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THE NATIONAL GEOGRAPHIC MAGAZINE

Growing Pains Beset Puerto Rico

By WILLIAM H. NICHOLAS

With Illustrations by National Geographic Photographer Justin Locke

AS OUR plane gained altitude, Miami and Miami Beach spread out below us.* The sun shone brightly as we picked up speed and headed southeasterly over the open sea.

The Bimini Islands and Nassau soon flashed beneath us; next, to our left, we glimpsed San Salvador where Columbus made his first landing in the New World. From time to time we sped over low-lying coral islands, mostly devoid of human habitation.

Three hours out, straight on our course, we could see the Caicos Islands, then the Turks, and a few moments later, off to our right, the shore line of Hispaniola.

On U. S. Soil 1,000 Miles at Sea

Another hour and a half, and our objective, Puerto Rico, came into view. We spied the houses of Aguadilla clustered near the northwestern tip of the island.

As we descended, the tropical shore line became distinct—the surf beating against a palm-lined shore, the well-paved highway, waving fields of sugar cane, and off to the south the tree-clad mountains.

Then San Juan rushed up to meet us, its famous old fortress of El Morro outlined grimly at the entrance to the harbor (page 420). Beyond the frowning guardian stretched a modern city, with skyscrapers rising both in the old town and in the fast-growing Santurce district to the east. The marble Capitol gleamed in the sun (page 422).

As we banked for the landing, heavy automobile traffic took shape on Ponce de León Avenue. Bustling activity was visible at the docks where ships from the States, Latin America, and Spain tied up.

For nearly five hours we had flown away from the continent, 1,000 miles out over the Atlantic; but we were not landing on foreign soil. When we came down at San Juan airport we had arrived in the heart of a teeming metropolitan area of the United States.

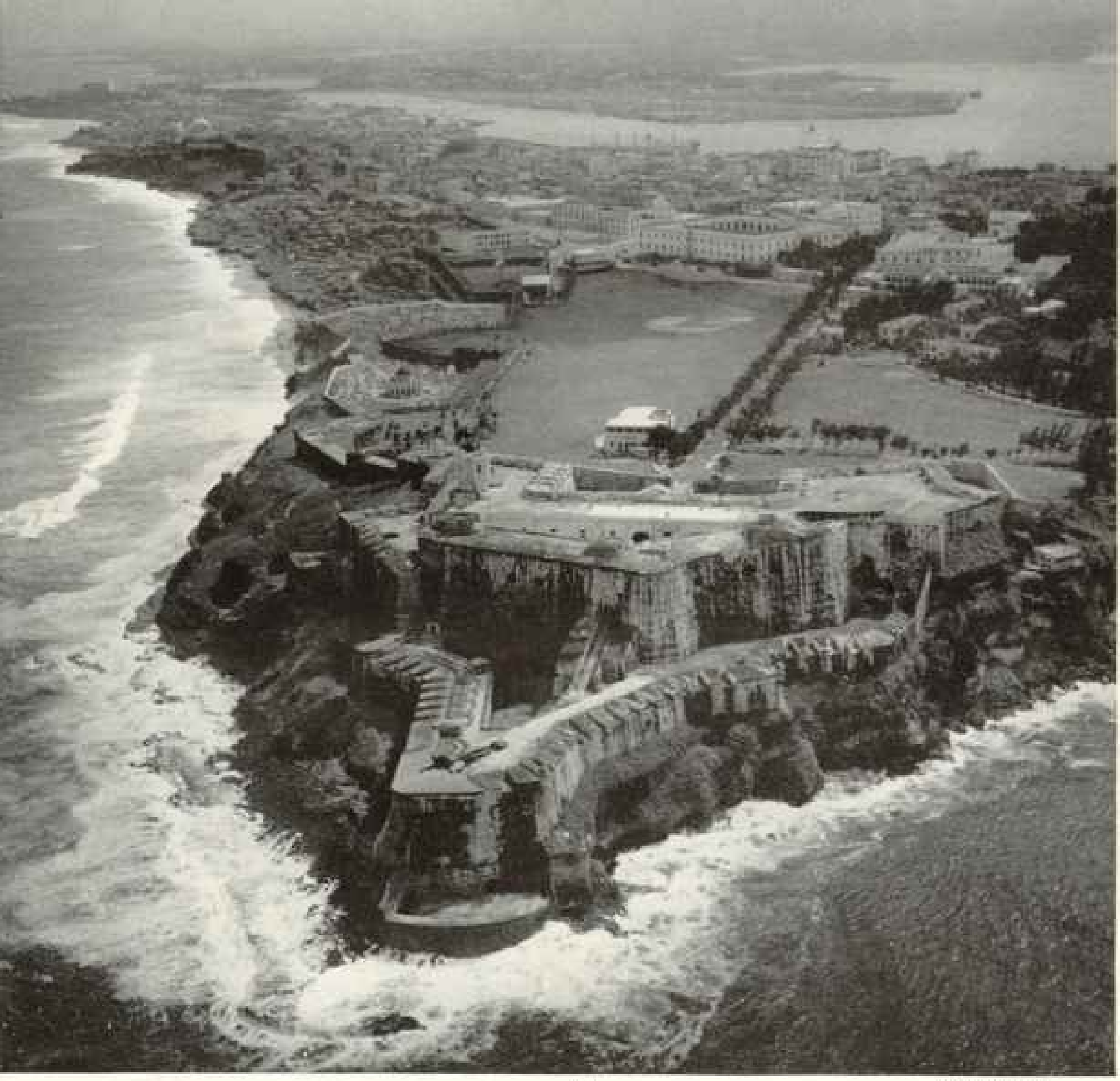
Puerto Rico, discovered by Christopher Columbus November 19, 1493, on his second voyage to the New World, is the easternmost of the Greater Antilles. One hundred miles long and 35 miles wide, it lies 70 miles east of the Dominican Republic and 450 miles north of Venezuela. The Atlantic Ocean washes its northern shores; the Caribbean Sea its southern (map, page 424).

Like the other Antilles, Puerto Rico is the summit of a submerged mountain range. Just offshore in the Atlantic drops one of the deepest chasms in the earth—Brownson Deep, more than 30,000 feet below the sea.

Ponce de León, who later discovered Florida and there sought the Fountain of Youth, founded the first settlement, Caparra, near the present San Juan, in 1508 and was Puerto Rico's first governor. The original inhabitants, the Borinquén Indians, soon disappeared, and the island was peopled by Spanish colonists and African slaves.

For four centuries Puerto Rico remained a part of the Spanish Empire, but in 1899 Spain ceded it to the United States as a result of the Spanish-American War. In 1917 Congress declared all Puerto Ricans to be United States citizens. During World War II 75,000 of them served in the armed forces, and three Puerto Rican regiments

* See "Miami's Expanding Horizons," by William H. Nicholas, NATIONAL GEOGRAPHIC MAGAZINE, November, 1950.



420 Hamilton Wright

Spain Four Centuries Ago Built El Morro's Thick Walls to Guard the Gate to San Juan

Every ship entering the harbor must pass the historic fortress. In 1595 El Morro (The Headland) defied Sir Francis Drake. Obsolete as a military work, it remains a shrine to every Puerto Rican (page 423). Fort Brooke, an Army camp, is built around the old parade ground. Normally it is manned by the 65th U. S. Infantry, a regiment of Puerto Ricans lately fighting in Korea. Suburban Santurce lies beyond the harbor.

distinguished themselves on the battlefields of Europe. Island regiments have also added new laurels fighting in Korea.

On January 2, 1949, Señor Luis Muñoz Marín was inaugurated as Governor. In the island's four and a half centuries of civilized history, its people had elected their own governor for the first time.

A quarter-century ago the influence of the United States was beginning to make itself felt in earnest.* A dozen years later the commingling of old and new was so pronounced that Puerto Rico had become a study in contrasts.†

Vivid contrasts still present themselves, but in decreasing numbers. Today, I soon learned, much of the island is modern. World War II gave it astonishing impetus.

San Juan's Spanish heritage, its beauty, and its progress are revealed to a visitor soon after arrival. As Justin Locke, National Geographic staff photographer, and I entered the airport, announcement of a departing plane

* See "Porto Rico, the Gate of Riches," by John Oliver La Gorce, NATIONAL GEOGRAPHIC MAGAZINE, December, 1924.

† See "Puerto Rico: Watchdog of the Caribbean," by E. John Long, NATIONAL GEOGRAPHIC MAGAZINE, December, 1939.

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Puerto Rico's First Elected Governor Works on the Terrace of His Fortress-Home

La Fortaleza, designed for war, has been the Governor's Palace since 1639, when it was rebuilt. Luis Muñoz Marin (reading paper) is the island's first Governor, Spanish or American, to be chosen by the people. Here he confers with Rafael Picó (left), chairman of the Planning Board, and Roberto de Jesús, Director of the Budget. His daughters roller-skate; their mother relaxes. Other callers wait beside the antique cannon.

sounded over the loud-speakers, first in English, then in Spanish. Spanish newspapers and magazines outnumbered English on the newsstands. Directions appeared in the two languages.

Both English and Spanish are taught in the schools, but Puerto Rico is essentially a Spanish-speaking community.

The air terminal itself is basically United States—a converted military hangar, for the Army Air Forces built the airfield during the war. Commercial airlines are using it pending completion of a huge new landing field and terminal building four miles east of Santurce. But the decorative motif is Spanish. The display of the Caribbean Crossroads Shop, set up by the insular government at the airport to acquaint travelers with the island's handicrafts, is wholeheartedly Spanish.

New Hotel Is Show Place

Through heavy traffic we drove past a palm-shaded U. S. Navy installation and the fashionable San Juan Yacht Club, now undergoing extensive improvements. We skirted tropical Muñoz Rivera Park and soon reached San Juan's newest show place—the $7,200,000 Caribe Hilton Hotel, a monument to Puerto

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Puerto Rico's Imposing Capitol Is the Product of Georgia's White Marble

Here the insular Senate and House hold their sessions. The building faces Ponce de León, an avenue named for Puerto Rico's first governor, who sought eternal youth in Florida. Italian and Tennessee marbles trim the interior.

Rico's efforts to increase its travel business and the island's newest social center (pages 428 and 449).

Operated by the Hilton Hotels Corporation, the new 300-bedroom hostelry is the most modern in the Caribbean area. It was designed by Puerto Rican architects and has a lobby entirely open to the cooling breezes which sweep in from the sea. The Caribe Hilton is located on a small peninsula at the eastern tip of old San Juan.

Across the Condado Lagoon rises the Condado Beach Hotel, which was built immediately after World War I. Here an energetic $1,300,000 face-lifting project has just been completed, marked by the addition of an Olympic-sized swimming pool, private bathing beach, new dining rooms and lounges, and a redesigned lobby decorated with murals from the brush of Hipólito Hidalgo de Caviedes, celebrated Spanish artist.

Santurce Resembles Cities on Mainland

The Condado stands in suburban Santurce, where more than four-fifths of San Juan's population of a quarter-million now dwells. Smaller hotels, apartment houses, and hundreds of new homes dot the area between the sea and Ponce de León Avenue, where a thriving commercial center has grown up in the last few decades, detached from San Juan proper. Here, too, rises the shining new Casino de Puerto Rico, noted for the striking Caviedes murals which embellish its spacious foyer and ballroom.

If a visitor forgets for a moment the tropical setting, the signs in Spanish, and the jalousies (wooden shutters resembling Venetian blinds), he may imagine Santurce to be the newer section of a half-dozen cities in continental United States.

The topography of San Juan's area in some respects suggests a miniature edition of New York's Manhattan and Bronx, except that whereas the two New York boroughs stretch from south to north, San Juan extends from west to east.

Old San Juan on its narrow island—the harbor to the south and the Atlantic on the north—represents Manhattan; Santurce sprawls out in Bronxlike fashion; San Antonio Channel, separating the old and the new, takes the role of the Harlem River.

El Morro, Grim Relic of Spain

Locke and I found old San Juan to be old only in the sense that New York or Philadelphia or St. Louis is old. For growing San Juan has kept abreast of the times.

Historic, indeed, are the grim fortresses of El Morro, on the headland guarding the approach to the harbor, and San Cristóbal, at the eastern end of the old city sea wall (pages 420, 440).

The Spaniards began to build El Morro in 1539. They did not finish the job for 67 years. Every bit of the fortress's enormous five-tiered pile of limestone, rising 140 feet, was carried to the island as ballast in Spanish ships. The 30-foot-thick walls sweep upward from an old gun platform, washed by the Atlantic, to the broad, windswept ramparts that crown the headland.

El Morro stood off the intrepid Sir Francis Drake in 1595. The English and the Dutch each succeeded once in capturing San Juan and holding it for brief periods, but they couldn't do it by a direct attack on El Morro.

Massive San Cristóbal didn't see as much warfare, but its tunnels and dungeons are intriguing. On the wall of one narrow cell, lighted only by beams penetrating a tiny ventilating shaft, are preserved the likenesses of seven Spanish galleons, painted by a luckless artilleryman confined there pending his execution for mutiny.

The two fortresses: the tiny fort of El Cañuelo across the harbor; and Casa Blanca, built in 1523 as a residence for Ponce de León, have been incorporated into the San Juan National Historic Site, under the jurisdiction of the U. S. National Park Service. Puerto Rico school children are brought to San Juan by bus to see these island memorials.

Old Fortresses in Use Today

But one need not think that they are mere relics. Detachments of Puerto Rico's famous 65th Infantry, encamped at Fort Brooke adjacent to El Morro, garrison the old fortress, which is equipped today to do duty in modern warfare. At San Cristóbal I saw U. S. Signal Corps installations and the island's Military Police headquarters.

Although Ponce de León never actually lived in gleaming Casa Blanca, his family owned it until 1773, when the Spanish Government took it over. Today, far from being uninhabitable, it is the residence of the Commanding General, U. S. Army Forces, Antilles.

La Fortaleza, now the Governor's Palace, originally was built as a fortress early in the 16th century. Reconstructed after a fire in 1639, it became the residence of the Governor and has so continued. In 1940 the building and its exquisite tropical gardens were restored at a cost of half a million dollars.

Still very much in use is the charming old Municipal Theater, built a century and a quarter ago and completely restored only re-

426 Drawn by Harry S. Ortner and Irving R. Allemann

Living Room Grows Scarcer for Puerto Rico's 2,211,000 Citizens

Easternmost of the Greater Antilles, the island stretches 100 miles long and 35 wide. It contains the same space as Rhode Island and Delaware combined, but holds twice as many people. Though many migrate to the States, congestion grows apace.

cently. Upper and lower tiers of boxes surround a horseshoe-shaped auditorium.

Here I heard the musical Trapp family, Austrian refugees whose home now is in Vermont, give a concert. The German-speaking Trapps concluded their presentations with a group of Venezuelan and Colombian folk songs in Spanish, which delighted the audience of Spanish-speaking citizens of the United States.

Old San Juan's teeming streets are narrow, and many of its business houses were erected a century or more ago. But merchandising is up-to-date. Nearly every product comes from the U. S. mainland, or "continent," as Puerto Ricans call it, and nationally advertised brands are available everywhere.

The 10-story Banco Popular dominates the downtown skyline. A large and imposing leaded-glass window lights its main banking room. From the perfectly appointed Bankers Club restaurant on the top floor I enjoyed a striking bird's-eye view of the city and bay.

The strong Banco Popular, with its numerous branches, is purely a Puerto Rican institution. Near it, in the downtown financial district, stand the modern buildings of the Chase National Bank and the National City Bank of New York, and also the houses of the Bank of Nova Scotia and the Royal Bank of Canada. Both of these Canadian financial institutions have had branches in Puerto Rico since early in the century.

But prosperous, bustling San Juan is not Puerto Rico. I knew the island was beset with growing pains and that it had serious economic problems to solve.

Puerto Rico's population in 1940 was 1,869,000. Now it has increased to 2,211,000. Its area is not much larger than Rhode Island and Delaware. If continental United States were populated as densely as Puerto Rico, it would have 1,900,000,000 inhabitants!

Modern medicine, hygiene, and transportation have cut the death rate materially. I was driving in the mountains with a Puerto Rican friend one day when suddenly I was startled by the wail of a siren. An ambulance soon sped past me.

A few years ago friends might have taken two or three days to carry that patient down from the hills to a hospital for treatment, and, if the case had been serious, death might have resulted.

Baby Born Every 5¾ Minutes

The birth rate in Puerto Rico has remained constant. A baby is born on the island every 5¾ minutes. Infant mortality has been drastically reduced.

"The main trouble with Puerto Rico," an island leader said to me in a spirit of oversimplification, "is that there are too many Puerto Ricans. We just don't have enough jobs to go around. Agriculture, and that means sugar, primarily, can't solve the problem."

One of the first men I met in Puerto Rico was dynamic Teodoro Moscoso, Jr., head of the Puerto Rico Industrial Development Company. This organization was set up by the insular government in 1942 to bring industry to the island and thus help reduce unemployment. Many Puerto Ricans are well-to-do; some are wealthy. But because of overpopulation unemployment never falls much below 80,000 and in slack agricultural seasons far exceeds that figure. Thousands of Puerto

Twanging Guitar and Rattling Gourds Blend in Rustic Concert

Puerto Ricans love *décimas*, 10-verse songs similar to Trinidad's calypsos; *plenas*, folk tunes; and *aguinaldos*, haunting Christmas carols. They call their guitar a *cuatro* (four), though it has six strings. Gourds, containing rattling beans, are known as *maracas*.

Ricans have never been gainfully employed.

Through his resourcefulness and energy, Moscoso has induced 100 industries, large and small, to locate on the island, thus furnishing about 14,500 new jobs. Other industry has arrived independently, to create more work.

Moscoso's first big development job, back in the war years, was to build a government-owned glass factory to manufacture bottles. The war produced a tremendous demand for Puerto Rican rum on the mainland. Since excise revenues on rum are returned to the island, Puerto Rico at last had a chance to realize substantial sums for its treasury. But something was needed in which to put the rum.

Moscoso was unable to get priorities for shipment from the United States of the modern machines needed to make bottles. He had built a plant, but he had no equipment for it. When all seemed lost, a delegation of Congressmen visited the island early in 1943.

Moscoso explained the island's plight to the delegation, which went back to Washington and worked successfully to get priorities.

The $4,000,000 plant was able to do its part in helping to export $84,000,000 in rum during and immediately after the war.

When I visited the glass plant, in a gov-

ernment industrial area of San Juan, it was running at top speed, turning out 35,000 gross of bottles of many types each month. An export trade in bottles of about $1,000,000 annually had been built up in the Caribbean area.

The Development Company also built a cement plant, a clay products plant, which were profitable, and a paper plant to make wallboard, which wasn't. The paper mill, a war measure, was designed to use bagasse, the waste of the sugar cane, as a raw material.

The next step was to sell these factories to private industry for the purpose of recovering the funds invested and using them again to build more factories.

The Ponce Cement Company, owned by the Ferré group in Ponce (page 459) acquired the four plants last October for $10,500,000.

Since the war, the Development Company's efforts have been aided by legislation which permits 12 years of tax exemption until June, 1959, to new industry.

Largest of the factories to be erected under this plan are the Crane China Corporation pottery and textile mills for Textron, Inc., operators of textile mills in New England and the South.

Girls Acquire Pottery Skills

The china factory, headed by Earl Crane, president of the Iroquois China Company of Syracuse, New York, had been in operation 13 months when I visited it.

Of the 465 employees in this ultramodern pottery, all but seven were islanders. Two-thirds had never had jobs before.

"We are trying to do in six months what it takes three years to do on the continent—make a skilled pottery worker," Mr. Crane said. "We preferred workers who had had no previous employment. It has been a wonderful experience. Puerto Ricans have a natural dexterity with their fingers.

"Changes in the girls in the decalcomania department have been amazing. They first came to work from their hill-country homes in worn and ragged dresses. After a week or so we could notice a little lipstick here and there, then some new shoes, then some new dresses. Look at them now."

And he beamed as he glanced at the rows of neatly dressed, dark-eyed girls, each performing her delicate task of transferring patterns to the pieces of china.

"Not only that," he pointed out, "but in many instances their wages represent their families' only income.

"In Syracuse," Mr. Crane went on, " 'decal' girls put the designs on the pieces, stacking the pieces one upon another as they finish. Then another girl comes along, picks up the stacks, carries them to a washing basin, and washes off the paper from which the design has been transferred.

"We tried to do that here, but we couldn't. The girls are too much interested in their work. They want to see how well they are doing their job, and how pretty the designs look. So we let each girl wash off her own pieces. She prefers it that way.

"Of course our production rate is not yet up to standards of the mainland. We still have entirely too many rejected pieces. But we are certainly making progress."

The Crane Company makes high-grade hotel china, most of which is shipped to the U. S. mainland.

The Textron plant in the city of Ponce, near the southern coast, went into active production on January 1, 1950. It now employs 450 learners. About 350 will be retained as permanent, experienced employees.

Another Textron mill, for weaving rayon and nylon, is being built at Humacao, near the eastern end of the island. It will be larger, with about 500 employees.

Other United States manufacturers who have built plants in Puerto Rico in recent months include the Beacon Manufacturing Company, one of the Nation's largest makers of blankets; the St. Regis Paper Company; and the Tennessee Knitting Mills.

Among the more numerous smaller enterprises are Brilliants, Inc., a diamond-cutting and polishing concern in a San Juan suburb, and Tycoon Tackle, Inc., makers of deep-sea fishing tackle, in Mayagüez, at the western end of the island.

Catching Up with Housing Demand

During World War II, building of U. S. Army and Navy installations in and near San Juan, together with other wartime enterprises, caused thousands of Puerto Ricans to move from the countryside and the small villages into the metropolitan area to obtain war work. Few left after the close of hostilities. No home building took place during the war. So San Juan was confronted with a desperate housing shortage, which has not yet been wholly alleviated. The same situation prevailed in the cities of Ponce and Mayagüez.

Of Puerto Rico's approximately 400,000 families, a fourth now live in congested urban areas in unsatisfactory surroundings. The island's new housing plan calls for building 30,000 new living units for them in the next six years.

This would seem to provide for a reduction

Kodachrome by Justin Locke

Who Needs Soda Fountains on Puerto Rico? Treat Your Friends at a Coconut Palm

Kodachrome by Justin Locke

Atlantic's Surf Rolls to the Doors of Hotels Caribe Hilton and Normandie, Two of San Juan's Bids to Travelers

The new Caribe Hilton (left) was designed by Puerto Rican architects; it is managed by the Hilton Hotels chain (page 449). Old San Juan crowds the distant end of the island. The wide patch of green is Muñoz Rivera Park. Docks line San Juan Harbor (left).

Crewmen Aloft on Her Yards, a Spanish Training Ship Glides Past El Morro at Sunset

For five days Spanish-speaking San Juan entertained *Juan Sebastián Elcano's* officers, cadets, and seamen. Every harbor whistle saluted the four-master on departure.

Lake Caonillas Is Man's Creation and Servant. Its Electric Power Turns Puerto Rico's Wheels

431 Kodachrome by Justin Locke

Salvador Cruz, Working His Lofty Corn Patch, Watches a Storm Break over the Cerro Morales

Puerto Rico Grows 10-pound Pineapples

Since World War II the island's pineapple industry has expanded so rapidly that production approaches 100,000,000 pounds a year.

Much of the fruit is processed in Puerto Rico canneries and shipped to the mainland.

This *cabezona* (big head) grew in the Palmarejo district, where soil and climate combine to produce whopping big pineapples. Elsewhere the fruit runs to normal size.

Bright Fish Ride to Ponce Market

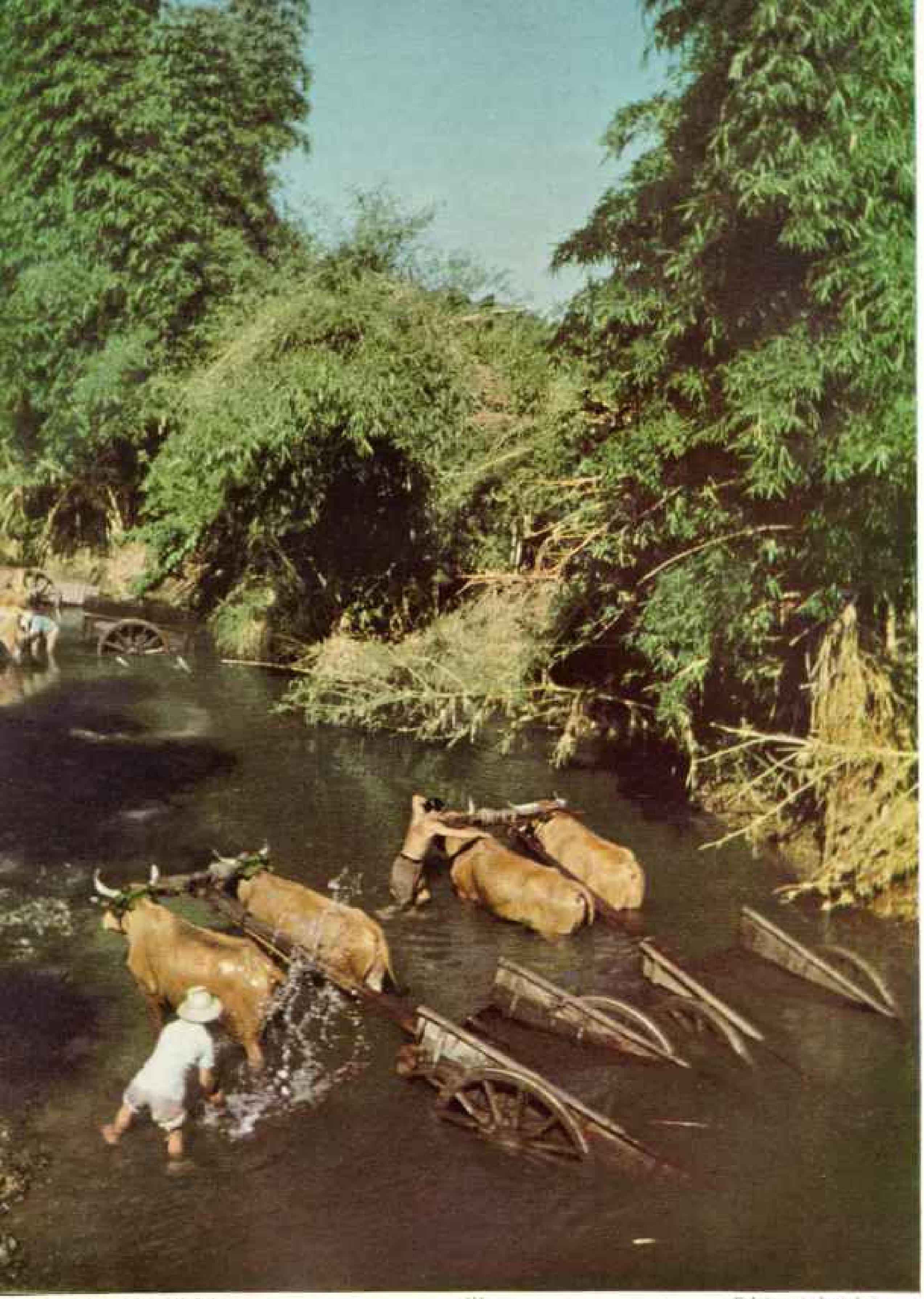
Commercial fishing is an old and thriving industry on Puerto Rico. Nicholas Carreras works the southern shore for his catches of *mero* (grouper).

Big-game fishing lures sportsmen to Mona Island, 50 miles west of Mayagüez, where schools of tuna swim within 100 yards of shore.

Barracuda, bonito, kingfish, mackerel, and shark offer other prizes.

Kodachrome by Justin Locke

Silvery Strokes of a Machete Fell a Sugar-cane Jungle



Kodachrome by Justin Locke

Day's Work Is Done. Weary Oxen Still Yoked to Carts Enjoy a River Bath

in slum dwellers to 70,000 families. But at the present rate of population increase the slums will have 12,000 new families by that time, so the net gain in new living quarters will amount to only 18,000. Of course private construction will add materially to the new homes available.

San Juan is making heroic efforts to eradicate its worst slum spot, the Mudhole, at the entrance to the Martin Peña Channel. Here, before and during the war, 70,000 squatters built nondescript homes ranging from mean shanties to more substantial dwellings. Some 1,500 of these houses have been moved bodily to the new San José housing development, and more are on the way. Shanties too poorly constructed to move are torn down as soon as new living quarters for the occupants have been found.

Houses are moved to San José free of charge, free paint is handed to the owner so he can spruce the place up, and free running water, shower bath, and sewer connections are installed. If the owner can afford to buy the lot, he can spread payments out over 20 years. If he does not choose to do that, he can rent the lot for from 50 cents to $4.50 a month, depending on his income.

37 Houses Built in One Day

In Río Piedras, San Juan suburb, a South Carolina engineer is engaged in an enormous single-family housing development. More than 4,000 four-room concrete houses have been erected and sold thus far. Price is around $4,000 each, which includes the cost of the lot at $1,200. Others are being built, and Leonard D. Long, the Charleston man backing the project, talks in terms of thousands more.

The houses are built of concrete poured in aluminum forms. Two men can lay the base strip for the walls in two hours and erect the entire walls in five days. In good weather, with a maximum of 5,000 workers on the job, Long has finished off as many as 37 houses in one day.

Called the Puerto Nuevo project, the development comprises 700 acres bought by Long for more than $1,000,000. Each house has a modern kitchen and running water. Because of the Puerto Rican climate, windows are not necessary. Metal shutters are sufficient protection. The whole development is crisscrossed by paved streets and a sewer system (pages 438-9).

Helping to alleviate to some extent both the unemployment situation and the housing shortage has been the postwar migration of Puerto Ricans to the United States. From 1941 through 1945 more than 27,000 came to the mainland. Since V-J Day five times that number have departed from their home island. Most of these have settled in New York City. Charter airlines vie for the migrant trade, charging fares varying from about $35 to $70.

In the heart of rapidly growing Río Piedras, which is a part of the San Juan metropolitan area and is more populous today than Wilmington, Delaware, I visited the University of Puerto Rico.

Its prewar buildings of Spanish architecture, with polychrome terra-cotta façades, are grouped around a quadrangle and dominated by an imposing 170-foot clock tower on the Administration Building. But new buildings of modern design, and less ornate, are rising on the campus to care for the institution's growing needs.

From 1920 to 1930, enrollment more than doubled; from 1930 to 1940 the new enrollment figure was tripled. Now, in the last ten years, that figure more than doubled again. Today 12,000 students attend courses here and at the University's College of Agriculture and Mechanic Arts at Mayagüez.

Some 2,000 are GI's, most of them in the Industrial School on the Río Piedras campus. This school is equipped with $2,000,000 worth of machine tools and other apparatus for courses such as mechanics, baking, and radio and electronics (page 447).

The famous School of Tropical Medicine in San Juan has recently been incorporated into the University. Most of its plant has been turned over to classrooms and laboratories for the new Medical School. First on the island, it will have about 50 students this first year. The 52-bed hospital of the School of Tropical Medicine has been converted into dormitories.

Heretofore, all Puerto Ricans wanting to study medicine had to seek enrollment in already crowded schools on the mainland.

University Owns Monkey Island

In taking over the School of Tropical Medicine, the University also acquired 37-acre Cayo Santiago off the eastern coast of Puerto Rico. Here dwells a colony of some 500 rhesus monkeys and their gentleman-in-waiting, Rafael Luis Nieva, only human being who lives on the island.

About 15 years ago the School of Tropical Medicine installed there two dozen rhesus monkeys brought from India. The hope was to raise a colony to supply monkeys for medical research. The climate suited them perfectly and they thrived and multiplied. Now there are too many.

Locke and I told Dr. Facundo Bueso, dean

of natural sciences at the University, that we would like to visit the island.

"Are you fellows as healthy as you look?" he asked. We assured him that we were.

"All right, then. But we have to be careful about our monkeys. No danger of their harming you, though. They're wild, but they will be afraid of you, since to them you will simply be bigger monkeys!"

Nieva met us at the Eastern Sugar Associates dock at Playa de Humacao with his outboard, and soon we approached the little landing on monkey island. Two or three monkeys strolled down to meet us. A dozen more looked us over from vantage points in trees as we climbed the hill to Nieva's bachelor quarters. We noticed the heavy screens on doors and windows.

"They would love to come in," he said. "But once inside, they tear the place apart."

Monkey King Deposed by Rival

Beyond the back porch, on a platform in an open shed, sat a big monkey with a badly disfigured face.

"I thought all these monkeys were extremely healthy," I said.

"He's the exception," Nieva replied. "He was king of the island until last week. Then one of the other chiefs beat him in a terrific battle that lasted an hour. I couldn't break it up. I even ran to the house, got my shotgun, and fired it in the air. That ran to cover all the other monkeys who were watching the battle, but the two fighters paid no attention. Finally this one knew he was beaten and ran away. Now he has to stick to his own section of the island."

The monkeys band in four distinct tribes, two large and two small. Each has a chief, and each lives aloof from the other tribes. But the king of the island is the chief that can beat the other three chiefs. He wanders over the whole area at will.

At 8 o'clock each morning, Nieva's four helpers from the mainland arrive with the day's menu of fruits, vegetables, and vitamin reinforcements. Each attendant places a large basketful of food on his head and solemnly strolls to the feeding place of one of the tribes. Its members run along with him, chattering noisily. It would never do to try to make all the monkeys eat together. The four tribes would fight it out to the death.

Nieva gave me a handful of dried corn, and I offered it to a score of monkeys that had gathered near the back porch. But only the king of the island approached for a tidbit. The other monkeys were not afraid of me; they were afraid of the king. So Nieva chased him away, and soon the other monkeys gathered close for handouts.

But these animals were very wary.

"I'll give you a dollar apiece for every one you catch," said Nieva. We left the island without accepting his offer.

Ascent to El Yunque

One of the most memorable drives in Puerto Rico leads from San Juan through the Luquillo Division of the Caribbean National Forest, a preserve of 65,950 acres in the eastern part of the island.

Locke and I set out on this journey one pleasant Sunday morning over good hard-surfaced roads. Driving eastward along the northern coastal plain, we passed grapefruit and sugar cane plantations and here and there a large dairy. On our right rose the Sierra de Luquillo, most imposing chain on the island, crowned by spectacular El Yunque, 3,494 feet above sea level, and slightly higher El Toro, loftiest pinnacle in the range.

Beyond the farming town of Carolina we crossed the Rio Grande de Loiza, one of Puerto Rico's largest rivers. It almost bisects the island. Twenty-five miles from our starting place, in the town of Palmer (Mameyes), we deviated from our course a few miles to Luquillo beach.

Although it was early in the day, hundreds of city dwellers had arrived and more were on their way to this favorite bathing and boating place, with its booming surf and crescent-shaped, palm-fringed sands.

Back in Palmer, we turned into the forest highway and began our ascent. As we passed the tumbling Rio Mameyes, women pounding their washing on the rocks and spreading it out to dry waved to us cheerily. Children along the roadside offered wild strawberries and flowers for sale.

A little farther up signs of a wetter climate began to appear, for this is a rain forest with rank, lush tropical growth. Average annual rainfall in the vicinity of El Yunque is about 180 inches, three times that recorded in San Juan. One year, rainfall measured 253 inches. About 133 heavy showers fall every month, but they last only 20 minutes on the average. Despite the heavy precipitation, rain falls only 6 percent of the time.

