

VOL. 117, NO. 5

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NATIONAL GEOGRAPHIC



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The Society has conducted more than 160 major expeditions and scientific projects. It disseminates knowledge to millions through its world-famous National Geographic Magazine, its 17 million color maps a year, its books, monographs, bulletins for schools, its information service for press, radio, and television.

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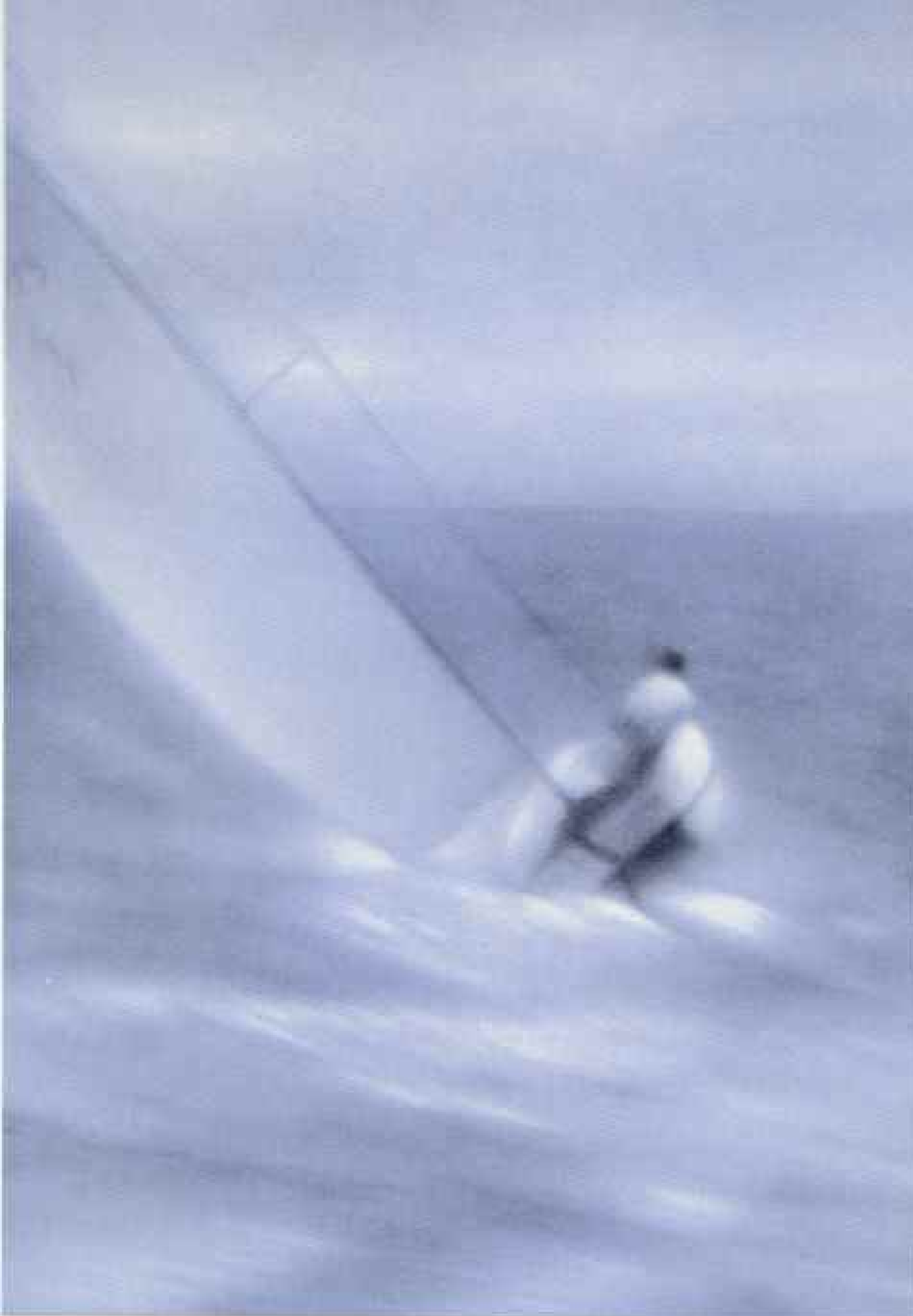
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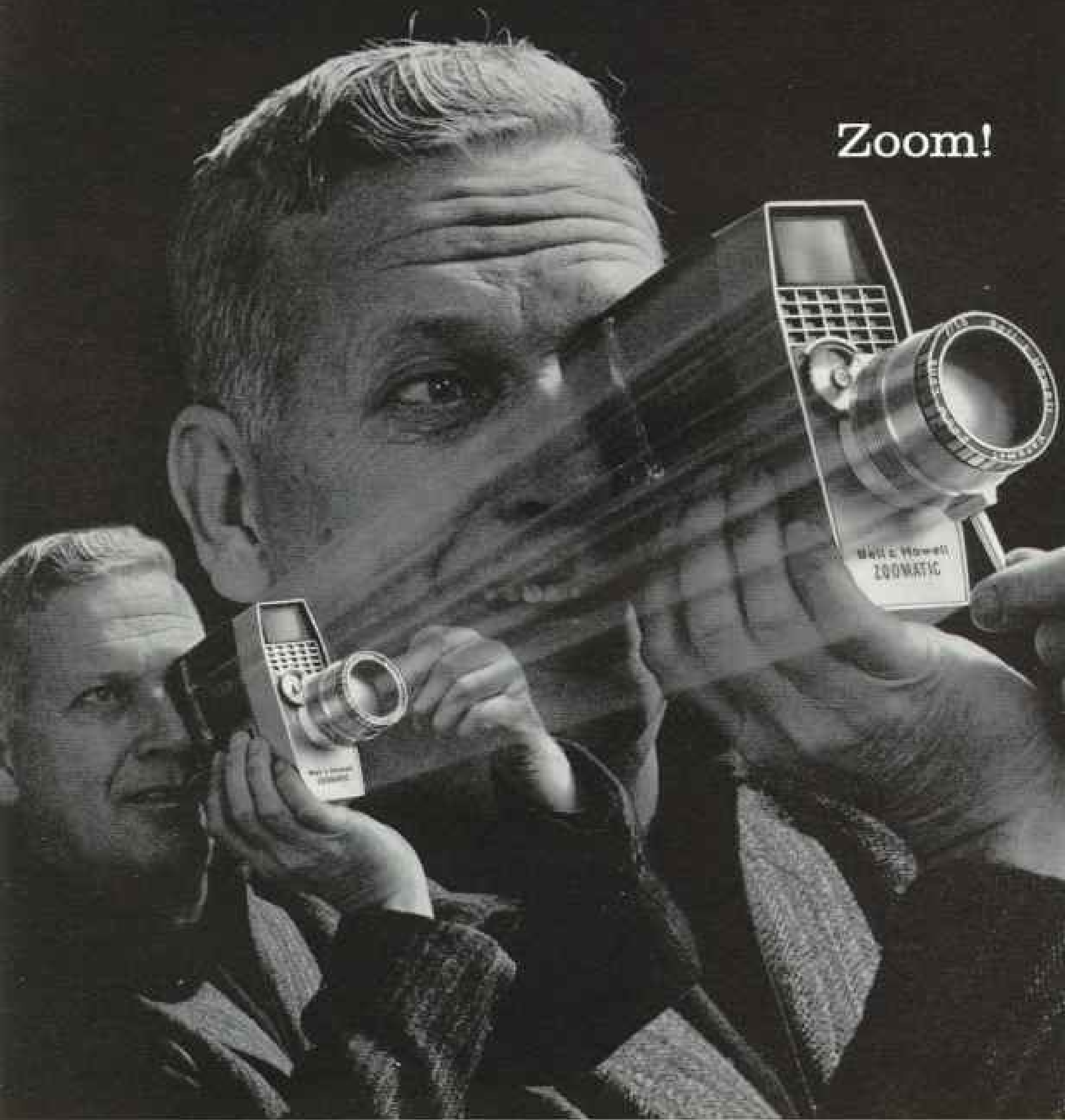
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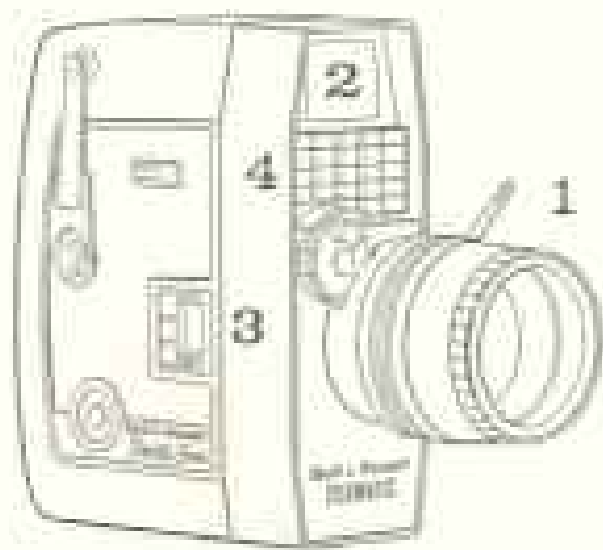
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DR. CARMICHAEL ADDS TO HIS ARSENAL

Dr. Leonard Carmichael, Secretary of the Smithsonian Institution, receives scores of gifts every year; trouble is, he cannot keep them. All go to the Nation's treasure house he heads.

Here he accepts the John Oliver La Gorce collection of arms and armor, long displayed in the late Dr. La Gorce's office at the National Geographic Society.

Next month, Dr. Carmichael takes us through the fascinating realm of the Smithsonian, a domain that includes the National Gallery of Art, the National Museum, Washington's zoo, the Freer Gallery of Art, the Astrophysical Observatory, the National Air Museum, satellite-tracking stations the world around, and a jungle isle for tropical studies in the Canal Zone—among other things.

Now he has added another province to his kingdom of the mind. Already a Trustee of your Society, he has accepted the chairmanship of its Committee for Research and Exploration, succeeding Dr. Lyman J. Briggs, who becomes Chairman Emeritus. With his new office goes responsibility for The Society's global program of scientific studies.

Thus he wields another powerful weapon in a crusade that never ends—the quiet battle to increase man's knowledge.



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Members of The Society roam the world through the pages of their official journal, the NATIONAL GEOGRAPHIC. Annual dues of **\$6.50** include subscription to the magazine, and bring frequent map supplements. Members' enthusiastic nomination of friends for membership explains the National Geographic Society's phenomenal growth.

Nonmembers who are interested in joining The Society—but who do not know a member—should inquire (right).

Members and others may make gifts or bequests of money, securities, or other property to The Society for "the increase and diffusion of geographic knowledge." Such gifts are deductible for tax purposes.

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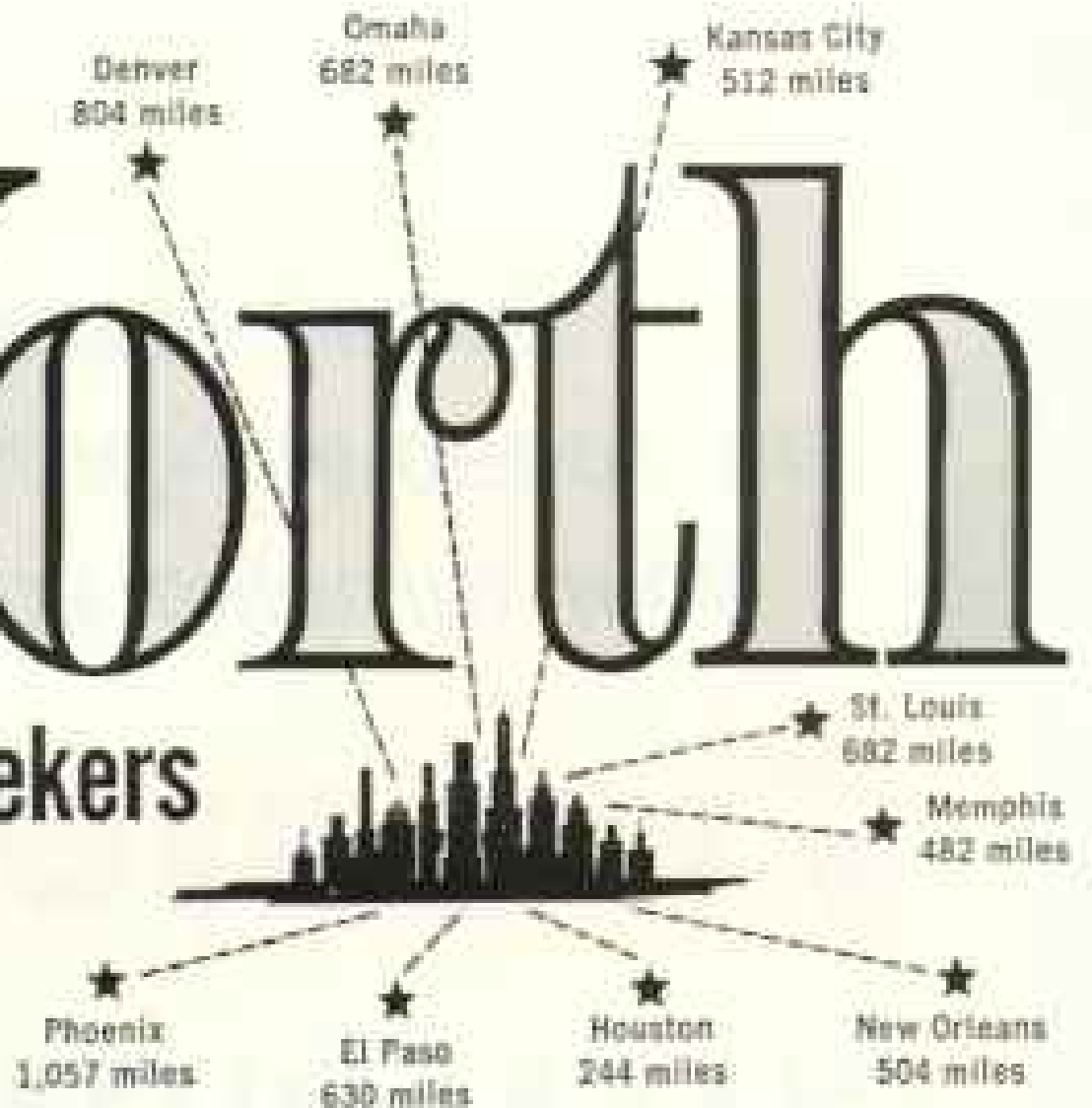


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information about

Ft. Worth

for industrial site seekers



Fort Worth is a highly desirable and logical location for companies wishing to serve the Southwest. In the center of one of the fastest growing regions in the nation, Fort Worth has an abundant labor supply proven to be easily trained for semi-skilled and skilled work. Tax laws and the local government's attitude toward industry are both favorable. If the following information about Ft. Worth interests you, get in touch with us for more specific details. We'll work with you in strictest confidence.

LABOR: Labor force of 212,500. Sound balance between supply and demand for workers provides an excellent pool of unemployed and reserve workers who could be recruited almost at once. Diversification of industry in Fort Worth has resulted in a large supply of highly skilled, versatile personnel.

POWER: Electric—1,140,780 KW daily generating capacity of Texas Electric Service Company. Three steam electric generating stations serve the area.

Gas—A gross underground storage capacity of 50,000,000 Mcf. Current estimated reserve of three trillion cubic feet—a 20-year supply. Gas is supplied from 13,000 wells in 300 gas fields in Texas and Oklahoma.

Fuel Oil—Unlimited commercial supply.

TRANSPORTATION: The Rock Island and eight other railroads; 34 common motor carriers; six airlines.

RAW MATERIALS: Ample forest resources, rapid growth cycle of commercial timber, vigorous conservation program. Texas is the nation's leading producer of cotton, cattle, wool, mohair, and grain sorghums. Limestone, clays, coal, sand, and gravel are in abundance in Tarrant County.

HOUSING: 111,000 new dwelling units since 1940. An average of 1,297 houses for sale and 559 units for rent per week. Average selling price of desirable homes is \$12,198, with per-square-foot costs ranging from \$10 to \$15.

THE COMMUNITY: 80 elementary schools, 26 junior and senior high schools, 2 technical schools. Two colleges, a university, and a theological seminary. Extensive adult education programs. 72 parks, 8 general and 2 children's hospitals; 1 doctor per 750 persons. Texas has no state or local sales tax,

and no individual or corporate income tax. The level of combined state and local taxes is about 10% below the average for all states.

COMMERCIAL SERVICES: About 1,000 manufacturing industries operate in Fort Worth, of which 90% employ fewer than 50 workers each. These smaller industries provide both diversity and stability to the economy of the city. Major activities are the manufacture of transportation equipment, food, machinery, and air conditioning. Among other industries are metal fabrication, printing, chemicals, fertilizers, plastics, electronics, and packaging materials. Agriculture and petroleum are also major industries. Over 1,000 firms are engaged in wholesale trade, and there are about 2,300 service firms in the city.

CLIMATE: Yearly normal temperature of 66 degrees; normal annual rainfall of 33.69 inches. The region is one of temperate climate, and occasional extremes of hot and cold are short-lived. Measurable snowfalls occur on an average of only once a year.

The man who knows Fort Worth industrial sites like the back of his hand is Wayne C. Gault of the Rock Island's Industrial Department. Mr. Gault and his staff are typical of Rock Island specialized personnel who, during the past three years, have helped locate over a billion dollars of private industry along Rock Island tracks. He can help you find just the spot you need. For full details, write, wire, or phone W. C. Gault, 720 Young Street, Dallas, or Industrial Department, Rock Island Lines, Chicago 5.



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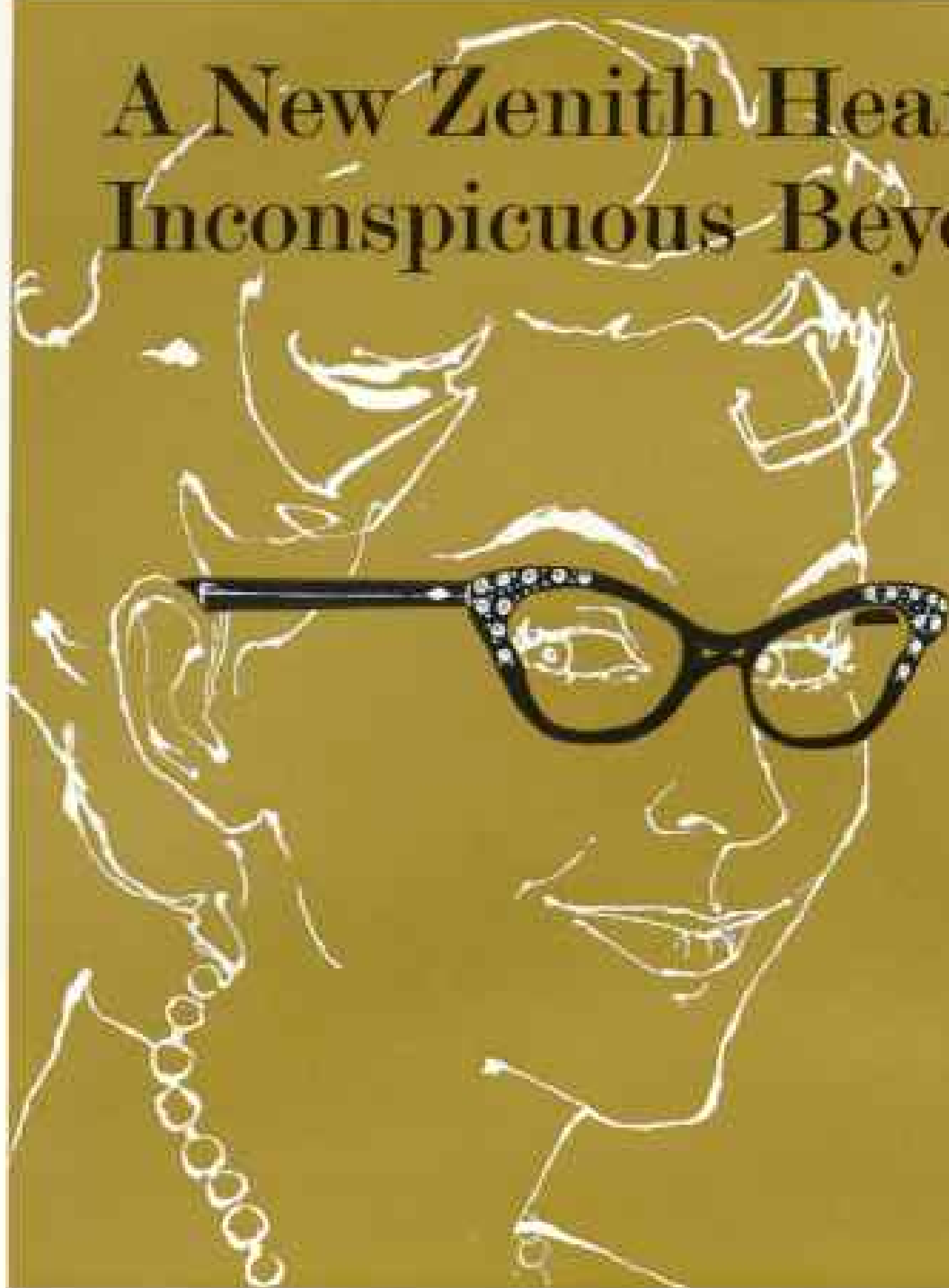
One popular way to see South America is on a packaged *Pan Am Holiday*. For example, *Holiday #713* visits 7 cities in 21 days. It costs \$966 from New York . . . \$900 from Miami. The price includes tourist flights (the long ones by Jet), drives to and from airports, hotel accommodations with private bath, many meals, sightseeing trips with English-speaking guides. Call your Travel Agent or Pan Am.

West Coast DC-8 service starts in May
 *Effective April 1, 1962, subject to gov. approval



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Great with kids.

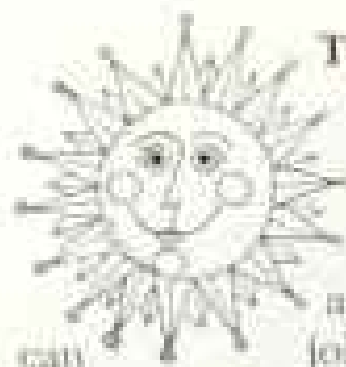


No clumsy two-piece tailgate. Rear window rolls down, can be controlled by driver.



Hidden luggage compartment lets you lock valuables safely out of sight.

Things to do and see in Europe this summer



can

The first thing to see is Lisbon—gay, romantic city and gateway to the Mediterranean. Many seasoned and first-time travelers are flying there. On the 13th, 24th, and 29th of June, for example, you join a parade and troop up Lisbon avenues under glorious banners and winking lights. During this Festival of Saints, the happy colors of flowers and fireworks and the Latin gaiety that greet you everywhere will enrapture you. And July 3rd and 4th, a few miles north of Lisbon, at Vila Franca de Xira, you'll shout "Olé!" as Portuguese gay blades catch a few bulls barehanded in the town streets. You might even try it yourself... if you're strong of heart and well-insured.

Only a short hop from the bulls of Portugal are the film stars at the International Locarno Film Festival in Switzerland. From the 21st to 31st of July, outdoors, the great celluloids of the world flicker on: some to make you roar, some to strike a deep chord. And near Zurich, for the mere pittance of less than \$7 a day (including meals), you can live in a genuine, stouthearted castle from an ancient day and tell your friends how you played the part of a beribboned baron.



From your castle, if you can tear yourself from the sky-poking mountains and cozy Swiss valleys, ride a short distance across the border to Oberammergau to witness 900 townspeople acting in the Passion Play and bringing to life the most painful day in Christian history. Fly to Cologne to hear the variety of musical compositions at the 34th World Festival of Modern Music, June 10th through the 19th. And during August, be sure to visit Rome to cheer the Olympians and then to muse at the grave of young John Keats.

And here's a bit of news to save you money: for only the price of your Swissair ticket to Rome, you can stop over at no extra cost in Lisbon, Zurich and Cologne where most of these things are going on.



heart of

Switzerland, which you might think of as suburban Europe (close by to everything and yet a worthy place in itself), is actually the geographic heart of the continent. From there, you're only minutes away from 'most anywhere. So, prepare now for a happy holiday on our luxurious Douglas DC-8 Jetliners...and continue on throughout much of Europe on our swift new Caravelle jets. If you choose, do it all on our pay later plan. SWISS-CARE...the loving-care with which Swissair tends its passengers...warms you to the heart every mile you fly. Call or write your travel agent or Swissair for more details. Offices in principal cities,



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This doesn't mean that investing is a sure road to riches. The prices of stocks and bonds go down as well as up. A company may not always pay dividends or interest.

However, if you follow these rules, you can reduce the risk.

1. Invest only money not needed for regular living expenses or emergencies.
2. Get facts about a company before investing in it. Don't trust tips.
3. Get advice from a reputable broker. Call on a Member Firm of the New York Stock Exchange.

If you are concerned about providing for your own and your family's future, you owe it to yourself to consider the possibility of investing in stocks and bonds.

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For offices of Members nearest you,
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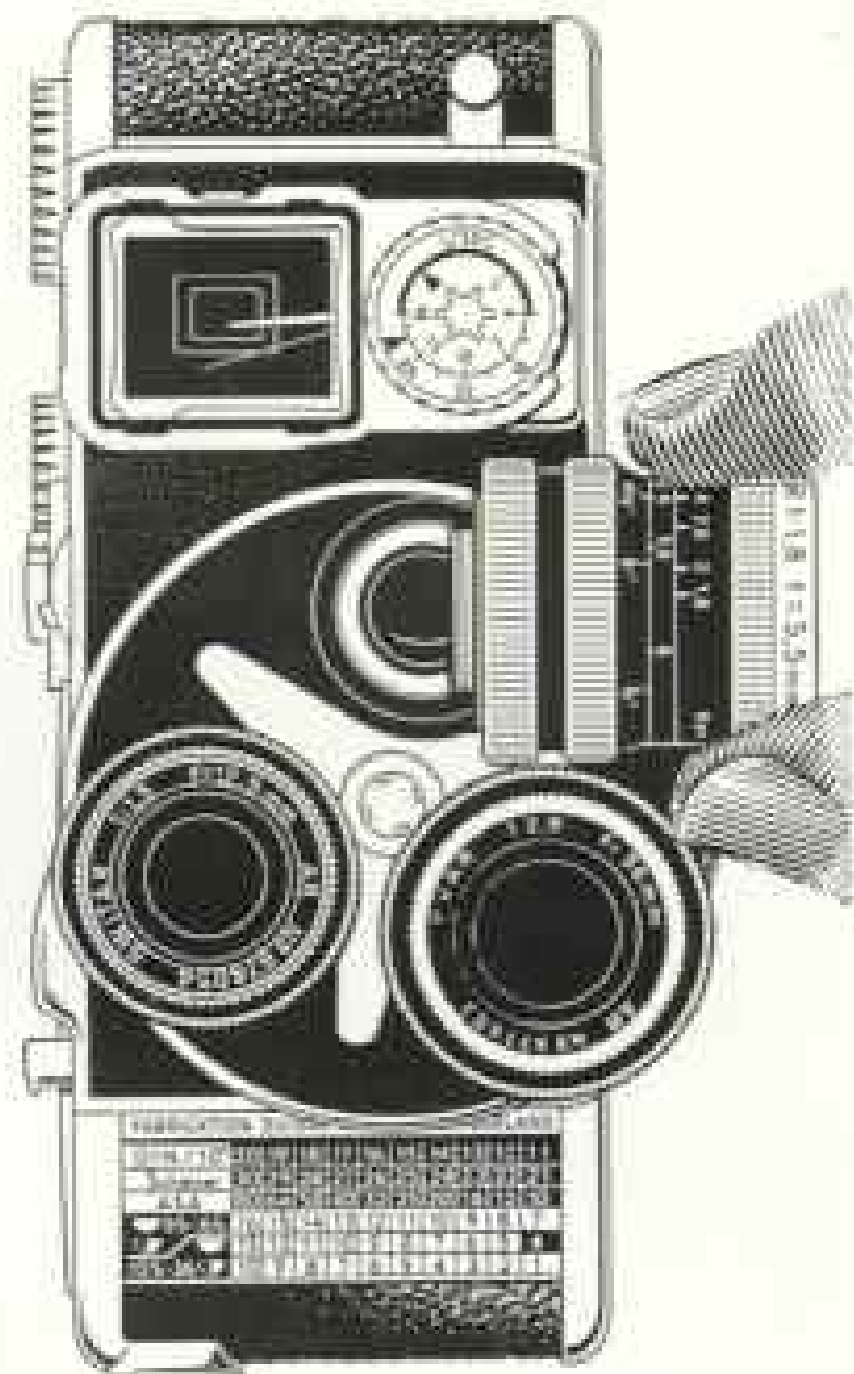
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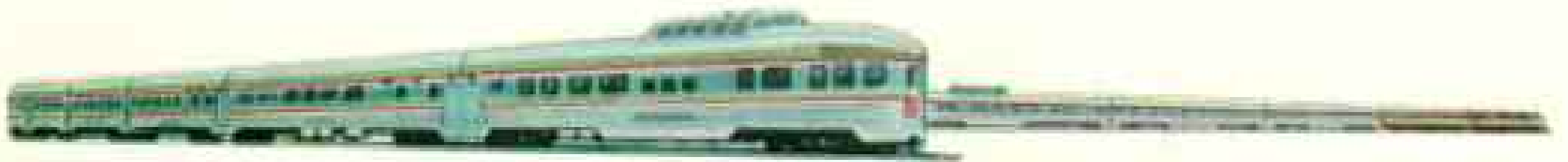
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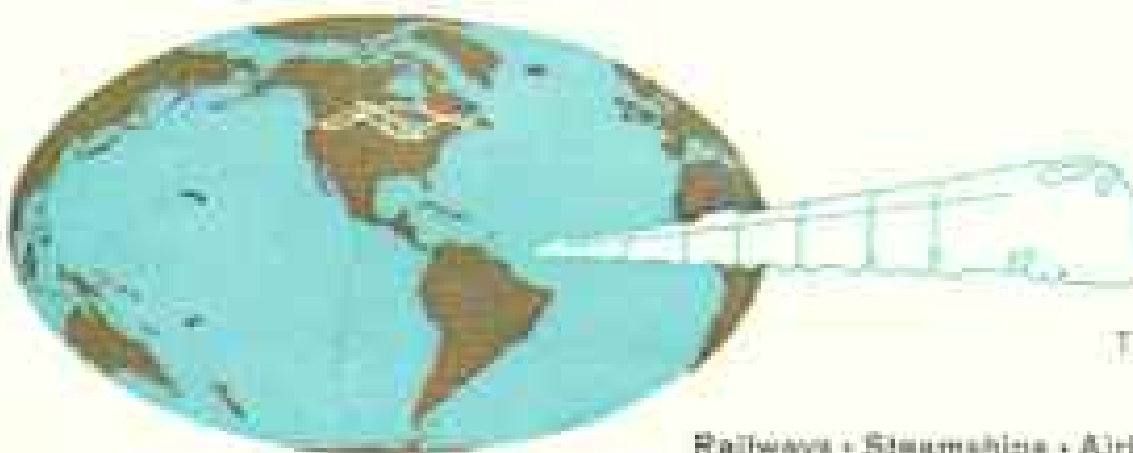
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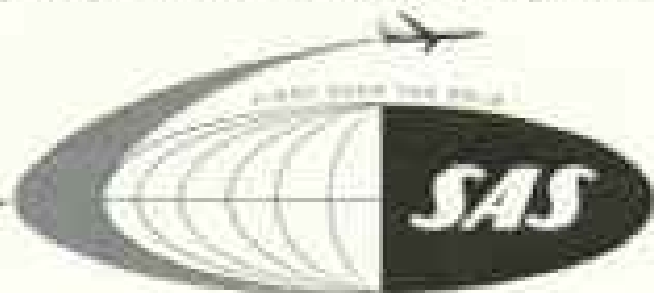
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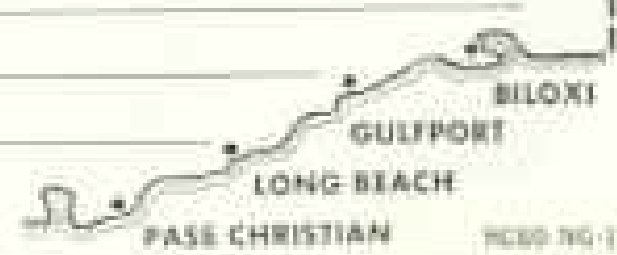
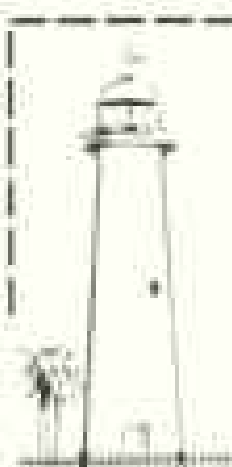
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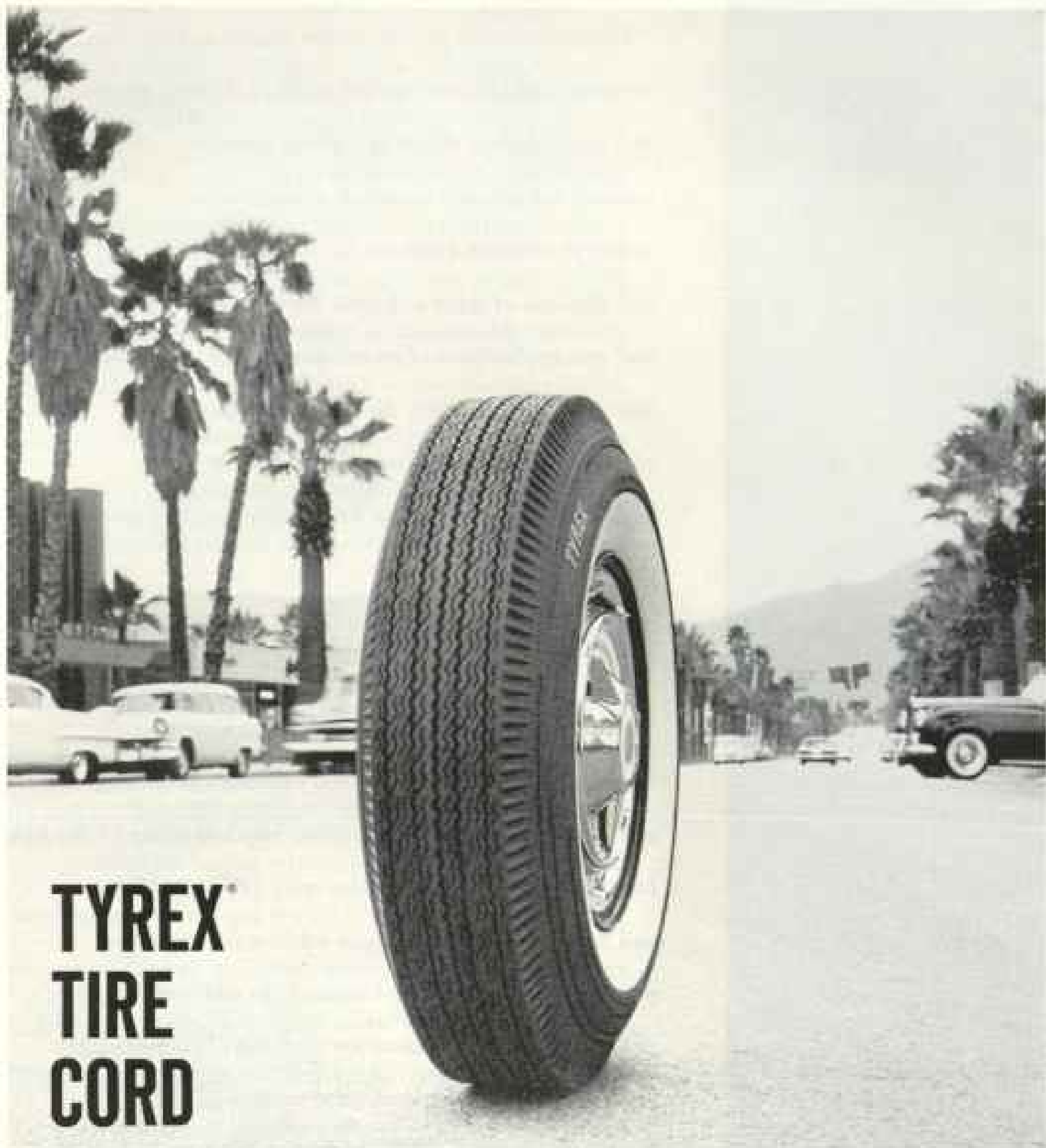
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de l'espace et du temps. D'ici quelques années, des conceptions and new applications of atomic power may within the next

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atomique permettant peut-être une exploration méthodique des couches of earth's upper atmosphere that will tell us what

supérieures de l'atmosphère terrestre, qui apprendra à l'homme ce qu'il we need to know before our first human step into space."

