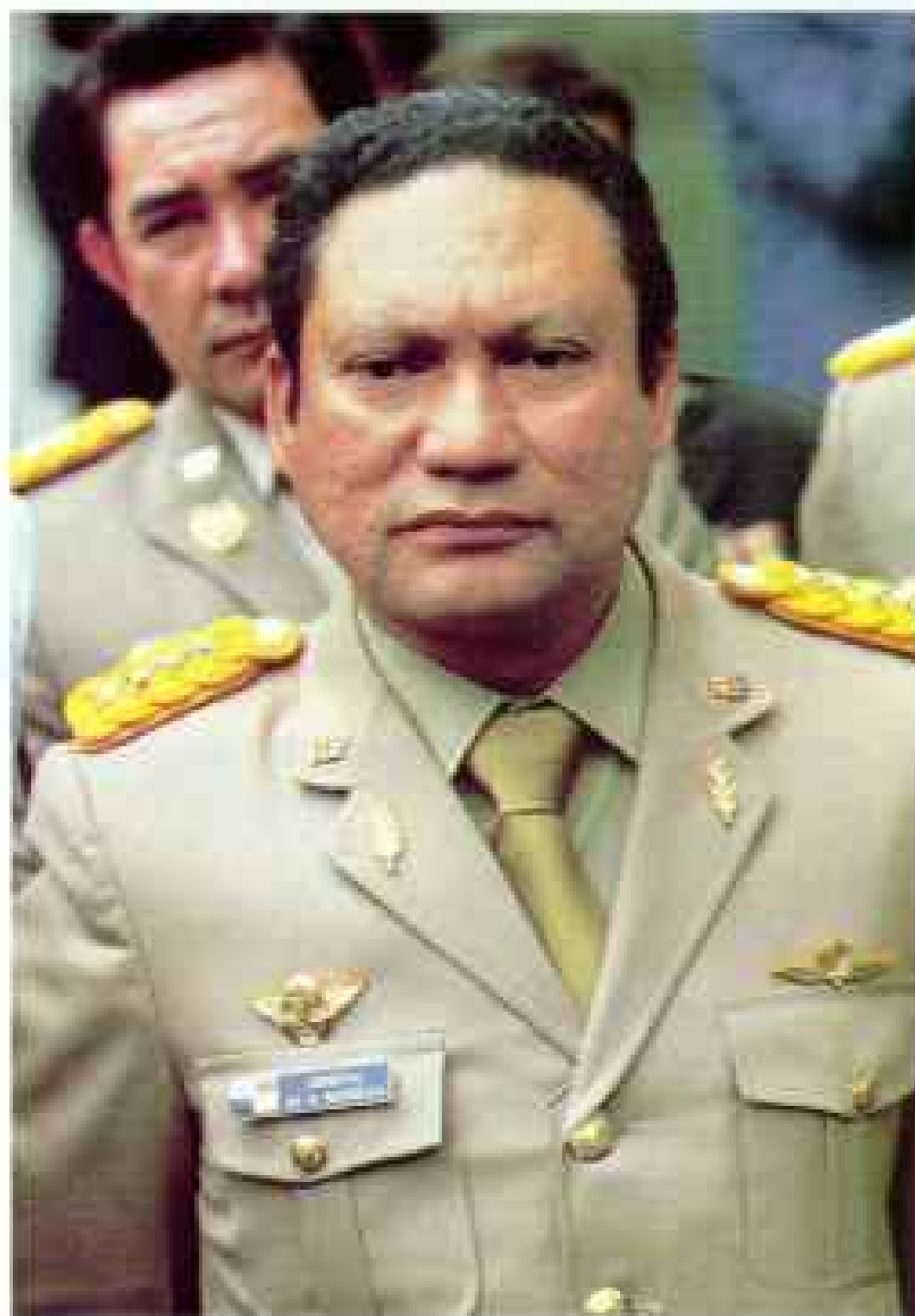
Stanley's "they" alludes to the people of the transit zone, the urbanized, intensely commercial Panama that began with the Spaniards but accelerated when the canal was built. This Panama of skyscraping banks in Panama City (pages 482-3) and the poor but bustling city of Colón on the Atlantic has developed around the traffic between two oceans. More than half of Panama's two million people live here.

Another Panama, the Panama that the Spanish explorer Rodrigo de Bastidas discovered in 1501, and from where Vasco Núñez de Balboa first sighted the Pacific Ocean in 1513, remains today very much what it was then: frontier. It is sparsely pop-

ulated, mostly by Indians. The frontier embraces the ferociously dense rain forest of Darién in the east and the thick forest that blankets the Atlantic coast between Colombia and Costa Rica. It is as primitive as the transit zone is developed.

And there is yet another Panama: the interior. The Pan American Highway and its feeder roads running west from Panama City define its geography. It is full of farmers and thriving little towns. Here one finds the nation's Latin heart and soul.

This is the Panama of *tamborito*, a graceful dance and song to small drums, and the *pollera*, a traditional dress of linen and lace often embroidered with flowers. It welcomes the visitor unsuspectingly, offering perhaps only rice and corn to eat, but offering with generosity.



CLAUDE HIRNACA, SYGMA

**Presidential string puller** Gen. Manuel Noriega proved himself the real power in Panama last year when he forced the resignation of Nicolás Ardito Barletta, the nation's first popularly elected president in 16 years. Despite military rule, freedom survives in the streets of Panama City (right), where demonstrators drag Noriega in effigy while protesting Panama's backsliding democracy.



Setting out from Panama City, I visited El Valle, a lovely mountain resort area about 75 miles down the Pan American Highway. I would not have found the croaking frogs here unusual, except that they were golden! More intriguing, some tree trunks here are square, and scientists do not know why.

Farther down the highway I stopped at the Church of Santiago Apostol in the town of Natá, one of the oldest in Latin America. Its wood-carved statues of Christian saints wear Indian faces. In nearby Penonomé, which a plaque in the town square describes as the geographic center of Panama, I joined in a pre-Lenten Carnival celebration. The townspeople frolic all day in the streets, dancing, eating, and splashing water liberally on each other (and especially on the unsuspecting visitor). I was told that this ritual

may have its origins in the belief that, with the dry season ending, faith should be expressed that the rains will come.

The interior contains Panama's most fertile and productive agricultural lands. Farmers here grow rice, potatoes, coffee, vegetables, citrus fruits, and a host of other products. Strawberries and Thoroughbred horses are raised near Cerro Punta, in a mountainous region that reminded me a little of the Swiss Alps.

There are cowboys, too, for cattle are raised throughout the interior. Cattleman and farmer alike wear the real Panama hat; not the white one with the wide brim—that is made in Ecuador—but the *pita*, a jaunty, narrow-brim straw hat with black and white stripes.

It is a hardworking land. The sign at the



border of Chiriquí Province says: "Welcome to Chiriquí where men work."

And women too. At sunup on her 50-acre farm in Chiriquí Province, not far from the Costa Rican border, Señora Manuela Moreno was watching the sky nervously. "I'm afraid, I'm really scared," she told me. She had 12 acres of sorghum to bring in, and what she did not need was rain.

If it rained, the sorghum would be too wet to harvest for another week; but it was nearly time for the next planting of rice. She had workers lined up, had already ordered seed and fertilizer; she needed a part for the broken tractor, but the money for all this was in the sorghum that had not been harvested. And the combine she had arranged to use had broken down.

"Fertilizers, tractors, fuel, spare parts; we thought mechanization was a bonanza," her son Stanley told me exasperatedly. "But the whole system now is based on credit, and that's a gamble, you know. My grandfather never borrowed in his life!"

A combine finally arrived; the rain did not. As the last of the sorghum was loaded, Señora Moreno sighed, "*Gracias a Dios.*"

I felt much the same way that evening bathing in the cool waters of the Río Chiriquí Viejo behind the farmhouse. Bagging sorghum all day had left me sweaty, tired, and covered with white dust. I itched all over. As the river's water washed away the

day's work, I thought surely I too was receiving my heavenly reward. From homesteads in the surrounding hills the aroma of roasting coffee wrapped around me.

Yet even here the problems of Panama intruded. There has been an increase of farming on the steep slopes of the volcano Barú to the north. When it rains, soil washes down to the river. What was once sandy and clear is now a patchwork of mud flats.

"Look! This has all come down from the mountain," Stanley said, digging his foot into the mud. He told me the riverbed may be as much as three feet higher than it was ten years ago. One alarming effect: During the rainy season water flows over the bank, sometimes five feet deep around the house.

Nearby is a grove of fig trees black with rot from flooding last year. "Those people don't understand that what they do up there has effects down here. They think we're far away in another part of Panama."

**I**N A SENSE they *are* another Panama. Señora Moreno struggles in the world of commercial farming. Many in the interior just eke out a bare existence.

They live in scattered villages or on isolated *huertas*, small plots protected by wooden fences that actually sprout.

In many places the soil is parched and cracked from decades of destructive agricultural practices. Of Los Santos Province—



*On the edge of Panamanian society, 11-year-old Amado Abrego and his family (left) live in the small Guaymí Indian village of Tibite in Bocas del Toro Province. Panama's largest Indian group, the Guaymís are poorer and less organized than the Cunas of eastern Panama.*

*To supplement their livelihood of hunting, fishing, and subsistence agriculture, they depend on employment with the giant banana producer United Brands. On the border of Costa Rica, along the Río Sixaola, a crop duster (right) sprays banana plants; the fruit is Panama's leading export.*









The Saints—former government planner Jorge Riba told me: “It reminds me of that song ‘When the Saints Go Marching In.’ When our saints go marching in, the forests are ruined.” The Sarigua desert on the peninsula of Azuero advances steadily.

I thought of Antonio Rodríguez, the farmer I had met panning gold. Like him, campesinos all over Panama chop down trees and burn off grass to farm small plots that become depleted of nutrients in a few years. Then the campesino moves on.

Says Jorge Illueca Bonett of Panama’s National Environmental Commission (CONAMA): “It’s a vicious cycle.”

The small staff of CONAMA spearheads a campaign to protect Panama’s fragile soils. According to one government study, only 23.9 percent of Panama’s lands are arable, and half of those are of marginal utility for intensive agriculture. Jorge points out that 92 percent of Panama was forested in 1850. This has declined to 37 percent today.

One region where tropical forest is vanishing rapidly is the Darién. Virtually impenetrable in parts, it is sparsely populated, mostly by Chocó Indians, one of Panama’s three main tribes, and blacks. Its rivers flow dark and mysterious. It screams and vibrates with insect and animal life: tapir, ocelot, monkey. The Darién is a natural barrier that protects Panama from, among other things, hoof-and-mouth disease. Loggers have felled thousands of its trees; settlers press in from exhausted lands in the interior.

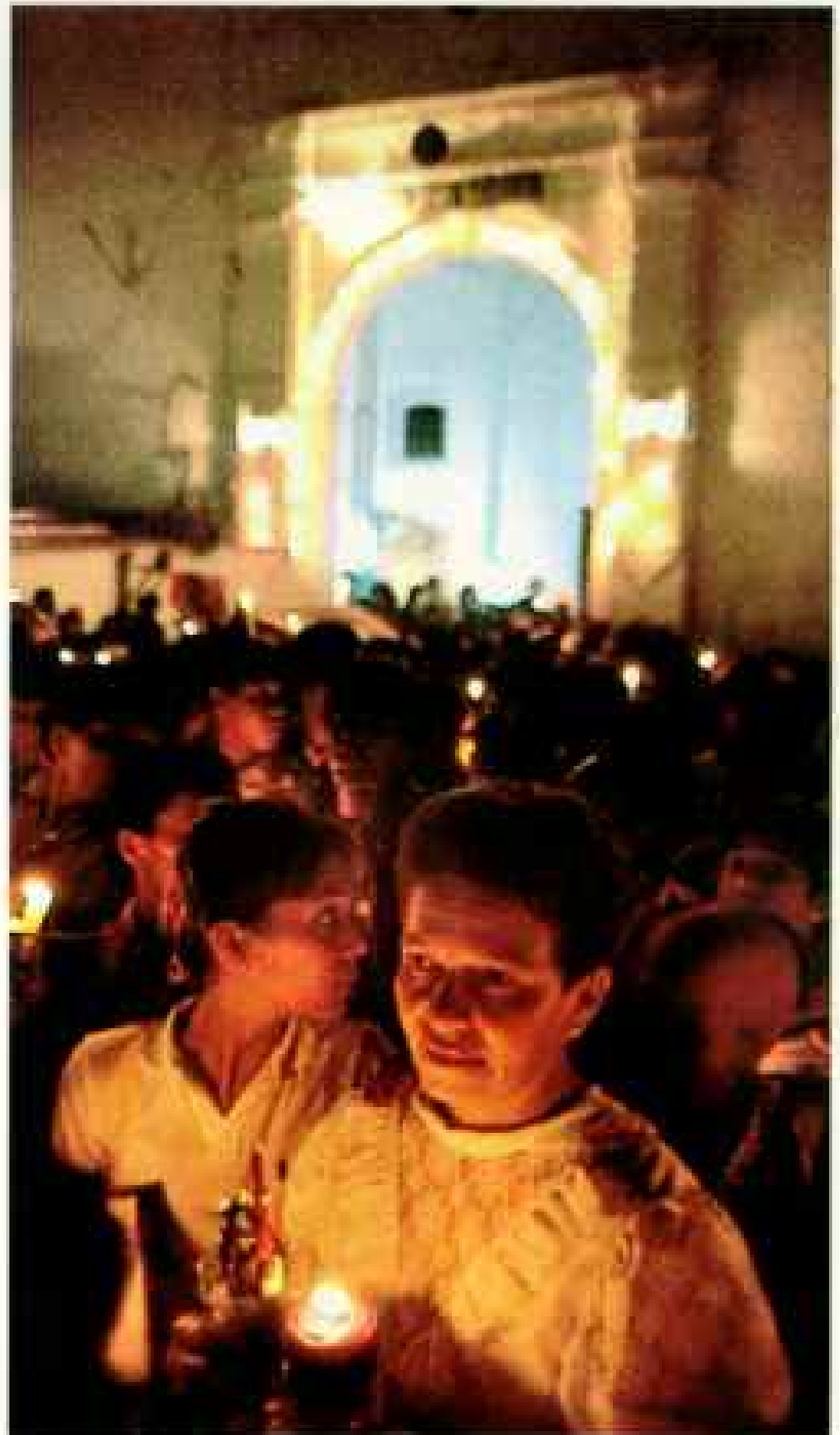
**W**HAT TO DO about this kind of destructive, haphazard penetration? Jorge and CONAMA want to educate farmers with programs in land management—crop rotation, for instance. But the campesino will be slow to change old farming practices.

The vitally important Panama Canal is boosting the nation’s environmental awareness. Field hydrologist Frank Robinson pulled out a map and pointed to the areas colored green around Gatun Lake, main reservoir of the canal. They represent virgin forest, “but it’s 70 percent deforested now.”

But this is not the major worry, he told me, indicating the watershed to the northeast. “*This* is what we’re deathly afraid of.” If farmers move there and chop down the

forest cover, heavy Caribbean rains could wash enough sediment into Alajuela Lake to threaten drinking water and hydroelectric power. With limited authority, Frank and his colleagues monitor and advise. “Sometimes I feel like a one-legged man trying to climb a mountain,” he said. Now more alert to the potential danger, the government has curtailed farming in this area and hopes to limit similar practices in the Darién. “I’ve done more environmental work in the past year or so than ever before,” says Robinson.

And so are Cuna Indians in the Comarca



*Pilgrims to Portobelo, the “beautiful port” named by Christopher Columbus in 1502, rest (facing page) before the nightlong feast of the Black Christ (above). Each year believers from all over Panama converge on the historic Caribbean town, once the greatest trade center of the New World, to honor a wooden icon credited with shielding the town from cholera epidemics.*





*Jungle bastion against the spread of hoof-and-mouth disease, the Darién Gap beyond Yaviza (right) marks the only break in the Pan American Highway from Alaska to Tierra del Fuego. Deforestation (top) has eroded Panama's tree cover to 37 percent. At Fort Sherman, U. S. troops befriend a sloth (above) while learning jungle warfare.*

de San Blas, thick forest extending from Colombia toward Colón on the Caribbean Sea. *Colonos*—settlers—are nibbling at the edges of the Comarca. "Yes, we know they want this land, but it's given to us," a Cuna youth in Nusagandi told me. He meant given by the Great Father and Mother, the Cuna Creators. The government, too, recognizes the Comarca as Cuna territory.

A Cuna agricultural colony was initially established here to stem the flow of new settlers into the Comarca. Now, with international assistance, Nusagandi will be the center of a 50,000-acre Cuna-run forest park and wildlife preserve. Cuna Indians are being trained as rangers and hope to develop "scientific tourism," with nature paths and observation sites in the forest.

Cunas live on about 50 of the more than 300 San Blas Islands, but they grow food in the coastal forest because there is not enough room on the islands. They believe the forest harbors spirits who are dangerous when disturbed. And Cuna medicine men gather curing herbs from the forest. To the Cunas, its disappearance would be disastrous.

Relative isolation on the islands and a strong internal cohesiveness have protected the Cunas so far. They straddle two worlds: theirs and Panama. About 8,000 of the some 40,000 Cunas work elsewhere in the country, sending money and goods back to the islands. Cunas vote but do not pay taxes. Panama's vice minister of government and justice is Cuna, as are two legislators.

With greater force today, the outside





world—Panama—impinges on the Cuna way of life. I found myself wondering, at what point is the pressure for complete integration irresistible?

The province of Bocas del Toro, at the other end of the Caribbean coast, is eager for greater integration. Its governor, Samuel Binns, explains: "We have little industry. We need roads, more markets. We need more attention and help from the central government."

It is larger and more settled than the Comarca, but in some respects more obscure and isolated. It too is a frontier that is opening up.

From the interior city of David, I drove across the continental divide through a forested emerald landscape, a Panama hardly

touched yet by man. Oil paved the route I traveled. A new pipeline channels Alaskan crude from Charco Azul Bay on the Pacific coast to Chiriquí Grande in Bocas. Until the pipeline was opened in 1982, accompanied by a new road, Bocas was cut off from the rest of Panama except by air, or by boat to the scores of coral islands strewn throughout 300 square miles of protected bay.

Before the pipeline, banana plantations run by the United Fruit Company (now United Brands) dominated the mainland economy. Bananas still carpet much of the northwest with green, but it was the islands that drew me. Christopher Columbus sheltered among them in 1502 to reprovision his ships. Despite this link with Spain, the main island  
*(Continued on page 485)*





*Latter-day Balboas, Rovers and Explorer Scouts navigate one of the Miraflores Locks (above) during their annual ocean-to-ocean race. A tight squeeze for many customers, the canal's three sets of locks are too small for a growing number of ships. Talk of a new, sea-level canal is giving way to plans to widen the present one. Thanks to the 1977 treaties, top canal jobs are changing hands. Shepherding ships through the waterway, tugboat apprentice Vielka Domínguez (top right) hopes one day to earn a captain's stripes, with a salary potential of \$45,000. Director of maritime affairs Hugo Torrijos (right) displays documents for some of the 12,500 ships that now fly Panama's flag—a source of more than 40 million dollars a year for national coffers.*





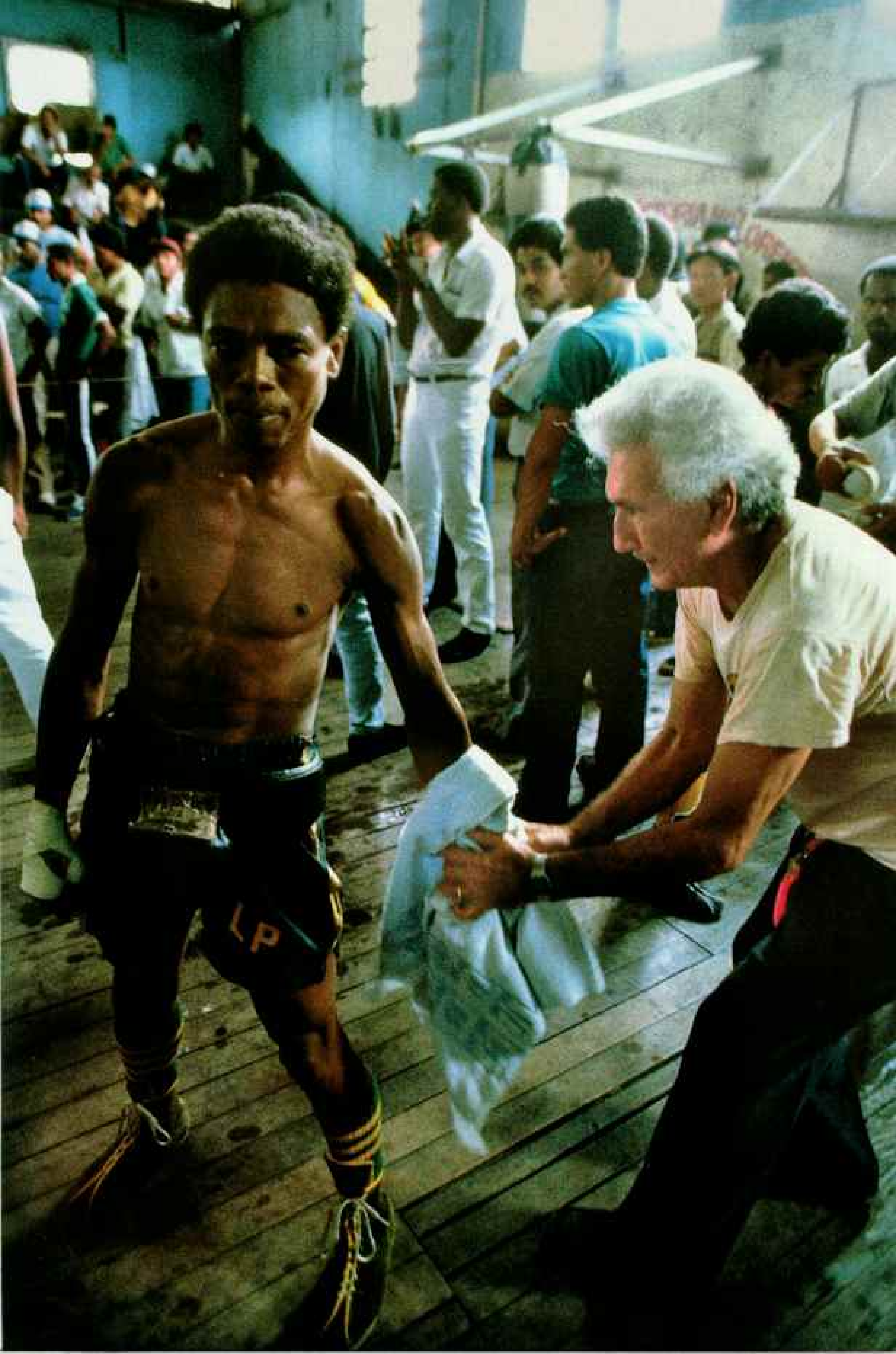
*More than a hundred banks, along with hotels and condominiums, bristle on Panama City's fast-growing skyline. With bank-secrecy laws more stringent than*





*Switzerland's and suspected infusions of illicit drug money, the country—which uses U. S. paper currency—has become Latin America's busiest banking center.*





settlements—Bastimentos and Bocas del Toro itself—are distinctly and unexpectedly West Indian. I heard Caribbean patois more often than Spanish and felt as if Jamaica or Barbados had magically been plopped down off the coast of Panama.