Soon we became aware of the graceful giant tree ferns, *Cyathea arborea*, along the sides of the road. Found only in the Tropics, some grow to a height of 30 feet.

At a point about five miles from the entrance to the park a spectacular view burst upon us as we entered a cleared area. Below, on our left, the tiny town of Luquillo hugged the At-

Caonillas Dam Harnesses Power for Western Puerto Rican Farms and Factories

Puerto Rico leads Argentina, Brazil, and Chile in per capita production of electric power. Dams now under way will irrigate 30,000 arid acres. Caonillas project was completed at a cost of $10,800,000 (pages 430-1).

lantic coast. Beyond stretched the San Juan capes (Cabezas de San Juan) and Cordilleras Reefs (La Cordillera), which form the northeast tip of the island. Farther to the east we could see Culebra Island, 30 miles away, which often figures in the maneuvers of the U. S. Navy's Atlantic Fleet.

On a clearer day, we were assured, we would have been able to see Crown Mountain on St. Thomas, one of the Virgin Islands, 55 miles away.

We continued our ascent to La Mina Recreational Area, 2,000 feet above the sea, where we left our car to stroll up a trail to the Baño Grande swimming pool. Hardier souls than we were splashing about in the chilly water. Trails wind through the dense forest here to groups of overnight cabins.

"Elfin Woodland" Crowns El Yunque

Now the summit of El Yunque was clearly visible, 1,300 feet above us. The peak is covered with dwarf growth known as "elfin woodland" because of its similarity to fairy-tale forests. The trees were fuzzy with moss —on their trunks, branches, twigs, and even leaves. Bejuco de palma vines (*Marcgravia* sp.) encircling the trunks bore showy, candelabralike flowers and fruits. Thousands of pineapplelike epiphytes, or air plants, were

Puerto Nuevo, City of Concrete, Springs Up Like Magic in Rio Piedras

Houses are built of concrete poured in aluminum forms. Two men lay the base strip in two hours and erect the walls in five days. One day saw 37 houses completed. Each unit sells for about $4,000 (page 435).

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Puerto Rico's Single-family Housing Projects Call for 10,000 Dwellings

This vast development does not begin to answer the island's desperate housing shortage. One hundred thousand families live in congested areas, some in shanties. A Charleston, South Carolina, builder backs this project.

Hamilton Wright

Plaza Colón, San Juan's Columbus Square, Sees All Urban Buses Come and Go

Old San Cristóbal fort (right) fired Puerto Rico's first shot in the Spanish-American War. Spanish defenders aimed it at the auxiliary cruiser *Yale*, one of Admiral William T. Sampson's besieging ships.

growing in the branches. The forest, which is accustomed to 60-mile-an-hour winds every few days, is hurricane-resistant.

The U. S. Forest Service also operates the Toro Negro Division of the Caribbean Purchase Unit, which lies in the center of the island, about 35 miles southwest of San Juan.

Puerto Rico has about 500 native species of trees, and many of them are found in these forestry preserves. Only a very few are native to continental United States. Most of the 500 are evergreen. Among the many varieties of hardwood, mahogany, though not native to the island, is now planted on a small scale.

We saw (and heard) Puerto Rican parrots (*Amazona vittata vittata*) near El Yunque. The predominantly green birds, less than a foot long, once were common throughout the island, but today they are found only in the Sierra de Luquillo. The Puerto Rican crow (*Corvus leucognaphalus*), nearly exterminated, also has made its last stand here. Puerto Rican tanagers, the bare-legged owl, and the scaled pigeon are encountered more frequently.

New Airport to Handle 500 Flights Daily

On our way back from El Yunque, Locke and I passed the site of San Juan's new airport, barely discernible in the dust raised by trucks moving earth from the landing strips. The new field, to cost about $12,000,000, will be able to handle 500 flights a day, as the main funnel through which many air operations will pour between New York and Latin America. Plans call for two 8,000-foot runways, one equipped for instrument landings.

One morning Locke and I started out from San Juan on a drive which was to take several days, leading us to the northwestern tip of the island, then along the western and southern coasts as far as Central Aguirre (page 459), and back to San Juan over the mountains by way of Caguas.

Our smooth road along the north coast had been built as a military highway during World War II.

The first ten miles we had traversed before, since we had visited Bayamón, a town of some 20,000, on Good Friday to see the religious processional there (pages 450, 451, 457). The Church of the Holy Cross in the plaza, built some 200 years ago, marked the establishment of the town.

One of Puerto Rico's outstanding artists, the painter Francisco Oller (1833-1917), was born in Bayamón. Were he living today, he would view with unconcealed interest the striking painting over the altar in the church—a modern conception of the Crucifixion from the brush of a Dutch priest stationed in the parish in recent years.

The cross is a gnarled branch; the body of Christ in tortured shape is affixed to the branch. The predominating hue in the canvas is a deep purple. The whole conveys a sense of anguish that is overpowering.

From Bayamón we drove westward along the coast, past extensive fields of sugar cane. It was harvesttime. Lines of men armed with machetes attacked the cane (page 433). Along the roads we passed huge trucks, horse-drawn wagons, and oxcarts, all heavily laden and proceeding to the nearest *central*, or sugar mill. Often railroad tracks paralleled the road, sending spurs into some of the fields. Cranes loaded the waiting cars with cane, and small engines pulled them off to the mills.

We left the main road to drive through the by-passed villages of Vega Alta, Vega Baja, and Manatí, each centering about its plaza, at one end of which stood the church.

At Arecibo, one of the island's oldest cities, settled four years before the Pilgrims reached Plymouth, our progress was impeded by long lines of trucks converging on the two sugar mills there.

At the northwest tip of the island the military highway came to an end at Ramey Air Force Base, permanent base built during World War II and now headquarters for the 24th Composite Air Group. Remote yet self-sustaining, the base has a business plaza with a group of stores, including a beauty shop for the wives of airmen. Since the war the base has been improved and now boasts a golf course and a palm-fringed bathing beach.

Just Where Did Columbus Land?

Generally speaking, the military layout of Puerto Rico comprises the Air Force at the western end, much of the Army near San Juan, and the Navy, a part of the 10th Naval District, at Roosevelt Roads, on the east end.

Driving south along the indented coast, we entered Aguadilla, gateway to an interior agricultural region. We visited near-by Parque de Colón, on the banks of the Culebrinas River, and learned that Columbus had made his original landing there. A cross marks the alleged spot.

Later, at Aguada, we saw another cross at the foot of Colón Street, also marking the original landing of Columbus; and farther along the west coast we found a third. We heard there were more. But at each disputed location the sea view is superb!

The Way Sugar Is Made

Near Mayagüez we inspected the Central Igualdad, one of the larger of Puerto Rico's 34 sugar mills. A huge refinery adjoins the mill. We saw a hundred laden trucks standing in line, waiting their turn at the receiving center.

A crane picks up a truckload of cane in a single gulp and deposits it on a moving chain. Swiftly it is carried into a series of revolving knives, then crushed by another series of heavy rollers, or mills, which extract about 95 percent of the juice. The bagasse, or residue cane, goes directly into the furnaces beneath the huge boilers as fuel.

The juice is treated with milk of lime, heated, and pumped into a clarifier. Later it is boiled into a syrup, then further boiled in vacuum pans under low pressure, whereupon it turns into a mass with a large proportion of sugar crystals. This is known as A sugar.

In further steps, the mother syrup is separated from the crystals, which take on the familiar appearance of raw, or brown, sugar. The residue from the various clarifying processes is known as final, or blackstrap, molasses.

By the time Locke and I had toured the central and the adjoining refinery, we were exceedingly hot and thirsty. We gratefully drank a glass of cold *guarapo*, or pure cane juice, handed to us as we entered the cooler area of the mill's laboratory. But we were cautioned not to drink too much—cold guarapo is delicious, but it also possesses laxative properties.

Of the 14,000 sugar cane growers in Puerto Rico, the big majority raise only a few tons each. Most of the production comes from a few large landowners. Eight to nine tons of cane produce about one ton of sugar. A central like Igualdad has a capacity of about 3,000 tons of cane in a 24-hour day.

Growers deliver their cane to the mills for processing, and are paid on the basis of about 65 percent of the proceeds from the sugar it yields. The higher the sugar yield, the higher is the price paid for the cane.

Production and marketing of sugar, both

raw and refined, are subject to the Federal Government's quota system. Average annual output of raw sugar for the last 10 years was 986,500 tons. The island's quota is 910,000 short tons, raw value, of which about 126,000 tons may be sold in refined form in continental United States. Puerto Ricans themselves use about 100,000 tons yearly.

Minimum wage rates for cane-field workers are set by the Secretary of Agriculture under the Sugar Act of 1948, and also by the island's Minimum Wage Board.

Needleworkers of Mayagüez

Mayagüez, fourth largest city on the island, is the center of a big sugar-producing area, with a seaport for shipping it to the United States.

Mayagüez is also the center of the needlework industry, which now employs about 70,000 women. Needlework is considered by many students to be second in importance only to sugar from an economic standpoint.

During World War I, when European and Asiatic markets for embroidery and drawn work were cut off, two small factories were opened in Mayagüez and Ponce to produce women's cotton underwear and blouses. A year later table linens were added and then handkerchiefs.

After the war, to hold the business, manufacturers taught the dexterous Puerto Rican women and girls how to do French hand rolling, bullion, and many other fancy stitches. This was not too difficult to do, for the island long had been noted for fine embroideries. Hand-sewn gloves became another important product.

By 1927 the industry was thriving. It suffered from the depression of the '30s, prospered again during World War II. But today serious competition from China, the Philippines, Madeira, Czechoslovakia, and even Japan, is causing apprehension.

I talked with genial Sam Schweitzer, president of the Puerto Rico Needlework Industry Association, in his Mayagüez glove plant. Near us scores of women had gathered at the distributing center to receive consignments of gloves to be taken home and finished or to turn in completed pairs.

"Island needlework is a home industry," Mr. Schweitzer said. "In the rural sections wages from needlework often represent a family's only income during the dull season in sugar, when the men are out of work. Seventy-five to 80 percent of the millions of dollars brought to the island by needlework exports is paid out in wages to these home workers.

"Hygienic conditions in thousands of rural homes have been notably improved, since homes must meet definite standards along this line before materials may be taken into them for sewing."

Bamboo Creates Industry

An Experiment Station of the U. S. Department of Agriculture at Mayagüez tests new agricultural products for the island and improves old ones.

For example, bamboo is not native to Puerto Rico. One species, *Bambusa vulgaris*, introduced more than a century ago, flourished. I saw 30 species and varieties established on the station grounds. Now several industries utilize various types in the manufacture of fishing rods, furniture, picture frames, lamps, and ladies' handbags.

The station also is experimenting in the cultivation of the bay rum tree *(Pimenta racemosa)* on steep and rolling land which today is virtually profitless. Bay oil, distilled from the leaves of the tree, is a component of bay rum lotion.

To replace acreage formerly devoted to growing coffee, an industry curtailed in recent years because of hurricanes, improper care, and sharp competition, the station is studying the possibilities of vanilla culture.

In vegetable growing, much study has been given to new varieties particularly adapted to Puerto Rico's climate and soil. Particular attention has been paid to cucumbers, eggplant, lettuce, okra, peppers, pumpkin, squash, sweet potatoes, and, above all, tomatoes. Yams from tropical Asia have been found to be better and more prolific than native yams.

Giant Pineapples Twice Normal Size

The pineapple industry has assumed a growing importance since World War II. In the southwestern section "giant" pineapples, twice the size of normal fruit, have been raised (page 432). Annual production of pineapples is approaching 100,000,000 pounds. Much of it is canned on the island.

From Mayagüez to Ponce we skirted the western and southern coasts, stopping near Cabo Rojo to chat with fishermen (page 432), and pausing in San Germán to visit what some Puerto Ricans believe is the oldest Christian church in the New World. Porta Coeli was built by, and for, Indian slaves as a mission church in 1511, three years after the settlement of Puerto Rico. It is not now in use, but plans have been drawn for its restoration.

Arid southwestern Puerto Rico now is the scene of a $24,000,000 hydroelectric and

Kodachrome by Justin Locke

Mantilla-covered Señoritas Preserve the Flavor of Old Spain in Barranquitas

Kodachrome by Justin Locke

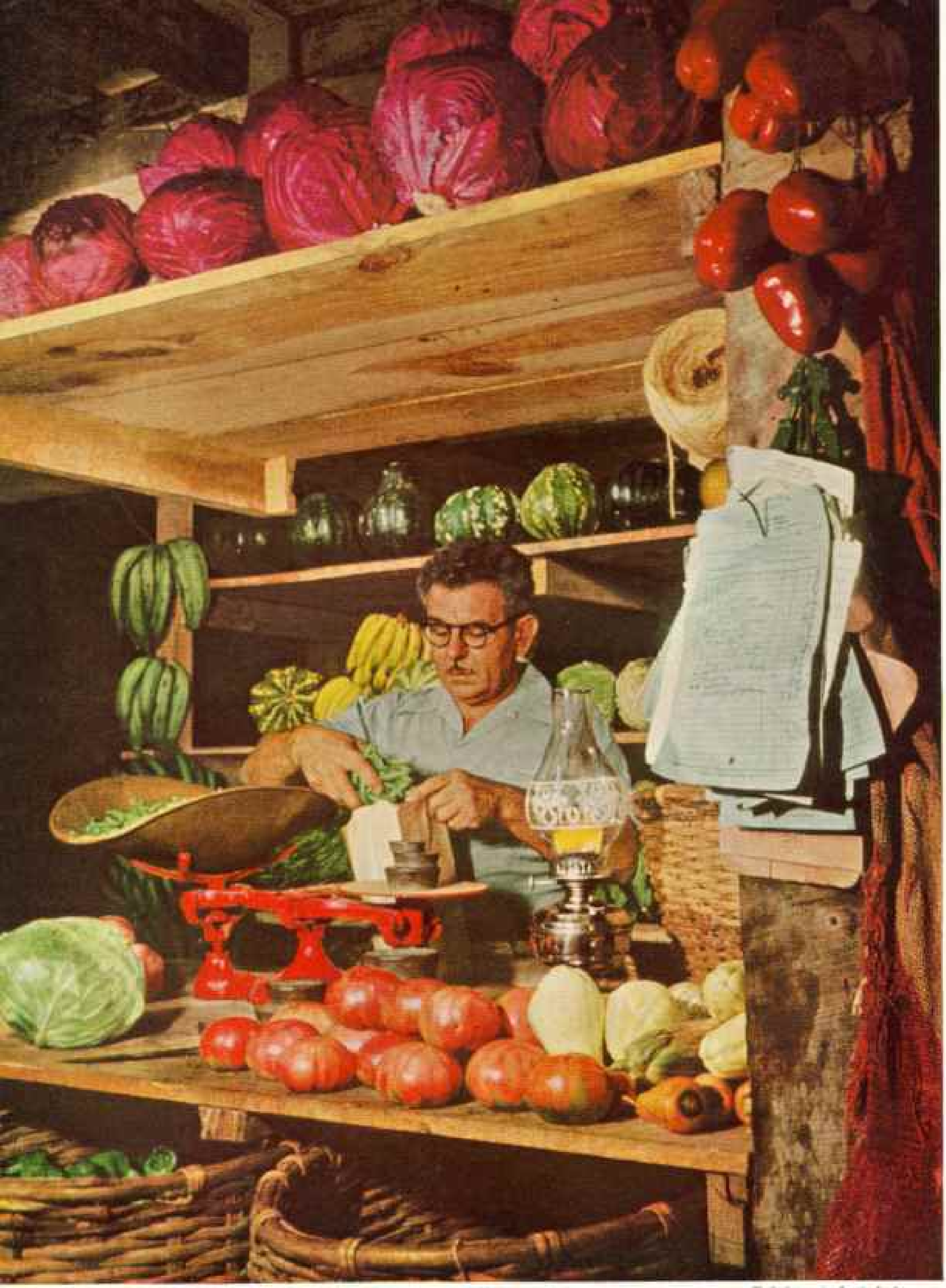
Ominous Clouds Rolling over the Mountains Bring Rain to Refresh Toa Baja's Young Sugar Crop

Central Constancia, one of Puerto Rico's 34 sugar mills, lies on the Rio de la Plata a few hundred feet from the old town of Toa Baja (left).

Flamboyant Trees Throw a Dazzling Archway Across Puerto Rico's Southern Coastal Road

Also called royal poincianas, the trees are native to Madagascar. Puerto Rico has planted many along its highways. Starting in May, they make a lovely sight (p. 452).

Kodachrome by Justin Locke



Kodachrome by Justin Locke

A Farmer Weighs His Stringless Beans, Red Cabbages, and Tomatoes under Lamplight

Starting his truck garden two years ago, Antonio Natalie surprised even the experts with his prodigious crops. Working at a 3,000-foot altitude, he has no trouble growing head lettuce and other nontropical vegetables.

Raw Sugar Cane: Who Wants Better Candy?

Puerto Rico babies munch the ripe cane before they learn to walk. Town boys pluck stalks from passing carts and, if a laden truck is left unattended, they leap aboard, as these lads did.

Guarapo, the sweet juice squeezed from ripe cane, makes a refreshing iced drink.

Ex-GI's Frost a Cake

Puerto Rico's Department of Education maintains at Rio Piedras an industrial school for 2,000 former servicemen. They receive instruction in electronics, mechanics, carpentry, and other crafts.

The baking course is one of the most popular. Cake frosting, however, baffles 75 percent of the tyro chefs, says the instructor, Hosmel Galán (center).

Kodachromes by Justin Locke

Mayagüez Spreads Out Before Bathers in a Mountaintop Pool

Earthquake, tidal wave, and fire virtually destroyed Mayagüez in 1918, but undaunted residents quickly restored it.

Today Mayagüez is Puerto Rico's fourth city (population: 59,000). Cargoes of sugar and rum call ships to its busy docks.

Another important industry is needlework. Distributing centers pass out unfinished handkerchiefs, gloves, table linens, and lingerie for delicate embroidering and hand stitching by women working in their homes. Such home industry helps 70,000 Puerto Ricans gain a living.

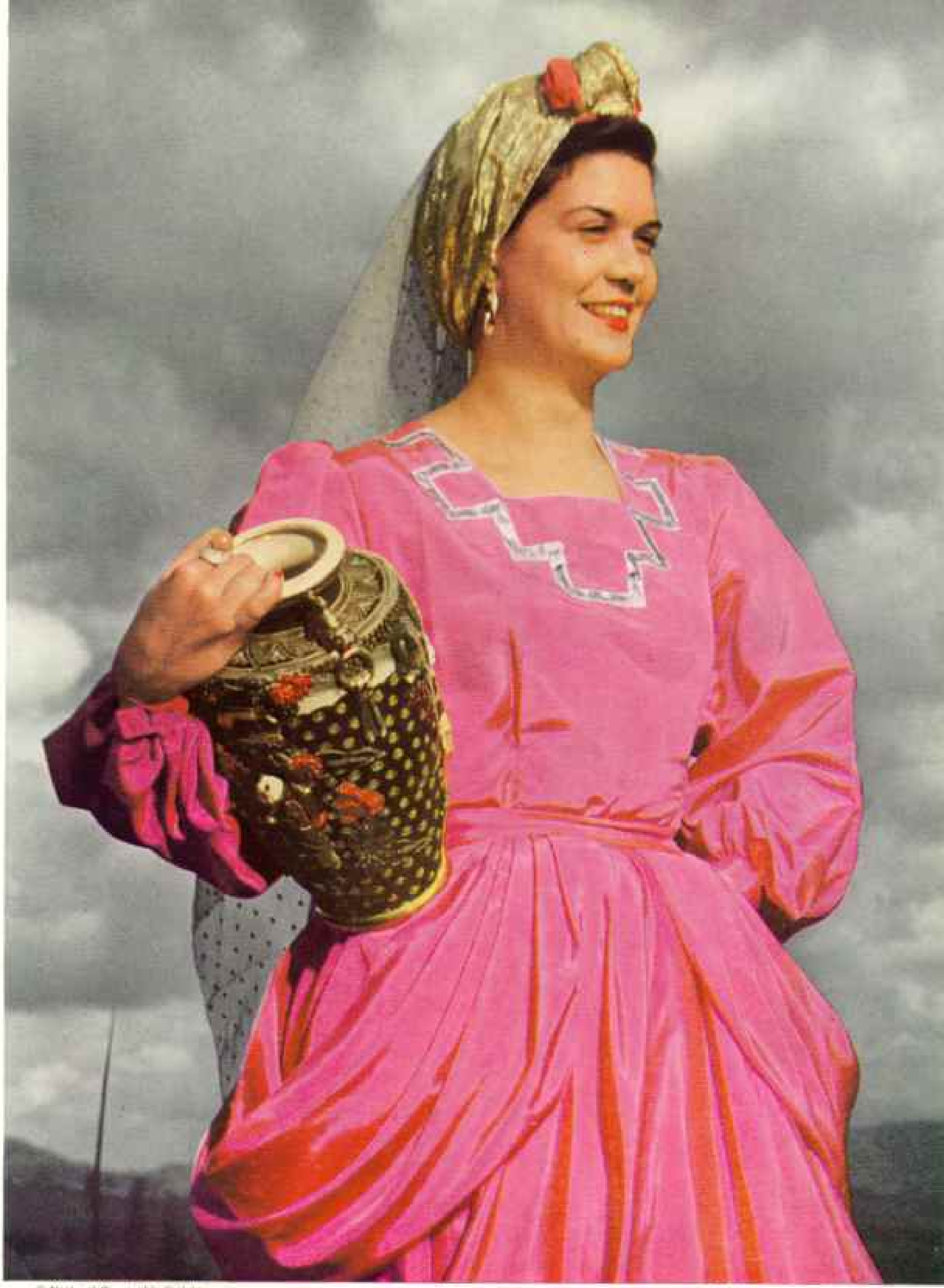
Here Mrs. Miguel García Méndez (extreme right) entertains guests on the terrace of her home atop Cerro Las Mesas.

Water Cyclists Pedal Past the Caribe Hilton. All 300 Rooms Face the Atlantic; Each Has Its Private Balcony

This $7,200,000 hostelry, Puerto Rico's newest social center, stands on a promontory. Sea breezes sweep through its open lobby.

Carmen Dresses as a Nazarene for the Good Friday Procession in Bayamón

All during the year the village seamstresses lavish fond attention on their daughters' costumes for *El Santo Entierro* (the Holy Burial).



Irza Portrays the Woman of Samaria, Who Gave Jesus a Drink from Her Waterpot

Bayamón's procession is the most spectacular of all the island's Holy Week and Easter rites. Each year it attracts hundreds of visitors, many of them from near-by San Juan (page 457).

Kodachrome by Justin Locke

Pulling, Pushing Boys Move a Cask of Water up the Color-splashed Villalba-Manatí Highway

Flamboyants brighten so many roads that it is hard to tell where the loveliest ones abound. They have spread across the frostless world.

Tropical Maricao's Junior High School Dispenses with Glass. Shutters Exclude Glare, Wind, and Rain

Puerto Rico, having earmarked about 40 percent of its budget for education, is engaged in a vast school-expansion program. In the last seven years it has placed 100,000 additional children in classrooms. Notwithstanding, four youngsters in every ten get no formal education.

Kodachrome by Justin Locke

Crude Sugar Moves in Bulk. Suction Pumps, By-passing Bags and Stevedores, Load the Ship

War's shortage of jute bags created a major problem for refineries. This new method lessens dependence on the Indian product. Here Central Aguirre loads the freighter *Marina*. A laboratory helper takes samples.

Kodachromes by Justin Locke

↑ **Salt, Evaporated from Sea Water, Wheels to the Drying Stack**

Cabo Rojo fields' brine is so hard on shoes that many workers adopt makeshifts or go barefoot. A fresh-water bath is an after-work necessity.

↓ **Hanks of Maguey Fiber Become Bright Mats and Rugs**

San Juan's Fiber Textile Shop is one of many set up to create jobs. It imports cotton yarns from the mainland, but takes maguey from the native soil.

Kodachrome by Justin Locke

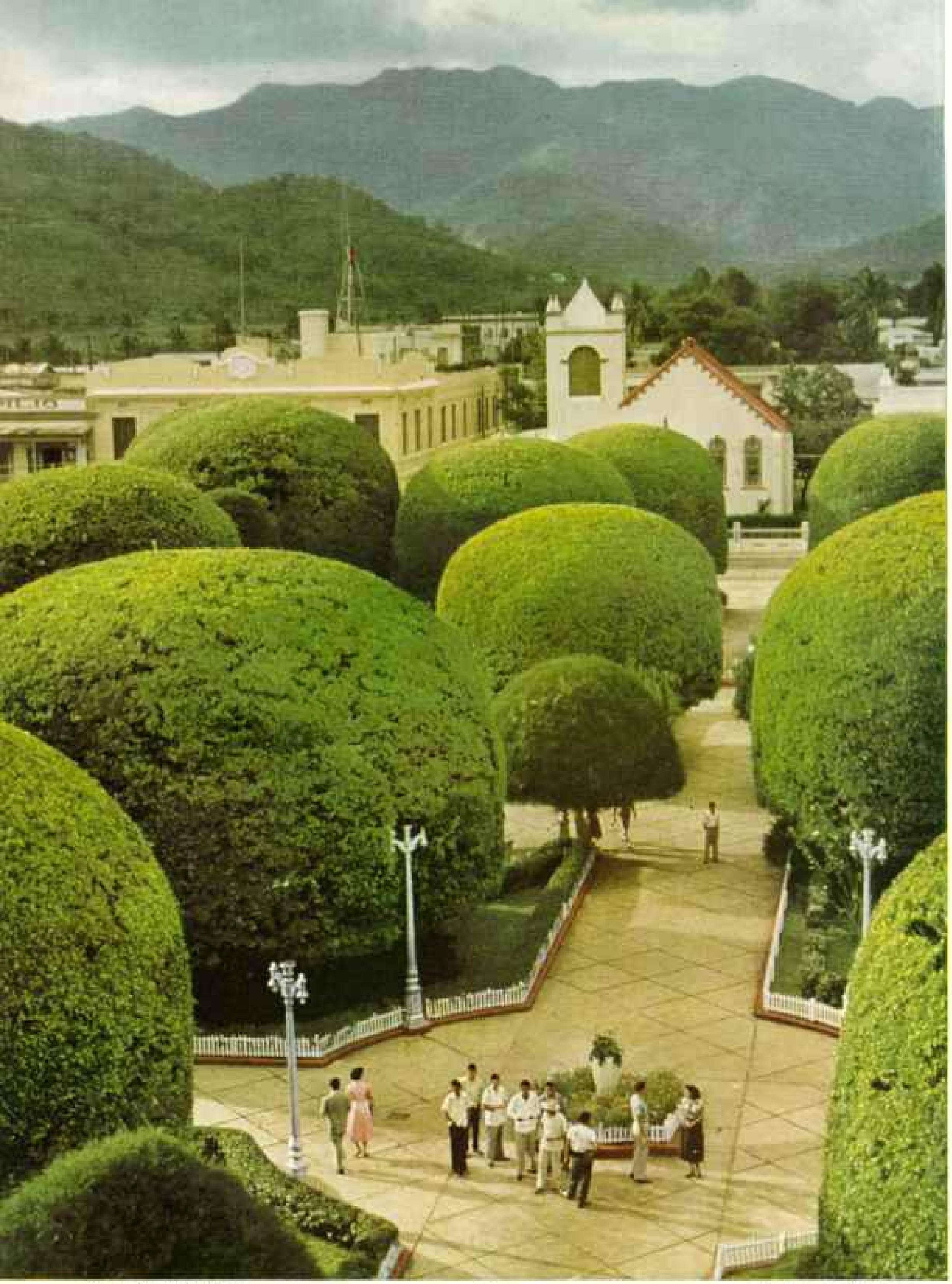
Spouting Figurines Enliven Juana Díaz's Plaza

Juana Díaz owes its name to a benefactress who, deeding land for the townsite, stipulated that it be called after her. Luis Llorens Torres, the poet, was born here. Virtually every Puerto Rican town duplicates the setting—church, plaza, and fountain.

Bayamón's Good Friday "Angels" Wear Chicken-feather Wings

With 12 other angels from Santa Rosa School, these girls took part in the procession (pages 450 and 451). Each regarded her selection as a signal honor. Right: The young salesman, in interior Aibonito, peddles lilies to passing motorists.

Kodachromes by Justin Locke



Kodachrome by Justin Locke

Guayama Clips and Shapes Its Jagüey Trees into Living Sculptures

The trees are a variety of banyan. Their leafy outer branches conceal a criss-cross of naked limbs. In this plaza a small tablet (not shown) honors an Ohio regiment which took Guayama during the Spanish-American War.

irrigation project, which is expected to add 30,000 acres of productive soil.

Five mountain reservoirs and two power stations will be part of the system designed to bring water from the mountains into dry Lajas Valley (Valle de Lajas), which contains some of the best land (pages 430-1, 437).

Locke and I early came to the conclusion that Ponce deserved its title of "Pearl of the South."

On one side of the double plaza stand ancient one-horse coaches, each with its *cochero* (coachman) sitting calmly on the box awaiting arrival of a fare. A leisurely trip in one of the old conveyances reveals fine residential sections, gardenlike parks, first-class hotels, a large public market, and expanding industry.

Factories are not new to Ponce. Alcohol distilleries, and plants for the manufacture of rum, candy, crackers, soup paste, bay rum, and hats help furnish employment in this city of 100,000.

Ponce's Self-sufficient Iron Works

Even larger are the interests of the Ferré family, whose Porto Rico Iron Works, employing 350 men, was established a generation ago.

Luis Ferré, spokesman for the family, takes pride in the economic stability of his workmen, many of whom own their own homes. His recital of workers' benefits, retirement plans, safety precautions, and health safeguards parallels that of any modern industrialist on the mainland.

Ferré also takes pride in the self-sufficiency of his plant.

"If we were located in St. Louis, for example," he said, "we would not have to be self-contained. There, if any order requiring special work came in, we could sublet such phases of the job to any one of a half-dozen specialists with plants across the street or down the block. Here we have to do all the work by ourselves, which means we must have many types of machines and equipment."

Jobs under way when I visited the plant included a contract for 22 huge gates for a new power dam, each with 32-foot-long precision hinges of a special hard steel; heavy sugar mill equipment; and a 10,000-ton steel fertilizer lighter to be delivered at the water's edge after a trundle of more than three miles through Ponce streets.

The Ferré family also operates the Ponce Cement Company, employing 200 men; a trucking company; and the Puerto Rico Marine Corporation.

Now their interests have been extended to San Juan with the purchase of the four government-built plants there (page 426).

One of the Iron Works contracts not long ago called for the steel to be used in erecting a million-dollar baseball park grandstand in Ponce. Puerto Ricans are devoted almost fanatically to the game, known to them as "beisbol." And they have added new expressions to the bright lexicon of the sport.

Bomberos Heroes of Ponce

Ponce takes extreme pride in its firehouse and fire fighters (*bomberos*). The fire department was formed in 1883. A few years later a church fair was held in the town. On ground in the rear of the church was built a fanciful wooden display pavilion, garishly painted in red and black, the city's colors. It was to have been torn down after the fair, but instead the bomberos moved in, equipment and all, and no one has been able to budge them since. It's the biggest tourist attraction in town.

The bomberos, wearing black patent-leather helmets and red flannel shirts, and carrying swagger sticks, take turns of an evening pacing back and forth in front of the firehouse, impressing all promenaders who pass by. But, with the exception of one or two old pieces kept as antiques, their motorized fire-fighting equipment is strictly modern.

Farther eastward along the coast we came upon the Central Aguirre, third largest sugar mill on the island.

Here, for the first time, we found sugar shipped in bulk. It was being loaded into gondola cars at the mill and carried over a pier to a waiting ship where it was sucked into the hold (page 454).

The great advantage, of course, is in the elimination of the bagging process. Value of such a method under World War II conditions, when jute for sugar bags was unobtainable from India, is obvious.

Hail and Farewell to Middies from Spain

We returned to San Juan in time to see renewed evidence of Puerto Rico's Spanish heritage.

In our absence the *Juan Sebastián Elcano*, Spanish naval training ship, had come into port. The four-masted schooner, named for the man who sailed Magellan's *Victoria* home to Spain in triumph, was manned by 24 officers and 200 sailors. Aboard were 53 Spanish naval cadets.

San Juan had wined and dined their Spanish guests lavishly during their stay. In their spick-and-span white uniforms they were conspicuous at the Casino de Puerto Rico, the

A Few More Turns of the Spit, and This Family Will Dine on Roast Pig

Most any fiesta or picnic calls for *lechón asado*, barbecued pig. Many a roadside stand specializes in the delicacy. These Barranquitas folk celebrate a christening. The guest of honor sits in her grandmother's arms.

Escambrón Beach Club, the Yacht Club, and the hotels. The time had come for them to say good-bye.

Five hundred people crowded the dock to wave farewell as the ship moved out to the channel, colors flying and band playing (page 429). Other hundreds lined the sea wall. Ships in the harbor tied down their whistles in salute. *Juan Sebastián Elcano* was bound for Venezuela, New Orleans, Ireland, and home. Nowhere would she receive a heartier welcome than in San Juan.

Puerto Rico is a part of the United States. Her sons die on the field of battle for Old Glory. But who can doubt that deep sentimental attachment still lingers for the land whose mother tongue most Puerto Ricans speak?

Notice of change of address for your National Geographic Magazine *should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your June number, The Society should be notified of your new address not later than May first. Be sure to include your postal-zone number.*

Portrait of Indochina

By W. Robert Moore and Maynard Owen Williams

TO UNEASY old Asia, war is not new. Today it trembles with forces more portentous than any since the Mongol hordes overran much of it and galloped westward beyond Moscow.

Now Indochina, like Korea, is a trouble spot. In mist-draped Tonkin mountains, piled against China's southern frontier like craggy peaks portrayed in famous Sung paintings, there is fighting.

Here Annamese underground forces, led by Moscow-trained Ho Chi Minh and bearing arms supplied by Communist China, are carrying on an organized guerrilla campaign against the French and the recognized government of Viet Nam (pages 463, 487).

News dispatches carry such strange-sounding names as Langson, Caobang, Locbinh, and Laokay, for French troops stationed in Indochina have been forced to abandon outposts guarding the slender mountain passes that stretch like fingers from the flat open palm of the rice-rich Red River delta.

Human Geography in Paintings

The accompanying 16 pages of paintings by Jean Despujols give a geographical and human portrait of this embattled land.

Having won the Indochina Prize for painting, founded by the Economic Council of the Indochina Government, this talented French artist, now an American citizen, spent two years in that country just before World War II. In those two years he produced more than 300 canvases and sketches (page 465).

His oils, water colors, washes, and drawings capture the atmosphere of Indochina's steamy jungle, depict its coiling roads that thread between mirrored paddy fields and rugged cliff, and portray the tribal mixture of peoples grouped in this section of Southeast Asia, an area little larger than Texas.

To find many of his subjects, he penetrated the least accessible parts of the country. He traveled from the plains of Cambodia, through tumbled hills of Laos, and to Tonkin mountain peaks where perch the isolated villages of gaily dressed hill folk—the Meo, Man, Lolo, and Thai.

He made friends with tribal chieftains and villagers among the Moi tribes in unpacified districts on the southern Annamese Cordillera, experienced a coastal typhoon, shot hazardous rapids of the Mekong and Nam Te (Noire), and sweltered in tropical humidity that made the drying of his paintings well-nigh impossible.