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interplanétaire ("Atlas-Able"), ainsi qu'à mettre des satellites lourds and Samos); and launch space vehicles for moon and

en orbite méridienne (Opérations "Midas" et "Samos"), et propulsera planetary probes (Project Centaur). In addition, scientists

des engins spatiaux d'exploration lunaire et planétaire (Opération of General Atomic Division are studying (Project Orion)

"Centaur"). En outre, l'équipe scientifique de la General Atomic Division the feasibility of using controlled nuclear pulses

étudie la possibilité d'utiliser des impulsions nucléaires ménagées to propel into space a ship weighing 1,000 tons. Meanwhile,

pour envoyer dans l'espace un astronef de 1.000 tonnes ("Operation Atlas, America's first operational Intercontinental

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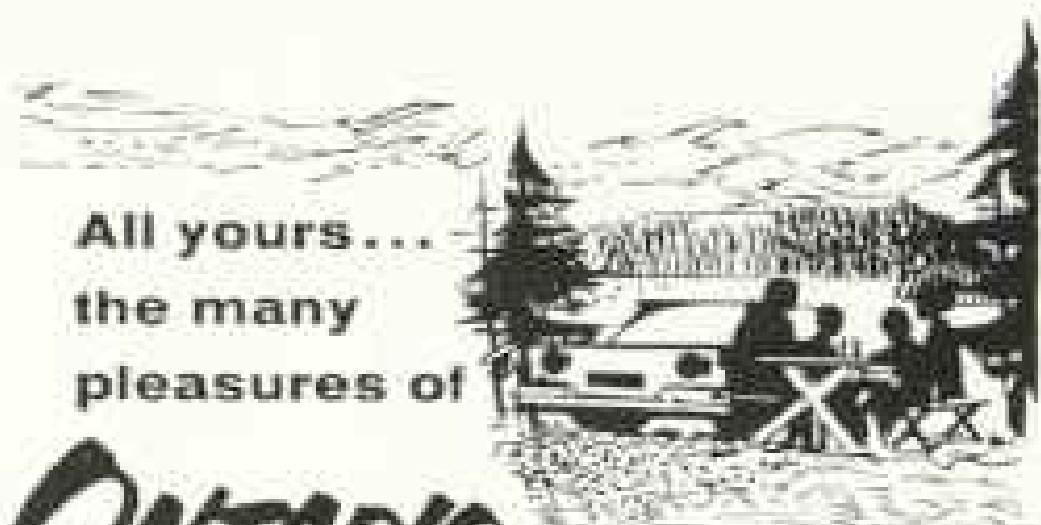
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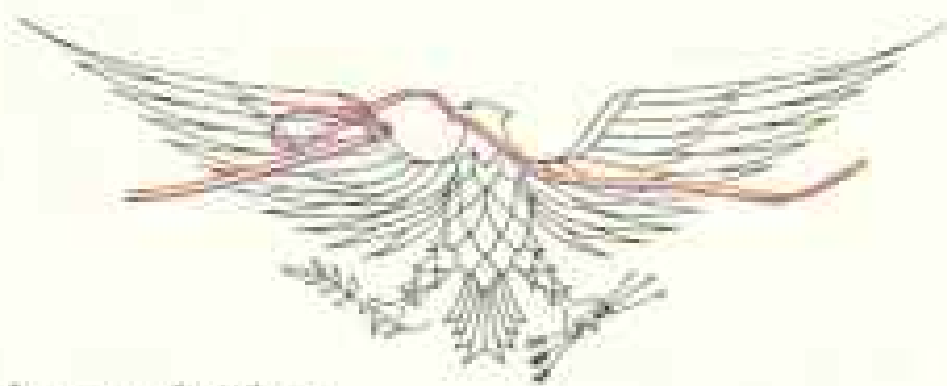
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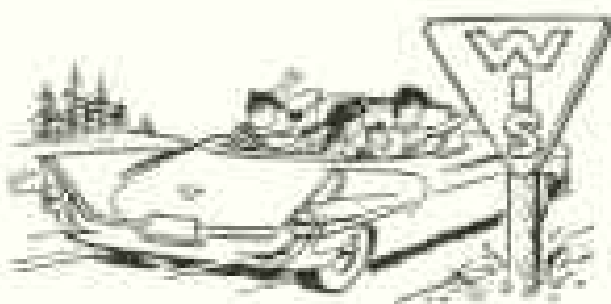




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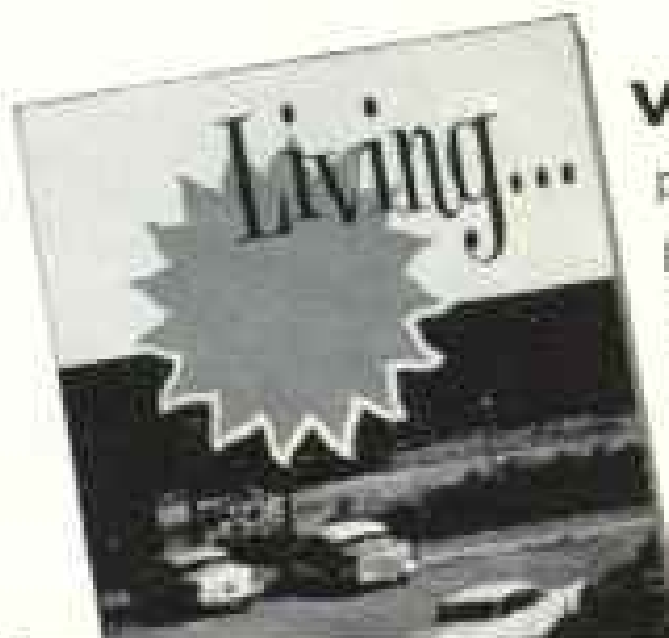
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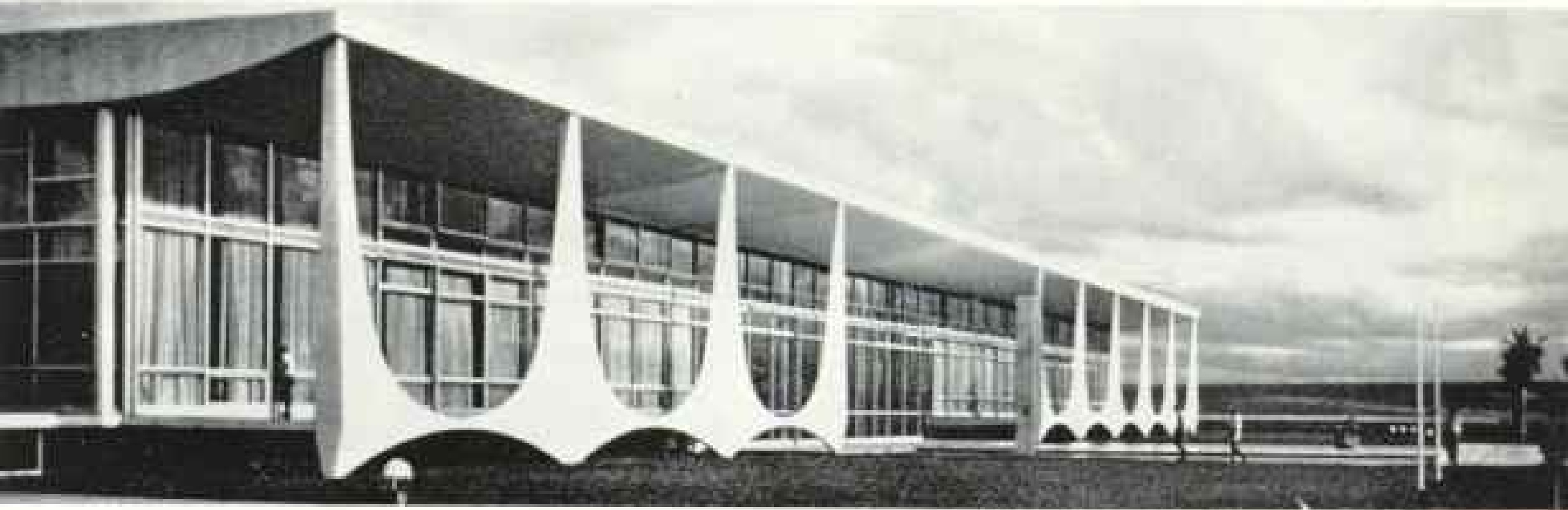
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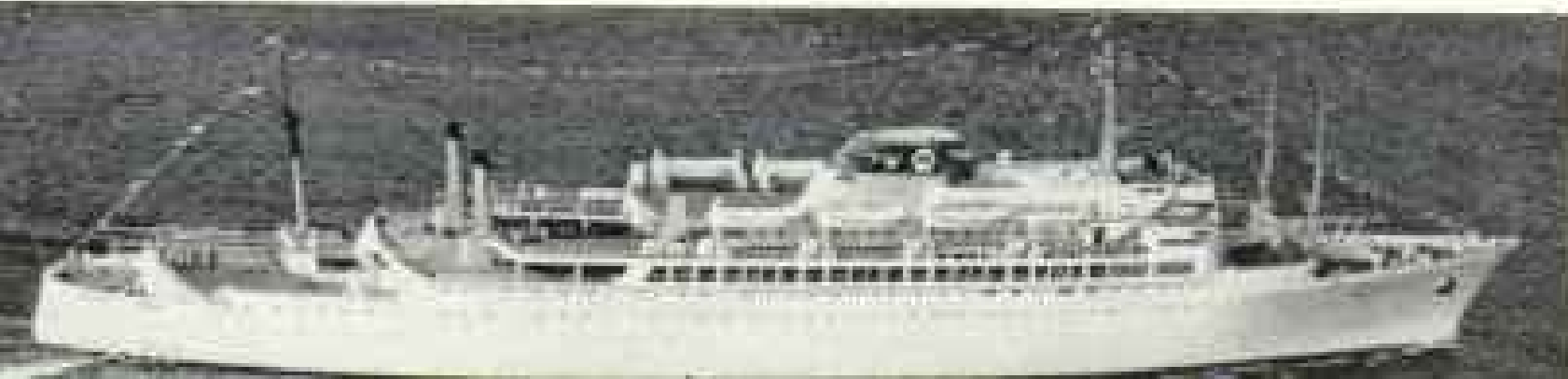
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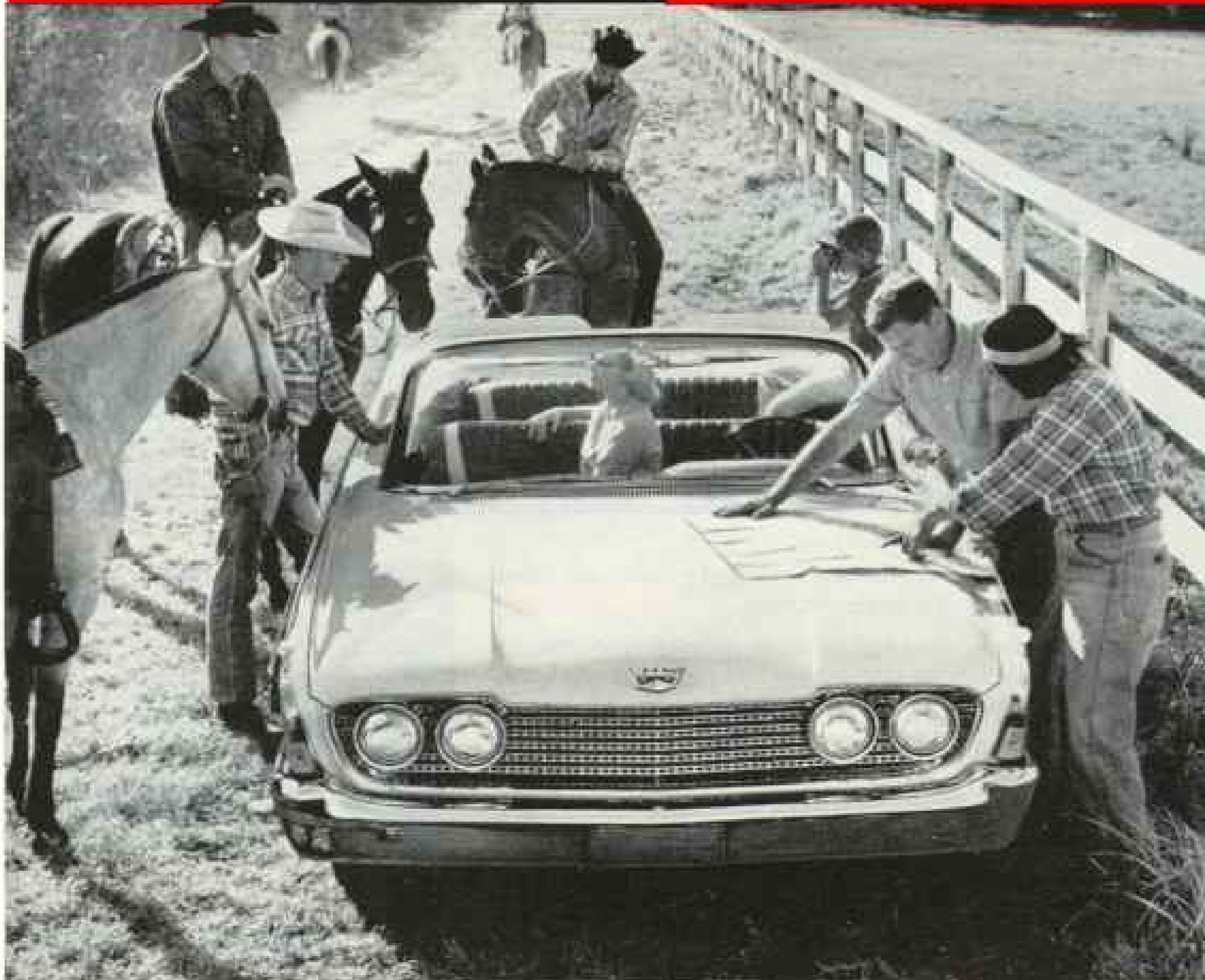


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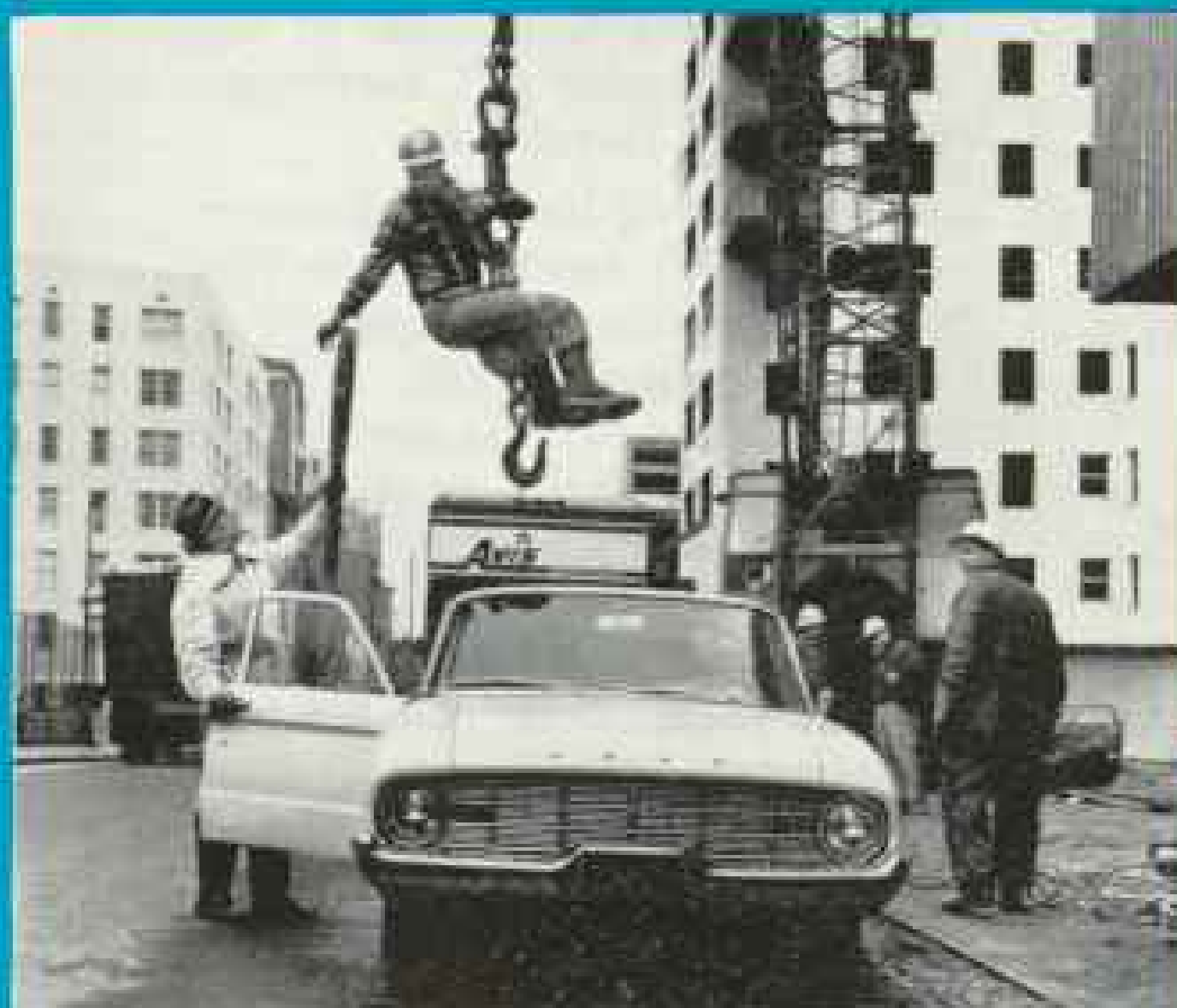
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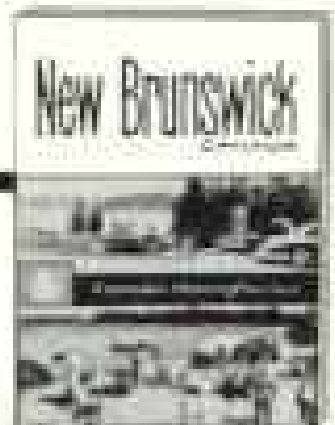


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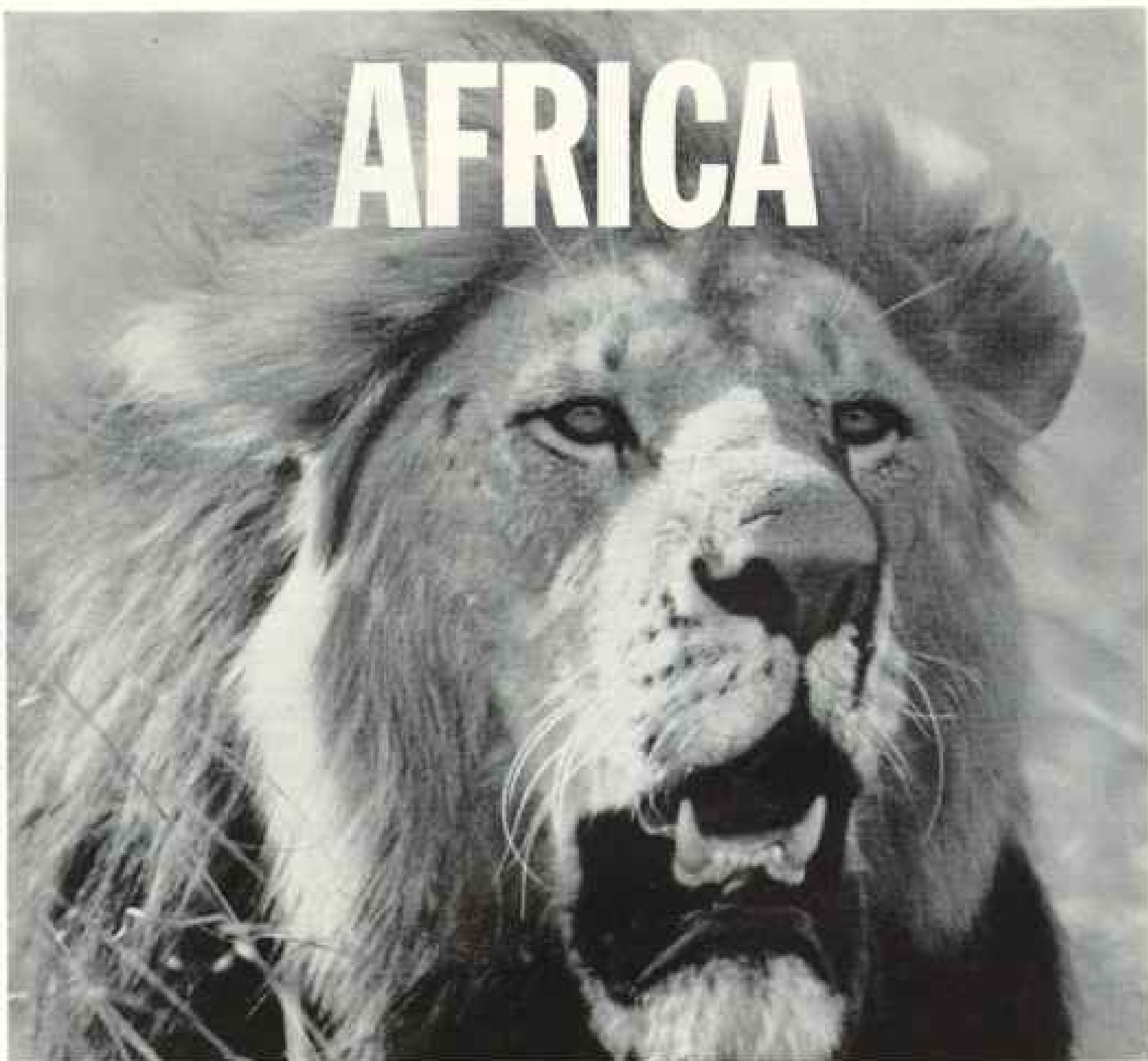
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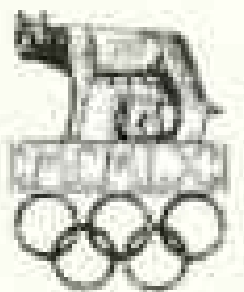
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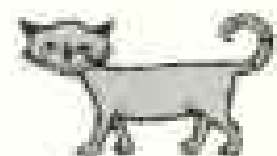
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Does your family have these breakfast problems?



Does Dad rush off to work—
with only a cup of coffee
and a bun to sustain him?



Does Junior get up with no appetite...
and dawdle over his food?



Does Sister skip
breakfast entirely...
to keep a trim figure?

The success or the failure of your day often depends on the breakfast that starts it. In the morning, perhaps more than at any other time of the day, you need a well-balanced meal to renew your energy and help you feel better, think more clearly and work more efficiently.

On the other hand, a sparse breakfast invites fatigue. In fact, many studies show that when you eat little or no breakfast, tiredness will almost surely overtake you while the morning is still young. And, in many cases, breakfast skippers become irritable, nervous or weak.

How much breakfast should you eat? Enough to supply at least one-quarter of your total daily food needs. And to get the essential carbohydrates, proteins, vitamins and minerals, your breakfast

should include fruit in some form; bread made from wholegrain or enriched flour; cereal, eggs, meat or fish; and milk to drink or use on a cereal.

Such a breakfast (with other things you like including coffee or tea) should be eaten by everyone in the family—mother, father and the children.

Try it for a while. Chances are you'll notice how much more energy you have, and how much better you'll feel around 11 o'clock than you did before.

Even if you're dieting, don't skip breakfast. Without breakfast, you're far more likely to overeat at lunch or dinner. And that can wreck anyone's reducing program.

All of us, overweight or normal, should take time to eat a substantial breakfast. It's a fine way to help every member of your family to better health.

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Herbert Hoover



Nature study program for Boys' Club members—Allegheny National Forest, Pa.

When the roots go deep, the tree grows straight

"A boy," Mr. Hoover once said, "is a complete self-starter, and therefore wisdom in dealing with him consists most in what to do with him next."

But wherever there is a Boys' Club, that's no problem. Under the guidance of dedicated men, there is always something for a boy to do . . . some interesting activity to catch his imagination and lift his eyes to the opportunities of a greater America.

And, in this age of greater leisure, many American families (prodded by a boy's insistence) seek *something to do next*.

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All these are for all Americans to enjoy; but boys, being boys, enjoy them most. And through understanding of Nature's ways, their own roots will go deeper. *They will stand straighter, and be better men for it. . . men who can and will make ours a stronger nation, in a better world.*

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SINCLAIR SALUTES THE BOYS' CLUBS OF AMERICA on the dedication of the Herbert Hoover Building in New York—new national headquarters named in honor of the former President who has so skilfully guided the growth of the organization for a quarter century. From this building are directed the many activities of the more than 550 Boys' Clubs of America which are serving to build tomorrow's citizens for a better community and a stronger nation.

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VOL. 117, NO. 5 MAY, 1960

A Message From the President of the United States

I HAVE been doing a lot of traveling in the past few months. I have seen and spoken before several million people—kings and prime ministers, camel drivers, gauchos, weavers, and farmers. In that great segment of the human family, I have sought a common denominator, and I believe I have found it in this:

All those people have an abiding faith that America will help lead the world on the way toward a just peace—in freedom.

My travels have given me a quickened sense of human geography, and left me with a treasure of vivid impressions. More than ever I am convinced that we have much to learn, just as we have much to give, in our contacts with men of other nations and other faiths. We have ever drawn deeply from the wells of enlightenment in older cultures. We cannot stop now.

My passport on these journeys has been a simple message: America's desire for peace and friendship in freedom. Everywhere I have found a wholehearted response to that hope. I have never yet found a people who were belligerent. Men do not long for the battlefield; women shudder at the thought of their husbands, fathers, sweethearts, or sons in the tragic march to war. In our longings and our aspirations, we are one.

In the pages that follow you will find a remarkable pictorial record of my trip last December, when I visited eleven nations on three continents. Here are the faces that wel-

comed our party. They are the faces of mankind, some weary, others eager and energetic. Here are those who have known the hunger that we must banish from our world, here the children who will one day inherit the world we forge today.

I shall not speak here of any single country; my hosts were as varied as their garb. Some wore Western-style clothing; the garments of others were as ancient as Abraham. Neither are their prayers directed to a single God: They are Buddhist, Moslem, Hindu, and Christian. But, seeing them massed along country roads and city streets from the eastern shore of the Atlantic to Karachi and Delhi, I came to know them as one family, with a common dream.

We, all of us, want to better the lot of humankind. We must eliminate the hunger that emaciates children and scars the souls of their parents. We yearn to see mankind reaping each year a richer harvest from the good earth, sharing a commerce in goods and in knowledge and in wisdom, that we may dwell together in plenty, and in peace.

All of us can share in this dream of plenty and this determination that it be fulfilled. In its fruition we can find our own fulfillment, and that of America. To this great goal we can join our hands and our hearts. It is our challenge, and our destiny.

Dwight D. Eisenhower

*A dramatic pictorial record of Mr. Eisenhower's
11-nation tour to Asia, Africa, and Europe.*

When the President Goes Abroad

Article and photographs by GILBERT M. GROSVENOR,
National Geographic Staff

IN DELHI a million Indians engulfed the car. In Tehrân the limousine rolled over exquisite Persian rugs. In Athens King Paul swung open a palace gate used only for rare state occasions. Peoples from all countries and all walks of life hailed Dwight David Eisenhower's journey to understanding. And in Pakistan, a mother named her newborn son Ike Khan.

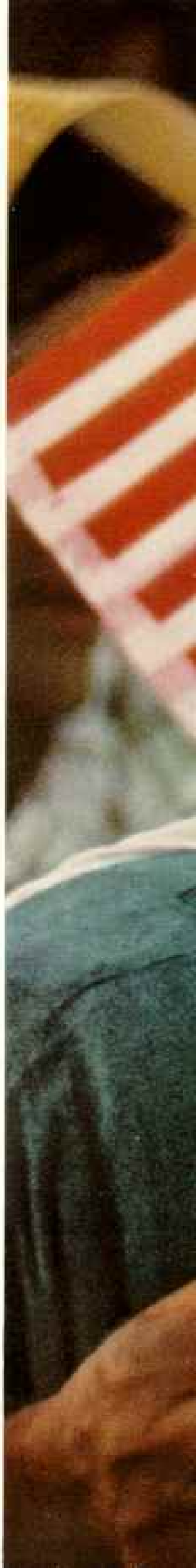
Indian Parliament members approvingly slapped their hands on desk tops, interrupting Mr. Eisenhower a dozen times—an unprecedented tribute to a foreigner. North Africa's veiled women wailed cries of joy: "you-you-you." And an Indian peasant, tears streaking his face as Mr. Eisenhower spoke in Delhi, said in native dialect: "I do not understand English, but I feel his sincerity—it is his heart that speaks."

With the Presidential party, I traveled 22,000 miles to watch and photograph the enthusiastic response of Europeans, Asians, and Africans to Mr. Eisenhower's plea for peace, justice, and freedom. Many had never heard of Dwight D. Eisenhower, but in him they found a fellow opponent of human suffering and war.

Mr. Eisenhower quickly won the affection and confidence of many creeds and races. In Rome he mentioned the ten million Americans of Italian blood, in Ankara spoke some Turkish phrases, in Karachi ate curry and spices. To Indians he quoted Mahatma Gandhi—"Freedom is a gift of God—the right of every nation." He lauded the ancient Persians Cyrus and Darius, and recalled the centuries-old democracy of Greece's classic age. He hailed Tunisian independence, named the early Spanish explorers of North America, and sampled the traditional dates and milk in Casablanca.

Memories of Mr. Eisenhower's journey to Europe, Asia, and Africa will live forever with the 9,000,000 people who greeted him. In twenty years, when that child in Pakistan reaches manhood, Pakistanis will still remember why he is called Ike Khan.

One of India's millions, a New Delhi woman shares in the world's ovation to President Eisenhower. As narrowed, spectacled eyes grope for a glimpse of him and hand-cupped ear strains to hear his voice, she waves the United States flag.







Rome in the rain:

ICY WIND and driving rain whipped Rome's Ciampino airport as Mr. Eisenhower alighted from his military jet. Only a few hundred Italians and Americans huddled along the ancient Appian Way to wave the President into Rome. Bouncing in open trucks, we photographers mustered little enthusiasm for "the most photographed highway in the world." Plainly, the Appian Way was a puddle. Even the sight of Gina



ALL PHOTO UNLESS OTHERWISE © NATIONAL GEOGRAPHIC SOCIETY

A soldier's tribute to the unknown dead

Lolobrigida's house failed to brighten our dampened spirits.

We sped past Colosseum, Forum, and into Piazza Venezia, where umbrella-covered Romans shouted, "*Viva Eckey!*" giving "Ike" an Italian twist.

That night I joined Rome society at a Quirinal Palace reception. "Have you ever seen such beauty?" I asked a companion, admiring the ceiling frescoes and wall tapestries. He eyed me strangely.

"Take a look at these ladies," he suggested.

I focused at eye level: Roman beauties with "Italian-cut" hair styles, pale lipstick, and fashionable gowns. My note taking suffered.

Next morning Mr. Eisenhower visited the monument to Victor Emmanuel II, who united Italy. Presidential Guards (left) carried the wreath that Mr. Eisenhower dedicated to Italy's Unknown Soldier. The President briskly mounted the 55 steps to the tomb and stood bareheaded in a downpour (above).

Some 400 spectators, including many American priests and nuns, cheered the President.

History repeats in the Vatican

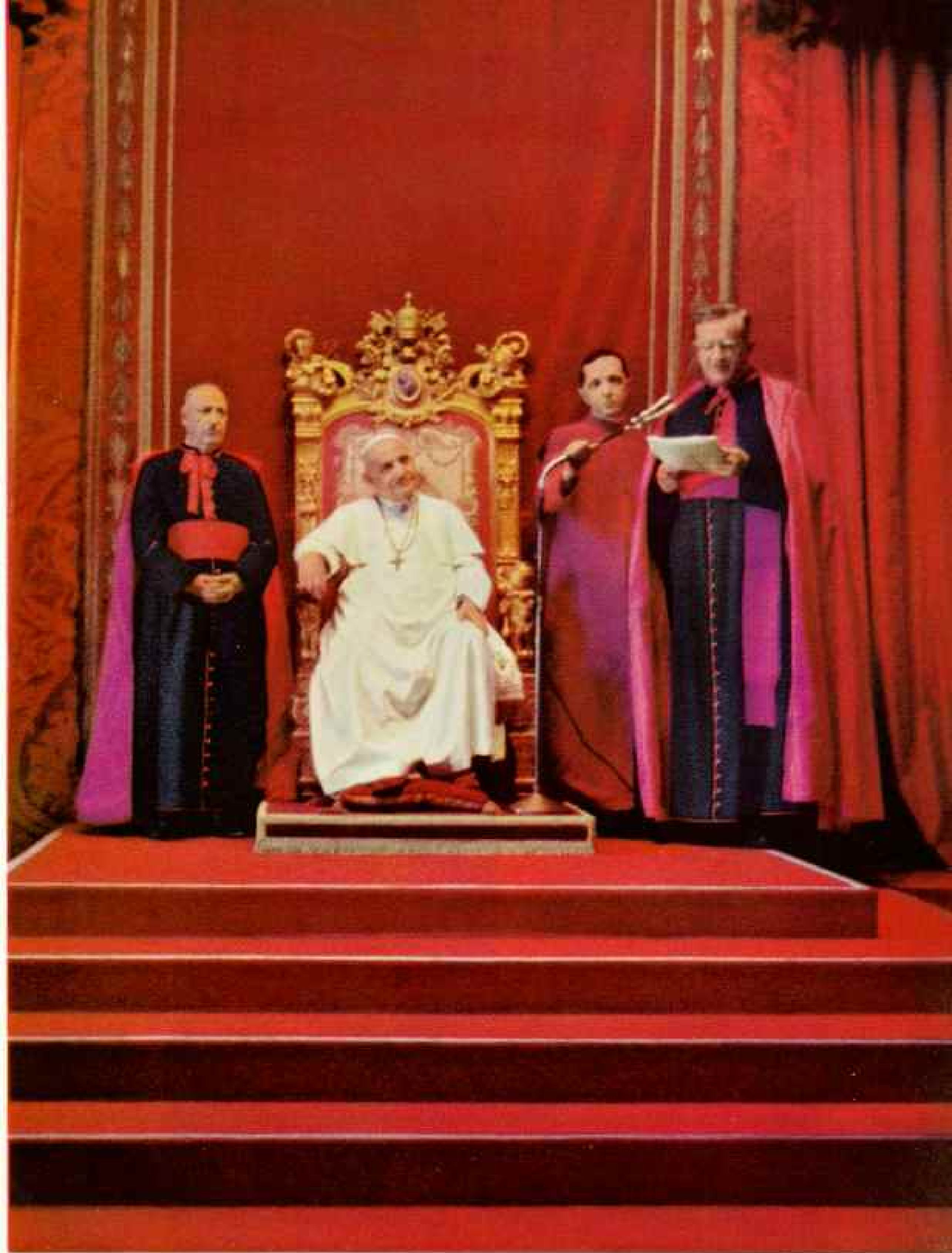
POPE JOHN XXIII met the President, his son Major John Eisenhower, and daughter-in-law Barbara at the entrance to his library. Their historic meeting closely paralleled the post-World War I meeting of President Woodrow Wilson and Pope Benedict XV, just before Wilson went to the Paris Peace Conference.

"We earnestly invoke the powerful assistance of God upon you in your noble efforts as the untiring servant of your people and of the cause of peace in the world," the Pontiff told Mr. Eisenhower in his newly acquired English.

WIDE WORLD © NATIONAL GEOGRAPHIC SOCIETY



Enthroned in the Vatican's Consistorial Hall, His Holiness granted the Presidential press corps a special audience. He



BY ESTABLISHED MODEL BY THOMAS REEDER © R. L. F.

reminded us of "the lofty mission that the responsible newspaperman fulfills" and remarked that if St. Paul were alive today he probably would be a journalist, so that he could spread the doctrine of Christ.

"If you will combine the propagation of truth with natural goodness and good will," he told us, "then you will render a great service to the cause of peace in the world." His words brought a glow of pride to all of us.

“Eekay” hovers over the Vatican in his helicopter

“EISENHOWER weather,” a legend drowned in Rome, finally prevailed. Sunny skies dried slippery pavements and brought out the Romans to cheer the President in St. Peter’s Square (right).

Riding in an open powder-blue convertible, the President flashed his smile and waved a familiar black Homburg as he set foot on the sovereign soil of Vatican City. He passed through the Arch of the Bells and later into the Court of St. Damasus, heart of the Vatican.

Swiss Guards, garbed in yellow, blue, and red uniforms said to have been designed by Michelangelo, saluted smartly. Palatine Guards presented arms, and a band played “The Star-Spangled Banner.”

The Vatican’s finest carpets, withdrawn from storage for the occasion, covered corridors and rooms leading to the Papal apartments.

Guest and host had never met, though they had once been in Paris at the same time in 1945, when General Eisenhower was Supreme Commander of the Allied Forces, and the Pope was Papal Nuncio to France. During the interval Mr.

594





PHOTOGRAPHS BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JAMES BEVIER © N.G.S.

Eisenhower rose to political leadership of the Free World, and the Nuncio ascended the Chair of St. Peter.

After a private talk lasting 25 minutes, Pope and President met the Eisenhower entourage (page 592) for an exchange of gifts. Mr. Eisenhower presented his autographed photograph framed in silver; the Pontiff offered a signed photograph and a gold medal inscribed with the words, "John XXIII . . . Obedience and Peace."

As departure time neared, the crowd in St. Peter's Square swelled (left). Many came armed with cameras to catch "Eekay" flying away in his helicopter (above). As the Presi-

dent told us in Washington, D. C., he was eager to "sit in the sky" and look down on Europe's and Asia's historic landmarks.

At almost every stop he planned to helicopter between city and airport, hoping to see in particular the Vatican, Agra's Taj Mahal, and the Acropolis of Athens.

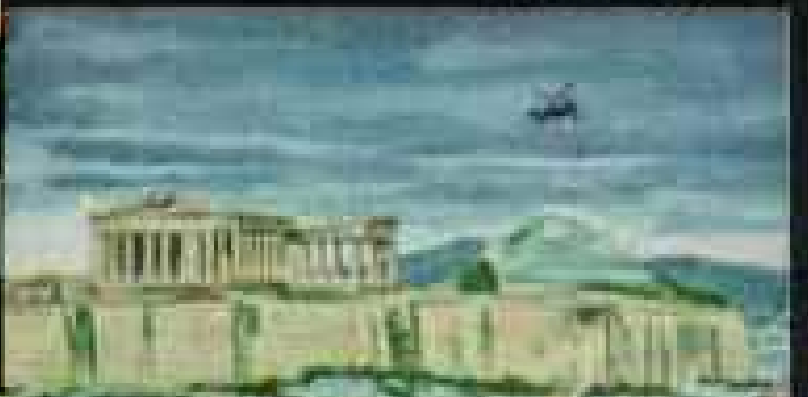
Soon his whirlybird lifted off the ground, hovered momentarily over St. Peter's, then sped away to Ciampino airport. Though disappointed by the weather, Mr. Eisenhower expressed pleasure at his reception in Rome.