These island settlements have an old-fashioned aura. Perhaps it is the turn-of-the-century frame houses that line the streets, or the somewhat prim manner of the people. I talked with some of the older citizens.

Early in this century Panama, encouraged by the United States, broke free of Colombia. Three years of conflict, the “war of a thousand days,” preceded independence. In Bastimentos, 93-year-old Herbert Rose recalled: “The conservative general over in Bocas, he say, ‘Surrender.’ The liberal one here say, ‘I’ll be there drinking coffee at eight in the morning.’ He was, for sure. The river turned red with blood from the fighting.”

Smaller and poorer now than when it was the banana capital, Bocas del Toro is still one of the most unspoiled, captivating places in Panama. Uncrowded beaches of

white sand lined with palms caress any care away. Before I left, Domingo Brown remarked one evening as we talked near a pier lit by a golden sunset: “People from cities like yours say this is a paradise. We don’t appreciate what we have here.”

**E**XAMINING the potential for tourism, exploring areas of economic growth, Panama is seeking a design for the future. Its infrastructure is one of the most developed in Latin America. This is largely because of the Panama Canal. Two busy ports have grown up with the canal: Balboa on the Pacific and Cristóbal on the Atlantic. Panama is planning to spend more than 70 million dollars in port improvements. The Colón Free Zone handles almost half a million tons of cargo worth more than two billion dollars annually.

But uncertainties will increasingly test this small country. Panama’s foreign debt, four billion dollars, is one of the highest per capita in the world. The unemployment rate is about 14 percent and climbing.



*Packing a mean punch in the boxing world, Panama has produced 14 world champions, most of them products of the Marañón gym in Panama City (left). Last August seven assembled for a ceremonial dinner (left to right): featherweights Ernesto Marcel (1972-74) and Rafael Ortega (1977), junior flyweight Jaime Ríos (1975), lightweights Ismael Laguna (1965 and 1970) and Alfonso López (1976), light flyweight Hilario Zapata (1980-82, 1983), and junior welterweight Alfonso Frazer (1971).*

The military government of the late Gen. Omar Torrijos Herrera steered resources and services to neglected rural areas. But at a cost. Wages got higher. Taxes and prices got higher. Said Alberto Navarro, past director of the Panama Investment Council: "We are an expensive country now."

"Yes, we have to make changes," businessman Fernando Núñez told me, "but the effort raises complex cultural, political, and economic dilemmas."

Former president Ardito Barletta, who holds a Ph.D. in economics from the University of Chicago, attempted to stimulate the economy and push a series of belt-tightening measures through the legislature. His efforts triggered protests, political turmoil, and ultimately compromise.

"He applied a basic textbook solution to the problem but forgot one basic: politics," coffee grower Pablo Durán told me. "To freeze government salaries, that's a no-no," he added, shaking his head.

For his part, when I spoke to him last May, Dr. Ardito Barletta said, "We are starting the democratic process, and that requires a great deal of accommodation. It's very easy for the democratic process to demonstrate a lot of heat and not enough light."

Ardito Barletta was soon at odds with Gen. Manuel Noriega, the head of Panama's most important political power: the military. In August the general was quoted as saying: "Economic intellectuals should give true solutions, not keep their heads buried in books from Harvard or Chicago." In September Ardito Barletta was summoned from a United Nations meeting by General Noriega and forced to resign.

Dr. Ardito Barletta might have lasted longer were it not for a murder, startling in its brutality, which brought into focus public discontent with the military.

On September 14 the decapitated and mutilated body of Dr. Hugo Spadafora, a prominent Panamanian who had been accusing the army of corruption, was found just across the Costa Rican border. The manner of his death sent shock waves throughout Panama, a nation not known for violence. Many believed that he was killed in Panama by army personnel.

Ardito Barletta seemed to embrace public calls for an independent investigation into

the killing, but—more important—the murder caused an uproar in the army itself, triggering an attempted barracks coup against Noriega. The attempt failed, but part of the price of reconciliation among the various army factions was Ardito Barletta's ouster.

Eric Arturo Delvalle, Panama's new president, was first vice president in Dr. Ardito Barletta's government. He attributes Ardito Barletta's removal to his political ineptitude: "We had a World Bank vice president, not a president of Panama."

There is little substantive difference in the views of Mr. Delvalle and Dr. Ardito Barletta about Panama's problems—debt, unemployment, bloated bureaucracy, high labor costs. But the new president intends to go more slowly, paying more attention to political realities: "We have to make people grow into change." Citing Panama's debt burden, he argued, "We want to pay it; we will pay it, but we can't pay it if we have to sacrifice all social development under orders from the International Monetary Fund. We will have an uprising here."

Meanwhile, the military remains the axis around which real power turns in Panama. Can President Delvalle or any civilian leader last if he takes a step that offends that power? Yes, says Mr. Delvalle. "Our Defense Forces are collaborating in the return to civilian government." But as General Noriega told a Spanish newspaper reporter late last year: "We were trying to leap into a full democracy, but that leap was not in our dictionary of national realities."

How full a democracy is a question with which Panama will be wrestling for years. Most Panamanians I talked with believe the military will always be a significant political force, and that the challenge is to design effective checks and balances on its power.

**T**HE YEARS between now and the end of the century are of critical importance to the economic lifeline of Panama: the Panama Canal. At the end of 1999 the canal will be fully in the hands of Panama. This new responsibility confronts Panama with some of its most difficult choices.

Not until I walked on its dry floor when one of the Gatun Locks was emptied for overhaul did I get a true sense of the canal.





*No one is safe when the water trucks enter the streets of Perionomé to kick off four days of Carnival with a thorough dousing of all participants. Anticipating the end of the dry season, the pre-Lenten event is celebrated throughout Panama.*

With senior lockmaster John Rowe I entered cavernous culverts, 18 feet in diameter, through which water from Gatun Lake flows to fill the great locks. The lock chambers are 1,000 feet long, 110 feet wide, and from 80 to 82 feet high. When I asked senior controller Gary Smith how close ships come to the walls, he pointed. "Look at the paint streaks," he said.

The 1977 treaties that defined the process of turning the canal over to Panama were a blow to the pride of many "Zonians"—some 15,600 U. S. citizens living and working in the Canal Zone. To them its monumental engineering and efficient operation is a metaphor for American problem solving.

But Panamanians share much of the pride

in the canal; their grandparents helped build it too. American control of the canal itself was not the most troublesome issue for them, but American *sovereignty* "in perpetuity" insulted national pride. "Imagine," a Panamanian told me, "that for five miles on either side of the Mississippi River, Panama was sovereign. You could be stopped by Panamanian traffic cops, tried in Panamanian courts under Panamanian law. You wouldn't stand for it; neither could we!"

Under the new treaties the Panama Canal Company has been replaced by a commission with a board of directors made up of five Americans and four Panamanians. The board is headed by an American administrator with a Panamanian deputy.

In 1990 this reverses, and a Panamanian gains the top post. Today 80 percent of canal employees are Panamanian; some 640 have gone through apprenticeship programs aimed at increasing the skilled work force, and several hundred more are enrolled. More than half a billion dollars has been spent modernizing and maintaining the waterway since the signing of the treaties.

Nevertheless, says Fernando Manfredo, Jr., the commission's Panamanian deputy administrator, there is a great deal of planning yet to be done. "When the treaties were signed," he told me, "everybody was tired from years of negotiation and said, 'Well, it's all over now.' I said, 'My God, negotiations are just beginning! Instead of rights of Panama, we now have to start thinking of responsibility of Panama.'"

**N**O DECISION has been made as to whether Canal Zone land returned to Panama will be available for sale or lease. "There is concern that the wealthy would buy all this land," Manfredo said, "and instead of the No Trespassing signs of the Americans, there would be Beware of Dog signs of Panamanians."

Other questions center on the future economic viability of the canal. U. S. legislation mandates tolls just high enough to cover improvements, maintenance, and operations. But when Panama takes full control, many experts think tolls will go up. Will higher costs drive shippers away? Congestion is also a potential problem. Increasingly, hazardous cargoes pass through the canal; some pilots fear a catastrophe. A new, sea-level canal has been discussed, but a widening of the present canal is more likely.

While the canal's monopoly over inter-oceanic traffic has eroded somewhat, Panama's economy is, in turn, far less dependent on the canal than it once was. In recent years the country has become the banking center for Latin America; 122 international banks with assets of 37 billion dollars have located in Panama City.

The result: a new kind of Panama Canal, channeling dollar traffic as the older one channels international shipping. Essentially, electronic transfers have replaced the mule trails of the Spaniards. Old and new are never very far from each other here.



*Their bottom line agreed upon, Cuna Indians at Río Tigre prepare to market their major cash crop with coconut buyers from Colombia, whose peso has dropped in value, hurting prices.*

*On Mulatupu Island attendance by an adult male from each Cuna family is mandatory at the nightly meeting (right), "chaired" from hammocks by town elders. Known for their business and political acumen, most of the 40,000 members of the tribe live offshore on the San Blas Islands. Farming in clearings in the mainland rain forest and fishing provide their major livelihood.*







*To soothe troubling spirits, cacao bean smoke is prepared for a pregnant Cuna woman, while an ikarwisit, or chanter—unseen except for his hand—sings incantations from the adjoining hammock. A similar ritual is depicted on a mola (top right), one of the Cunas' traditional appliquéd panels.*

*Cunas employ a concoction of potentially lethal pinkroot (bottom right) to purge someone accused of unwittingly sending his spirit to attack another in a dream. In rare instances this treatment ends in death.*

I constantly found old and new dissolving into one another. I walked the streets of Casco Viejo, the Panama City built by the Spaniards after the original was destroyed during Morgan's raid. Aging buildings with wrought-iron balconies overlook narrow streets that seem to lead to the 17th century. Instead they led me to the presidential palace, where mostly U. S.-educated planners look toward Panama's 21st century.

Rumbling from the unceasing flow of traffic, clinking until the wee hours of the morning with the sound of slot machines in always full casinos, giving come-hither neon winks to anyone with money to buy goods,



Panama City is fast-paced and exuberant.

Just a few steps away from the public market full of produce from the interior, there is a gymnasium full of dreams. Here boxer Roberto Durán took his first steps toward international fame, and today scores of young men swing and sweat, hoping to join the list of more than a dozen world-class Panamanian boxing champions.

Panamanians spar just as vigorously with words: In Plaza Santa Ana I listened to the public expression of opinions as fiercely felt and freely stated as any in London's Hyde Park. From a thunderous denunciation of corrupting foreign influences, I rounded the

corner to cacophonous Avenida Central, where merchants offered the wares of the world—always cheaper than the vendor next door—in the finest Panamanian tradition of hustling entrepreneurship.

**A** NEWER CITY emerges where Avenida Central becomes Vía España. It is a city of glass-and-concrete bank buildings, high-rise condominiums and apartments, posh hotels and shops. Yet even here, where the Marriott hotel sits elegantly near the Pacific shore, fishermen still fling their nets—*atarrazas*—from boats, hoping for a good day's

catch in the increasingly polluted water.

The transit zone is the fastest growing part of Panama. Some projections suggest that three-quarters of the population will be concentrated here by the year 2000. According to architect and former government minister Jorge Riba, 15 percent of the transit-zone population is composed of squatters. As a result, there is increasing pressure on infrastructure and social services. Yet Riba allows himself some "skeptical optimism." Perhaps the transit zone can become a kind of social laboratory. As he put it: "What we have not been able to do with the rest of the country, we can do here and send a message throughout the country."

In Panama City's San Miguelito neighborhood I visited a "learn, work, and earn" project that hinted at part of the solution. With the assistance of the Institute for the Formation and Training of Human Resources and the Overseas Education Fund, women here—many of them single parents—organized small home businesses. They make automobile seat covers, sell baked goods, produce clothing. They were trained in specific skills, such as woodworking. They learned budgeting and marketing and were encouraged to raise their often low self-esteem.

One woman named Norma Catón, trained three years ago, received a loan of \$875; since then she has repaid the loan, put her oldest daughter through secretarial school, and clears about \$350 a month from her baking business. Most of the women entrepreneurs in the program average about \$75 a month; not a lot, but more than they earned before.

And freedom of expression has not been buried by military power. On the anniversary of Panama's independence from Colombia, I stood on the balcony of the presidential palace as scores of high-school bands paraded by. Several, on reaching the palace, turned their backs on President Delvalle in solemn protest of the Spadafora murder. A few placards called for an investigation.

"Students," the officer next to me shrugged.

Small changes. Partial solutions. Limited gains. In the shadows of the skyscrapers that house Panama's 20th-century conquistadores, this is the pace of change in Panama. If the future is a tapestry yet to be woven, its strands and colors are wound on the spools of Panama's energetic everyday life.

**T**HUS EVEN NOW I linger over the memory of my visit with Teodoro de Jesús Villarrué, known to all as "Yoyo." He is a bus painter. Buses in Panama stitch together the rich fabric of neighborhoods, cities, and towns. They are moving rainbows, rollicking with music and rhythm. Chrome-plated exhaust pipes issue a throaty roar integrating with blaring salsa and calypso music.

Elaborate murals decorate the vehicles' rear doors, and the artists like Yoyo who paint them are well known. Much of Yoyo's work borrows from science fiction: eerie moonscapes or futuristically clad women challenging space demons.

Beneath the mango trees in his yard, Yoyo was engaged in his bread-and-butter work of lettering taxicabs when I arrived. "Ay Yoyo! You look just like the Pope. A shade darker perhaps," the waiting cabbies teased when he showed them a portrait of Pope John Paul II he had painted. "We should put you in a gown." A neighbor's son shyly approached and said his mother had sent him to find out what paint to use for her house. "You're too short, Yoyo," another cabbie teased, suggesting that another painter was better. "Perhaps we should put you on a ladder."

And so it went all morning, Panamanians enjoying each other, which is really an essential truth about the character of this tiny new-old nation. I asked Yoyo about the science-fiction motif in his paintings. His response, apt enough for a Panama that in many respects is still searching for gold: "The glitter of the future is an important element." □

*Social security for her parents, a young Cuna prepares for her puberty rites by having her body painted with berry juice, which darkens her skin. Following seclusion during four days of feasting, dancing, and drinking, she will be eligible for marriage—which will mean an extra pair of hands for the young woman's household.*









**PORTAL TO A WORLD rarely visited by man leads through sea ice to the depths of Antarctica's McMurdo Sound. Isolated from the rest of the world's oceans by cold currents, the waters around the southernmost continent are among the most productive on earth.**



# UNDER ANTARCTIC ICE

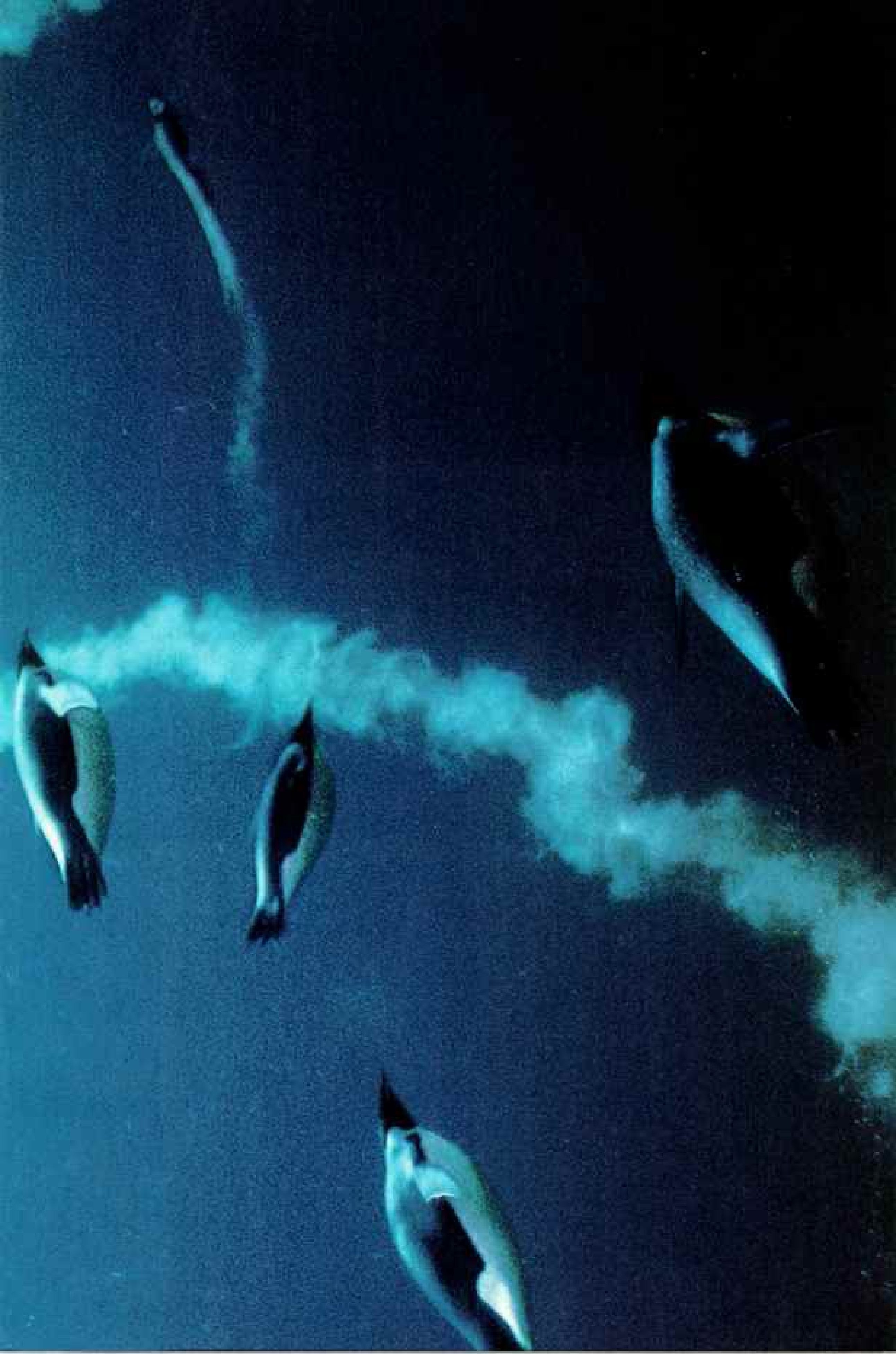
*Undersea aviators, emperor penguins fly beneath the ice in a never ending hunt for squid. Contrails of air bubbles escape from their feathers when the birds accelerate. Shallow and nutrient rich, the waters of McMurdo Sound spread an abundant feast.*

TEXT AND PHOTOGRAPHS BY BILL CURTSINGER

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**I**T IS AS COLD as I remember from my last dive here, 16 years ago when I explored beneath the ice of McMurdo Sound as a U. S. Navy photographer. Now, as then, the seawater temperature hovers near 28°F. Enveloped in the new technology of an insulated dry suit, I am chilly but comparatively warm, much warmer than in the wet suit of years ago. As my eyes adjust to the dim, ice-filtered light, I see the rock-strewn seafloor. Farther out in deeper water, a mat of sponges covers the floor. The water below me sparkles with drifting planktonic creatures, yet lateral visibility is fully 600 feet, the best I have seen in any waters. This is the remembered beauty that has lured me back after years of diving in many oceans.

I am a hundred yards from shore on the sound's east side with Dr. Paul Dayton, a marine biologist with the Scripps Institution of Oceanography, who has been studying the bottom of McMurdo Sound off and on since 1967 under the auspices of the National Science Foundation. My companion when I dived here before, he has invited me to join him again on his investigation of the thriving life of the sponge mats.

Years of exposure have not diminished Paul's enthusiasm for ducking beneath the ice of McMurdo Sound. For a marine scientist the Antarctic provides a unique laboratory. Unlike the continental shelves underlying Arctic waters, the Antarctic

side of McMurdo is as populous as that of any coral reef I have seen. Yet in the western sound, where less fertile currents sweep out from beneath the Ross Ice Shelf, brittle stars creep slowly across a soft, flat, largely barren seabed. Here and there lie scallops and pencil urchins. It has an otherworldly look, a deep-sea look.

Most of our diving was done near shore from a heated hut placed over a hole blasted through the ice. We also made several dives around the sound away from the comfort

of the big U. S. base at McMurdo. Ferried in by U. S. Navy helicopters, we camped on the sea ice and slept in insulated tents. The diving was rugged. I remember being cold for most of those dives even before I entered the water.

In spite of the cold, these were some of the most fascinating dives I have ever made. The beauty of this unlikely setting is sharpened by the sense of finding myself where few have gone before, and that makes this a special place to me.





shelf is unconnected to any other, surrounded by a moat of deep ocean. Frigid circumpolar currents form a thermal barrier, killing most temperate-water life that might drift in. For some 40 million years the biological system of the Antarctic shelf has remained isolated—as isolated as that of the deep-sea floor. But here, in McMurdo, it lies within reach of a scuba diver.

The ice overhead is six feet thick, and I find myself keeping track of the hole through which we entered. Drifting to the bottom, I see a vast array of invertebrate life. Where the floor slopes below 100 feet, sponges are everywhere. Some are round, others resemble fans, stag horns, bushes, and volcanoes. One species of volcano sponge is large enough for a diver to climb into its cone. The mat itself is a carpet of the skeletal remains of sponges nourished over countless years by plankton in the nutrient-rich currents from the open sea.

At dive's end we clamber into a heated hut and shout questions about all we have seen. "Paul, did you see that patch of bottom lifted up by anchor ice?" Paul has been teaching me about anchor ice, which forms on the seafloor in water shallower than 100 feet, then tears free and floats upward, carrying sponges, bottom creatures, and even fish trapped or frozen within. "We first noticed it years ago," he says. "It's what accounts for the seeming barrenness close to shore."

The sponge-mat community on the east



**Home on the ice** for a week of diving on the west side of the sound, double-layered tents (top) sheltered us from the high winds. Our team kept close contact with McMurdo Station across the sound, helicopter staging area for such forays and base for much of our stay.