In Despujols' scenes no enemy is more formidable than the tiger (pages 470, 474). His models reflect Oriental calm, rather than wide-eyed fear. His canvases give the peacetime look of Indochina, now darkened by the shadow of war.

To us, writing these words, Despujols' paintings picture our friends and places we know, for we have roamed Indochina in peacetime and since war came.*

Lissome Women and Dragon-robed Mandarins

To us, exotic Hanoi, Hue, Phnom Penh, Vientiane, Luang Prabang, and Saigon are vivid spots that recall golden-skinned people crowding teeming market places, trousered, lissome Annamese women and dragon-robed mandarins treading Chinese-styled courts, and patient farmers bowed to the good earth beside the Red River and the mighty Mekong.

In some places their homes have been flattened by fighting or by scorched-earth tactics of Ho Chi Minh's followers, the Viet Minh. These places also recall the hospitality of open-hearted Cambodians whose noble Khmer ancestors raised the majestic temples of Angkor, and of friendly Lao princes and commoners.

To understand the land and its people, consider first the why of *Indo-China*.

India and China were its cultural parents. Behind the massive towers of mysterious Angkor, thrusting in ruin above the jungle near Tonle Sap, or Great Lake, in central Cambodia, looms the age-old culture of Brahmans imported from India (page 490).

Brahmans also tutored the Chams, whose brick towers and a mere 100,000 people are all that remain of a once-powerful kingdom in the coastal region that is now part of Annam. Farther north, Chinese culture patterned the court life of Hue.

Mention the word "mandarin" and to most persons it connotes an official of Imperial China. But in its origins the word is Indian Sanskrit and long since traveled north along Indochina's old Mandarin Road, which the French relabeled "Route Coloniale No. 1."

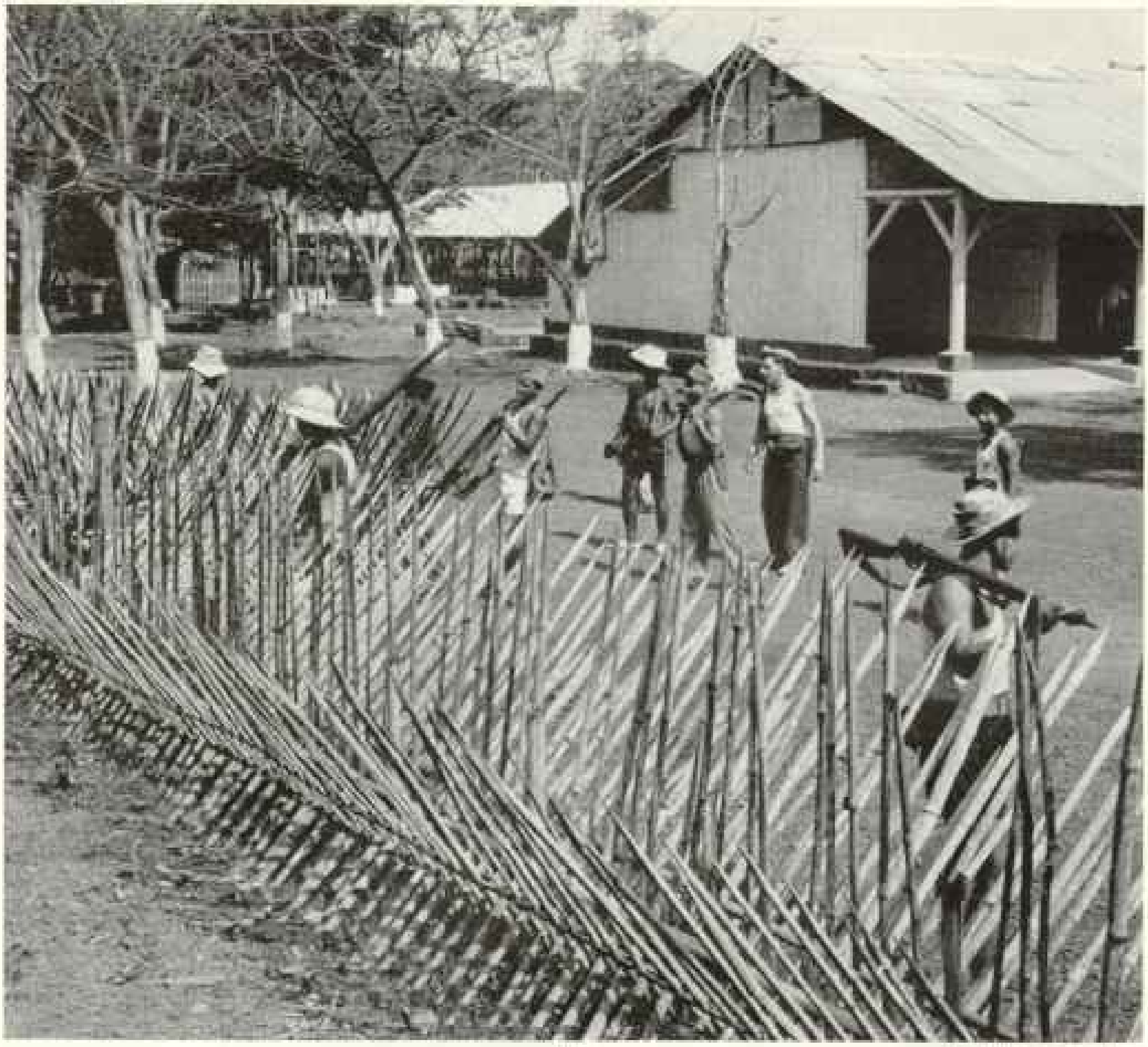
Hindu Brahmans, who sparked the native genius of the early Khmers, and Chinese officials, who lent their culture to the Anna-

* See, in the National Geographic Magazine: "By Motor Trail Across French Indo-China," by Maynard Owen Williams, October, 1935; "Strife-torn Indochina," October, 1950, and "Along the Old Mandarin Road of Indo-China," August, 1951, both by W. Robert Moore.

462 Paul Almasy, Three Lions

Rue Catinat, Lined with Trees and Shops, Is the Champs Elysées of Paris-flavored Saigon

Indochina, mosaic of Indian and Chinese cultures, is composed of the war-torn State of Viet Nam and the comparatively peaceful Kingdoms of Cambodia and Laos. Saigon, capital of Viet Nam, knows Communist terrorism; grenades are tossed without warning into its cafés and theaters. Cycle-pushed pedicabs replace its old-style man-pulled rickshas. This Chinese girl, homeward-bound with flowers and groceries, rides one.



463 Paul Almasy, Three Lions

Triple Rows of Bristling Bamboo Lances Protect Quan Loi, a Military Outpost

Elsewhere brick towers, manned by French and Viet Nam troops, guard highways and bridges against Red raiders, who loot, burn, and kill, then sneak back into the jungles. Some villages have log palisades.

mese, were not the only comers here. Indochina's ancestry also has roots in the Tibetan hills, the wind-swept Mongolian plains, and the isles of Indonesia, as Despujols' paintings show.

In this land of rich racial heritage the industrious Annamese have won the dominant place. Viet Nam, reviving its ancient name, meaning "People of the South," embraces the prewar divisions of Tonkin, Annam, and Cochin China, which edge the eastern S-shaped coast. In this State, menaced by war, are some 22,000,000 persons.*

The Kingdoms of Cambodia and Laos, which occupy the western inland half of the country, have a combined population of only a few more than 5,000,000 people. They have remained relatively peaceful and govern themselves, but already there is talk that they, too, must be "liberated."

The Laotians and their more primitive tribal cousins scattered throughout the valleys of northern Tonkin show how old Asia's peoples have shifted. They are members of the extensive Thai (Tai) race, to which also belong the Siamese and the Shans of Burma.

Centuries ago they dwelt in the southern region of China before it had become Chinese. Many are still there. Persistent pressure, and the sweep of Kublai Khan's armies, with whom Marco Polo was the only European "war correspondent," broke up their organized kingdoms and sped their southern migration.

A Land of Hillside Homes

Other tribes have moved over these same home-seeking paths.

The Man, or Yao, tribes, who followed the Thai into northern Laos and Tonkin, found their predecessors already occupying the val-

* See sketch map on page 501 of the National Geographic Magazine for October, 1950, and the National Geographic Society's map of Asia and Adjacent Areas, published as a supplement with the March, 1951, issue.

National Geographic Photographer Maynard Owen Williams

Costumes Rather than Faces Identify the Tonkin Hill Tribes

To experts, these ageless fashions serve as altimeters, for each girl normally lives at a different mountain level. Bashful White Meo (left) wears coiled hat and sailor-style collar. The legginged Man-Tien's kitelike hat appears ready to take off in the first high wind. Her Man-Coc cousin wears turban, soft red pompons, and check trousers. All three share a fondness for silver neck rings.

leys; so they set up their homes on the hillsides. The Meo, Lolo, and others who have come since settled on the higher slopes of the mountains. Indochina's people have thus become a study in vertical pyramiding as well as one of horizontal expansion.

We learned about feminine style too, as we climbed into the hills. Hill-tribe men often adopt the dress of the plains people. But not so the women! So colorful and distinctive is female costume that one depends more on fashion than feature to recognize a tribe.

The Man-Tien beauty with oiled hair and high, elaborate headdress, well-polished jewelry, and fashionable skirt-flare is not easily confused with her Man-Coc cousin, who prefers checkerboard-embroidered trousers, bright red pompons on her blouse, and a multicolored turban.

Beside them the Meo looks like a schoolgirl in a sailor collar, short skirt, and wide hat. This latter is built up of layer after layer of braid until it stands out, pancake flat, around the head.

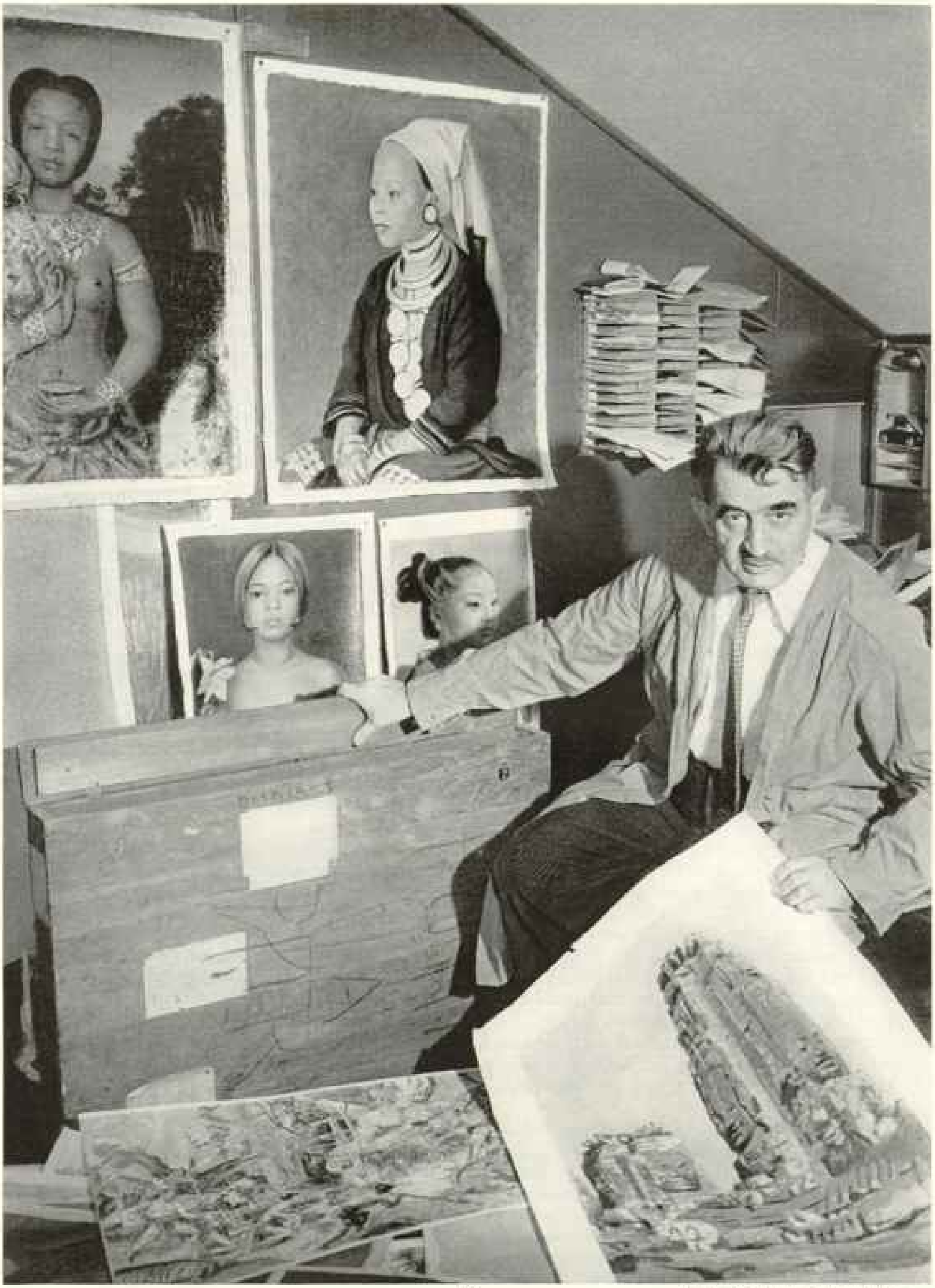
Even the Meo are divided into several groups, the Black, White, Red, and Flowery, according to the type of dress the women wear. The wide-eyed Meo girl Despujols painted wears her hair in a turbanlike roll of twisted horsetail (page 471).

Tribal recognition may also hang on an eyebrow! Among the Man women eyebrows hardly show, but under a Nung headdress, which lies like a brilliant folded napkin on the head, are eyebrows as well trained as if they had been shaped in a beauty parlor rather than in a mountain hut.

"Man" means "Barbarian" in Chinese or "Savage" in Vietnamese. A more accurate name for the tribe is Kim-mien, meaning "Mountaineers." Among these Man tribes are the Man of the "Horns" (Man-Coc), the Man of the "Chinese Money" (Man-Tien); and those of the "Large Boards," the "White Pantaloons," of the "High Villages," the "Ferocious Man," and several others!

The White Thai and Black Thai

White Thai sounds more formal than Black Thai, but the opposite is the case. The Black



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Langston McEachern, Shreveport Times

The Artist, in His Studio, Checks a French Shipment, His Precious Indochina Paintings

Jean Despujols produced some 300 works in Indochina. He took them to his native France just as World War II broke out. Later he became an American citizen. Here, in 1948, his collection arrived in Shreveport, Louisiana. Three of these paintings, including the tiger hunt, are reproduced on pages 467, 474, 479.

Thai set down their language with ink stick and brush. They cherish their feudal loyalties and are less inclined to become Vietnamized than the White. Despujols' paintings of the Black and White Thai reveal that they are sisters, save for the difference in color of the blouses (page 481).

It has been estimated that three-fourths of upland Tonkin is inhabited by the Thai, for here, in addition to the Black and White Thai, are the Thô, Nung (Giai), Nhang, and numerous other members of that race.

Since trouble has brewed in these Tonkin hills, many of these groups have banded together into a Thai Federation, under the leadership of a hereditary prince, and have indicated that they will resist any incursion and occupation of their lands.

Against machine guns and mortars, hand-forged guns and crossbows are of little avail, but mountaineers have a stubborn tradition of freedom.

In isolated tribal villages the people live at home and till their crops of maize, buckwheat, potatoes, and sometimes opium poppies in forest slashings. Some of their crude huts are built on stilts on the hillsides; others rest on earthen floors.

The people are shy but hospitable. One of us remembers the friendly gesture of being presented two eggs by a Meo village headman; in his tiny village eggs were scarce.

It must be admitted that photographing the timid, gaily dressed womenfolk or seeing Meo men dancing in dervishlike whirls to plaintive tunes of bamboo-piped *kans* is more pleasant than spending nights in smoky houses where pigs often wander at will. Hill villages, idyllic from a distance, can be incredibly dirty.

High light of Williams's experience with these tribal folk came one day when he had motored up to Nguyenbinh and Thatkhe.

Hundreds of hill villagers had come down to town, many dressed in their festival best. Before his cameras they stood with reluctant feet and downcast face, for despite their eye-arresting costumes the young mountain maidens were bashful.

Among themselves, however, the tribal folk could be gay. Young men and girls, playing a game that seemed a combination of David's sling and archery, laughed and shouted with uninhibited joy. Teamed in pairs, they took turns in hurling long-tailed weights at a high paper target, and were not content until they had riddled it. If a thrower missed the target, the partner tried to catch the projectile by the tail before it touched the ground.

It was a chance for the youths to show off. Actually, the girls were just as skilled in barefoot fleetness. In the excitement of the game, these tight-belted, high-breasted girls showed Olympian power and grace and revealed a gay camaraderie.

Checker "Board" Where Girls Are "Men"

A game of checkers, played between the Man-Coc and Man-Tien, was novel. The "board" was a rice terrace, marked in squares by long strips of split bamboo. Pompon- and silver-ornamented girls were the "men."

They progressed from square to square in accordance with the moves of the master players, who sat under a rude shelter near by. When a man—girl—was won, she left the board and joined the spectators.

Simple pleasures, yes. But here was gay recreation for a people who toiled in hill fields by day.

Market day in quiet towns assumes a county-fair atmosphere, with gambling games and performances of Annamese actors serving in lieu of a midway. With fine feathers and soft silks, nondescript villagers become fine birds, indeed. And their orchestras, at least, are loud!

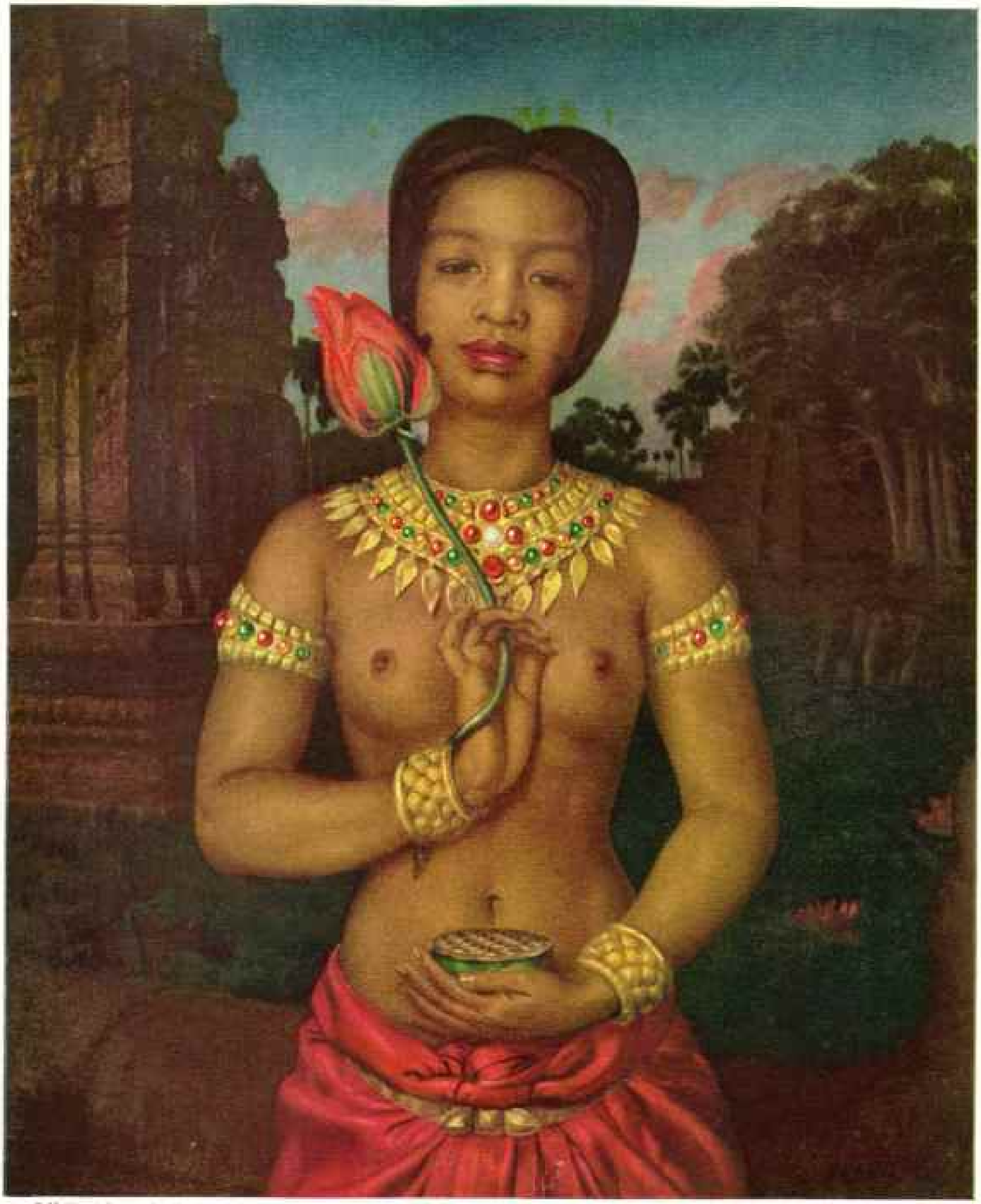
It is a journey that finds no measure in miles to come back from the hill villages or rural towns to attend a cocktail party or a tea dance in Hanoi, itself divided into a well-built European city and a native town where wrinkled flower girls spread a garland of blossoms along the shore of an urban lake. This once-peaceful capital has been little damaged by war.

It is something else again to motor over the countryside around Hanoi and see roads guarded by armed troops, and to visit the villages and towns that have been so wrecked that hardly one brick rests atop another.

Ho Chi Minh's soldiers forced the villagers to tear down their own houses when they retreated before the French two years ago, then often ordered the bricks and timbers carried away. In some towns, abandoned in haste, water towers and the main public buildings were blasted to prevent their being used by the French.

It has been said that the force which controls the rich rice plains of Tonkin and Cochin China controls all Viet Nam. As we write, most of both areas are under control of the French and Viet Nam troops, save for sniping, incendiarism, and night raids.

One sees few smiles on the faces of the peasants whose homes were wrecked, and whose water buffaloes were slaughtered for food by the Japanese during World War II or have since been taken by the Viet Minh



Painting by Jean Despujols

Ruined Angkor Re-creates the Dances of the Apsaruses, Chorus Girls of the Hindu Deities

With this painting the NATIONAL GEOGRAPHIC MAGAZINE introduces a 16-page series by Jean Despujols, a French-American artist. Before war disrupted Indochina, he devoted two years to portraying its people, from civilized Cambodians, Annamese, and Laotians to unpacified mountain tribes.

This Cambodian girl, who holds the sacred lotus and its seed pod (left hand), stands in Angkor, the Hindu temple-city which her ancestors, the talented Khmers, built seven to ten centuries ago (pages 468, 469, 470, 471). On its walls they carved in bas-relief the portraits of hundreds of sacred dancers.

Should the performer dance in the modern Cambodian court, she would exchange her scanty wraps for heavy brocades, but, like her Angkor predecessors, she would enact India's ancient classics, the *Mahabharata* and *Ramayana*.

Painting by Jean Despujols

The Khmers Abandoned Angkor Wat's Soaring Towers and Sculptured Galleries; the French Rescued Them from the Jungle

Live Dancers, Ghostly White in Chalk Make-up, Perform in Dead Angkor under the Glare of Torches

Painting by Jean Despujols

The Gods Are Gone; the Tiger Holds Court at Their Temple. He Did Not Pose, but His Roars Sent the Artist Packing

Paintings by Jean Despujols

Daughters of the Khmers and Mongols Reflect Indochina's Medley of Peoples

Left: The Cambodian girl, a dancer at Angkor Wat during the winter season, belongs to the royal troupe at Phnom Penh, which is led by her foster mother, a princess. She appears in her Sunday dress. Angkor Wat stands as one of the world's greatest architectural achievements.

Right: The Meo girl dresses snugly to endure the frosty temperatures of her mountain village on the Chinese border. Her hair is bound in a turbanlike roll of twisted horsehair.

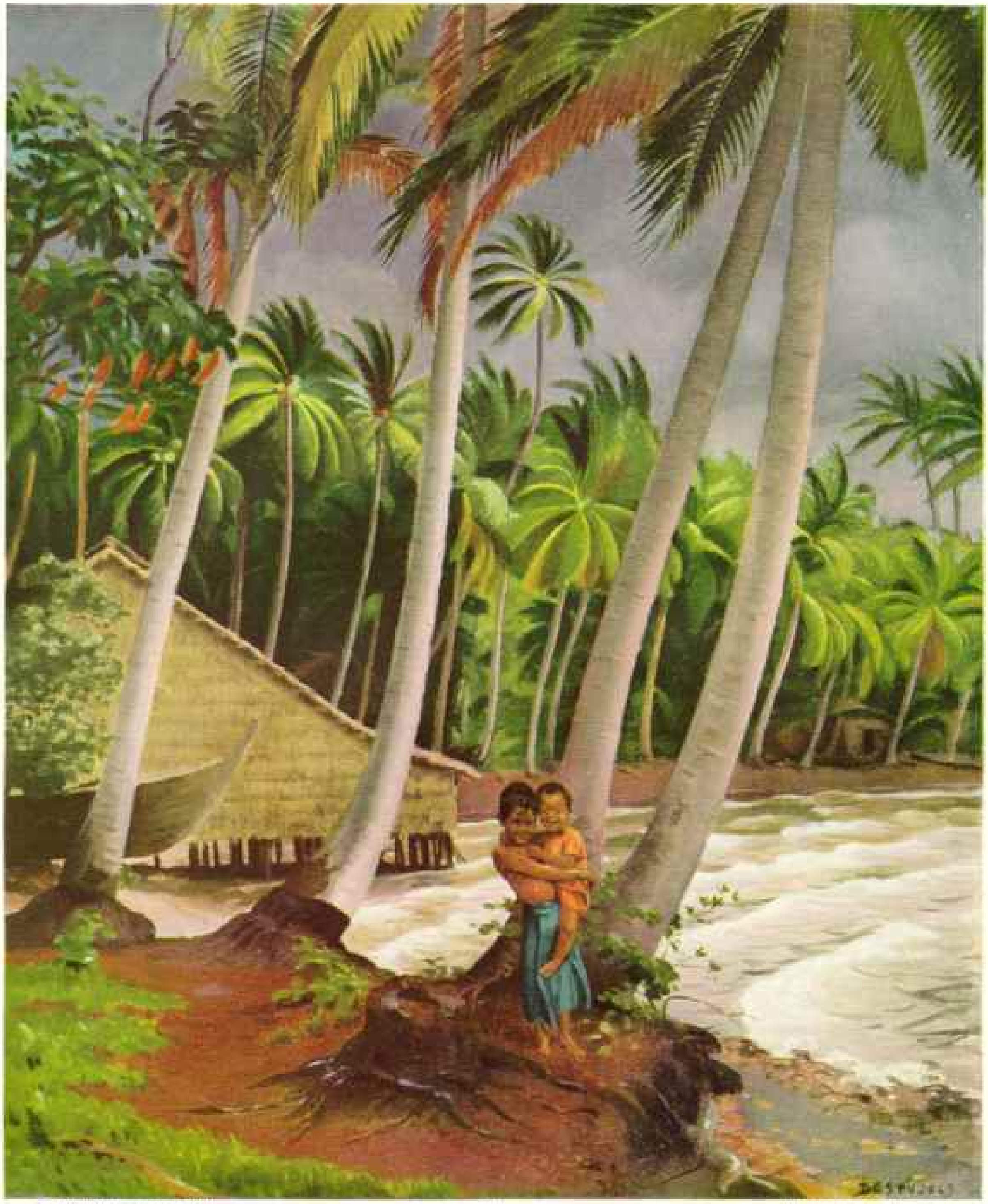
Painting by Jean Desmidt

A Cremation Pyre's Kitelike Banners Sing in the Breeze Like Aeolian Harps

This spired pavilion, seen in Siemreap, shelters the body and pyre of a Buddhist priest. Though built of inflammable bamboo and paper, it will not be given to the flames but will be dismantled.

Buddhist monks in their yellow togalike robes of humility face the pavilion. Squatting Annamese eat rice sold by an itinerant cook. Cambodians accompany a venerable monk borne on a litter.

Cambodian Buddhists belong to the Hinayana, or Little Vehicle, sect. Most of their men serve in monasteries for a part of their lives.



Painting by Jean Despujols

Coconut Palms Wave in Monsoon Winds Sweeping In from Gulf of Siam

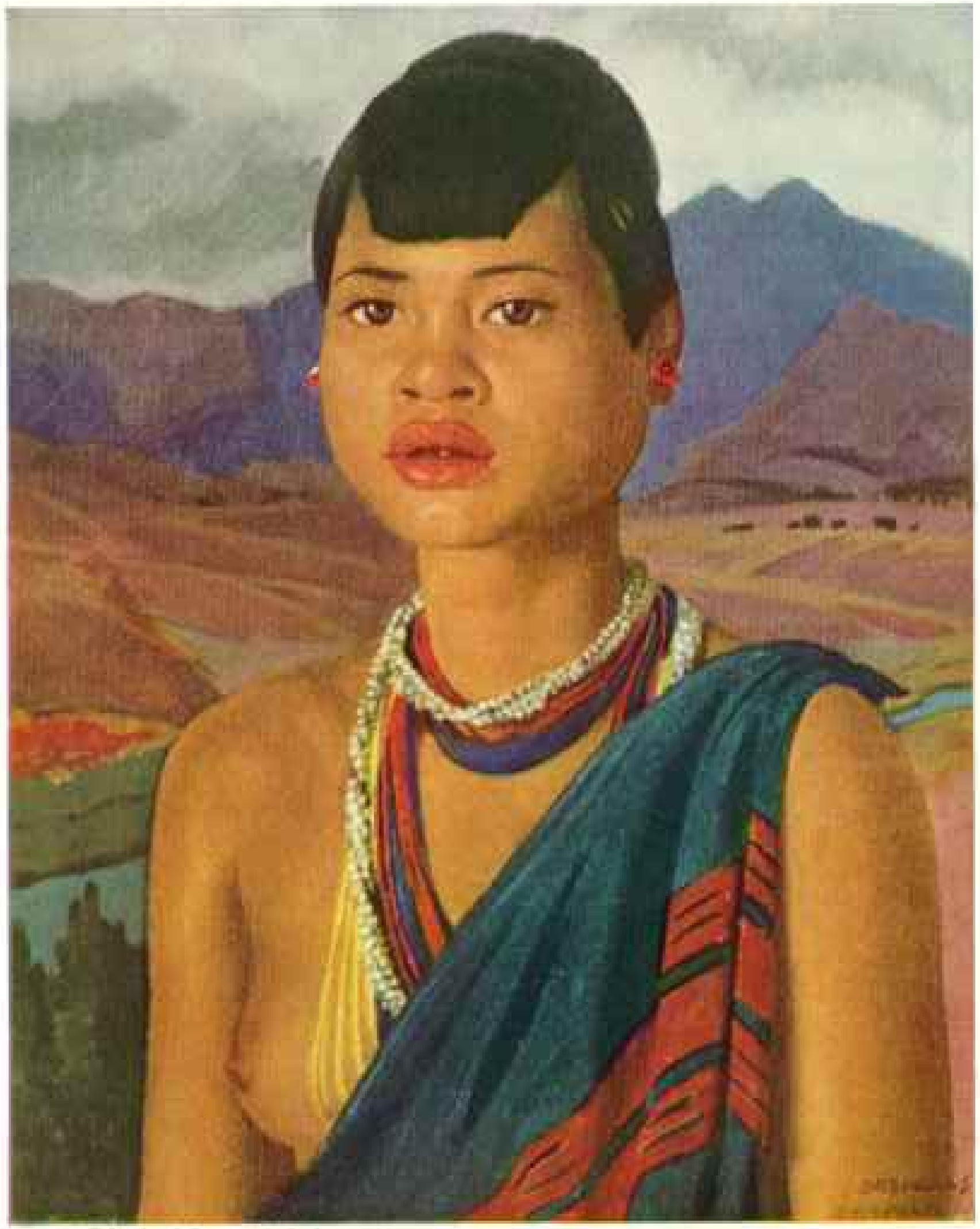
This young girl, who carries her baby brother on her hip, followed the artist everywhere he went while he worked in her village. Her Annamese parents, whose canoe rests beside their thatched house, were fisherfolk, like the other villagers.

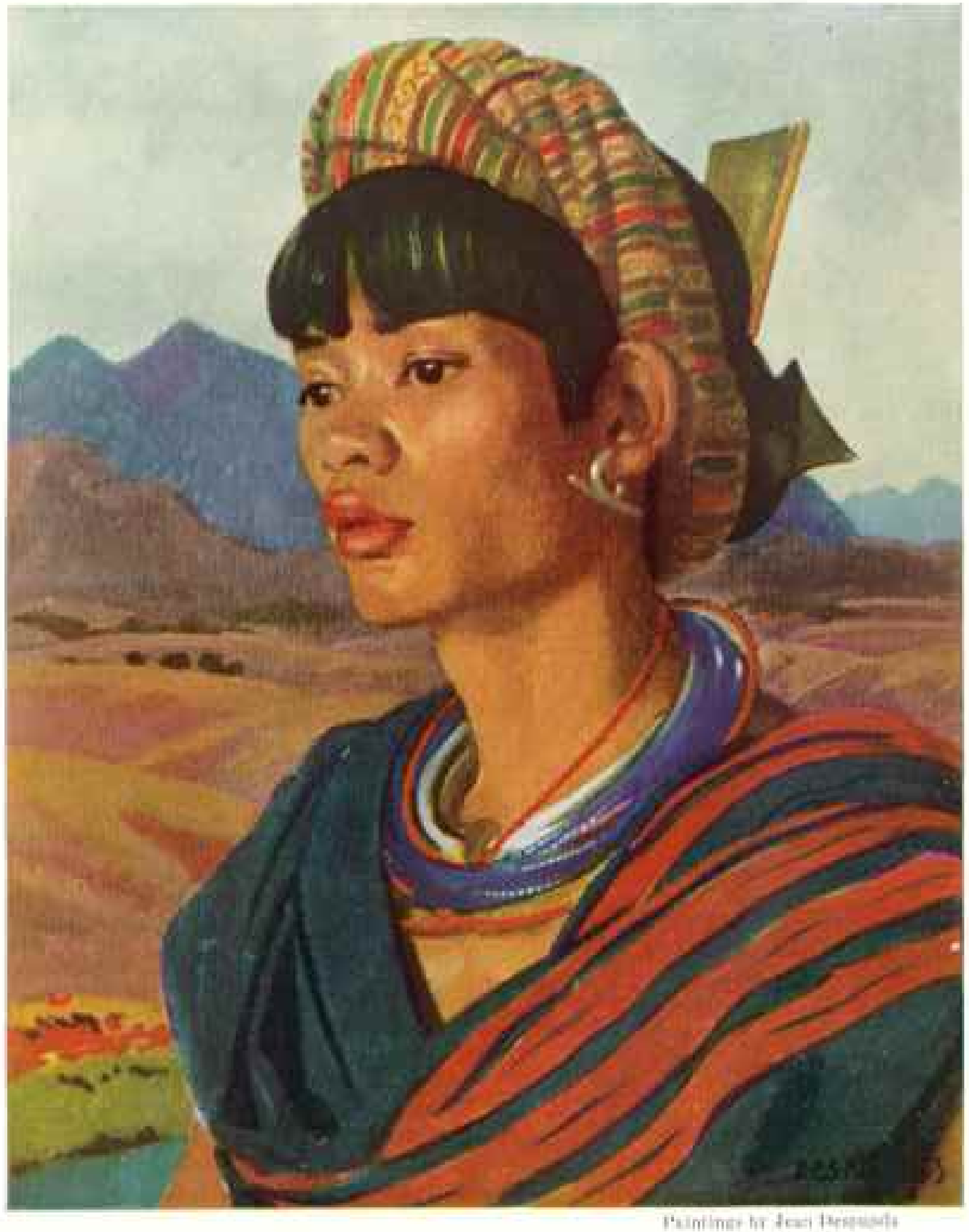
Late each afternoon, when the men came in from the sea, the painter saw them divide the catch among the women according to the number of their children.