Boarding his VC-137 (a Boeing 707 jet) for Ankara, Turkey, he remarked, "I feel that a very fine beginning has been made here."

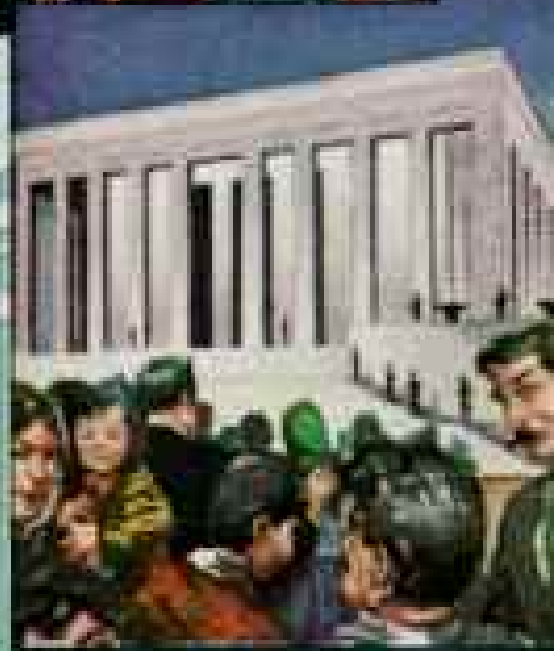
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ATHENS



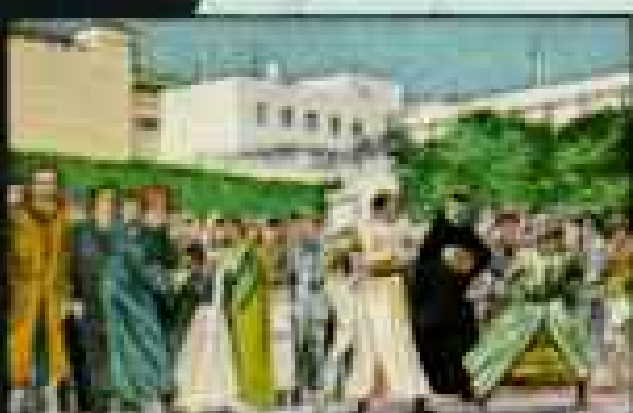
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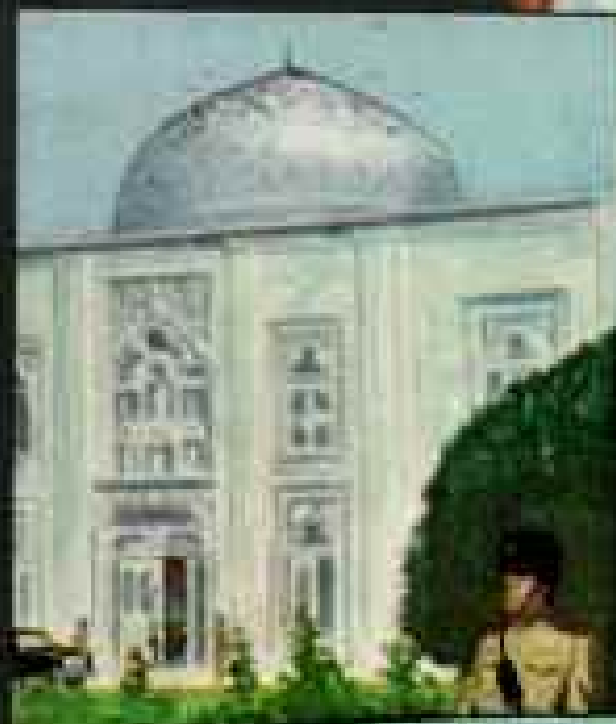


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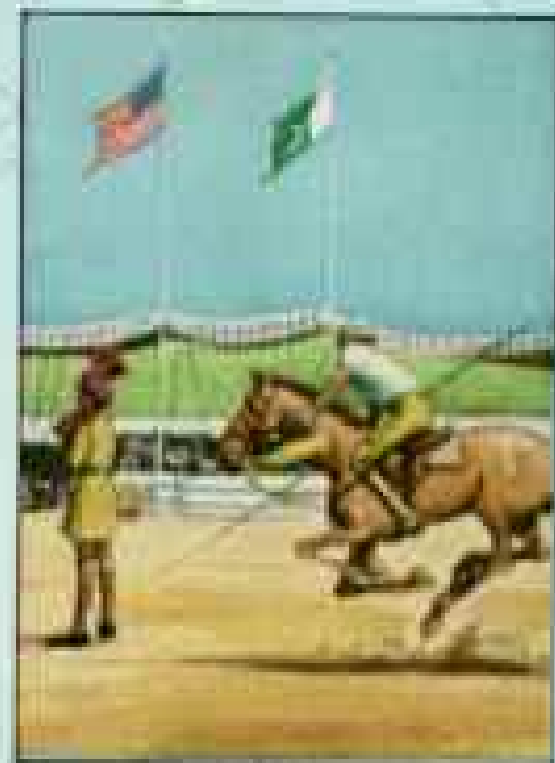
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TEHRAN



KARACHI

FLIGHT TO PEACE December 3-22, 1959

Twenty-two thousand miles in 19 days. Eleven nations played host to the President on his peace and friendship mission to Asia. Nine million people turned out to cheer him along the way. Rome's Colosseum, the Acropolis at Athens, Ankara's Atatürk Mausoleum, Tehran's Marble Palace, and the Taj Mahal captured his eye. In every country he found "the greatest of all resources—people of good heart and stout will. . . . They are now our warm friends."

W. Palmstrom
 R. Nicholas
 J. Lotters
 © N.C.B.

Ankara: 400,000 Turks hail Ike's arrival

"HOŞ BULDUK. Çok teşekkür ederim," blared the airport loudspeaker.

"Ike even speaks Turkish," said the Turkish photographer next to me on the truck.

"Could you understand?" I inquired.

"Sure! He was good. He said, 'We are happy to be here. I thank you very much!'"

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Photographers everywhere have a single code: Every man for himself. But after the President's speech my colleague asked, "Do you have enough room? Is my bag in your way? Can you see all right?" The Eisenhower charm had melted even a photographer's heart.

As we rode into Ankara, I saw a land mountainous, barren, and brown. But the people and government are striving for a new Turkey: industrialized, modern, and prosperous.

At Ankara's outskirts modern apartments have sprouted beside wide paved streets.



Frantically I started taking pictures, but my Turkish friend cautioned me: "This is nothing. Wait until we come to Atatürk Boulevard and your Ike changes cars."

And he was right. The cheering, flag-waving crowds thickened. Native dancers, mainly men, swirled in the streets. Drummers and flutists, with instruments centuries old, piped out Turkish melodies.

Then Turkey paid this visitor its highest honor: a ride in Atatürk's open 1934 Lincoln touring car (below). All of Ankara was draped in red, white, and blue bunting. On

a university building hung a portrait of the President six stories high.

Estimates of the crowd range from the official 400,000 to an optimistic 700,000 by the Turkish press. Since Ankara is a city of no more than half a million people, the turnout was almost unbelievable. "Never have I seen so many people in the capital," a Turk told me.

Of his reception in Ankara, President Eisenhower remarked, "This was the most stupendous reception I have ever seen in a city of this size."

PHOTOGRAPH BY GILBERT W. BRIDGEMAN, NATIONAL GEOGRAPHIC STAFF © N. G. S. S.

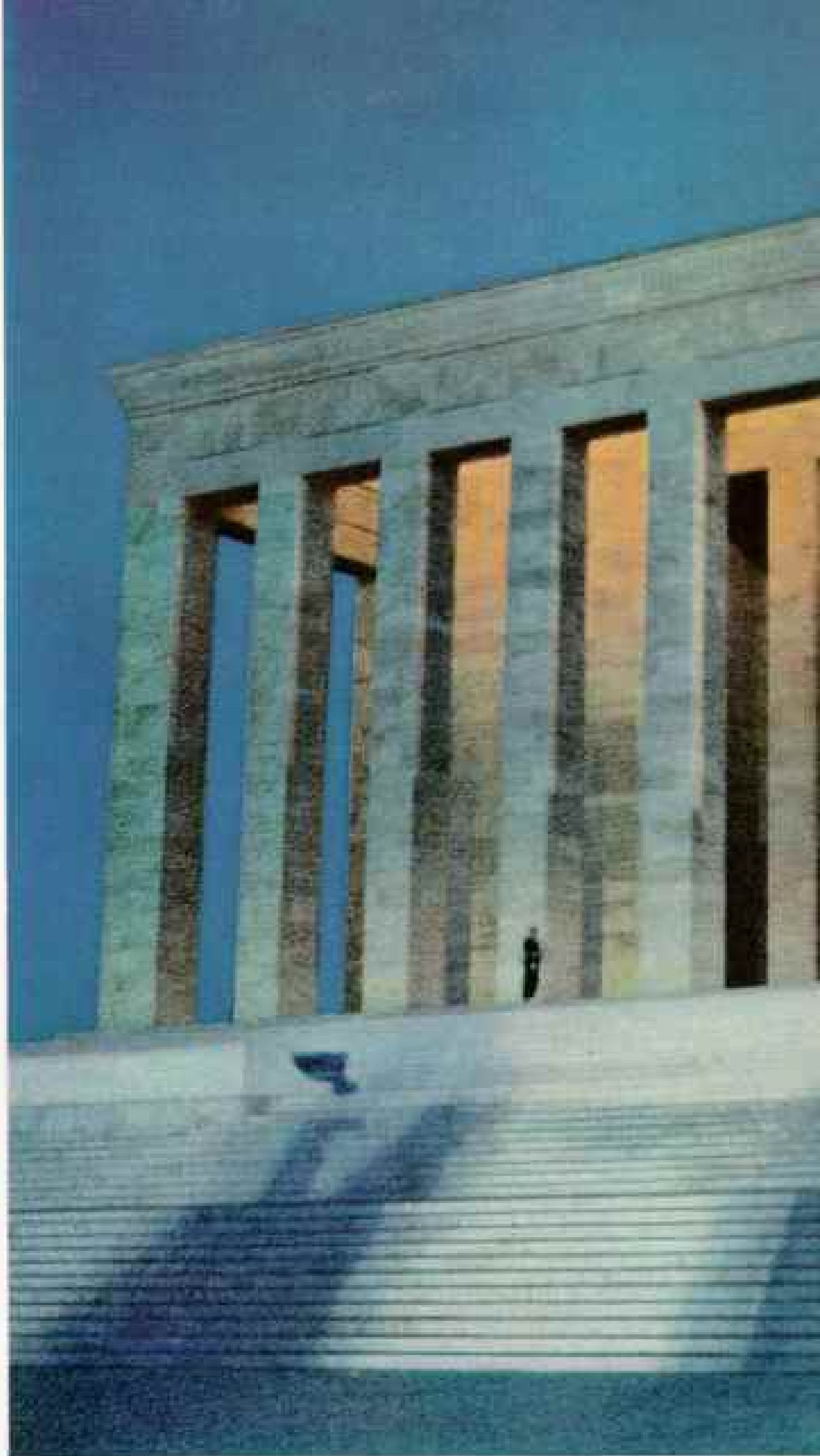
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Dusk falls on Atatürk's tomb

"NOTHING is more sacred to us than this memorial to the great Atatürk," a young Turk told me. "Without him, we'd have no modern Turkey."

After World War I, Kemal Atatürk emerged from the military ranks to establish a republic. He liberated Turkey's veiled women, dis-

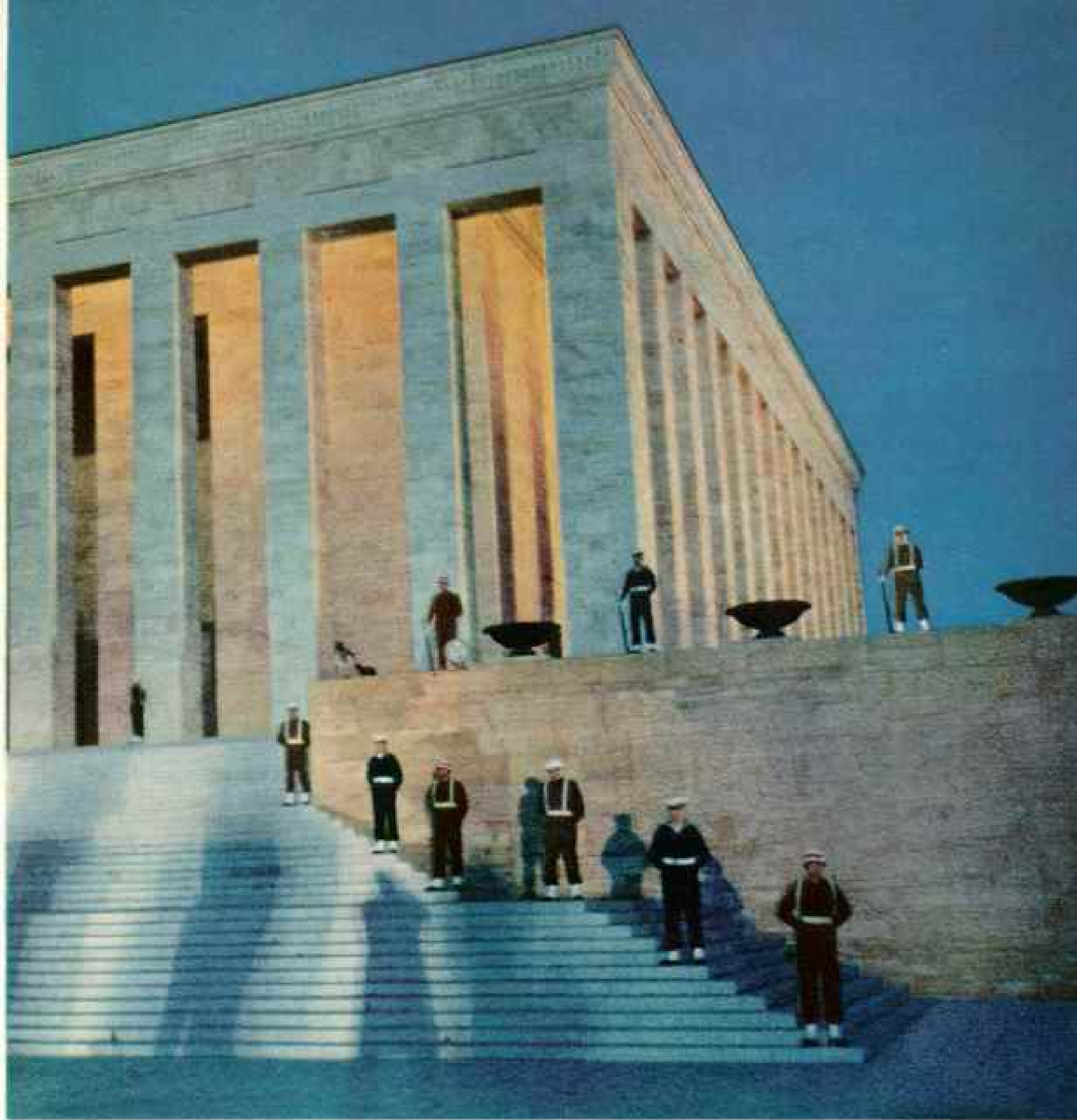


carded the beautiful but cumbersome Arabic script for the more facile Latin, and industrialized his country. Before his death in 1938, Turkey became the envy of all Moslem countries.

This mausoleum would have pleased Atatürk. It was designed and built by Turks with stone from Turkish quarries, and the architecture beautifully reflects his Spartan character. Even the rigid Turkish honor guard complements its columned severity.

Bathed in spotlights at dusk (above), it reminded me of our own Lincoln Memorial in Washington, D. C.

Inside, a bronze wreath (left) is embedded in stone; Turkey's emblem of crescent and star, behind a latticed grill, sets off the brown marble block holding Turkey's Medal of Independence.



ALL THE EXTRUDINGS BY GILBERT W. BOGGS/STAFF, NATIONAL GEOGRAPHIC SOCIETY © N.G.S.



Ankara's lights blaze a greeting

ATATÜRK BOULEVARD was jammed. Cars were blocked solid. Nothing moved. Crowds of Ankara's well-dressed citizens mingled with shawled women clinging to their mustachioed farmer-husbands. Thousands of lights flashed on and off, colorful banners and ribbons fluttered in the night breeze, and floats depicting Turkey's struggle for independence lined the street. I inadvertently jostled a Turk and paused to beg his pardon.

"Quite all right. My name's Galib Sami. Are you with Ike?" he asked. I had another Turkish friend. "Never saw such crowds in

Ankara. Hoping they'll get another glimpse of Ike tonight, I guess," he said.

"You people have done a lot of work preparing for such a short visit," I remarked.

"Yes, that's true," he agreed. "This last week we've done nothing but clean and dress up the city. It rained all yesterday, but we worked until well after midnight getting the banners up."

"But why?" I asked.

"We like being part of the NATO team," he said. "We're the first string—as you'd say in America. We stand between East and West. Without your dollars we'd be on the scrub team. Now we can show Ike how Turkey appreciates your help."

We walked down Atatürk Boulevard. "All of Ankara was out today," he laughed. "I think people were anxious to see if Ike *really* smiled like his pictures."

"And did he?" I naturally asked.

"He was *mükemmel*—perfect."

Everywhere I saw slogans: TURKS ARE YOUR REAL FRIENDS, IKE; ALWAYS HAND IN HAND, IKE; TURKS TRUST IKE. Some were quite candid: PEACE YES, CONCESSIONS NO; OF HONOR AND FREEDOM AT ALL COSTS, NOT PEACE AT ALL COSTS.

I admired Turkey's determination. Her speedy development is geared to meet a yearly population increase of nearly 3 percent among her 27,000,000 people, to raise the standard of living, and to compete with Europe's industrial production. A staggering goal.

Her armed force of half a million—proportionately the largest in the West after France—is wholly committed to NATO strategy. One-third of her national budget is allocated for military defense.

"We are a buffer zone, and we know it," Galib Sami admitted. "If East and West clash, the first battle—and perhaps the last—may be fought on Turkish soil. But as long as your country continues to back us up, we'll play on the first team."

Said President Eisenhower to Turkey's President Celal Bayar that night. "No power on earth, no evil, no threat, can frustrate a people of your spirit."

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Gone are fez and veil, old-time Turkey's attire. Ankara's smartly dressed citizens mingle with their country cousins, shawled women and capped husbands, to see the President drive by. Some have guarded their

curbside observation posts all day; the child at left carries a handy canteen of water. Turkish and 49-starred United States flags were waving as our photographers' truck rumbled past. I took the shot on the fly.



UNIVERSITY

نئی سیریس

RESTAURANT
GULZAR RESTAURANT

Coca-Cola

Karachi: Turbans, veils, and a state carriage

THE TAIL GATE flipped down as our truck lurched forward. Losing my balance, I tumbled out headfirst onto the pavement. Films and lenses rolled down the street. I looked up: Six black horses clattered toward me. Clutching my cameras, I scurried into the gutter just in time to photograph Mr. Eisenhower as his carriage rumbled by (left). This was my introduction to Pakistan.

The President's first moments in this young Asian country, though more dignified, were no less exciting. From his open car he waved to cheering Pathan tribesmen wearing baggy white trousers, long-tailed white shirts, and faded turbans. Had he looked closely, the President could have seen black-veiled Moslem women in purdah—seclusion—peering at him through curtained lattices; these women dress in *burgas*—shapeless, head-to-toe gowns with tiny eyehole slits.

Certainly Mr. Eisenhower saw a unique welcome of bright saris—long scarflike garments of red, blue, green, and yellow—flying from lines strung atop orange-tiled roofs.

He visited Moslem refugees who had come to Pakistan from Hindu India and waved to the skinny, naked little boys, the toothless old women racked with disease, and the barefoot men draped in rags. It is for these people that Pakistan's President Mohammed Ayub Khan is rushing to completion his United States-financed housing development.

In Karachi the two Presidents climbed aboard the state carriage—a scarlet-and-gold-trimmed,

black horse-drawn coach. A horde of Pakistanis jam-packed the streets yelling, "Ike zindabad, Ike zindabad!" (Long live Ike!).

Modern Karachi women waved U.S. flags. Men, clad in pajamalike cotton trousers and Western white shirts, clung to window bars, dangled from high balconies, and shinnied up street-light poles for a better view.

From his goatskin canteen a Pakistani vendor (below) peddled water to thirsty crowds waiting under the scorching sun to cheer the President.

HE STACHURSE (OPPOSITE) AND KODACHROME © R.G.L.







A daring sport of man and horse

TRUMPETS sounded and the crowd hushed. A horse charged at full gallop. The rider, clutching a nine-foot, steel-tipped lance, crouched low in the saddle. For two hundred yards he measured his target, a slim four-inch peg driven into the ground. Another man, much the braver, straddled the peg (above).

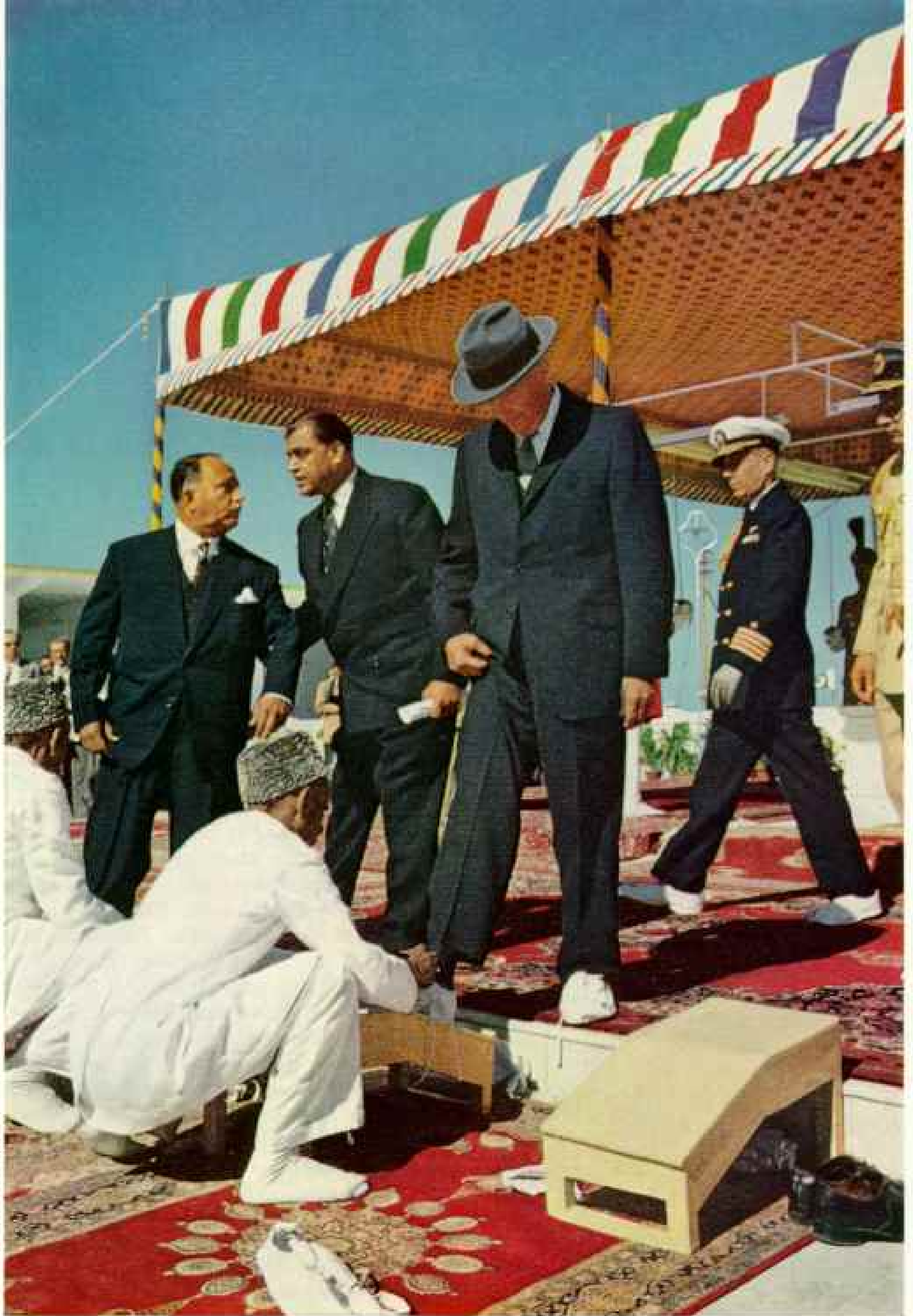
The horse closed at breakneck speed, and the rider dipped his lance, speared the peg, and jerked it from between the brave one's legs even as the horse hurtled past. The rider flourished the lanced peg aloft. The Pakistanis howled with glee as Mr. Eisenhower vigorously applauded this 500-year-old sport of tent pegging.

Next the Pakistan Presidential Guard passed in review. The ranks were straight, the riders rigid, as they paraded in perfect cadence to the accompanying music. Red-and-white pennants lashed to their lances were raised in tribute to Mr. Eisenhower (left).

During his 40-hour stay in Karachi, Mr. Eisenhower collected vivid impressions. A camel wagon slowed him down, and a donkey refused to move, even for the President of the United States. He watched snake charmers piping their flutes to old, tired cobras. He chuckled at newsmen matching wits with nimble-tongued merchants in the bazaar. He admired Karachi's tall modern buildings and wide cluttered streets, but winced at sights and smells of the refugee huts.

Pakistan's young government gives top priority to resettling Moslem refugees from India. In six months they have built 15,000 family units in Korangi, housing 40,000 refugees. For only two dollars a month, the refugee will lease, and eventually own, his own home.





KODAK SAFETY FILM (ABOVE) AND BY BRADYCORNER © N.Y.C.

Even Presidents cover their shoes at Jinnah's tomb

HUNDREDS of Pakistani children squatted along the road, clicking small stones together in a traditional rhythmic welcome to President Eisenhower outside the entrance to the tomb of Mohammed Ali Jinnah, Quaid-i-Azam, or Great Leader, of free Paki-

stan. The attendant (above) trembled so badly when he tried to tie on the cotton shoe covers for Mr. Eisenhower that the President seemed almost ready to bend down and help.

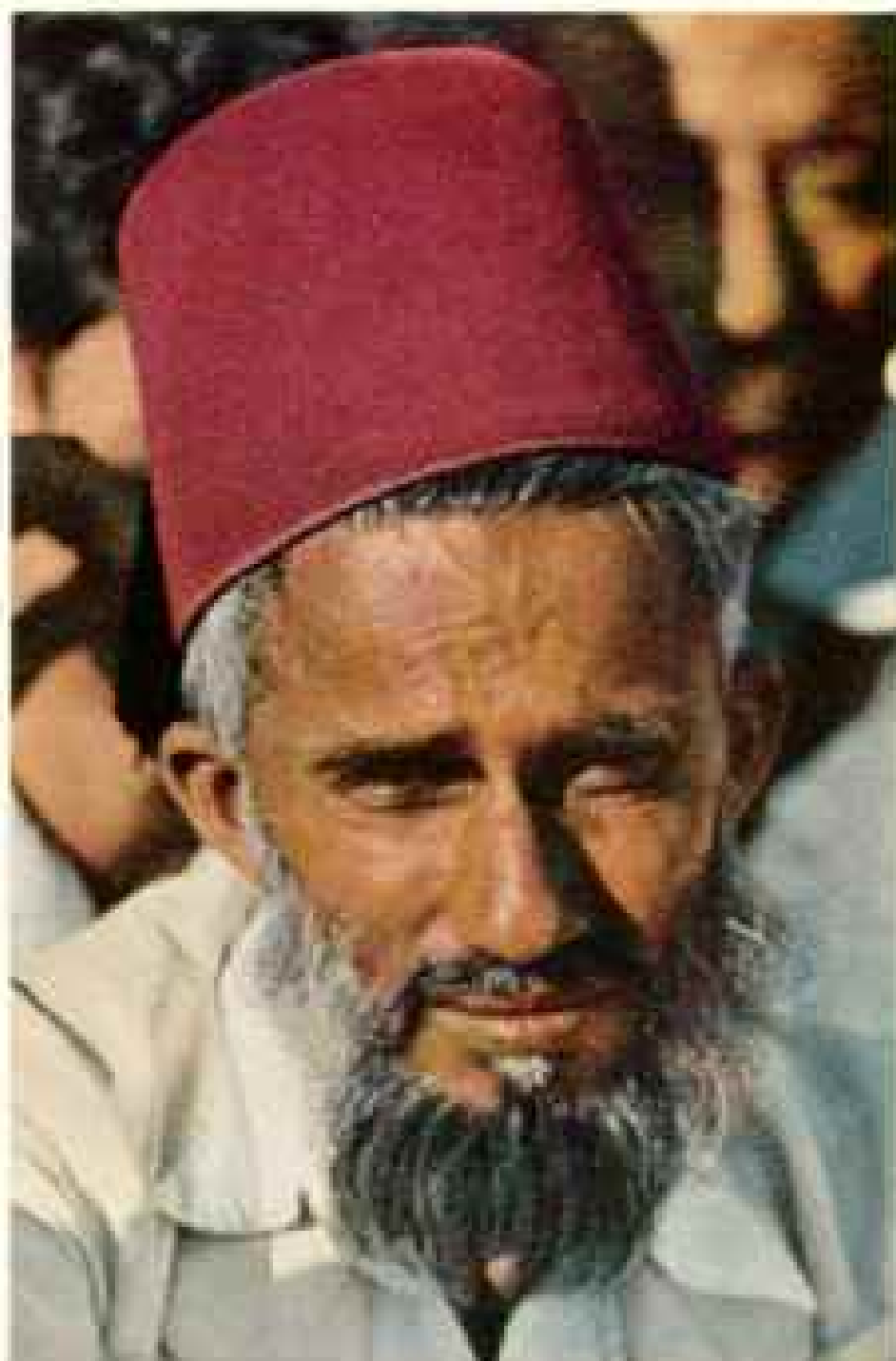
Captain Evan P. Aurand, the President's Naval Aide, crosses behind him.

Gold earrings and chic saris

PAKISTAN'S modern women are well educated and enjoy equal status with men. They join in building a new nation. But they still wear graceful saris and gold jewelry (right and lower left). Older men of Karachi still wear the traditional cap of felt (lower right).

In Karachi, Mr. Eisenhower enthusiastically sampled such Pakistani dishes as *nan*, flat, circular bread; *biryani*, spiced fried rice and small cubes of meat; and *keema*, chopped mutton curry mixed with peas.

All in one day he spoke to U. S. Embassy personnel, held talks with President Ayub Khan, watched the tent pegging (page 607), laid a wreath at the Jinnah memorial (left), saw a cricket match, addressed a welcoming crowd, flew by helicopter over resettlement areas, hosted a dinner for President Ayub Khan, and attended a reception for Pakistani officials.





Kabul: MIG's, men, and mountains

SOVIET-BUILT MIG's piloted by Afghans streaked across blue skies and swooped on a United States jet transport crossing the border. By order of King Mohammed Zahir, they welcomed Mr. Eisenhower to Afghanistan. The President's plane threaded a narrow pass and landed in Kabul, the Afghan capital. Northward, 100 miles beyond the Hindu Kush range, lay Russia; 350 miles northeast, Red China.

Mr. Eisenhower and King Mohammed Zahir inspected tough, confident Afghan troops (above and right). In contrast, shy, native-

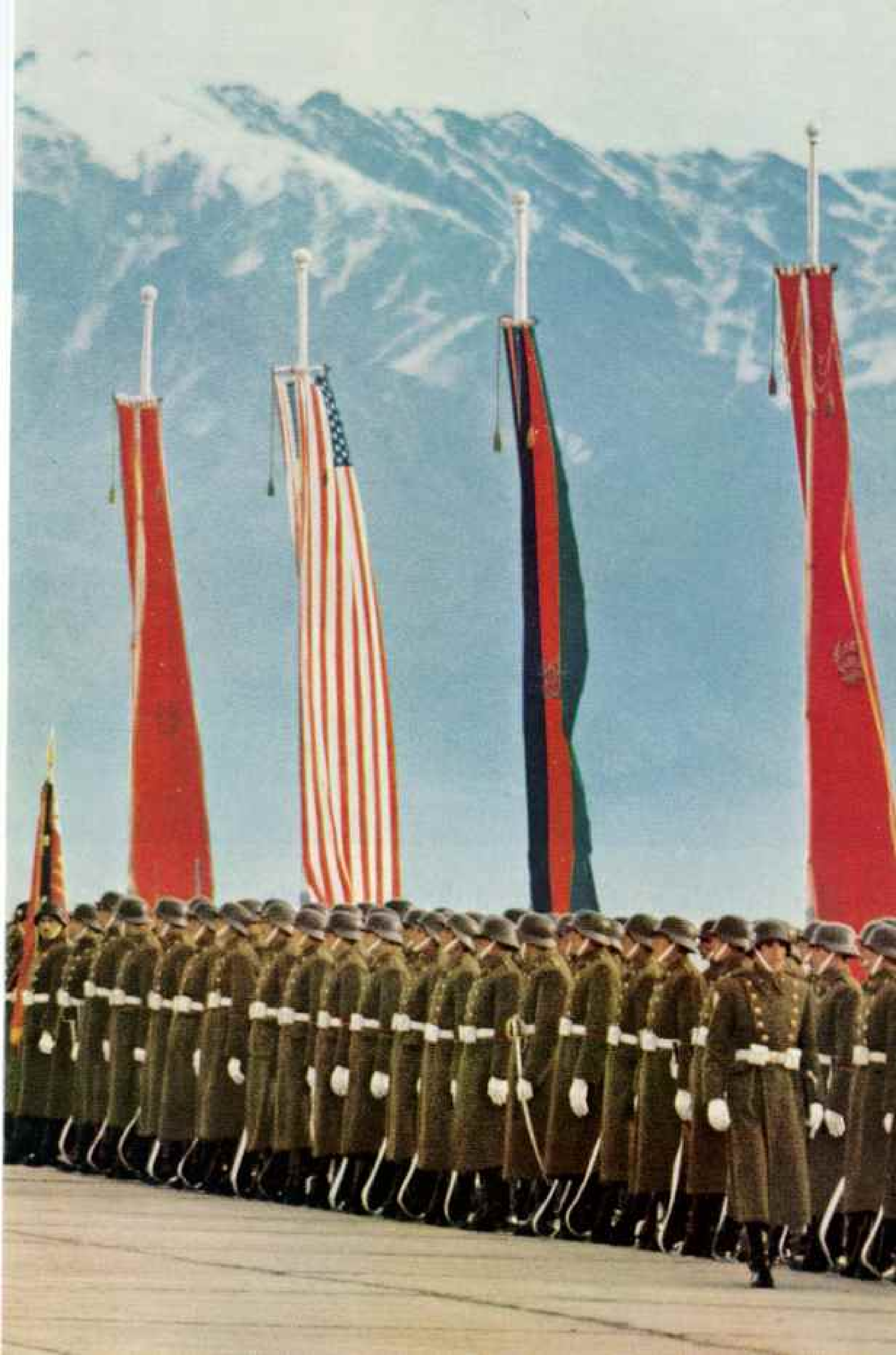
dressed children offered the President flowers (below). We saw few women: They were hidden beneath enveloping *chaderis*.

Communist influence was evident. A paved road, new buildings, and our buses were Soviet-financed or Soviet-made. The buses were miserable. They shimmied, the cramped seats were hard, and the windows jammed. One poorly trained driver fell asleep and swerved into a ditch, another got lost.

Thousands of Afghans tossed government-supplied *serpentin* at the President's car, entangling it in a bright paper cobweb.

HE EXTERIOR (OPPOSITE) AND KODACHROME © H. B. S.







KODACHROME (TOP) BY GILBERT W. SACCHERON, NATIONAL GEOGRAPHIC STAFF © N.G.S.

At India's gate, a jet vaults the Khyber Pass

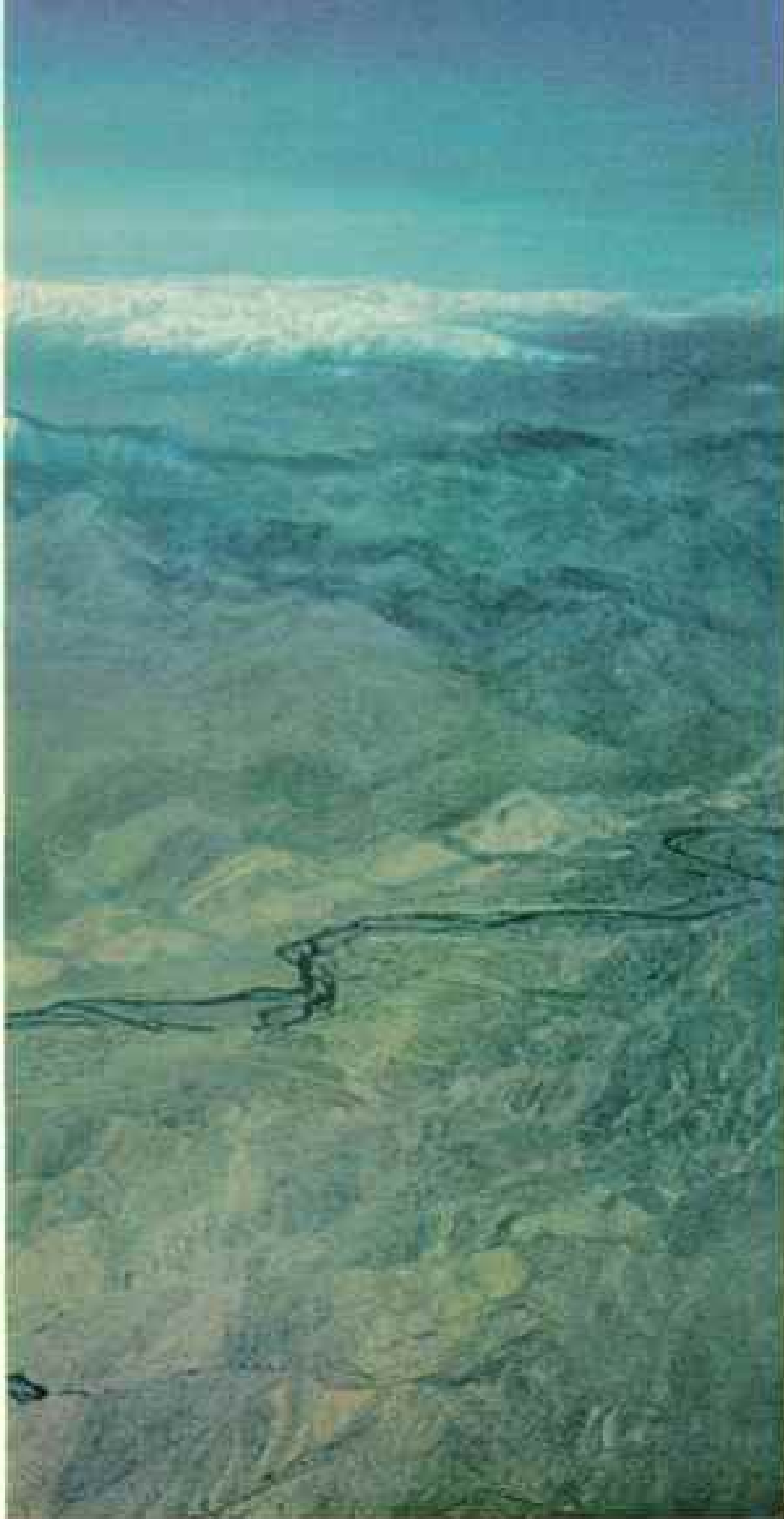
THIS is a vivid reminder that all of us live very close together in this 20th century," Mr. Eisenhower remarked to Afghanistan's King Mohammed Zahir. In less than two hours, he had flown from Karachi to Kabul—730 miles. Outside temperatures dipped 70 degrees as the land soared from sea level to as much as 20,000 feet.