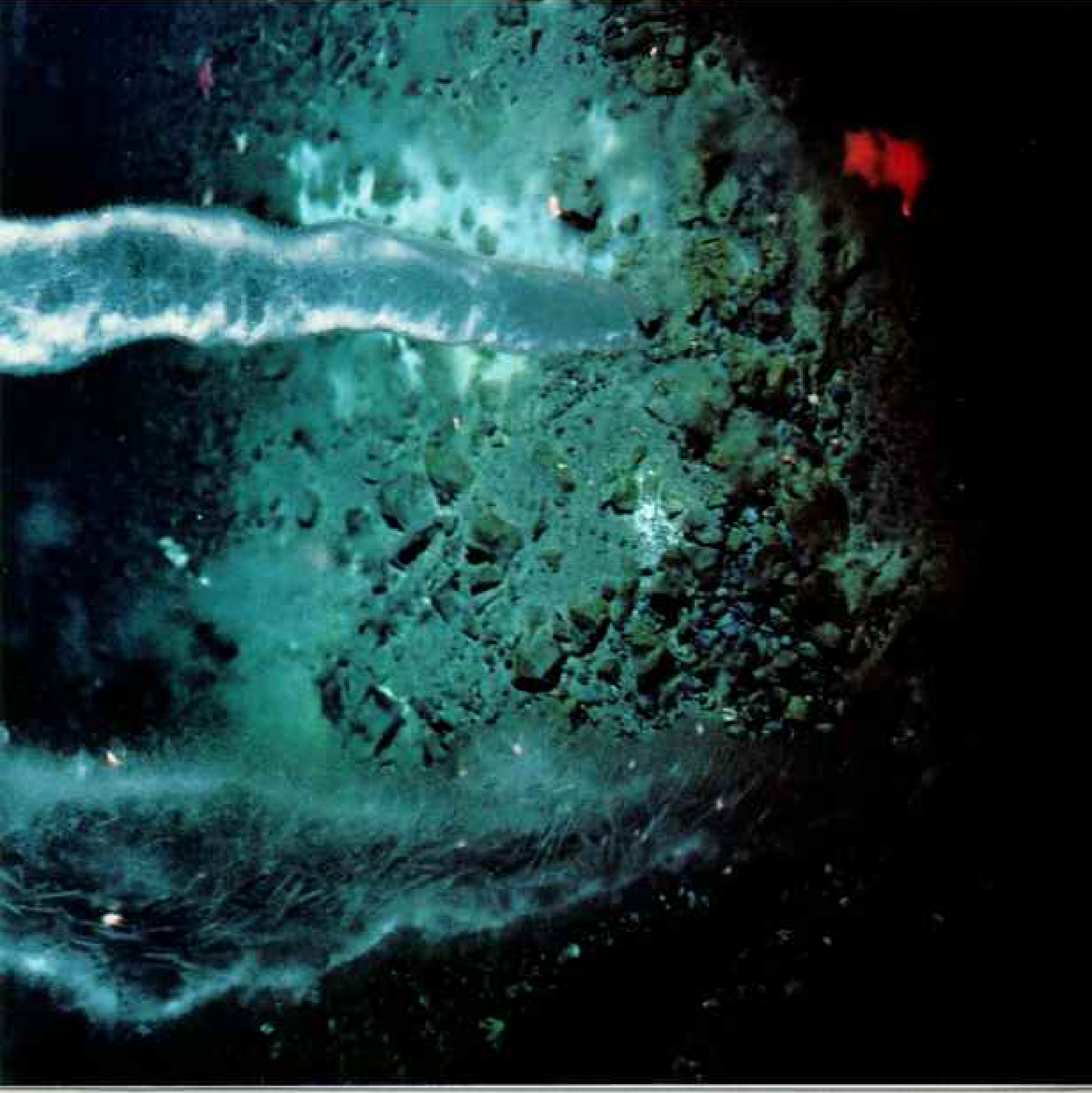
*I visited in the Antarctic spring, October and November, before blooms of phytoplankton cloud the water. My biologist companions documented and experimented with bottom life. Wearing a sash of extra flashbulbs, Scripps Institution's Jim Barry installed sponges in trays (left) and will return to measure the growth rate.*



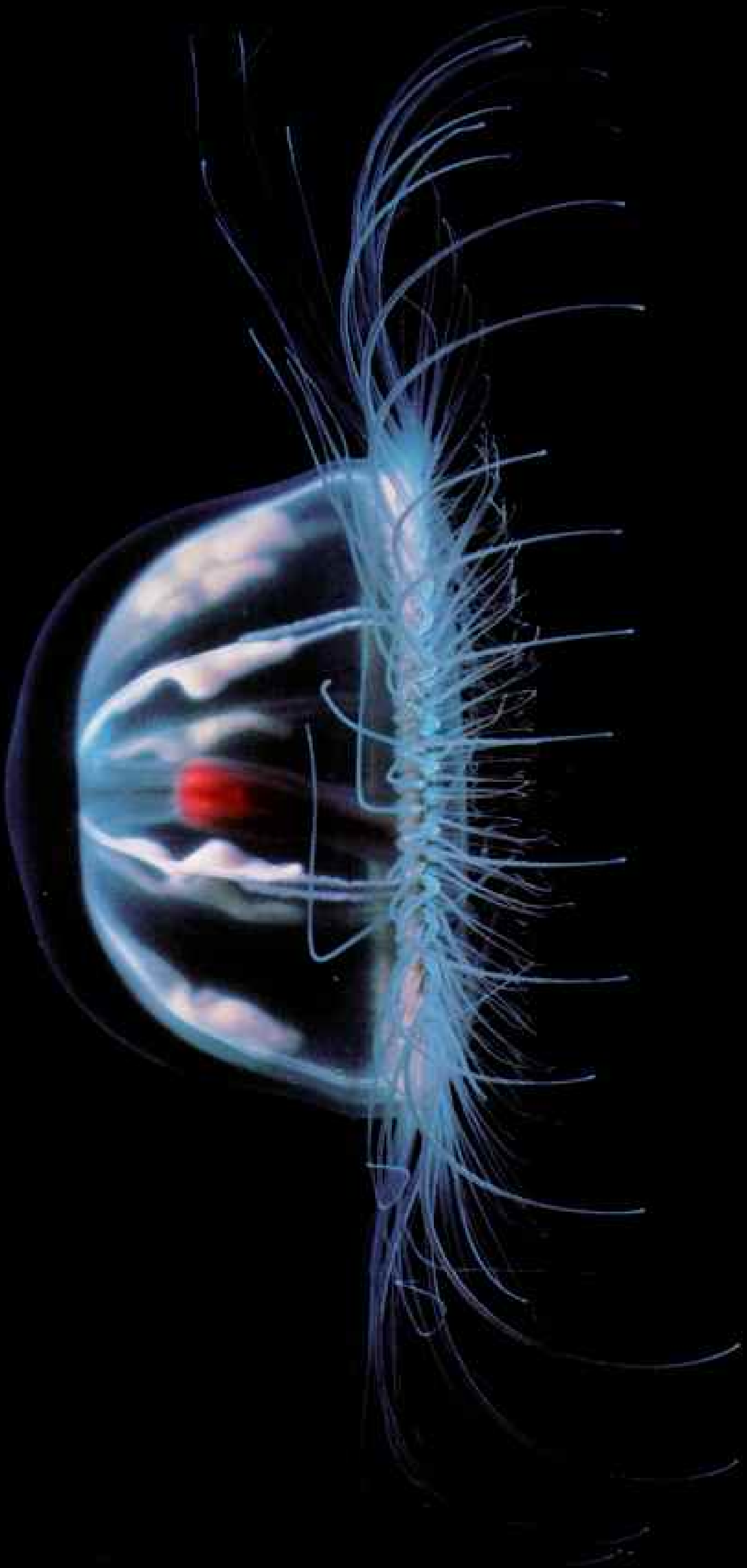
# Ice beneath ice

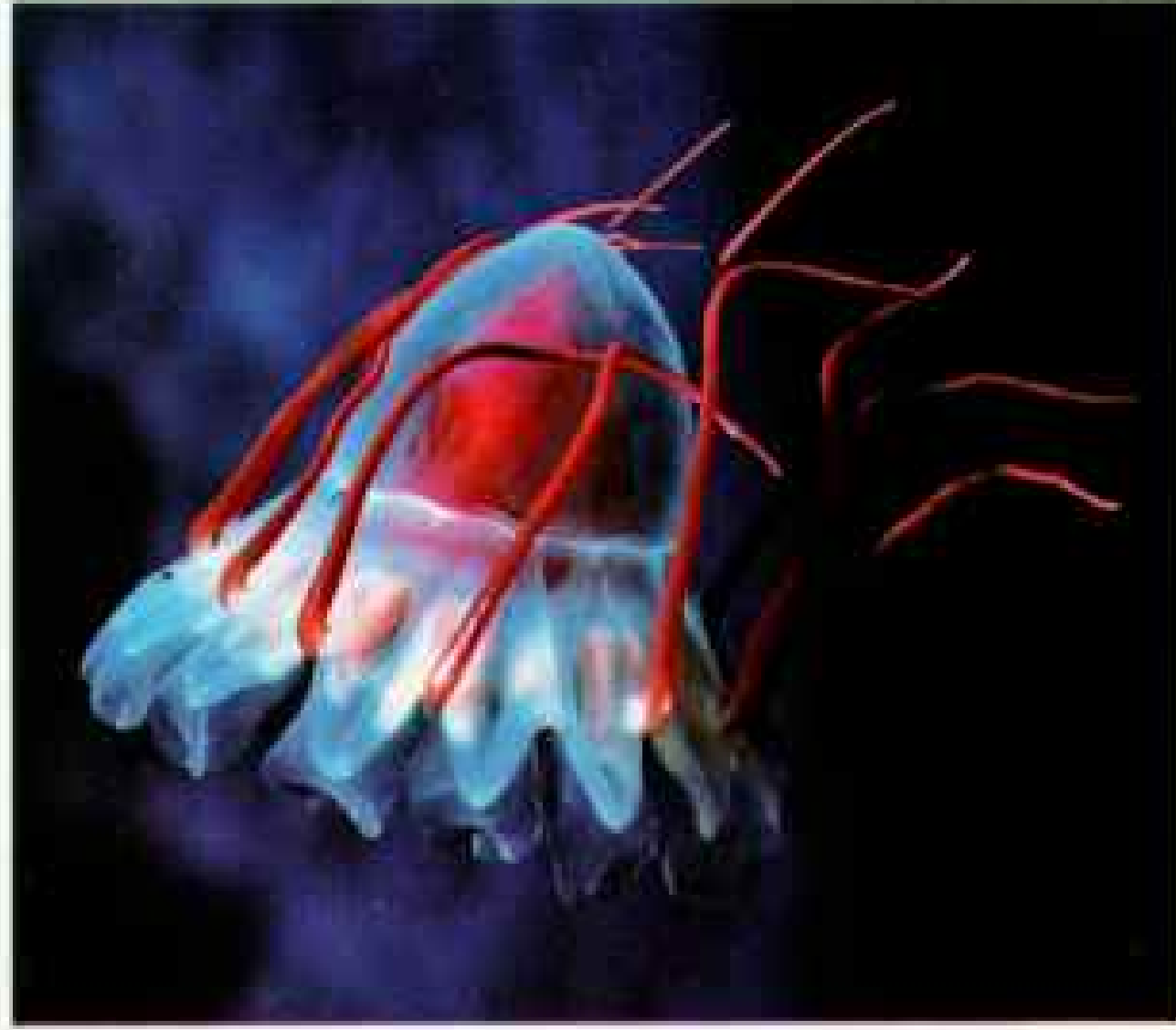
**S**PIRES OF ICE seven to ten feet long lead from the frozen surface of McMurdo Sound to the bottom (left). Close to shore we saw many stalactites. Super-chilled, concentrated brine from the surface trickles through cracks and freezes seawater that touches it, making hollow columns.

Another inshore phenomenon, anchor ice grows thickest and most frequently in the shallowest water. Starfish, fish, and other mobile bottom dwellers are often entrapped in fast-growing anchor ice (below). Eventually the ice's buoyancy lifts chunks from the floor to float against the solid ice sheet at the sound's surface (above), carrying along a cargo of bottom life and leaving a zone devoid of growth. In summer the ice breaks away and moves out to sea, where it eventually thaws. Creatures such as starfish and sea spiders have survived after weeks in anchor ice.





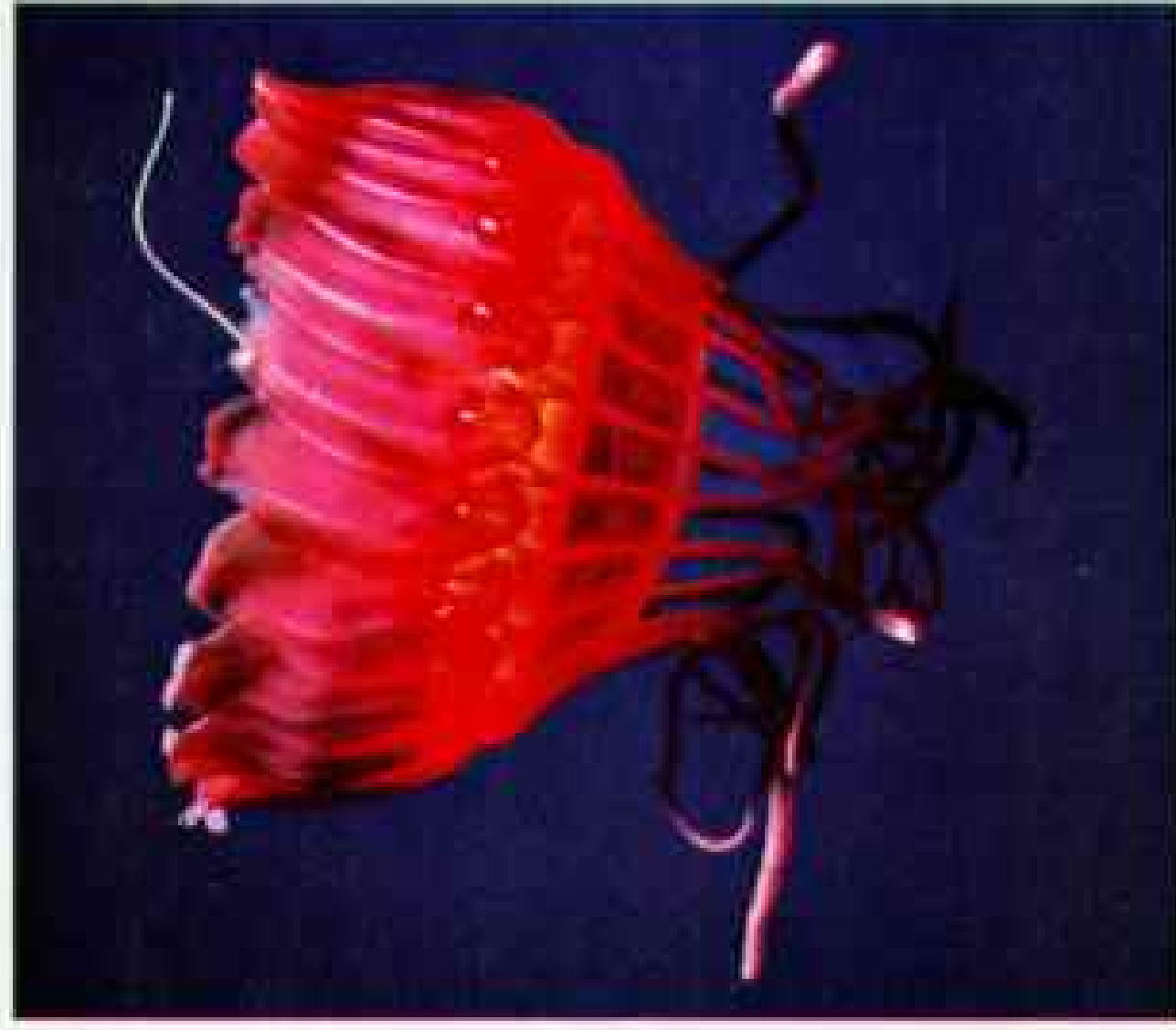




PHOTOGRAPH BY JEFFREY M. HARRIS. COURTESY OF THE U.S. NAVY

## Beautiful drifters

**S**ENIOR PREDATORS in the drifting menagerie of McMurdo Sound's planktonic life, large jellyfish feed on a wide variety of creatures borne on under-ice currents. A many-tentacled, one-inch *Arctapodema* (top) appeared as an awesome raider of the deep in the light of my lamp, its white



reproductive organs and red stomach glowing within a translucent bell.

A ctenophore (left), little more than a stomach with a mouth, winked rainbow lights at me from rippling cilia on its edges. Helmet jellyfish (far left) were common, a pelagic species swept near shore by the currents that invade the sound from the open ocean. Another open-ocean visitor I found as mysterious as it is beautiful—the rarely seen six-inch *Atolla wyvillei* (above).

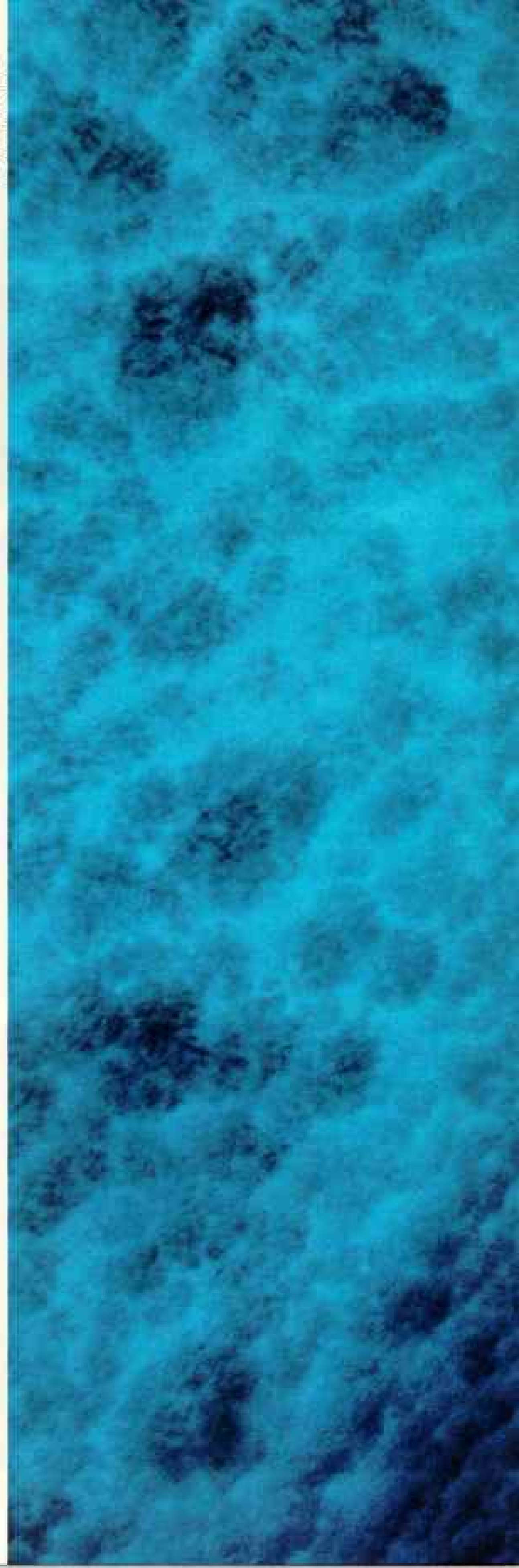
# Riders for life

**I**NNER-SPACE HITCHHIKERS in a galaxy of underwater life, hyperiid amphipods perch aboard a

*Desmoneima gaudichaudi* jellyfish (right), riding in holes they have chewed in its tissue. I have seen *Desmoneima* as large as three feet in diameter (below) freckled with a cargo of amphipods. These crustaceans, shown at right just smaller than life-size, often eat their host when their

main food—scraps from the jellyfish's own meals—becomes scarce.

Making a nursery of their host, the amphipods raise their young on board until they reach the swimming stage of their development, when they are able to depart in search of a new host. I have observed this apparently one-sided type of relationship between jellyfish and amphipods in tropical and polar waters.