Besides fish, the people ate coconuts and rice. Palms shut out the view of their rice fields.

Painting by Jean Despujols

Radé Tribesmen, Crying "Death to Mankillers," Charge a Tiger with Spears and Crossbows. His Mate Lies Slain





Paintings by Jean Despujols

Girl and Boy, Members of the Primitive Davak Tribe, Wear Hair in Bangs and File Teeth to Points

Mountain-dwelling Davaks, of Indonesian origin, belong to a remote group generally called Moi, meaning "savage." Bold hunters, the Moi think nothing of facing tigers, elephants, and wild cattle. Some are matriarchal, transmitting names and property through the mother.

The young man decorates his headdress with a "rear-view" mirror.

Painting by Jean Despujols

Craggy "Mountain of 99 Hills," the "Backbone of the Annamese Dragon," Rises Abruptly from Table-flat Rice Fields

Water buffaloes, so slow they seem barely to move, plow the flooded land. Men and women transplant rice seedlings. On the left, a boat rides the Song Day, a branch of the Red River.

Communist Viet Minh guerrillas lurking in the Tonkin mountain country have repeatedly raided French forces controlling the plains.

Paintings by Joan Dominicis

Delicate Annamese and Robust Tonkinese Reflect the Contrast Between Viet Nam's Racial Cousins

Yeu (left) was planting rice near Hue, seat of the old Annamese court, when the painter found her. He remarks: "For her obvious refinement, the former poet-emperors were responsible, they having selected the fairest women for service in the court."

Xuan (right) "was embittered and hardened by privations. Rice planting, dyke building, and childbearing were her destiny. A breath of resignation seems to slip through her lips." For centuries her coastal village was the prey of Chinese pirates.

Painting by Jean Despujols

Laotians Ascend the Mekong's Rapids in a Motorized Dugout Canoe. Lookouts Watch for Rocks Exposed by Low Water

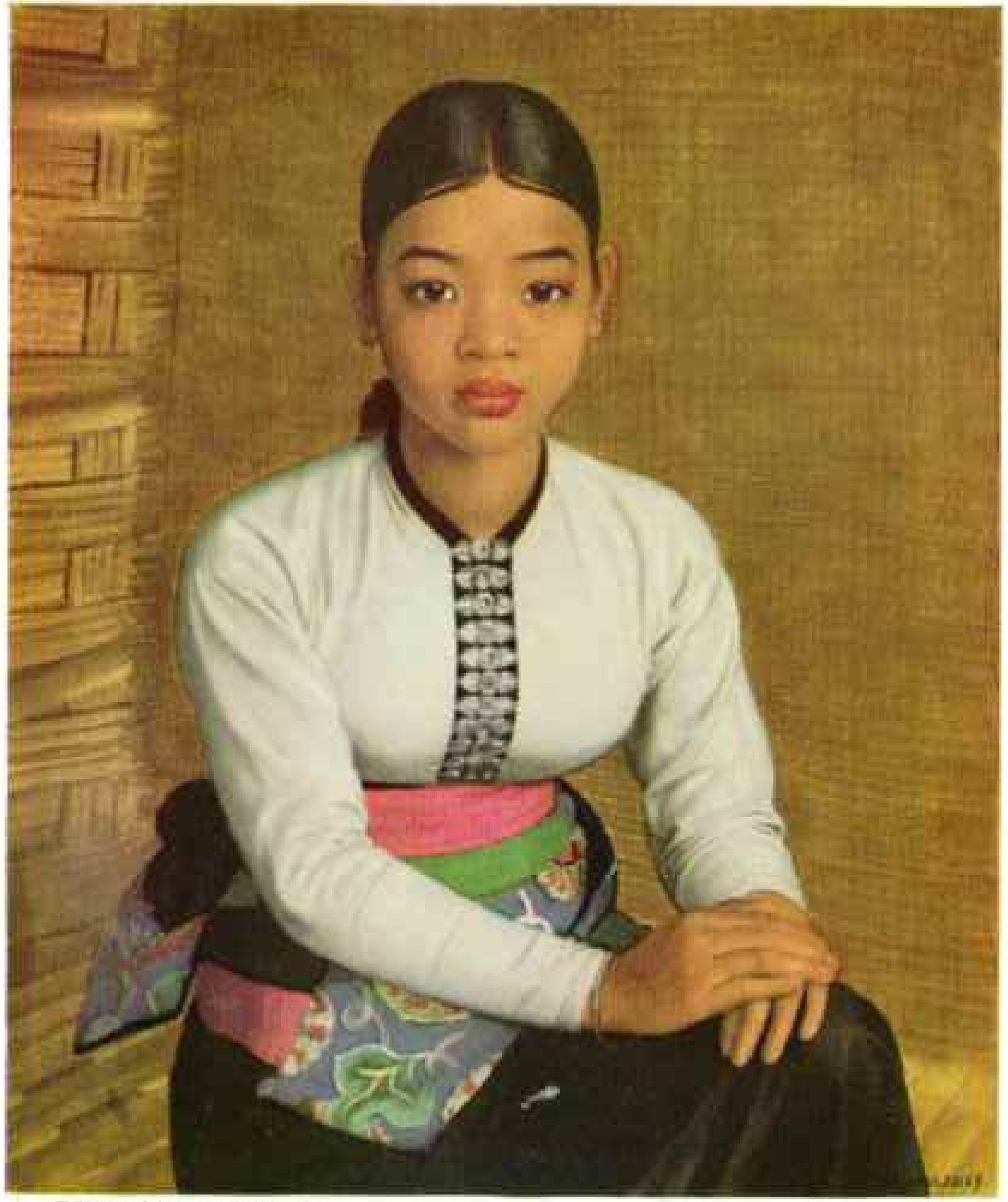
Paintings by Jean Despujols

Laotian (Left) and Wouni Maidens Reminded the Artist of Tigress and Madonna

Gentle Bouddhi (in yellow scarf) belied her determined, sometimes ferocious expression. Born a plebeian, she was a natural aristocrat. The Wouni girl, sweet and kind, obligingly walked two days from her mountain village to keep an appointment with Mr. Despujols.

Painting by Jean Despujols

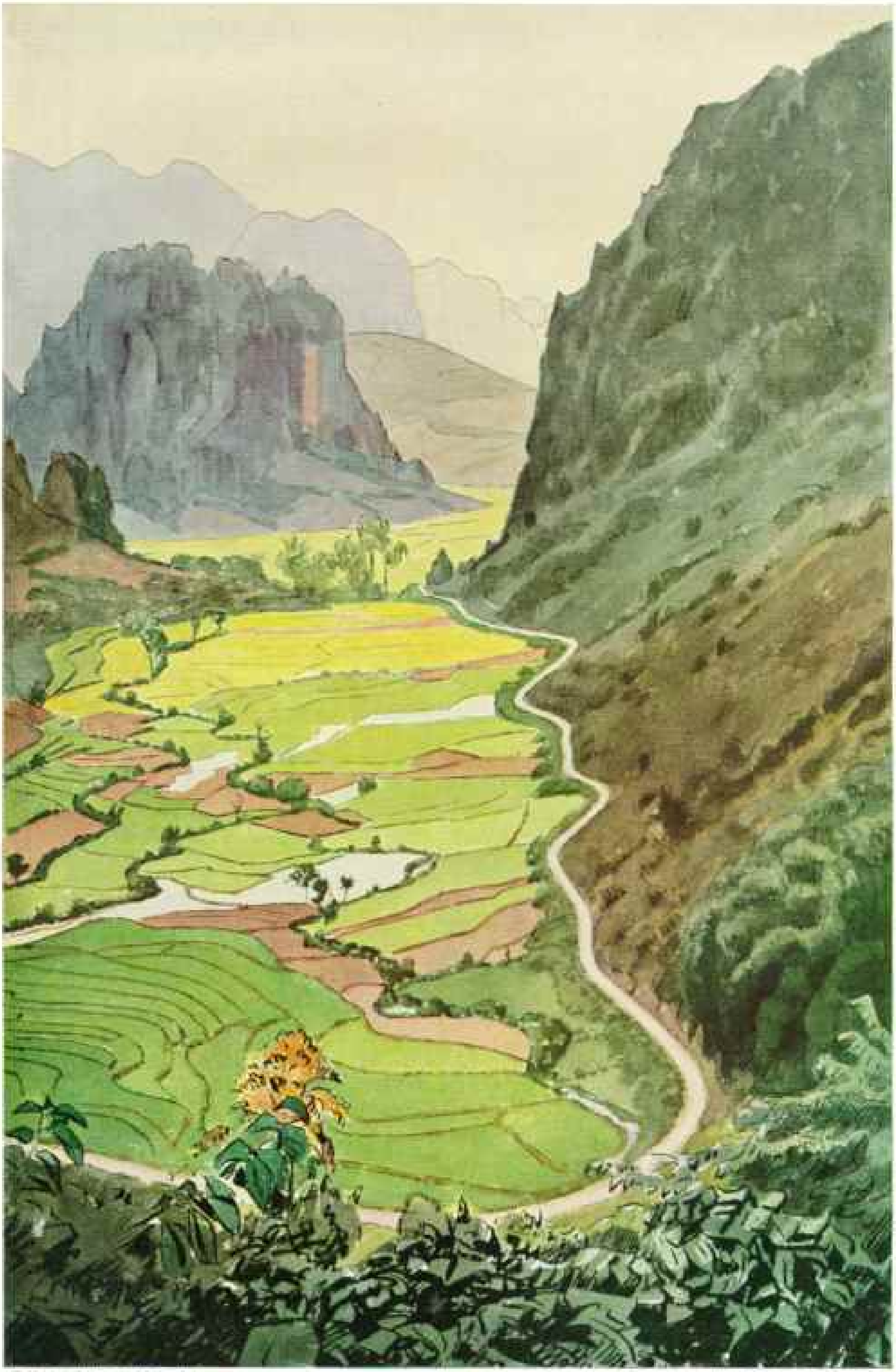
Morning's Fog Lifting from Laotian Peaks Reveals a Peaceful River. The Artist's Title: "Awakening on the Nam Khan"



Entire Tribes Are Called White Thai (Left) or Black Thai, According to the Color of Women's Blouses

These Thai people retain many archaic customs. Women steadfastly cling to ancestral styles, though the men frequently adopt Annamite dress.

Both models decorate bodices with silver buckles. White Thai maiden, a chieftain's daughter, wears a skirt of stamped silk. Black Thai, actually as pale as ivory, carries in her girdle the keys to many coffers, indicating wealth.



Painting by Jean Despujols

Tonkin's Road to Red China Bears No Sign of Guerrilla War's Bitter Battles

Three emigrant tribes from China live in this region and cultivate its terraced rice fields. They hold curiously aloof from one another, meeting only in the market place or on the high plateau.

forces. But today, as always, farmers' backs are bent to their muddy rice plots, whose grain barely feeds all the mouths of the country.

Paintings Reveal Racial Differences

Although Viet Nam lies entirely within the equatorial zone, its northern end almost touches the Tropic of Cancer. Its "winter" season is edged with raw coolness. Despujols' paintings on page 477 reveal how this cooler climate is reflected in the peoples' physique, for the folk in Tonkin are more sturdy than those farther south where Viet Nam sprawls deep into the hot Tropics.

But there is more difference between Despujols' broad-faced Xuan of Tonkin and her more delicately boned sister from near Hue than just climate. Part is due to generations of breeding in the old courts of Annam.

In peace years, when we drove along the Mandarin Road with no fear of ambush, we were struck by the contrast of the peoples on the opposite sides of the Annam Gate, that sharp mountain spur which rears across the way, midway between Hanoi and Hue.

By topping its crest, where stands a monument that once marked the division between Tonkin and Annam, one leaves behind most of the stocky, broad-cheeked Tonkinese, whose women wear muddy-colored brown skirts and flat, cartwheel-size hats.

Southward are the slender Annamese, clad in trousers and long, closely fitting tunics. Here also are big hats, but they are shaped like broad mushrooms, rather than flat 3-inch-deep inverted tea trays.

Hue itself means "Concord," and for long years it seemed a singularly appropriate name. Amid its hoary, Chinese-fashioned palaces on the flower-scented River of Perfume, life seemed static and assured.

When Oriental odors rise on sticky heat waves, "River of Perfume" seems a euphemism. But Hue's perfume is not so much scent as sense of historical attraction.

No farsighted town planner, seeking trade routes or industries, chose the city site. That was done by geomancers, seeking escape from evil spirits. As in faraway Peiping, to which Hue often sent tribute, three concentric walls added protection to the capital, the Royal Town, and the Purple Forbidden City. But walls have not protected dreams—or hopes; several of the palace buildings have recently been burned and their treasures looted.

Before the French began to transfer political power to Viet Nam authorities, Emperor Bao Dai (Greatness Sustained) was the hereditary monarch here. Now he has become the Chief of State of Viet Nam. And with this political change have gone many of Hue's dreams, which relied on proud ancestry and carved their "Who's Who" on memorial stone tablets.

If Hue's walls and Temple of Heaven suggest Imperial Peiping, so its mausoleums suggest the Ming tombs of China at the end of their statue-lined avenue. Until recently, royalty in Annam had carried on traditions which ended in China with the fall of the Manchus in 1912.

An aviator, flying above Hue's Tomb of Filial Piety, might see flower beds which form the character THO—Eternity. Over the near-by mound the National Geographic Society colors would be appropriate. The Blue Heaven, Brown Earth, and Green Water stand for the Three Powers to whom all Annamese bowed.

In March, 1942, Bao Dai celebrated the last triennial sacrifice to the Supreme Being. March, 1951, again would have been the time for this greatest act of Annamese worship had not political forces caused its abandonment, as in China.

Sampan Life in Hue

On Hue's quiet plant-choked waterways sampan life seems idyllic. In these craft bare-legged boatmen, standing in the shadow of candle-snuffer headgear, face forward as they swing the oar. It must be a hard life, but as the yellow-oiled craft glides through sweaty mist or sun-dappled shadow, one feels as if some hidden director were arranging "local color" for its picturesque beauty.

From Quangtri, a few miles northwest of Hue, a good road hurdles the green mountain backbone between the South China Sea and the Mekong Valley, which divides Annam from Laos. Traveling over it one day, Williams was met at Savannakhet by a gay-colored reception committee of girls, bearing sweet-smelling flowers and waiting to enact such a love court scene as delights Laotian youth (page 485).

While the rainbow-scarfed girls paid respectful attention, five Laotian chiefs in solemn ceremony tied a strand of cotton cords around his wrist as a good-will symbol to ensure safe flight to Europe and a happy homecoming to Washington.

In Paris, a few days later, it seemed as if people there were as superstitious as in Laos. Noting this simple cotton cord around Williams's wrist, a young Parisienne asked if she might touch it. Within minutes a dozen others had asked to do the same. One person even ordered champagne!

484 National Geographic Photographer W. Robert Moore

Silk-robed Priests, Holding Offerings in Uplifted Hands, Celebrate the Feast of the Dead

Le-van-Duyet, a Viet Nam hero of a century ago, was honored at his tomb and shrine near Saigon April 4, 1950.

484 National Geographic Photographer Maynard Owen Williams

Laotian Swains Rehearse by Day Their New Year's Love Court, a Nighttime Spectacle

When the moon came out in Savannakhet, the photographer heard boys and girls exchanging love's compliments with extemporaneous verses. These youths bore a tinsel tower to the women's shelter.

That day Mrs. Williams in Washington read three obscurely related items: One, a letter from Saigon saying that Williams might return by steamer; one, a telegram announcing his arrival in Paris by plane; one, a newspaper paragraph telling how the ship that would have been his was lost at sea off Socotra, with 69 dead.

Not until he returned home was the frayed good-luck charm, carrying Laotian prayers for safe return, removed from his wrist!

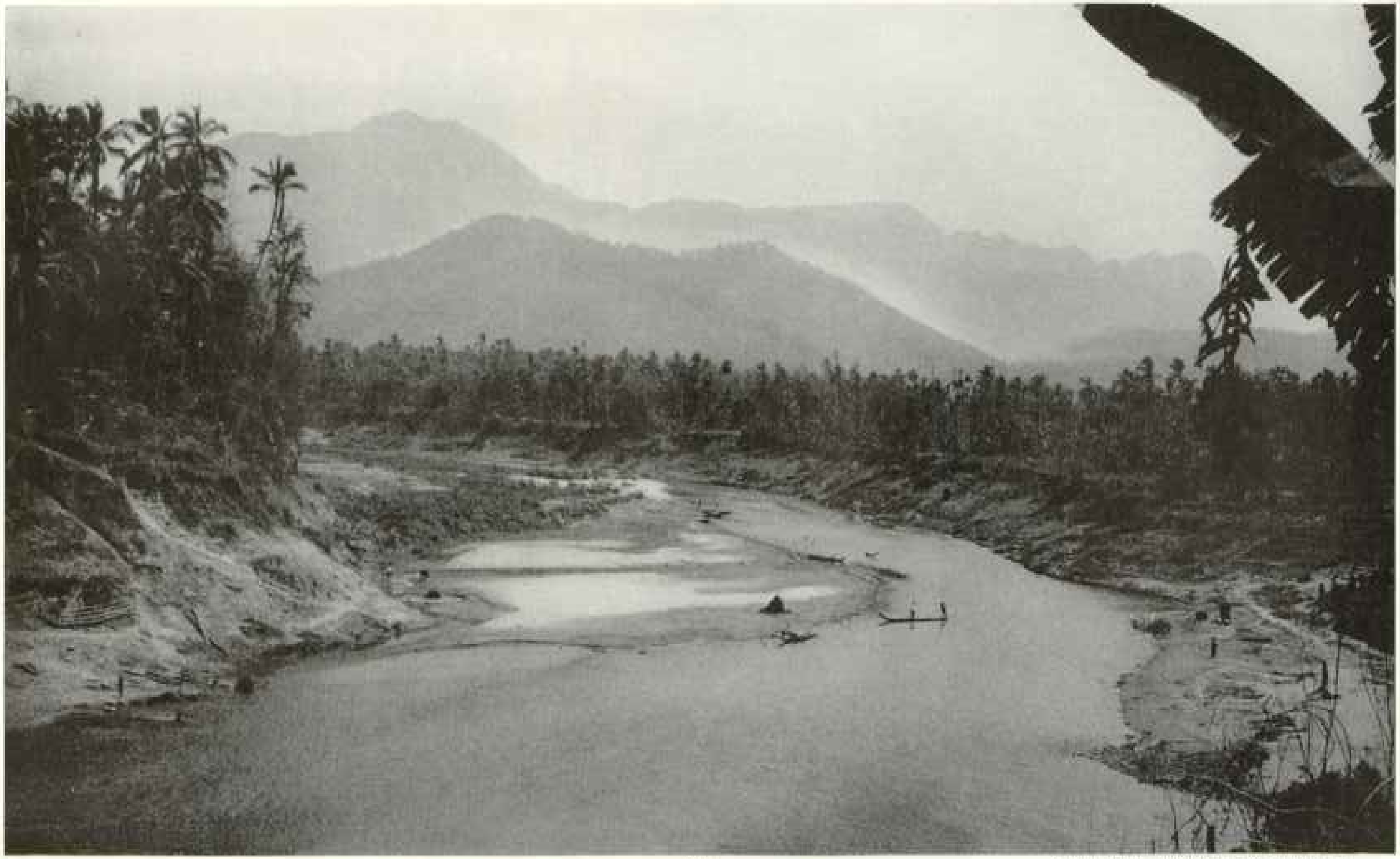
As one motors south from Savannakhet toward Stungtreng, there is an ominous sound which increases to a steady roar. Downriver one sees clouds of mist hanging in the colorless sky. By sound and sight one knows that he has come to a rock barrier over which the mighty Mekong tumbles and against whose deadly currents and sharp crags no river traffic can make its way.

Before airplanes made light of earthly obstacles, steamboats had fought their way up China's Yangtze gorges. But no boat has triumphed over the Falls of Paphang, near Khone, on this other great river of Asia.

A century ago, statesmen thought that one might follow the Mekong to China. But the Paphang Falls stopped Ernest M. L. Doudart de Lagrée and Francis Garnier. When Jean Dupuis in 1873 showed that the Red River was the route toward Yunnan, Tonkin took first place in the race for empire.

Long native river boats, now motorized, do triumph over portions of the river and chug upstream to Luang Prabang. Scores of ferries also hurdle river barriers along the 1,600-mile Mandarin Road and lesser highways, and crossing the Mekong in several places is routine.

The approach of nightfall in the tropical jungle has a nostalgic quality. The rude torch held by a friendly native, standing in heavy forest or close to an upended serpent of stone, conjures a sense of fellowship in black magic. Now, along such trails, it is not always the light of a friendly, smoky torch or flash of fireflies, but the sharp crack of a sniper's rifle.



National Geographic Photographer W. Robert Moore

The Nam Khan Twists Through Tumbled Hills of Laos Toward Its Union with the Mekong at Luang Prabang

Dreamy, misty Laos escapes the worst aspects of Viet Nam's fratricidal civil war. This is its dry season, when sand bars lie exposed and boatmen have no difficulty poling the narrow channel. Tall areca palms, source of betel nut, line the shores. For an artist's view of the Nam Khan, turn to page 480.

Paul Almasy, Three Lions

French Foreign Legionnaires, Sprucing Up Before Moving into Battle, Use a Hill Stream as a Laundry Tub

These men fight an elusive, all but invisible foe, Ho Chi Minh's Red terrorists, who usually strike by night and then fade back into the hills.

458 Truman Bailey

Prince Engages Demon in a Dance-duel Beside Angkor's Storied Walls

Phnom Penh's theatrical troupe duplicates poses frozen into stone by Angkor's sculptors a thousand years ago (pages 467, 469). Here Prince Rama (left) of Hindu legend fights the multiheaded Ravana to regain his stolen wife. Reciters, musicians, and pilgrims occupy the background.

From near the noisy falls a road slices eastward to the coast at Binhdinh. The other extends south through Kratie to Saigon. A left fork at Kratie also branches eastward to the coast.

This latter path threads wild wooded hills and grassy plateau lands of the Annamese chain, where dwell more of Indochina's medley of peoples. For here are the primitive Moi. Moi again is an all-embracing word that simply means "savage," and under it are grouped Radé, Jurai, Sedang, Davak (page 475), Khasi, and many other tribes.

Unlike the hill folk in the north, these people are Indonesian. Unlike those gaily bedecked tribes, too, these people clothe themselves in almost no costume at all.

On trails and in isolated villages we saw men clad only in G strings and cloth headbands. Their womenfolk adorned themselves in a simple skirt, neck beads, and coils of brass or copper wire dangling from pendulous slit earlobes. Some, with a passion for more finery, had bracelets of coiled brass reaching from wrist to elbow and fingernails dyed bright vermilion with plant sap.

Here homes are of bamboo and thatch, perched on stilts. Some are hundreds of feet long and seem veritable row houses, save that they have a single entrance! Several

related households often dwell under one roof.

Most conspicuous in the interiors, which are almost devoid of furniture, are the rows of rice-wine jars ranged against the walls. As in other tribal houses, there are no chimneys, but the sooty smoke that eventually seeps through the thatch has the advantage of serving as a mosquito repellent.

Among the Radé and Jarai, who are the most numerous and highly developed of these Moi tribes, women's rights are not in question. For here a matriarchate prevails, both property and name being transmitted through the mother.

Because there are usually more men than women in the tribe, brides also are in good position to bargain.

Rigid Rules for Matchmaking

The first step in any matchmaking must begin with the young man's parents. When paying a first call, they bring a gift of betel, the gesture being popularly known as the "visit with the little gift of betel to the little garden gate." If favorably received by the girl's parents, then a second and more elaborate gift is offered. It usually includes chickens and rice as well as betel.

If all progresses smoothly, the young man may find himself combining wooing with working in the house of the bride's parents to pay the cost for her hand.

In some Pacific islands couples burn "love scars" on each other's arms; here tribal lovers scratch each other's faces as a seal or signature of the marriage contract!

Although essentially agriculturists, many of the Moi men are excellent hunters and trackers of big game, which abounds in the region. The Mnong particularly, who live to the west of Bannethuot, are famed as elephant hunters. Capturing and domesticating young elephants affords a major source of income.

Dalat, pleasant hill resort station for sophisticated Saigon, lies in these hills where near-nude Radé trek the paths, toting crossbows and baskets of produce. Emperor Bao Dai spends much of his time here at Dalat rather than in Saigon, the capital. He and other officials commute by plane.

A few months ago one of us was also glad to have taken a plane, for a motor convoy traveling between Saigon and the hill station was ambushed and more than half of the vehicles destroyed.

Gay Parisian-flavored Saigon of a few years ago isn't quite so gay now. Even though grenades are sometimes tossed into its open-front cafés and theaters, it still maintains a good measure of calm (page 462).

Last spring, when Moore was there, the rigid night curfew had been lifted. Cabarets and casinos in the adjacent Chinese city of Cholon again shimmered with soft silks, and the excited hum of voices rose above the monotonous call of the croupier.

One night, though mortars still boomed in the river marshes at the edge of the city, he attended a gala celebration at the Cercle Hippique, where frothily gowned Frenchwomen and their immaculately dressed escorts watched cavalry officers and other horsemen give a spirited exhibition of hurdle jumping.

Next day there was a memorial Feast of the Dead, held by Viet Nam officials at the temple and tomb of Le-van-Duyet, the famed general under Emperor Gia-Long who held Annam's jade scepter a century ago. Sacrifices of a bullock, goat, pig, and heaped trays of rice and fruits had been placed before the altar (page 484).

To a long wailing chant punctuated by drums, flageolet, and thin stringed instrument, temple officials in long blue and purple robes, upturned-toed felt shoes, and square hats lighted candles and incense and bowed over offerings of tea and alcohol.

Motor northwestward from Saigon to Phnom Penh, and the face of Indochina again changes. On roads and in bamboo villages marked by slender temple spires you see dark brown-skinned men and women, their hair cut in a short brush and both wearing as a lower garment the *sampot*, a cloth wrapped around the body and caught up diaperwise between the legs.

Among them, too, are numerous shaven-polled Buddhist priests in yellow togalike robes. These are the Cambodians, whose Khmer ancestors once dominated much of the southeast corner of Asia (page 471).

Today 29-year-old King Norodom Sihanouk rules over some 3,500,000 of these friendly, hospitable folk. His palace in the center of the trim city of Phnom Penh, by an odd twist of history, appears of the same pattern as those in Bangkok, Thailand.

Centuries ago the Khmers controlled much of Thailand, or Siam, but that, as also the fabulous Khmer capital of Angkor, fell to the Thai, who had migrated from the north.

Victorious Thai monarchs adopted many Khmer court customs, because, to them, the Khmer etiquette represented culture. The Cambodians, in turn, have adopted some things Siamese as their country has reasserted itself. Both countries share the influence of the southern form of Buddhism, the Hinayana, or Little Vehicle, sect, which has replaced their earlier worship of Hindu gods.

The heart of Cambodia is a broad spreading plain, bare and burned in the latter part of the six-months' dry season, but lush green with rice fields when daily rains come in May or June. In Phnom Penh Annamese and Chinese are the chief shopkeepers; the Cambodians are the officials and people of the soil.

Lacelike Carvings Defy Jungle

Both of us have been in Phnom Penh during the April New Year, when the capital city has been in festival mood. But somehow the classic dances and holiday temple pilgrimages seem best when viewed against the background of historic Angkor, whose stone towers and lacelike carvings still defy the onslaughts of the jungle, their battle fortunately assisted by clearing operations and skillful reconstruction by the French.

There, during daytime, we have watched pilgrims lighting incense in the echoing courts and caressing the stone reliefs to lustrous marble smoothness. There, when tropic night brings jungle peace, we have feasted our eyes on a spectacle too dimly lighted for lens, but which Despujols has transferred to canvas.

Across the lotus-clogged moat, yellow flares pinpoint a darkness in which the five tall towers of Angkor Wat seem more ghostly than the stars.

Walking over the huge, uneven causeway, a towering form lumbers past. One of the temple elephants is about to add his colorless bulk to the glitter of gold costumes, reflecting yellow torch-flare under a velvet sky.

Behind a troupe of dancers, on mountainous masses of storied stone, are carved lively Apsarases whose postures now are matched by living leg and arm. The chalk-faced dancing girls, chattering in offstage confusion a few moments before, assume such plastic poses as nameless sculptors had created in formless rock before Marco Polo saw other marvels in Asia, but failed to see these.

Dancing Girls of Angkor

At Sabrata or Syracuse, living actors bring brief new life to the time-bleached bones of ruined theaters. But at Angkor, in the tropical darkness, both massive stone and living dancing girls seem ethereal (pages 467, 469, 471, 488).

Compared with warring elephants in bas-relief, our pachyderms appeared lifeless, for they carried no princes into battle. And the living dancers, clad in today's stiff brocaded blouses, seemed less vital than the temple Apsarases with round breasts and enigmatic smiles that the sculptors had coaxed from unyielding stone. Yet here it was almost as if the Khmers again had awakened from the dust of centuries.

The walled city of Angkor Thom, known in its day as Yaçodharapura, once held a million people. The people have gone, and so have their houses. But here still stand the five city gates, the large central Bayon temple, and outlying monasteries upon whose towers smile the four faces of the Lokesvara (Avalokitesvara), which also represent a stylized portrait of King Jayavarman VII, the great warrior-builder king of the late 1100's.

Other kings before him also studded the country with richly carved shrines which, even in the jungle's green grip, emphasize the glory to which the Khmers had risen before Europe launched its Crusades or Genghis Khan had come to power.

Laos Has Two Capitals

Northward, across the big bulge of eastern Thailand, partially outlined by the Mekong, is Vientiane, capital of Laos. Government in Laos is a problem, since the ministers meet in Vientiane, while the King and his court reside at Luang Prabang farther upriver.

For the ministers to get from Vientiane to Luang Prabang to confer with the King requires some 12 days by one of the motorized pirogues that ply the winding river. In the dry season, however, one can traverse the distance by road or fly there in an hour—if the fogs haven't hidden its hill-girt airstrip.

Fortunately, when we went, the hills were clear. Expertly the pilot circled the sharp pagoda-crowned hill in the center of town and glided down to the short landing field.

Both Vientiane and Luang Prabang are quiet templed towns, and the people seem to enjoy idyllic lives, wanting little beyond that provided by a bountiful Nature. Certainly, if smiles and hospitality are accurate evidence, then the Laotians are happy.

Biggest traffic block Luang Prabang knows is when the palace elephants march to the river to take their daily baths or pause before a temple to be fed bundles of grass and have incantations whispered in their ears.

Having lived in Thailand for a number of years, Moore felt almost at home, for the Buddhist temples, folk dances, dress, and the language of these people are almost identical with those of northern Siam. At times, in earlier days, Laos sent small tribute trees of gold and silver to the Bangkok court.

In the piled mountains north of Luang Prabang are numerous hill dwellers who have migrated there, seeking peace. But today Laos anxiously watches this northern frontier against less peaceful invasion.

Yosemite's upper cataract, 1,430 feet, exceeds nine Niagaras end on end. Lesser falls drop 995 feet. Earthquakelike tremors from the downpour can be felt half a mile. California's Yosemite National Park lies on the Sierras' western slopes about 150 miles from San Francisco. Mariposa Grove of giant sequoias stands in the park.

Ektachrome by Ralph Hopewell Anderson

Ski Enthusiasts, Snow Tanned and Brightly Togged, Grab a Snack at Badger Pass Ski House

Begun in 1935, the Badger Pass development includes ski school, rope tows, and miles of downhill runs. These attractions account for more than 100,000 visits a year. Heavy snows and light winds make conditions ideal.

A Circle of Friends, a Blazing Fireplace—the Perfect Spot to Wax Skis

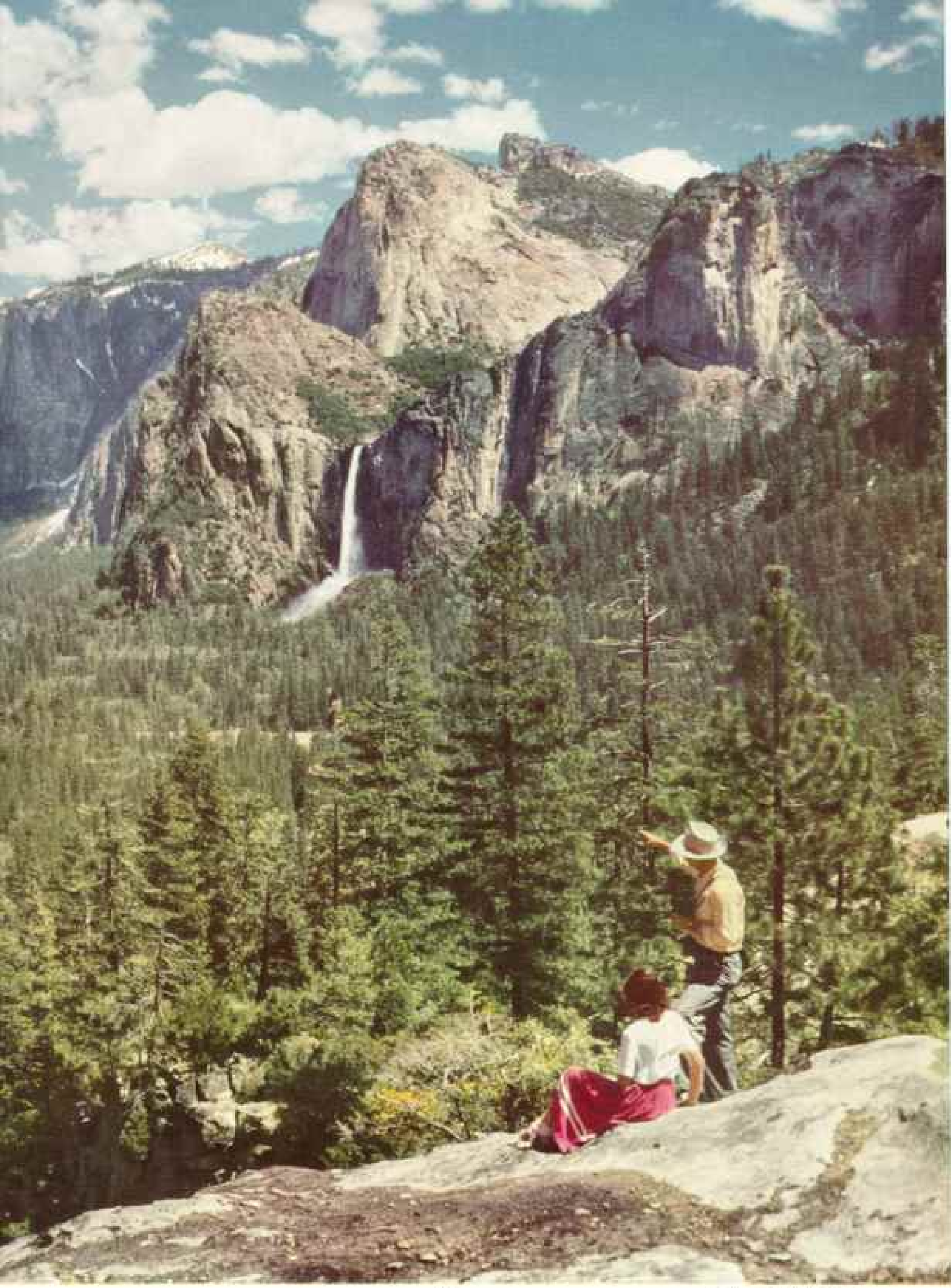
Badger Pass's first deep snows attract a steady procession of cars, their tops loaded with skis, their seats filled with bantering, singing young men and women.