Before the air age, travel in this remote, mountain-crammed country was tortuous. Armies of Alexander the Great, Baber, and, more recently, the British, met fierce resistance by Afghan tribesmen who controlled this strategic gateway to India and who demanded tribute for safe passage. Travelers refusing

to pay were robbed and murdered. Claiming their land unfit to farm or even to pasture goats, the tribesmen profitably "farmed the pass."

Looking down here on the Khyber Pass, I sympathized with Afghans struggling to survive in this naked, arid land of scant rainfall, scorching summers, and freezing winters.

Today both East and West court Afghanistan with aid. The Soviets pour millions into showy military equipment and building projects. The United States finances the Helmand River development, underwrites education, teaches agricultural techniques, and supports medical teams fighting malaria, trachoma, and malnutrition.



Pomp, circumstance— and a million details

A UNITED STATES plane circling Kabul radioed weather data to Karachi. It was perfect jet weather: ceiling unlimited, visibility good, runways ice free.

Off Karachi, a communications relay ship stood by to beam messages to Mr. Eisenhower's airborne jet. In emergencies, he could scan documents three minutes after they left the White House.

In New Delhi, Air Force mechanics unloaded a Lockheed C-130 cargo plane crammed with spare parts. They serviced the President's plane and an identical stand-by jet that evening. A similar team waited in Tehrān.

Aboard our Kabul-bound press plane, Jack Romagna, White House shorthand reporter, received an account of the President's Karachi departure via radio. (We always left before Mr. Eisenhower to cover his arrivals.)

Captain George G. Burkley, a Navy physician, distributed antidysentery tablets. Correspondents who scoffed regretted it later. In 19 days we consumed 2,000 pills.

Short flights were hectic aboard our Pan American 707. Efficient stewardesses quickly served 97 meals before our next landing. We checked cameras, selected film, and carefully scrutinized our arrival instructions. Complicated diagrams showed where we could—or, more often, could not—take pictures. We rarely found time to nap during flights.

Homework and conferences occupy the President during his global flight. At right, he confers with his son, Major John Eisenhower.

We newsmen did not envy the Chief Executive: At each stop he had to deliver a fresh speech, hail a strange king, president, or prime minister, and wave to cheering crowds.

His U. S. Air Force jet has tables, sofa beds, and a galley to assure him a comfortable, functional home.



Delhi: A sea of hands salutes a peaceful sahib

I STOOD ankle deep in flowers; still the crowd pelted our truck with yellow "snowballs" (right). The fragrance of crushed petals underfoot overwhelmed Delhi's usual odor of pungent spices and sweating bullocks. Thousands of camel carts and the trampling of more than a million Indians kicked up thick, stifling dust. I never got used to the taste of grit.

Prime Minister Jawaharlal Nehru had spread the word that "Eisenhower Sahib" was coming, and his people responded. From as far away as 150 miles they came by bus and truck, bullock cart and camelback—even on foot. Few had heard of Eisenhower, but village gossip said that a real maharaja or *badshah* was visiting Delhi. Others heard that "a big American commander is coming to get rid of the Chinese Red Flag People." Villagers were assured that he would "tell Mr. Nehru many secrets about how to do good farming."

Dusk faded to darkness, and still the In-

dians stood placidly in place. Spaced about fifty yards apart, human lampposts balancing kerosene lanterns atop their heads lighted the route through the countryside (lower). Roadside vendors peddled peanuts, bananas, sticky candies, and fried potato cakes.

In time, that undulating sea of humanity lost its patience. Indian police furiously beat their *lathis* (four-foot-long sticks) on the pavement in a futile effort to contain the mob as it inched forward. Billies slashed shinbones, whacked shoulders, and tapped heads before the crowd grudgingly gave ground.

Then they came, the smiling, waving Mr. Eisenhower and the stoic Mr. Nehru. The frenzied Indians surged into the street. Finally in Connaught Place, the very heart of the city, the motorcade was engulfed.

Friendly crowds, shouting hysterically, surrounded the leaders. Greeters shoved forward to touch Mr. Eisenhower or just his automobile. They crushed fenders, stove in the trunk, and snapped off the radio antenna. U.S. and Indian security forces fought off those who tried to clamber aboard. Several security men emerged bloodied and bruised.

The grinning President, using his arm as a shield, deftly fielded the steady stream of flowers hurled at him. With equal skill, Mr. Nehru tossed the yellow marigolds back to his cheering countrymen. The almost fanatic response of the Indians deeply impressed Mr. Eisenhower. He had chosen the perfect moment for his first visit to India: For more than ten years, Indians have tasted freedom and democracy, but now they face grave aggression on their northern frontiers. Domestically, India's hungry masses yearn for a full stomach. They desperately want help from Eisenhower Sahib.

Neither rolling cars nor club-swinging police could disperse the crowd. The terrifying, surging movement of the mob increased. So squeezed together were its members that those who raised their arms to toss a few last petals found they could not lower them. Our truck, too, swayed with the human tide. These people were close to stampeding.

Resolute and unafraid, Mr. Nehru jumped from the open car and waved his arms to disperse his people. The mass slowly parted before him and Mr. Nehru walked straight ahead—untouched. He climbed aboard his jeep, and like magic the street opened. Later Mr. Nehru told me, "This is the largest crowd I've ever seen in Delhi."







Dance and song fill India's presidential mansion

WITH the delicacy of butterflies, the nation's most celebrated artists perform classical and traditional dances of India in the Rashtrapati Bhavan (above).

Mr. Eisenhower dined in the banquet hall. The Indians allowed us to go through a rear palace entrance, around the closely guarded kitchen, and up a dark stairway to the musicians' balcony. Peering down, I saw glittering chandeliers and the long table seating

some 100 guests (page 618). I counted 30 white-turbaned servants resplendent in white pantaloons and gold-trimmed scarlet tunics, with the lions of India emblazoned in gold across the front.

An eye-opening Delhi inspection tour impressed Mr. Eisenhower with India's rapid development. Toasting India's President, Dr. Rajendra Prasad, he said, "All around me I see evidences of India on the march."



Jingling gold coins, bell-like earrings, and heavy anklets tinkle in rhythm during a gypsy dance (above, right). The performer wears multi-colored costume; her hands and feet are painted red. She uses dark eye make-up and a red beauty spot on the forehead (right). Many Indian women have their nostrils pierced for these gold nose screws.







Dinner in state, tea in a garden

AT THE 500-acre Rashtrapati Bhavan, India's presidential estate, Mr. Eisenhower is the honored guest at a state dinner (left).

In the famous Mogul Gardens (above), M. C. Chagla, India's ambassador to the United States, and Mr. Eisenhower are surrounded by scarlet-coated attendants at teatime.

As the President's acting First Lady, Mrs. John Eisenhower (right) was extremely popular. She shopped for saris and silver, watched a snake charmer, rode a cranky elephant, visited hospitals, and talked to school children. The tall, slim housewife, mother of four children of her own, impressed the Indians immensely with her winning smile and enthusiasm.





Tasseled President

Mr. Eisenhower accepts a Doctor of Laws degree at the University of Delhi. Speaking to students and faculty, he emphasized the importance of international student exchange



HE ENTERTAINS BY GILBERT W. ANTHONY, NATIONAL GEOGRAPHIC STAFF © N.G.S.

in promoting world understanding; he urged his audience to undertake such "missions of peace." Much to the President's amusement, Vice President Sarvepalli Radhakrishnan,

Chancellor of the University of Delhi, called the distinguished visitor "our youngest graduate." Prime Minister Nehru sits beside Mr. Eisenhower; both wear academic gowns.



U. S. pavilion: "Food, family, friendship, freedom"

"**H**ERE are four words that are mightier than arms and bombs," President Eisenhower said at the opening of the World Agricultural Fair at Delhi.

It was dusk when the President cut the ribbon opening the \$2,500,000 United States exhibit. Gold-tinted domes (above) recall ancient Mogul architecture. Combined with marble-tiled walls and floors, artificial lakes, and spouting fountains, the U. S. exhibit far outshone its next-door neighbor, where the U.S.S.R. exhibited towering rockets, missiles, and earth-circling sputniks.

Inside, Mr. Eisenhower started a nuclear

reactor that will produce radioisotopes for research, inspected heavy farm equipment, and watched electric milking machines. At the dairy exhibits he confided to Indians that when his "present form of occupation comes to a close," he plans to farm.

He saw chicks hatching in incubators, munched cookies baked in modern kitchens, and sipped soft drinks.

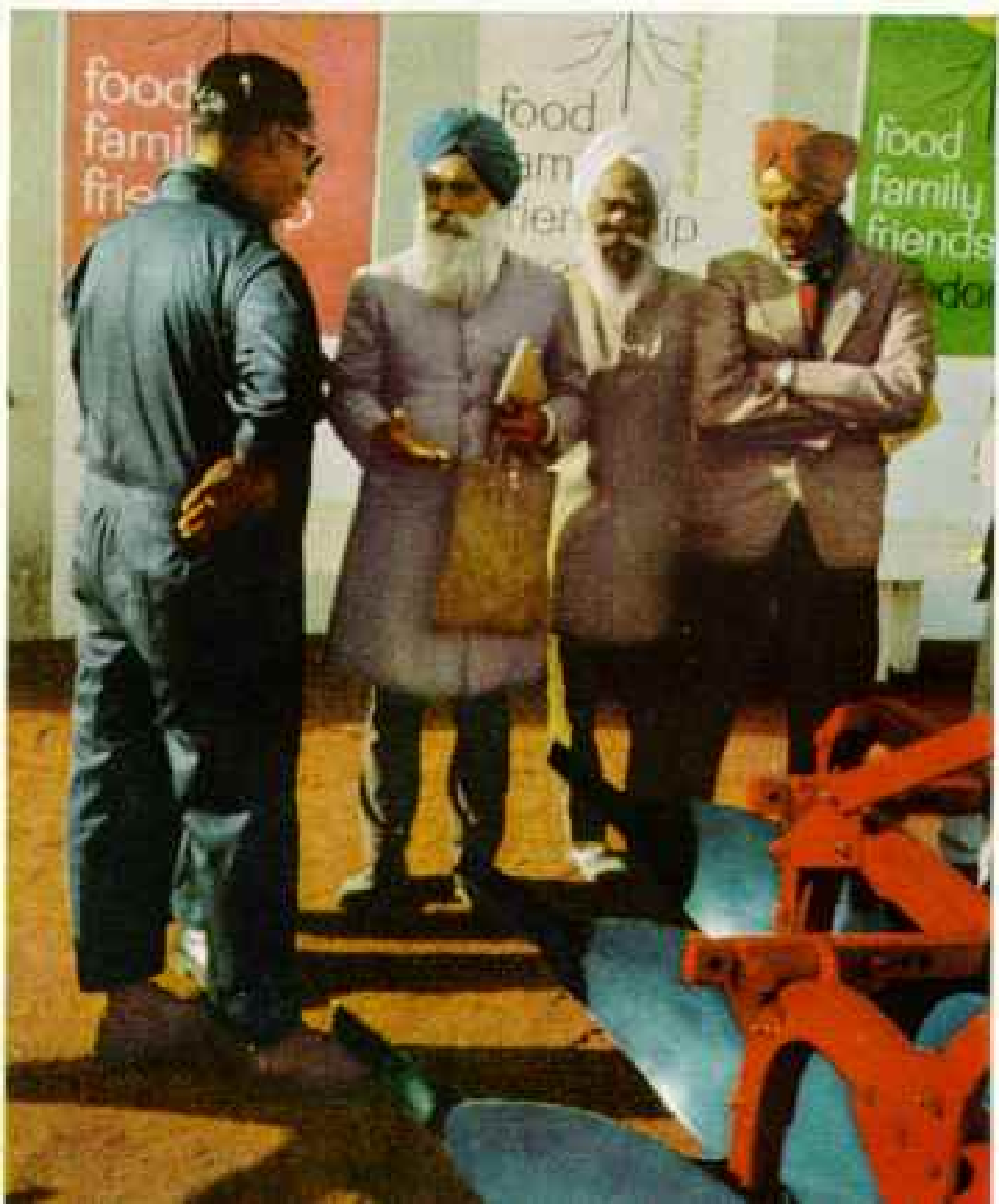
The entire exhibit supported Mr. Eisenhower's claim that "men, right now, possess the knowledge and the resources for a successful world-wide war against hunger—the sort of war that dignifies and exalts human beings."



Naga folk dancers (above) from India's northeast frontier perform at the Agricultural Fair. Annually, they flock to Delhi for the January 26 Republic Day festivals.

Heavy farm machinery (right), a key to India's future agricultural development, attracts curious farmers.

"Farming," Mr. Eisenhower told an Indian audience, "is the chief assurance of better living."





BY STEPHEN JARVIS AND EDITORS OF HERBERT S. WILSON, NATIONAL GEOGRAPHIC STAFF © W.G.C.

Speaking in India's Parliament House, President Eisenhower stressed the need for close Indian-U. S. ties. Above him hangs the late Mahatma Gandhi's portrait. Indian members speaking Oxford English wear jodhpurs and white Gandhi caps. To applaud they slap their hands on desk tops.

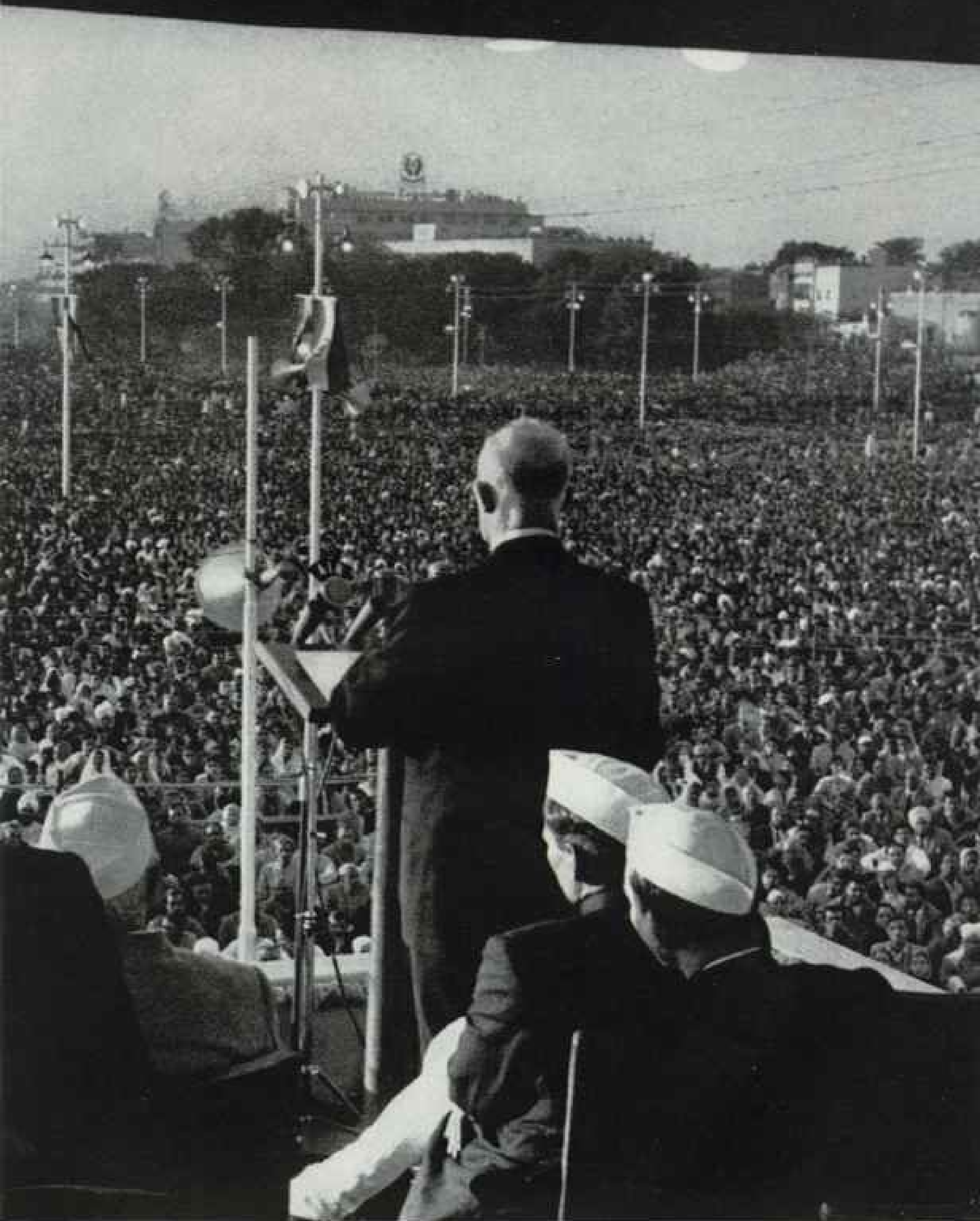
In cosmopolitan New Delhi, a flock ambling through the main streets is a rarity. Building is booming, and camels and cattle have given way to cars, trucks, and bicyclists in beards and turbans. Beyond the flag-lined boulevard rises the stadiumlike Parliament building.





Human flood

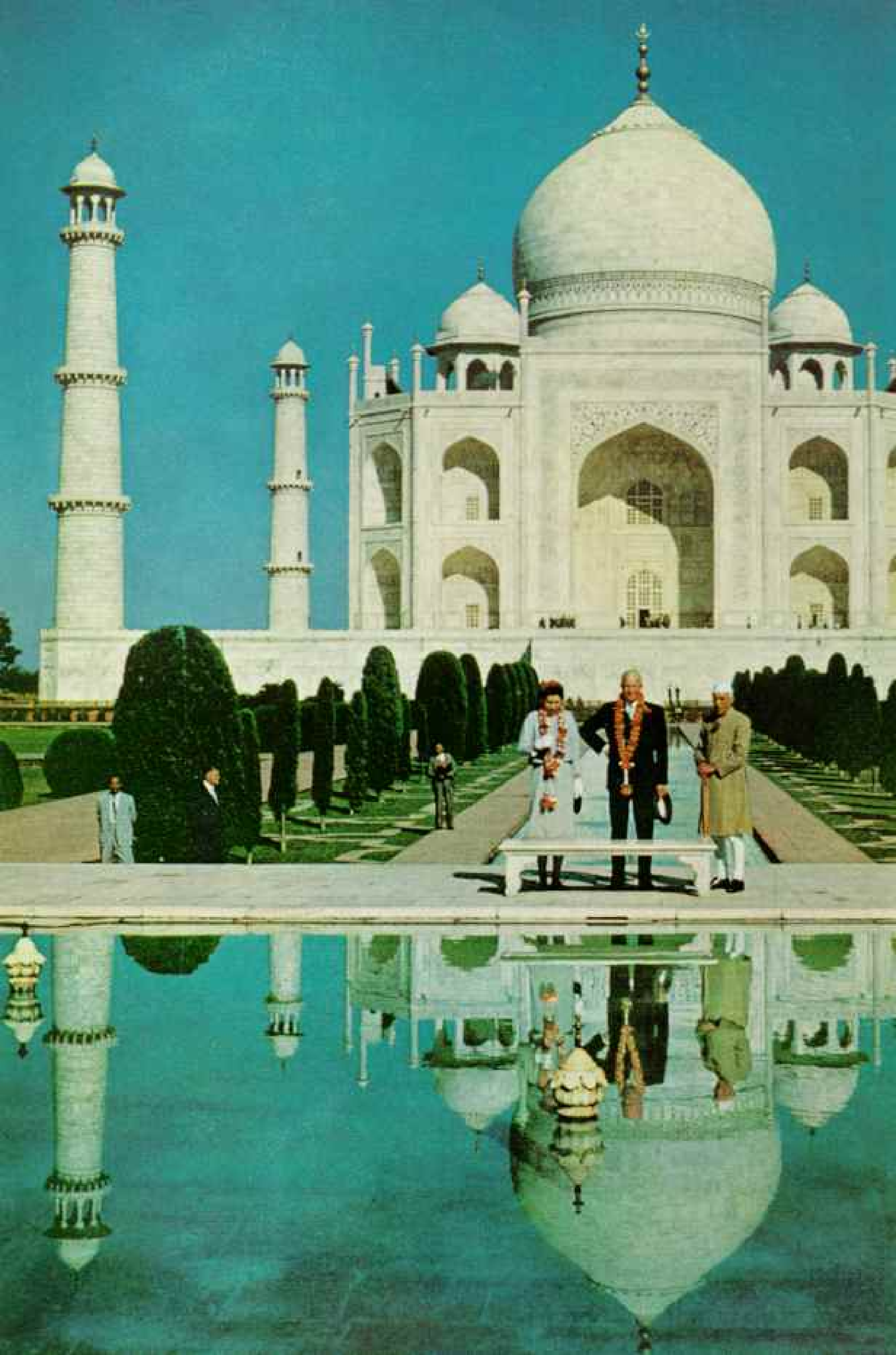
President Eisenhower greets a million Indians in Delhi's Ram Lila Grounds. The vast throng sat patiently for hours in the sun to hear the President assure them that their



HERBERT WILLY / BLACK STAR

starving masses will be fed and India be industrialized. He told them that "as you prosper, the whole Free World will prosper." Not even the saintly Mahatma Gandhi or

Prime Minister Nehru ever attracted such large crowds here. Undoubtedly this is the greatest mass of people President Eisenhower has ever seen in one place at the same time. 627





A boy's dream fulfilled: President sees Taj Mahal

"IT IS more beautiful than I thought it could be," exclaimed Mr. Eisenhower to his guide, Mr. Nehru, at first glimpse of the dazzling white Taj Mahal. Ever since he had read about this marble mausoleum as a Kansas farm boy, the President dreamed of visiting it.

Mr. Nehru gazed reflectively at the minarets. "In my judgment," he observed, "the Taj would have been more beautiful without them."

"Well," said the President tactfully, "it would be pretty hard to quarrel with the architect who built this lovely thing."

Only once did we correspondents disturb the guide and his enthusiastic sightseer. Mrs. John Eisenhower, President Eisenhower, and Mr. Nehru obligingly posed before the Taj Mahal and the reflecting pool (left).

Mr. Nehru told the President the Taj Mahal's history. It was love that drove the Mogul Emperor Shah Jahan to build this massive tomb in the 17th century. Such was his adoration for his wife, Mumtaz-i-Mahal, that when she died he vowed two things: First, he would build her the world's largest, most beautiful mausoleum; second, he would never marry again. Both vows he kept.

The emperor gathered Asia's finest craftsmen, who toiled 22 years, day and night, to finish the tomb.

Like any visitor, President Eisenhower gazed at intricately carved marble screens; marble inlaid with bloodstones; jasper and agate in the form of wreaths, scrolls, or frets.

As always, Mr. Nehru courteously answered Mr. Eisenhower's many questions in detail. I am sure the President grew as fond of this amazing man as we photographers did. Mr. Nehru frequently talked to us informally. At the Parliament House after Mr. Eisenhower ended his visit, the Prime Minister returned to ask if we were comfortable. One day he walked into the press room "just to say hello." If time permitted, he willingly posed for pictures.

At 70, Mr. Nehru is vigorous. He looks young, dressed in his brown *achkan*, or long coat, a red rose in its buttonhole, his *churidar*, or tight white trousers, and white Gandhi cap.

Both Mr. Nehru and Mr. Eisenhower left reporters panting in their wake as they moved briskly through the Taj Mahal, down the cypress-treed walk, past the reflecting pool, and into their waiting car.

Progress, and a President's gift

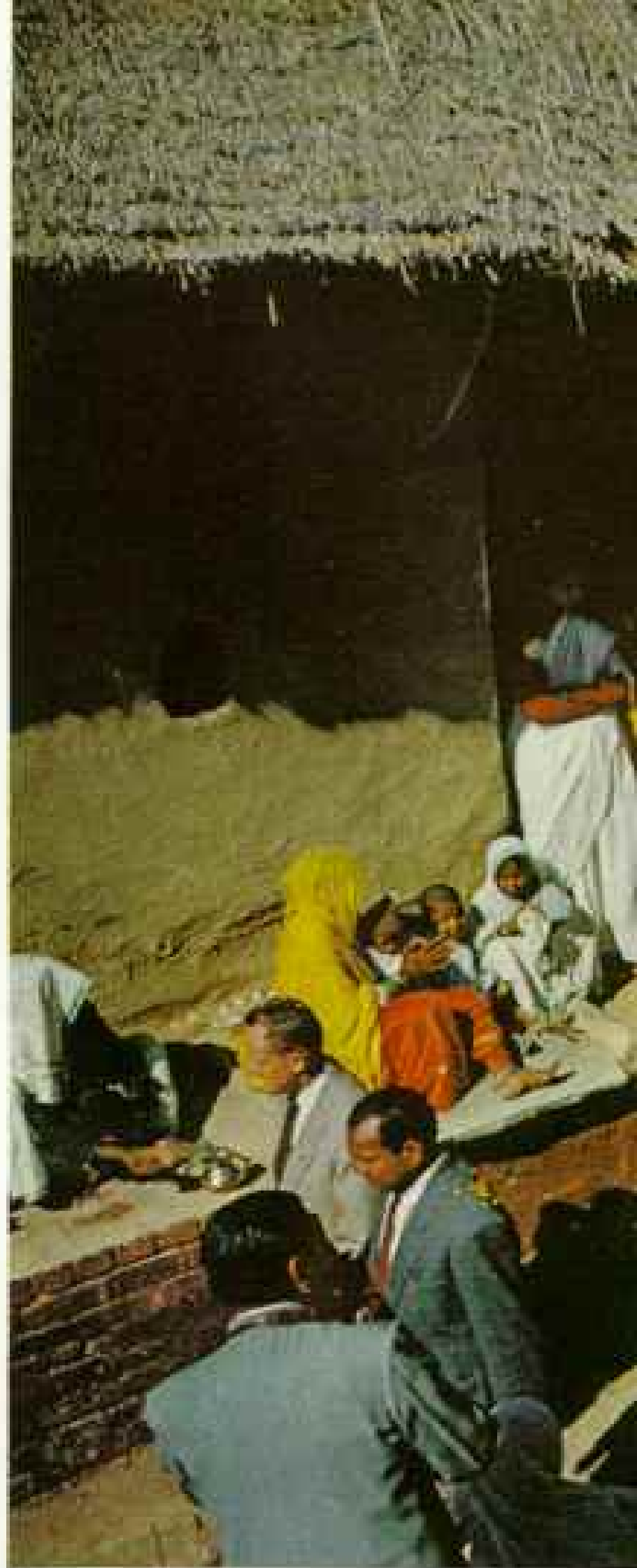
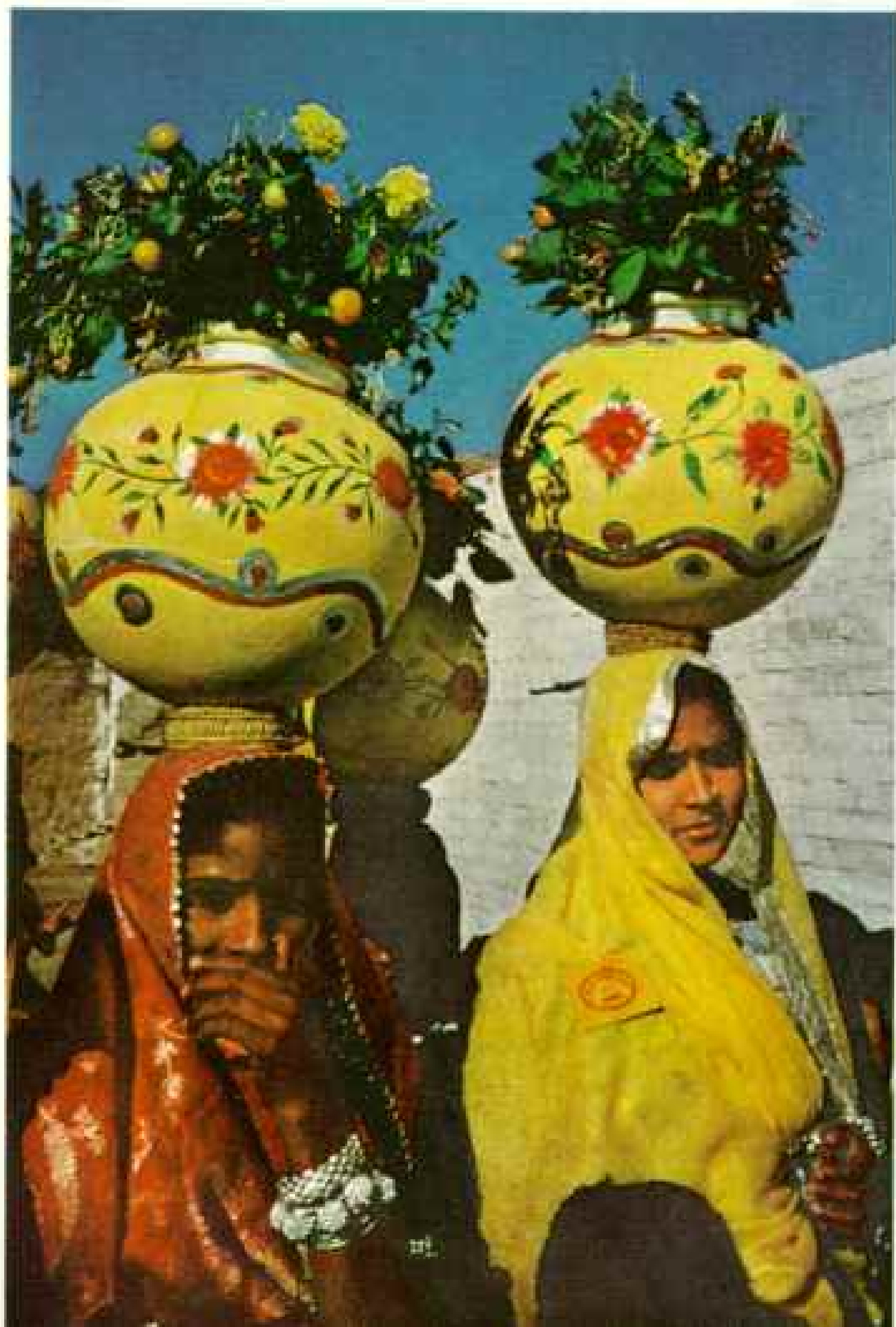
LEAVING the splendor of Taj Mahal, the President drove over Agra's dusty roads. Streets teemed with ragged peasants. Mud hovels dotted the road. Monkeys, peacocks, and water buffalo roamed the countryside. Thousands of parrots shrieked from treetops.

Then he visited Laraonda, once typical of India's half-million slumbering villages but now a model community. Here a development program is under way.

The President entered town on new brick roads free of dust; he passed whitewashed buildings, new schools, and wells. Stepping forward, a woman garlanded him with marigolds and sprinkled him with rose water tossed from mango leaves. Another daubed his forehead with a *tilak*—a vermilion paste mark signifying welcome.

Mr. Eisenhower ducked into the modern home of Mr. Tikam Singh, a village elder. Mr. Singh showed the President how his family lived, and told how farmers have increased their yields four-fold.

When he left Laraonda, the President said he hoped to return. At the Delhi airport he still wore his red *tilak*. But the mark had disappeared when we reached Tehrān.



Vivid saris, silver bracelets, and specially decorated pots containing plants, all borne by these Laraonda villagers, signify a great celebration. Homeowners cleaned and whitewashed their 120 houses for the *mela* (fair). Floral arches and a huge welcoming committee greeted the President.

Mr. Eisenhower was much impressed by Laraonda's progress toward modernization. An antique community radio set seemed to spoil the village's "new look." The President immediately donated 500 rupees (about \$105) for a new one.

It will be years before Laraonda forgets him.



KODAKPHOTO BY HERBERT S. WILSON, NATIONAL GEOGRAPHIC STAFF (LEFT), AND PIERRE STEPHAN © N.G.S.

Tehrān: A royal ride on Persian rugs

OUR press plane left Delhi in darkness. Soon the sun rose behind us, and we raced it to Tehrān at 650 miles an hour.

We reporters had slept only four hours that night, but we stayed awake debating an issue: not the touchy Soviet border, not Afghan military might. Iran's part in CENTO (Central Treaty Organization) was not even mentioned. No, these journalists, the world's highest salaried, discussed only one topic: Would we see the Persian Shah's fiancée, Miss Farah Diba? I was so confident we would that I wagered my last ten rupees with a fellow passenger as we landed in Tehrān.

With a flourish, Shah Mohammad Reza Pahlavi, wearing his bemedaled khaki uniform, arrived at Mehrabad airport as Mr. Eisenhower's jet streaked across Tehrān's sky. Miss Diba was nowhere in sight.

PHOTOGRAPHS BY JESSE LARRAIN, WIREPHOTO



The President's reception was the most military we had so far seen. Soldiers swarmed around the airport and along the route into Tehrān. Overhead, Iranian jets whizzed by, spelling out IKE.

An estimated 750,000 people cheered Mr. Eisenhower's motorcade. He saw welcoming banners such as GREETINGS TO FARMER IKE FROM THE FARMERS OF IRAN. One recalled home: WE MISS MAMIE BUT WELCOME IKE.

Huge U. S. and Iranian flags framed our view of the distant Elburz Mountains; exquisite Persian rugs carpeted the pavement. To our horror, motorcycles and automobiles rolled over them. "Don't worry," an Iranian assured us, "they're good Persian rugs. We often age them this way." He explained that the best hand-woven rugs have more than 500 knots per square inch. Each district has distinctive design, color, and technique.

At the Shah's Marble Palace, I knocked on the gate for the guard. I had drawn the pool for Tehrān, meaning I was one of only two photographers allowed in the royal grounds. My cameras were loaded and ready—in case Miss Diba should pass by.

Jubilant Iranian courtiers told us that in the Shah's study Mr. Eisenhower had congratulated him on his approaching marriage.

In the palace I was shown the dazzling, confusing room of mirrors, a beautiful mosaic dome, and famous paintings.

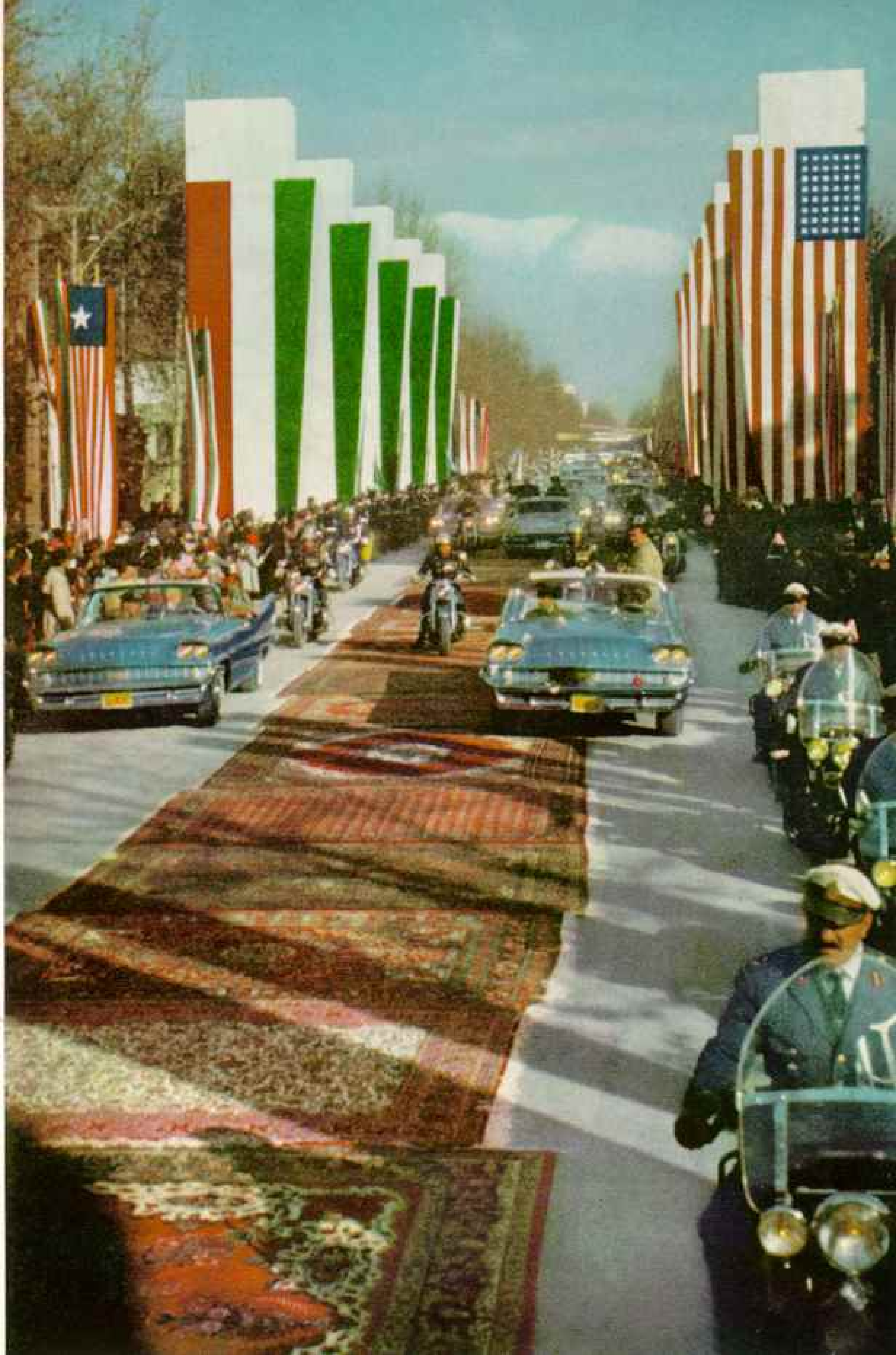
Iran had one thing in common with every country we visited: wet paint. I brushed against it in a palace bathroom. It mattered little because my clothes, smeared with green, white, olive drab, blue, and black, already looked like jungle battle dress.