**DEEP-SEA DIVERS, Weddell seals fish to depths of more than 1,500 feet and remain submerged for about an hour. Reaming a hole through sea ice with their teeth, Weddells maintain breathing holes in an otherwise fast-frozen realm. At Turtle Rock a Weddell pauses below a cubist display of ice.**







SCORPASTER VALLISII (RIGHT), STYLLONELLA BOGAL (LEFT) (BOTTOM LEFT),  
CHALIPIDOPSIS SPA, 8 IN 8 IN (BELOW)

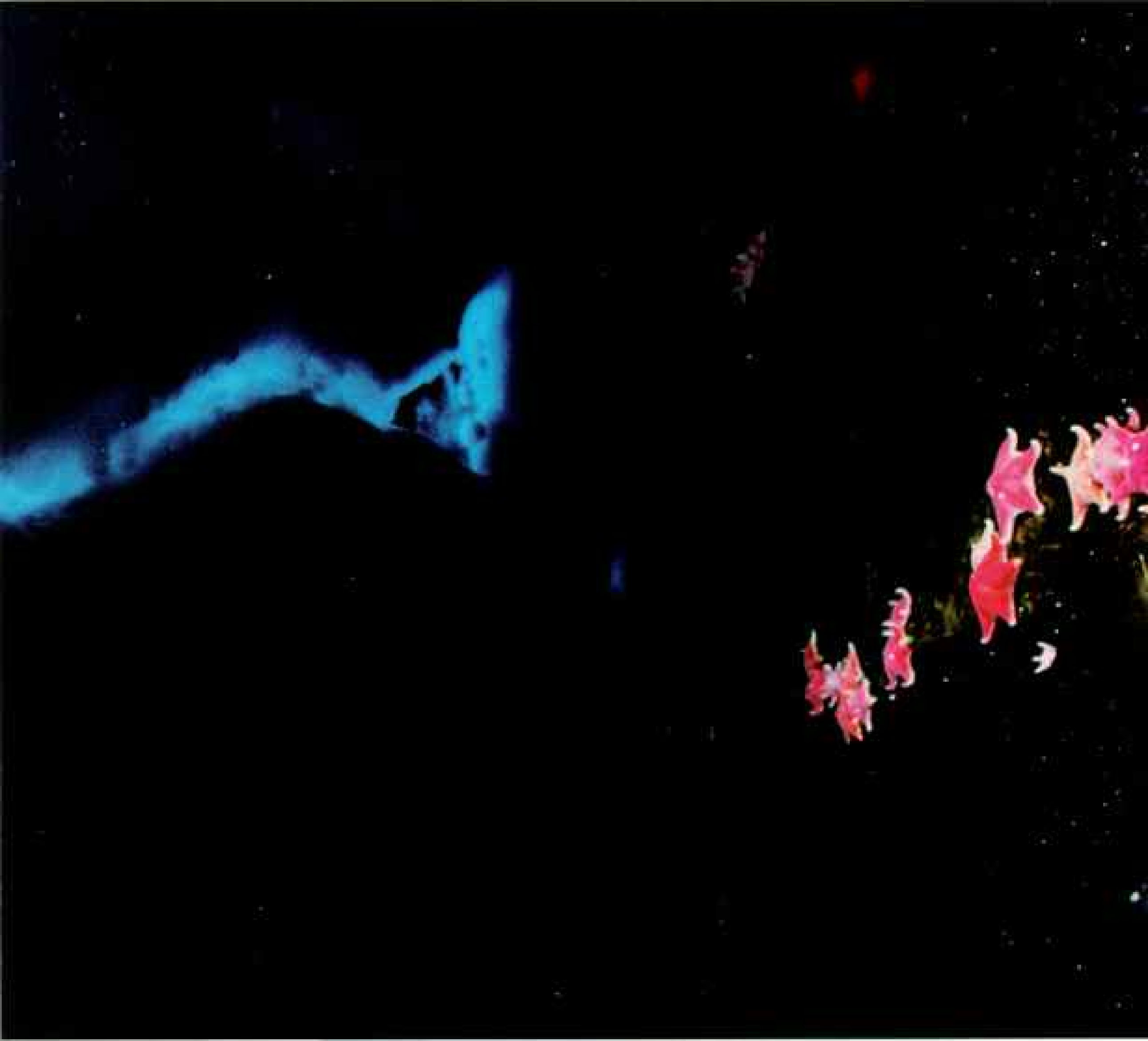


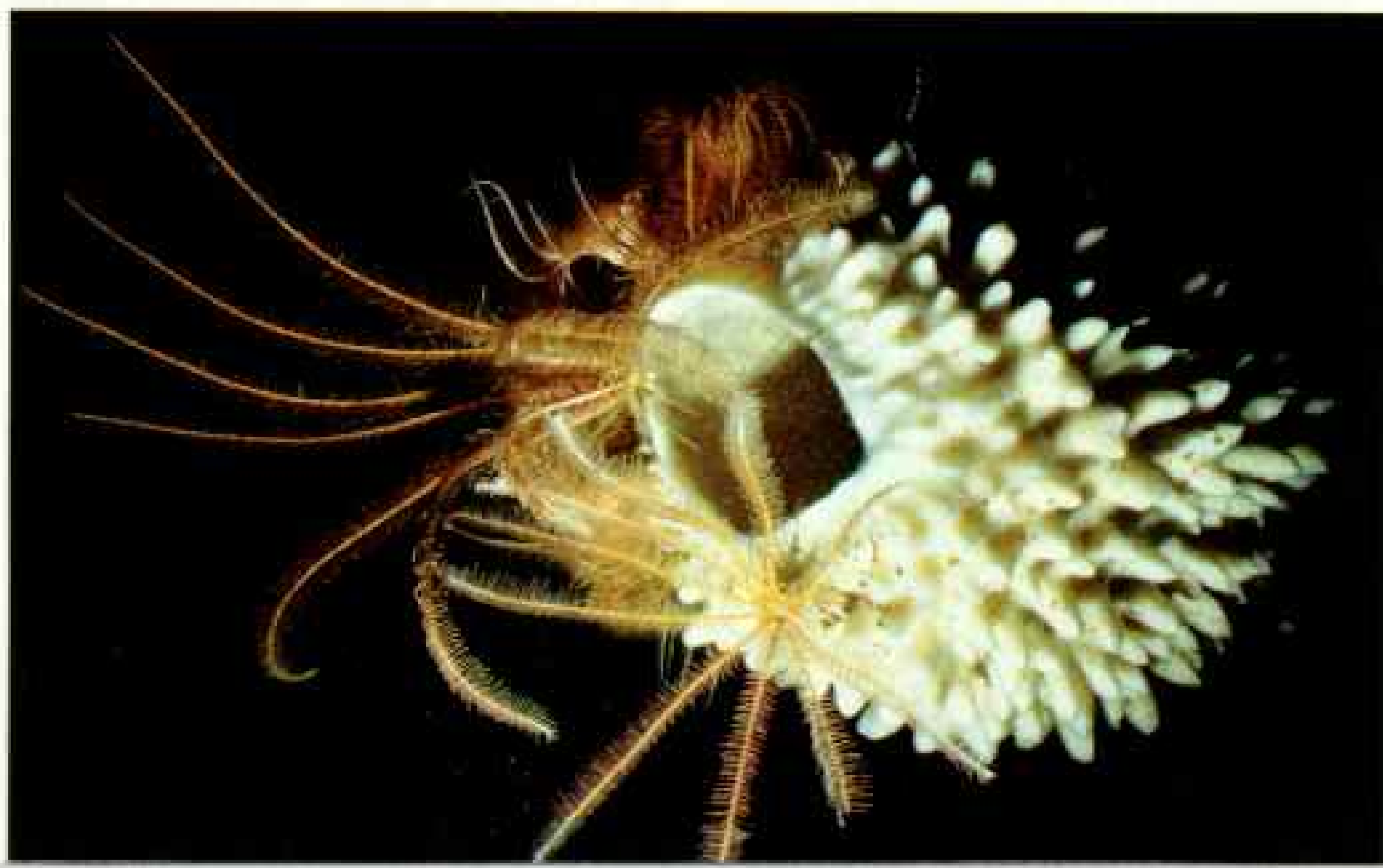
## Seafloor parade

**S**LOW-MOTION feeding frenzy brings a train of starfish (right) to dine on seal droppings beneath a tide crack at Turtle Rock on the sound's east side.

In deeper water, crinoids, more outlandish relatives of the starfish, perch on a volcano sponge (below). A pycnogonid, or sea spider, cleans itself atop a sponge mat (above).

There seems no end to the interesting and beautiful forms of marine life found in McMurdo Sound. This is among the last of the divers' underwater frontiers and one to which I hope to return soon. □





## JAPANESE AMERICANS

# Home at Last

By ARTHUR ZICH

Photographs by MICHAEL S. YAMASHITA

**O**N THE DAY IN MAY 1942 when American soldiers took her and her family to the concentration camp, the very last thing Mary Tsukamoto did was sweep the house. "I had to leave it clean," she explains. "We didn't know how long we'd be gone."

Mrs. Tsukamoto was one of nearly 120,000 American citizens and alien residents of Japanese ancestry who, after the Japanese attack on Pearl Harbor, were uprooted from West Coast homes, farms, and businesses and herded, most of them, into assembly centers in racetracks and fairgrounds. Later they were transported to ten desolate concentration camps—the term used by President Franklin D. Roosevelt himself, whose Executive Order 9066, signed February 19, 1942, put them there.

Categorized by this presidential action as potential spies and saboteurs, they remained behind barbed wire for an average term of two and a half years. The ordeal devastated the life's work of Issei (first generation Japanese in the United States), costing them millions in lost property and income. It deprived their Nisei (second generation) offspring, born in the U. S., of liberty and the rights of citizenship. It fractured families along political and generational lines.

Above all, in branding them as disloyal without charge or trial, it inflicted on Japanese Americans a gnawing sense of shame—for some to the third and fourth generations.

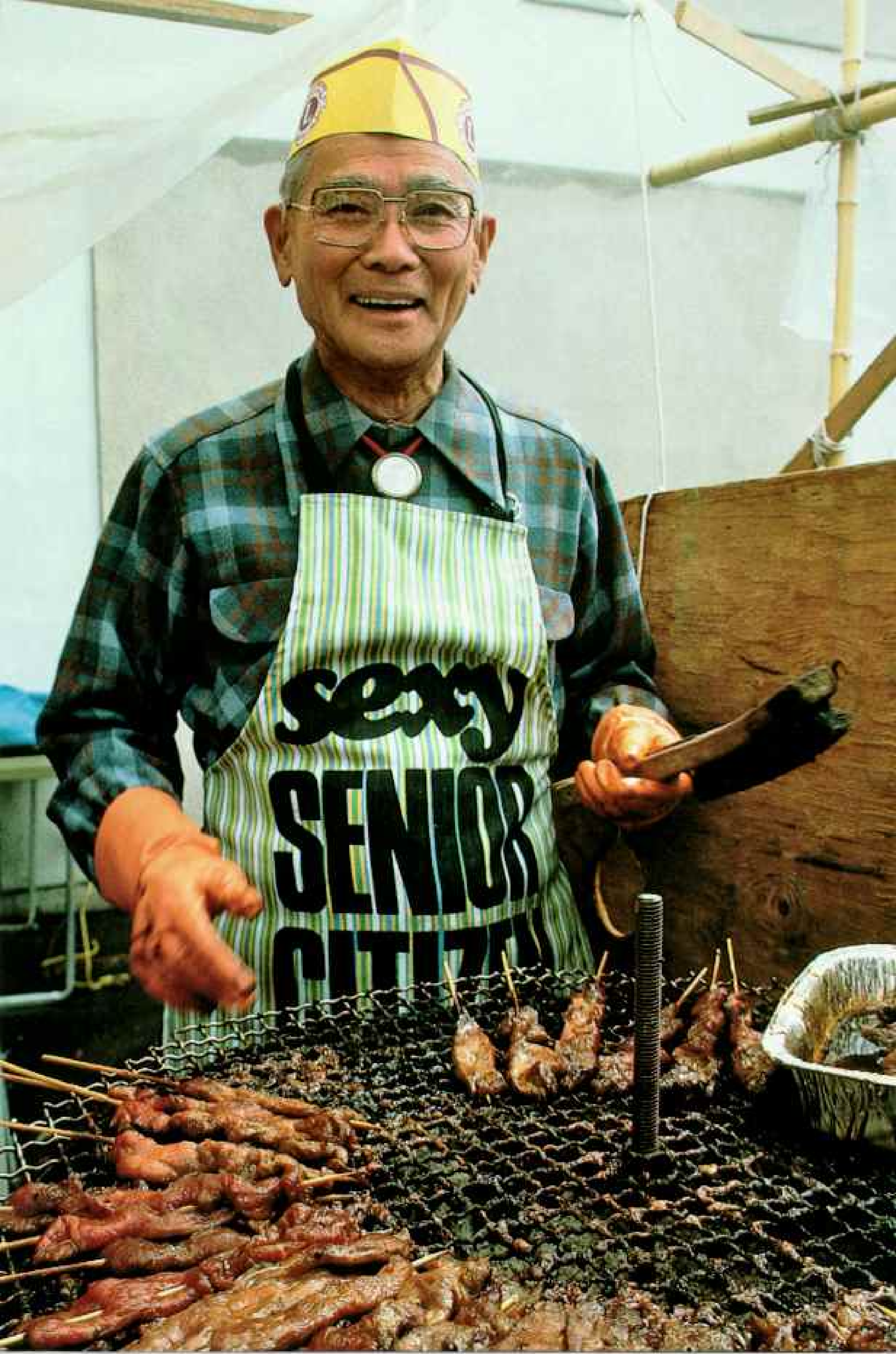
In the years since the war Japanese Americans have surmounted most of the social obstacles erected against them. They have risen so high and so fast, in fact, that they have been called a model minority—an epithet they deplore as simplistic, condescending, and forgetful of their traumatic history in the United States. Dr. Ford H. Kuramoto, director of Hollywood Mental Health Service, calls the stigma of internment "a psychic skeleton in the closet."

Mary Tsukamoto, retired now after 26 years of teaching in Florin, California, still loves to talk to children of Japanese ancestry about old country culture. "They look up at me with their big eyes," she relates, "and ask, again and again, 'Was Great-grandpa really guilty when they put him in the concentration camp?'"

**W**INDBLOWN and seasick, 18-year-old Yuki Torigoe stood at the rail as the salt-caked steamer *Siberia Maru* slipped through the Golden Gate into San Francisco Bay. Like a score of other "picture brides" descending the ship's gangplank, she looked from her

*At ease in two cultures, Hisao Inouye tends a grill laden with teriyaki during San Francisco's Cherry Blossom Festival. Overcoming harsh prejudice and the humiliation of internment during World War II, Japanese Americans have become a successful, dynamic, and distinctive ingredient in the United States of the 1980s.*











husband's photograph to the faces of the men in the dockside throng. It was May 1914. Less than a month before, at her home in Kurashiki, she had knelt before a Shinto altar in her finest kimono and married, by proxy, a man she had never met—a man who was then 5,500 miles away, running a small shop in Watsonville, California.

"Somehow we all just found each other," Mrs. Torigoe, now 90 and widowed, remembers. "Some of the other brides were crying: Their husbands turned out to be 20 years older than their photos. But we all went off in cars for a mass American wedding at the hotel."

Of the 214,000 Japanese immigrants who arrived in the United States in the first two decades of the 20th century, fewer than 30,000 were women. Perhaps half were picture brides; most were a decade or more younger than their husbands. Many immigrants were impoverished farmers from southern prefectures like Hiroshima. But they carried in their hearts a fierce pride in Japan's rising power, a profound commitment to its stern, traditional values—*on* (duty to family and country); *giri* (a moral indebtedness, as to a parent, that cannot be repaid); *gaman* (stoic endurance)—and a burning determination to work hard in America, make good, and return to their beloved homeland.

"They had no intention of staying," Yuji Ichioka, researcher at the Asian American Studies Center of the University of California, Los Angeles, explains. "They were sojourners—birds of passage."

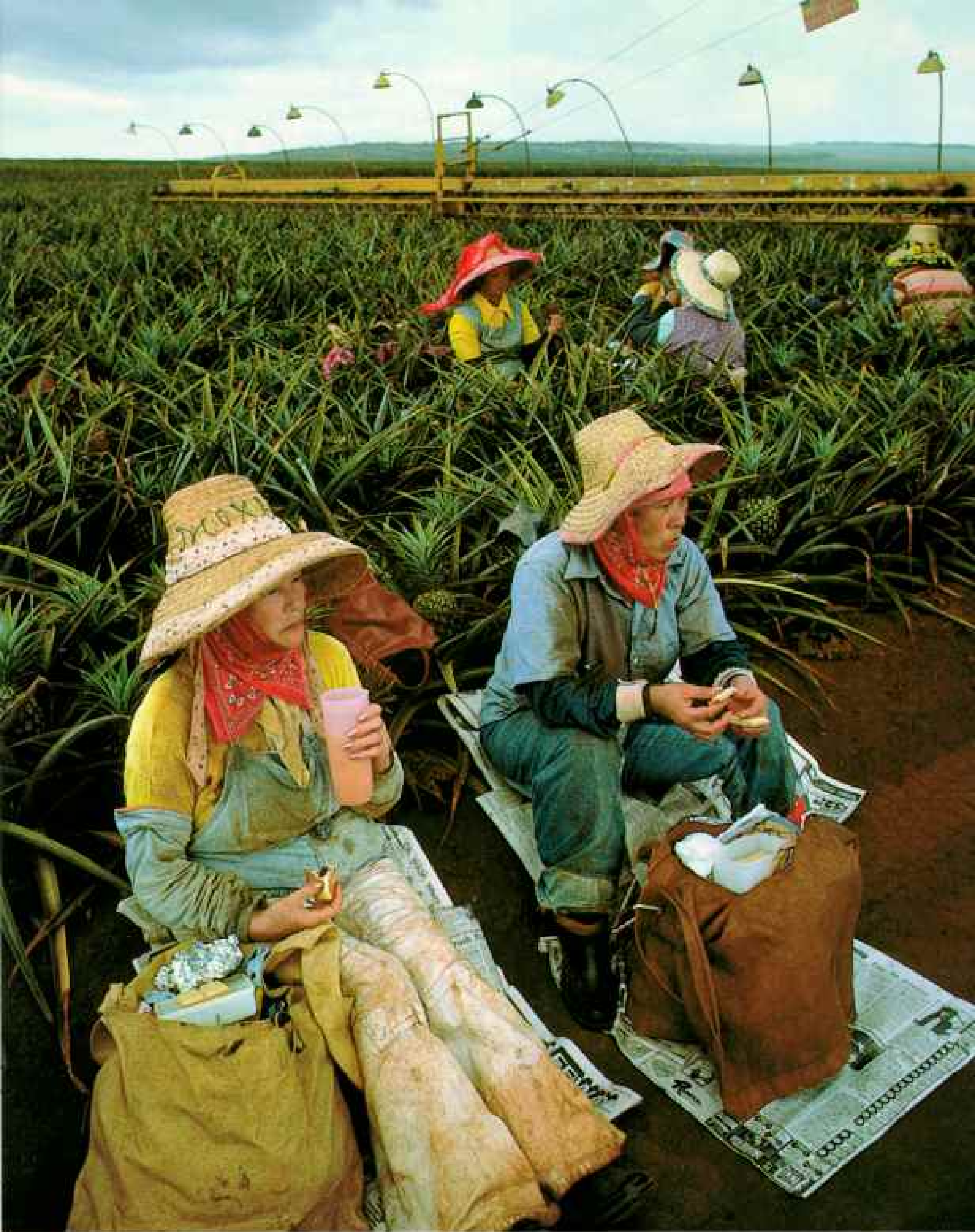
America did not invite them to stay. As Asians they were barred from U. S. citizenship—"the single most important factor affecting the Issei in this country," Ichioka avers. "It kept them out of the American

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Arthur Zich studied Chinese at Yale University and has written extensively on Asian topics. Photographer Michael S. Yamashita is a third-generation Japanese American.

*Crush of merrymakers accompanies the mikoshi, a portable Shinto shrine, through San Francisco's Japantown during the Cherry Blossom Festival. California claims more than a third of the nation's 720,000 Japanese Americans.*





*First field of endeavor for many, agriculture provided work for Japanese immigrants to Hawaii in the late 19th century. Two pineapple pickers are among the last employees of Japanese ancestry on Dole's Lanai plantation. Workers of Filipino descent have taken the place of many Japanese Americans.*

political process and left them defenseless against discriminatory legislation."

From 1907 through 1948 anti-Japanese bills were introduced in every session of the California legislature. In 1907 a gentlemen's agreement between the United States and Japan halted immigration of male laborers. In 1913 a California law banned purchase of land by aliens "ineligible to citizenship." Seven years later a similar law prevented them from leasing land. Then, in 1924, a new U. S. Immigration Act slammed the door on Japanese immigration completely.

The Japanese settled for whatever wages they could get—often half what whites were paid for similar labor. Most turned to farming, laboring under Japanese bosses in picking, packing, and pruning gangs that began work by lantern light well before dawn and finished long past dark.

Michiko Tanaka, who left Hiroshima for California in 1923 and bore 13 American children, recalls the life. "Until the internment camp, I worked in the fields right up to the day each baby was born," she says. "We would finish the work, wrap our children in blankets—and move on. Papa loved to gamble and drink. All the Issei men did. Me, he never talked to. The children, Papa harangued: 'Learn your culture! Learn Japanese! As long as you look Japanese, you are going to *be* Japanese.'"

"Papa knew the struggle was futile—that as long as we lived here Americanization was going to gobble us up," says the Tanakas' daughter Akemi Kikumura, a cultural anthropologist. "But he fought it as long as he lived. That was my father's way."

**N**ONETHELESS, the Issei sought places to put down roots. Some managed to buy or lease farms before alien land measures passed into law. Some put titles in the names of their American-born children or of trusted American friends. In all, the Japanese never owned or leased more than 4 percent of California's improved cropland. But by 1920, sales of Issei farm produce accounted for more than 10 percent of the total value of all commercial truck crops in California.

"Japanese neighborhoods grew up as sanctuaries against outside hostility," Dr. Kikumura goes on. "They became, in effect,

extended families." The Japanese community in San Mateo, south of San Francisco, was typical. By 1924 the town had both a Buddhist and a Christian church. A chapter of the Japanese Association of America was resolving commercial disputes and staging annual picnics. There were six billiard parlors and an apartment house complete with backyard tea garden and redwood *o-furo* (hot tub bath), where Issei men gathered on Saturday nights to soak away cares, sip sake, and strum the samisen (three-stringed banjo). Tanomoshi, an informal savings and loan system, helped provide capital for local businesses serving local needs. "Default meant disgrace to the borrower and his family," Dr. Kikumura explains. "No one would have dreamed of it."

For boys, most communities had a Scout troop, a baseball team, and a kendo (Japanese fencing) and sumo (wrestling) club. Girls joined the Camp Fire Girls and odori (Japanese dance) groups. Nisei males, growing up in this mixed world of old Japan and new America, were separated from their fathers by an average age difference of 38 years. Three-fourths of the parents were Buddhist; most knew little English. The majority of the children were Christian; all spoke English, and few spoke Japanese.