Arriving, the visitors lose no time decking themselves in ski boots, plaid shirts, smoked glasses, and sometimes parkas. Then they shove off for the ski tows and cross-country runs. At evening, tired but happy, they return to the ski house (right) to thaw out, satisfy ravenous appetites, and wax skis for the next day's run. They sleep elsewhere.

Left: Diners on the cafeteria terrace enjoy a view of the crowded skiway.

Massive Glacial Sculptures Hem in Yosemite Valley's Piney Wilderness

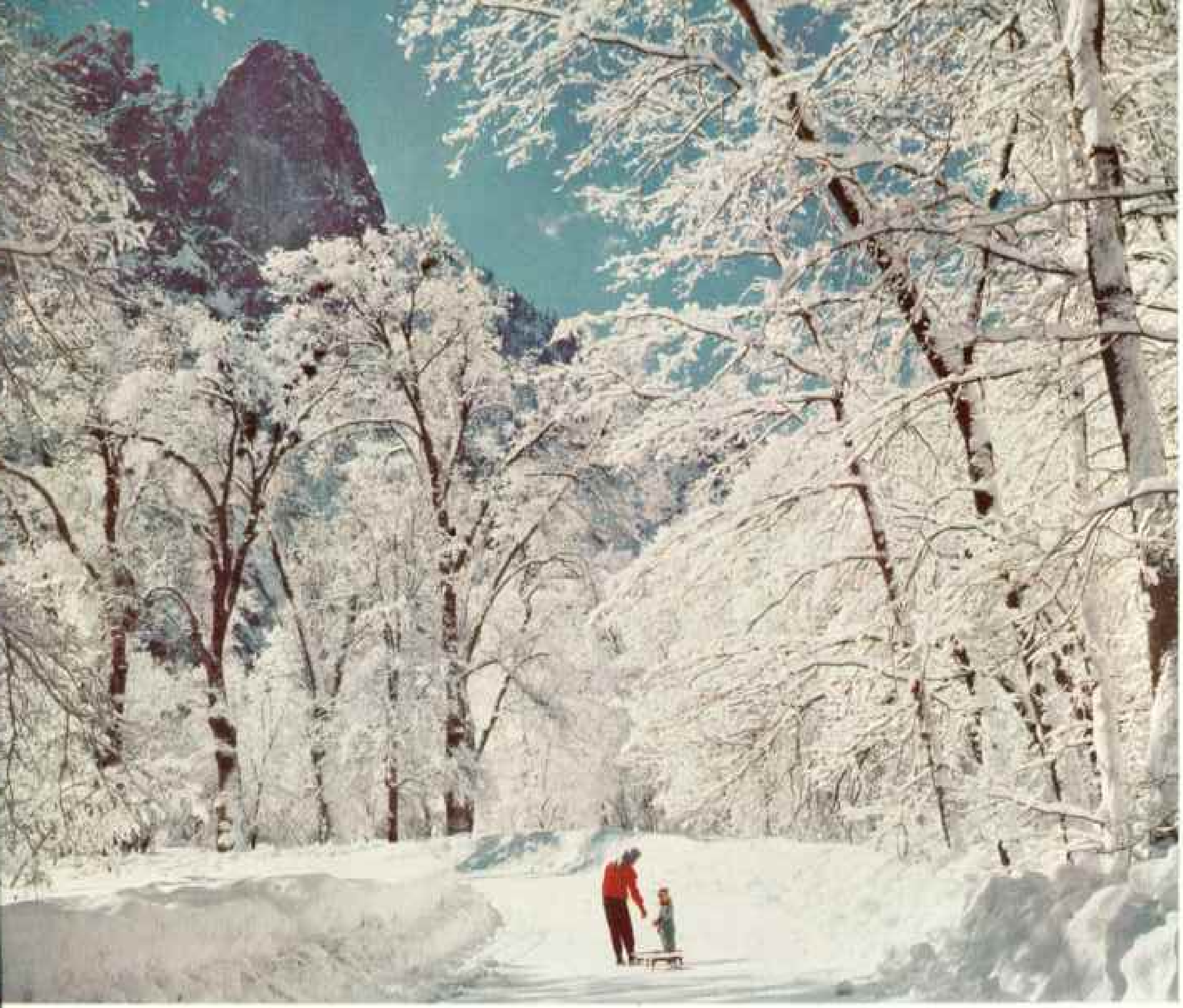
El Capitan (left), a tower of granite, has the volume of four Gibraltars, the height of nearly three Empire State Buildings. Half Dome (distant center) marks the valley's east end (page 498).



Photograph by Ray Atkeson

Bridalveil Fall, a Column of Gauzy Spray, Streams from a Hanging Valley

May's thaws flood the cataract; August's droughts dry it to a trickle. Merced River (left foreground) is the outlet. Three gabled peaks form the ridge known as Cathedral Rocks.



Mother and Daughter Explore a Fairyland of Glistening Boughs

Settlers in pursuit of Indians explored Yosemite Valley in 1851. Thirteen years later Congress set aside the valley and Mariposa Grove of giant sequoias, 35 road miles distant, as a trust to be administered by California. In 1906 these areas became part of Yosemite National Park.

Towering cliffs shade the valley's skating rink and toboggan slide. Often, following snowstorms, avalanches plunge down the granite walls, throwing off clouds of snow. Their dull rumble, increasing to a roar, can be heard for miles. The entire spectacle lasts but a few seconds.

Each cold winter night turns Upper Yosemite Fall's spray into crystal plaster hanging to the rocks. Dislodged, tons of ice thunder to the middle ledge (page 491). Spray drenches the fallen chunks, and freezing welds them into an icy cone hundreds of feet high.

Watercolor by Ralph Rapson© Anderson

Where's Ma? Lost Fawn Accepts a Substitute

To escape Yosemite's deep snows, deer head for the lowlands at November's end. Marmots, beavers, and wood rats go into hibernation, some until June.

Silver Lake Yields a 10-pound Rainbow Trout

Each year California stocks Yosemite's waters with a million trout. In season any angler may take 10 fish a day, 20 a week. Silver Lake lies east of the park.

Photograph by Ralph Hopewell Anderson

A Mythical Indian, Turned to Stone, Forms Her Own Monument, Mile-high Half Dome

Legend says the cliff's dark streaks are tears shed by a wife caught fleeing her husband. Half Dome, seen from Glacier Point, appears barren, but lizards and squirrels find a living on its bald summit.

Holy Week and the Fair in Sevilla

By Luis Marden

With Illustrations from Photographs by the Author

ROMAN soldiers in gleaming breastplates and red-crested helmets sat at sidewalk café tables eating ham sandwiches and drinking beer.

Under street lamps, masked penitents, like sinister figures of the Inquisition in their long gowns and high, pointed hoods, conversed in whispers (pages 504 and 507).

Troops of cavalry in brilliant full dress, with drawn sabers held stiffly upright, clattered over the cobbles as muffled drums thudded monotonously and a bugle blared brassily in the still air.

It was midnight. Holy Week had begun in Sevilla.

A Week of Processions

I had driven down from the bleak Castilian highlands to the spiritual capital of Spain's sunny southern region of Andalusia* to see striking demonstrations of two aspects of the Spanish character: piety and gayety. The first reaches its fullest expression during the impressive Holy Week processions; the second shows itself at the Spring Fair that follows.

Sevilla's Easter week processions begin on Palm Sunday and continue through Good Friday. Day and night, at least one procession will be making its way round the city. Pilgrims become used to the solemn beat of muffled drums and the lugubrious notes of the bugle.

Forty-eight *cofradías*, religious brotherhoods of laymen, have charge of the *Semana Santa* (Holy Week) processions. Oldest of the brotherhoods dates from the 14th century, several from the 15th. They bear sonorous titles, such as:

"The Pontifical, Royal, and Very Illustrious Brotherhood and Cofradía of Nazarenes of the Sacred Decree of the Most Holy Trinity, Most Holy Christ of the Five Wounds, Most Holy Mary of the Conception, and Our Lady of Hope."

The *cofrades*, or brothers, usually file in absolute silence, wearing voluminous tunics and tall conical hoods (page 514). Originally the loose robes and masks, different in color for each brotherhood, hid the identity of the penitent, so that no one could recognize the sinner. Penitents are also called *nazarenos*, probably because some early Christians were known as Nazarenes. No women march formally in the processions.

Most cofradías carry two *pasos*, or platforms bearing images, in procession. The first shows an episode of Christ's Passion, and the second canopied platform bears the sorrowing Virgin Mary (page 508).

The pasos of Sevilla are famed for the rich ornamentation of the dais and the images. Most elaborate of any in Spain, they are made of carved and gilded wood. The Virgin's paso is surmounted by a richly worked velvet canopy, or baldachin. Twenty to forty men, hidden by the fretwork sides and velvet curtains of the paso, carry the heavy platform through the streets (page 503).

I stood one night among a throng of Spaniards and fervent pilgrims from all over the Spanish-speaking world in a park on the edge of Sevilla. As the beat of drums heralded the approach of a procession, street lights snapped off, leaving the night to a brilliant moon.

Along a sandy path that ran under a high wall a double line of hooded penitents shuffled into sight. Flames of the four-foot candles they carried threw wavering circles of yellow light on the moonlit wall.

Though thousands packed the line of march, the only sounds came from the drums and the shuffling of sandaled feet. As I looked down the two lines of flickering light, the square bulk of a paso, bearing the figure of Christ Carrying the Cross, turned the corner. Glass-shaded candelabra at the corners of the paso threw a fitful glare on the agonized face of the Saviour, and made the varnish of the wood carving glisten like sweat.

The Haunting Song of Repentance

As the ponderous dais approached, the clear voice of a woman rang out from somewhere in the crowd at my back. In long-drawn-out minor notes, modulated by the ululation of the Moors, the woman sang to the image.

It was the *saeta*, a song of repentance and sorrow aimed like an arrow at the bowed figure on the platform. At the first notes, the invisible bearers came to a halt and lowered the heavy paso to the ground, facing the voice issuing from the darkness. For a couple of minutes the saeta continued, then died away on a long-drawn wail. The drums beat again, the platform shuddered into life, and the pro-

* See "In Andalusia, Home of Song and Sunshine," 14 ills. in color by Gervais Courtellemont, National Geographic Magazine, March, 1929.

500

Heart and Voice of Sevilla: the Giralda Bell Tower

To Sevillians, the Giralda is like London's Big Ben. No matter how far they wander, they never forget its 25 musical bells, each named for a saint.

Originally a Moorish minaret, the graceful tower now forms the Cathedral's campanile (pages 506 and 507). Visitors going to the top tread a ramp wide enough for horsemen. No one is permitted to ascend alone, the authorities fearing suicides. Lone sight-seers must wait for partners.

Orange trees burdened with fruit ornament this courtyard, the Patio of the Flags. Small boys rarely steal the oranges; they are too bitter.

cession continued forward.

Again and again saetas burst forth from invisible singers in the crowd and on balconies overhead. The wailing voices, the pungent scent of burning beeswax overlaying the fragrance of the mild Sevillian night, and the hypnotic stare of the cofrades through the eyeholes of their masks combined with the atmosphere of religious fervor to make the hairs rise on the back of my neck.

Eternal Tears of Sorrowing Mary

Beyond two more long lines of candle-bearing penitents a golden haze of light marked the approach of the paso of the Virgin. Scores of banked tapers lighted the haloed face of the sorrowing Mother of Christ and glowed in miniature in two crystal tears that are frozen eternally on the cheeks of the image.

On these images of Mary the *sevillanos* lavish such veneration that the rest of Spain calls Sevilla the Land of Maria Santisima.

When the Virgin's canopied paso stopped abreast of me, I saw dark and sweaty faces peering from beneath the velvet side curtains (page 503). The twenty-odd bearers called hoarsely for water, which an attendant poured from an earthen jug into tin cups. At some of the frequent stops along the route the weary porters drink a little wine.

The men who carry the heavy pasos wear split gunny sacks over

501

Spanish Bullfight and American Movie Advertise Side by Side

Because the sunny side of the ring grows very hot by afternoon, bullfight patrons find it more comfortable, fashionable, and expensive to sit in *sombra* (shade) than *sol* (sun). Not many crowd this ticket booth, for speculators and season-ticket holders have already taken the best seats. *The Flesh Is Weak*, says the poster of Sevilla's Cine Trajano. The Hollywood title was *The Foxes of Harrow*.

their heads like hoods and carry the weight on their shoulders by stooping under cross-beams. They move in step, with a shuffling gait, to the directions of a major-domo who walks ahead.

After a few moments' rest, the major-domo gave a warning signal by striking two blows with a knocker built into the front of the platform. Presently he struck a second time, and the paso jerked upward as the men lifted in unison. At the next knock, the bearers moved forward with their swaying shuffle.

The director reminded me of the hortator, who in ancient galleys beat time with a mallet on a wooden block for the oar stroke of the galley slaves.

Immediately behind the paso of the Virgin followed a robed priest chanting in Latin and flanked by altar boys. When the priest saw me making photographs, he turned and said abruptly in English, "Don't forget to send me that issue!" then continued the Latin intoning as he moved on. The prelate was a professor of languages whom I had met the day before.

The biggest and richest cofradía in Sevilla is that of the Christ of the Gran Poder—the Great Power. The image of Christ carried

507

Water Satisfies These Children; Their Parents Make a Ritual of Drinking Wine at the Fair

Lunchtime finds the fairground promenade all but deserted and business dull for the water vender. Strangers in Sevilla wonder at the street cries "Fire!" and "Water!" traditional calls of match and water hawkers.

by this brotherhood, a wood carving of great beauty, is the one most revered by the Sevillians. It was carved by the master Juan de Mesa in 1620, the year the Pilgrims landed at Plymouth. The brotherhood itself dates from 1431.

Just before 2 o'clock on the morning of Good Friday I waited with thousands of others densely packed into a small square to see the Gran Poder leave the San Lorenzo Church.

At 2 o'clock the church bell boomed out two deep, ringing strokes, and at precisely the same instant the great doors swung open and the first black-robed brothers emerged.

"Just like the bulls!" a voice behind me whispered with entire piety, referring to another Spanish event that starts exactly on time.

In a double line more than 600 black-clad cofrades filed into the darkened streets. Some carried long staffs topped with ornate silver standards centuries old; others carried the customary thick yellow candles.

Nazarenes' Candles Pure Beeswax

Only pure beeswax, says the Church, may be used in the candles carried by the Nazarenes.

All along the route children hold their hands out, palm upward, hoping that the silent brothers will let a little hot wax drip on them. When they have enough to roll into a small ball, the youngsters sometimes try to chew it like gum. Toward the end of Holy Week, Sevilla's streets accumulate a slippery coating of wax that has dripped from myriad candles.

Most of the cofrades wore sandals, but

503

Pale Moonlight and Brilliant Candles Illuminate the Virgin of Candelaria at Midnight

Sevillians lavish adoration, jewels, and silks on their many manifestations of the Virgin (page 508). Devout onlookers on balconies wail sorrowful *saetas* (religious songs) as her images pass.

Here the Candelaria Virgin is accompanied by lay brothers in hoods, white tunics, and wide grass belts. They stare, seemingly in sinister fashion, from round peepholes. Generation after generation, men of the same family march with the same brotherhood. Some, on dying, wear their treasured tunics as shrouds.

Tired porters, gunny sacks cushioning heads and shoulders, rest beneath the platform during a pause in their six-hour march. When they rise, lifting the heavy dais on bent shoulders, they will be concealed by curtains.

Low clouds reflect the moonlight. Beeswax candles burn so brightly that the photographer made the picture by their light alone.

Hooded Candle Bearer Embodies Spanish Mysticism

At 2 a.m. this penitent emerges from church with his fellows. His spectacles gleam milkily through the mask. A plain gold ring on the right hand marks him as a husband. Some brothers circulate among marchers relighting candles.

some scuffed along in bare feet. Often I heard the clank and rattle of chains; a penitent had made a vow to traverse the entire route dragging an iron ball, or with his feet loosely chained together. Others bent under heavy wooden crosses.

Processions start from their parent churches all over the city, but as they near the center they must follow a prescribed route to and from the Cathedral.

One obligatory point of passage is Sierpes, the narrow shopping thoroughfare of Sevilla (page 514). Formerly, rivalry among the cofradías was so hot that the masked brothers fought for precedence in entering this narrow street, abandoning their candles for stout cudgels, laying about them and breaking heads in their excess of zeal.

The climax of Holy Week's fervor comes when the image of the Virgin of Good Hope returns to her chapel on Good Friday. This Virgin is commonly called La Macarena, after the quarter of Sevilla where she has her chapel.

La Macarena is borne on a rich paso, and wears a collection of jewels that dazzles even among the splendors of Sevilla's holy images. Women of wealth and nobility bequeath and lend their jewels to the Macarena. She wears a heavy crown and halo of gold, and a glittering array of diamonds, emeralds, and other precious stones (page 511).

Civil Guards Escort the Virgin

A special group of Civil Guards in gala uniform guards the Virgin on her slow progress through the city, though the mere thought of robbing so holy a figure would fill the pious sevillanos with horror.

As the Macarena neared an arch flanked by ramparts built by Julius Caesar, a woman beside me said excitedly to her companion, "She's wearing my pearls!" The close-packed crowd that filled the great square broke into applause, and with hand clapping and shouts of "Viva la Macarena!" the faithful pressed forward until there was barely room for the procession to move.

The Virgin seemed to falter; for nearly ten hours she had threaded the streets of Sevilla and she must have been tired. People wept, cried out, and sang saetas, as religious fervor mounted to exaltation.

The spirit infected the hidden *costaleros* (porters) who carry the paso, and they began to make the Virgin dance, swaying from

side to side, turning completely around, and then jiggling her up and down. The clergy frowns on this practice, but it made the populace shout for joy.

Thus, amid the applause and cries of the multitude, the Macarena entered the door of her white temple to rest for another year.

Joyful Bells Usher in Easter

After the fervent processions of Good Friday, Holy Saturday passes quietly, and then come the joyous bell ringing and High Masses of Easter Sunday.

In the afternoon a gala bullfight in Sevilla's handsome bull ring opens the major bullfight season and marks the final release from all solemnity (pages 501 and 512).

The April Fair begins within a few days to a fortnight after Holy Week, and in the meantime I had a chance to see a relatively normal Sevilla.

Sister, Posing, Pouts and Scowls. Her Eyes Speak Volumes

Brother's Andalusian costume includes a ruffled shirt fastened at the collar with linked studs. He, like his elders, never wears a tie with the *sevillana* hat. Two-tone shoes are his own idea. The girl dresses as a gypsy, complete to curl.

The city lies on the east bank of the Guadalquivir, amid orange and olive groves. Though 65 miles from the river mouth, Sevilla is an important seaport, and ships come upstream to its quays to load olives, olive oil, oranges, and cork (pages 516 and 520).*

From ancient times the fertility of the vast basin of the Guadalquivir attracted colonists and conquerers, and Sevilla, as the Hispalis of the Romans, became a rich city in whose neighborhood were born the emperors Trajan, Hadrian, and Theodosius (page 519).

In addition to the Romans, Sevilla has seen the passing of the Phoenicians, Greeks, Carthaginians, and Moors.

An inscription on a now-demolished city gate summarized the city's history thus:

"Hercules built me, Julius Caesar encircled me with walls and towers, and the Sainted King took me."

The last referred to the reconquest from the Moors by Ferdinand III in 1248.

Sevilla's many famous sons and daughters include the painters Velázquez and Murillo, and the imaginary characters Don Juan, Carmen, and Figaro, the Barber of Sevilla.

Ortega y Gasset wrote that the culture of Andalusia is agrarian, as contrasted with the warlike tradition of Castile.

The easy-going *andaluz* reflects the benign climate and bright sun (Sevilla has more than 250 days of sunshine a year) of his land. The

* See "Sevilla, More Spanish Than Spain," by Richard Ford, National Geographic Magazine, March, 1929.

hyperbole, grace, and romanticism that other Spaniards expect of the Andalusians flower best in Sevilla.

"Salty" Shop Signs

A Spaniard pays you a high compliment when he says you have salt; that is, wit, grace, spirit. Sevillanos are salty talkers, and their ready wit extends even to shop signs. One sign I saw read:

"Purveyors of Languages, Talent, and Sentiment."

It hung over a pork-butcher's shop that specialized in pig tongues, brains, and hearts.

In another street a cabinetmaker's shingle said:

"We Make Furniture and Sonnets."

Once chicken thieves robbed a henhouse on the grounds of a rural police station outside Sevilla. They took every hen, leaving only the disconsolate cock. Next morning the police found the dejected rooster perched alone in a corner. Round his neck hung a placard that read:

> The ladies of this Don
> To Sevilla are gone.

Incidentally, Spanish, because of its paucity of technical terms, is a poor language in which to describe machinery, but an excellent tongue in which to navigate or to make love.

The Moors have left their stamp on Sevilla in streets so narrow that pedestrians can stretch out their arms and touch both walls at the same time (page 524), and in white, massive-walled houses built around courtyards bright with flowers and pleasant with the sound of running fountains.*

Giralda Symbol of Sevilla

Over the low roofs of the city the slender tower of the Giralda points a terra-cotta-colored finger into the blue Andalusian sky (pages 500, 507, and 521). As much a symbol of Sevilla as the Eiffel Tower is of Paris, the Giralda holds a special place in the hearts of the sevillanos. Homesick Andalusians in Mexico and South America sigh for the sound of its bells.

The Giralda houses a "hagiography of bells," 25 of them, each named for a saint. Atop the spire a huge bronze figure of Faith holds a vanelike banner and turns slowly with the wind. The populace nicknamed the figure Giraldillo, Little Turner, from the Spanish verb *girar*, to turn; from this derives the name of the tower itself.

Erected by the Moors as minaret for the city's chief mosque in the 12th century, the tower has undergone many changes, and now shows the influence of several periods.

Today the Giralda forms part of Sevilla's Cathedral, a vast Gothic pile with flying buttresses. Its size fulfills its builders' avowed intent to "make such a Church that those who behold it shall think we were mad," for it is one of the largest Gothic churches in the world.

Next to the Cathedral another imposing edifice covers a whole block: the Casa Lonja, or Exchange, built in 1598 from designs of famed architect Juan de Herrera, the man who finished the Escorial and gave his name to a style of architecture. The rectangular building now houses the stupendous document collection of the General Archives of the Indies.

From the time when I first began to retrace the steps of the conquistadors in America, and to read of their exploits, I had seen references to this collection.† I wandered now among the magnificent mahogany racks and cases that hold nearly 36,000 files. The Archives contain the basic documents for practically the entire early history of the Americas, and only a fraction of this fabulous treasure has been published.

Autographs of Famed Adventurers

Glass cases display many of the first maps of the New World, astonishingly well drawn and painted in colors.

In one case alone I saw autographs of Cortés, Pizarro, and other conquistadors, grouped around a letter written by Christopher Columbus to his son, signed with the Admiral's famous cabalistic cipher.

This year Spain celebrates the 500th anniversary of the birth of Isabella, the farsighted queen who financed Columbus's expedition which discovered the New World.

After the discovery of America Sevilla became the chief port of embarkation for the Indies, and through the 16th century and part of the 17th enjoyed a virtual monopoly of trade with the New World. Hence the accumulation in Sevilla of documents relating to Spain's overseas possessions.

At Sevilla began the so-called Course of the Indies, over which ships sailed in about two and one-half months to Mexico, Panama, and Cartagena on the South American mainland. Doubtless this helps explain why the speech of Spanish America more closely resembles the Andalusian turn of tongue than the pure Castilian of the highlands.

* See, in the National Geographic Magazine: "Adventurous Sons of Cádiz," by Harriet Chalmers Adams, and "Moorish Spain," 26 ills. in color, by Gervais Courtellemont, both August, 1924.

† See "On the Cortés Trail," by Luis Marden, National Geographic Magazine, September, 1940.

Kodachrome by Luis Marden

Lay Brothers Robed as Penitents Show that Holy Week Has Begun in Sevilla

Each Easter week some 50 brotherhoods parade in distinctive silk robes. Their predecessors adopted hoods to escape recognition as repentant sinners. These two stand in front of the Giralda, bell tower of the Cathedral.

Kodachrome by Luis Marden

Surging, Praying Crowds Follow the Virgin's Mobile Dais Through the Streets

The canopied platform is borne by 20 toiling men who, their shoulders to crossbeams, walk in shuffling steps, perhaps as long as 10 hours. With frequent pauses they proceed blindly, directed by a major-domo.

Pedestrians Clog Sevilla's Narrow Street of the Serpents. Cars and Carts Are Forbidden

No one knows why this nonserpentine street was named Sierpes (Serpents). In summer, when awnings stretch from side to side, the thoroughfare looks like an Oriental bazaar. Sierpes has no curbs; it is one big walk (page 514).

Kodachrome by Luis Marden

Seven Centuries Look Down on Sevilla's River Port. Moors Built the 12-sided Tower of Gold in 1220

Opposite page: La Macarena, the city's most lavishly decorated Virgin, returns to her chapel on Good Friday. She wears a fortune in jewels bequeathed or lent by wealthy women. Hooded penitents accompany her. Onlookers perch on ramparts laid out by Julius Caesar and restored by the Moors.

Reduction by Luis Marden

Like the Romans Who Demanded Bread and Circuses, Sevillians Require Bread and Bulls, One as Necessary to Them as the Other

Madrid's ring is the high temple of the art, but Sevilla's is the handsomest. No other arena has sand of this peculiar golden color. Two white rectangles identify barricades where a hard-pressed *torero* may take refuge from his charging adversary.

Holy Week Takes Sevilla's Beauties Out of Seclusion

On Holy Thursday Andalusian girls drape black-lace mantillas over high tortoise-shell combs and, carrying rosaries, prayer books, and gloves, visit several churches.

At other times black mantillas appear only at high church or social functions. White mantillas are worn at gala bullfights.

The making of lace mantillas is almost a lost art. Women used to create them, thread by thread, at the cost of time-consuming, eye-straining toil.

Several hundred dollars would not buy one of the finest of these generations-old heirlooms. Imitators produce them today by working designs into a background of tulle net.

Most Spanish girls are brunettes (left), but some, perhaps reflecting Visigothic ancestry, are blondes (right).

Every Spanish woman knows how to use her expressive eyes and fan. She opens and shuts the fan with a shot-like snap and makes it flutter like a bird's wing.

Kodachromes by Luis Marden

At Dusk Glowing Candles and Masked Penitents Advance Beneath Laden Balconies

Sierpes Street is lined with rented chairs; daylight will see them stacked, making room for shoppers (page 509). Beeswax candles in a brilliant bank born on the Virgin's platform.

Orange trees grow in public parks and squares and along many streets of Sevilla, and in season fill the city with the scent of orange blossoms. Small boys do not try to pick the ripe oranges because they are bitter, the kind that make the bitter-sweet marmalade of Scotland and England.

I breakfasted one morning under an orange tree in the courtyard of my hotel. When I asked for marmalade, the waiter said,

"I am sorry, sir, but we have none; the shipment has not yet arrived from England."

Sierpes, the Street of the Serpents, runs throughout Sevilla's heart. So narrow that wheeled traffic is prohibited, Sierpes is not a long street, but along its shop- and club-lined length flows the life of Sevilla (page 509).

No one seems to know why Sierpes bears the name; it runs nearly straight, and does not at all resemble a snake. By the way, the visitor to Spain should avoid using the word "snake" or "serpent"; Spaniards say it brings bad luck. If one does mention them, hearers mutter, *¡Lagarto!*—lizard. This removes the curse.

Typical of Sevilla are the private clubs, called *círculos*, in Sierpes and other central streets. Here, behind plate-glass windows, cattle barons, olive magnates, and orange and cork kings sit to watch the other half go by. Some club chairs have padded, crescent-shaped backs, so that members may turn the chair around and sit astride, comfortably leaning their elbows on the cushioned chair backs as they turn an indolent eye on the strolling crowds.

Where Cervantes Created Don Quixote

A plaque let into the wall of one club in Sierpes marks the site of the jail where Cervantes, says the inscription, "to the delight and amazement of the world," created the ingenious Hidalgo, Don Quixote de la Mancha. Cervantes set the scene of several of his works in Sevilla.*

Sierpes itself is too busy and narrow for sidewalk cafés, but on side streets and in adjacent plazas little tables invite tired strollers to sit and drink sherry, while venders circulate among them, selling rose-pink prawns, shrimp, potato chips, crab mandibles, lottery tickets, and even marionettes (page 521).

Most of the venders are slight, dark boys, very knowing and cynical, and yet very appealing, with their dark eyes and sudden smiles.

I had seen bands of them in these same streets at Christmastime, singing carols and beating time on bells, triangles, metal spirals, and tambourines. Sometimes a boy played a *bandurria*, a sort of lute, and, for a bass note, another slapped the mouth of an earthen jug with an old rope sandal.

Campanilleros, bell ringers, they are called, and their boyish voices singing the simple rhythmic melodies, accompanied by the ringing metal and the booming of the jug, make a pleasant sound in the night.

In the elegant cafés of Sevilla, marked by the inevitable magnificence of great crystal chandeliers, the gentry sip coffee and liqueurs. Here I saw something I had first noticed in France. Every now and then an elegant woman would hitch up her skirt and sit on her slip, apparently to keep the skirt from wrinkling.

It seemed odd to see a smartly dressed woman in furs and diamonds, delicately sipping brandy, with her skirt tucked up and a foot of pink slip showing.

Andalusia Breeds Fighting Bulls

Andalusians love fine horses and fighting bulls. Of Spain's 168 major breeding ranches of "fierce" bulls, nearly half are in Andalusia.

To go to the most famous of them, the Miura ranch, I drove from Sevilla 20 miles to Carmona, site of an extensive Roman necropolis. Here a rudimentary road struck off across seemingly limitless pastureland.

Don Eduardo Miura, present head of an establishment that traces its blood line unbroken back to 1842, received me in his handsome white *cortijo* country house, and over glasses of manzanilla, a white wine like sherry, but drier and more aromatic, we talked of the bravery trials I had witnessed here some weeks before.

Don Eduardo had sent me a guarded telegram. "House party set for Thursday," it read, "hope you can come."

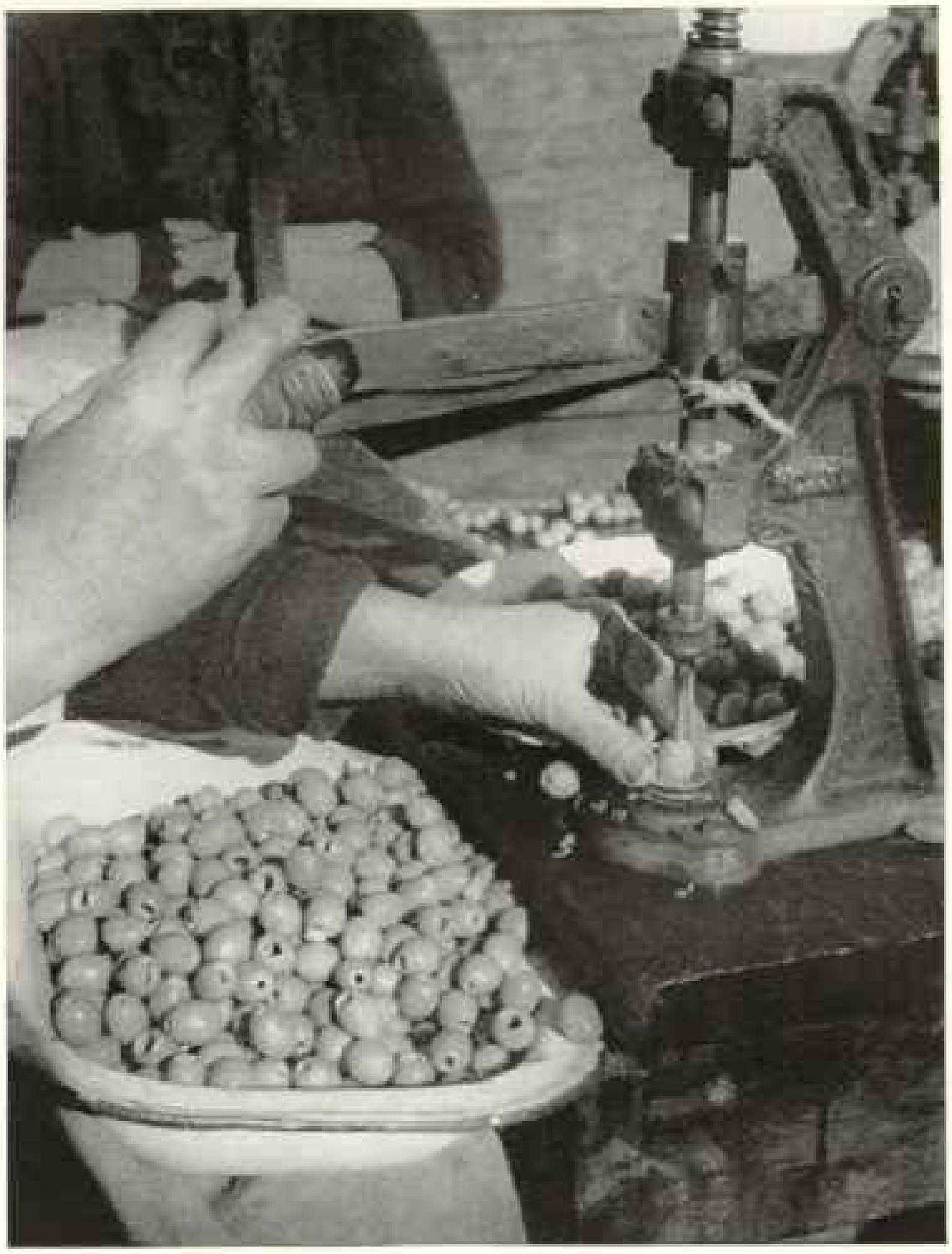
Breeders conceal the date of bravery trials, because if word leaked out, every *aficionado* for miles around who could drive, ride, or walk would hurry to the scene and impede the work of the herdsmen.

In a big pasture two wagons were lashed together as a camera platform from which I could make motion pictures.

The Miuras, father and son (Don Antonio Miura has ceded the direction of the ranch to his son Eduardo), and a group of friends including Pepe Luis Vázquez, one of Spain's leading matadors, wearing Andalusian country dress and wide-brimmed sevillano hat, mounted agile horses.

Most Andalusians are born horsemen. Perhaps their skill and their love of horseflesh

* See "Speaking of Spain," by Luis Marden, National Geographic Magazine, April, 1950.