When the President and Shah lunched on Caspian Sea caviar, grilled steak, and partridge, I departed. There was no time for pictures. Mr. Eisenhower was scheduled to address Parliament after lunch (page 635).

For the President and reporters, the schedule was crowded. Before dawn he bade Mr. Nehru farewell in Delhi, then lunched in Tehrān with the Shah, and now was airborne for Athens and a state dinner with King Paul.

Aboard our Boeing 707, I dozed off. A correspondent jabbed me. "It's about those ten rupees," he reminded me.

"Oh, yes, of course," said I, reaching into my pocket. None of us ever did see Miss Farah Diba, soon to become Queen Farah—but the President did.





IRANIAN PARLIAMENT (ARROW) AND US DELEGATION BY ROBERT W. BROVENSIS, NATIONAL GEOGRAPHIC STAFF © U.S.G.P.

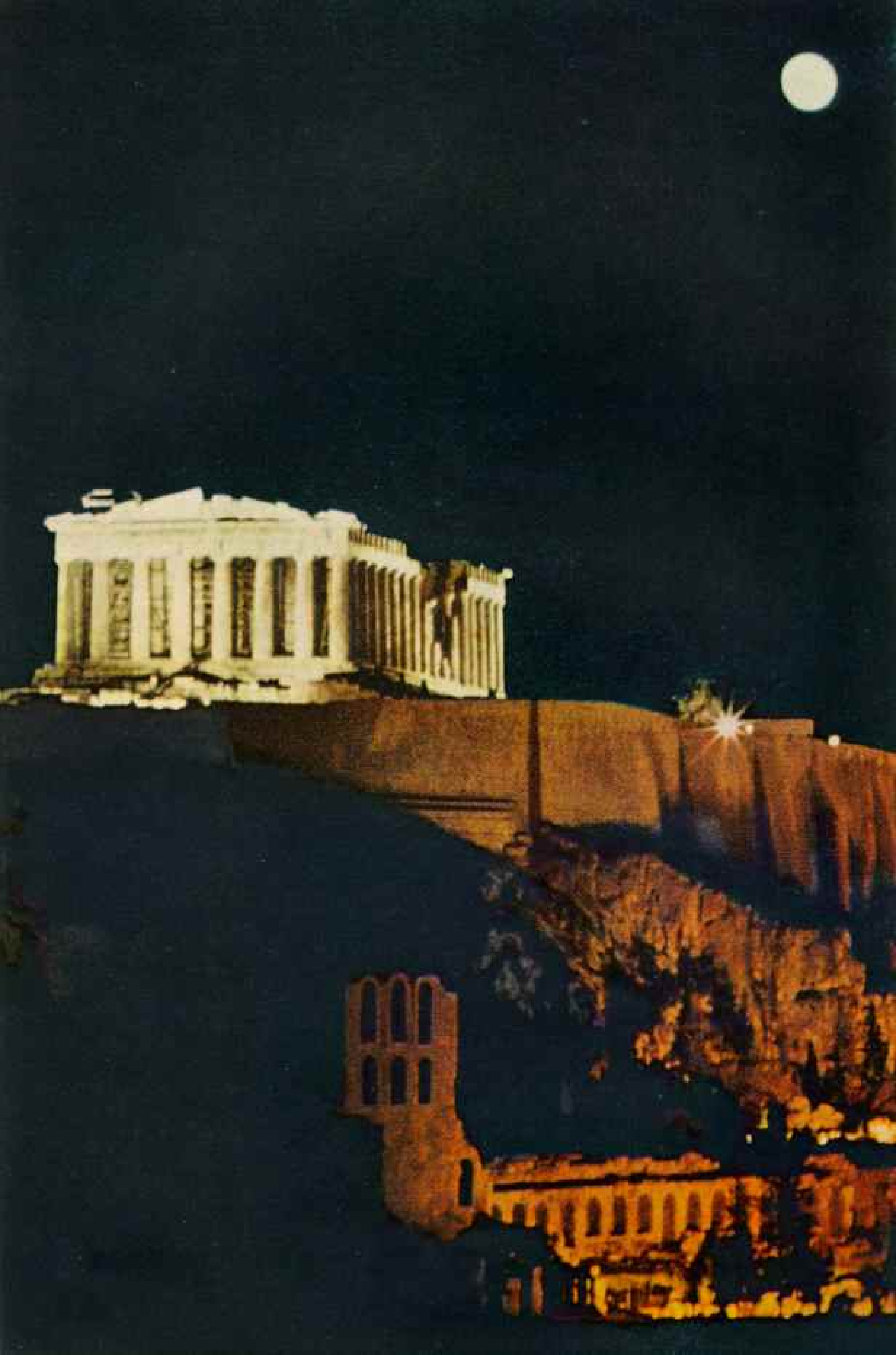
Iranians hear old truths in a new Senate

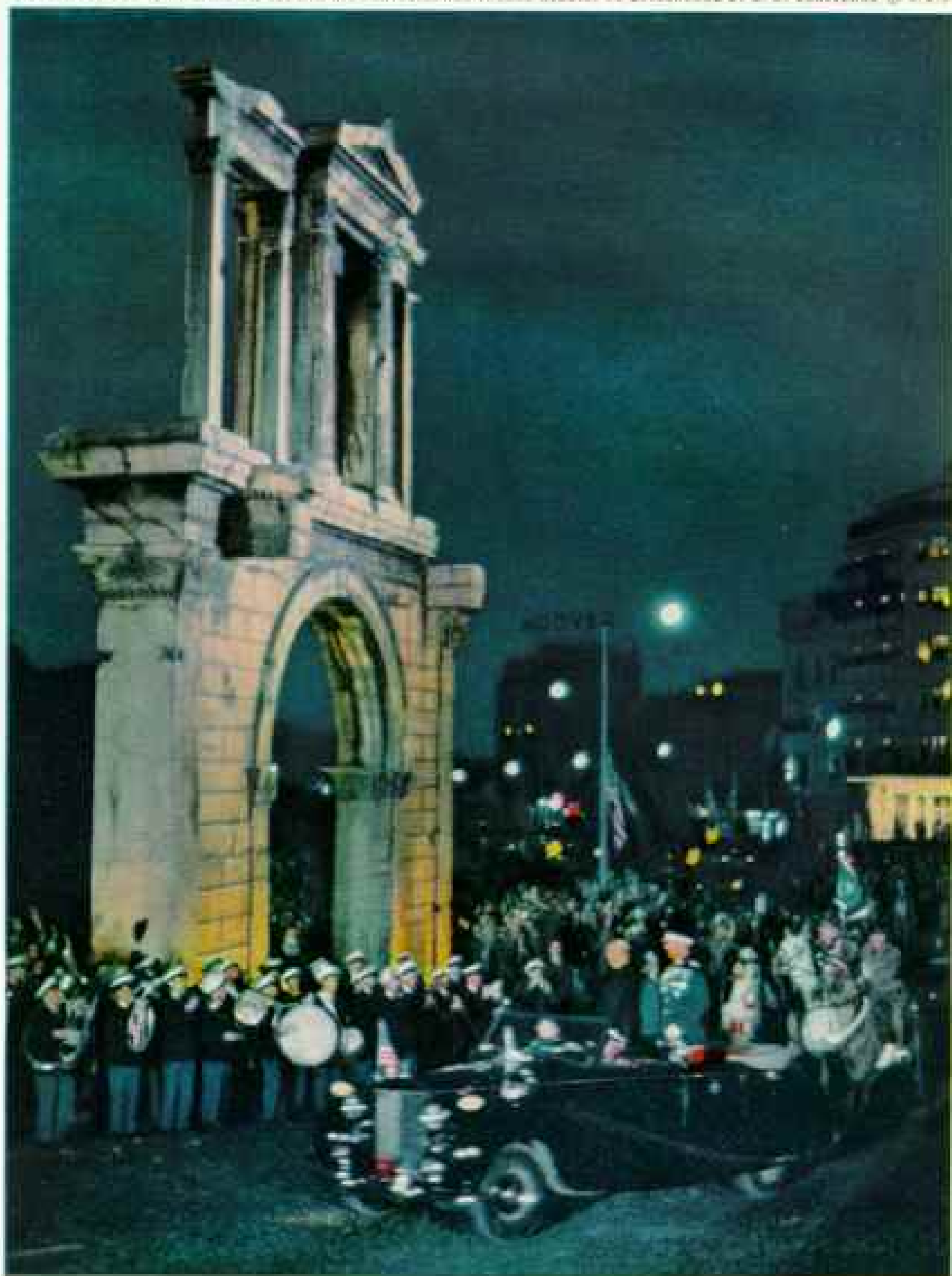
KING DARIUS, greatest of all Persians, would have rejoiced at the words spoken by President Eisenhower, for that monarch brought civilization, law, and order to an empire that stretched from Africa to China.

Said King Darius in the 5th century B.C.,
634 "I love justice, I hate iniquity; it is not my

pleasure that the lower suffer injustice because of the higher." -Mr. Eisenhower (opposite, extreme left), speaking before Iran's Parliament, stressed "a just peace in freedom . . . the impulse toward justice . . . the recognition of the worth and dignity of each and every human being."







Athens: Spotlit glories of Greece

MR. EISENHOWER returned from Asia to Europe on a four-hour Tehrân-to-Athens flight. "I come back to a country that is responsible for much that belongs to Western culture and civilization," he said, before joining Greece's King Paul in his open Rolls-Royce. Half a million flag-waving Greeks cheered from sidewalks and buildings.

From afar, the President saw a famous Athenian landmark, the Parthenon (left), spotlit in his honor. Later he passed the Temple of Olympian Zeus adjoining Hadrian's Arch (above). At the Greek Parliament he laid a wreath on the Tomb of the Unknown Soldier.

A smiling Queen Frederika greeted him at the door of the royal palace. She had ordered 13,000 roses flown in from the Netherlands, and King Paul opened the Herodes Atticus palace gate—a high tribute.

That night the President dined with the Greek royal family. When he bade King Paul and Queen Frederika good night, Mr. Eisenhower closed a twenty-hour day in which he had flown 3,100 miles from Delhi to Athens—spanning the entire empire of Alexander the Great.



EVZONES AND AN EVZONIKOS (OPPOSITE, LOWER) BY NATIONAL GEOGRAPHIC PHOTOGRAPHER THOMAS BEBBA © N.G.S.

Evzones, kilted guards of honor, march to post

“CLICK, CLICK, CLICK” of soldiers’ spiked shoes warns Athenians to make way for the Evzones. The crack guards were standing watch over the royal palace and the Tomb of the Unknown Soldier.

Usually recruited from mountain villages, these tall Greeks must have straight legs and

solid physiques. Their winter uniform includes dark pleated kilts, sometimes containing 40 yards of material, tight white stockings, and red shoes with black pompons. They wear gold-braided jackets with gold buttons and black-tasseled caps. In summer, guards change to cool white kilts.

Huddling under winter coats, Greek children wait for King Paul and Mr. Eisenhower.

Stacked like bricks in a huge tower, sesame-seed rolls are a Greek specialty. But just now the vendor's cry of "*Koulouria*" is stilled; he's watching the procession pass. Many Greeks have their favorite *koulouratzis*. For five cents you choose the roll you want, even if it is wedged at the bottom of the vendor's stack. A good *koulouratzi* can deftly snatch it out without toppling the pile.

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Piraiévs: Salute from a man-of-war

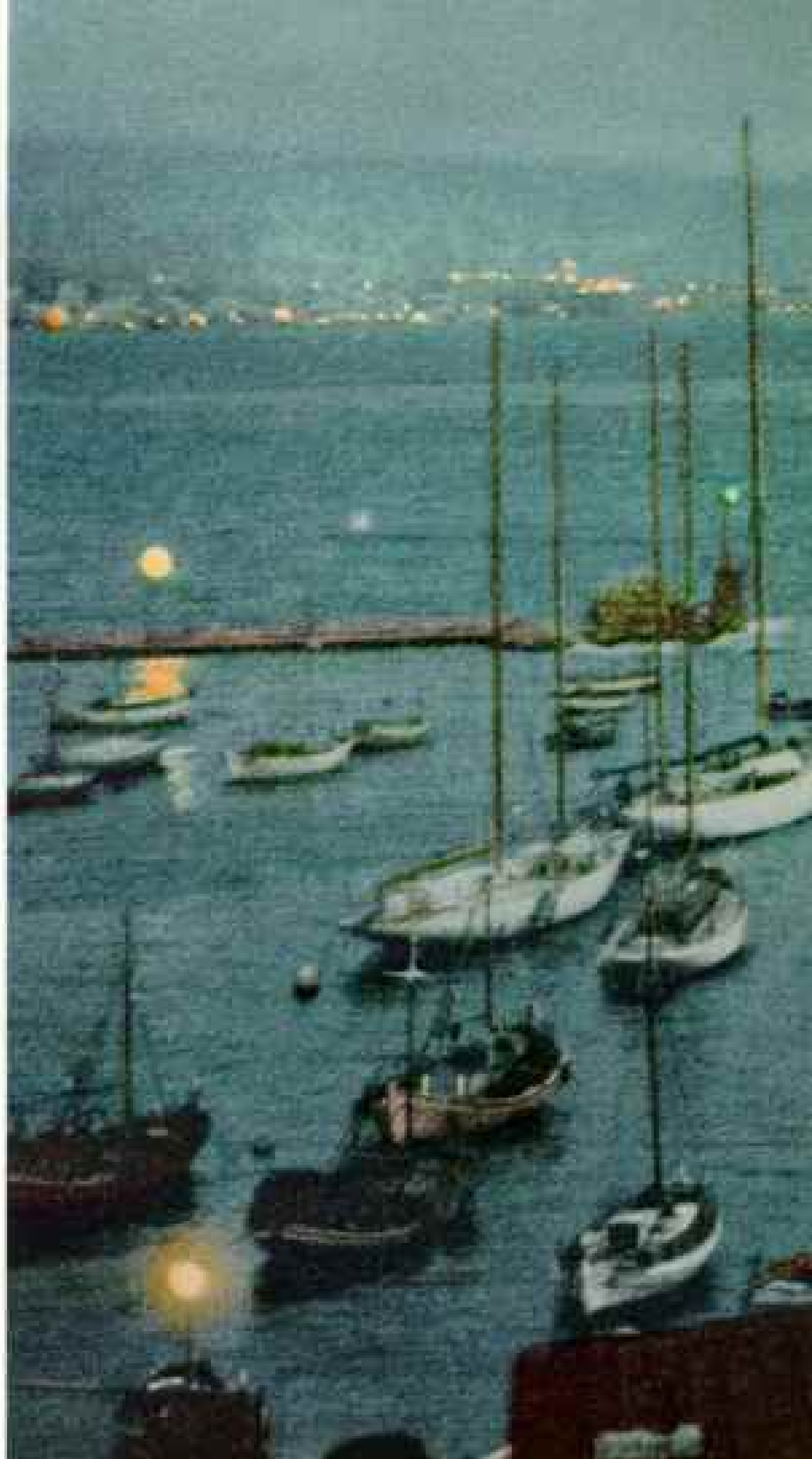
TWO SIX-POUNDERS on the U.S.S. *Des Moines* pivoted shoreward and boomed out a 21-gun salute for Mr. Eisenhower, who hovered overhead in a helicopter. The sound echoed off the Attic hills, and the vibration must have shaken the almighty Zeus himself. Perhaps, I thought, it was not an echo, but Zeus the Thunderer answering the challenge.

When god and sailors had made their peace, the President's whirlybird touched down on the *Des Moines* (extreme right), and the busy man began his well-deserved two-day rest aboard Vice Adm. George W. Anderson, Jr.'s Sixth Fleet flagship. Running escort, the U.S.S. *Essex* (center) carried the press corps.

Before the President's arrival, both ships dropped their hooks off Tourkolimano Harbor, where Greek shipping magnates moor yachts among fishermen's caiques.

These men-of-war roam the nearly million square miles of the Mediterranean, which Emil Ludwig called "the loveliest of all seas, favored by situation, shape, and climate. . . . This is the Helen among oceans; like her it was desired by all that saw it, and captured by the boldest."

The Sixth Fleet boasts many talents. Its





HE EXTRACTORCE BY ALBERT W. GARDNER (OPPOSITE) AND THOMAS BERRY, NATIONAL GEOGRAPHIC STAFF © N.G.S.

vast striking power can wage war hot or cold, atomic or conventional. Said Greece's former Foreign Minister Panayiotis Pipinelis of this deterrent force, "In the powerful gray diplomats of the Sixth Fleet, we see the guarantee of small peoples' independence."

Another fleet mission is frequent Mediterranean port calls. Parties are held aboard for underprivileged children, sports between fleet and local teams are arranged, and sailors worship ashore in churches of their faith.

The Friendly Fleet roves the Mediterranean, ready to assist anyone. When a disastrous earthquake rocked Greece a few years ago, the Sixth rushed to the rescue with doctors, food, and medicines.

Two years ago when a four-year-old boy lay seriously ill on a tiny Greek island, a U. S. destroyer brought him to Rhodes, where a private plane could take him to Athens for treatment. Today he lives.

In Villefranche a fire threatened French

homes. The *Des Moines* dispatched more than 200 well-equipped men to help extinguish the blaze. They saved the homes.

As the huge *Essex* steamed toward Tunis with the *Des Moines* and the *President*, we witnessed a routine rescue. One of the Greek fishermen clustered around us thought our big ship would ram his rowboat. He dived overboard. An *Essex* helicopter plucked him from the sea, and Navy doctors fed him brandy before a second helicopter flew him home.

We continued to Tunis, where Mr. Eisenhower interrupted his rest for a brief visit. The next day he landed at Toulon, France, where he entrained for Paris and the Western Summit talks with French President Charles de Gaulle and British Prime Minister Harold Macmillan (opposite).

Des Moines and *Essex* were again free to prowl the Mediterranean, where the Navy lives by President Theodore Roosevelt's saying: "Speak softly and carry a big stick."



Tunis: A wail of welcome

"YOU-YOU-YOU," shrieked Tunisia's veiled women, waiting for Mr. Eisenhower's helicopter to flutter down. Dressed in white *lehjas*, these statuesque women look like sheeted ghosts (right). Their ululating cry of joy is traditional to North Africa.

We newsmen who helicoptered ashore from the U.S.S. *Essex* tried to imitate their cry. "It's simple," a Tunisian told us, "you just wiggle your tongue back and forth. Like this: you-you-you." Simple for him, impossible for us.

When Tunisian President Habib Bourguiba greeted Mr. Eisenhower, musicians in tennis shoes and red sweat suits with large white V's played their brassy instruments (left). It reminded me of half-time ceremonies at a football game.

The friendly crowds responded vigorously to the two Presidents, whose appearance is strikingly





AGENCY CHROME (OPPOSITE), AP/WIDE WORLD AND RE-ATTACHED BY GILBERT M. BRIDGES © R.A.S.

similar. Both flash winning smiles and exude an almost mystical magnetism with crowds. Tunisians are desperately concerned lest the Algerian conflict spread to Tunisia and threaten their four-year independence. Huge placards warned, NO WORLD PEACE AND SECURITY WITH DEPENDENT PEOPLES.

Mr. Bourguiba, Tunisia's dynamic Moslem leader, was frequently jailed as a young agitator for independence. Twice he was sentenced to die; each time he won reprieve. Aides bend low to listen as the two leaders (left) recall Tunisia's troubled days in World War II.

Madrid: Flags and triumphal arches

IT MAY be true, as Eliza Doolittle says in *My Fair Lady*, that "the rain in Spain stays mainly in the plain." At least the evening Mr. Eisenhower arrived, rain fell in Madrid. But this did not dampen the splendid Spanish fiesta.

Laborers built arches 50 feet high garlanded with greenery and topped with banners, lights, and pictures of Mr. Eisenhower and Generalissimo Franco. From one arch they hung Madrid's arms (right). Four-story-high U. S. flags and color portraits clung to building façades; in all, the hosts distributed more than 260,000 U. S. and Spanish flags.

The Spanish installed a thousand new street lights and huge electric signs that flashed *ESPAÑA SALUDA A IKE* (Spain salutes Ike) and *IKE—*

AMBASSADOR OF PEACE: Office lights spelled out *IKE* in Madrid's 34-story Tower building, which Spaniards boast is among Europe's tallest.

Mr. Eisenhower was the first top Western statesman to visit Spain since Generalissimo Franco assumed power in 1936. A square was named in honor of the guest—Plaza del Presidente Eisenhower. Later, a monument will be raised there.

As usual, President Eisenhower touched the hearts of the people soon after he touched their soil. Said he, "I was born in Texas, where De Vaca traveled and the comrades of De Soto wandered after his death. I was raised in Kansas, which Coronado reached. . . ." Delighted Spanish cheers drowned out the loudspeaker.

In the city Mr. Eisenhower and Generalissimo Franco rode the President's famous bubble-top Lincoln, brought from Washington. Even in the cold drizzle, Mr. Eisenhower stood bareheaded and waved, to the cheers of half a million friendly but subdued Spaniards.

Soldiers held back the crowd on the sidewalks; photographers were not tempted to tangle with these tough troops. When they said remain in the trucks, they meant it.

Mounted lancers leading the procession wore shiny silver helmets, blue-scarlet-and-gold uniforms. Red-and-white capes covered riders and much of the horses.

The schedule was tight: a state dinner, an early breakfast, a short conference with Generalissimo Franco; then off to Morocco.

The Madrileños forgot the departure. Not even the government radio carried the farewell. Instead it carried the annual Christmas lottery, worth millions. Stiff competition, even for Dwight David Eisenhower.





Prensa Grafica



Morocco salutes a war hero

A MUSKET shot rang out, then another—then a barrage. Frenzied security forces were powerless. No one could keep the fabled Berber tribesmen from firing a traditional Moroccan salute with their ancient muzzle-loaders. Horses reared. Donkeys bolted across the plains, dragging wobbly carts. Veiled women wailed the North African greeting, “*you-you-you-you*” and beat tambourines.

Horsemen by the thousands had trekked from the Atlas Mountains to greet President Eisenhower. Some of the mounts were caparisoned with colorful saddles and blankets; riders wore turbans, brown *djellabas*, and ankle-length robes (below, right).

At the outskirts of Casablanca, the royal party rode an open car. The King looked strangely un-Moroccan with his dark glasses. Crown Prince Moulay Hassan sat between the President and King (left).

Half a million Moroccans lined the wide, palm-fringed boulevards of this glistening white city. They remembered General Eisenhower at Casablanca in 1943 when he was routing Hitler's forces from North Africa.

HE SALUTES HIS HERO BY SILBERT M. KRISPERER. NATIONAL GEOGRAPHIC STAFF © N. G. S.

Emanipated women of Morocco (left) drop the veil at will. I sensed their gradual independence in the variety of styles: Some have discarded the covering altogether, some drape it around their chins, while others remain completely hidden.

Their personalities are changing, too. Veil-less women are outgoing and positive, while those clinging to tradition are shy.

Crowds were larger in Delhi, more dignified in Rome; but the Moroccans gave the President his most bizarre greeting.





THE SPARKLERS BY JAMES H. BOYD (AROUND AND J. BAYLEN ROBERTS (OPPOSITE); ROSSIGNOL (CLOCKWISE) BY KATHLEEN REVE © N.S.E.



Home-coming

AFTER a 22-hour day that included breakfast in Madrid and lunch in Casablanca, the President flew into Washington on the night of December 22.

Welcoming him, thousands of Washingtonians in Lafayette Square held aloft a galaxy of giant sparklers. Moments later he entered the floodlit White House (right); the last sparklers (left) died, and an epochal journey became history.

Summing up his three-continent travels in a nationwide radio broadcast—as in his message on page 587—President Eisenhower asserted that the common denominator of the peoples he visited is “their faith that America will help lead the way toward a just peace.”





Globemaster loads ammunition at Elmendorf Air Force Base, Alaska;

Artists Roam the World

By CURTIS E. LEMAY, Vice Chief of Staff, United States Air Force, and Trustee,

THE PAINTINGS PARADE across the walls of the Pentagon. One day my eye may fall upon the lonely grandeur of an Alaskan peak; the next I am transported to the everlasting sun that burns North Africa. Succeeding days bring scenes of Roman times, an Ecuadorian jungle, a Thailand bucket brigade.

I like to look at these paintings. Even though I have piloted our mightiest jets to the far reaches of the globe, still, like other members of the National Geographic Society, I find armchair travel stimulating.

But these compositions of form, color, and light are more than glimpses of faraway places. Each is a moment in the life of the men in



OIL PAINTING BY ALEX ROSS © NATIONAL GEOGRAPHIC SOCIETY

artist Alex Ross captures a guard's lonely duty in zero cold

of the U.S. Air Force

National Geographic Society. *With 24 paintings by noted American illustrators*

your United States Air Force—caught on the canvas of a well-known American artist.

To posterity, these paintings will furnish a priceless pictorial history of our Air Force in a brilliant era. Future Americans, accustomed to split-second travel through measureless space, may find these scenes as antiquated as covered wagons seem today. Yet they

record a chapter in the life of our Air Force as vital as Kitty Hawk.

This month visitors to the Smithsonian Institution in Washington, D. C., may share my pleasure in 150 major paintings, works which outstanding artists have presented to the Air Force as a patriotic gesture.

Following this exhibit, May 8-30, the paint-



Walt Schwab
104 Starfighter

Like a Comet Blazing a Trail of Fire, Starfighter Streaks Through the Heavens

The earth below seems to melt away. With awesome slow motion, mountains dissolve into wrinkles and rivers shrink to spider-web lines. Still the Starfighter climbs, leaping straight up at supersonic speed.

The pilot in the cockpit of Lockheed's 104A, the United States Air Force's highest flying clear-weather fighter, sees little scenery. His eyes range ceaselessly across a panel of instruments, for, as one officer said, "There's no time to correct mistakes."

After living with a squadron for days, artist Woodi Ishmael wrote: "I found the fighter pilot a special, highly perceptive breed of man, with a compulsive drive to see what is on the other side of the mountain. He lives in the spirit of Sir Walter Scott's words, 'One crowded hour of glorious life is worth an age without a name.'"

Adventurer into the unknown, painted by Stan Galli, walks away from a Convair Delta Dagger at Edwards Air Force Base, California.



WATER COLOR (OPPOSITE) BY WOODI ISHMAEL
AND TEMPERA BY STAN GALLI © NATIONAL GEOGRAPHIC SOCIETY

ings will be split into groups and sent on tour. Finally, many will go on permanent display at the United States Air Force Academy in Colorado.*

The artists represented here join others who have documented our Nation's bitterest struggles and greatest triumphs.

Every school child recognizes Tompkins Matteson's famous Revolutionary War painting, "The Spirit of '76," and Emanuel Leutze's equally stirring portrayal, "Washington Crossing the Delaware." Winslow Homer captured phases of the Civil War, Frederic Remington the conquering of the West. Artists in the Spanish American War, World War I, and World War II added their work to the national treasury.

Early in the 1950's, when the Air Force was spreading its bases overseas, it invited members of the Society of Illustrators in New York City to paint a history of the globe-girdling mission. The Society established a committee for the project, led by its president, Robert Geissmann.

Generously giving their time and talent, famous artists—many of them members of the National Academy of Design—toured Africa and Europe, the Far East and the Far North. They traveled by dog sled and sampan, camelback and foot, enduring enervating heat and numbing cold. With our airmen they shared the fearful loneliness of an Arctic winter and the warmth of a Japanese orphans' party. Their vivid canvases capture the drama—and the humanity—of the Air Force in a historic decade.

Portrait of a Nation's Courage

At no time did the Air Force recommend a subject to any artist or suggest how any theme might be handled. Yet all the paintings, though widely varied in style and setting, express one man's feeling on his return: "My impression was one of pride, pride in the knowledge that our country is defended by a vast array of winged might and by men whose courage never falters.

"I am convinced that our people would be greatly heartened could they see and share the spirit of these guardians of our Nation's defenses."

On these pages National Geographic members will find 24 paintings chosen to encompass the widest range of geography and of Air Force missions. Others of equal merit had to be omitted for lack of space.

* See "Where Falcons Wear Air Force Blue," Nathaniel T. Kenney, NATIONAL GEOGRAPHIC, June, 1959.



INTERIOR BY ROBERT FAWCETT © NATIONAL GEOGRAPHIC SOCIETY

Winging Across the Atlantic, a Globemaster Transfers Airmen to Foreign Duty

The engines' steady drone, swelling and fading like the whir of a revolving fan, lulls some men to sleep, others to open-eyed dreams. The restless ones fight boredom with cards, resist oblivion with coffee and cigarettes, escape homesickness with talk.

So it went during the long hours of the flight that transported this fighter-bomber squadron from its base at Lake Charles, Louisiana, to a training field near Aviano, Italy.

Riding the C-124 to gather impressions, artist Robert Fawcett found his companions full of contradictions: "They fly million-dollar aircraft at

nearly supersonic speeds, but get excited over a game of cards in which never more than a dollar seems to be wagered. Their lives are filled with danger, yet they get kicks out of reading adventure comics."

When not carrying personnel, the C-124 can transport two cross-country buses. On this trip the plane hauls 100 passengers, about half its capacity.

Like the berths in a Pullman car, twin floors of the rear upper deck have been drawn up. But the forward deck remains in place; a net protects its riders from a fall.

Air Rescue Observer Searches for the Survivors of a Crash

Honolulu International Airport heard the chartered plane's cry of distress: "One engine gone . . . ditching." Word flashed to Air Rescue Service at Hickam Air Force Base. Minutes later a Douglas SC-54 nosed out over the Pacific with two airmen peering through the Plexiglas for signs of the lost plane. Before long one spoke: "Wreckage below; survivors near by." Rubber rafts tumbled from the plane as its radioman summoned a helicopter from Hickam. Within the hour the chopper fished four living and one dead out of the sea.

Artist Al Buell painted this observer to demonstrate the importance of the individual. "The eyes of one man," he wrote, "can spell the difference between life and death."



Paramedics on practice mission await the signal to jump into a snowbound Alaskan wilderness. Observing them, artist Carl Roberts marveled at their courage: "They were deadly intent on learning the job, knowing that upon their skill hung survival, not only for themselves but for those they would some day be sent to save."





Planes on the Flight Line Endure a Hurricane's Lash

When Hurricane Audrey boiled up from the Caribbean in 1957, the commander of Eglin Air Force Base, Florida, faced a hard decision. Should he spend thousands of dollars to fly his aircraft to safety, or could they ride out the storm? When Audrey veered west, he ordered planes tied down and weighted with sandbags.

Artist Walter D. Richards, an Eglin visitor, tells the story. "We caught only the fringe of the storm, but its power proved dramatic and humbling. Sleek aircraft capable of supersonic speeds shuddered under the sting of rain and whip of wind." His painting shows an F-102 (left), an F-86 (center), and three F-100's.

A B-52 commander briefs his crew before a test flight at Eglin. Wearing high-altitude pressure suits, the men prepare to put on parachutes, Mae West jackets, and helmets.

Artist Ishmael found inspiration in "the faith each man had in his teammates. Six men worked as parts of one body." After thorough testing, the \$8,000,000 aircraft joined the Strategic Air Command.

WATER COLORS BY WALTER D. RICHARDS (UPPER)
AND ISHMAEL (LOWER) © NATIONAL GEOGRAPHIC SOCIETY



*Ishmael
The Flight Briefing - Fall 1957
Eglin AFB, Fla.*



*Hurricane Audrey
CAMP A.F. 0440
Walter D. Richards*





George Sargent



A DEW Line Outpost Scans a Sky Spangled by Northern Lights

Flying north to Point Barrow, Alaska, artist George Samerjan looked down on the Brooks Range and found its peaks terrifyingly ragged. Beyond them the vast, flat tundra seemed peaceful in contrast. But Mr. Samerjan soon discovered it was the peace of isolation and emptiness, of night as long as winter.

In the days that followed, Samerjan lived with a lone Air Force officer and the civilians who manned this pivot station of a 3,000-mile Canadian-Alaskan radar fence, the Distant Early Warning Line. With them he spent long hours watching the radarscopes for blips that could mean the approach of enemy planes. And, like his hosts, he relaxed with motion pictures, books, music, and tramps across the snow.

Even so, the artist easily recognized the enemy—loneliness. "The gallant fight these men make against it inspired my painting," he writes.

Samerjan pictures the aurora borealis glowing above. Snowdrifts wash like waves against the long, low buildings where the men live and work. Plastic dome protects the rotating surveillance radar. Central tower with its aircraft beacon holds speakerlike antennas to catch radar blips from low altitudes. Four parabolic antennas close to ground communicate with other DEW Line stations.

Sun Breaks a Winter of Darkness; Spring Arrives at Thule, Greenland

Incoming pilots of the 74th Fighter Squadron like to home on old Dundas, the massive flat-topped mountain that serves as a clear-weather guide to their base. Eskimos call Dundas *Umaniq*, meaning "heart-shaped mountain."

In painting a distant view of the northernmost United States airfield, artist John Pike endeavored "to show a little of the fabulous engineering accomplishment of our country in building a 6,000-man city within a stone's throw of the North Pole." To record his impressions, Mr. Pike made pencil sketches of the terrain in 42°-below-zero weather.

Here, in March, icebergs lie in a frozen sea like boulders strewn across a glacial moraine. The midday sun is so low and wan that floodlights still pick out runways at left and piers and warehouses at right.

Hot air pours into a T-33 to warm the oil for instant starting; a tractor pulls an F-89 onto Thule's flight line. Diesel shovel crane at left dumps snow into a truck.

Impressed by the fact that "man seems puny in the Arctic wastes," artist Kenneth S. Fagg sought "to convey the undaunted spirit of the men of the Air Force as they work at a remote outpost under adverse conditions."





OIL BY JOHN PIER JACQUE AND WATER BY PENNYN S. TRAE © NATIONAL GEOGRAPHIC SOCIETY



The Air Force Holds Open House; Arabs Visit Wheelus Base at Tripoli

For more than a decade citizens of Libya watched the planes cross the sky like migratory birds. Silver wings moved in mystery to and from Wheelus AFB, a gunnery practice field and major stop for MATS planes.

Then, on Armed Forces Day, 1955, the gates of Wheelus swung open, and for the first time Arabs had a chance to see—on the ground—the tenants of their skies. Visitors by the thousands wandered in awe among planes, hangars, barracks, and shops.

These men in flowing burnouses approach a C-119, a transport for troops and cargo.

"The Air Force carries modern technology to the corners of the earth," says artist Robert T. Handville. "I designed my painting to show the contrast between an age-old culture and the American present."

Roman Ruins Along the Appian Way Echo the Roar of Jet Fighters

F-84's from Ciampino airfield near Rome flash across the Italian sky. Below them, gaunt remnants of a 2,000-year-old aqueduct and a farm family plowing with a yoke of oxen form a pastoral setting little changed since the Middle Ages.

These are Italian Air Force planes flown by Italian pilots, who were trained by U. S. airmen at Craig Air Force Base near Selma, Alabama. After winning their wings, the graduate cadets checked out in F-84 instrumentation. Finally they took to the air over their own land.

Artist George C. Bales, a lieutenant colonel in the Air Force and director of its art program, titles his painting, "Ancient, Medieval, and Modern."

"Jets, oxen, aqueducts," Colonel Bales muses, "under the same summer sky. Paul the Apostle walked the Appian Way and saw these same aqueducts supplying Rome."





TOP BY ROBERT F. VANDAVILLE (OPPOSITE), AND BOTTOM BY CARL SETTERBERG © R. G. S.

Jet pilots duel over a chessboard in the ready room at Hamilton Air Force Base, California. Flight jackets show they are alert for action. The blare of the scramble speaker will send the players racing for the door. Within minutes their jets can clear the runway to intercept a target.

"Time and again," says artist Carl Setterberg. "I saw these men make practice runs. In the mid-1950's their alert was the prime continental defense against enemy aircraft. That's why I call my painting 'Complicated Moves.'"



Survivors of a Crash Hail a Helicopter of the Air Rescue Service

Stationed at Albrook Air Force Base in the Panama Canal Zone, the men of the First Air Rescue Group answered cries for help from half of Latin America during the early 1950's.

When a snake bit a Panamanian child, an ARS helicopter whirled a doctor to her village to treat her.