Parental word was law. There was virtually no juvenile delinquency. Teachers ranked second only to parents. "Honor or shame to the family name would be brought according to the success or failure of the child in school," wrote Seattle sociologist S. Frank Miyamoto. After-school Japanese-language classes only created more cultural conflict. Retired U. S. Army Maj. Tom Kawaguchi, 64, director of Go For Broke, Inc., a Japanese-American veterans' organization based in San Francisco, tells how one Nisei saw it: "I hated every minute of it. Hell, I wanted to be an *American!*"

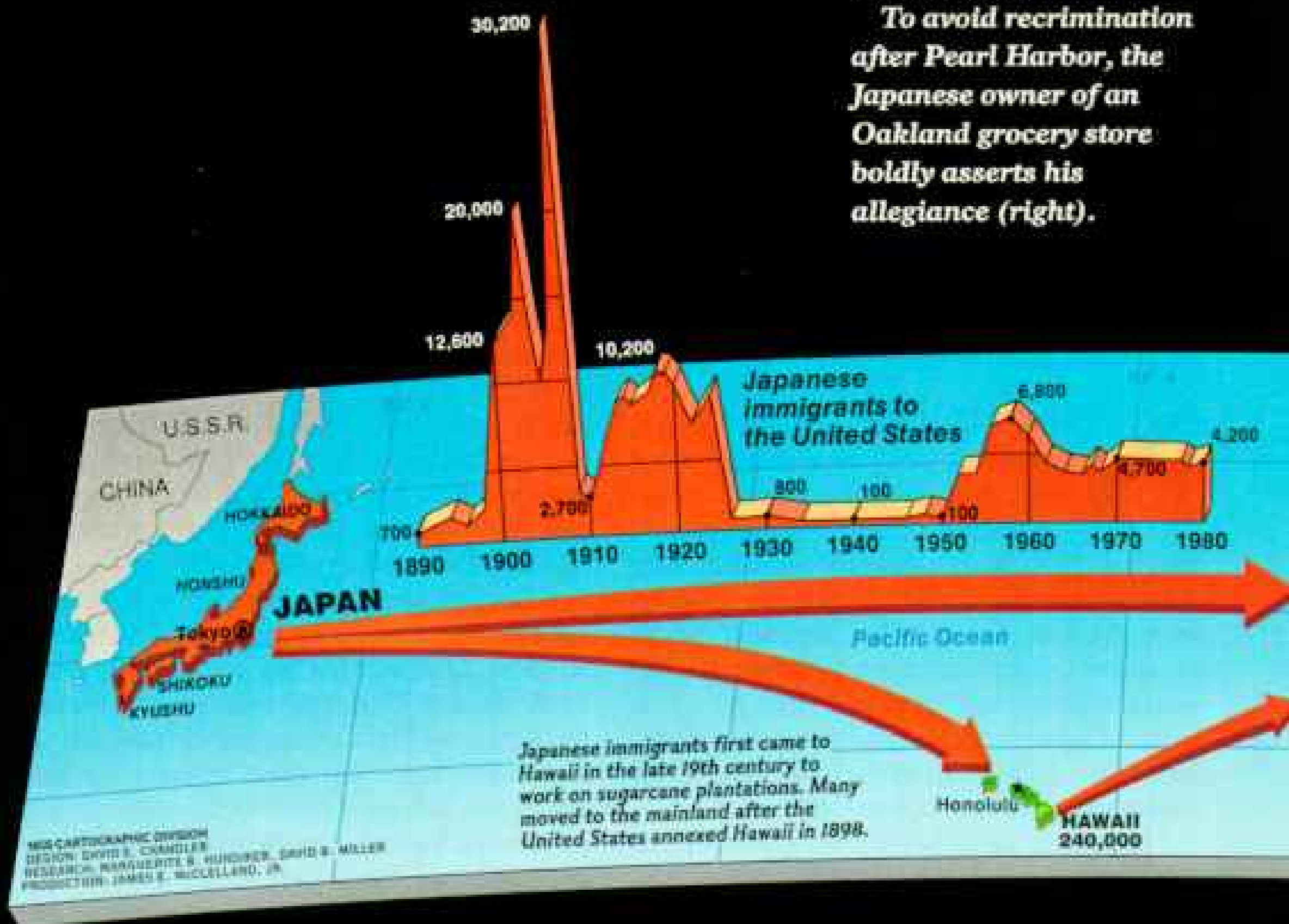
This sentiment was shared by many members of the influential Japanese American Citizens League (JACL), founded in 1929. Issei, denied U. S. citizenship, still looked on Japan as their motherland, still felt its emotional tug. But their Nisei sons and daughters adopted the JACL credo: "I am proud that I am an American citizen of Japanese ancestry," and they pledged to defend the United States. (Continued on page 526)

# A separate America



**S**IGNS OF HATRED on a Los Angeles house in the 1920s (left) proclaim the blatant prejudice often faced by Japanese Americans on the West Coast during the early part of the century. Anti-Japanese sentiment was marshaled by a host of exclusion associations that sought to deny immigrants property ownership and to prevent further immigration. Speeches by demagogic politicians and inflammatory newspaper headlines kept feelings against the "yellow peril" running high.

To avoid recrimination after Pearl Harbor, the Japanese owner of an Oakland grocery store boldly asserts his allegiance (right).







UNITED PRESS INTERNATIONAL (LEFT); DOROTHEA LANGE, NATIONAL ARCHIVES



**E**RRATIC PATTERN of immigration (chart) reflects the seesaw effect of exclusion policies against the Japanese. During World War II the U. S. government held 120,000 Japanese Americans at ten internment camps (map). States that today have the largest Japanese-American populations are highlighted.

## *Prejudice gets the upper hand*

**H**IS DIGNITY unruffled, an elderly man waits with his grandchildren in 1942 for transportation from their Hayward, California, home to an assembly center. Tags affixed to their clothing bear their family's identification number. Evacuees were ordered to bring only what



they could carry, forcing many to liquidate their property.

A dusty summer wind buffets the tar-paper barracks of Manzanar internment camp in California (right), where 10,000 persons were held during World War II.





BOTH BY DOROTHEA LANGE, NATIONAL ARCHIVES



# Living in uncertainty

**V**OWS of devotion helped Dr. Kazuyuki Takahashi and his wife, Soyo (right), endure internment. Pictured at their wedding (below right), the couple had hastened their marriage to keep from being separated

during the war. Takahashi was a medical student at Stanford University when war broke out. In a letter written at the Santa Anita assembly center he tells a former professor of his hope and bewilderment.



the method for recruiting workers as adopted by the personnel office amounts so obviously to the same thing.

The same issue of the paper brings us news that arrangements have been made so that people can send their shoes out to Arcadia and Los Angeles to have them repaired. So far so good shoe repairing shops have been permitted to operate within the center though I'm sure there are ex-shoe repair men worth the 18,500. No private enterprise is allowed, that's why. And for the same reason there are no barber shops and a haircut is a rare thing around here. Amateur barbers are much in demand because professional ones are hiding fearing that they'd be swapped, and they will be. We learn also that the number of items carried by the canteens will be increased from the present 14 to 163 and will include such things as cakes, pies, apples, needles, threads, etc. -- things which ought to have been provided for a population of 18,500 long ago.

I want to add some explanations in regard to the rationing of toilet paper and sugar mentioned in my last letter. There is no actual shortage of these items, as we ordinarily understand the term. Previously when sugar was on the market table, you'd begin to bring their own containers and take some sugar home; similarly, people were walking off with the toilet paper. Why did people have such bad manners? The explanation is very simple. These people have been deprived of their right to earn a living. How can they afford to buy condiments and ketchup when they have no income? But are we to take home the sugar and the toilet paper. But are we going to blame them entirely for wanting to eat something sweet but not wanting to spend any money because they have no income? There are people here who are really destitute; people who have been here for two months without a single penny ~~left~~ coming in, even though a number of the family may have been working 8 hours a day; people whose businesses were wiped out way back in December; people whose husbands were interned many months ago.

I received a telegram from the State Department informing me that arrangements have been made for my repatriation and that my wife and I could return to Japan on the exchange vessel leaving New York around the 10th of this month. I made no request to be repatriated and the offer was a big surprise for me. Transportation to New York was to be provided, all expenses United States government. I turned down the offer and told the State Dept that I did not wish to be repatriated. I guess I am a political refugee in self-exile now.

Sometimes I wonder whether I'm right in maintaining, somehow, faith in the American Way -- or whatever you want to call it; at least, it's something this country is supposed to be fighting for. This American Way is fine but it's so inconsistent. Japan's fascism I deplore, but at least it's consistent. What I exiled myself from is clear to me; but what I exiled myself into puzzles me ~~sometimes~~ sometimes.

will you buy for me a copy of the new edition of Maximow Takahashi's  
and send it down?  
Thanks.

P.S. Sugar now 4 reassurances



MICHAEL S. YAMASHITA (TOP LEFT); LIBRARY OF CONGRESS (ABOVE); COURTESY KAZUYUKI TAKAMASHI

**I**N SPARTAN surroundings Akira Toya and his mother, Aki, whiled away long hours at a temporary center in Salinas, California.

Located in inhospitable locales such as deserts and swampy lowlands, permanent facilities were congested and lacked adequate medical services.

# Fighting for their country



DOROTHEA LANGE, NATIONAL ARCHIVES

**T**WOFOLD DUTY to his country is served by Ted I. Miyata (above), who had signed up for the Army before the Japanese bombing of Pearl Harbor. He used a furlough to help his mother, Nami, prepare to move to an internment

camp. The irony of Japanese Americans fighting for a nation that confined their people is sharpened by the valor they displayed on the battlefield. For its size and length of service, no other American unit was more decorated than the 100/442nd Regimental Combat Team. Made up primarily of Japanese Americans, the unit earned more than 18,000 individual citations for bravery.

Awarded a Distinguished Service Cross, Senator Daniel K. Inouye of Hawaii (left), who lost an arm during the war, addresses fellow veterans of the 442nd at a reunion marking the 40th anniversary of the unit's formation.



MICHAEL S. YAMASHITA (ABOVE AND LOWER RIGHT)





COURTESY WILSON MAKABE



**I** DON'T REGRET having served at all," says Wilson Makabe. After a brief internment and work-release program, he enlisted in the Army, only to lose a leg during combat with the 100/442nd in Italy. "We were more upset with the Japanese for having started the

whole thing." During ceremonies honoring the unit in Washington, D. C., Makabe received thanks from President Harry S. Truman (above).

Now retired in Nevada, Makabe (left) was chief of prosthetic services at the Veterans Administration Medical Center in Reno.

(Continued from page 517) "against all enemies." Seattle Issei Yoshisada Kawai articulated the Issei's dilemma: "I felt a turmoil deep in my mind," he told an interviewer at 81. "I did not want my sons to take arms against my mother country. But I owed this country a lot. I was crushed between human affection and giri."

Kamechiyo Takahashi, 94, of San Mateo, recalls her own family circumstance: "We'd saved a goodly amount over the years to build a home of our own. Then, when it looked as if war was imminent, Mr. Takahashi said he thought we should take the money and go back to Japan. But our two sons said, 'Wait! We're Americans! Our world is here.' So we built our house and moved into it in the fall of 1941."

Just a few weeks later Mrs. Takahashi, busy in the kitchen, heard a radio blaring in the living room. "I couldn't understand the English," she recalls. "All I could hear was the announcer shouting." It was Sunday, December 7.

**J**UST VISUALIZE that day! The Pacific Fleet, our first line of defense, was all but sunk! Our second line was the West Coast, where the heaviest concentration of Japanese and people of Japanese descent resided. And we were getting it straight from the horse's mouth—from intercepted cable traffic out of Tokyo, which we code-named MAGIC—that the Japanese were setting up an espionage-sabotage network on the coast. There was only one thing to do, and that was move those people out of there!"

The speaker is New York lawyer John J. McCloy, 91, Assistant Secretary of War under President Franklin D. Roosevelt.

"Earl Warren, the attorney general out there in California [afterward Chief Justice of the United States], had been pleading with the White House: 'For God's sake! Move the Japanese!'"

"The President called Francis Biddle, the Attorney General, into his office.

" 'Francis,' the President said, 'are you in favor of this move?'"

" 'Oh yes, Mr. President,' said Biddle. 'But I want to see it carried out *humanely*.'"

" 'That's exactly what I want to do,' the President said. 'You help draw the order'—

and right then and there, Biddle did. The President went on: 'And I want the Army to carry it out!'"

"When he heard of the plan, Chief of Staff General George Marshall pleaded: 'Please, Mr. President, we've got our hands full.'"

" 'No,' said the President. 'No civilian agency can do this. I want the Army to take it on.'"

"We were faced with what Mr. Churchill called the 'bloody dilemmas.' I said, 'We're going to have litigation about this, but we better go ahead and do it. We don't know where their next attack is coming from.' I didn't give a damn whether they were citizens or not."

Scholars have questioned the necessity of President Roosevelt's action, pointing out that the Office of Naval Intelligence, the Federal Bureau of Investigation, and President Roosevelt's own special investigator all assured Washington that there was no evidence of espionage or sabotage by Japanese Americans. Dr. Peter Irons, associate professor of political science at the University of California, San Diego, who conducted an exhaustive study of 2,000-plus MAGIC messages, concludes: "The MAGIC cables do not implicate Japanese Americans in any sabotage or espionage activity. They provide no substantiation for concern on the President's part about the loyalty of Japanese Americans on the West Coast."

"We're charged with wanting to get rid of the Japs for selfish reasons," said the secretary of California's Grower-Shipper Vegetable Association in the *Saturday Evening Post* in May 1942. "We do."

Declared U. S. Congressman John Rankin of Mississippi: "This is a race war." But whatever else is said, ultimate responsibility was the President's. As McCloy states: "Franklin Roosevelt was the only man in the world who could sign that order relocating those people. And he signed it." Reflected Attorney General Biddle in his memoirs: "The Constitution has never greatly bothered any wartime President."

On the West Coast, FBI agents and local police rounded up more than 2,000 suspected security risks: Japanese-language and martial-arts teachers, Buddhist priests, community leaders. Among the targets were picture bride Yuki Torigoe and her



*A place of sorrow lives on in the memories of Karl and Elaine Yoneda, who return each year for commemorative services at Manzanar, now a national historic landmark. Because she is Caucasian, Elaine could have remained at home when evacuation was ordered for Karl and the couple's three-year-old son. But she demanded to go with her family to Manzanar. A monument to those who died at the camp (below) bears the Japanese symbols for consolation, soul, and tower.*







*Room at the top is the reward for Japanese Americans with pluck and drive. Relaxing with his wife, Yone, at their Pelham, New York, home, Kay Sugahara (left) is chairman of Fairfield Maxwell Ltd., which has holdings in oil tankers and refrigerated cargo ships. The son of immigrants who worked on sugar plantations, Honolulu hotel owner H. T. Hayashi (right) has been honored as Hawaii's Businessman of the Year.*

husband, who ran a small watch-repair and gun shop in Watsonville, California: "That very morning they took Mr. Torigoe away. I didn't see him again for nearly a year."

**T**HE PRESIDENT'S ORDER had little effect on Hawaii. Fewer than 2,000 Japanese were taken into custody. Hawaii's 158,000 Japanese represented 37 percent of the population and an even higher percentage of the skilled labor force. "Without them," says Franklin Odo, director of ethnic studies at the University of Hawaii at Manoa, "Hawaii simply couldn't have functioned."

A civilian War Relocation Authority (WRA) was established to assist in the evacuation. Its first director, Milton S. Eisenhower, brother of the general, envisioned the agency overseeing a humane resettlement program that would put the uprooted Japanese back to work in public and private jobs throughout the inland states. But the reception Eisenhower received at a meeting with the governors and attorneys general of ten western states on April 7, 1942, convinced him that such a scheme had no hope of realization. Wyoming Governor Nels Smith warned that if Eisenhower's plan were attempted "there would be Japs hanging from every pine tree." Explained Idaho Attorney General Bert Miller: "We want to keep this a white man's country." Eisenhower resigned.

"So," says Yuji Ichioka, "the great fire

sale got under way." Evacuation notices, posted on telephone poles, gave some Japanese just two days to dispose of the possessions of a lifetime. A few, like Mary Tsukamoto and her husband, were able to leave homes and property in the care of trusted friends. Most had to deal with bargain hunters and profiteers.

Mary Oda's family, who farmed 30 acres in the San Fernando Valley, had just two weeks to dispose of a new \$1,200 tractor, three cars, three trucks, and all their crops. "In all," recalls Dr. Oda, now a physician practicing near the former family homesite, "we got \$1,300. We couldn't argue. We had to leave."

When evacuation day arrived, Norman Mineta, who was then ten and later became a U. S. congressman from San Jose, put on his Cub Scout uniform. At the 1942 commencement exercises of the University of California at Berkeley, the top scholar was absent. Harvey Itano, who recorded four years of straight A's, was in the Sacramento assembly center. Explained university president Robert G. Sproul: "His country has called him elsewhere."

Hoping thereby to prove their patriotism, the majority of Japanese Americans went off to the internment camps without a whisper. Exhorted JACL president Saburo Kido: "Let us leave with a smiling face and courageous mien. Let us look upon ourselves as the pioneers of a new era looking forward to the greatest adventure of our times."



"Like a lot of couples then, we got married just before the evacuation so we wouldn't be separated," remembers Dr. Kazuyuki Takahashi, retired now after 23 years in internal medicine at Oakland's Kaiser Hospital (page 522). Adds his wife, Soyo, "We honeymooned at Santa Anita assembly center."

The racetrack, near Pasadena, was converted into a holding area for Japanese Americans, pending construction of permanent concentration camps. At Santa Anita the Takahashis shared a single, manure-speckled horse stall, and one roll of toilet paper a week, with another newlywed couple. "Manure dust kept drifting down from the walls and ceilings," Doctor Takahashi relates. Soyo adds: "We had four wood-frame cots, with straw-filled mattresses, jammed in crosswise with a blanket hanging down the middle for privacy. After a couple of weeks, mushrooms began growing up through the floor."

Kaz tacked up wrapping paper to block the manure dust; Soyo hung a Stanford pennant. "Something great and something American may come out of all this," young Kaz wrote in June 1942. "In the meantime we live on from day to day, not unhappily but in a fog of uncertainty about the future."

By September, ten camps had been constructed in the wilds of Arkansas, Arizona, California, Colorado, Idaho, Utah, and Wyoming. Rohwer, Arkansas, was surrounded by mosquito- and snake-infested swamps and became a quagmire when the

rains came. Poston, Arizona, got so hot that people jokingly renamed the camp Roastin', poured water on their canvas cots, and slept outdoors trying to keep cool—until dust storms drove them back inside.

California's Manzanar—where the Takahashis were moved in the fall of 1942—was typical: wood-frame, tar-paper barracks, armed guards in sentry towers, barbed wire. An American flag fluttered over the gates. Each barracks consisted of four 20-by-20-foot rooms furnished with an oil stove and a bare hanging bulb. There were no closets, Takahashi wrote, "no shelves, no table or chair, not even a nail to hang one's hat." Open showers and latrines offered no privacy.

Five doctors cared for the camp's 10,000 people. Mary Oda lost her father, older brother, and a sister in the scant space of seven months. Tom Watanabe, now of Chicago, lost his wife and twin girls in childbirth. "What haunted me," Watanabe says, "was that for years I didn't know what they did with the bodies."

**T**O EASE THE WARTIME labor shortage, the WRA allowed some internees to work outside the camps. The plan, for the most part, was successful—but not always. Nancy Araki and her parents left Amache, Colorado, to start a farm at American Fork, Utah. "I slept on a sofa under the living-room window," she recalls. "I was just falling asleep one night when someone threw a brick through the glass. My father moved us back into a camp."

The camps weren't trouble free either. "The air has been tense and explosive for the past several months," Takahashi wrote as the winter of 1942 set in. Small, pro-Japanese gangs were trying to have their way by a reign of terror, he explained. Some, though not all of the Kibei—that is, American-born citizens educated in Japan—were openly pro-Japanese. The "thoroughly American" internees were keeping quiet because "we all realize that Americanism has somehow skipped the Japanese Americans. . . ."

Two days before Pearl Harbor's first anniversary, one of the pro-American JACL leaders at Manzanar, Fred Tayama, was severely beaten. Three Kibei were arrested



for the assault. Next day a riot erupted—the worst violence of the evacuation. Two internees were killed by military police, ten others were wounded. “We stayed in our quarters. We were frightened,” Dr. Takahashi relates now.

To separate loyal from disloyal individuals and to identify those who might be called up for military service, the government in February 1943 required internees over 16 to fill out a loyalty questionnaire. Question 27 asked Nisei males: “Are you willing to serve in the armed forces of the United States on combat duty, wherever ordered?” Question 28 asked: “Will you swear unqualified allegiance to the United States . . . and forswear any form of allegiance or obedience to the Japanese emperor . . . ?”

Some 9,000 answered the questions “no-no,” qualified their answers, or refused to respond at all. All persons giving so-called no-no answers were summarily branded disloyal. Most were eventually removed from their camps and segregated for the duration at Tule Lake, California. But more than 65,000, about 85 percent of the internees who responded, answered “yes-yes,” affirming their loyalty. “It was *my* country and I wanted to defend it,” says Tom Kawaguchi. “It was that simple.” Explains Hawaii’s Senator Daniel K. Inouye, who lost an arm in combat and earned the Distinguished Service Cross, America’s second highest decoration for bravery: “We were fighting two wars—one against the Axis overseas and another against racism at home.”





**T**HE 23,000 NISEI who fought for the country of their birth averaged five feet four inches in height and 125 pounds in weight, with M1 rifle and grenades. They wore shirts with 13½-inch necks, pants with 26-inch waists, and size three boots. They won more than 18,000 decorations for bravery, including a Medal of Honor, 52 Distinguished Service Crosses, 560 Silver Stars, 28 with oak-leaf clusters, and no fewer than 9,486 Purple Hearts.

Nisei were barred from enlisting in the Navy and Marines, but 6,000 served as Army military intelligence specialists in the Pacific. They were attached to about 130 units from eight different countries and the armies of China. According to Gen. Charles Willoughby, intelligence chief for Gen.

*Business blooms in California's Monterey County, where 61 Japanese-American families dominate the cut-flower industry. At a nursery outside Salinas (above), Masako Hirai tapes buds to prevent splitting. Nearby, rows of greenhouses (above left) march away from the home of Morinaga Tashiro and his wife, Kumi. After emigrating from Japan in 1956, Tashiro worked as a migrant farm worker and gardener. Today he produces more than six million carnations a year. In a Japanese-style living room (top) the Tashiros toast family and a neighbor with sake.*

Douglas MacArthur, they shortened the war against Japan by two years.

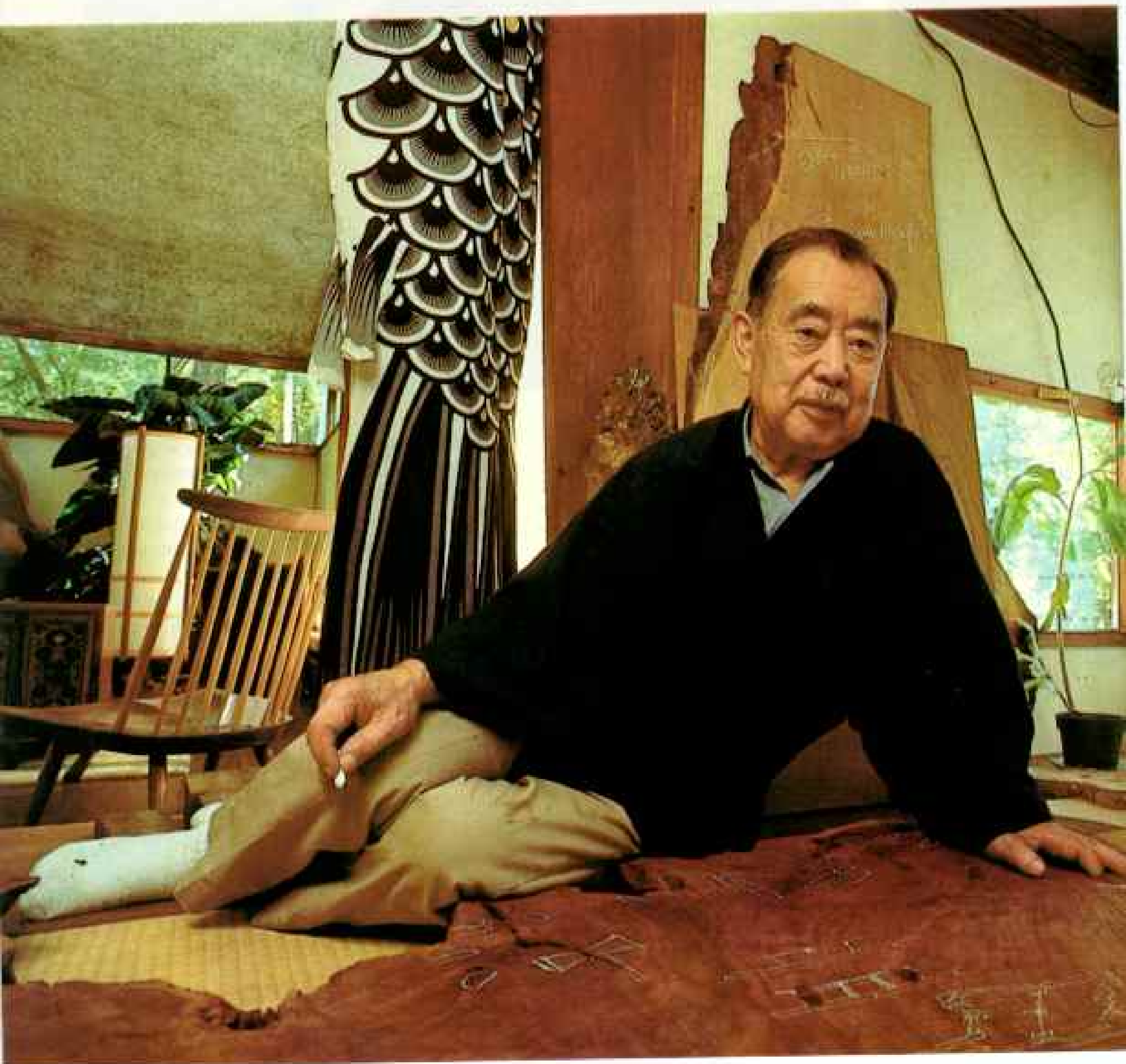
Their single most valuable exploit, says Shig Kihara, one of the founders of the Army's Japanese-language school at the Presidio in San Francisco, was cracking Operation Z, Japan's strategic plan for the defense of the Philippines and the Marianas. The result of that effort was the U. S. naval victory in the Battle of Leyte Gulf and the final destruction of the Japanese fleet.