Olives Shed Their Pits for Pimiento or Anchovy Stuffings

Sevillians say the best table olives grow within sound of the Giralda's bells. These green olives were soaked in soda and brine to eliminate bitterness. The punch pushes out the pit together with an adhering button of flesh.

stem from the Moors, whose old proverb says that the horse, the woman, and the rose are God's most beautiful creations, presumably in that order.

Don Eduardo and his friends carried long, blunt-pointed lances with which to topple the young bulls, which had been herded into one corner of the pasture.

A Good Bull Comes Up Fighting

At a signal, two horsemen with lowered lances rode off to single out one bull. The senior Miura and the ranch overseers and foremen rode slowly after them.

Riding hard, the two horsemen bore down on the running bull (page 518). One rider kept the bull from swerving away, while the other lowered his lance and caught the bull in the rump with its point, toppling him head over heels.

Those who followed carefully noted in the record book the reaction of the young bull—whether on regaining his feet he turned and charged the lancers, or ran away. His bravery or lack of it determined whether he should become a fighting bull or beef.

Two by two, the guests rode after their bulls. Once the lancer was thrown backward off his horse by the impact, but the other rider engaged the attention of the bull until his friend could remount.

The fighting bull, selected for generations for pugnacity, will charge and attempt to kill anything that moves. Bullfighters have an almost superstitious awe of Miura bulls; they say they have a neck like an accordion, which they can stretch out to hook the matador as they charge by to follow the cape or muleta.

Formerly, bulls were not considered ready for the ring until five years old; now they are fought at four or even younger. One reason is that, as my friend Don Pablo Merry del Val says, "age makes alcoholic drinks and bulls more expensive," and the breeder wants to get a return on his investment as soon as possible.

When I left the Miura ranch I drove toward Córdoba, having still a few days before the opening of the Fair. At the arched bridge, built on Roman ruins, that spans the broad Guadalquivir at Córdoba, boys wait to show travelers the sights. When I slowed to a stop, a thin, dark boy jumped nimbly into the seat beside me and directed me up a sloping street to the Cathedral.

As the Great Mosque of Moorish Córdoba,

the Cathedral was exceeded in size only by the Kaaba in Mecca.

Today other buildings crowd the enormous edifice, making it difficult to gain an impression of its size; but inside the forest of marble columns seems to recede unendingly into the dimness.

Córdoba Relic of Moorish Splendor

Córdoba under the Moors became one of the great capitals of Islam, with 200,000 residences, 600 mosques, and magnificent palaces and gardens. To build the Great Mosque, which was begun in 785, the emirs brought marble, jasper, and granite from Rome, Carthage, Constantinople, and France.

My little guide took me to the spacious central plaza of the city. In the center stands a bronze equestrian statue of Gonzalo de Córdoba, the Gran Capitán, who won the Kingdom of Naples for Spain.

Juanillo pointed to an incongruous white marble head on the bronze body of the warrior and said, "That is the head of Lagartijo, the great matador. When the statue's original head was broken off, they stuck on a marble head of the bullfighter."

When I walked closer I saw that the face did indeed resemble pictures of the great Cordoban bullfighter, who in his apprentice years was tossed so often by the bulls that people said he spent more time in the air than on the ground.

The resemblance is doubtless only a coincidence, but Cordobans like to think that the monument combines homage to two local heroes.

I visited the cafés of Córdoba and saw a few conservative old gentlemen who still wear the high-crowned, broad-brimmed hat called a *cordobés*.

Little Penitent Lifts His Hood; Father Never Does

Few youngsters march in Holy Week processions. When they do, parents often pin up masks to ease breathing. The man carries a silver-topped staff and wears the embroidered insignia of his brotherhood.

Through a friend, I became an honorary member of a *peña*, an informal club that meets regularly in a tavern or café. This group met every afternoon and evening in the back room of a tavern and called itself the Informals.

The Informals had decorated their room with bullfight posters, photographs of club outings, and a copy of the bylaws, which stated that there were no bylaws. Everyone sat where he pleased around a long table; there was no president and the first comer occupied the chairman's seat at the head of the table.

Spaniards respect a man as an individual,

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Andalusian Horsemen Test a Miura Bull Calf's Bravery by Toppling Him with a Lance

Toreros feel an almost superstitious awe for Andalusia's Miura strain, which has been bred without a break for more than a hundred years. Many bullfighting greats have met death on the horns of Miuras. A generation ago several matadors refused to meet them in the ring.

Each January, as rains refresh the grass and strengthen the calves, Miura breeders hold bravery trials to cull any timid Ferdinand out of the herds. Here the rear horseman, rising in the stirrups, aims his lance at the bull's rump and bowls him heels over head. Then, if the animal gets up and charges, he is marked as a ring fighter. If he runs away, he becomes steak (page 516).

Even the cows are bravery-tested with cape and muleta, but bulls never receive such trials lest they learn to seek the man behind the cloth.

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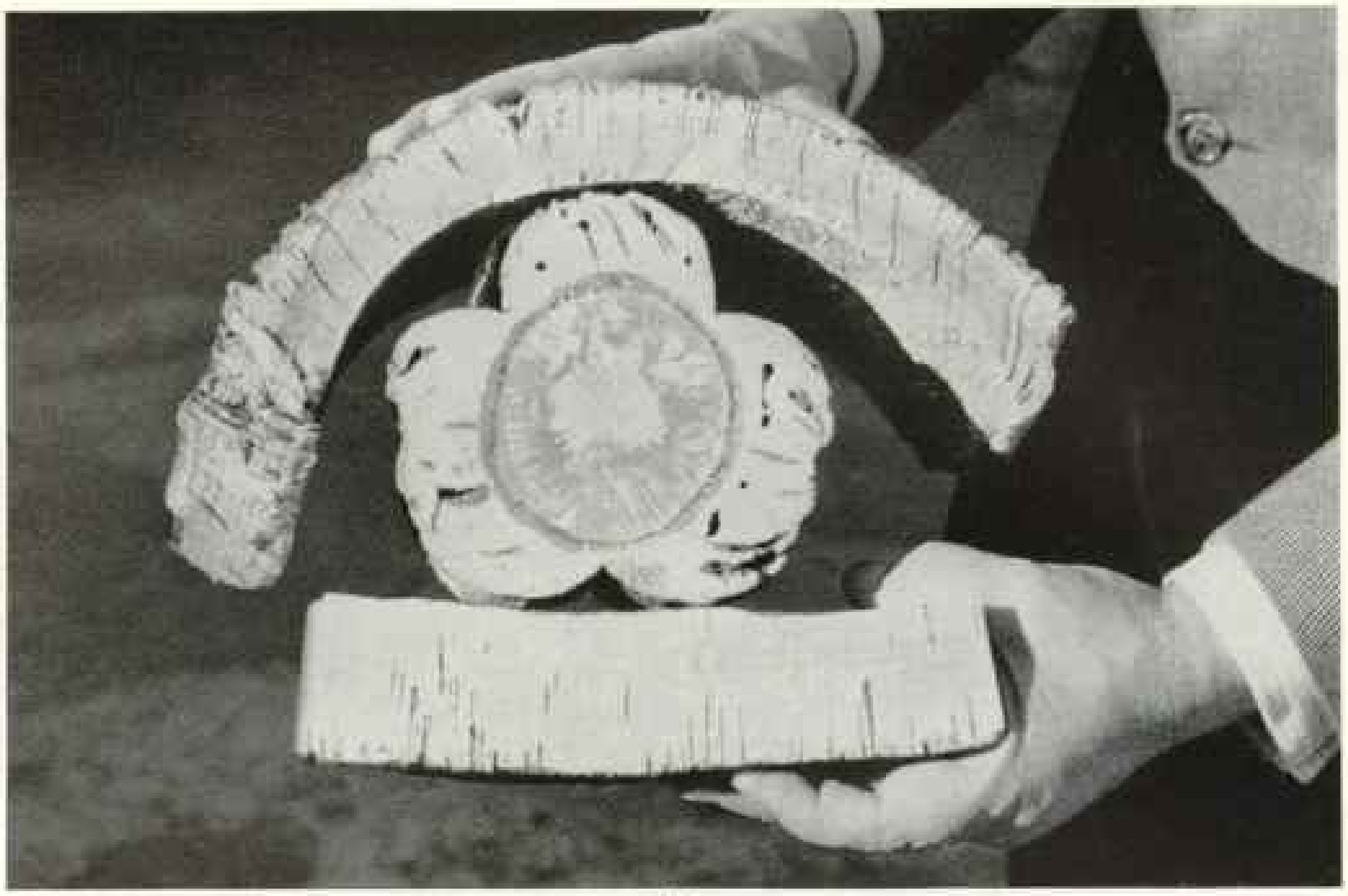
Gladiators and Wild Beasts Battled in This Ruined Ring near Sevilla. In Roman Times It Held 25,000 Fight Fans Yelling for Blood

The Romans, who ruled Spain six centuries, built nine big amphitheaters throughout the peninsula. Here on holidays they treated the populace to the sight of famished lions emerging from trap doors in the central trench and falling upon cringing prisoners.



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Cork Stoppered Greek and Roman Wine Jugs 2,000 Years Ago

Sevilla processes cork stripped from wild oaks throughout Andalusia. A cross section (center) shows the virgin cork, which is so poor it is usually discarded. In nine years the oak grows a thick, high-quality layer, like the curved slab. Boiling and pressing produce flat slabs like the bottom specimen.

and care little about his social or economic status. The heterogeneous roster of the Informals included a bank official, master tinsmith, journalist, tax collector, chemist, police inspector, photographer, landed proprietor, prison schoolteacher, lawyer, automobile mechanic, and olive expert.

They talked in the sibilant Córdoban accent about crops, bulls, flamenco singing, and women while they drank half-tumblers of Montilla and Moriles, the potent local white wines.

Montilla, from the town of the same name that saw the birth of the Gran Capitán, is a dry, pale-gold wine. Certain sherries resemble Montilla, hence are called *amontillados*.

Sevilla Crowded for the Fair

When I returned to Sevilla I found that as many tourists had crowded into the city for the Fair as for Holy Week.

Founded in 1847, principally for the sale and exchange of livestock, the Fair today has become a regional festival of dancing, promenades of equipages and equestrians, and special bullfights, with the horse-trading an incidental appendage.

Everyone who goes to the Fair tries to look as Andalusian as possible. Somber Basques, lank Galicians, and prosperous-looking bespectacled Catalans all take off their neckties and put on a wide-brimmed sevillano hat. With a big Havana cigar cocked in one corner of the mouth, they saunter up and down Sierpes, hoping no one will notice their accent, and that they will be taken for sevillanos.

Shiploads of cigars from Cuba supply the heavy Spanish demand. During the Fair bullfights a Havana cigar is as necessary to the real aficionado as an entrance ticket.

On an earlier visit to Sevilla, after I had looked for days at the men who thronged the streets and cafés, I asked a waiter, "What do you have to do to see women in Sevilla?"

"Señó," said the waiter, "go to 7 o'clock Mass."

I had photographed some good-looking girls during Holy Week, but Feria is the time to observe the famed beauties of Sevilla, when they leave the Moorish seclusion that keeps them, as a French guidebook puts it, "little visible to the tourist."

On the Prado of San Sebastián, close to the ornate 18th century Tobacco Factory where Carmen of the opera worked, there springs up a city of canvas for the Fair. *Casetas*, temporary structures of canvas over wooden framework, line streets hung with strings of red and white lanterns (page 525).

The casetas wear brightly painted false fronts. Families, clubs, unions, and other groups rent the casetas and decorate them

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Coffee Drinkers, Undisturbed by Women, Sit in the Morning Sun and Talk About Them

This dead-end Sevilla street is lined with cafés and bars serving patrons outdoors. No wheeled traffic breaks the serenity. Few women appear before teatime. When the sun grows too hot, waiters pulling halyards (above) will cover the street, eave to eave, with the white canvas awnings now furled like bats' wings (upper right).

with posters, pictures, guitars, draperies and rugs, competing for the prize offered by the municipality for the best decoration.

The casetas are the scene of much visiting back and forth, and music and dancing go on in them far into the night.

Down one side of the fairgrounds runs the Street of Hell—the midway, with merry-go-rounds and sideshows. Near by, open-air restaurants sell food and drink.

Gypsies Specialize in Doughnuts

Gypsies, the dark, nonchalant race that has inhabited Spain for centuries, have their stands at the opposite side of the ground, where smoke and the hiss of frying grease announce their specialty: *buñuelos*, a sort of doughnut fried in deep fat, served with hot chocolate.

During the day everyone who has a horse or a mule- or horse-drawn vehicle goes to the fairgrounds to promenade. Men wear Andalusian cowboy dress and the inevitable sevillano hat, and women usually dress in full-skirted, polka-dot gypsy costume (page 526). Children wear their own gay versions of these costumes (page 505).

Spectators lining the sidewalks applaud when a gaited horse paces by. Every rider tries to have a girl behind him on the horse's crupper (pages 525 and 530).

I saw an amazing variety of carriages: open victorias and fiacres, high breaks, and several kinds of gigs, surreys, and wagons, as well as many rigs I could not identify.

Mules drew many of them, and nearly all wore bright harness, jingling bells, and tassels in the national colors, red and yellow (page 528).

At noon the mass of promenaders jams the fairground streets. The torrent of color flows slowly, as riders make a few turns, then stop at friends' casetas for a glass of manzanilla.

Sometimes the horsemen hitch their animals and go inside, but usually attendants rush racks filled with little cylindrical glasses out to the thirsty riders (page 527).

No one seems to eat during the Fair; everyone drinks manzanilla and dances the *sevillanas* to the jaunty music of a barrel organ.

Spectators keep time with the music by clapping hands; some on the beat, while others clap on the offbeat, which results in a tricky, syncopated rhythm.

All women of Sevilla, from childhood up, dance the sevillanas, a graceful dance of much movement and clatter of castanets. In some tents I saw professional dancers, usually gypsies, dancing and singing in wild flamenco style.

The origin of the term flamenco in reference to singing and dancing is obscure. Literally the word means Fleming or Flemish, and some theorize that it was first applied to the soldiers who had fought in Flanders or who were stationed there when it was a Spanish possession.

Upon returning to the homeland, they must have seemed a wild lot to the stay-at-homes, who, when they heard singing and carousing in the streets at night, would shrug and say, "After all, they are flamencos."

True flamenco has a wild, abandoned sound, and undoubtedly stems from the Moors, though some have tried to find a Byzantine influence in its strange minor tones, embellished by modern exponents with extravagant modulations and vocal embroideries.

At 5 in the afternoon the fairgrounds are deserted; everyone has gone to the bullfight. At the Fair series of bullfights famous matadors repeat triumphs of other years and new "phenomena" consecrate themselves on the sands.

The sand of the bull rings of Barcelona and Valencia is whitish; that of the northern plazas is dark, and the Madrid ring has pinkish sand. Only in Sevilla did I see the bright golden sand of the Guadalquivir, of a hue to gladden a color photographer's heart (page 512).

"Salt" Marks Sevilla Bullfighting

Sevilla, city of passionate bullfight aficionados, has produced many famous matadors, who have developed a style full of Andalusian grace and "salt," marked by gayety, color, and movement, full of embellishments in which the bullfighter reaches out to touch the bull's muzzle or horn, and stressing lighthearted and showy passes.

This contrasts with the sober, austere style of Ronda, where the classic rules of bullfighting originated.

At the gala bullfights of the Fair good-looking Sevillian girls wear white mantillas—the black ones are reserved for church-going (page 513)—and brilliant embroidered *mantones*, the so-called Spanish shawl that originated in Manila.

In the front rows at the bullfights sit the old aficionados, sevillano hat over one eye, and long Havana cigar tilted critically.

Sevillians like these aficionados believe in the good life. One old gentleman, of the type Spaniards call a "green old man," told me his slogan for living:

"Eat and drink well, make love boldly, and thumb your nose at death."

There are worse philosophies.

April Fair Brings Gayety; Carmencita Wears a Mantilla of Linked Yarn Balls

Most women wear Gypsy dress (page 526), but this professional dancer prefers her period costume. She carries castanets. In her hands they vibrate like a rattlesnake's whirring tail.

Kodachrome by Luis Marden

Spring's in the Air, Sevilla's at the Fair—What More Could Lovers Ask?

Moors designed this narrow street to be shady; sunlight penetrates only at noon. Geraniums and carnations brighten balconies. Street lamps burn gas. Walls mask green patios and murmuring fountains.

Kodachrome by Luis Marden

No Man Has Truly Seen Sevilla's Fair Without a Horse Beneath and a Girl Behind

Sidewalks are lined with temporary structures where families eat, drink, dance, and receive friends. Girls ride without saddles; they hold on by clutching escorts' waists and horses' cruppers.

  Kodachrome by Luis Marden

Polka-dot Gown, Gypsies' Standard Attire, Becomes Fashion's Favorite During the Fair

This girl, accompanied by friend and coachman, holds her absent cavalier's *sevillano* hat. "Don't dare bend the brim," he warned, but she forgets. To keep the brim flat, he removes the hat with both hands.

↑ Mounted or Afoot, *Sevillanos* Love Their Pale-gold Manzanilla

This light dry wine, a Sevilla specialty, has a faint scent of apples, though it is made entirely of grapes. Here a host offers each passing friend a drink from a rack. A waiter holds olives and snacks (page 530).

↓ Brother and Sister in Toy Carriage Feel They Are Riding on Air

This two-wheeler, complete with pneumatic tires, was a miniature. Even the donkey that pulled it was tiny. Sister spreads her "grown-up" Gypsy gown across the carriage. Spanish children radiate unaffected charm.

Kodachrome by Lilo Marden

Trotting Mules, Bells Jingling, Tassels Flying, Draw Merrymakers Through the Fairgrounds

Andalusians often hitch teams in unorthodox fashion—sometimes in single file, at other times in fives, three ahead, two behind.

Paper Lanterns Overhang the Horseman's Way →

Above all things, the Andalusian loves fine horses and fighting bulls. He breeds both on his wide plains.

Wiry Spanish horses accompanied the conquistadors on their triumphs in Mexico and Peru. American Indians, who never had seen such creatures, regarded man and horse as a single supernatural beast.

← Seamstress Models Bullfighter's Cape

Toreros from all parts of the Spanish world order their "suits of lights" tailored at Manfredi's, of Sevilla. They wear such embroidered capes only while parading into the ring; then they lend them to friends, who spread the garments across front-row boxes. While fighting they use plain rose-and-yellow capes (page 512).

Top-ranking matadors rotate a dozen costly outfits each season. Womanlike, they would not dream of being seen in the same costume twice in succession.

Kodachromes by Luis Marden

Boy and Girl, Toasting the Fair, Share a Glass and a Horse

The rider offers his lady manzanilla, Sevilla's favorite drink. Fair-goers down it, glass after glass, day and night, but no one appears tipsy. Utter strangers sometimes thrust glasses at passers-by (page 527).

Perfume, the Business of Illusion

By Lonnelle Aikman

OUT of the sky over Syracuse dropped a perfume-laden helicopter—with a large Easter rabbit at the controls.

In New York City a man stepped out of a store, carrying jars of scented bath salts. He sprinkled the crystals on the icy pavement and then went back inside, as passers-by sniffed in surprise at the fragrant, frosty air.

In Washington, D. C., a crowd of curious shoppers gathered about the display window of a leading department store. They were watching a pretty girl in evening dress, who was apparently imprisoned inside a huge perfume vial, as a miniature ship is caught within a glass bottle.

Such antics are not figments of an Alice-in-Wonderland fantasy. They are real incidents in the day's work of a world-wide industry that in the United States alone has an annual "take" of more than one hundred million dollars.

The rabbit in the helicopter was actually a hard-working pilot dressed in masquerade for a stunt assignment to fly in an Easter shipment of a new perfume.

Sprinkling the bath salts was the idea of a cosmetics manufacturer, who thus disposed of some sample goods, protected pedestrians from slippery streets, and called attention to his products.

The girl in the bottle was, of course, an eye-catching advertisement, a flesh-and-blood demonstration of party-going perfume.

All this is part of the fabulous business of making and selling scent. For perfume is not a commodity that nourishes, clothes, or shelters. It is the essence of hope for the first prom, and the time-honored stand-by for that last-minute anniversary present. It is the breath of romance—at 50 cents to $100 an ounce!

Behind the Scented Curtain

Those in the trade speak of the power of association, of the "tweak to the nose of memory" by the fragrance that recalls some long-ago apple-blossom time, or the aroma of spice in a sunny, old-fashioned kitchen. They cite the psychologist's belief that smell is man's most primitive sense.

As for "matching your personality with your perfume," it is all a matter of physiology. The chemicals in the individual skin, say the doctors of scent, must harmonize with the perfume used. Otherwise, a fragrance changes or fades away.

That's perfume and its public. Exploring behind the scented curtain, I found a practical industry that is stranger than Alice's dream. It is a world of scientific formulas and closely guarded secrets; of globe-girdling transport, customs regulations—and Ethiopian tribesmen who hunt wild civet cats for a malodorous essence of perfumery. For not the least of the anomalies in this business is the fact that its most delectable and expensive fragrances may contain tiny amounts of some of the worst smells known in Nature.

There is hardly a country which does not supply at least one of perfumery's numerous and exotic raw materials. Its aromatic oils and essences follow you from the cradle to the grave, from babyhood's delicate powders to the strong substances of the mortuary.

Even if you never touch perfume, you use it in scented soaps and creams; and in cooking turn to its flavors and spices. Tasting, as anybody who has ever had a head cold knows, is largely smell.*

Aromatics Linked with Medicine

Many of perfume's aromatics have a medical history, linked with the arts of beauty, that reaches back beyond Hippocrates to the healing practices of ancient Egypt. Some of its germicidal and antiseptic ingredients are still found in your doctor's prescription. Barber and beauty shops are safer, perfume chemists told me, because of these aromatic materials. Kissing would be more dangerous without them.

Modern perfume making itself has given birth to a new and allied activity that has grown to rival the parent industry. It supplies manufacturers of a wide range of articles, from rubber toys to house paint, with appropriate and customer-luring scents.

But perfumery is the only major field in which the nose is the final arbiter. In fact, the maestros of the profession—the men who dream up the formulas for fine perfumes—are known as "Noses."

A Nose is not necessarily an expert botanist and chemist, although often he is both. He must, however, have the sensitivity of a professional teataster or winetaster, to be able to recognize and handle thousands of different odors and to blend his creations with that touch of universal magic called glamour.

The first conscious use of scent may have come about when some experimental Eve,

* See "Spices, the Essence of Geography," by Stuart E. Jones, National Geographic Magazine, March, 1949.

Georges Vadim

The World Beats a Path to Paris Scent Shops

Perfume, the business of illusion, derives its name from the Latin *per fumum* (through smoke). It is the concentrated fragrance; cologne and toilet waters are dilutions. Customer and saleswoman here examine scents in a Place Vendôme shop. This octagonal plaza is the hub of a Paris district specializing in perfumery, jewelry, and fashion. Napoleon robed as a Caesar stands atop the column. He, too, liked perfumes (page 534).

having accidentally crushed a few rose petals in her hair, noticed a gratifying response from husband Adam. More substantial, though, is evidence that prepared perfume began with the dawn of religion, when men burned fragrant gum and herbs along with sacrifices to primitive Nature gods. The word "perfume" is derived from the Latin *per fumum*, which means "through smoke."

Whatever its origin, perfume has left a long and redolent trail through history (page 544). When the dusty Egyptian tomb of Tutankhamen was opened, it gave up alabaster vases of unguents around which still lingered the breath of fragrance placed there nearly 3,300 years before.*

Aromatic unguents and spices lent mystery and luxury to the rites of birth and death, to the temples and boudoirs of the ancient civilized world. The Bible is full of references, and even formulas, for sweet-smelling ointments used in worship or personal adornment.

Babylonian and Assyrian warriors were not too martial to comb their curls with pungent oils. Rome's gladiatorial arenas as well as its rich matrons reeked of them. Roman emperors had their unctoria; and in Athenian banquet halls wealthy Greeks sipped wines lush with the essence of roses, hyacinths, and violets.

Cleopatra's Barge Had Scented Sails

With Cleopatra perfume reached new heights of drama. When Mark Antony first met the Glamour Girl of the Nile floating downstream under the scented purple sails of her barge, the very winds, said Shakespeare, "were lovesick."

After the fall of Rome perfume went under the eclipse of

* See "At the Tomb of Tutankhamen," by Maynard Owen Williams, NATIONAL GEOGRAPHIC MAGAZINE, May, 1923.

Roger Foster from Rancho Guillumette

Mediterranean Sun and French Soil Produce Acres of Carnations, Not for Show but for Scent

Perfumers look to the Riviera for jasmine, rose, orange blossom, violet, mimosa, and carnation. To harvesters of Grasse time is truly of the essence, for they must gather blossoms at exactly the right moment. Jasmine they must pluck in the dew before sunrise. These carnations required running at full bloom.

Coty, Inc.

Girls Fill Perfume Vials from Massive Glass Barrels

This operation is trusted to hands rather than machines because of minute differences in the capacity of the tiny bottles. Fresh supplies are poured into the carboys through filter-paper funnels.

Europe's Dark Ages, only to reappear farther east in the mosques and harems of the Arab world that was also to keep alive the more solemn arts and sciences of the West. Then, when the Renaissance awakened Europe, the art of perfumery swept Western courts and found a place in the French economy and heart that has lasted for 500 years.

Both Napoleon and Josephine were among the large and royal company of perfume fanciers. You can still see, at Malmaison, faded perfumers' bills for the Eau de Cologne in which Napoleon so lavishly splashed. Years after her death, the Empress's apartment was reported to reek with musk. Even the queen of propriety, Victoria, had her favorite in the definitely proper "Ess. Bouquet."

There is a world of difference between the simple floral combinations that delighted the staid Victorians and the sophisticated perfumes I sniffed in gilded New York scent shops. But even greater is the gap between these modern types and the powerful aromatic substances that graced the dressing table of some long-mummified Egyptian princess.

Today's perfume, despite the "Sin," "Temptation," and "Sorcery" of trade names, has been softened and gentled by scientific treatment. The ancients had to take Nature's pungent plants and woods all but raw, pounding, squeezing, and distilling out their essences for use in crude powders and in simple solutions and salves made with olive and other oils. Not until about the close of the Middle Ages did perfumers learn about stainless, odorless alcohol, the perfect diluent and carrier.

In a Perfumer's Laboratory

Yet most of the basic ingredients used 2,000 and more years ago are still on perfumers' shelves, along with chemistry's now indispensable synthetics. From the Red Sea regions come two fragrant gum products that were known on history's oldest caravan routes. The frankincense and myrrh of the Bible—which the Wise Men brought as precious gifts

National Geographic Photographer Willard R. Culver

Subtle Woman's Final Touch of Fragrance Is Unheeding Man's Undoing

Smell has been called man's deepest and most primitive sense. Since the dawn of history, millions of unsung Cleopatras have known how to lead him by his nose.

when they followed the Star to Bethlehem—are still found on the lists of today's importers.

"What goes into a good perfume?" I asked around the industry.

"Art," said the New York head of an old French house, looking out reflectively over the city's roofs. "The master perfumer is like the composer; he builds a symphony of odor. He is working on it in his laboratory, his garden, or when he goes to the theater. He may take a year or more to create a successful composition."

"Put it this way," said an aromatic-oils dealer, whose firm has more than 25,000 formulas locked in its vaults. "A good perfume may have 10 or 50 ingredients. It must have a theme, of course. Taste, originality, and appeal are part of it. But carrying it out takes fine natural oils and aromatic chemicals (you call them synthetics), plus good fixatives, which blend and hold together the mixtures. . . . Come along," he added, "I'll show you one of our laboratories."

In the perfume chemist's workshop I counted more than a thousand bottles of perfume raw materials crowding row after row of shelves that lined the wall. I saw filters, measuring glasses, and big and tiny scales; powder grinders, lipstick molds, cream and soap mixers, and other equipment for handling products to be impregnated with scent (opposite, and page 541).

"Try this," suggested the perfumer, dipping a narrow strip of professional blotting paper into a small bottle and waving it under my nose.

"Isn't it," I ventured, "a little too sweet?"

"Not bad," he approved. "I'm looking now for a brighter, spicier note."

He patted his breast pocket, out of which peeped several scent-saturated blotters. "Here's some homework I'll be smelling tonight."

In such well-equipped laboratories as this, the perfumer takes his choice of Nature's oils and essences, collected from flowers, leaves,

E. I. Du Pont de Nemours and Company

This Perfume "Organ" Rack Holds 300 Scent Notes

Betty Valentine, whose title is experimental cosmetician, spices and sweetens trial creams, lotions, and powders with perfumes at New Brunswick, New Jersey. Here she measures the fragrance required for a sample order.

The perfume organ is comparatively small; some racks have a thousand different scents.

White paper strips are perfume blotters used for nose guidance.

and roots; from bark, seeds, fruits, and grasses; from balsams, gums, and resins.

He dips into all the new aromatic chemicals, with their long technical names and endless possibilities, synthesized from other chemicals found in pine oil or obtained from such unexpected sources as coal tar.

Fragrance and the Beast

But strangest of all ingredients are the animal fixatives. I crumbled in my fingers a lump of ambergris—that mysterious substance excreted by whales. It was gray-black, waxy, and faintly musty. I saw the fur-covered pods and dried grains of musk taken from the male musk deer; the soft, alcohol-preserved glands of the beaver (source of castoreum) and muskrat; and evil-smelling, butterlike civet (from civet cats), still kept in the original cattle or goat's horn in which it was packed in East Africa.

These are the essential animal fixatives which keep a perfume "whole" by slowing up and equalizing the evaporation of the more volatile oils. Their pungent, and sometimes even revolting, odors would seem to make them the hopeless enemies of fragrance. Actually, used in small quantities and diluted, they pleasantly round out and mellow a mixture.

How and why men first thought of tapping the animal kingdom for perfume is a story that may never be told. References to musk as early as the 10th century prove that the story is an old one. Back in the 16th century, the Sultan of Fez was making lavish gifts of civet and ambergris, along with slaves. One London

Carl Perutz—Magnum

A French Factory's Air Is Thick with Scent and Flying Jasmine Blossoms

Jasmine yields one of perfume's most delicate, expensive, and useful essences. Its scent serves as a building block for nearly every floral perfume. So heady are the blossoms that this man lays down his scoop every hour or so to rest his nose. He tosses the dew-drenched petals to prevent mildew.

perfumer, in the reign of George II, did business at the sign of "Ye Olde Civet Cat."

Today the trade gets most of its civet through a primitive practice still carried on in Ethiopia. Tribesmen there keep captured civet cats in corrals and cages, teasing them till fury causes the glandular secretions to flow.

High in the Himalayas of inner Asia, hunters stalk the small musk deer for its precious gland (page 547). Cut from the animal's abdomen and packed in boxes by Far East exporters, it is about the size and shape of half a walnut. Yet so valuable is it in perfume markets that the hunters have risked the Tibetan lamas' penalty for killing the deer—a punishment that called for slashing off the hands of the guilty and nailing them to temple doors.

More prosaic are the methods of acquiring the glands of Canada's beaver and the American muskrat. They come to perfumery as a by-product of the modern fur industries in these countries. "American musk" is a relative newcomer to the trade, although the muskrat's tantalizing odor in springtime was commented on by the earliest settlers.

Of all the fixatives, ambergris—that familiar prop of sea adventures—is least understood. This whale product is found floating on the water or on distant shores, or even discovered

Givaudan-Delawanna, Inc.

Chemistry's Magic Creates Perfume for the Millions

Chemicals derived from coal tar, turpentine, and other raw materials have interesting odors, many unmatched in Nature. Such crystals and liquids are harmonized with flower oils to produce alluring scents. This vacuum still at Delawanna, New Jersey, produces such odorous compounds (page 542).

by whalers in the creature's intestines. Various theories as to the causes of its formation and excretion remain unproved. It is known only that large finds are rare and that all that floats is not ambergris (page 543).

Squeezing Perfume from Nature

"Now and then," said an official with Uncle Sam's Appraiser of Merchandise for the New York Port, "I am called on to examine a mass of something brought in with high hopes by captain and crew. I am pretty unpopular when I have to say that this stuff they may have hauled thousands of miles is just the long-exposed carcass of some sea creature, or a fragment of a cow that once fell off a cattle boat."

To keep the perfumer supplied, men search the earth for useful bits hidden in odorous plants and trees. They take such melodiously named flowers as ylang-ylang from the Philippines, the vetiver root from Java, the geranium from Algeria, and all three of these, plus others, from the isle of concentrated scent, La Réunion, in the Indian Ocean.

Sun, soil, and air have combined to make such geographic spots the "naturals" of the trade. Another is southern France, the floral-oils center of the world, where farmers patiently watch the calendar and the clock for

Coty, Inc.

Beginners Learn Tricks of the Trade in a New York School for Beauty

Millions of dollars' worth of perfumery products go into beauty's scented tools—creams, powders, lipsticks, and lotions. Here an instructor massages temples before applying cleansing cream. These students take notes; later they will demonstrate make-up in department stores.

the exact moment to snatch their ripe crops of jasmine, tuberose, and orange blossoms, of jonquils, carnations, and hyacinths.

Bulgaria is famous for roses; India for sandalwood. One thinks of lavender in connection with England and France. Zanzibar is the breath of cloves; and Ceylon and cinnamon are interchangeable.

Deep in Asia Minor forests, workers beat and bruise the native tree *Liquidambar orientalis* for a resin known as storax. This secretion, obtained in crude form by boiling the bark and skimming off the sticky film, is a vegetable fixative especially valuable for perfumery. So are the "benzoin tears" of Thailand and Sumatra, the balsams of Central America and Canada, and Yugoslavia's oak moss.

Even the United States, though more important for production of the aromatic chemicals, has the peppermint plant and a few other specialties.

The Detroit of Perfume

But a pile of roses, a forest of cinnamon sticks, or a mountain of pungent gum are just the beginning. To turn the sticky, hard, oily, and brittle materials into workable oils and essences is a job for the chemist.

The capital of floral chemistry is a small

Fritz Goro Brothers, Inc.

Cold, Sticky Lard Extracts Jasmine's Delicate Essence

Just as butter captures food odors in a refrigerator, perfumery's enfleurage process employs purified animal fat to absorb a flower's essential oils. Each blossom is embedded by hand in the fat and allowed to remain some 24 hours. An alcohol wash extracts the essence.

town in southern France called Grasse. Saturated with the vapors of its scent-extraction factories, in the heart of the flower-raising country that suns itself beyond the Mediterranean, Grasse has been called the "Detroit of Perfume" (pages 533 and 537).

Visitors flock there to see in operation most of the trade's major processes for assembling Nature's essential oils (page 548).

In the jargon of perfumery there are five basic methods for capturing these essences—distillation, enfleurage, maceration, the volatile-solvents process, and expression.

For plants hardy enough to stand heat and steam, distillation is a simple and inexpensive operation. Used by the ancients, it is practiced today with primitive stills in various parts of the globe. With modern technology and equipment, but basically the same idea of earlier times and far-away lands, this process carries on in leading aromatic-chemical factories. Through boiling or steaming the plants give up their aromatic oils, which are carried off in steam vapors and recovered in droplets when the steam is condensed.

The principle employed in both enfleurage and maceration is similar to one noticed by any housekeeper when she discovers that her uncovered butter in the refrigerator has picked up the odor of other foods. In the same way, flower oils are absorbed by cold fats in the enfleurage process, and by hot fats in the maceration method.