Braving treacherous air currents in the Guatemala mountains, an Albrook helicopter landed on a ridge to bring out the sole living passenger of a downed airliner.

News that Auca Indians had slain five American missionaries in Ecuador sent an ARS team speeding to the scene.

After an explosion in the boiler of a ship off the coast of Nicaragua, an amphibian landed in high seas to take off the injured chief engineer.

During a three-week visit to South America in 1956, artist John Pike heard these stories and many more. In depicting an ARS SH-19 rescuing the victims of a civilian plane crash in an Ecuadorian jungle, he endeavored to illustrate the "fine gestures of friendship shown by the Air Force toward people in distress the world over."

Mr. Pike feels the painting exemplifies the code of the air rescueman: "It is my duty . . . to save life and to aid the injured. I will be prepared at all times to perform my assigned duties quickly and efficiently, placing these duties before personal desires and comforts. These things I do that others may live."





JOHN
PICKER

Bamboo Hood of an Oxcart Frames the Tail of a C-97 at Delhi, India

Each week a silvery symbol of the United States drops down out of the skies and rolls across the runway at Palam Field, Delhi. Carrying passengers, cargo, and Government mail as a part of the Military Air Transport Service, the airplane pauses a few hours. Soon it soars aloft again, continuing the "embassy run" that connects Honolulu, Manila, Saigon, Bangkok, Delhi, Karachi, and Dhahran.

On one such stopover in 1956, Thornton Uta stepped from the door of a Boeing Stratocruiser and stared into the face of timeless India.

"I was struck by the contrast between the oxcart and the Stratocruiser," writes the artist. "The one, a crude holdover from millenniums past; the other, the last word in speed, safety, and comfort. The painting represents my hope that India will not turn her back on the free world, as these Indians have averted their faces from its symbol."



Word came during the morning hours of July 15, 1958: The President of the United States had ordered armed forces to Lebanon to protect American lives and support the beleaguered government of President Chamoun. Men scattered across half the globe began to move in a studied pattern, converging on the small, troubled nation.

Artist John Moodie was in Spain when the crisis broke. Fourteen days later he jumped out of a jeep on a beachhead near Beirut, Lebanon.



WATER COLOR BY JOHN MOODIE (LEFT) AND OIL BY THORNTON COE © NATIONAL GEOGRAPHIC SOCIETY

"I set up my easel at this spot in a dusty olive grove beside the Beirut airport because the view told a complete story: the Army and Marines ashore, the Air Force on the field, the Navy on the horizon—all working in common cause.

"The guard at left challenged me in rather colorful language," Mt. Moodie recalls. "I must have looked strange, wearing sports shirt and sneakers and carrying my box of paints. Since clearance from headquarters was verbal, the guard

stuck a rifle in my back and marched me off to his commanding officer."

Again receiving permission to paint, the artist set to work. The sentry then accommodatingly posed near an Army water truck and a soldier washing out his mess kit.

Tanks and jeeps cluster about the deep-bellied C-130 that ferried equipment in. Cargo-carrying Globemasters line the runway; ships of the Sixth Fleet lie at anchor offshore.



**Japanese Geisha and Apprentices Dance a Welcome
to Men Returning From Combat in Korea**

Night after night, for weeks that stretched into months, B-26 crews took off into the darkness. As night intruders, the attack-bombers sortied singly and in pairs. They prowled North Korean highways and railroads, zoomed down on Communist airfields and supply depots, and zeroed in on shipping centers and power plants.

After 15 or 20 missions, the hunters' eyes grew catlike in detecting their prey. Flickering sparks from a train's firebox, a truck momentarily silhouetted against a mountain horizon, a dark blotch on the face of a moon-white river—all gave proof of the enemy. Diving, B-26's loosed bombs and spurted machine-gun fire.

With the end of war, the Third Wing pulled back to Johnson Air Force Base in Japan. Artist Mario Cooper portrays its reception. "Stepping with small, gentle movements," he recalls, "the dancers gave these battle-weary veterans a new insight into the world of grace and beauty."



ILL. BY MARIO COOPER

Thai Women, Jogging in Intense Heat, Haul Concrete for an Airport Near Bangkok

The scene at Don Muang Airfield calls to mind the days of World War II when war planes crossed the skies over Southeast Asia. Thousands of patient Chinese, Burmese, and Indians carved by hand the airfields needed by their Allied defenders. Swarming like ants, men cut trees and slashed underbrush. Women, balancing bucket-loads across shoulders, carried rock by the ton.

Visiting Thailand in 1957, artist James Bama found that nation staunchly allied with the United States. The Air Force trained Thai pilots and mechanics, and the construction of the Don Muang Airfield went forward with the help of United States funds.

In Mr. Bama's painting, four F-84G's given through military assistance to the Thailand Air Force await refueling on a completed runway.

"But Asia changes slowly," writes the artist. "These women in their dyed dresses and lampshade hats, endlessly plodding across runway and catwalk, work in temperatures that American men could scarcely stand. The sight of age-old building methods and modern air power harnessed together for peace inspired my painting."



ILL. BY JAMES BAMA © NATIONAL GEOGRAPHIC SOCIETY



**Japanese Love Affair:
Eight Orphans, One Airman**

Since World War II, members of the United States Air Force in Japan have voluntarily contributed more than \$400,000,000 to the support of orphanages, old people's homes, and cultural activities.

Visiting the Mahayana Orphanage in Tokyo, artist Al Buell painted Master Sgt. Robert Carswell playing Santa with an assortment of gifts. Of the six-foot, five-inch Carswell, Buell reported, "Next to the jungle gym in the background, he could hold the greatest number of children."

Later, in a letter to Mr. Buell, Sergeant Carswell wrote: "After you left, we made many more trips to the Mahayana Orphanage. We helped the kids in building and furnishing a new dining room and kitchen. Also we were able to outfit them in clothing a couple of times. . . ."

Meeting Korean friends, the Air Force base commander at Kimpo applies ointment to their cuts and scratches.

"This was an every-morning ritual," observed artist Omi C. Brown, "an act of friendliness far more powerful than bombs."





OIL BY LOUIS S. GLANZMAN © NATIONAL GEOGRAPHIC SOCIETY

Ready to Scramble on Instant Notice, an F-86 Pilot Reads Beneath His Umbrella

There was a shooting war in Indochina when artist Louis S. Glanzman went to Japan in September, 1954. Pilots sat in their planes during 24-hour alerts against possible Red Chinese action in Korea or the Formosa Strait.

"This man raised his umbrella," Mr. Glanzman observed, "as much for protection against the burning sun as against the rain that comes and goes during typhoon season. Closing the canopy would have meant no ventilation and more sweating.

"The umbrella was such a good idea and so typical of our guys that a picture just naturally followed. The incongruity of an umbrella over such a powerful piece of machinery shows how human we are, after all. And the mechanics working on the engine reveal how necessary the human mind and hand are in piecing together our mechanical masterpieces."

Mr. Glanzman inscribed the word "Buck" on the plane in commemoration of his World War II days in the United States Army Air Corps, where he was known as Buck.

Three planes in the stormy sky billow smoky exhaust plumes. Black-and-white-striped cart at right ignites the jet engine.

If the call—"Scramble!"—came over the phone in the field alert shack, the pilot would toss umbrella and book to the crew chief and thunder away as if pulled by a magnet.

Air Force Offspring in England Launch a Homemade Rocket

"I spent a rainy afternoon at Bushy Park, President Eisenhower's old headquarters in southwest London," writes artist Ishmael. "The base commander told me about a rocket society formed by Air Force dependents and gave me some pictures of the boys testing their homemade device.

"Air Force kids launching rockets struck me as history repeating itself. The airman looking on probably made model airplanes when he was the age of these youngsters. And when the boys are 40, they may be rocketing to the moon."

The boys conceived and executed their project all by themselves, Mr. Ishmael learned, but their rockets became "too hot, too soon"; hence the official observer in the painting.

"Adult supervision is absolutely necessary," says one Air Force officer; it is now the subject of a standing order at all fields. "Without it, the kids might hurt themselves, or even knock a plane out of the sky."





OIL BY RALPH HIGEN © NATURAL GEOGRAPHIC SOCIETY

Spewing Fire at Cape Canaveral, Atlas Blasts Off in a Cloud of Vapor

The rocket leaps up with 360,000 pounds of thrust provided by the fires of liquid oxygen mixed with a kerosene derivative. Vaulting into the near-vacuum of space, it will fly more than 4,500 miles in 30 minutes to a target near Ascension Island. Already operational, the Atlas may soon be joined by the Titan, a similar intercontinental ballistic missile in the test stage. The Minuteman, a solid-fueled missile now under development, will be fired from permanent underground installations or from mobile bases. Loaded with a warhead, it will take off on a moment's notice, bringing push-button warfare to reality.

The late artist Ralph Higen's rocket can be used for destruction, but his purpose was "to illustrate the American dream of exploring space for the good of all mankind."



*An aquarium fish from the Amazon
acts remarkably like a mammal
in feeding its young*

The Discus Fish Yields a Secret

By GENE WOLFSHEIMER

With photographs by the author

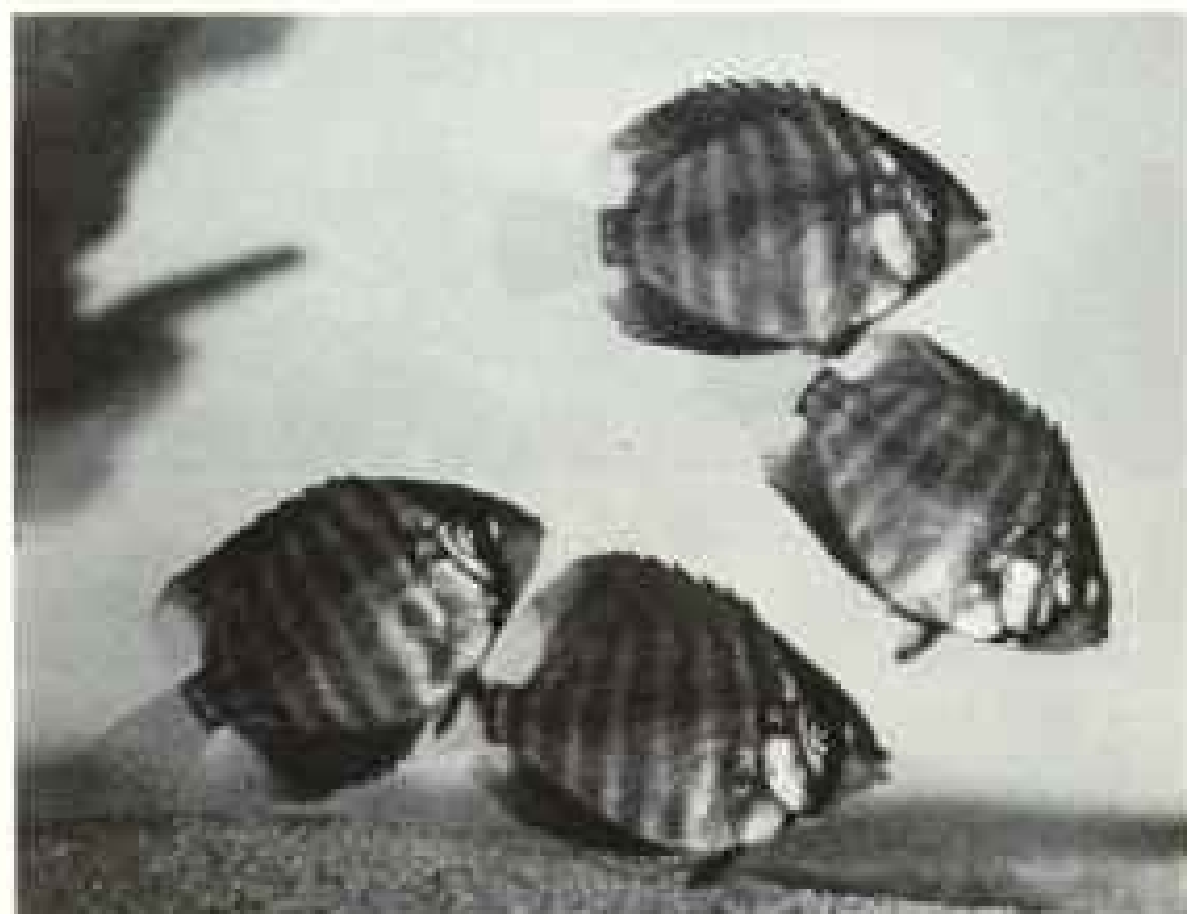
THE MYSTERY of the discus fish has puzzled the country's aquarium owners ever since this graceful Amazonian was first imported into the United States about a quarter of a century ago.

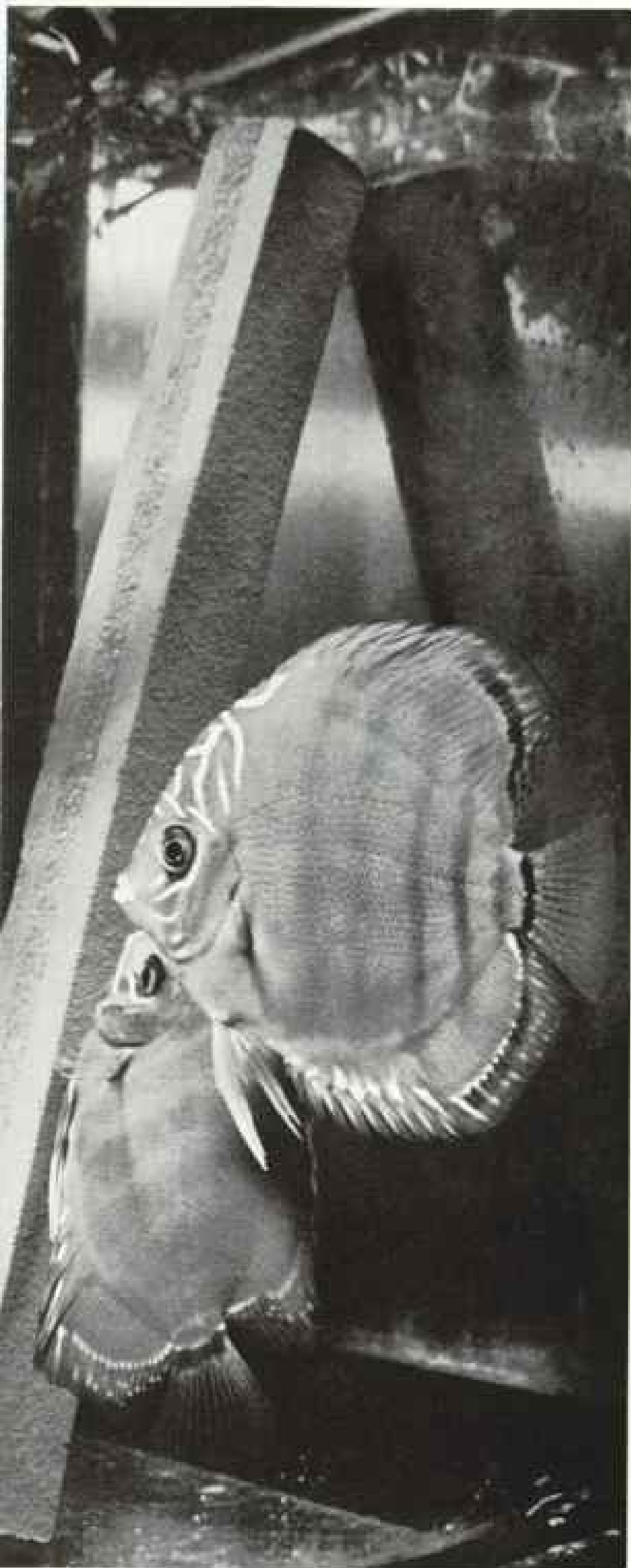
Rarely does the wild discus breed successfully in captivity. Discus mates often eat their eggs; if the eggs do hatch, the parents may turn, cannibal-like, on their own offspring. Yet if the babies are separated from their parents, they frequently starve to death.

Why? The answer lies in a startling characteristic of this strange fish: It feeds its young in very much the same way mammals do.

Saucer-shaped discus fish lays eggs on a tilted tile slab. Her mate hovers at her tail to fertilize the spawn. Native to the Amazon Basin, *Symphysodon discus* rarely succeeds in raising a family in captivity. The author, a fish fancier, finally coaxed a pair into caring for their young. He photographed the parents in his California aquarium.

One-inch fry explore their tank. Shown life size at six weeks of age, they may grow nine inches long. 675





Prospective parents scrub the spawning site by nibbling off aquatic growth. They drive other fish away, and flirt by trembling and spreading their fins. First imported in 1933, *Symphysodon* is known also as the pompadourfish because of the combed-back look of its dorsal fin.

I first made the acquaintance of the discus in 1949, when I tried to raise 10 young specimens. Relatively colorless, they gave little hint of the beauty that makes the fully grown fish so prized by experienced aquarists. Not until breeding time does the mature discus acquire the hues that make it, in my opinion, the most colorful of fresh-water fishes.

The discus's body ranges from burnt orange to shades of brown, with irregular blue-green striping on the head and fins. Darker vertical bars appear and then fade again, apparently in concert with the fish's emotions. Its eyes often gleam bright red.

In size, too, *Symphysodon discus* commands attention. One of the larger home aquarium fishes, it has a disk-shaped, pancake-thin body that measures up to nine inches in diameter. Like its cousin the fresh-water angelfish (both are members of the cichlid family), the discus hangs with motionless grace alongside the aquarium wall, or glides through the water like a vessel in full sail.

Discus Habits Frustrate Owners

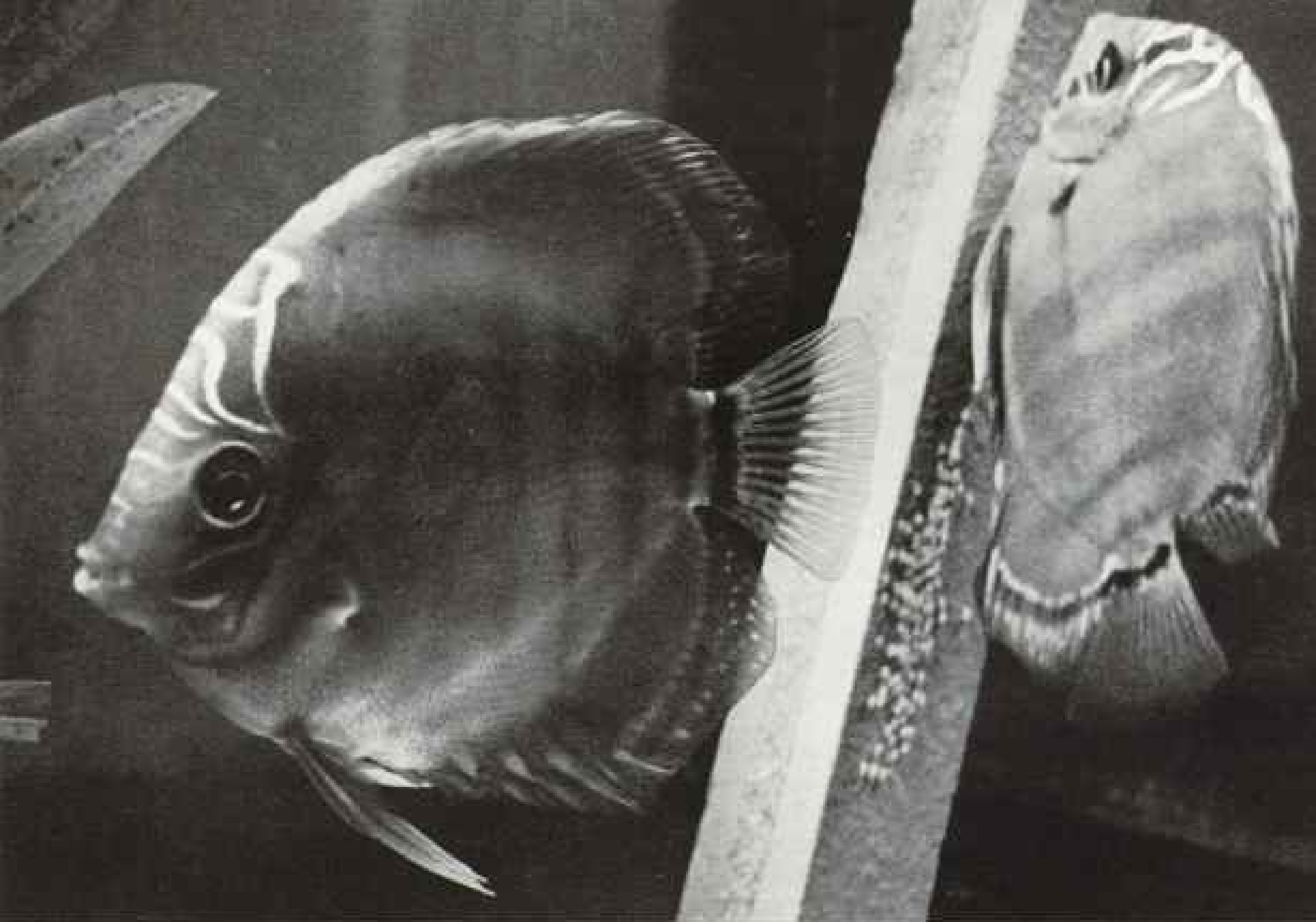
I soon found that raising the delicate and temperamental discus can be a most frustrating experience. For one thing, the fish is notoriously shy. Given profuse plant growth or rock grottoes in an aquarium, it will at first hide constantly.

Compared to many fishes, however, it is extremely intelligent and soon learns to recognize its owner. Whenever I appeared, my 10 specimens would rush to the front of the tank to welcome me. But when alarmed by a stranger or by a sudden gesture, they would dart for shelter behind a rock or a leaf. In their terror, some slammed repeatedly against the aquarium walls.

Then there is the matter of diet, a vexing problem with any fish when spawning, but a monumental obstacle with the discus. For no apparent reason it may stop eating and waste slowly away, even while the desperate owner dangles such delicacies as worms, mosquito larvae, and aquatic crustacea before it.

In my first experiment, I ran the gamut of problems. Despite plenty of room, and water carefully adjusted for temperature and acidity, several of my discus simply starved to death before my eyes. Others sickened and died. One leaped out of the tank at night. Within three months all had perished.

Other breeders met with similar discouragement. Those who managed a successful spawn-



Guarded by Her Mate, a Breeder Lays a Stream of Tiny Eggs

The female's spawning runs continue until she deposits 200 to 600 eggs. If healthy, she may lay more roe within 10 days and spawn 30 times in a single breeding cycle. Her mate sprays the eggs with an invisible cloud of fertilizing milt. To the despair of aquarists, parents often devour eggs or young for no apparent reason.

ing usually isolated the fertilized eggs from their sometimes cannibalistic parents before hatching. But once the fry began swimming on their own, they almost always refused food and died.

Eventually I acquired eight more young discus and determined to investigate this puzzling infant mortality. This time most of my pets prospered, and to my delight a handsome pair finally showed promise of spawning.

Courting Fish Lock Lips in a "Kiss"

As the female filled with ripe ova, or roe, several males sensed her impending spawning. They vied for her attention, and a period of flirting—marked by fin spreading and trembling—followed. At intervals the female locked lips for a tug of war with one or another of her suitors.

Once a mate had been selected, the pair interrupted their flirting to stake out a section of the aquarium for spawning. I substituted a tile for the smooth leaf or branch that the

discus prefers in the wild. With a zeal that would have done credit to the fussiest housewife, the two fish repeatedly scrubbed and polished the tile's already immaculate surface with their mouths (opposite).

Then the female began her spawning runs, crossing and recrossing the site, emitting streams of small beige-colored eggs that stuck instantly to the flat surface (above). Following closely, the male gently hovered over the eggs, fertilizing them with invisible milt. Any wayward eggs were snatched up by mouth and blown back on the spawning surface. If they failed to stick, the adults ate them.

The discus, like other members of the cichlid family, shows definite parental instincts. Normally it zealously guards both eggs and young. But in captivity the fish is unpredictable, and usually eats the eggs or fry. Nevertheless I decided to gamble and leave the eggs with the parents. I was rewarded by a heart-warming display of parental devotion.

The adults took turns fanning the eggs with

their large pectoral fins, thus providing an ample supply of oxygen for the embryos. At the same time they constantly inspected and mouthed the eggs; no harmful detritus was allowed to sully them.

The female did the bulk of this work, while the male kept constant watch, prepared to attack any threat to his unhatched brood.

Parents Puff Young Back Into Line

On the fourth day wriggling fry began to hatch. The parents scooped up the infants in their mouths and transferred them to another site, already prepared and cleaned. Through the next three days, during which the nonswimming fry lay anchored by slender filaments connected to their heads, the parents frequently shifted their offspring's moorings, as if to thwart some predator.

As the babies made the first feeble efforts to swim, the parents caught them in their mouths and blew them back into place. These efforts soon assumed comical proportions, with several hundred fry wriggling free and the harried adults gulping and puffing desperately. When the parents finally abandoned the impossible task, the fry schooled around them.

The young ignored the almost microscopic food I placed in the aquarium. Instead they clung to the adults much like a litter of possums.

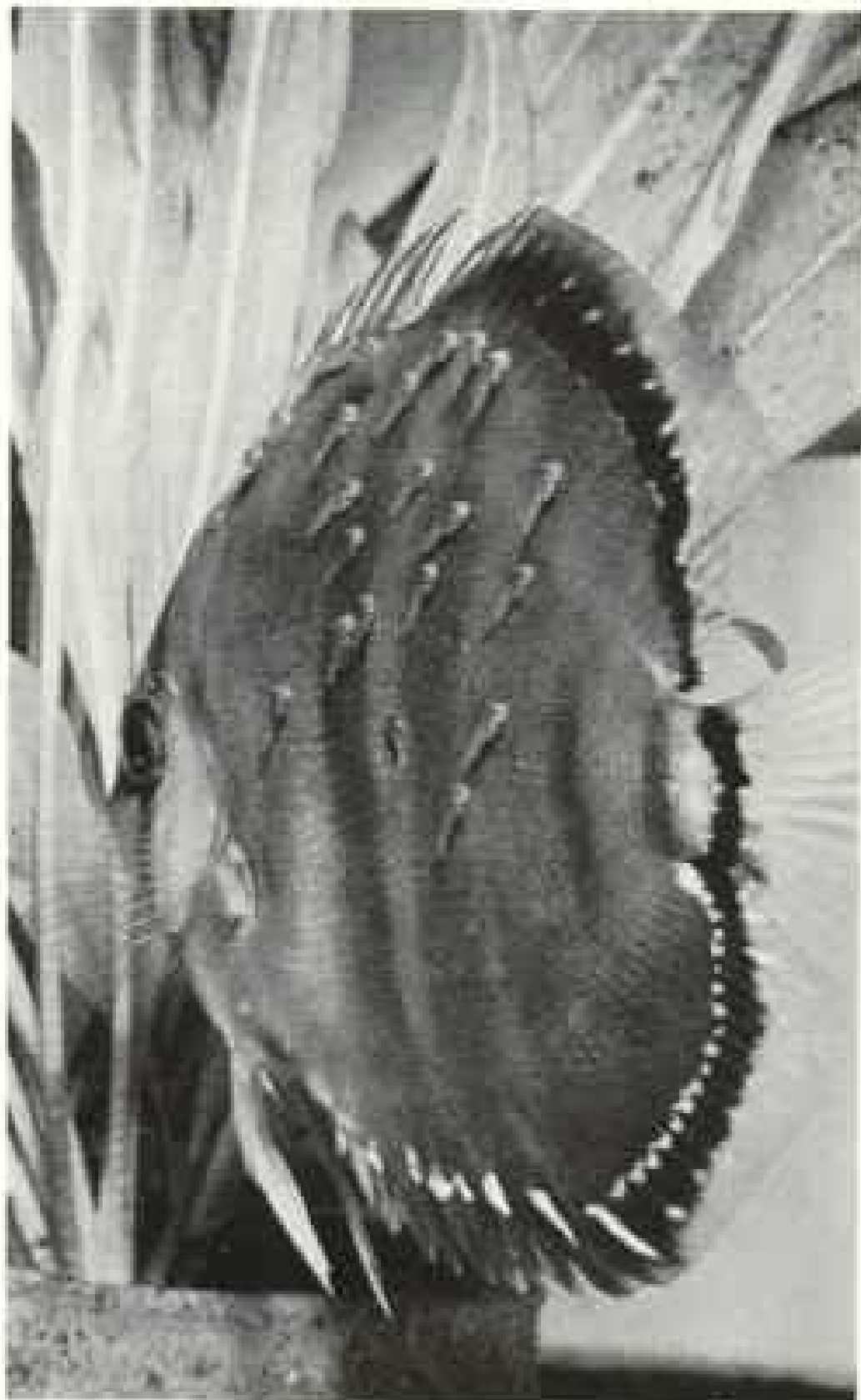
I noted that they seemed to be nibbling at the sides of the adults, digging into the skin and jerking their heads back and forth as though tearing away food (opposite).

Since they grew fatter and more vigorous each day, I could only conclude that they were somehow being nourished by the parents. Close inspection just before breeding had revealed that the slimy protective coating on the scales of the adults had thickened considerably. I felt sure that the babies were feeding upon this substance. But what was it?

Fish Secrete Mysterious "Milk"

Dr. William H. Hildemann, currently of the University of California at Los Angeles's School of Medicine, investigated the problem. Anesthetizing both breeding and nonbreeding adult discus, he removed samples of scales and slime from each of his unconscious patients for analysis in his laboratory.

Nothing extraordinary appeared on the skin and scales of the nonbreeding fish—only the



Small Fry Cluster on Mama's Back for a Guided Tour of the Aquarium

Four days after spawning, discus eggs hatch into a squirming mass of tiny fish. Joined to their yolk sacs and unable to swim, the fry survive by absorbing the sacs. Breaking free at last, the youngsters swim directly to their parents and climb aboard for protection and nourishment (pages 680-81). If all goes well, they grow strong enough within eight days or so to face the world on their own.

This mother, seemingly teetering on outstretched fins, turns tail with her swarm of babies. The stiff leaf of a potted "sword-plant" slants across the aquarium.

Fingerlings cling like leeches while hitching a ride on a parent's steep flank.



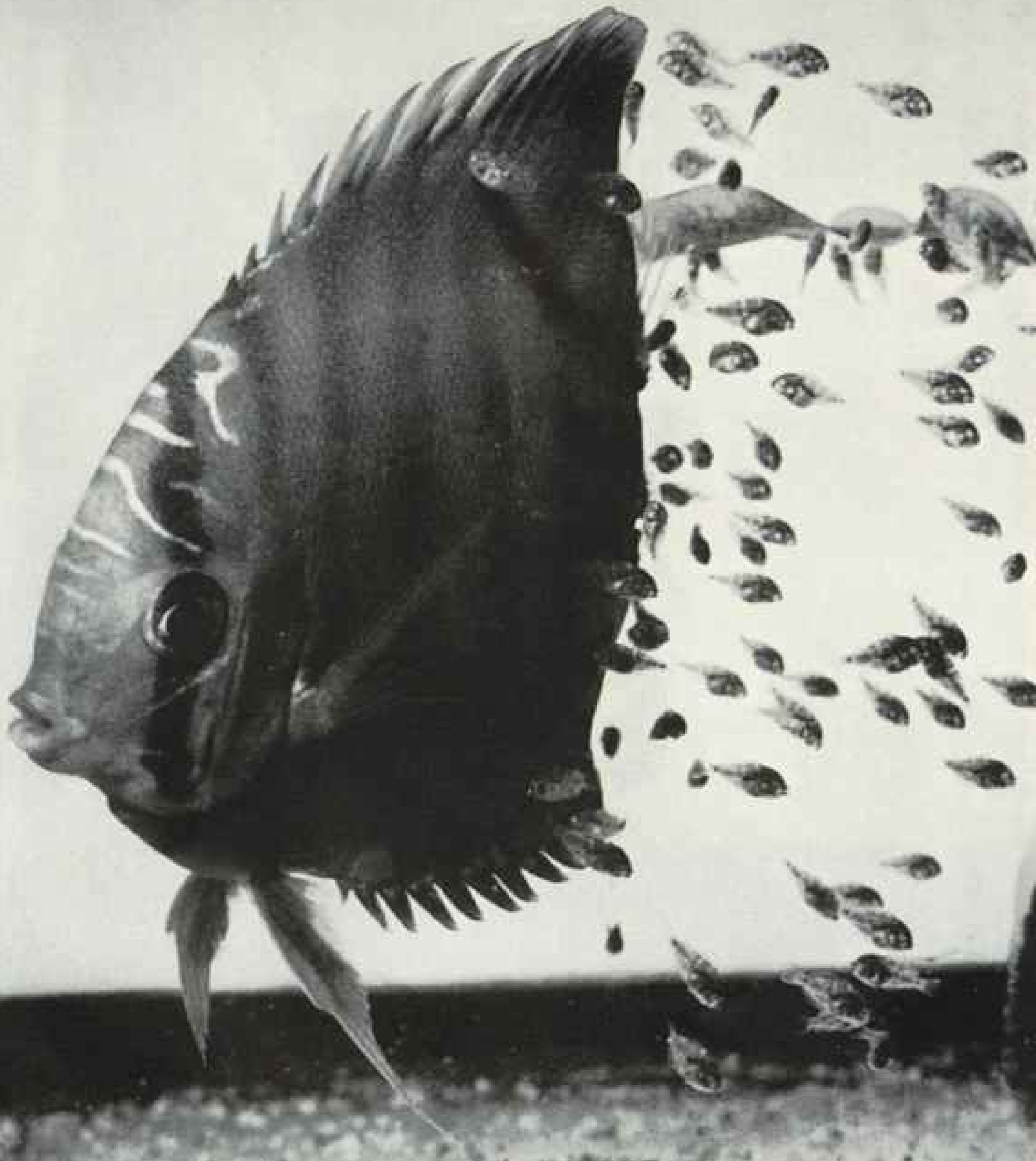
usual thin mucous coating. However, Dr. Hildemann found a copious whitish secretion on the skin of the breeder. Granular in composition, the substance changed into tiny filaments when rubbed or pulled. This was the discus "milk."

Microscopic sections of the scales confirmed the finding: The parent fish do produce a

food which the young normally must have to survive. Dr. Hildemann observed large mucous-producing cells in the epidermis of the breeding specimen.

The secretion awaits detailed analysis, but Dr. Hildemann believes it will prove to be a complex mixture of protein, fat, and carbohydrate. Presumably its manufacture is con-

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trolled by hormones, as is the milk production of a mammalian female.

Among vertebrates, this "lactation" of both male and female is possibly unique. Until research explains the full significance of the phenomenon, the discus—the fish that "nurses" its young—stands as a small but arresting biological wonder.



Piggyback passengers feed on a parent's secreted "milk." Fins resembling insect wings lend a whiskered look to the adult's face.

Darting From One Parent to the Other, Babies Gain Lunch and a Free Ride

As soon as they can swim, discus fry instinctively begin to feed on a slimelike secretion that covers the parents' bodies. Microscopic examination shows that this coating comes from large mucous cells in the epidermis. Smaller cells on the body of a nonbreeding discus appear less productive.

Intelligent but timid, a tank-dwelling *Syngnathus* soon learns to recognize its owner. But if disturbed, the captive dashes madly about the aquarium and may even kill itself by banging its nose against the glass.

Fish fanciers pay up to \$10 for a young discus; mated pairs sell for as much as \$350.

*Off the coast of Turkey, the oldest shipwreck ever found
yields relics and secrets of the Bronze Age*

Thirty-three Centuries Under the Sea

By PETER THROCKMORTON

THE POWERFULLY BUILT man at the near-by table glared at us, then grunted something to his companion. He had the look of the sea about him, and gestures that come from one used to having commands obeyed. The glass that he raised to his lips was dwarfed by his huge hand.

I glanced at my friend Mustafa Kapkin, whose ear was cocked to what they were saying. We had come to that waterfront cafe to find the skipper of a sponge boat who had brought up an ancient bronze statue and a clay urn from the sea. That stretch of sea bottom, we thought, might be a likely site for some underwater archeological exploring.

Skin Diving Gear Causes Sensation

We had just arrived in Bodrum, home port of most Turkish sponge divers who work the waters of their nation's Aegean shores. Yet already the village was buzzing about the Aqua-Lung, compressed-air bottles, and underwater cameras we had brought on the bus from İzmir. And the air was filled with rumors about the undersea treasure we were after.

For us, it was the beginning of a two-year quest that was to lead, eventually, to the discovery of the oldest undersea wreck yet located—a ship that rode the waves 33 centuries ago, before the time of Homer's *Odyssey*, and ripped her ribs on a jumble of rocks off the Turkish coast.

That Bronze Age ship is at least eight hundred years more ancient than any found heretofore. And the words written here are the first personal account of this remarkable find. Through detailed notes and photographs of the wreck, outstanding archeologists at the University of Pennsylvania and at Princeton University have definitely placed the discovery in the late Bronze Age, about 1400 B.C.

But sitting uneasily in the scrubby cafe—really little more than an arbor roof supported on classic columns—we could not have guessed that such an end was in store. Now I was absorbed in the table near by.

"What are they talking about?" I asked.

Mustafa flushed. "The man with the big hands and lantern jaw is saying that our Aqua-Lungs are for tourists, and that a real

In Eerie Gloom, a Sponge Diver Slogs Through a Jungle of Broken Pottery

Shattered wine jars from ill-fated argosies litter the Aegean floor off southwest Turkey. During two years of underwater exploration in a graveyard of ancient ships, the author charted 38 wrecks, including a Bronze Age vessel some 3,300 years old. Laying aside his bulging bag of sponges, this diver examines the graceful neck of a Roman amphora.





Aqua-Lung Mermaid Scrapes Sand From the Ruins of a Bronze Age Ship

Atop this rocky ridge in the Mediterranean's misty blue depths, explorers uncovered the oldest shipwreck ever found, the remnants of a galley that sank about 1400 B.C. Divers with crowbars spent hours prying loose copper and bronze artifacts concreted together after three millenniums in the sea. Limestone-encrusted copper ingot shaped like an oxhide appears in the lower right foreground.