In Europe, the mainland Nisei's 442nd Regimental Combat Team, combined overseas with the Hawaiian 100th Battalion, took for its motto "Go For Broke." Fighting in Italy and southern France, the 100/442nd emerged for its size and length of service as the most decorated unit in American history—earning eight Presidential Unit Citations and taking 300 percent casualties.

Its most celebrated mission was the October 1944 rescue of the "Lost Battalion"—a unit of the Texas 36th Infantry Division, which had been cut off and was being chewed to pieces in the Vosges Mountains of France. In furious fighting over six days, the 100/442nd suffered more than 800 casualties to rescue 211 members of the Lost Battalion.

Fifth Army Commanding Gen. Mark Clark told them: "The whole United States is proud of you."

Not quite. Having survived three major campaigns, T/Sgt. Shig Doi hitchhiked back to Auburn, California. With his duffel bag on his shoulder and a Bronze Star on his chest, the diminutive hero topped the crest of a hill and looked down onto his hometown. Doi still shuts his eyes at the bitter recollection: "Every store on Main Street had a 'No Japs Wanted' sign out front."



**T**ULE LAKE, the last of the concentration camps, closed for good in March 1946. At least a third of all Japanese-American truck farmers on the West Coast found their lands ruined or lost to foreclosure. Japanese neighborhoods everywhere were gone, their rented homes and shops taken over by war workers who had flooded into the region.

Soyo Takahashi found her parents' home in Palo Alto filled with migrants sleeping ten to a room. After three wartime years as a cook in an Idaho labor camp, John Saito's mother, Sakuyo, had saved enough money for a down payment on a modest house in southwest Los Angeles; the day she tried to move in, she was handed an injunction. "Restrictive covenant," Saito explains. "A thousand-dollar fine and/or a year in jail if we moved in. We sold—for a song."

It has been estimated that Japanese-American losses totaled 400 million dollars—in 1942 dollars. In 1948 Congress appropriated 38 million dollars to settle claims, but the processing was so snarled that the internees settled for an average of a dime on the dollar. Mary Oda's mother, a former teacher who turned to field labor to support herself, carried the ashes of her dead husband, son, and daughter around in an urn for six years, unable to afford a proper funeral. She finally settled for \$1,800 just to see them buried.

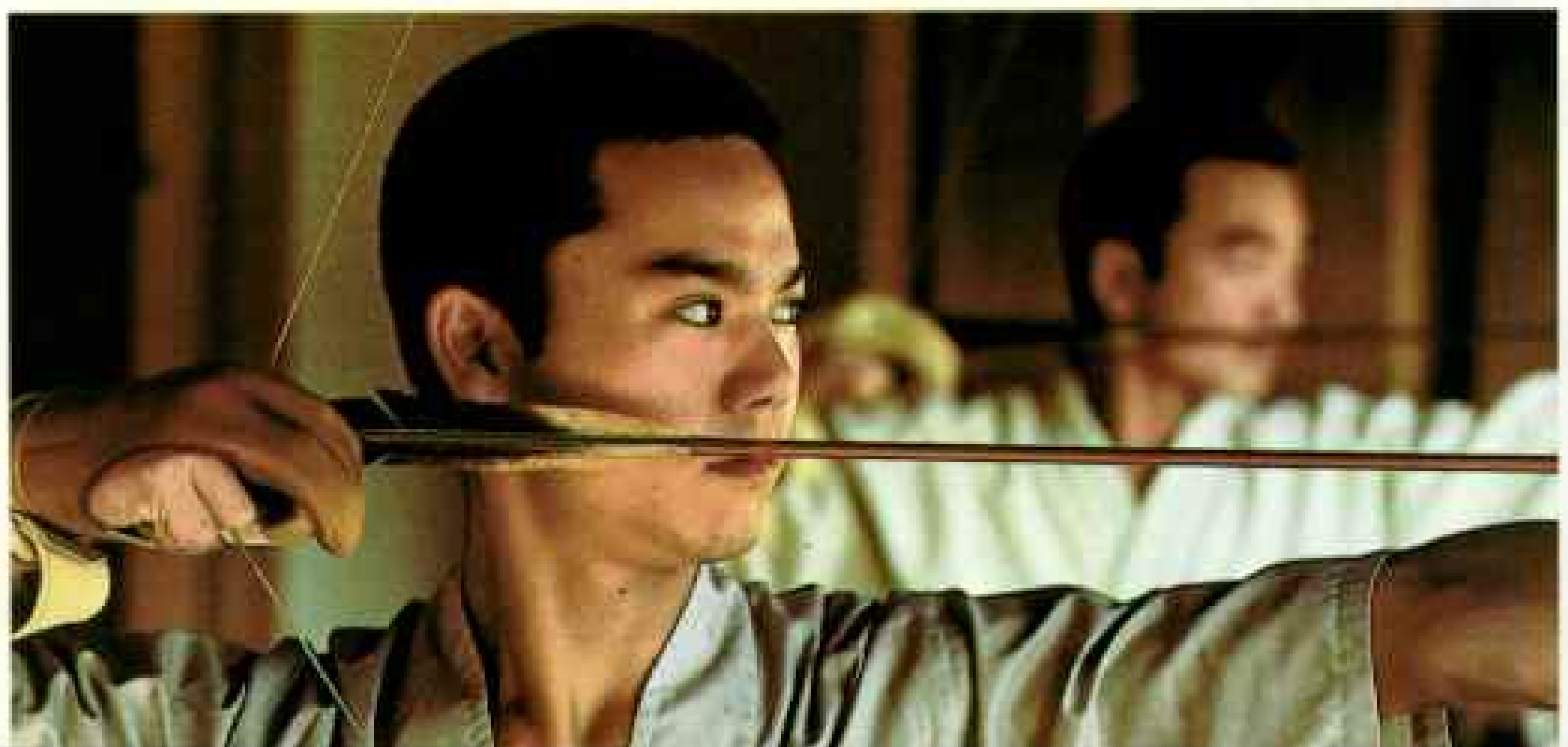
Some injustices were redressed. In 1952 JACL helped win repeal of California's alien land laws, and Congress granted the Issei's right to citizenship at last. Among those who applied is Michiko Tanaka, now 81. "I have 11 children living and 22 grandchildren, all citizens," she said. "I'm entitled."



*"Trees have a yearning to live again." That philosophy guides the hand of furniture maker George Nakashima (left), who strives to highlight the wood's fullest natural beauty. He marks this slab of walnut for butterfly inlays. At his Bucks County, Pennsylvania, home he maintains his own workshop and showrooms to display his work.*

*In a playful gibe at American culture, artist Masami Teraoka (above), who resides in Hawaii and California, used a traditional print style for a work entitled "McDonald's Hamburgers Invading Japan/Chochin-me (Woman With Lantern)."*







*Seeking the path of enlightenment, two Zen Buddhist initiates walk through grounds of the International Zen Dojo's Chozen-ji Temple outside Honolulu (above). Many American-born Japanese forsook their ancestral religions and adopted Christianity. Now some of their children fulfill yearnings for deeper cultural bonds by embracing the beliefs of the old country.*

*Trainees at this Honolulu temple arise at 5 a.m. to meditate before breakfast and their normal duties tending the temple and herb garden. Evening activities include training in music, ceramics, and martial arts such as kyudo (left), an approach to archery that incorporates the same three disciplines of concentration, breathing, and posture that are emphasized in meditation.*

*Man in the middle, gold trader Alan Yamashita has his hands full at Goldman Sachs & Company in New York City as he talks with a buyer on one phone and a seller on the other. Holder of degrees from Yale and Princeton, Yamashita, 35, now oversees the company's foreign exchange and commodities business in Tokyo.*



Social barriers fell too. Nisei men and women found that traditional Japanese values had become marketable commodities in America. "The Japanese work ethic—personal discipline, deference to authority, high productivity, and emphasis on quality—corresponds to the old Protestant ethic," explains UCLA sociologist Harry Kitano. "Once these qualities were ridiculed, despised. Now they dovetail with the needs of the American marketplace."

Twenty-five years after the camps were closed, the average personal income of Japanese Americans was 11 percent above the national average; average family income was 32 percent higher. A higher proportion of Japanese Americans were engaged in professional occupations than were whites. By 1981, an astonishing 88 percent of Sansei (third generation) children were attending college, and of these, 92 percent planned professional careers. In California, where more than a third of the nation's 720,000

Japanese Americans reside (88 percent of them U. S. born), family income remains 15 percent above the statewide average. Wrote sociologist William Petersen: "Even in a country whose patron saint is Horatio Alger, there is no parallel to this success story."

**A**ND IT'S A STORY told over and over again. Paul Terasaki, 56, grew up on the poor side of Los Angeles, where his father had the ill fortune to open a bakery in 1941. The family spent the war years in the desert camp at Gila River, Arizona. Terasaki worked his way through UCLA, earning a doctorate in immunology-embryology, and studied with Nobel laureate Sir Peter Medawar at University College in London. Today Dr. Terasaki heads UCLA's Terasaki Laboratory, recognized as a pioneer in the crucial area of tissue-matching for organ transplants.

The late Minoru Yamasaki and his bride, Teruko, shared a one-bedroom New York



apartment with his parents and younger brother during the war years. Before the war, Yamasaki spent his days boxing imported china; nights, he struggled toward a master's degree in architecture at New York University. The crowning achievement of his career: Manhattan's twin-tower, 110-story World Trade Center.

The first Japanese-American astronaut, Lt. Col. Ellison Onizuka of the U. S. Air Force, who died with six other crew members when the space shuttle *Challenger* exploded last January 28, had dreamed of spaceflight since boyhood. At 13 he had stood on the black lava shores of the Big Island of Hawaii and looked up at the night sky, filled with wonder at the flight of Alan B. Shepard, Jr., America's first man in space. This is how Elli Onizuka described his own first flight in 1985:

"I looked down as we passed over Hawaii and thought about all the sacrifices of all the people who helped me along the way. My grandparents, who were contract laborers; my parents, who did without to send me to college; my schoolteachers, coaches, and ministers—all the past generations who pulled together to create the present. Different people, different races, different religions—all working toward a common goal, all one family."

Postwar Japanese-American success gave rise to the media catchphrase "model minority." The term makes virtually every Japanese American wince. Some resent being held up for other races to emulate. "It's the whites who are the model. We're still the minority," says one San Francisco attorney. "The term measures us against them, on *their* terms." Others object that the label obscures the many human problems—from neglected elders and broken marriages to kids strung out on drugs—that Japanese Americans share with other Americans.

Many Sansei grew up torn between their parents' unspoken shame and a fierce new American pride in ethnic identity. For a long time, Japanese Americans shrouded the wartime experience from the world, from themselves, and from their own children behind 40 years of silence, a resigned shrug, and the phrase *shikata-ga-nai* (nothing can be done). "Anger, shame, humiliation—all are part of it," says Dr. Edward Himeno, a

*Space hero Air Force Lt. Col. Ellison Onizuka, Hawaiian-born Japanese-American astronaut, perished in the January 1986 Challenger shuttle explosion.*



NASA

psychiatrist who has worked extensively with Nisei camp victims.

"The Sansei absorbed the emotions their parents bottled up," says Dr. Himeno. "They grew up feeling 'there's something wrong with me, and I don't know what it is.'" Congressman Robert Matsui, interned as a one-year-old, offers an illustration: "I remember about age 14 sitting on the back porch with a friend. He said, 'Gee, I wish I weren't Japanese.' I said, 'Yeah, me too.'"

Some Sansei turned their anger inward. "I did heroin, every drug I could find," relates Vietnam combat veteran Mike Watanabe, now executive director of Los Angeles' Asian American Drug Abuse Program (AADAP). "I wasn't proud of my heritage as an Asian American and wanted to assert my own identity—even if it was a destructive one." Eventually, Watanabe says, he understood that he was proud of being Japanese American. He got off drugs, earned a master's degree, and dedicated himself to

social work at AADAP, a storefront community clinic in Los Angeles' multiracial, working-class Crenshaw district. Says Watanabe: "In the ten years I've been here, we've treated thousands of Japanese Americans for drug abuse."

Other Sansei moved to set their ethnic record right. In 1980 five Sansei attorneys crafted a brief laying out the constitutional violations surrounding the camp experience. In 1983 these attorneys and a team of more than 100 volunteer lawyers and law students forced reopening of the three convictions the Supreme Court upheld in 1943 and 1944. In the first of the cases—that of Fred Korematsu, who was tried for resisting

internment—a U. S. district court judge in San Francisco cleared the conviction, declaring that our institutions must "protect all citizens from the petty fears and prejudices that are so easily aroused."

The most momentous of the legal actions was finally getting Congress to establish a commission in 1980 to investigate the facts and circumstances surrounding FDR's Executive Order 9066. For the first time Japanese Americans came forward and publicly recounted their experiences in the camps. Men and women wept as they testified. "After 40 years," says Dr. Kuramoto, "the emotional boil was lanced, and the healing process was begun."

After hearing testimony from some 750 witnesses, the commission concluded that Executive Order 9066 was not justified by military necessity, that "a grave injustice" had been done to those interned, and that the broad historical causes behind the order were "race prejudice, war hysteria, and a failure of political leadership." The commission recommended the appropriation of 1.5 billion dollars as compensation to the victims. "It was a redemption," says Warren Furutani of UCLA's Asian American Studies Center. "The victims weren't guilty—and the Sansei finally found out what their parents had been through."

Their problem now was to find out who they were themselves. Sansei Philip Gotanda, 35, of San Francisco, perhaps the most prolific of young Japanese-American playwrights, went to live in rural Japan to try to answer the question, "How Japanese am I?" "I had the language down pretty well," he relates. "I was wearing the clothes, getting around fine, feeling comfortable. And one day, walking down the street, I had a profound experience: I suddenly realized that all the faces I'd been seeing in the movies and on television, all the faces of the people on the street, were Japanese. Everyone looked like me. For the first time in my life, I was anonymous."

Gotanda pauses, as if to let the experience sink in anew. "I think it gave me the vantage point to accept the fact that I am not Japanese," he says. "For better or for worse I am an American."

And what did Gotanda do then?

"I came home," he says with a smile. □



*Class clown turns a gesture of ridicule into a good-natured acknowledgment of his heritage at a Buddhist school in Gardena, California (above). In Los Angeles' Little Tokyo district, Jiro Uchida (facing page) adds a beard to traditional garb to play "Shogun Santa." In like fashion, his fellow Japanese Americans draw from two societies to create a culture uniquely their own.*







# *Gentle Fliers of the African Night*

Article and photographs by MERLIN D. TUTTLE



*Dining on board, a Gambian epauleted bat pup nurses as its mother soars. Shown nearly life-size, the female can carry a pup two-thirds her own weight. Epauleted bats are members of a large group called flying foxes: vegetarians that navigate with keen eyesight. They are wrongfully blamed and slaughtered as crop-destroying pests, but they are actually vital to the regeneration of forests. Decimation of these bats could have a devastating effect on tropical ecosystems on three continents and several Pacific islands.*



THIS PAGE FOLDS OUT



**H**ANGING IN A TREE beside a streetlamp in a night-darkened town on Lake Victoria in East Africa, an epauleted bat fluffed his white shoulder fur, puffed out his cheek pouches, fanned his wings, and gave voice to the repeated gonglike calls that would attract a mate.

This handsome little mammal with a 50-centimeter (20-inch) wingspan had already attracted me; for weeks I had been trying to photograph an epauleted bat vocalizing in full courting display. Now I had stumbled onto just such a remarkable demonstration.

Unlike many bats, the epauleted species lack the ability to echolocate. Females apparently need light to see the males' come-hither performance. Here on the main street of Kisumu, Kenya, male bat "townies" guarded lighted streetlamps that allowed them to practice their amorous allurements all night long.

Epauleted bats were not in my plans in 1982 when I accidentally became aware of their extraordinary characteristics. They and other species of flying foxes are among Africa's most interesting and important animals. (Indeed, the decline of fruit- and nectar-eating bats here and elsewhere poses a very real threat to the survival of tropical forests—but more of that later.)

On my first adventure in Africa I was mist-netting for other bats on the Sengwa River in Zimbabwe. Alone in the dark at 2 a.m., knee-deep and shivering in the cold water, I was more than a little nervous about the many unidentifiable sounds. Lions and hyenas called, and a herd of Cape buffalo rustled the tall grass nearby. One sound, particularly, was memorable and tantalizing—a continuous singsong honking. What creature spoke with this voice? In the next few nights I netted several epauleted bats, but weeks passed before I discovered that the haunting call was the courtship song of this member of the flying fox group.

I set out to capture on film a courting epauleted bat. Yet my many attempts invariably failed. The animals were extremely shy and alert; they simply wouldn't permit intrusion into their private lives. So my 1982 African journey ended without my seeing even one courting epauleted bat.

My next encounter with this intriguing

creature came in 1984, during research on frog-eating bats in Kenya.\* Dr. Michael J. Ryan, a frog behaviorist from the University of Texas at Austin, was recording evening frog calls beside Lake Victoria when he summoned me to come quickly.

Mike had spotted an epauleted bat performing in a nearby tree. We watched from a few yards away one of the most fascinating of mammalian displays. The bat was simultaneously singing, beating half-closed wings, and flashing the long tufts of white shoulder fur from which it takes its name. Except during courtship, this fur is withdrawn into shoulder pouches. Glands in the pouches are believed to secrete attractive odors, which the long epaulet hairs and beating wings help waft to cruising females.

\*Dr. Tuttle wrote and photographed "The Amazing Frog-Eating Bat" in the January 1982 issue.

A research project supported in part by your Society



*Youthful jaws pluck more than a mouthful (foldout, facing pages) as a Gambian epauleted bat pup takes off with a fig. An elongated snout and upright ears inspired the name flying fox. Retractable patches of fur on the shoulders of some species, such as this Büttikofer's bat (above), gave rise to the term epauleted bat. Apparently used solely for sexual attraction, the patches are found only on males.*



Distinctive, too, are pouches in the cheeks of the males, inflatable sacs that act as resonance chambers to enhance their calls, rhythmic honking audible for 200 meters or more, with a frequency sometimes exceeding one per second.

I made up my mind to photograph this amazing behavior. Canceling homeward plane reservations, I returned with my camera equipment and Kenyan assistant Paul Kabochi to our previous observation site in the Kaloka Veterinary Research Station.

That evening I was ecstatic when epauleted bats resumed their courtship. The next day we spent seven hours rigging and concealing flashes, remote tripping devices, and other photographic equipment. Our bat returned at dusk, as we had hoped, but before a single picture could be taken, a sudden tropical storm terminated his

display and nearly wiped out our gear. A change in weather foiled further attempts.

I had noticed that epauleted bats called every night from perches beside the streetlights in Kisumu, a town we regularly passed through on the way back to our hotel in Kakamega. Inspection revealed that only one "streetlight" bat held forth where I could photograph him. He guarded several trees beside a light at the edge of a shopping center parking lot. I hired a second helper to hold flashes on six-meter (20-foot) poles, while Paul climbed 12 meters into the trees with a light meter to practice getting our exposures right. At night I ran from tree to tree, shaking them and yelling, trying to move the bat to the best perch. In the end I got fewer than half a dozen quality photographs from hundreds of tries. Many of the townspeople must have wondered about my sanity!



Siren songs lure a Gambian female in a courtship ritual (left). As she flutters near, the male honks and flaps his wings, a display that may also fan scent from glands beneath his shoulder tufts. During mating, the male enfolds the female within his wings (below).



Prolonged attempts to photograph the courtship of epauleted bats taught me much about the species' behavior. My subject typically came at dusk to his courting territory and immediately began calling. The early hours of evening seemed to be devoted chiefly to defense of his territory. When another male began calling nearby, my bat responded by speeding up his call rate, apparently to outdo his competitor. When other males attempted to take the site by force, none seemed successful.