Grasse has made a specialty of enfleurage, an operation in which no time can be lost after the flowers are plucked. To its plants blossoms from the near-by hills are rushed while still exhaling their fragrant breath. Their petals are spread by hand on trays of purified lard piled one atop another to hold in the fragrance. As the fats absorb the odor, fresh blooms are exchanged for the exhausted ones. The resulting "pomade" is washed with alcohol, from which an extract of flower oil is obtained.

In maceration the flowers are steeped in vats of hot fats, after which the scented mixture is washed and purified as in enfleurage.

But in the case of many flowers this method is now giving way to the modern process making use of volatile solvents.

These solvents are simply chemical dissolvers, such as petroleum ether or benzene. Flowing over the plants in sealed containers,

they release the floral oils and waxes without the use of harmful heat. The concentrated "concrete" that eventually results is considered by many perfumers to be the closest man can come to realizing Nature's own creations. Further treated, the concretes yield the perfumer's prized floral absolutes.

Finally, simplest of all, is expression, just pressing out. This is the age-old method used with citrus fruits—oranges, lemons, limes, and bergamots. Sometimes, as in certain Sicilian, Spanish, and West Indies centers, the fruit is scraped and squeezed by hand and the fragrant oils sopped up with sponges; or it may be obtained by modern hydraulic presses and other machinery.

Acme

Flagons, Tossing Like Ships in a Storm, Age Perfume Blends

Once perfumers sent their concoctions to sea to let the waves merge ingredients. Nowadays essences and alcohol sometimes rock on turntables simulating the ocean's motion. The secret of maintaining a specific fragrance lies in the skillful use of fixatives holding the mixture together.

The Chemists Take a Hand

With all the natural oils and fixatives, perfume seemed complete in Grandmother's day. But already, in chemistry's test tubes, a new industry was brewing.

Gradually, organic chemists, probing generally into the composition and structure of matter, began turning up substances with fragrant smells resembling those of Nature. Their curiosity aroused, they started analyzing aromatic plants themselves—with spectacular results.

Once it had been thought that the essential oil of a flower, such as a rose, was a single, characteristic substance. Investigation showed, on the contrary, that all plant oils are made up of numerous chemical ingredients, and that these ingredients include not only the identifying and dominant odor but many supplementary ones.

It was discovered, moreover, that different plants—the rose, the geranium, and citronella grass, for an outstanding example—contain many of the same odorous components, in varying proportions and different arrangements. The experimenters had found some guideposts.

Armed with this knowledge, chemists learned to extract from more abundant and cheaper materials, such as coal tar and crude oils, chemicals that approximate odors existing in Nature. By isolating certain aromatic substances (from aromatic grasses, say), and, following Nature's own way, by building up, or synthesizing, various combinations of chemicals, they have created a chemical world of scent that steadily comes closer to Nature's.

They have even developed synthetics for

Denham & Associates

New-car Odor Glamorizes Jalopies, Belies Mileage Records, and Mesmerizes Buyers

Scent helps to sell stockings, raincoats, toothpaste, insecticides, and Christmas wrapping paper. This nose bait, applied by brush from a bottle, creates the illusion of factory-fresh upholstery. Counter-smells often save customers from a raw material's unpleasant odors (page 545).

animal fixatives—synthetic musks, civet, and ambergris.

"Some of this laboratory musk is powerful stuff," a perfume expert told me. "I once handled an unopened bottle with one part in 10,000. Though I washed and washed my hands, I could hardly eat dinner that night."

The men in the laboratory have gone further. They turn out chemicals today that resemble the fragrance of flowers, such as lilac and lily of the valley, which cannot successfully be made to yield their natural oils. And they have created new scents which are not found at all in Nature. It was the daring use of one such chemical, I learned, which skyrocketed a specific brand (Chanel No. 5) to fame, and introduced an entirely new perfume type to the industry.

But the synthetics have not pushed the natural oils and essences out of the market. For that final touch of delicacy and fine shading perfumers still call for Nature's own. Even when it takes four tons of rose flowers to make one pound of rose oil, and when prices for rare floral absolutes reach beyond five and six hundred dollars a pound, there is still demand and supply.

The synthetics' contribution has been to add to the variety and increase the range of raw materials. Used with naturals, their reliability and consistency make possible the duplication of formulas with noseworthy exactness. By drastically lowering the costs of basic perfume ingredients, they have brought the industry out of the exclusive realm of the rich, within reach of the average pocketbook.

Making Scents to Order

As for the consumer, a rose is a rose, even when its fragrance is made up, among other aromatic chemicals, of "geraniol-nerol-citronellol-rhodinol-phenylethyl alcohol."

At a big aromatic-chemicals plant I visited at Delawanna, New Jersey, an average of 60

National Geographic Photographer B. Anthony Stewart

Ambergris, Excretion of a Sick Whale, Helps Blend and Fix the Finest Perfumes

This waxy substance is found afloat or cast up on lonely shores. Many a sailor, gold fever glittering in his eyes, has salvaged worthless flotsam as treasured ambergris. One theory holds that it is formed, somewhat like an oyster's pearl, around indigestible squid beaks swallowed by whales (page 537).

gallons of concentrated scents is turned out every 15 minutes.

To unloading platforms and storage rooms came coal-tar derivatives, pine oils, acids, and alcohols, as well as essences of gums, oleoresins, oak moss, clove buds, and nutmegs.

Put through their paces, these raw materials are heated and frozen, broken down, built up, distilled, liquefied, and crystallized. Out of it all come such well-known synthetic-perfume chemicals as terpineol, made from turpentine and resembling lilac in odor; eugenol, from oil of clove, with the fragrance of carnation; and ionone, which substitutes for the violet and is manufactured from chemicals found in oil of lemon grass.

There is a laboratory where chemists test gas and liquid reactions in cookers geared to high and low pressures; and a blending section, like an apothecary shop, with thousands of bottled perfume ingredients, both natural and synthetic, from around the world.

I found fragrant mills, redolent with the grist of spices; and rooms for solids such as the delicate crystalline vanillin, which must be kept far from the strong synthetic musks—five kinds of them.

In yet other rooms I saw long lines of giant stills and condensers (page 538), attached to floor and ceiling by a labyrinth of pipes. Some of these pipes bring in the working steam, while others take off the various distillations, flowing toward still other rooms where they drip into waiting open-mouthed bottles.

Outside, that hot summer day, a pool with eight spraying fountains looked coolly inviting.

"It's strictly for business," said my host, "although occasionally some of our girls take a dip in it. It provides water for steam and other purposes in the plant, and is eventually piped back here. Those goldfish you see there work for us too. If any leakage occurs to pollute the water, the fish tell us by rising to the surface."

Richwood News Leader

Once a Year the Richwood, West Virginia, *News Leader* May Be Smelled as Well as Read

Ramps, an onionlike herb, are a Richwood specialty. Their odor, the very antithesis of perfume, saturates the newspaper's annual ramp issue. Postmaster Wheeler Green expresses the mail handlers' reaction.

National Geographic Photographer Willard R. Culver

A 26-century-old Bas-relief Shows Egyptian Women Squeezing Lily Essence into a Jar

Egyptian, Roman, and Islamic cultures are represented among these perfume vials from the Ray Winfield Smith collection. The slim flask (center) belongs to the 18th Egyptian Dynasty (about 1580-1320 B.C.)

Wide World

No Free Sniffs Allowed. Uncle Sam Displays Contraband Perfumes Behind Wire Netting

These imports were confiscated at New York for failure to meet customs regulations. Owners may have evaded declarations or neglected to obtain entry permits. Buyers will get a chance to bid at public auction. Unlike department-store customers, they are not allowed to handle the goods.

To fill its orders, which may range from a few sample pounds to many tons, this factory uses enough steam, fuel oil, gas, and electric power to serve a small town. It covers 30 acres and has its own fire department.

But the score for an aromatics plant is not found in its machines, or even in its chemical formulas. It is recorded in the "nose chart," kept by an expert sniffer who grades there each sample of finished material.

"The chemical analysis for an order may check perfectly," I was told by the plant chemist. "But if the odor is off, even infinitesimally, back the solution goes till it is nose perfect."

From such factories come scents that make a thousand and one everyday articles easier to live with. Manufacturers now regularly neutralize or replace the disagreeable smells inherent in some raw materials or acquired in factory processes.

Scented Goods Include a "Best Smeller"

The old fish-oil and kerosene-reeking ink of news rotogravure sections has come to be just a bad olfactory memory. The once smelly paste jar gives off a delicate lilac odor. The air circulated by air conditioning can be freshened to recall the pine-scented out-of-doors. Even periodicals have been printed on

National Geographic Photographer Willard R. Culver

"Madame, It's Divine. It's Dynamite!"

Experts say that skin chemistry affects fragrance and that emotions dictate reactions to odor. So the saleswoman's rules assert that the customer is always right in what she likes. Advice to beginners: let the liquid dry before sniffing; don't try too many scents at once; avoid jarring combinations.

scented paper, and experiments made to "spice" a cookbook hint at the unexplored possibilities for "best smellers."

Raincoats, insecticides, and textiles have a new personality because some aromatic chemist evolved a formula for a pleasant ozone smell, like that of a hayfield after a thunderstorm.

Sometimes a desired characteristic odor is missing and added—the leather smell to a plastic product, for example, or a pine-tree tang to wrapping paper for Christmas presents.

Occasionally a laboratory-created odor may break down, and then it is up to the chemist to repair the damage.

"Here's a bad one," said the chief chemist of one aromatics house, whose completed orders for perfumes and other scents run into tens of thousands. He let me sniff a can of tooth-powder whose minty flavor had gone sour.

"I think I've found the offender," he added. "We can fix it up."

Often the customer is unconscious of the lure in smell. An experiment was once made with two sets of stockings placed on sale in a department store. The stockings were the same, except that those on one table were faintly scented and the others were left with the rather unpleasant odor from the finishing process. Decidedly more purchasers took the perfumed goods, though few consciously noticed the lightly applied fragrance. Their preference, they innocently explained, was dictated by "superior quality and finer texture."

On the other hand, an odor appeal may be direct, as in scented ink, now often used in mail order and even newspaper perfume advertisements. Reverse psychology is the advertisement of an insurance company which warns potential clients of fire risks by a folder exuding the suggestive smell of wet, burnt wood.

Some Odor Oddities

"We get some queer orders," a dealer in industrial aromatics told me. "Once we were asked to make an odor of fresh-baked cake. A publishing concern was having its 10th anniversary and wanted to send out pictures of a birthday cake, with ten candles. . . . Yes, we filled it. Here's the card, though the scent now is faint, you might say stale."

Most people agree on what smells good and bad. But there are surprising variations. In

group tests some have been found to favor odors generally considered revolting.

Other experiments hint at the effect that color and other associations may have on perfume preferences. Of a large group asked to test three bottles of differently colored perfume, nearly all gave reasons for favoring one over another, although the odor actually was the same.

Every girl knows that her "Allure No. 17" may live up to its name with one beau and bring from another the disgusted comment, "Where did you get *that?*" The lavish use of scent may provoke pleased compliments in one social group and polite censure in another. European and Latin-American men frankly delight in perfume for themselves, while American men shudder at the word. But even Anglo-Saxons can be wooed by a "man's cologne," bottled in a sturdy container and decorated with horses and dogs.

That the scent appeal is real, though unconscious, was proved by a shaving-cream manufacturer who sent out thousands of letters to men asking whether they preferred his product perfumed or unperfumed. Ninety-six percent voted against the scented article. A little later, when the same group was queried on its choice of two accompanying samples, 92 percent favored the one which had been perfumed—just in case.

Yet the human nose, as a delicate apparatus, is capable of extraordinary feats. It can smell substances that are too minute to be detected chemically or to be weighed by any precision instrument. The average normal person can notice mercaptan—said to be the worst odor ever compounded—in an amount of only one ten-millionth of a pound in 100 cubic feet of air. It has a lifesaving capacity when the malodorous mercaptan, added to household lighting, heating, and cooking gas, gives warning of dangerous leaks.

One group of students has classed the wide variety of our odor sensations into but four elementary categories. These scents are called fragrant or sweet; acid or sour; burnt; and caprylic or goaty. Humans generally, according to this study, like the fragrance of class one. The masculine vote, certain tests indicated, tends toward musky odors, the feminine to those of the lighter, flowery group.

Joseph F. Rock

Western China's Musk Deer Gives His Life to Perfume

Lacking antlers, the deer uses fanglike upper canine teeth as weapons. His furry abdominal pod carries a glandular material which, like ambergris, fixes and intensifies perfumery's delicate flower odors (page 537). One grain of musk scents millions of cubic feet of air. Chemists, by synthesizing musks in the 1930's, improved the deer's life chances. This hunter was attached to the National Geographic Society–Joseph F. Rock expedition to Yunnan (1929).

Carl Perutz—Magnum

↑ Connoisseurs Find Pleasant Sniffing in Grasse's Fragrant Showrooms

What Detroit is to automobiles, Grasse is to scents. Perfumers acknowledge the French town as capital of the flower-oil industry (page 540). This countryman, in town for a holiday, absorbs the beguiling atmosphere but cannily buys nothing.

↓ Youth Samples the Breath of Romance in a Long Island Drugstore

Products of the perfume industry may be found everywhere from Oriental bazaars to Main Street variety stores. The pharmacist's shop is an appropriate market because many of perfume's antiseptic ingredients have ancient links with medicine.

Ewing Galloway

249 Bal Goldberg

Cornell University's Olfactorium, Flooded with Odors, Tests the Nose's Capacities

What is smell? How is it sensed? Scientists created this air-conditioned chamber of tempered glass and stainless steel to experiment on sensitivity to smell, odor "blindness," and other little-understood problems. Here the observer, in airtight clothing, has been reduced to an olfactory zero by scentless baths and mouth rinses. Receiving a combination of smells, she reports her sensations to the director.

Like man, many insects seem to prefer fruity and flowery fragrance; hence insect pollination. Japanese beetles are especially susceptible to rose odor. They will go far to reach the seductive trap, baited with the rose-smelling chemical geraniol and equipped with glass jars to hold its scent-drugged victims.

Dogs and most carnivorous animals, on the other hand, prefer goaty and burnt odors. Rats, one researcher reports, dislike the smell of peppermint. During World War II, the discovery that a certain odor was repulsive to sharks led to the development of a repellent which was used to protect shipwreck victims or air crews ditched at sea.

Not everybody realizes the pervasive role that scent has come to play in the modern world. It was less than 200 years ago that a bill was sponsored in the British Parliament providing a witchcraft trial for "all women . . . virgins, maids, or widows, that shall . . . seduce and betray into matrimony any of His Majesty's subjects by the use of scents, paints, cosmetics . . ."

Today perfumery is not only big business for France (following its World War II blackout) and the United States (pushing its aromatic-chemicals lead). It is also the essence of flourishing old industries from Algeria to Zanzibar and of new enterprises from Australia to fast-growing Jaffa-Tel Aviv, in the fledgling State of Israel.

Uncle Sam's lusty business in aromatic chemicals got its first impetus, like the dyes

National Geographic Photographer Willard R. Culver

Scent-laden Silver Earrings Bewitch the Nose and Enchant the Eyes

Such accessories, holding a few drops of perfume absorbed by cotton stuffing, call to mind the 16th-century finger rings and jeweled boxes filled with fragrant pastes and powders. These earrings were designed by Druid Hills Silvercraft Studio, Hendersonville, North Carolina.

trade, when World War I blocked the supply lanes of perfume raw materials. By World War II, when such natural-oil producers as France, Bulgaria, and the Netherlands Indies (Indonesia) were lost to the market, U. S. perfumers had acquired a valuable shelf of chemical substitutes. Backed by the accumulated stockpiles of dealers in natural oils, the industry was able to carry on during the war and even to expand under the warming influence of high-voltage pay rolls.

Now, again threatened by war's potential shortages, this far-flung international traffic faces new readjustments as a luxury-hungry world reaches for a perfume atomizer.

For the United States, the leading consumer nation, the trade has some interesting prospects. There is a tendency, some of its leaders told me, to turn the spotlight away from trade names and exotic scents that glorify the brief romantic moment. Instead, they plan to emphasize all-purpose perfumes that can follow a user around the clock, from tennis or typing to dining and dancing. There are even predictions of a return to the restrained and dainty flower fragrances of the Victorians.

Whether this will lead to an old-lavender note in café society or to a wood-violet flavor in debutantes' reception lines remains to be seen. Certainly, it's a long way back to a little 1880 number called simply "Modesty."

But scent is persuasive business. If perfumers could please a Cleopatra, a Napoleon, and a Victoria, Miss 1951 may indeed find herself smelling modestly of 1880.

So far, only small boys and circuses seem to be immune. After reading various reports of the perfuming of circus animals, I wrote one big outfit to inquire how it was done. Back came the answer: Yes, a scented disinfectant *had* been sprayed in Madison Square Garden before a performance, as a sales demonstration. But "the circus still smells like the circus—one of its greatest charms."

Alaska's Russian Frontier: Little Diomede

by Audrey and Frank Morgan

American Eskimos, Three Miles from Russia, Skid a Skin Boat into the Boundary Channel

Since the glacial age the Diomedes, two islands in the Bering Strait, have served as steppingstones between Asia and America. In 1867 Russia sold Little Diomede to the United States, but retained Big Diomede, three miles away.

Each island supports an Eskimo village. Their inhabitants scratch a living from sea and land by hunting whales, walruses, seals, bears, and foxes.

Little Diomede families, living closer to Siberia than to Alaska, used to trade with their Russian neighbors. Soviet and American citizens, oblivious of passports and politics, commuted between the islands; they intermarried. United States cigarettes, tea, flour, and sugar bought Siberian furs and walrus-tusk ivory.

During the summer of 1948 a little Iron Curtain was clamped down in Bering Strait. Russian soldiers imprisoned 18 Little Diomede traders visiting Big Diomede. For 52 days the captives existed on black bread and watery soup while Soviet officers questioned them about Alaskan defenses. Released, they returned home starving.

Hunters and youngsters here slide an umiak down to the channel facing snow-flecked Big Diomede. Their walrus-hide boat shows two changes in the last 2,000 years: steam-bent hardwood ribs and outboard motor. Once out of water, the umiak will be placed on a rack to dry out lest soggy skins rot (page 559).

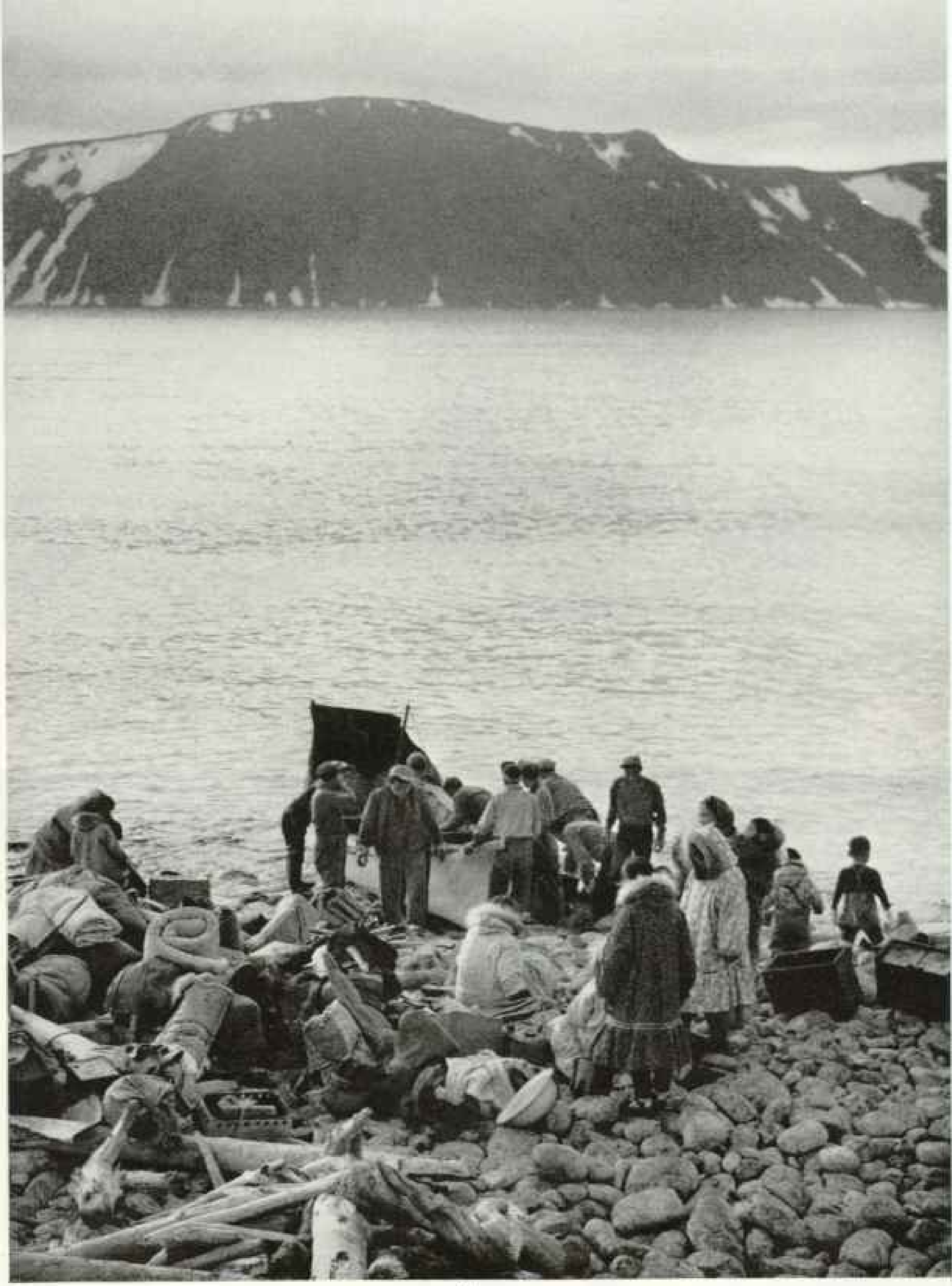
^ Issac and Rebecca Form a Devoted Husband-Wife Team

Other Diomede couples are rarely seen together outside their homes, but these two, lavishing affection on each other, rarely appear apart. They were two of the 18 Eskimos detained by the Russians.

Long ago, when Rebecca became a bride, she had her chin tattooed with a soot-coated thread.

Seventy-year-old Issac, who complains of rheumatism, no longer travels with the big-game hunters. Now he seeks such small fry as fish and crabs, or he hauls snow to be melted for water. In his youth Issac sailed in white men's whaling ships. One year as his ship slipped south out of the Arctic a storm prevented his landing on Little Diomede. Carried to San Francisco, he spent the winter there. He is an accomplished storyteller, but not in the English he learned with the whalers.

Right: Map locates the Diomedes.



551

Big Diomede Lies Across the Channel—Another Nation, Another Hemisphere, Another Day!

The U. S.-U. S. S. R. boundary and International Date Line run between these shores. Shut off from Russia, Little Diomede folk turn to Kotzebue, Alaska. Food, trade goods, and 20 passengers will crowd this umiak.

Bering Strait, Diomede's Icy Food Locker, Yields Seals for Skins, Blubber, and Fuel Oil

Above: Spike Milligrock, the hunter, was born on Russian Diomede, but, preferring the American way, he took a Little Diomede wife and moved to her village. Below: A rifleman retrieves his seal with hook and towline.

An Entire Family Turns Out to Fish in an Ice Hole

Out on windswept Bering Strait, mother thrusts her pole into a hole cut through four feet of ice. Baby sister, who grasps a whalebone-mesh ice scoop, snuggles in her parent's fur-lined parka. This arrangement protects her so comfortably that she thinks nothing of going fishing in zero weather.

Two girls cover their parkas with calico coats to keep the furs clean. Mother, who must melt all water from snow or ice, has no small job washing these flowered outer garments.

Right: Two tomcod, caught with bright glass-bead lures, dangle from man's ice-coated line, which he winds between outstretched sticks. Reindeer pants, fur parka, and parka cover shut out the cold.

556

Seal Oil and Canvas Wick Feed a Stove Cooking the Dinner and Heating the Home

Two families, living happily without conveniences, eat, sleep, work, and play on the 12-by-12-foot floor (below). At teatime they squat in ageless fashion around an oilskin "tablecloth" unknown to their forefathers.

Baby's Primitive Pacifier Is a Gob of Blubber Pierced with a Stick

Some Little Diomede babies are breast-fed, a few up to the age of five. Others get canned-milk formulas (page 560). This swaddled girl contentedly sucks a greasy mouthful of seal meat. The stick prevents swallowing.

Oscar Pops into His Parlor; His Door Is a Hole in the Floor

Little Diomede preserves two doorless, centuries-old stone houses. These strange dwellings shut out the wind, not with storm windows and weather stripping, but with walls of solid stone. Entrance is gained to the one room, not by a door cut in a side, but by a 30-foot rock tunnel leading to a hole in the floor. A roof shaft admits air; light filters through a walrus-membrane skylight.

Right: This stone house has a storm-shed door.

For 2,000 Years a Village Has Clung to Little Diomede's Snow- and Wind-swept Slope

559

Men Secure Umiaks Against Bering's Crushing Ice Packs; Dogs Haul Sledsful of Meat

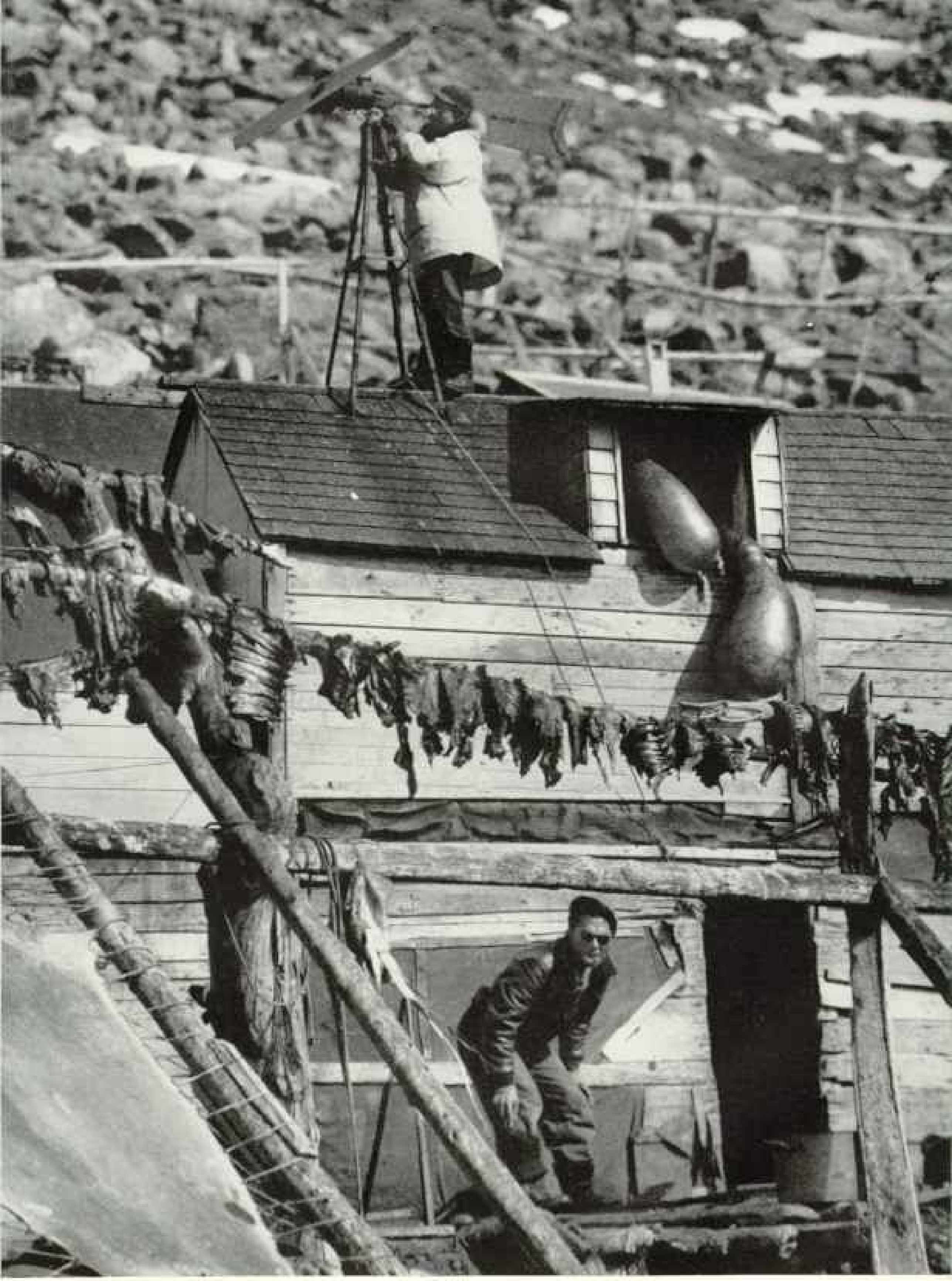
Arctic Tom-toms Throb; Dancers Squat and Sway

Some Eskimos own phonographs and enjoy dancing to American popular music, but Little Diomede folk have not forgotten the drum music and vigorous steps of their ancestors. They used to celebrate successful hunts with thanksgiving feasts and dances; now they observe the white man's holidays. The safe delivery of a canned-milk shipment (left) was incidental to this festival.

Drummers beat the vibrant rims of their huge pie-platelike instruments, which consist of walrus membrane stretched over hoops. Dancers, sitting on the shelf, seem to crouch like jigging Cossacks; they wave their arms in Javanese fashion.

"It looks easy," the photographers remark, "but an hour of this strenuous exercise is enough for one evening."

Below: Little Diomede turns its schoolroom into a dance hall. George Washington looks down from the place of honor. Two youths perform a dance of bygone days; older men beat drums; children wave their arms in tempo; women chant in their native tongue.



561

A Walrus Hunters' Shed Bulges with Inflated Stomach Casings. Meat and Hides Dry on Lines

An Eskimo on the roof repairs a wind charger so as not to miss evening's radio programs for lack of power. Blown up like balloons, the two stomach linings will make food containers or drumheads.

542

A Little Diomede Netman Scoops His Winged Quarry from the Air

Live birds, threading a rawhide strand, serve as decoys. The hunter, crouching behind a rock, swings his long net at crested auklets flying low to investigate. One man took 208 birds in an hour and a half.

NATIONAL GEOGRAPHIC SOCIETY

ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded sixty-three years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

A notable undertaking in the history of astronomy was launched in 1940 by The Society in cooperation with the Palomar Observatory of the California Institute of Technology. This project will require four years to photograph the vast reaches of space, and will provide the first sky atlas for observatories all over the world.

In 1948 The Society sent out seven expeditions to study the eclipse of the sun along a 5,250-mile arc from Burma to the Aleutians. The fruitful results helped link geodetic surveys of North America and Asia.