Treasury of Bronze Age relics includes two copper oxhides; bronze picks, chisels, axes (center row); broken amphora (lower left), and a metal object believed to be a mirror (lower right corner). Sally Hinchcliff inspects the collection.

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diver wouldn't be caught dead in one. Also that he doesn't like skin divers."

I laughed, and the burly man looked toward us. Then, to my consternation, he lurched to his feet and started in our direction.

The cafe's proprietor rushed out and grabbed his arm, and from the smattering of Turkish at my command I could tell he was pleading: "No, no, Captain Kemâl..."

With a bull-like shrug of his shoulders, the husky captain shook off the restaurant owner and kept coming.

I got up, put on the best smile I could manage, and put out my hand.

He looked me hard in the eyes for a moment. Then he grinned and shook my proffered palm. I motioned for him to sit down.

For the next four hours—over raki, a Turkish aperitif, and savory roast fish and shish kebab—Capt. Kemâl Aras told us tales about diving, the price of sponges, brushes with that dread of all divers, the bends, and fantastic things he had seen in the sea.

"And if it's pots you're looking for," he said, "In Allah's name, I can show you pots."

Turkish laws restrict foreigners from making extended trips on boats of that country's sponge fleet. But through the help of the İzmir Frogman's Club, a group of Turkish skin divers, I got permission to spend a month aboard Captain Kemâl's 38-foot sponge boat and make a survey of underwater antiquities in Turkish waters.

Mandalinci Tackles the Deep

So it was that on a warm afternoon in July, Mustafa and I hoisted our gear over the gunwale of the *Mandalinci*. Mustafa, at age 37 one of the top industrial photographers in Turkey, shared my interest in underwater camera work and archeological exploration. Together we hoped to prove to Kemâl that Aqua-Lungs were good for something besides tourists. The captain was after sponges; undersea relics would be only incidental.

The *Mandalinci*—its name means "tangerine" in Turkish—was a weathered old *trechandiri* (page 697), one of those highly maneuverable, double-ended sailing boats developed in the Aegean archipelago.

Her hold was layered on the bottom with sea-worn gravel for ballast, and much of the space was taken up by an ancient air compressor. Her cookstove was half an oil drum lashed near the stern, her engine an antique single-cylinder diesel that would start, I learned, only after prolonged heating with a blowtorch. It could push the old boat along at a maximum four knots. In a fair wind, with sail helping, she could do seven.

Ancient Jar Becomes Water Tank

But, decrepit as she looked, the *Mandalinci* was shipshape and clean, kept that way under the tight discipline of Captain Kemâl and his mate, "Uncle" Çiasim Arslan. (In Turkey, older men are often called "uncle"—*amca*.) Other divers in the crew were young Ali Zorlu, who was dressed in a spanking new double-breasted suit, and "Uncle Şeytan"—Uncle Devil. His real name was Ahmed, but he was called *şeytan* because "only a devil could have had so many narrow escapes and lived."

Ahmed walked with a bad limp from an attack of the bends. He liked to dive, he told us, because under water he did not limp. A couple of ship's boys completed the crew.

My eye fell on an amphora lashed to the foot of the mast. I stared in surprise. Its double handles, narrow neck, and tapered shape stamped it as one of the typical jars used in classical times for holding oil and wine.

Probably Roman, I guessed, dating from about the 2d century. It held the *Mandalinci's* water supply.

Captain Kemâl grinned at my wonderment. "The old jars are better made than the modern ones," he explained. "Cheaper, too. We can get all we want for nothing—just pull them up from the bottom."

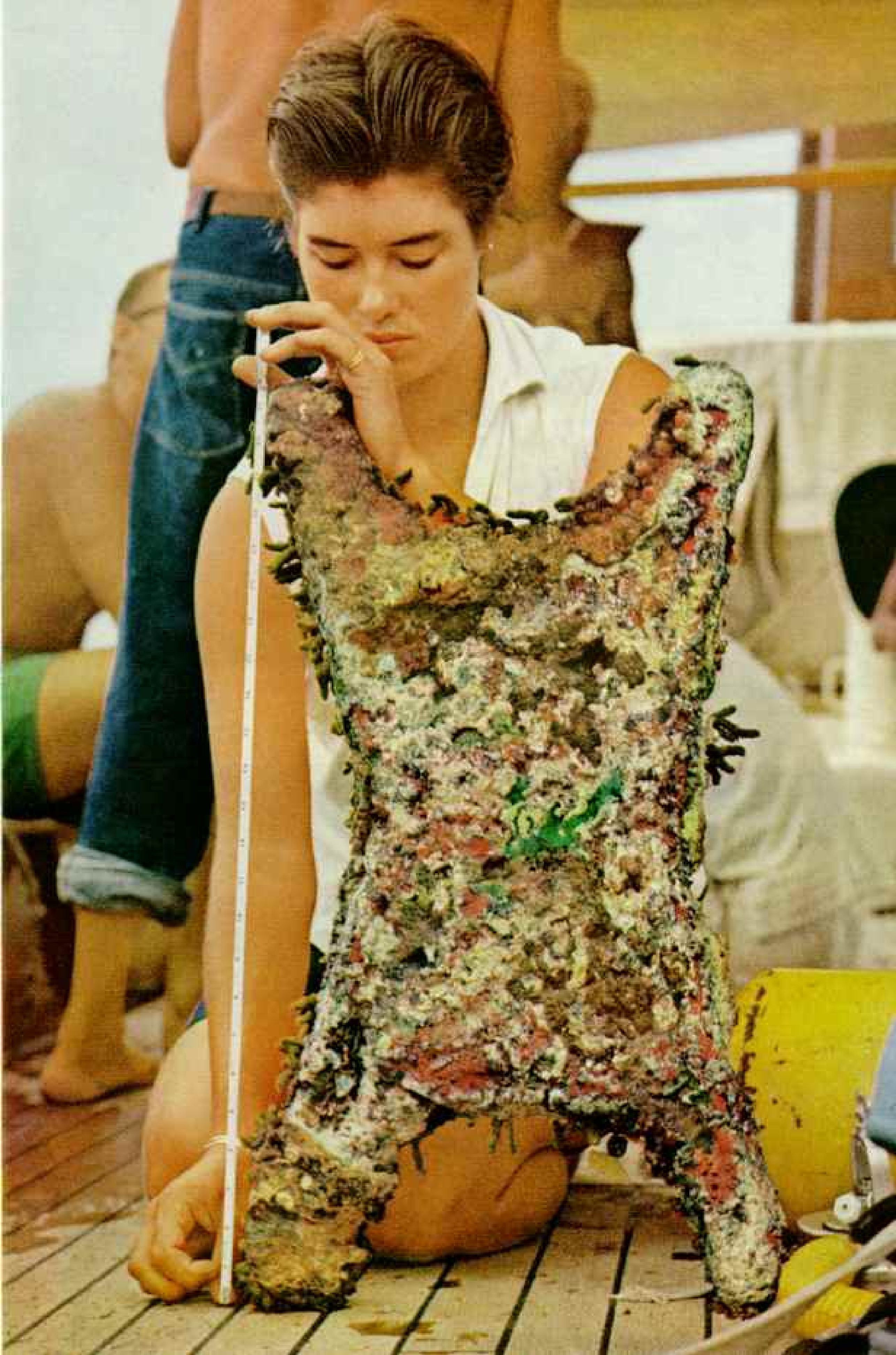
Our expedition, I thought, was off to an auspicious start.

It was evening before all the equipment and supplies for the trip were aboard. At dawn the next morning we got under way, and I watched the shoreline drop behind.

Bodrum is a little port hanging to the coast at the edge of an amphitheater of thousand-foot hills. They sleep now, but those hills

Bronze Age Bullion, a Four-legged Metal "Oxhide," Emerges From the Sea

Flat and rectangular, with a leglike extension at each corner, the ancient oxhide is believed to have represented, in metal, the value of a cow or an ox. This crusted copper ingot, smelted in Cyprus before written history began, may have ridden a galley en route to Mycenae or Troy. Corrosion has flaked off possibly 10 pounds, leaving 48 pounds. Susan Phipps applies the tape measure: 24 inches.



have seen the glories of the past, for Bodrum is the site of the ancient Halicarnassus. That fabled city was the birthplace of Herodotus, father of written history. It was the location of the famous Mausoleum, built to honor the Carian king Mausolus, and one of the ancient Seven Wonders of the World. The city was sacked by Alexander the Great in a victory that helped open his way into Asia.

On a peninsula that juts into the bay stands a castle built by Crusaders more than five centuries ago (page 690). Its walls contain stones cut in classical times, many even taken from Mausolus's now-obliterated tomb. The castle was named for St. Peter, and the town that grew up around it on the ruins of ancient Halicarnassus was called Petronium. In time this was corrupted to Bodrum.

Two hours' run from Bodrum lies Yassı Island, in the Chuka Channel. There, a hundred yards from shore, Captain Kemal cut the engine. Çiasim put on the lead shoes and copper helmet of the boat's lone diving suit and dropped overboard.

Ten minutes later came the signaling tug on the lifeline that meant he had found the

spot the captain had promised to show me. I donned snorkel and mask and slipped over the side into the channel's crystal-clear water.

There, below me, was a fantastic mass of amphorae, some broken and some complete, lying on the bottom only 25 feet down. Çiasim, his back turned, was standing in the middle of them.

Friendly Taps Startle a Diver

I swam down to him and rapped the familiar tattoo of "shave and a haircut, two bits" on his helmet with my knuckles. He nearly jumped out of the water, so startled was he at my tapping. Later he told me that it was the first time in his 40 years of diving that he had had company while under the sea.

Mustafa came down to look at the pile, and then the captain signaled for all to come up. Ali took over the diving suit from Çiasim, and we moved to deep water on the south side of the island, where Captain Kemal said there were two more piles of amphorae.

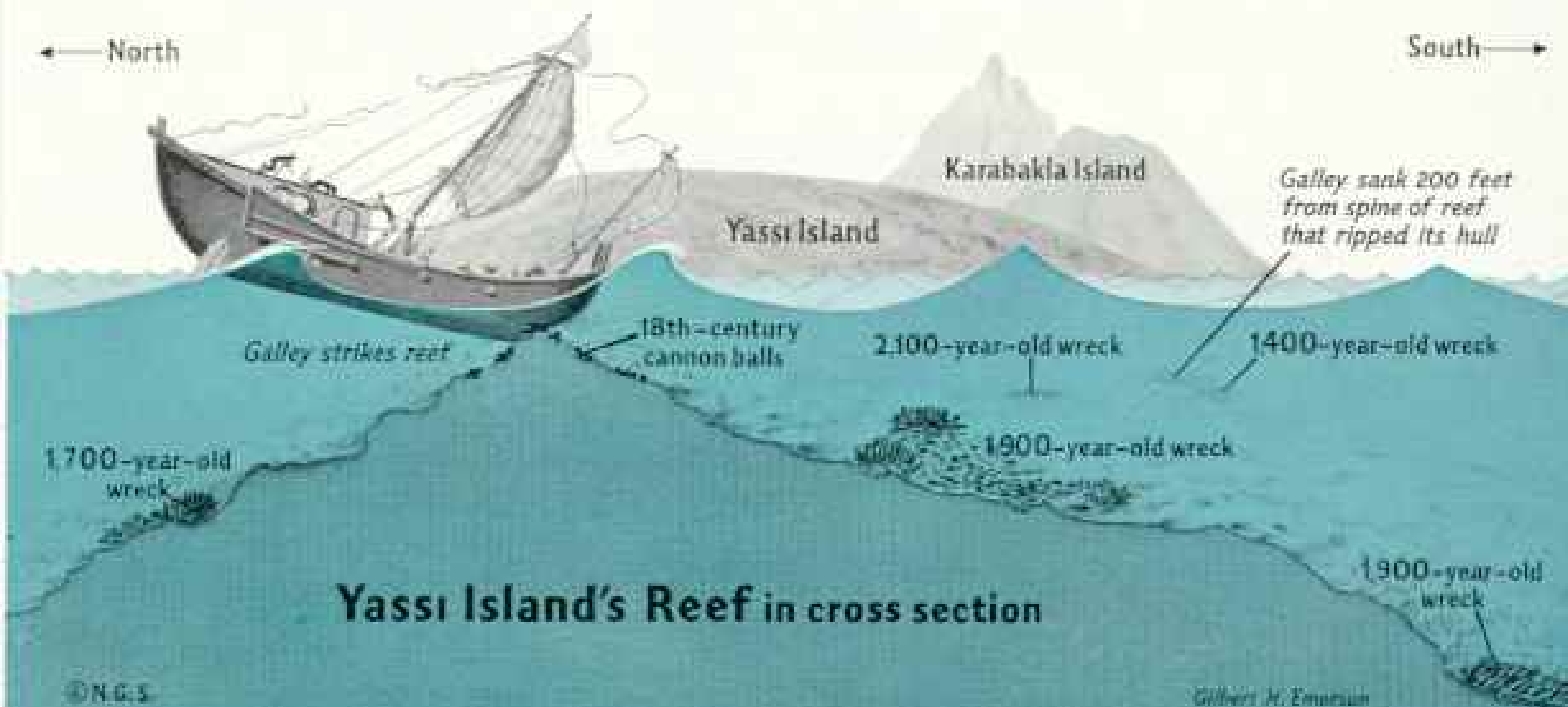
Minutes later—but what seemed like an eternity, in my excitement—I was shaking hands with Ali in 120 feet of water, on top

Floating above a mound of amphorae, archeological draftsman Honor Frost sketches a wreck off Yassı Island. Tiles among the jars may have floored the ship's galley.

ILLUSTRATION BY PETER FRIDRICHSON © NATIONAL GEOGRAPHIC SOCIETY

Heavily laden merchantmen sailing out of Rhodes, Cyprus, Rome, and other Mediterranean trade centers swarmed to the island-dotted waters off Turkey in ancient times (map, opposite). Yassı Island's treacherous reef, its crest rising within six feet of the surface, took many a ship to its grave. Some vessels, hulls split wide open, sank immediately, spilling their cargoes on the reef. Others, like the 1,300-year-old galley depicted below, strove in vain to reach Yassı's beach. Their bones still rest on offshore slopes in depths ranging from 20 to more than 100 feet.

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of the wreck of a big amphorae carrier. There were literally scores of jars lying in sea-encrusted piles. I did an Aqua-Lung dance of glee, and then Ali led me to another, even larger wreck!

Here were huge globular amphorae of a type I had never seen before, each one almost perfectly round, with two small handles. This wreck was also strewn with iron objects, some of which turned out to be ancient anchors. A scale of barnacles encrusted the jars, and sea worms had built their tubular

homes in twisting patterns on their surfaces, but their ancient beauty was unmistakable.

Yassi Island, however, was to offer even more. In subsequent explorations we have found evidence to indicate that at least 15 additional wrecks lie near the island's shore — a veritable graveyard of ancient ships!

And little wonder. Just a hundred yards from Yassi Island's western edge lies a treacherous reef. Its crest, six feet below the surface, is almost invisible, especially with the sun in the steersman's eyes, his ship running

**Bodrum, Home of a Turkish Sponge Fleet,
Stands Atop the Ruins of Halicarnassus**

Birthplace of Herodotus, father of written history, Halicarnassus was a fabled capital of the Kingdom of Caria. The city boasted a magnificent marble



before the prevailing wind. Today the reef is marked on charts, but it still takes its toll of ships, the latest a sponge boat sunk atop a pile of cannon balls from an 18th-century Ottoman frigate. The two deep wrecks we saw that first day have since been identified as Byzantine cargo carriers of the 6th and 7th centuries.

At least two other big cargo ships—used by the wine carriers of Rhodes—came to grief there in the last half of the 1st century. One littered a hundred square yards of bottom

several feet deep in smashed amphorae. The other came to rest in one piece, her deck cargo of 5,000 wine jars still stacked as they were the day she left Rhodes. A handful of civilizations—Greek, Roman, Byzantine, and Turkish—have left relics on that savage reef.

As I write these words, I can think calmly of these discoveries. But that first day with Captain Kemal on the *Mandalinci* was a frenzy of photographs and dives and excitement. And of frustrating conversations trying

(Continued on page 695)

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tomb, one of the ancients' seven wonders, begun for King Mausolus by his widow about 353 B.C. The word "mausoleum" derives from his name.

Centuries later Crusaders used stones from the ruined edifice to build the massive castle of St. Peter commanding the harbor.

STYLING: JANE BROWN; PHOTOGRAPHY: NATIONAL GEOGRAPHIC SOCIETY







**Susan Phipps Buoy
an Amphora With Air.
Like a Rocket, the Jar
Will Shoot to the Surface**

Divers working off Yassi Island found it a back-breaking job to lift the jars, which weighed as much as 100 pounds. Shells and pebbles, seeping in through broken seals, displaced the wine long ago. Some amphorae contained octopus nests.

Substituting air for muscle, the divers made their Aqua-Lungs work for them. Dumping out the silt, they piped their own exhaust into the jars. Rising slowly at first, the amphorae gained speed with every foot until they popped out of the water.

Archeologists theorize that tapered bottoms made it easier for stevedores to move the jars about on deck. Ashore, the amphorae could be planted upright in soft earth.

Similar relics have been recovered from the ruins of Pompeii. In 1952 Capt. Jacques-Yves Cousteau and his fish men salvaged an entire cargo of Greco-Roman amphorae off Marseille, France (see NATIONAL GEOGRAPHIC, January, 1954).

Bubbles form a cloud above Miss Phipps as she inflates a jar. A hole in the base allows a trickle of air to escape. Black reef fish exhibit no fear of the stranger in their midst.

JOHN COCHRAN



Two thousand years of sediment spill from Rhodian amphorae saved by the author (left) and Rasim Divanli of the Izmir Frogman's Club. Brilliant marine encrustations faded after exposure to sunlight.



Outsized roof tile recovered from a Byzantine wreck gets a cleaning. Honor Frost, who helped bring up the tile, wears a snug neoprene suit that holds body heat in the chill depths (page 688).

After scraping away the sea growth, Miss Frost will make an archeological drawing of the slab.



Lump of sea-worn wood may have been part of the cap rail of a Byzantine argosy, the globe-shaped amphora an item in her cargo. John Righter examines the relics from the 1,200-year-old wreck.

ACCOMPANIED BY MUSTAFÄ KAPYVA (PHOTO) AND PETER THORLEWORTON
 © NATIONAL GEOGRAPHIC SOCIETY

to explain to Kemâl and the other divers the importance of what we had found.

Life on a sponge boat quickly becomes routine. When there happened to be a wreck in areas where the *Mandalinci's* divers were harvesting sponges, Mustafa and I photographed and made notes. When there were no wrecks, we speared grouper for the cook pot, dove with our Aqua-Lungs to add a few pounds of sponges to the day's catch, or settled into the little boat's routine.

If there was a man down in the diving suit, the *Mandalinci's* old engine ran at half power. It droned a steady, sleepy vibration, never changing except when the man at the tiller kicked the throttle ahead to stay over the diver. The lifeline between diver and boat was no bigger than a clothesline, but very strong and carefully made from hard-twist manila. That lifeline was always tended by one of the older men, usually either Kemâl or Çiasim, who sat, impassive, attention fixed on the diver, fingers holding the strand with delicacy to respond to the diver's signals.

Chants Mark Diver's Progress.

The air hose was always in the hands of Samy, the oldest of the ship's boys, and he in turn was watched by the man on the lifeline—and cursed roundly when the hose wasn't held exactly right: just slack enough for the diver to be free, but tight enough so that it could not catch on underwater obstructions.

Time was punctuated by the ship's boy singsonging out the diver's depth, which he read off in fathoms from a gauge attached to the compressor. One knew by the boy's chant when the diver was climbing down rocks, as the depth call changed rapidly.

"Seven. Going on nine. Going on twelve. Still twelve. Going fourteen. Going seventeen. Steady at seventeen. Sevent-e-e-n."

Occasionally, the man tending line would glance at an old alarm clock, the only time-piece on board except my wrist watch. After an hour, he gave three strong jerks that signaled the diver to ascend. In five minutes the net bag, bulging with sponges, would be aboard, the diving suit switched to another man, and the *Mandalinci's* crew settled back to another hour of watchful waiting.

The sponges, gleaming black balls, were piled up around the mast. By nightfall we had collected what would amount to about ten pounds, cleaned and dried. This was an average day's catch, worth about \$50.

By noon the first day out I was hungry, but

saw no sign of cooking. I asked Mustafa: "What about lunch?"

"Divers never eat during the day," he said. "It's supposed to bring on the bends."

So that day, and every other day of our voyage, we staved off our emptiness diver-fashion, with a cigarette and a hunk of bread. Hunger for us, as for the men of the crew, became an accepted part of the routine.

At suppertime the ship's boys set out the "table"—a piece of canvas laid on the foredeck—and the men sat down in order of rank.

Captain Kemâl presided; Mustafa and I, as guests, flanked him. Then came Çiasim, who had spent the previous hour over the oil drum and a fire of wood gleaned from shore in the morning by the boys. At the foot sat the other divers.

The meal was usually *çorba*—a soup made from tomatoes, fish, and peppers—a salad of more peppers with tomatoes and olive oil, a lobster or a grouper caught during the day, and that seaman's staple, boiled beans. Bread was hardtack, made edible by dipping into a pan of water that stood ready by the canvas.

The boys stayed in the background. They would eat the cold and greasy leavings after they had cleaned up the foredeck. As compensation, perhaps, or as concession to the appetites of 14- and 15-year-old boys, they were the only ones on board who could get an extra bite from the ship's larder during the day without earning a scowl from Kemâl.

Mandalinci Roams a Lifeless Coast

When night fell, we would anchor in a cove, or behind an ancient breakwater such as the one at Cnidus, where the ruins of a city that once sheltered thousands of people lay around the harbor. The sail would be spread on the *Mandalinci's* foredeck, and we'd roll up in our blankets in some corner. Or sleep ashore on a sandy beach.

We seldom saw another boat or another human being. The coast we cruised along was beautiful, with great mountains that loomed sheer out of the sea and deserted valleys where grew wild figs that we sometimes picked on trips ashore in the dinghy. It was a life like that which must have been led by the sea raiders of Homer's time—raiders who may have hauled their black-hulled ships onto the very beaches where we slept.

So the days went by, pleasantly—and profitably. In addition to several well-preserved wrecks, we found many sites worth further

investigation someday. And our notebooks were full of jottings about other wrecks, on other parts of the coast, gleaned in evening talks around the mast or campfires ashore.

For we were accepted now as divers, not tourists. We had proved we could pick sponges and live on a sponge boat. Divers along the coast gave us information, even though they might think our search for broken pots and sea-rotted pieces of wood was *deli*—crazy. Some even became interested in archeology themselves—a tribute to the stories, cribbed from Homer, which Mustafa had told around our campfires.

"Rotten" Bronze Hints at a Treasure

When our month's cruise was over and we were back in Bodrum, Mustafa and I were invited to spend an evening with Kemal and a sea captain friend of his from Istanbul. The talk turned to dynamite and its use in salvage jobs. I was sitting half asleep, unable to follow much of the conversation. Then I was snapped alert by the word *bakır*, Turkish for copper.

"What was he talking about?" I asked Mustafa.

"Some things they found in the sea."

"What things?"

"Bronze things. He found some pieces of bronze, stuck to the rock."

After ten minutes of confused questioning the story came out. The season before, Kemal had been diving near Finike, at a place called Cape Gelidonya (map, page 688). He found about two tons of bronze objects—"big bars of metal, but flat, all stuck together on the rock in 15 fathoms of water." Amca Şeytan had taken some pieces and sold them for scrap. But the price was poor, very poor, because the metal was so corroded and rotten.

I lost interest. Big bars of metal, ingots, no doubt. Sounded modern. Probably from an 18th- or 19th-century merchant ship. But something about the story bothered me.

That night, thinking it over in my hotel room, I decided what it was.

Kemal had said that the bronze was rotten and corroded. Now, I had seen plenty of bronze from wrecked 18th-century ships, and it almost never was so badly corroded that it could be called "rotten." The only bronze I had seen that badly decayed had been from classical times. I began to speculate about the bars: Where had I heard that flat ingots were traded by the Kefti, a seafaring people who lived in the Aegean during the Bronze Age?

Next morning I went through my books and found a reproduction of a painting from



PETER THORLBERG/STOCK

an Egyptian tomb of about 1500 B.C., which showed the Kefti bringing tribute to the Pharaoh. Part of the tribute was, unmistakably, flat ingots with leglike handles, looking for all the world like an animal hide.

It was weeks before I got a chance to bring up the subject again with Kemal and his men of the *Mandalinci*. Did any of them remember the bronze stuff in the sea near Finike? Yes, one of them did; he had taken two bronze boxes from the place, hoping that they would be full of gold. Instead, they held some black, greasy stuff, and were so corroded he had thrown them away in the sea.

I knew I was on the right track when Devil scratched his head and said he had picked up some pieces to sell for scrap. He remembered there had been three of them.

"One was like a spear point. And there was a knife. And a thing like a sword. All of bronze."

"Who bought them?"

"Oh, some junkman; I don't remember."

Kemal broke in. "Don't worry, Peter. Next



Helmeted diver hands a bag of sponges to deckhands aboard *Mandalinci*, a double-ended vessel that carries motor and sail. Sponge diving is a fading industry in Turkey, says Mr. Throckmorton, who worked beside these divers. "Young Turks want no part of it; too many have been killed or crippled, and the disabled get no compensation."

Exhausted by a long dive, Capt. Kemal Aras rests on deck before quitting his bulky suit. "Sponging is a grim business," reports the author. "Divers live with the fear of the bends. Diving too often, too deep, or too long can cause paralysis or death. After coming up, the diver watches his body with the attention that a mechanic gives to a racing car."

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year when we dynamite the stuff for salvage, I'll save you a piece."

On an impulse I turned to Kemâl. "Promise me you won't touch the bronze wreck until I get to see it," I blurted. "I'll pay you double the scrap value, by weight, of everything we recover from her."

Where I'd get the money I didn't know. Nor had I any idea, at the moment, how I'd be able to promote the expedition to hunt for the underwater wreck.

Summer passed. I returned to the United States, thoughts of the bronze wreck and my impulsive promise to Kemâl a nagging voice in the back of my mind. Then, through an archeologist friend in New York, I met Drayton Cochran.

Air Hose Makes a Necklace

Cochran is a New York yachtsman who owns the *Little Vigilant*, a steel-hulled, 70-foot auxiliary ketch (page 700). His son, John, and a friend, John Righter, were experienced skin divers. Another friend, Stan Waterman, was a true professional and an underwater photographer as well. So we formed a team. Objective: a cruise in Turkish waters, with the hope of finding the bronze wreck at Cape Gelidonya.

In June of 1959 we outfitted the *Vig* in Piraiévs, Athens's ancient and still bustling seaport. From Miami, Boston, and New York came crates of air tanks, rubber suits, and the endless minutiae of diving paraphernalia. From Germany there was a new and powerful Bauer air compressor and a special Dräger portable decompression chamber that was a bit of insurance everyone chipped in on willingly.

The Cochran party stepped off a plane at Athens with airline flight bags filled with spare parts—and with 50-foot coils of air hose draped over their shoulders as necklaces. And an attractive last-minute arrival was Susan Phipps, a Floridian whose family knew the Cochrans.

At last the *Little Vigilant* moved out of the harbor at Piraiévs, her crew hosing the

Ankle-deep in Ooze, John Cochran Reclaims Two Perfect Amphorae

Standard container for the ancient wine trade; each amphora held seven or eight gallons. A Rhodian vessel foundering here some 2,000 years ago carried an estimated four thousand jats to the bottom.





gluelike mud of ages from her anchor. Her course was set for İzmir. There Hakkı Gültekin, on vacation from his post as Director of the Archeological Museum in İzmir, and Mustafa and another diver friend, Rasim Divanlı, were waiting to join us. With them aboard, we headed first for Yassı Island reef.

We checked out our equipment in dives on the wrecks Mustafa and I had spotted with Kemâl. The sight of the amphorae, some a jumble of shards, others as neatly arrayed as the day they were stowed in the ship that carried them, was no less thrilling now than on that first voyage with the *Mandalıncı*.

Octopuses Live Where Wine Once Flowed

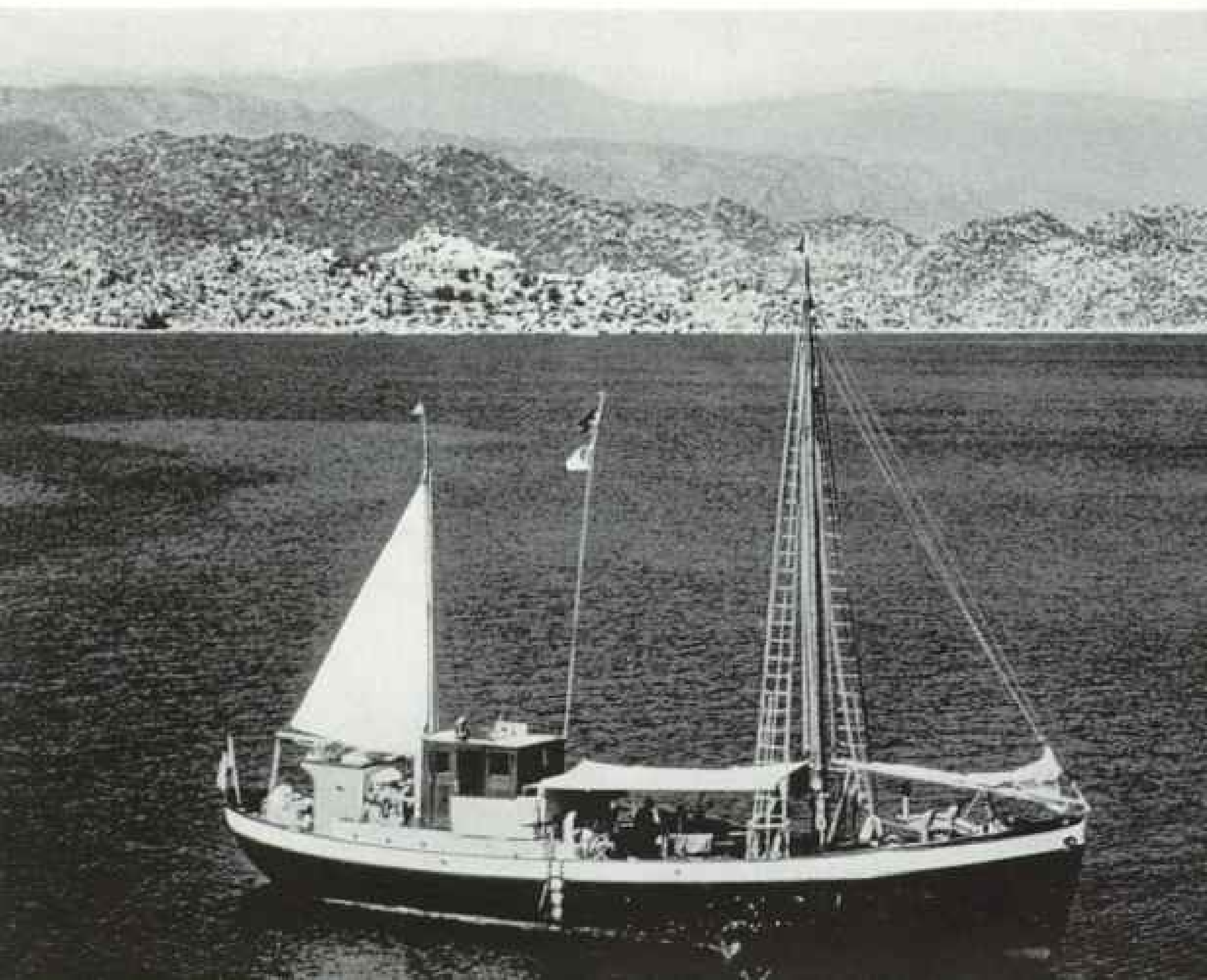
Seals in the narrow necks of the jars had long since disappeared. Instead of the wine or oil once stoppered within, the timeless motion of the sea and nest-building octopuses had packed down pebbles and sand. Frequently the tenants would jet away in a cloud of ink when disturbed.

The pebble-filled jars were heavy. It sometimes was all one diver could do to hold a jar off the bottom, neck down, while another probed inside to loosen the packed filling. Then the amphora was held over the nozzle of an air hose from the surface or the exhaust bubbles from the regulator of one of the divers' Aqua-Lungs. Slowly, like a primitive balloon, the jar would begin to rise.

Then, gaining momentum, it would take off like a rocket, venting a white stream of sand. At the surface, those waiting in the *Vig's* dinghy would see the jar pop out of the water, to bob until recovered.

Along the coast we went, probing the wrecks marked in my notebook, until at last we were off Cape Gelidonya. That great cape, crowned by a beacon, thrusts into the Mediterranean with a string of islands jutting from it, just as Kemâl had said.

The islands were forbidding stumps of rock, and they proved as inhospitable as they looked. Their jagged surfaces were so sharp



each step slashed our shoe soles; we could not sit down without getting cut. They were waterless, their only vegetation a thorny shrub that clung to eroded hollows. I pitied the shipwrecked sailors of the past who must have struggled ashore there.

The channel where the wreck should be was a passage between the outermost island and another one 200 yards nearer the shore. Kemâl had said the wreck was on an underwater ridge that ran between the two islands.

We spotted the ridge without trouble—a tangle of ledges, clefts, and hillocks as uninviting as the two islands they joined. On each side of the ridge the bottom dropped off to depths of 150 feet and deeper. The crest of the ridge itself varied from 40 to 100 feet down, with occasional pinnacles that soared to within 10 feet of the surface.

It was noon when the *Little Vigilant* first dropped anchor into a mass of boulders on the ridge. That afternoon was spent in reconnoitering and eager speculation.

JOHN COLHARAN



Next morning we all went over the side at once, and swam slowly along the bottom in a long line. Within five minutes the line had broken up into scattered groups wandering in the ridge's jumbled formations. Ten minutes more, and the groups became individuals wandering aimlessly here and there. Soon heads began popping to the surface, each person coming up to see where he was.

"It's a mess," Rasim said. "We could look down there a month and not find the wreck."

First Dives Net Newspaper and Cookpot

During the morning's dives we managed to sweep a good part of the bottom between the ship and the outer island. We found nothing—except an object that looked like a cookpot and a page from a Turkish newspaper.

That afternoon we split up into two parties, one group covering each side of the ridge. I swam with Stan and Mustafa. The area swarmed with fish—and huge boulders. I went around one side of a rock that was the size of a small house; Stan and Mustafa went around the other. When I got past it, my partners were nowhere to be seen, so I carried on alone. Again, nothing.

Mustafa, though, fared a little better. When we were all back on board the *Vigilant*, he displayed a piece of discolored rock. It unquestionably had been stained by decomposition of bronze or copper. He said that it came from a spot such as Kemâl had described as the wreck site—the bottom of a cliff face in 90 feet of water. The area, Mustafa said, looked as if it had been dynamited.

That night we dined in deep discouragement. The others wanted to leave as soon after sunup as we could, but Mustafa and I held out for one last day. Morning came—and passed in another round of fruitless dives. I was beginning to wonder if Kemâl had misled us, or if one of his divers had talked, and another boat had been there before us.

At lunch it was decided the *Vig* would weigh anchor that afternoon. Cape Gelidonya is hard to get to; I despaired of ever getting another chance to come back. Half an hour

Tranquil Kekova roadstead near Finike shelters *Little Vigilant*, the 70-foot auxiliary ketch that carried the author and his companions to the site of the Bronze Age wreck. Crewmen found a city of the dead—hundreds of limestone sarcophagi—on the distant slopes of the Turkish mainland.

before sailing time Mustafa and I made what we thought would be our last dive toward the rock. John Cochran and Susie Phipps also went down for a final look around—and to take pictures of Susie among the groupers.

We combed the labyrinth of formations along the ridge, Mustafa and I, parting seaweed and chipping off bits of rock, hoping against hope. Our reward: Nothing. Dejected, we rose to the surface.

But on board the *Vigilant*, the crew was gathered in a knot around John and Susie. There were shouts of exultation as we clambered to the deck. John was holding in his hand two hunks of bronze, covered with so much limestone concretion that at first glance they looked like shapeless lumps. Mr. Gültekin and I excitedly chipped off the limey crust—fairly easy to do when objects are fresh from the sea, but difficult after the crust gets dry and rock-hard.

Gradually the true shape of the pieces emerged. John had found spear points—unlike anything any of us had seen before, crudely made, with what archeologists call a shoe socket. Undoubtedly they were very old.

"There's a lot more down there like 'em," John said. "And a bunch of big flat pieces of metal, shaped like oxhides."

Ingots! Kefti ingots! Or would they turn out to be something else?

Stan Waterman checked the latest U. S. Navy diving tables that he had gotten through Luis Marden, writer and underwater photographer for the NATIONAL GEOGRAPHIC. As soon as Stan felt it safe, we dived again.

Copper Ingots Signal Victory

The wreck lay in a sandy-bottomed bowl formed by huge boulders, very near where Mustafa had found the discolored stone. Each of us had been within 20 feet of the site.

The ingots—dozens of them—lay heaped on the top of a rock that protruded from the sand, so solidly stuck together that they could be moved only after hours of prying with a crowbar. Between the ingots, under the sand, and under the surrounding ledges, were bronze tools.

When we pried an ingot from the top of the heap, we found under it a hollow, full of bits of wood preserved by the copper salts released in the slow corrosion of the metal bars. There were some crude pottery, bronze axes, picks, and spear points. And, most surprising of all, bits of rope made out of grass, or reed, the original twist still in it.

The way the ship sank was one of those things that happen once in 10,000 chances.

She must have dropped like a stone after gutting herself on an upthrust pinnacle. If she had drifted a few feet farther, she would have landed on the sandy bottom, to be covered and preserved—but probably never discovered by human eyes. Exposed on the rock, she was found, but the ravages of the sea and the centuries have left only bits of her for us to study.