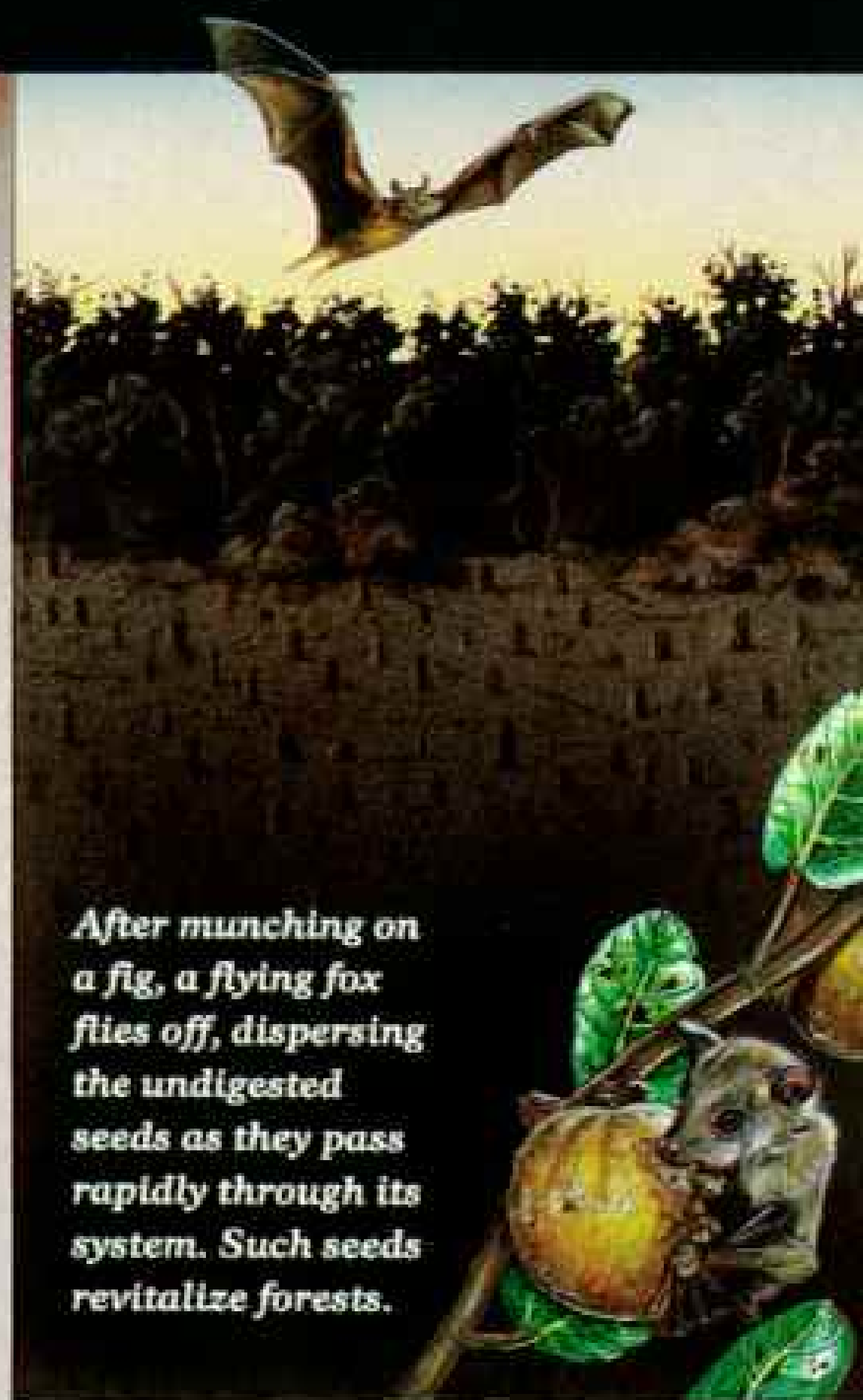
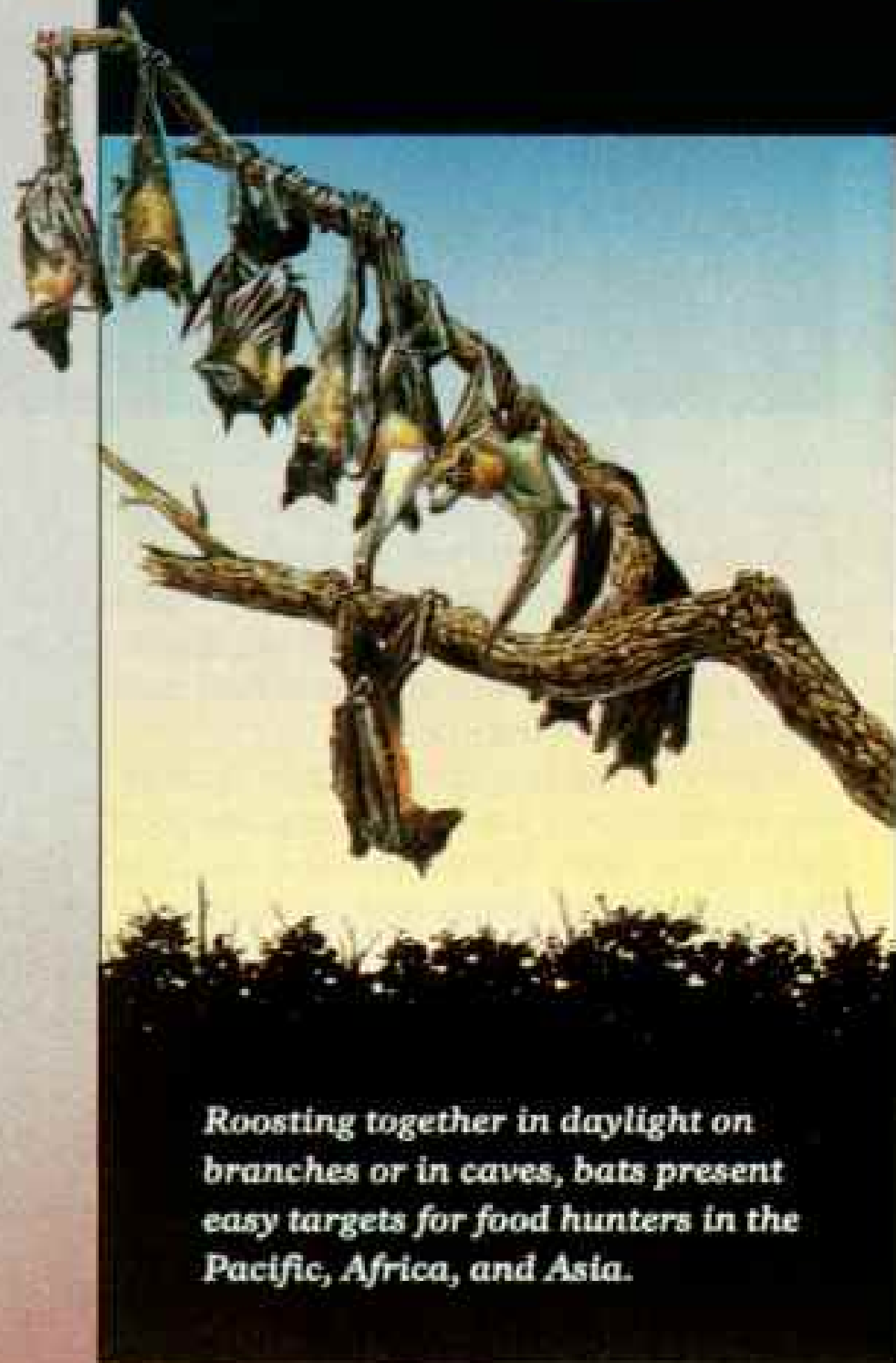
Females arrived, one at a time, fashionably late—few before 11 p.m. Each time, the male's excitement was immediately apparent: His song rose to a staccato pitch, and his wing "dance" blurred. As he did his best to impress her, the female would hover a foot or two in front of her suitor. Females were in no hurry; they appeared to move

about checking on several males before making a choice. Male voices clearly varied, and I suspected that the high-pitched squeaky ones belonged to young beginners. The culmination of wooing, the actual mating, took place in trees nearby.

Suitors often continued their performances until past 3 a.m., when exhaustion likely forced them to find food and return to their roost. I calculated that an eight-hour courting period cost each male bat more than 26,000 calls and 100,000 wingbeats, a demanding endeavor. I can only speculate on the fate of the unfortunate, or perhaps lucky, males who may never know the thrill, or the price, of "owning" a streetlight!

**I**N THE END I had to work with captive bats to get many of the behavior pictures I wanted. From a hotel room



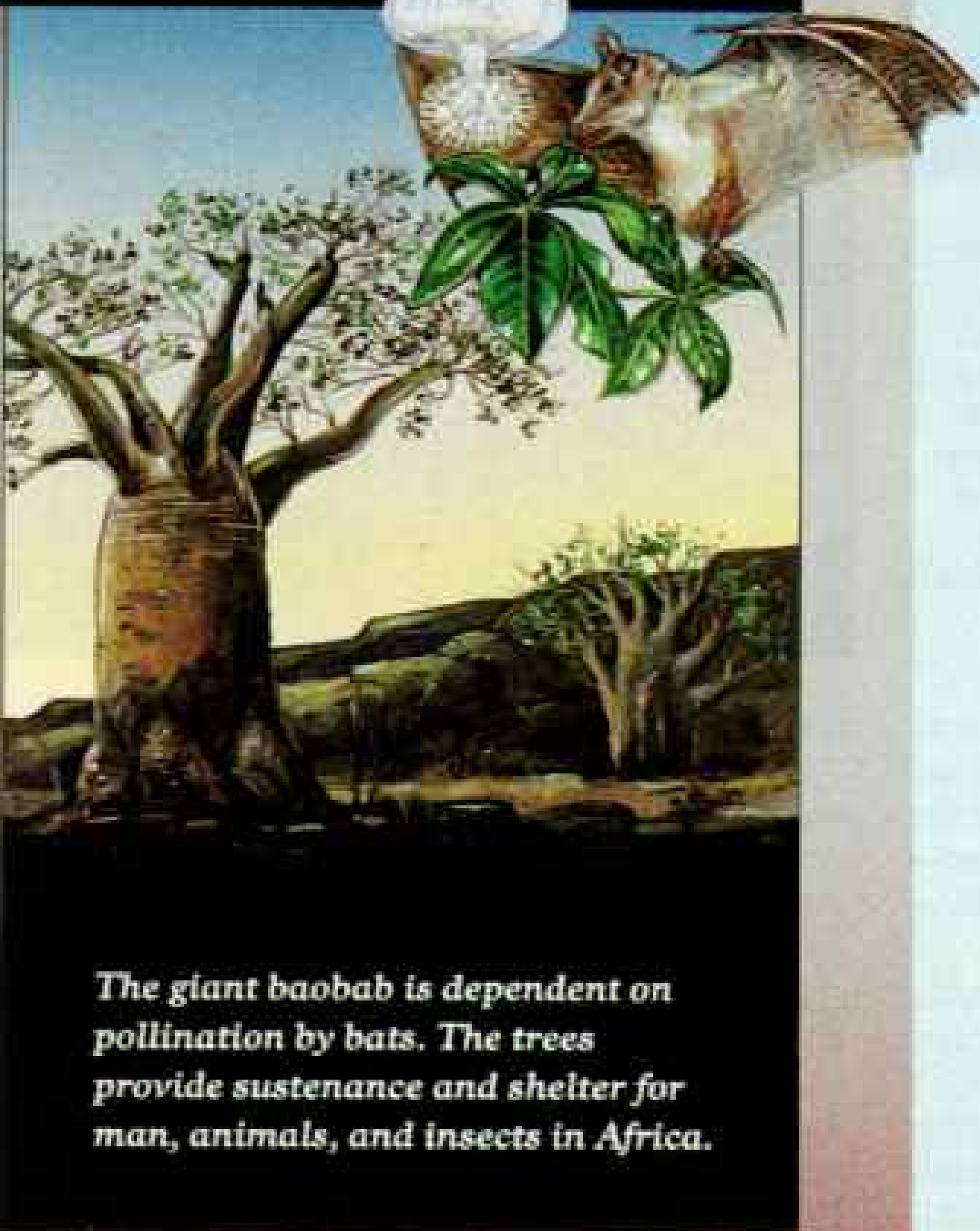


# Flying Foxes

Earth's only flying mammals, bats are found everywhere except in the most extreme desert and polar regions and a few isolated islands. Nearly 1,000 kinds have been identified—almost a quarter of all mammal species. In undisturbed forests bats may outnumber any other mammal. Exaggerated fears of rabies and dark tales of vampires in folklore have contributed to the vilification of bats. This, along with misunderstanding of their ecological role, has led to their widespread eradication.

Flying foxes play a crucial part in plant reproduction, pollinating countless species as they fly from flower to flower sipping nectar. They also spread seeds by their feeding habits, ingesting fruit juice and expelling solid matter, and by defecating in flight. In the wild, fruit trees that rely on these bats for propagation include bananas, plantains, dates, breadfruit, mangoes, and figs. Studies in West Africa show that the role of flying foxes in the reproduction of several kinds of trees is crucial to initial reforestation of clear-cut areas and abandoned farmlands, paving the way for the regrowth of valuable hardwoods.

Recent neurological and morphological studies indicate that flying foxes may actually be primates. Despite their usefulness, an undetermined number of the nearly 200 flying fox species face a double threat: overharvesting for human consumption as a delicacy and destruction as fruit-eating pests. Some countries have begun massive eradication campaigns, and others are considering similar programs. Population reductions of more than 90 percent have been recorded in Australia, Southeast Asia, and the South Pacific. Symbols on the map indicate regions where one or more species are known to be endangered or extinct. But information is so sketchy that others are believed to be facing extinction even before their endangered status can be documented.



**The giant baobab is dependent on pollination by bats. The trees provide sustenance and shelter for man, animals, and insects in Africa.**

*Merlin D. Tuttle is founder and president of Bat Conservation International, organized to prevent the extinction of bats and to preserve bat populations worldwide. For information write Bat Conservation International, Brackenridge Field Laboratory, University of Texas, Austin, Texas 78712.*



*Satisfying a sweet tooth, a Wahlberg's epauleted bat spies a baobab flower (right), then tips the petals to drink nectar (above). The bat's body collects and distributes pollen, crucial to the tree's reproduction. Like many plants that depend on bats, the baobab has light-colored and scented blossoms, easily found by these nocturnal feeders.*

northeast of Lake Victoria, I removed furniture, then laid heavy plastic on the floor and installed a screened enclosure and camera gear. In mist nets I caught a dozen epauleted bats as they came to drink nectar from flowers of nearby banana trees.

My captive bats proved gentle and inquisitive, yet even in a controlled setting, success always came hard. For nearly a month I virtually lived with my bats, sometimes working for six hours preparing for a single shot, then frequently waiting all night—



often in vain—for my subjects to perform.

It was observation of wild bats that taught me most about their habits. By day epauleted bats roost alone or in small groups, usually in trees, sometimes inside well-lit cave entrances. Colonies may include 150 or more bats, spaced at regular intervals, often only a few centimeters apart. Males of at least one species seem to jockey for positions close to females. When disagreements arise, the bats use their wrists to box each other in harmless tests of strength.





Mother epauleted bats give birth to a single baby once or twice a year. In some areas these births are closely synchronized with the onset of the long and short rains, but in others, births seem to occur throughout the year. During the day nursing young are cradled beneath their mothers' wings, invisible except when they occasionally peek out. At dusk mothers carry their babies with them when they fly out to feed, even though, amazingly, some young are two-thirds the weight of their mothers and quite capable of

flying on their own. The young bat rides clinging to its mother's breast with its mouth and to her side with its feet. At feeding sites a baby may fly alongside its mother and even compete with her for food. That same baby may then suckle as it is carried home.

These bats depend on a wide variety of native fruits and flowers. With an excellent sense of smell, they may detect food at distances of a mile or more, but young bats need to learn which odors to follow. Mother bats often

*(Continued on page 556)*



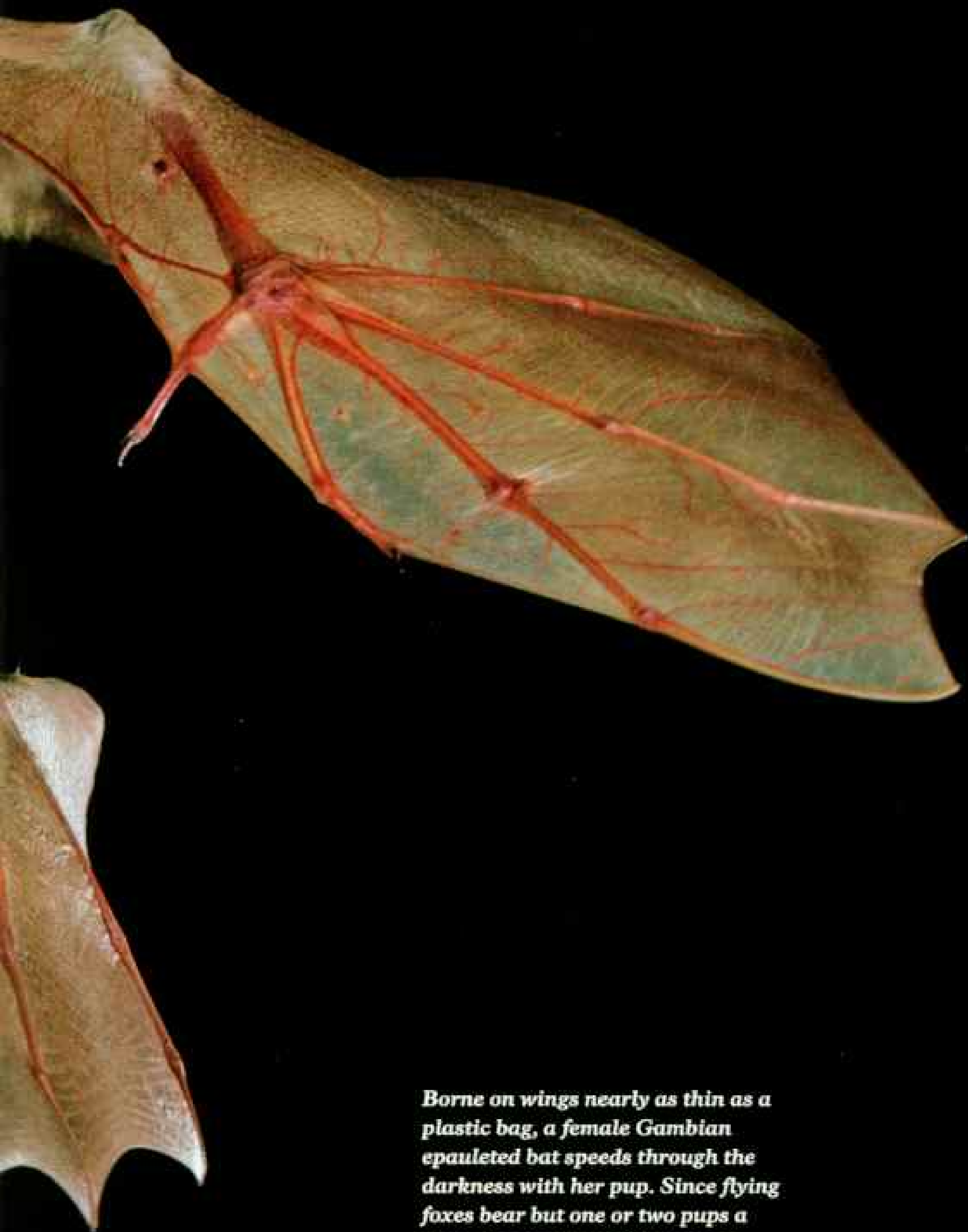
*Ever vigilant for predators such as hawks and snakes, part of a colony of 150 Gambian epauleted bats roost in a tree (above) at Kaloka Veterinary Research Station on Kenya's Lake Victoria. Speedy takeoffs are facilitated by hanging upside down.*

*A Wahlberg's epauleted bat feeds on a mango (left). By licking its mother's mouth (right), a Gambian pup learns which fruits are acceptable as food. Mango farmers in Kenya, the author's principal area of study, have killed off flying foxes, mistaking them for crop destroyers. But mangoes and other commercial fruits must be picked for shipment several days before they are fully ripe, and Dr. Tuttle's studies show that flying foxes avoid unripe fruit. By eating only ripe, unmarketable produce, they may help reduce fungi and destructive fruit flies.*









*Borne on wings nearly as thin as a plastic bag, a female Gambian epauleted bat speeds through the darkness with her pup. Since flying foxes bear but one or two pups a year, the recovery of decimated populations is slow.*



bring food in their mouths, teaching babies the scents of acceptable fare.

Epauleted bats inhabit most of sub-Saharan Africa. Four genera include more than a dozen species, most of them quite commonly heard but seldom seen.

**D**URING EARLIER investigations on the Mombasa coast of Kenya, Mike Ryan and I learned that these and other flying foxes are considered serious pests in mango plantations. By association, people tend to dislike all bats, killing them at random. Many caves had been eliminated as bat habitat by blocking the entrances. Of the 14 caves we learned about, half already were permanently sealed. In another, the bats had been intentionally killed.

Disturbed by this destruction, I decided

to seek the truth. Visiting 15 farms over an area of 2,500 square kilometers (965 square miles), I learned to identify the tooth marks of a variety of animals and examined nearly 7,500 mangoes for damage. When harvestable mangoes were harmed, the culprits nearly always were monkeys, not bats. Bats apparently do not like unripe fruit any more than people do.

On the M'Sangani Estate south of Mombasa, where Mr. and Mrs. Akberkhan Khan own one of Kenya's largest mango farms, they explained that mangoes for export must be picked five to seven days prior to ripening. Even those sold locally were harvested at least two to four days early. The Khans were aware that bats weren't a threat to their crops, but because many of their neighbors thought otherwise, I decided to experiment with captive bats.





*Fast repast: After plucking a fig, a Wahlberg's epauleted bat takes it whole in its mouth, masticates it, then licks its chops. Undigested seeds are expelled during flight. Thus do flying foxes live out their role, taking from nature but also giving back, while facing a growing threat from one of the many creatures they benefit: man.*



**U**SING NETS BAITED with ripe mangoes, I caught 31 flying foxes of six species, including three kinds of epauleted bats. For my tests in a rented beach cottage, the bats were placed in a three-meter-square mosquito net enclosure and for 18 hours were deprived of any food except fruits purchased in local markets. These included mangoes, avocados, bananas, papayas, and guavas; none would be ripe for two to four days. The bats refused these fruits, even though they were very hungry, but immediately ate ripe fruits at the end of each of the five trials.

I was able to demonstrate an important point: Fruits that are ripe enough to attract these bats are too ripe for harvest and worthless to farmers anyway. In fact, bats may well perform a service by removing ripe fruits that otherwise might become

food for the larvae of the dread Mediterranean fruit fly.

Recent research clearly shows that the seed dispersal and pollination activities of epauleted bats and other flying foxes are vital to the survival of tropical rain forests and dependent economies. In West Africa, for example, Dr. Don Thomas, biology professor at the University of Sherbrooke in Quebec, concluded that flying foxes, mostly epauleted bats, are critically important to forest regeneration in savannas, abandoned farmlands, and clear-cut areas.

He found in these environments that epauleted bats eat as much as two and a half times their body weight in a single night, digest meals in as little as 15 minutes, defecate in flight, and account for up to 95 percent of aerial seed dispersal. In patches of cleared land each square meter received at least one

and sometimes hundreds of seeds a year from bats, and Dr. Thomas concluded that "the steady influx of bat-dispersed seeds can potentially give rise to a massive regeneration." Birds, on the other hand, tend to drop seeds beneath accustomed perches in standing tree groves, where seed predators easily find and eat them.

In East Africa I watched epauleted bats pollinate the baobab tree. This famous giant of Africa's bush, with its large-petaled flowers that open after sundown and drop off the next morning, depends on bats for pollination and supports and shelters a whole community of birds and other animals.

In West African forests flying foxes are the only known seed dispersers for the iroko tree, whose timber is worth millions of dollars annually. The most important bat in this tree's regeneration is the straw-colored flying fox. Single colonies feed on the fruits and nectar of thousands of native trees each night and cover vast areas in annual migrations.