The Society granted $25,000, and in addition $75,000 was contributed by individual members, to help preserve for the American people the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

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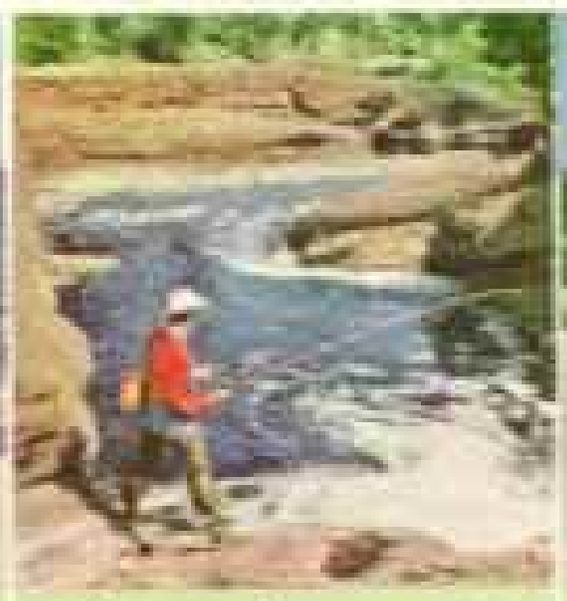

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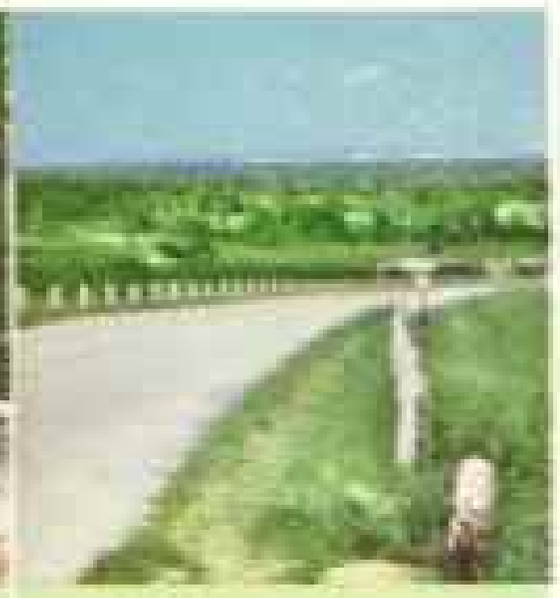

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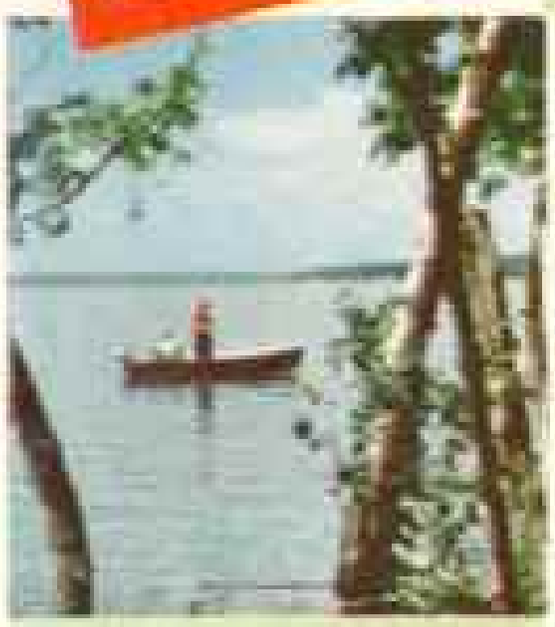

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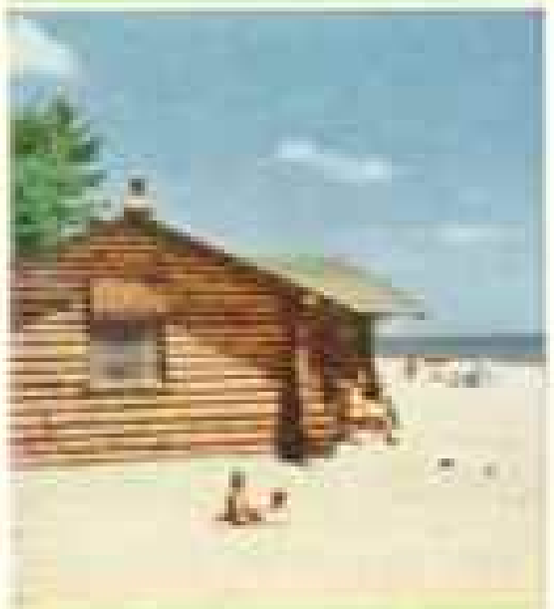

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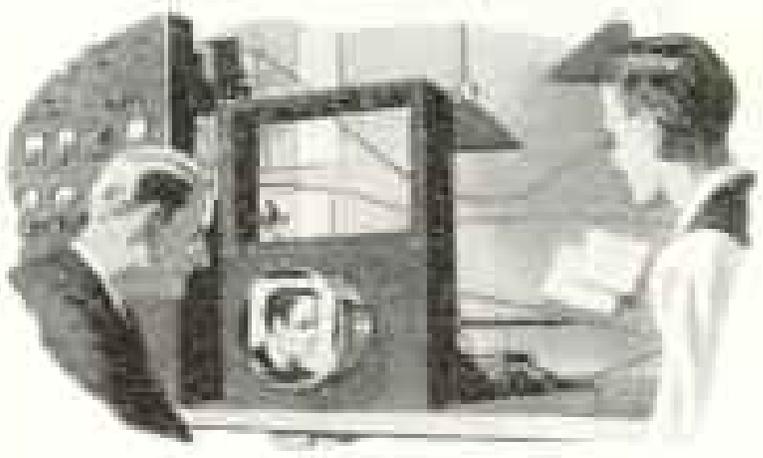

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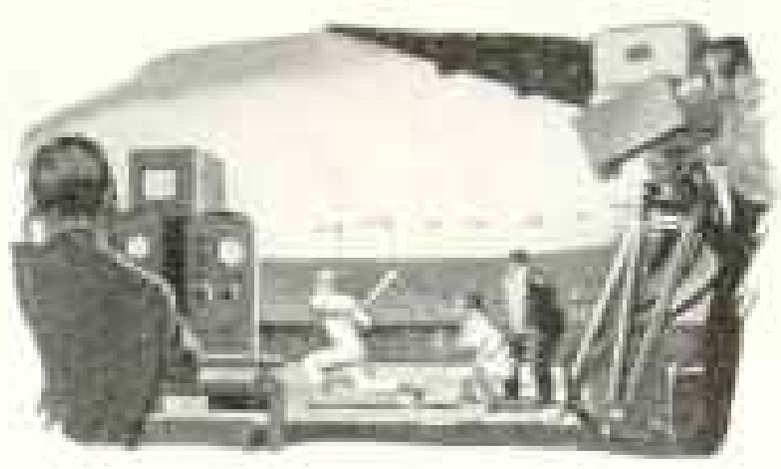

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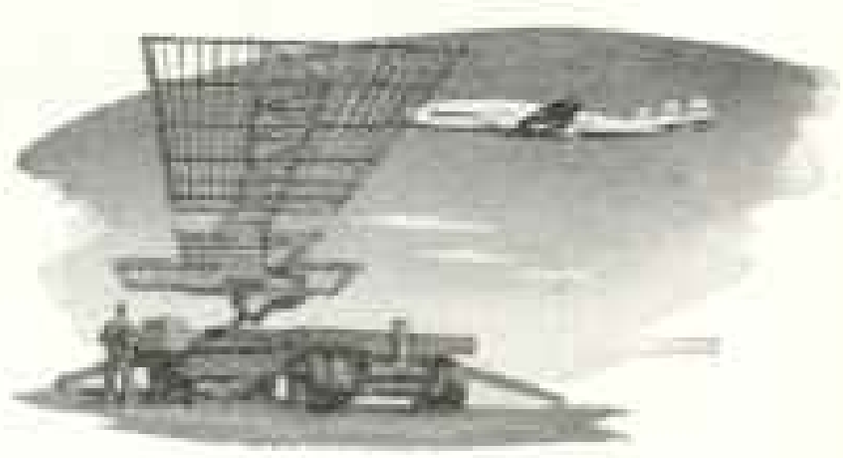

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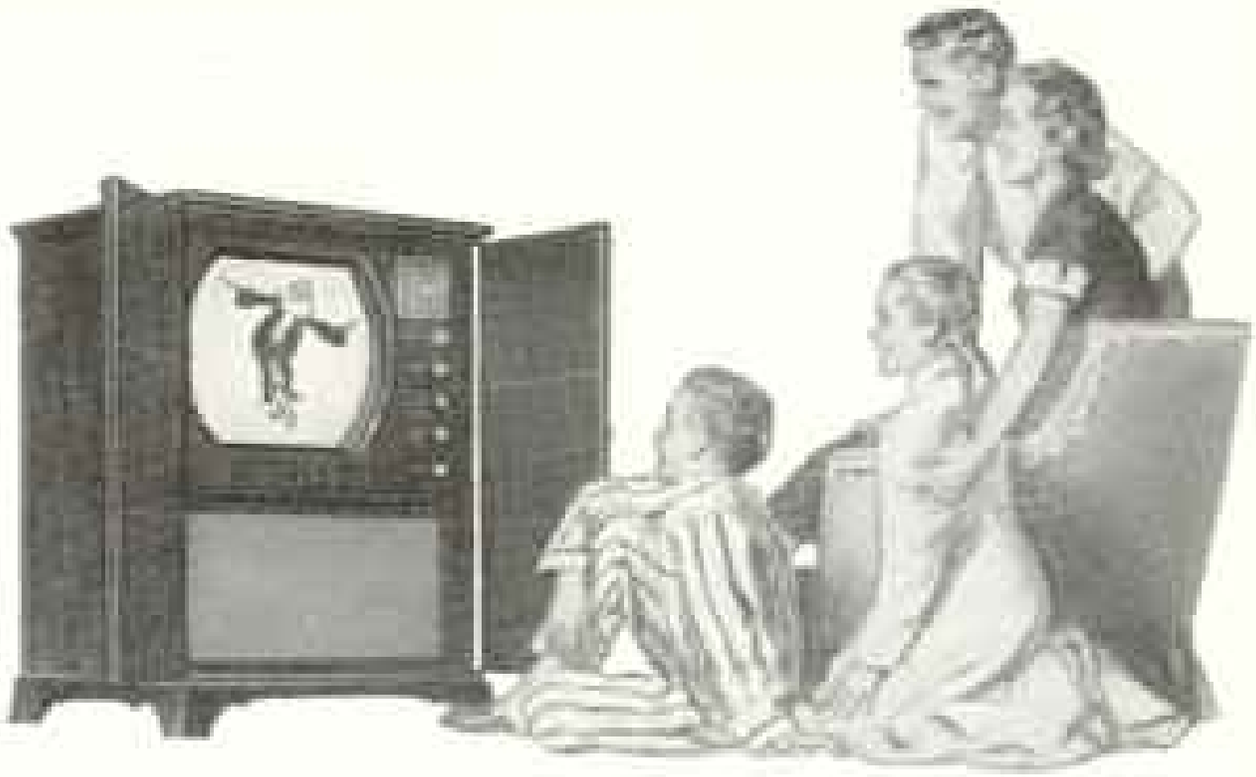

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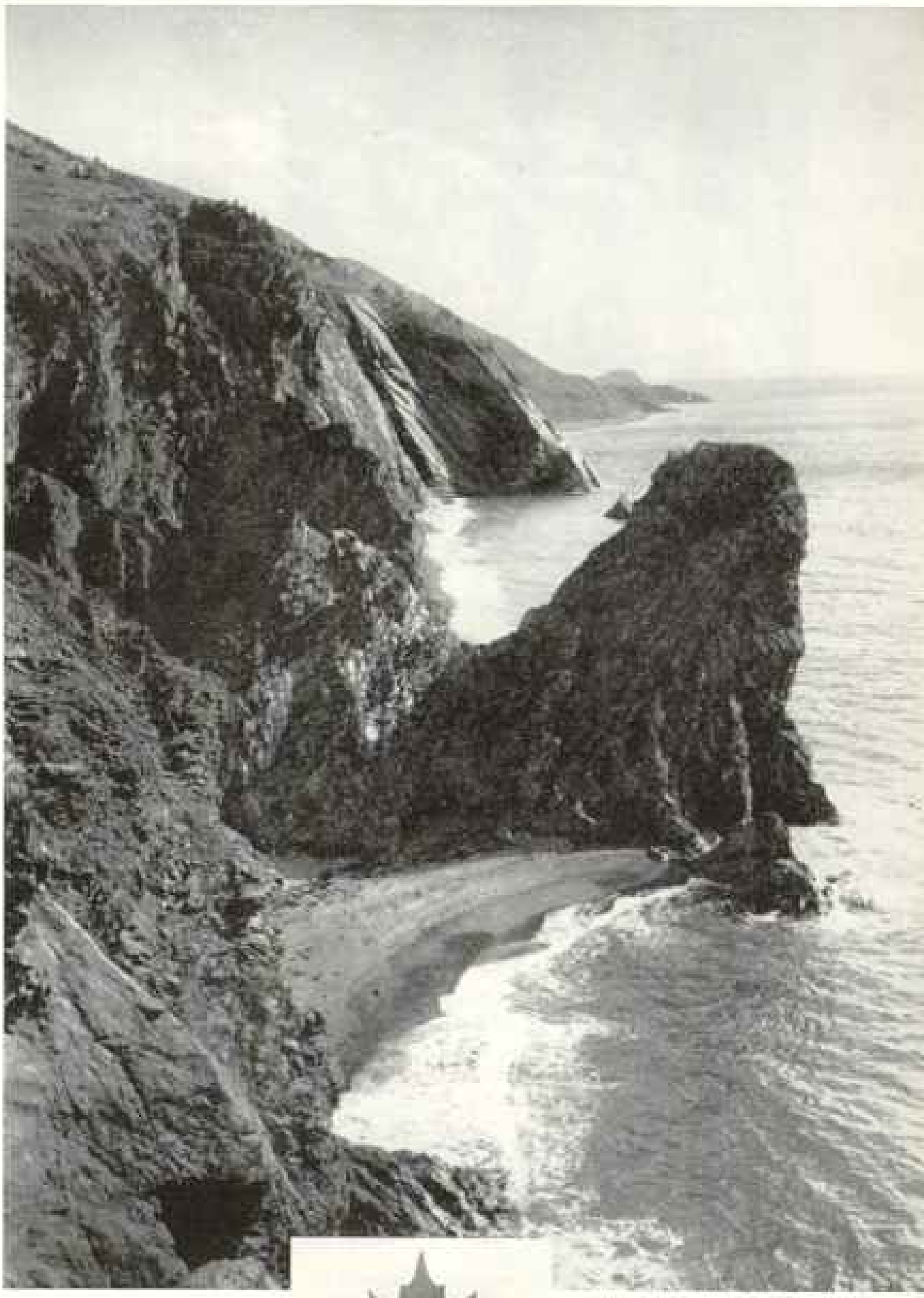

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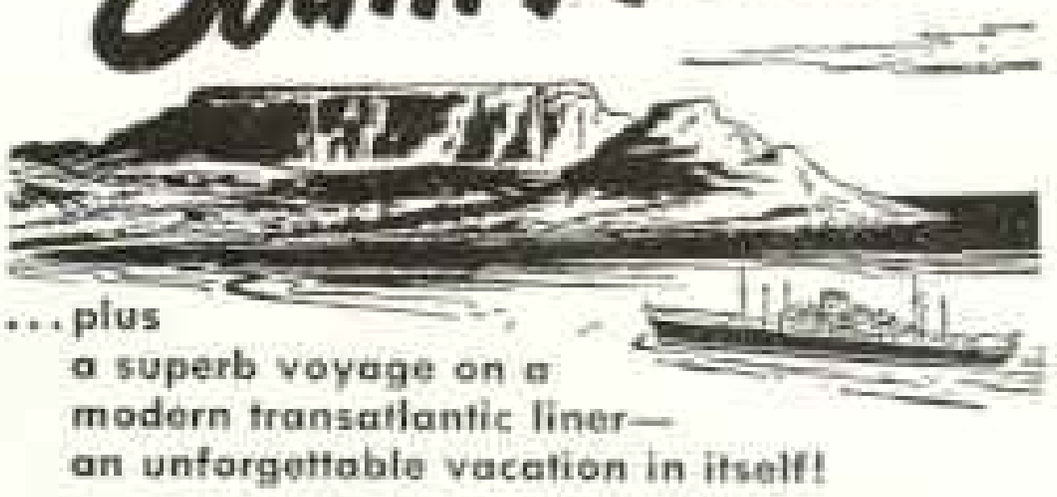

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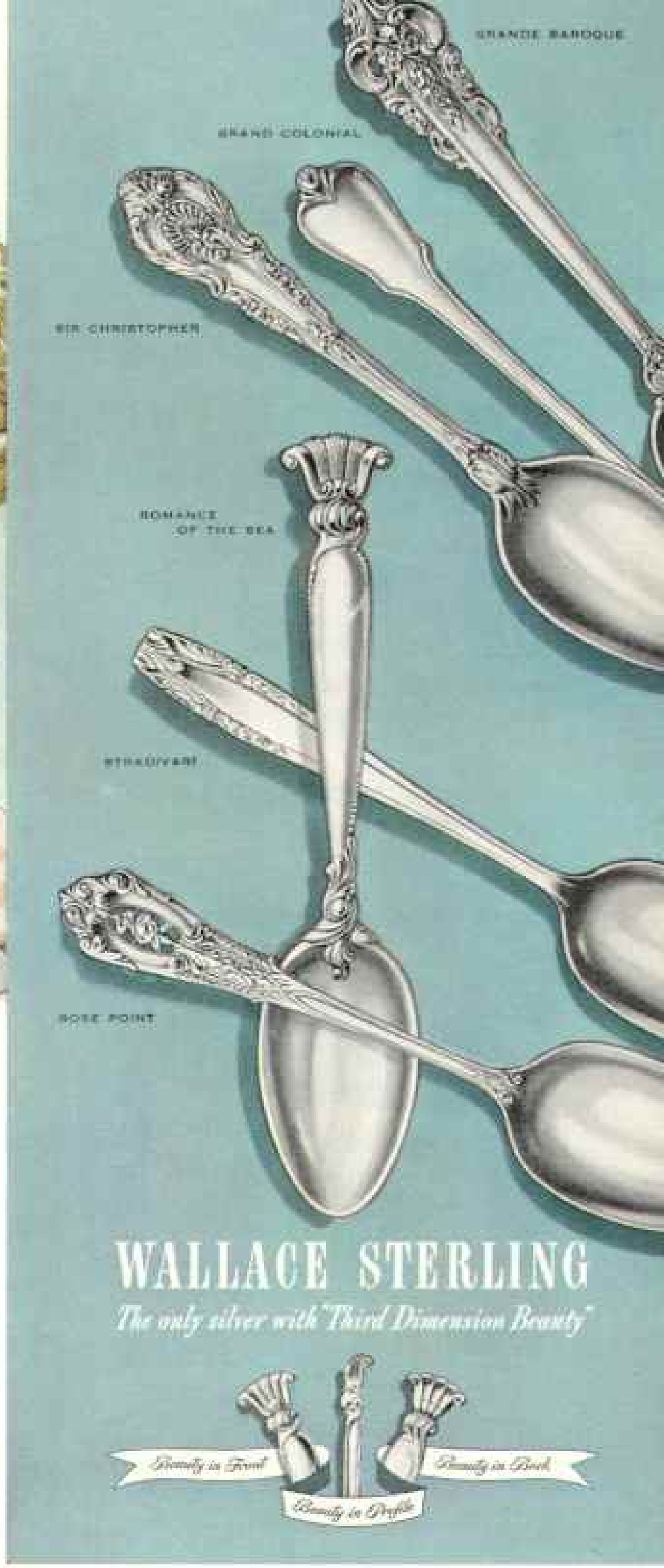

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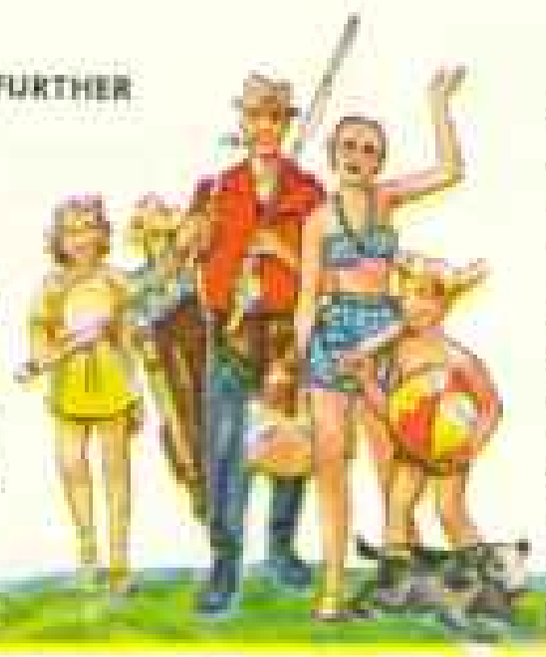

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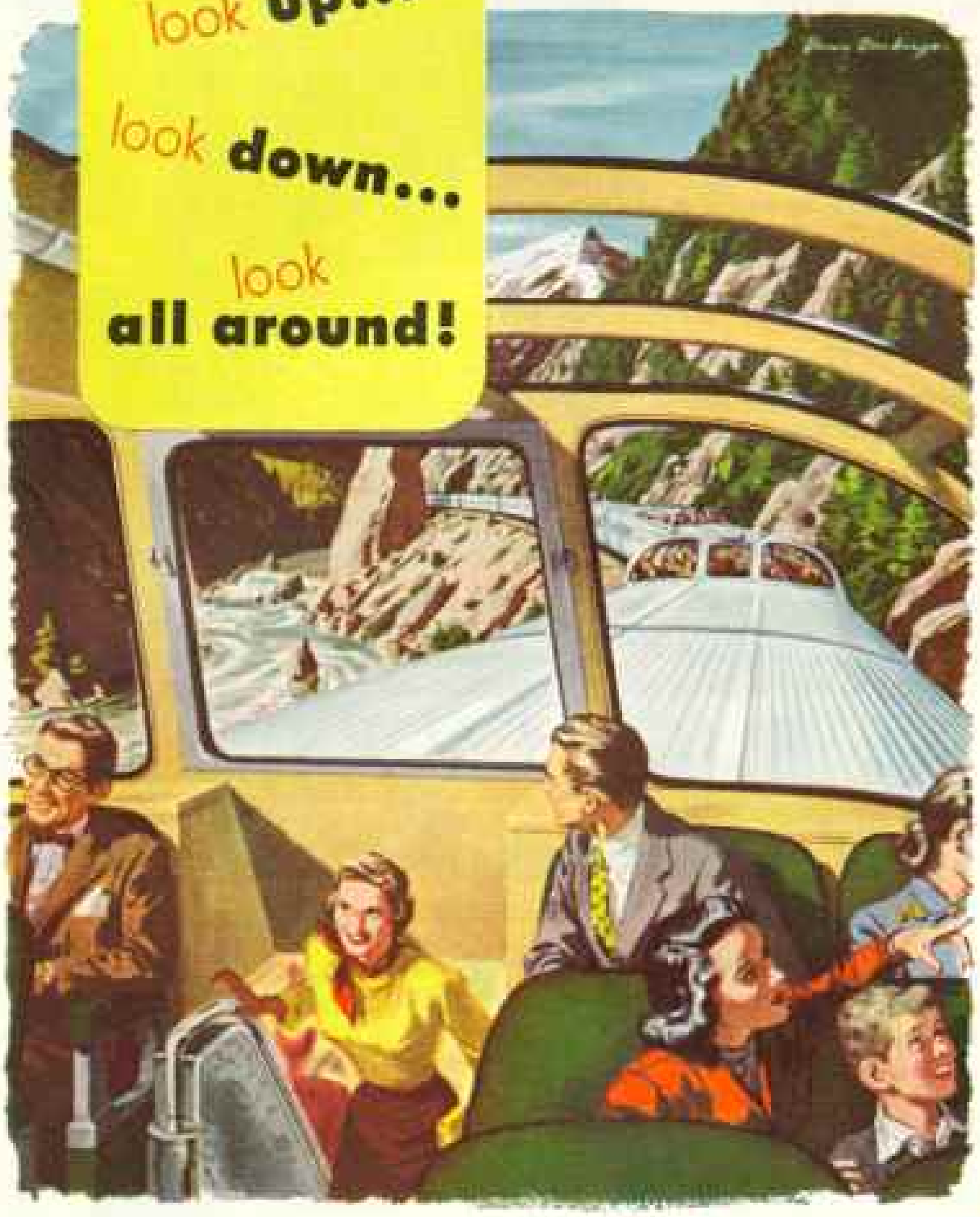

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More alertness . . . *less danger from* CANCER

Although cancer ranks second among the causes of death in our country, headway is being made against it. In fact, medical science is making such progress against this disease that there are now *four chances out of five* for curing some types of cancer—provided diagnosis is made early and proper treatment is carried out promptly.

One of the reasons why there is increasing hope of bringing cancer under control is that more and more people are facing the facts about this disease. They are learning its possible early "warning signs" and are seeing their doctor as soon as they notice any of them.

These Are Cancer's "Warning Signs"

1. Any lump or thickening, especially in the breast, lip, or tongue.
2. Any irregular or unexplained bleeding.
3. Any sore that does not heal, particularly about the mouth, tongue, or lips.
4. Progressive change in the color or size of a mole, wart, or birthmark.
5. Loss of appetite or continued indigestion.
6. Any persistent hoarseness, sore throat or difficulty in swallowing.
7. Any persistent change in normal elimination.

Pain is not usually an early symptom of cancer.

These "warning signs" do not necessarily mean cancer. In fact, in the great majority of cases, they are due to other causes. They do, however, indicate that something is wrong—and that an immediate medical examination is advisable.

If the doctor finds cancer or conditions leading to it, he will recommend prompt treatment—usually complete removal by surgery, destruction by X-ray or radium, or by a combination of the two.

Surgical techniques are constantly being improved so that operations for cancer may be performed with a minimum of risk. Machines that emit X-rays of greater penetrating power are making this form of treatment more effective.

Medical science is continuing its search for other ways to attack cancer. For example, hormone therapy is of benefit in some types of cancer, even when the disease is advanced. In addition, the search is on to discover chemical compounds which will destroy cancer cells without harming normal cells. Studies are also continuing on tests to detect cancer early.

While the outlook for the conquest of cancer becomes more hopeful each year, alertness on the part of each individual is still necessary to curb it. That is why doctors urge prompt medical care at the first sign of trouble—for cancer can be cured in most cases if detected and treated early.

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For a few weeks after they are born, the young of the shearwater, *Puffinus kuhlii borealis*, are crammed with food.

All day long, their parents shuttle between the beach and the nesting site with choice morsels for their fledglings. The young birds grow so fat from this forced feeding that, long before they leave the nest, they are bigger than their hard-working parents.

The accumulated fat soon serves a good purpose. For the grownups suddenly stop feeding their babies and fly away. Left to shift for themselves, the fledglings live off their surplus fat. Presently, they're strong enough—and streamlined enough—to fly, so they can skim up their own food from the sea.

For the shearwater, getting a youngster off the ground is simply a matter of a few weeks' hard work. And sometimes don't you wish that the problem of bringing up your children were as simple as that!

But it isn't. Your children are going to need—during the fledgling years—not only food but decent clothes to wear, an education, and a home. So isn't this a wise step for you to take right now?

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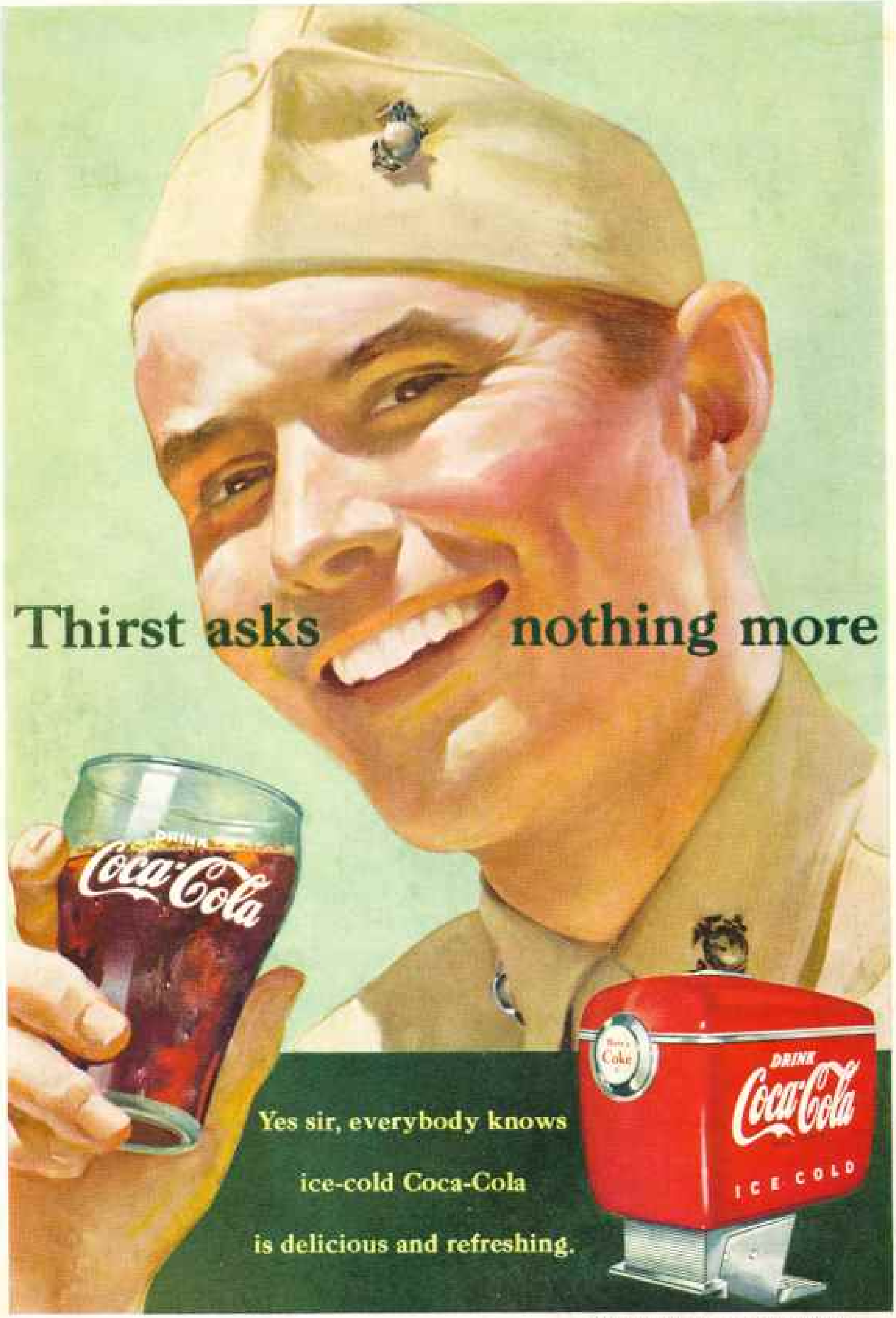
And as you talk with him, we hope you'll remember that growing up these days costs a lot more than it did when you were under 21.



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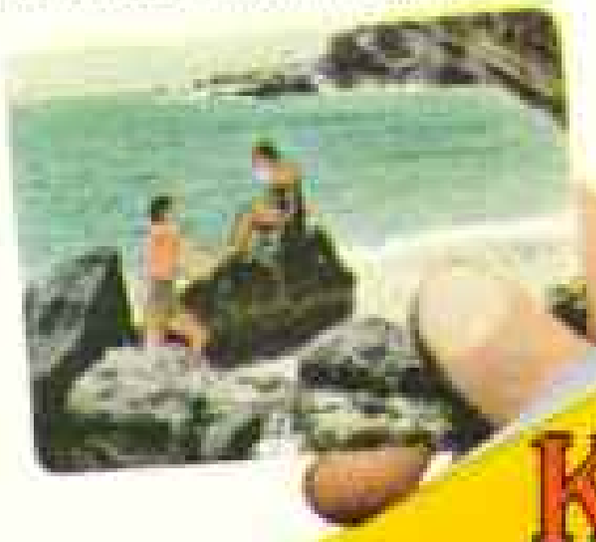

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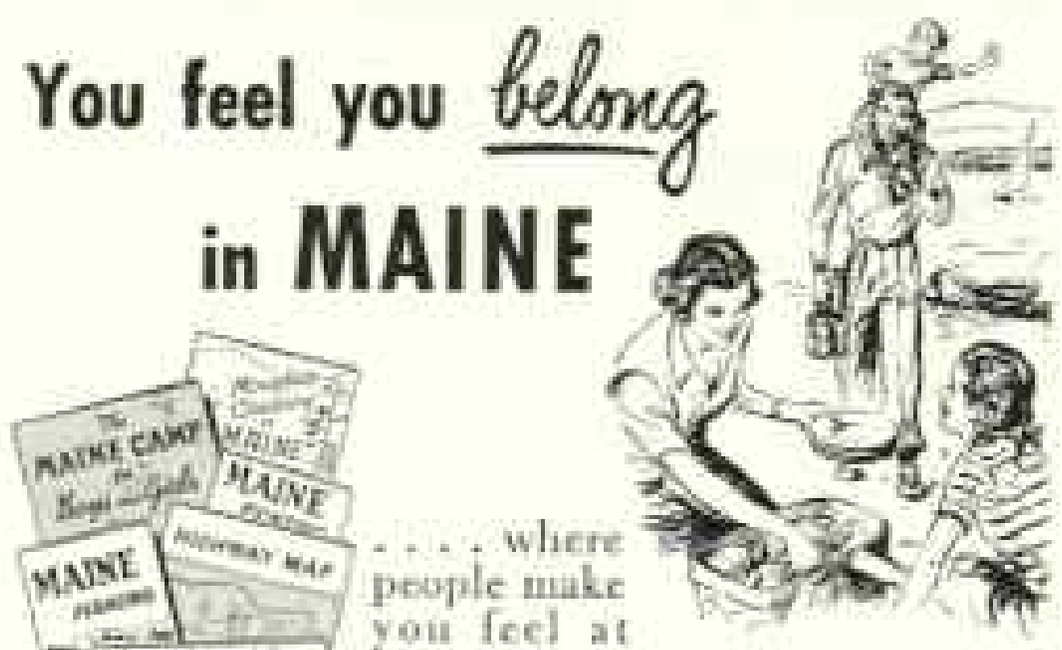

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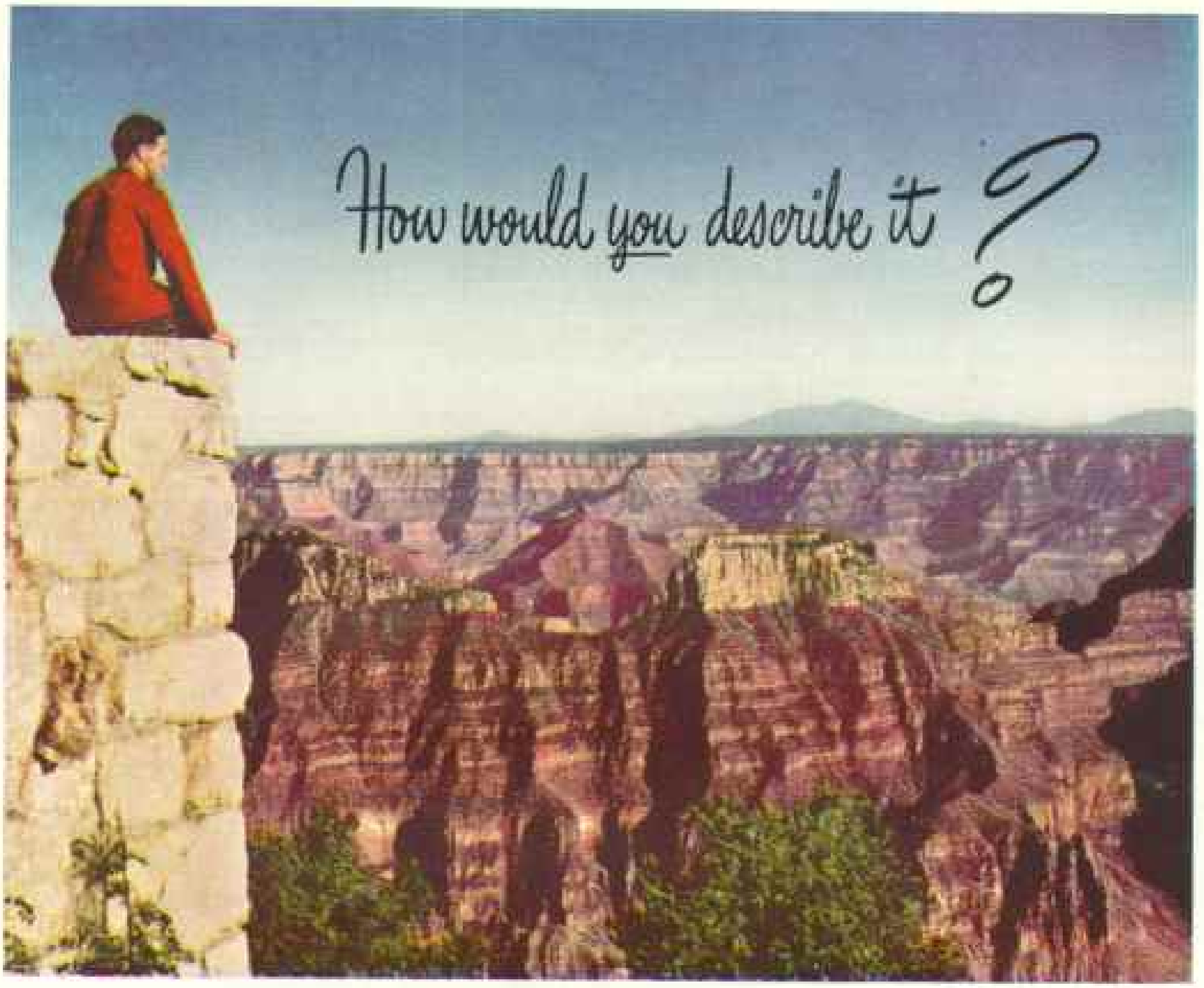

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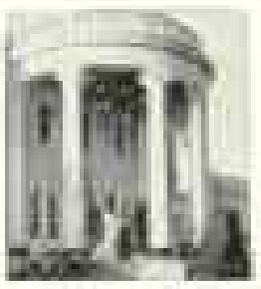

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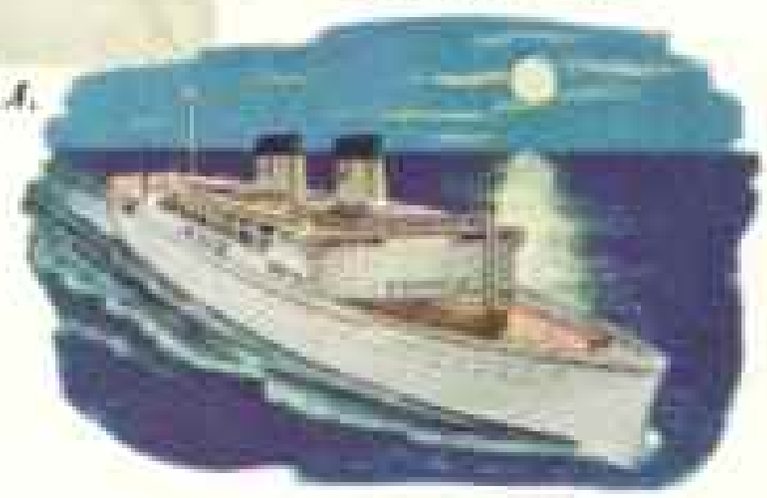

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