For several months each year, straw-colored flying foxes congregate in colonies that may contain up to a million bats. They roost in dense clusters on tree branches, where each mother rears her single infant. The whole of West Africa may count only a dozen or so such colonies, conspicuous and extremely vulnerable to human persecution.

In many areas the meat of the straw-colored flying fox is considered a delicacy. A shotgun blast can kill 20 to 60 roosting bats. Many more die of wounds. In the Ivory Coast, short of other meat protein, market hunting of bats is lucrative and on the increase. Complicating the problem, misunderstandings have led some countries to consider mass eradication of bats. Wiping out a single straw-colored bat colony could affect forest regeneration over hundreds of thousands of square kilometers. With large areas of Africa being deforested each year, such losses pose serious threats to the continent's ecology.

**M**ISPERCEPTIONS by fruit growers have brought massive, sometimes government-sponsored, bat eradication programs—in the Middle East, even of bats in nature reserves. And in

Queensland, Australia, in response to unstudied fruit-grower complaints, recent legislation places flying foxes on the same list of pests as introduced rats, mice, and pigs. Thousands of Queensland's flying foxes, the prime agents for pollination of many Australian hardwood forests, are now being shot at their nursery roosts. Biologists fear that the results may prove ecologically disastrous.

The rate of decline of flying foxes throughout much of Asia and on islands of the Pacific and Indian Oceans is truly alarming. They are overharvested by hunters, both for their own consumption and as a lucrative market item. On Guam, people pay \$10, \$25, or even more for a bat, and tens of thousands of slaughtered flying foxes are imported by air.

**S**EVERAL SPECIES are already extinct, and once vast populations now survive as mere remnants. A Samoan flying fox with a wingspan of more than a meter is one of the world's last diurnal bats. Soaring on midday thermals, it is an important pollinator of rain forest flowers. But, exported to Guam and Saipan for food, it is rapidly disappearing. Legislation to protect it may be the only way to save this Samoan bat from extinction.

Dr. Norman Myers, consultant for the BBC "Living Planet" series, recently referred to bats such as those that pollinate the baobab as "keystone species." Were such pollinators eliminated, he said, "the loss could trigger a cascade of linked extinctions." Actually, the most important consideration often may not be bat extinction but the effect of bat numbers becoming insufficient to service rain forest ecosystems and associated economies. This requires large populations, not mere remnants.

The contribution of bats to a healthy ecology has gone largely unnoticed or misunderstood for far too long, even among biologists and conservation planners. Major land-use studies have failed to acknowledge that bats even exist, making it easy for special interest groups to push eradication programs with potentially disastrous consequences. So it is my fervent hope that this brief introduction to the lives and values of epauleted bats and other flying foxes will serve to focus attention on these important mammals. □

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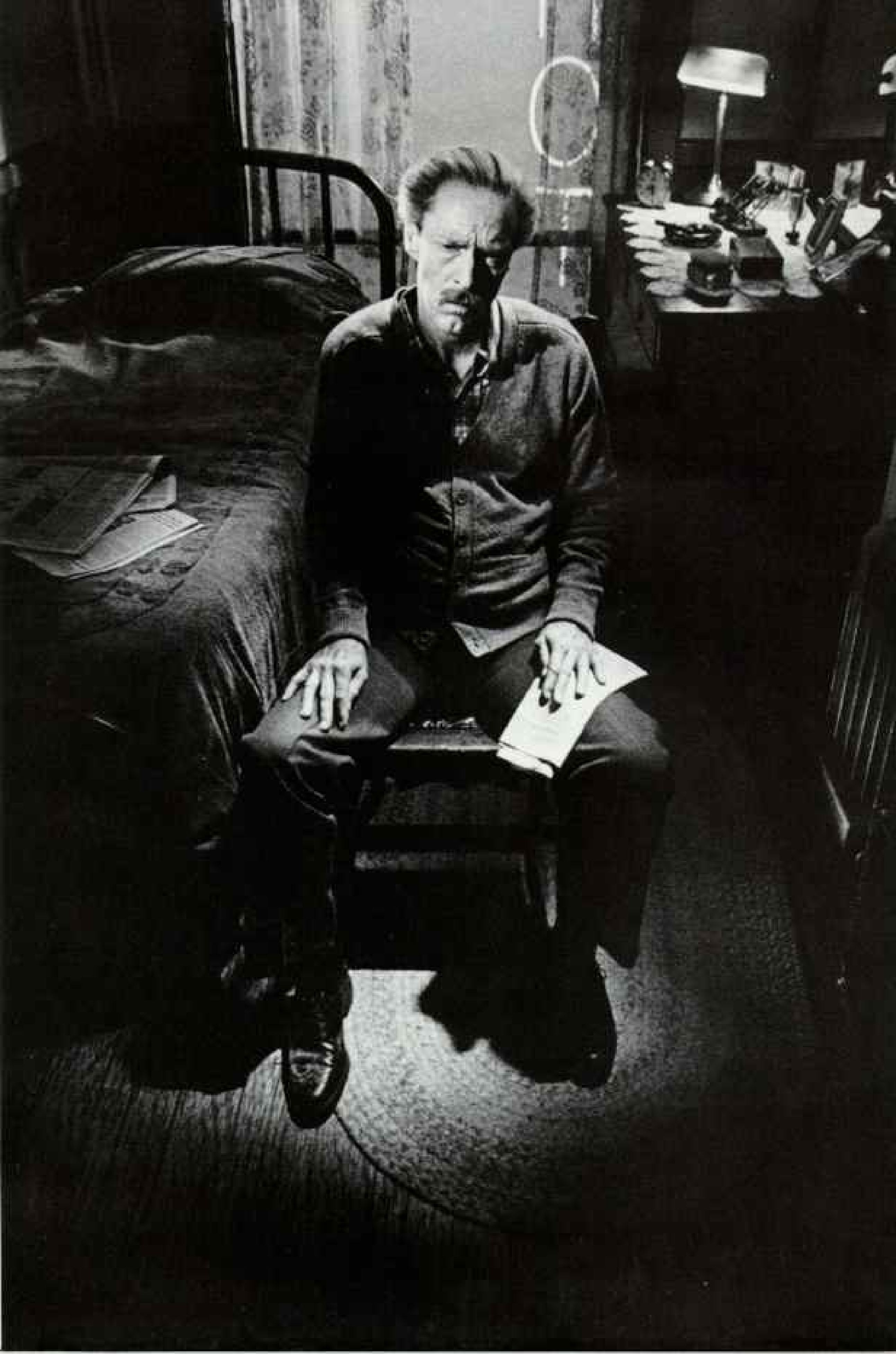


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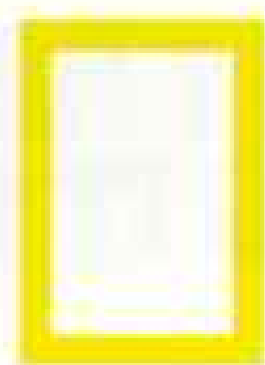
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# The future of America's outdoors



CLOCKWISE FROM LEFT: BY JONATHAN WRIGHT, DAVID S. BOYER, ROBERT W. MADDEN, AND STEPHEN S. BROWN

**WE WANT YOUR IDEAS** about the future of the American outdoors. "We" are the members of the President's Commission on Americans Outdoors, on which I am pleased to serve as vice chairman under Lamar Alexander, Governor of Tennessee. The commission, established by President Reagan, is composed of 15 members appointed by the President to reflect a full spectrum of interests and experience from both public and private sectors.

The commission's charge is to determine what you and other Americans want to do in the outdoors over the next 20 years and to recommend ways to accomplish those goals.

What does the outdoors mean to the American people? Where one person may think of backpacking in a national park or wilderness area, another may think of tending a garden in a public city plot.

There are bikers, skaters, runners, rowers, climbers, swimmers, paddlers, skiers, sketchers, anglers, picnickers, divers, drivers, sailors, walkers, and watchers. There are the young, the old, the handicapped—and people who live in cities, towns, and countryside. Such lists can go on forever.

Available leisure time, family structure,

population distribution, recreational habits, and many other factors have changed in recent decades. Because of this, the President's Commission on Americans Outdoors is determined to solicit and weigh the views of the widest possible cross section of the American public on the future of our nation's outdoors. That means *you!*

To this end I have put at the disposal of the commission the survey research, sampling, and statistical analysis capabilities of the National Geographic Society. As I write, a scientifically designed survey is being conducted nationwide. It will, I am confident, provide a fair and comprehensive view of what Americans want for outdoor recreation in the next decades.

But we don't want to stop there. We want you to participate. Send me your ideas and reflections on *what you want* or *what you think we need* for our nation's future in outdoor recreation. Please do so soon—write to Americans Outdoors, c/o National Geographic Society, Washington, D. C. 20036.

*Silvestro A. Brosener*

PRESIDENT, NATIONAL GEOGRAPHIC SOCIETY



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Photographed by Francois Gohier *Maned Wolf: Genus: Chrysocyon Species: brachyurus*  
Adult size: Length of head and body, 105cm; tail, 45cm; shoulder height, 87cm Adult weight: 23kg  
Habitat: Grassland and scrub forests in Brazil, Paraguay, Argentina, Bolivia, and Peru  
Surviving number: Unknown



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

Considered in local folklore to possess supernatural powers, the maned wolf makes a very fascinating research subject. According to one myth, the nocturnal cries of this solitary animal can foretell the weather. Despite widespread legends, however, the maned wolf remains one of the least known of all wild dogs, and continues to decline in number throughout its diminishing range.

Nothing could bring back the maned wolf should it vanish completely. And while photography can record it for posterity, more importantly photography can help save it and the rest of wildlife.

The maned wolf is a difficult species to maintain in captivity. With so little information available about the ecology of maned wolves living in the wild, the future of these shy canids will depend upon continued research and the protection of the remaining wild population. An invaluable research tool, photography can help promote a better under-

standing of the maned wolf and its requirements for survival.

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



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# Members Forum

## Titanic

I was startled by mention of the "mystery ship" that was near *Titanic* (December 1985) when she was sinking. Brought to mind was a picture in our Ashtabula Marine Museum showing the *City of New York*, built in Norway in 1885 for the seal trade and originally named *Samson*. Henrik Naess, a Norwegian, was her first mate in 1912. He testified long afterward that in April 1912 the crew of *Samson* was poaching seals ten nautical miles from *Titanic*. They saw lights and rockets but, thinking them signals of other sealers and scared of being caught, turned their ship about and slipped away. In 1928 *Samson* was renamed *City of New York* and used by Admiral Byrd on his first Antarctic expedition.

Bradley S. Burroughs  
Ashtabula, Ohio

My father, now almost 89 years of age, left England in early April 1912 to come to Canada [aboard the liner *Victorian*]. He claims, and has claimed for years, to have witnessed the flares from *Titanic*. This ship may well have been the mystery ship and closest witness to this tragedy.

Geraldine Hamilton  
Calgary, Alberta

Did you reverse your December cover photo? The port rail appears to be on the starboard side.

David Evans  
Anchorage, Alaska

*The photo—and you—are both right: starboard.*

In the effort to miss the iceberg, *Titanic* was not turned "hard to starboard," but hard to port. The command given, however, was "hard-a-starboard," a holdover from days when the tiller was pushed to starboard to make the rudder [and the ship's bow] swing to port. Thank you, Dr. Ballard and NATIONAL GEOGRAPHIC, for giving us this glimpse of what may be the most famous ship in history.

Ken Marschall  
Redondo Beach, California

To call it "this greatest of sea tragedies" is not correct, in terms of loss of life. On January 30, 1945, the 25,000-ton German liner *Wilhelm Gustloff* was loaded with 8,700 passengers—mainly refugees from the eastern part of Germany. In the Baltic it ran with its lights on at night. At 9:10 p.m. the ship was torpedoed. Some 7,700 perished, more than five times the number lost in the *Titanic* disaster.

David M. Bush  
Monterey, California

*National Geographic, April 1986*

The pictures and article on the *Titanic* were something I had longed to see since first reading *A Night to Remember* as a boy of 12. However, pictures are all I hope are taken from the *Titanic*. To try to scavenge or to raise her, if it were possible, would reduce the liner to just another rusting hulk. To leave her where she is serves not only to preserve her as a memorial to those who died, but also serves to preserve the mystic quality of one of history's great stories.

Michael J. Ginther  
Torrance, California

## Nicaragua

As a member of the Witness for Peace delegation that was captured by contras last August, I found the information in the article (December 1985) to be on the whole factual and well balanced. I found it disappointing, however, that the concluding statements should deviate sharply from that balance. The fact of the matter is that kidnappings, rapes, killings, and other atrocities committed by contras against Nicaraguan civilians far exceed those committed by Sandinistas.

Andrew C. Mills  
Scotch Plains, New Jersey

I was left with but one feeling, *outrage*. It is incomprehensible to me that yet another nation with a deep history of dictatorship has sacrificed so many of its people and suffered so much pain for a system that is as brutal and revolting as the one it replaced.

John A. Barone  
Albany, New York

Nicaragua is such a desperately poor country that it cannot possibly be a threat to anyone, especially to us. Yet our government is financing, organizing, and directing a war of terrorism against the people of Nicaragua, with the tragic consequences described in your article.

David T. Slaney  
Cambridge, Massachusetts

Sandinista attempts to portray Nicaragua as striving for political pluralism, a mixed economy, and nonalignment in foreign affairs are a strategic deception bound to become increasingly obvious to even the most gullible supporter.

David E. Wilke  
Chicago, Illinois

The article reports sensitively and accurately on the deep divisions that permeate that country. We especially appreciate the way in which you captured the concerns of the Miskito and Creole people. Too many journalists do not understand how strong the land and cultural ties are of native Nicaraguans along the Atlantic coast.

Bernard E. Michel  
Bethlehem, Pennsylvania

Permit me to congratulate you on your fine article on Nicaragua. It meant so much to me because I was a missionary for 30 years in Nicaragua. Eighteen of these were with the Miskito Indians in Waspam and along the Río Coco. When I saw a picture of my church on page 801, I almost cried. Yes, that was my church of St. Rafael.

Thanks for bringing the plight of the Miskito Indians before the public.

Fr. Charles Repole  
Stamford, Connecticut

## Daniel Boone

Daniel's son Nathan continued a family tradition (December 1985). An early explorer of what is now central Iowa, he surveyed the Neutral Strip separating the Sac and Fox from their northern enemies, the Sioux, and in 1835 was one of several officers who led mounted dragoons in the government's first explorations of this vicinity. Early Iowa historians credit him with having all his father's skills as a hunter, trapper, tracker, and scout. He is commemorated by the names of this county and its seat of government.

Thomas Tanner  
Boone, Iowa

It is good to know Daniel Boone as he was. You will get mail from those of us who "touched the hem of his garment" with our own ancestry.

Mrs. Thomas D. Carpenter  
Granger, Washington

## Vatican

Your excellent article on the Vatican City (December 1985) was marred by a phrase not in keeping with your usual standards. In the third paragraph [an observer] refers to the Vatican as a "costly religious Disneyland." Disneyland, as most people know, is the greatest vacation park in the world. But to refer to the Vatican as a plastic circus is in truly unbelievable poor taste.

Sandy O'Grady  
North Bay, Ontario

How could the Pope, cardinals, priests, nuns, and Catholic laymen enjoy or appreciate those paintings, statues, and treasures, knowing that thousands are dying of hunger?

Manuel H. Rubio  
Simi Valley, California

You have failed to recognize efforts slowly but surely being made for distribution and use of the Vatican possessions.

Lynn Philip  
Somersville, Connecticut

The very first line reads, "It is the world's smallest country." I thought that Villa Malta, headquarters of the Knights of Malta and comprising only three acres in Rome, is the world's smallest sovereign state.

Larry Kirk  
Tinton Falls, New Jersey



*The Order of the Knights of Malta retains a sovereign status and maintains diplomatic relations with many nations, but it is not recognized as a country by the majority of the world's states.*

### English Houses

Page 671 of your November 1985 issue says: "The duke's crest appears above the eagle door handle." What appears is not a crest but a coat of arms. A crest is entirely different. Thanks for your wonderful magazine.

Paul Bogorad  
New York, New York

*You are correct. But a crest, representing the crest of a helmet, may appear atop a coat of arms.*

### Kluane Park

Thanks for the article and pictures of Canada's wilderness park (November 1985). Forty years ago I spent a summer with a party surveying from Lituya Bay to Yakutat along the beach. The beautiful high mountains and all that ice of the ice fields were a sight to behold for a Mississippi farm boy not long from the delta. While walking along the coastline, I always wondered what was over behind the lofty mountains.

W. W. Gholston  
Isola, Mississippi

### Two Samoas

In your October 1985 issue Robert Booth reports



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You'll also find that Dodge wagons are solidly

from Western Samoa that Aggie Grey said, "It makes me happy to dance. If I didn't, I think I'd be in a wheelchair." I'm sorry to report that Aggie is now confined to a wheelchair, since a stroke last year. She still makes every effort to welcome and farewell her guests, but she leaves the dancing to her daughter. She's still the "Grand Old Lady of the Pacific."

Maybe some of the World War II servicemen who left Aggie their photographs would like to write to her and, by sharing some of their happy memories of the past, help her, as she helped so many of them.

Tony Adams  
Melbourne, Australia

Robert Louis Stevenson's "Requiem" contains the line: "Home is the sailor, home from sea," not "the sea." This line is often misquoted. Is Stevenson's line also misquoted on his own tomb as you say in "The Two Samoas"?

Frank Dunn  
Hackettstown, New Jersey

Yes.

.....  
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# On Assignment



**T**HERE REALLY IS a batman, and his name is *Merlin D. Tuttle*. Though he wears no mask, Tuttle is a crusader. As head of Bat Conservation International, he travels the world to fight persecution of these fascinating animals.

"Flying fox bats are valuable, gentle creatures and easily trained," says Tuttle, feeding a friend in a hotel room in Kenya (*above*). Responding to his command, the bats would not eat until he set the camera and whistled. The scent of fruit, transferred by his fingers to the camera lens, draws a visitor (*right*).

This zoologist's fascination with bats began during his youth in Tennessee, when he found that a group of gray bats, thought to be nonmigratory, occupied a cave only in the spring and fall. His proof that the bats were migratory later

formed the basis of his doctoral thesis at the University of Kansas. Author and photographer of NATIONAL GEOGRAPHIC's article on frog-eating bats (January 1982), Tuttle most recently visited the South Pacific to study endangered Samoan flying foxes.



BOTH BY MERLIN D. TUTTLE





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A man with a red headband and a camera around his neck is rappelling down a steep, rocky cliff. He is wearing a green t-shirt and a harness. The background shows a rugged mountain landscape.

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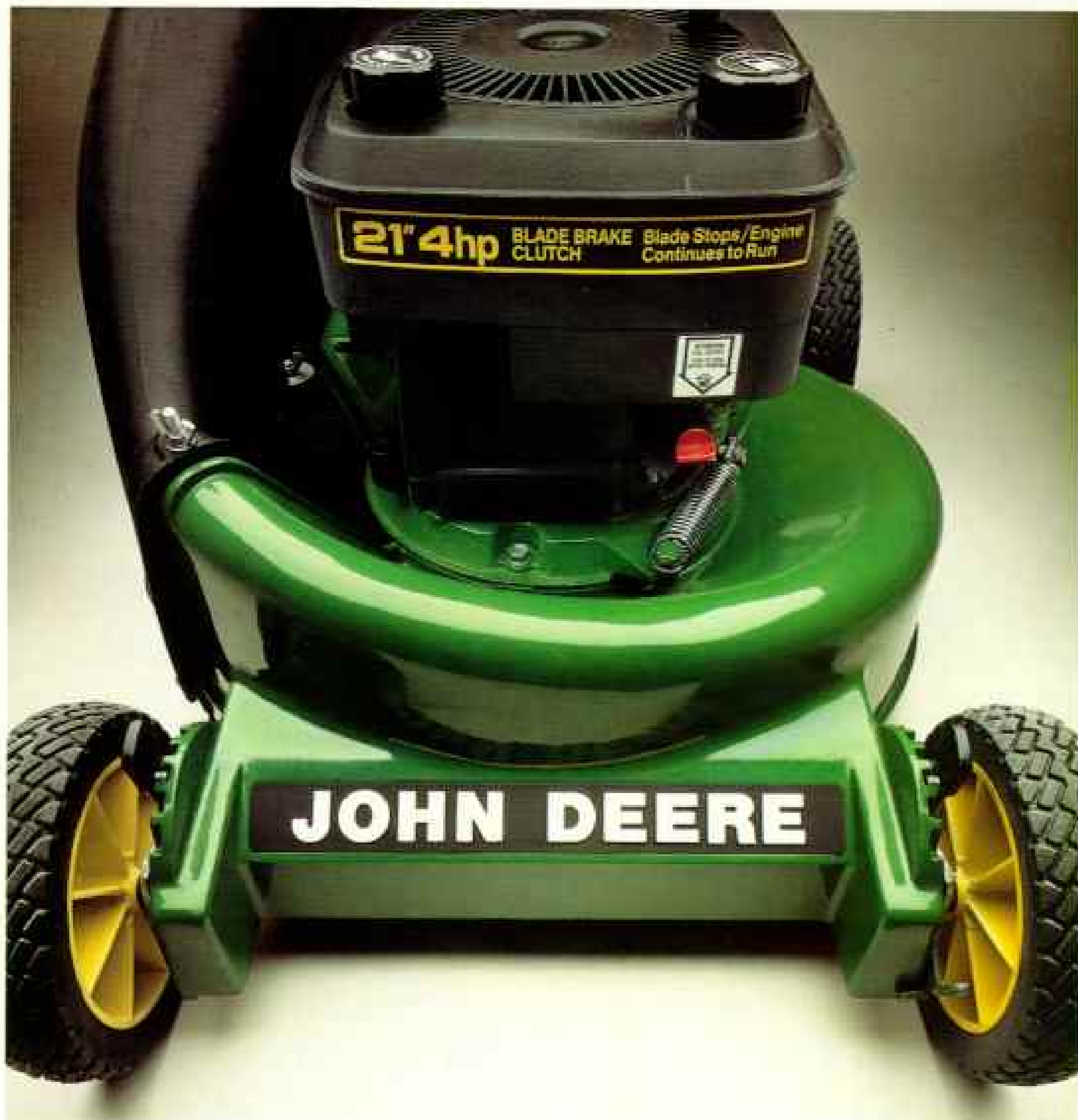
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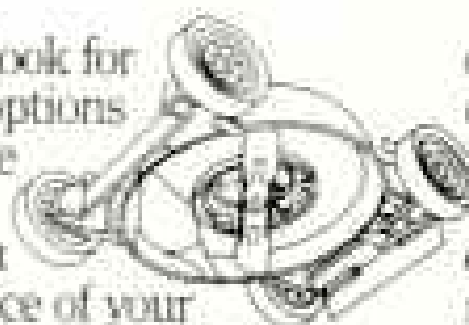
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