Many of the bronze objects she carried are crudely made and have the look of trade goods—the same sort of things that were traded to North American Indians 150 years ago, or to African natives in recent times. Others, particularly some sword blades and double-headed axes, are beautifully fashioned. The wreck site is directly on the course for Greece, the Aegean Islands, or the western coast of Anatolia, from a starting point in Cyprus (map, page 688).

Relentless Current Plagues Divers

Discovery of the wreck scrapped plans for an afternoon departure. For two more days we dived from the *Vigilant*, under weather that gradually worsened. It was the season of the *meltem*, a steady northerly wind that sweeps the eastern Mediterranean. The seas surged through the channel between the two islands, and the current became so strong it was possible to get to the wreck only by going hand over hand down a rope we had attached to one of the ingots.

We all had moments of panic when our masks were nearly snatched off by the current. Twice divers were swept half a mile down the channel; it took three of us, rowing to exhaustion in relays, to get them back to the *Vig* in the dinghy.

But our notebooks were full of sketches of the wreck site, and we had taken samples of material from it. Further exploration really needed an expedition with special equipment and a stay of several months. We called a halt to our diving, and the *Vigilant* upped anchor for home.

We know that copper from Cyprus was exported in oxhide shapes, and that bars have been found in Sardinia and Mycenae from sites that date between 1600 and 1200 B.C. So we conclude that our bronze wreck has lain beneath the sea for 33 centuries or so—eight hundred years longer than any other wreck previously known.

Experts quickly confirmed our beliefs.

Dr. Rodney Young, head of the Department of Classical Archaeology at the University of Pennsylvania, pronounced the ingots "completely characteristic of the late Bronze Age." Dr. Erik Sjöqvist, Professor of Classical Archaeology in Princeton University's Department of Art and Archaeology, found pieces of a dagger and a spearhead to be typical of Cypriot armament of the 15th and 14th centuries B.C.

Wreck Yields Clues, Puzzles

Modern man knows tantalizingly little of the ships and commerce of the Bronze Age. Soon he shall know more—far more, we hope—for in another expedition soon we plan to study the ancient wreck off Cape Gelidonya in detail.

What sort of ship was she? What did she look like, and how did those ancient mariners sail her? For what strange tribesmen did she carry her trade goods? Were the copper ingots destined for a more advanced people after she had finished her coasting? Will chemical cleaning of delicate, still-unidentified lumps reveal silver and gold in a cargo that must have been worth a king's ransom three millenniums ago?

A thousand questions flood my mind impatiently as I await whatever answers may lie in 90 feet of water off the craggy Turkish coast.

Still, my impatience is tempered with gratitude. Except for a sea captain's chance remark, the questions might never have been asked at all.

Labyrinthine pinnacles and overhanging cliffs menaced this diver as she sought Bronze Age relics. So strong was the current that swimmers sometimes descended hand over hand on a rope tied to a copper ingot.





Sunrise silhouettes a sentinel in Brasília, newly created capital of Brazil. Pillars

METROPOLIS
MADE TO ORDER: **BRASÍLIA**

By HERNANE TAVARES DE SÁ

Illustrations by National Geographic photographer THOMAS J. ABERCROMBIE



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resembling paper cutouts dress the Alvorada Palace, futuristic home of Presidents

THE GOAL WAS SIMPLE, but magnificent: To plant in the midst of Brazil's trackless prairie a new, ultramodern city, capital of a nation of 65,000,000. The city's dual aim: To serve as a seat of government and as a magnet to draw a nation's people and energies away from the narrow, crowded coastal region first settled 400 years ago.

For Brazil's rich and untapped back country is one of the world's great remaining reservoirs of wealth, the slumbering heart of a continent that has experienced a surging boom during the past fifty years. Brasilia is a daring, yet confident gamble on a nation's and a continent's future.

The city's setting is a Federal District of 2,260 square miles, carved out of the

vast cattle-and-diamond State of Goiás. Several hundred miles south of the Amazon forests, it is not a steaming jungle capital. It sits on a 3,500-foot-high plateau, where the climate is invigorating. Noontime sun beats hard, but summer brings heavy rains, and the air is usually cool at night.

It was clear from the start that Brasília would be fantastically hard to build, for it lies far from any population center. An entire network of roads and rails would be needed to tie the city to the outside world. Machines, materials, architects, engineers, and workmen by the thousands would have to be transported, housed, fed, and paid.

This was the dream, and I have seen it come true.

The instrument was a government-owned company called La Companhia Urbanizadora da Nova Capital, long since shortened to Novacap. It bypassed bureaucracy, and it ensured speed. And the job had to be done

The Author: Dr. Hernane Tavares de Sá edits the Brazilian news weekly, *Visão*. Long a champion of Brazil's new capital, he recently received the Maria Moors Cabot Award from Columbia University for "advancement of international friendship in the Americas."

Members of The Society will recall his colorful article, "Spectacular Rio de Janeiro" in the March, 1955, NATIONAL GEOGRAPHIC.

fast, so that there would be no turning back.

As you read these words, the Government of Brazil will just have moved to Brasília. On April 21 the city will have become the capital of this vast young nation.

Thus comes to a successful conclusion a debate that began in 1789. For the country was still a colony when the romantic 18th-century revolutionaries—whose leader carried around with him a copy of the two-year-old Constitution of the United States—proposed that a new capital city be erected in the empty space of the Central Plateau as a beacon for settlement and development of the hinterland.

Brazil finally won her independence in 1822, and for more than a century successive governments pledged themselves to move the capital; even the name Brasília was proposed. Yet nothing happened except talk.

Then Juscelino Kubitschek (page 720), the President who took office in 1956, announced that he would carry out his campaign promise. And in less than three years JK, as Brazilians call him, had the site chosen, the master plan selected, the city under way, and the government ready to move.

Of course, not all Brasília has been erected in less than three years. No amount of human endeavor could have planted, in that short time, a community of half a million—the eventual population planned for the city.

Nor could the multitude of agencies that make up a modern government all move simultaneously 600 miles from Rio de Janeiro. Ready to move on April 21 were the two Houses of Congress, the higher echelons of the executive branch, and the Supreme Court.

The city was set to receive 3,000 government employees who, with their families, comprised 15,000 people. Their apartment homes were completed barely on time.

But these 15,000 are only the advance



Sightseers on a Spiky Sculpture Suggest Children on a Jungle Gym

Brazil's best sculptors, artists, and muralists collaborated in construction of the capital. This angular bronze, shaped by Maria Martins, rises from a mall near the Alvorada Palace. Guards periodically shoo climbers off the abstract figure.

Inland capital carved from a wilderness occupies a 3,500-foot-high plateau 600 miles northwest of Rio de Janeiro, the former capital. New highways dedicated in February link Brasília with Rio and Belém.



Starkly Styled in Concrete and Glass,
Superblock Apartments Stand on Stilts

Each superblock, a group of apartment houses for hundreds of families, comes with primary school and shops. Taken from a helicopter, this

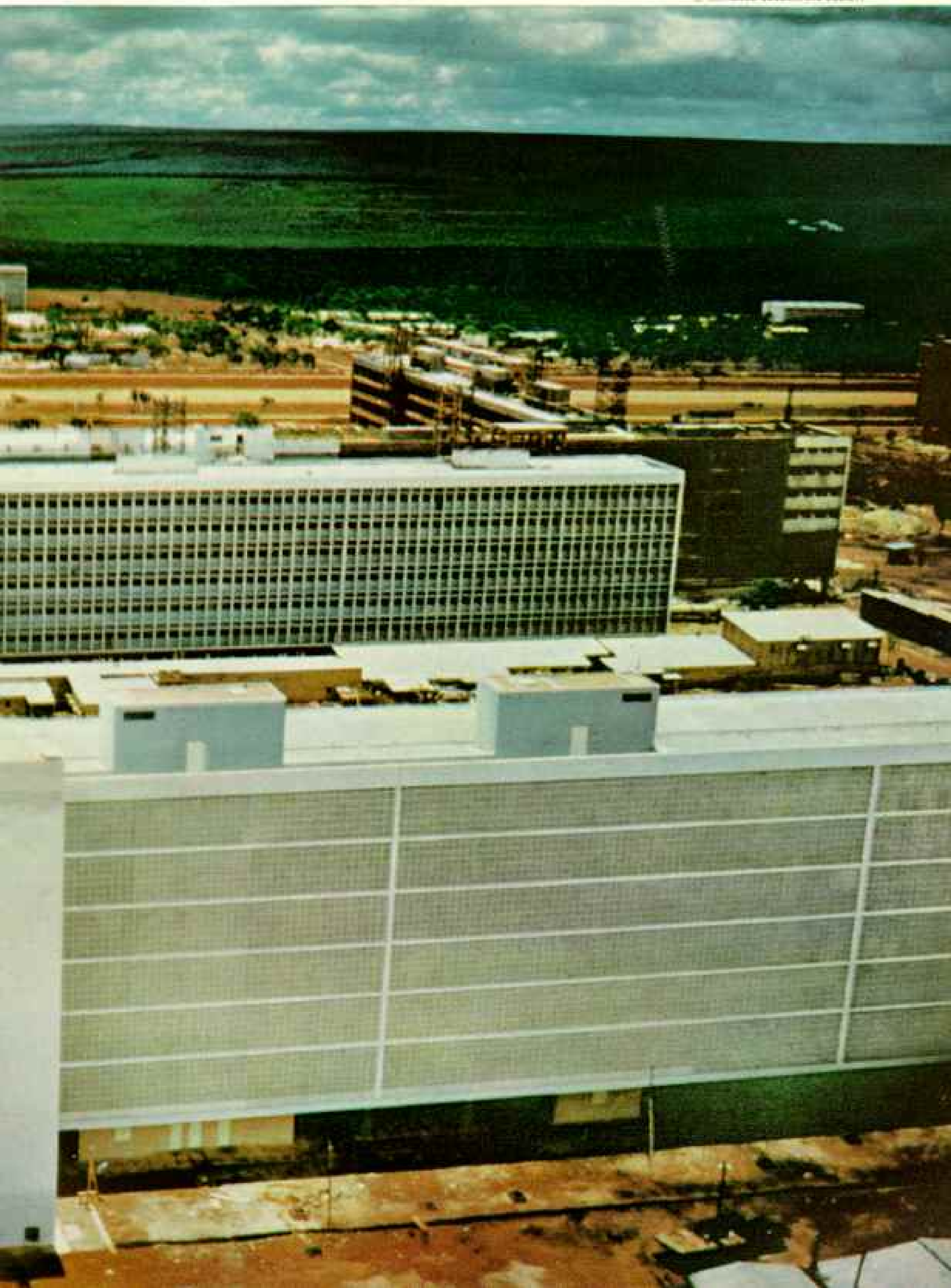


view shows parts of several blocks near the heart of Brasilia. Vertical shafts attached to the buildings hold elevators and stairways. Glass block

faces some walls; perforations in others catch the breeze. After landscaping, belts of trees will surround the six-story multiple dwellings.

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guard. The moving has just begun. It will continue for years, keeping pace with the builders, new departments moving as accommodations are readied for them.

I have found that airports are pretty much alike in every country. People such as foreign correspondents, whose profession makes of them constant travelers, complain of their monotony and sameness.

Settlers Met at the Airport

Not so the airport of Brasília. In the early days it had a mood and pace all its own. In good part this was the doing of the "Association of Airport Habitues," as they liked to call themselves.

Many of Brasília's oldest settlers showed up at the airport at least once a day. The bustling, shedlike structure was a clearinghouse for local news and choice bits of gossip. It was also the center of communication with the outside world, for mail, telegraph, and long-distance telephone services were just beginning to work. Many a pilot and passenger of the frequent daily flights that connect Brasília with Rio and São Paulo doubled as cour-

ier. Everything from birthday presents to blueprints has traveled via the courier route. Once, when a meat shortage emptied Rio's butcher shops, passengers carried back steaks from Brasília's plentiful supply.

Built in nine months, the airport was the first indispensable step toward bringing the city into being. Even the runway asphalt had to be flown in. When the airport opened on April 2, 1957, with a mile-and-a-half runway for jetliners, it put the yet unborn capital only a couple of hours away from Rio and São Paulo. While the staggering job of completing road and rail links with the rest of the country goes on, the airport still remains a vital tie.

Flying to Brasília from Rio or São Paulo is almost like boarding a local bus. Many passengers make no reservations, but simply go to the airport and hop on the first plane with an available seat.

When I first visited Brasília, almost every incoming passenger was connected with the building of the city. But in recent months representatives of private enterprise have grown into a sizable contingent.





EQUATORIAL AND HIGH-SPEED EXOTICISM (BOLIVIA) © NATIONAL GEOGRAPHIC SOCIETY

Woman With a Man-sized Job Bosses Work on a Traffic Cloverleaf

Eleonora Quadros, who supervises a construction firm (page 722), checks plans for an interchange. Snarling earthmovers gouge the red soil, carving out an ultramodern network of streets and boulevards. Underpasses and overpasses at most intersections will take the place of traffic lights and stop signs.

Workman shoulders shovel after a stint on one of the apartment houses. To build Brasília from scratch, the government formed a company known as Novacap, from the Portuguese *nova capital*—new capital. Federal expenses will exceed \$400,000,000. Novacap hopes to defray the city's cost by selling land for farms and lots.



Muddy boots symbolize the city's pioneer spirit. Rain turns the site into a morass; dry days smother the city with clouds of red dust. Known as "buffalo boots," this popular type is made with the leather's rough surface facing out.



Strollers skirt a puddle in Cidade Livre. Caio Caiuby (right), journalist, contractor, and co-owner of the first apartment house built in Brasília by private enterprise, rolls a cigarette. His companion, Leopoldina Eugenia de Moraes, opened the temporary town's second law office.

Jeep, Bus, and a Horse-drawn Taxi Ply a Dirt Street in Free Town

Shacks and shops for Brasília's workers sprang up haphazardly on a suburban tract. Planners called the settlement Núcleo Bandeirante—Pioneer Center. Residents instead adopted Cidade Livre—Free Town—from the fact that anyone at the time could obtain land tax-free for four years.

Built entirely of wood, the town looks like the set of a TV Western but serves a population of 45,000.

Cidade Livre will be destroyed once Brasília is built. Says National Geographic photographer Abercrombie: "The task will not be difficult. One match would do it."

Brasília's real-estate boom is going full blast, as one can see in the advertising pages of newspapers in Rio and São Paulo. Novacap maintains that Brasília will be "self-liquidating"—the vast sums spent to build it will be paid back through the sale of land in the Federal District.

\$450,000,000 Bet on a Boom

And in fact this seems to be working out. The company has already begun to reimburse the treasury. This brings us to a question often asked: How much will Brasília cost?

Estimates vary widely, but the best survey available puts the total cost at about 250 mil-



lion dollars for the first phase, which ended April 21. Another 200 million will probably be spent before the city is completed. These sums, of course, cover only expenses of the federal government. Since private enterprise is just beginning to invest on a large scale, its share cannot yet be estimated.

The advance guard chosen to move to Brasília included the 389 Senators and Representatives with a clerical staff of 932. The President's staff numbered 256, and each Cabinet Minister's 50 or 100—key personnel only. A few vital specialists were also picked, among them linotypists and printers, for no government act can be enforced until it has appeared

in proper form in the daily federal gazette.

What sort of place do these newcomers find on arrival? The answers are just now becoming clear. Food supply, the housewife's first demand, is met by the neighboring farming community of Ceres and rural areas surrounding Anápolis and Goiânia, two near-by towns. There are cattle ranches all through southern Goiás, and farmers of Japanese descent have moved in close to Brasília to raise vegetables. One basic food still short is fresh milk.

On arrival, the housewife is able to switch on her refrigerator and other kitchen appliances, for a hydroelectric station at Dourada Falls, 230 miles away, produces enough power



Swooping Roof Lends Airy Grace to Our Lady of Fatima Chapel

Plans for the chapel came from the drawing board of Oscar Niemeyer, Brazilian architect who helped design the United Nations headquarters in New York. A lover of the limpid curve, Mr. Niemeyer seems to divorce his buildings from the ground, giving them an appearance of weightlessness.

Visiting priests inspect the chapel. Loudspeakers on the distant tower broadcast carillon music.

Checkerboard tiles—white pigeons and dark squares—sheathe the chapel's outer walls. Athos Bulcão created the design.



for 80,000 people. Her radio can pick up the local broadcasting station, and soon television programs will be beamed in by microwave transmission.

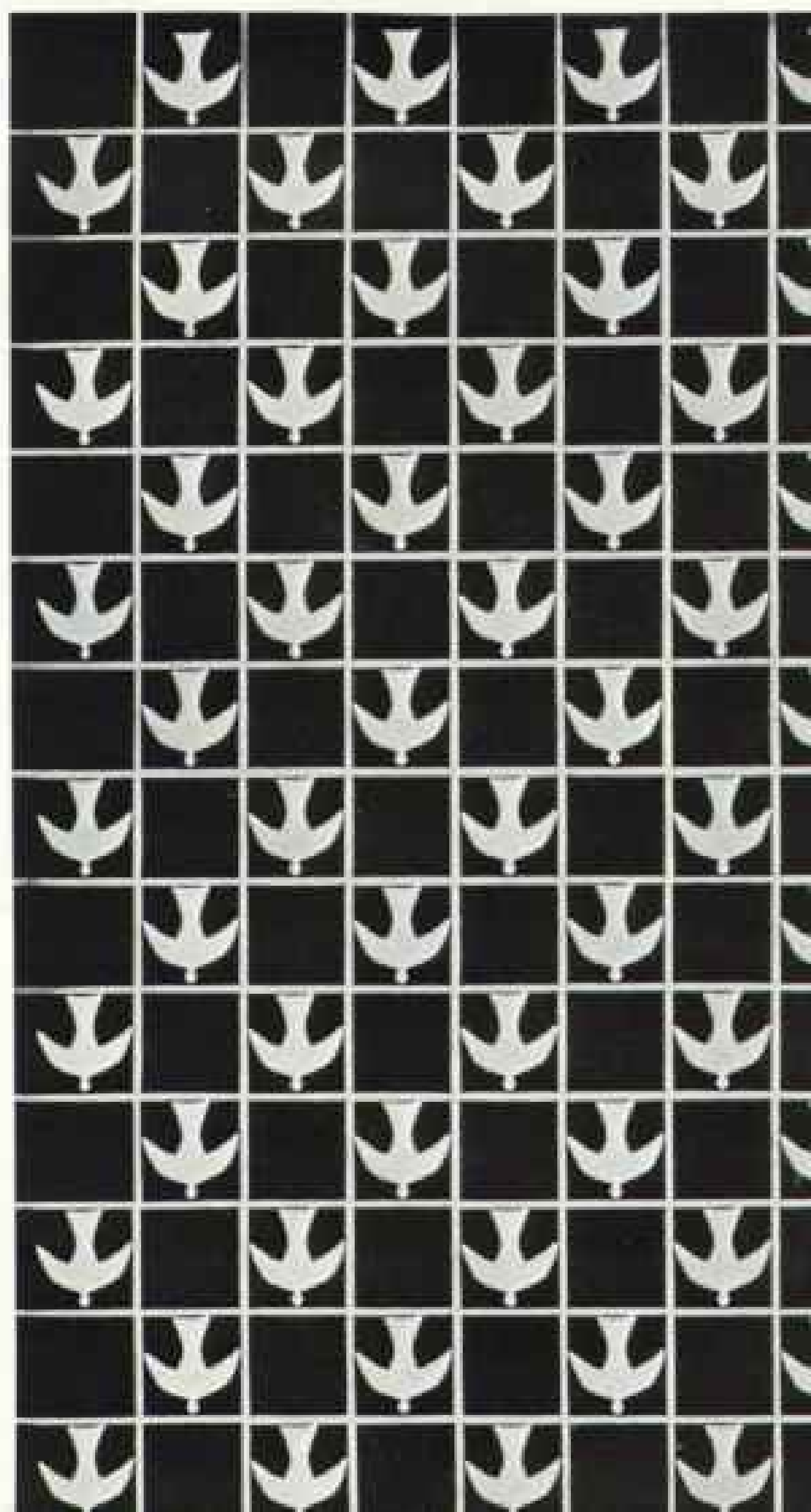
The kitchen stove operates on bottled gas. Water is abundant and safe—a welcome change from Rio where, until recently, every housewife kept her bathtub full day and night against inevitable periods when faucets ran dry. Garbage collection, another sore spot in the old capital, has been operating in Brasilia for several months. The sewerage system is completed for the city's inhabited sections.

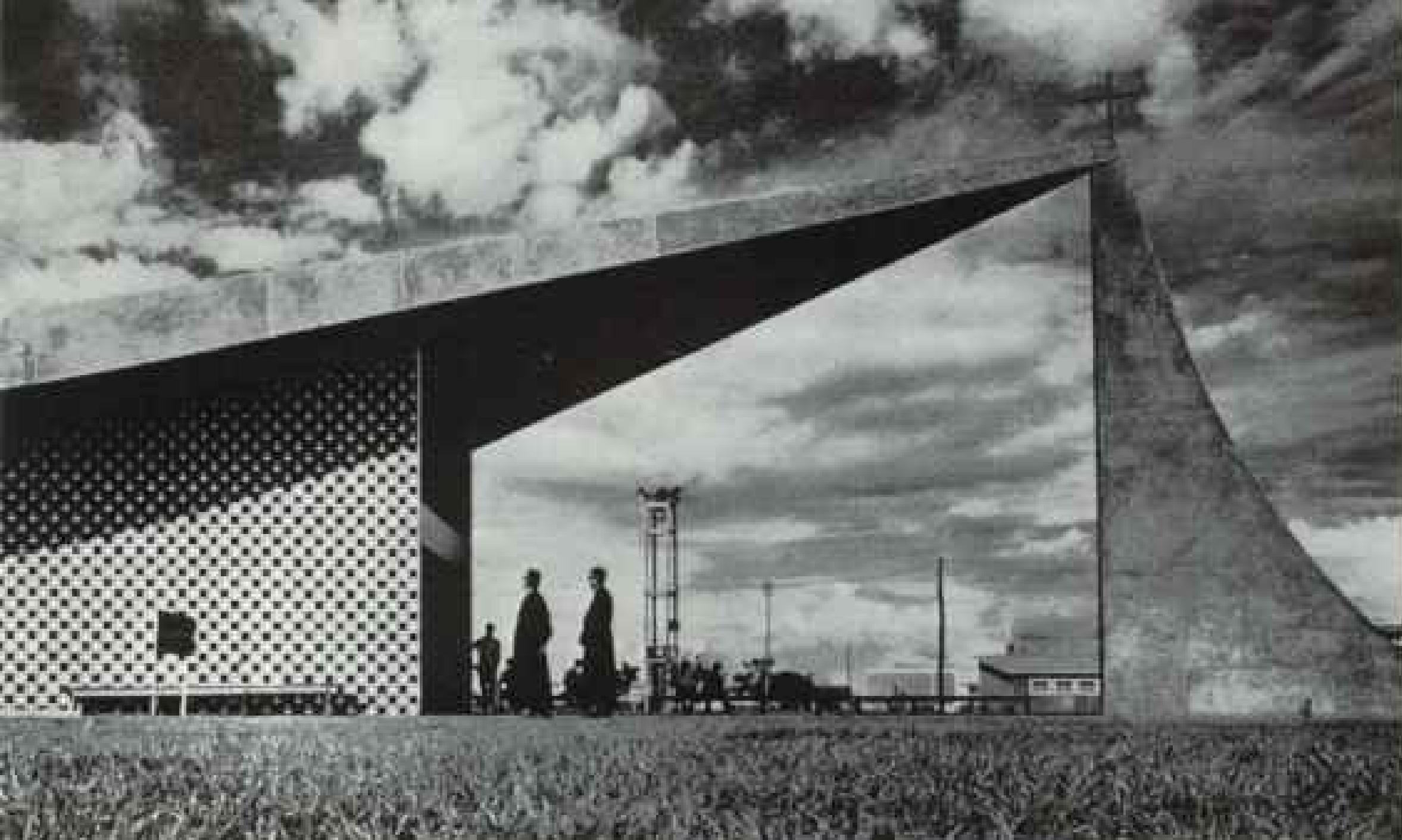
Free Town Was Built to Tear Down

The brand-new apartments are, of course, going through a shakedown period. As in any new community, need for minor repairs and adjustments keeps cropping up. So our housewife tries to locate these modest but indispensable contributors to the well-being of any city—the electrician, the plumber, the painter, the upholsterer.

All these craftsmen, in fact, have been around a long time. But not in Brasilia. They set up shop in Cidade Livre—Free Town—a community seven miles away (page 712).

Cidade Livre is a Far West town, 20th-century style, and its trademark is reddish dust, which, as I discovered on my first visit, turns into sticky brick-colored mud when it rains. I quickly learned why almost everybody wears boots: It's a necessity, not an affectation. Most are manufactured locally. The fancy kind known as "buffalo" are made of a special leather flamboyant in color. Boots, wide-





brimmed hats, unpaved streets, wooden-frame rickety buildings, and board sidewalks are all reminiscent of a cattle town in Arizona or Wyoming when the West was being opened.

Free Town was not built to last. Its function is to provide a base for the men and women building Brasília. No permanent structures were allowed, for every building is to be torn down; business permits were granted for only a four-year period. On the other hand, no federal taxes were to be levied during these years—which gave origin to the name.

As Busy at Midnight as at Noon

Free Town wakes up very early in the morning and never really seems to go to sleep. During the day its banks, airline offices, and innumerable small shops are packed with customers. Radios blare in the dusty streets; a continuous stream of trucks, buses, jeeps, and even some horse-drawn carts adds to the bustle and good-natured confusion.

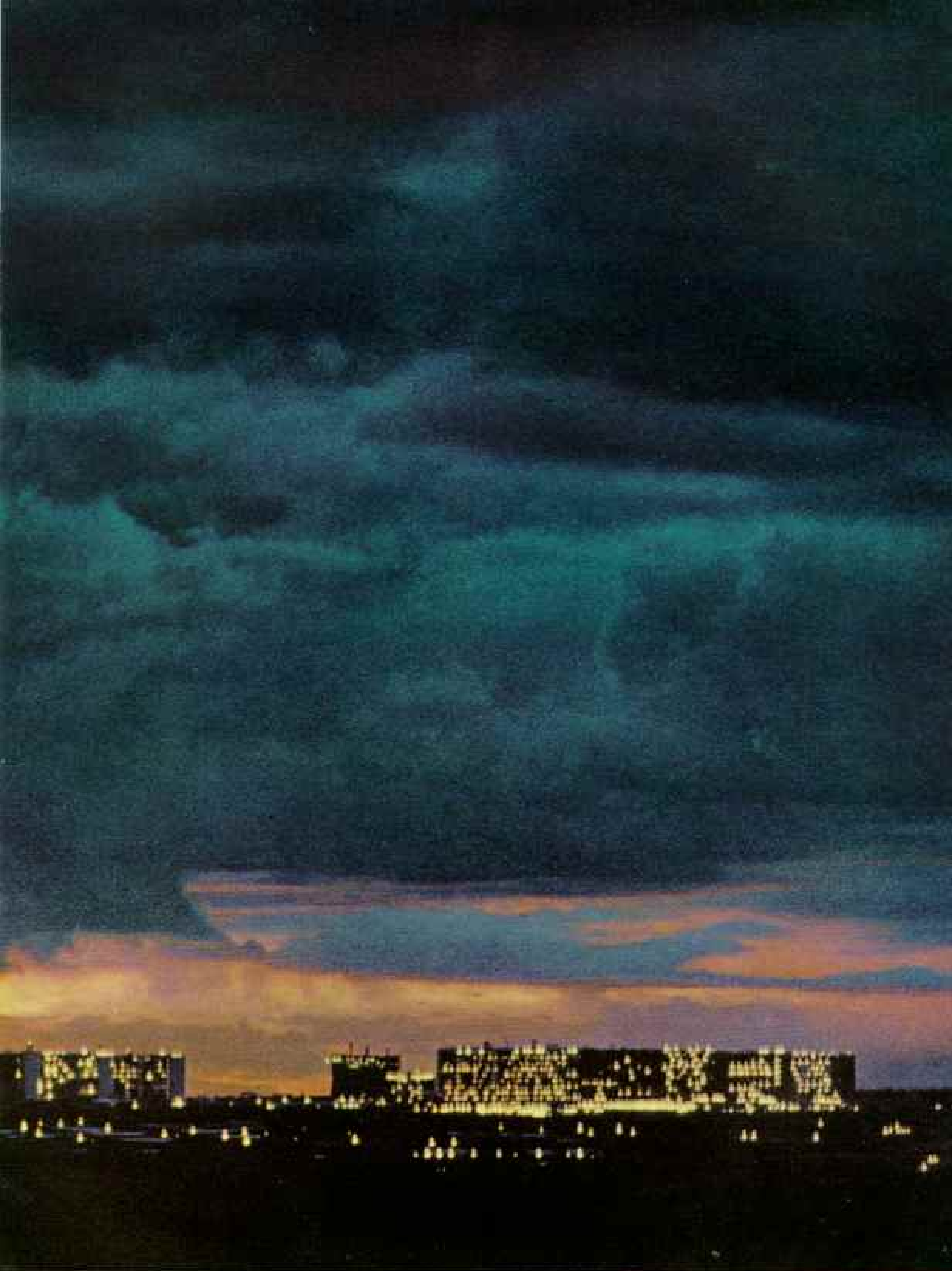
As night falls, people throng back to the dozens of small hotels and boardinghouses for the evening meal. Those who want a respite from the standard rice and black beans may repair to the Brahma, a restaurant where the *porco com farofa* (spicy roast pork with manioc flour) tastes so good that it attracts many away from the sleek comforts of the Brasília Palace Hotel in the city proper.

I have eaten Neapolitan pizzas at two different Free Town restaurants and authentic schnitzel at Chez Willy (run by the former owner of the Zillertal, São Paulo's huge Austrian restaurant). For dessert one goes to an



Night-shift Lights Spangle Steel Skeletons;
Darkling Clouds Squeeze the Setting Sun

Two relays of workmen raced against time to meet construction deadlines. Supreme Court justices, lawmakers, and some 3,000 key officials opened



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offices here in April, just three years after work began. Ultimately the city expects a population of 300,000. This panorama, seen from the top

of the Brasilia Palace Hotel, shows the 28-story congressional office building at left and the 10-story homes of government ministries.



Towers of Congress Probe the Sky Amid a Blaze of Lights

Congress, Supreme Court, and the executive office building occupy the corners of the triangular Plaza of the Three Powers. Senators meet beneath the dome at right. Inverted dome at left, resembling a kettle-drum balanced on its round bottom, houses the Chamber of Deputies. The twin towers, still under construction in late December, 1959, provide legislative offices.

Workmen clear litter from a mall.

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Architectural arbiter of the new capital, Oscar Niemeyer (foreground) designed the federal city's public buildings. He approves all plans for private structures.

Italian bar, where hard liquor and a variety of sherbets from tropical fruits are served side by side.

In the evening, movies are shown in a great barn of a building. When the film is a musical, the erratic local current does strange things to the singing on the VistaVision screen. But usually it is a Western, and the shooting is not noticeably affected.

Incidentally, in the early days there was a certain amount of real shooting and stabbing in the streets and bars of Free Town. But since a police force was set up, the situation has improved. No one is allowed to carry a gun, and at the airport and the central bus station the police inspect packages and brief cases of incoming passengers to make sure no firearms are brought in.

Sailors Ready Before Lake Had Water

On Saturday nights there is dancing at the Paranoá Club, founded by higher ranking employees of Novacap. For yachtsmen transferred 600 miles inland, there are even sailing clubs, the first one having been founded before Brasilia's 19-mile-long artificial lake had a single drop of water. Fishing expeditions are also organized over the weekends.

But for Novacap engineers and prosperous businessmen of Free Town, the idea of a real weekend is to take a room at the Brasilia Palace Hotel and relax in the luxurious surroundings. Nowadays, however, they have to

make reservations many weeks in advance.

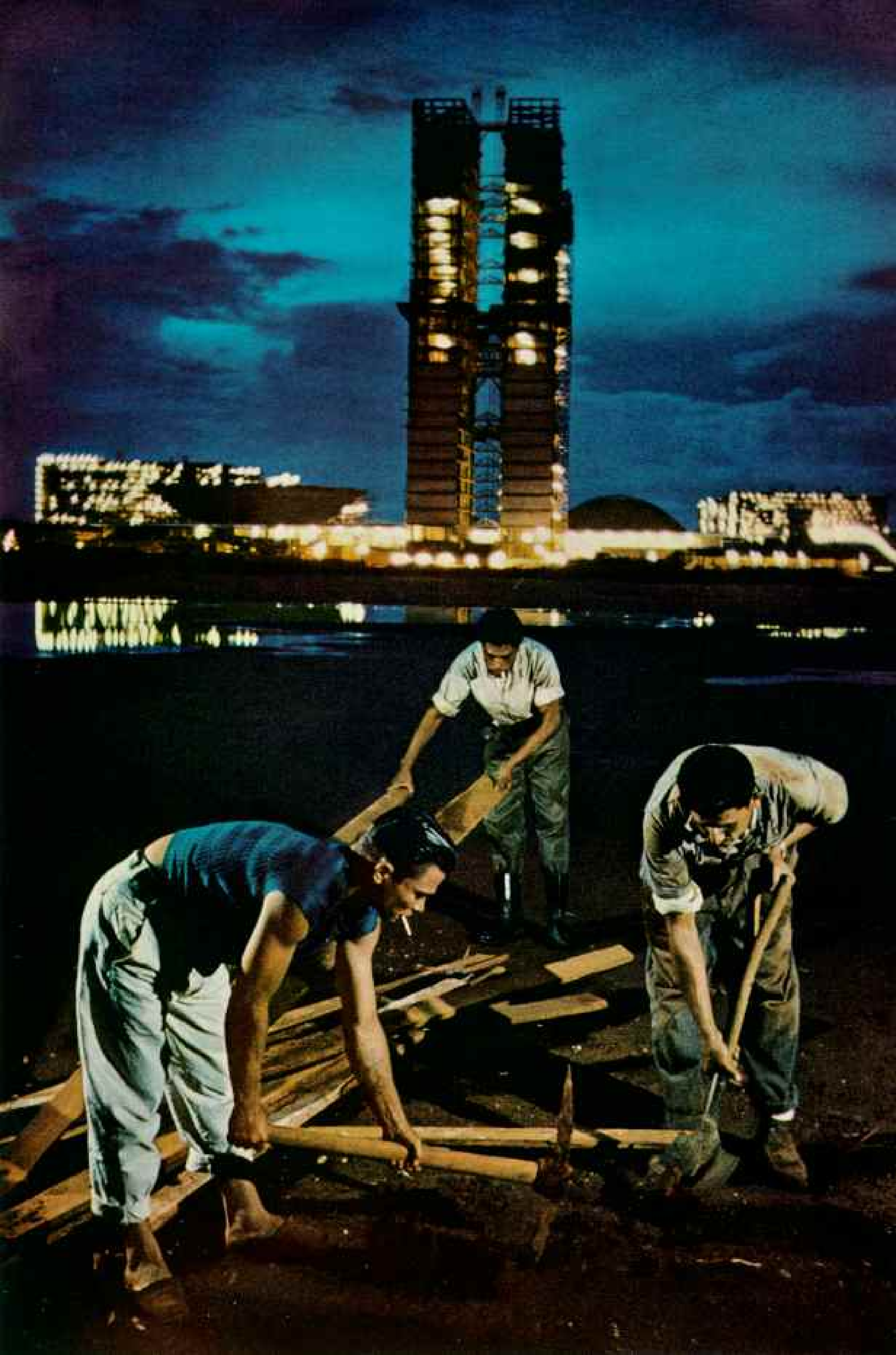
Strictly speaking, the only citizens of Brasilia itself are those 15,000 government employees and their families selected for the initial move. But for the whole Federal District, including Free Town, near-by workers' camps, and other small settlements and farms, the population has already reached 70,000.

Who are these people—the ones who actually built Brasilia? Most are *candangos*, a word coined for the migrant to Brasilia. A typical *candango* was a forlorn, almost pathetic figure, undernourished and underprivileged, living at a bare subsistence level in rural Minas Gerais, a neighboring state, or in one of the remote northeastern states. It took him days in a ramshackle bus or weeks trudging on foot to reach Brasilia.

Yet these men erected a gleaming new city in record time. Many of them have become skilled tractor drivers, mechanics, electricians. And all of them are today healthy, well fed, and imbued with an immense pride in having built Brasilia (page 710 and opposite).

To Novacap should go a major part of the credit. The company organized a reception and selection service for the migrant workers and a medical organization to bring them back to health. Then they were assigned living quarters in a camp with plentiful meals, movies, and a weekly drive to Free Town.

The new Federal District was practically womanless in the early days, and it is still





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Shaped like a swept-wing plane, Brasilia rises on the shore of a man-made lake (right). Suggesting a fuselage, the monumental axis bisects the city for seven miles, from golf club to railroad station. Homes and superblocs line the curved wings, an eight-mile-long residential arc. Government buildings and the business district take

shape around the central mall above, which stretches nearly two miles from the Plaza of the Three Powers to the radio-TV tower. President Juscelino Kubitschek (inset) realized Brazil's century-old dream—moving the capital inland. He will occupy the palace less than a year because the chief of state may not succeed himself.



predominantly a man's place. Even so, a few women did men's jobs when the going was really rough. One of them was attractive Eleonora Quadros.

Last November President Kubitschek announced that he would land by helicopter to inspect one of the social security institutes, and proceed by jeep to another. Actually, there was no road in between, but within 24 hours one was laid. Eleonora Quadros, a society girl from Rio, got the job done.

Nora, as she is known, became a familiar figure in her jeep as she sped over the roads and trails in the Federal District, helping to manage her father's construction firm. She sometimes had 400 workers under her orders.

Her pioneering days are ending. Nora is engaged to a young engineer—and now must ask her fiancé's permission even to allow her picture to be taken (page 711).

In everyone's mind, Brasilia is closely associated with Juscelino Kubitschek. It was the President's energy and dogged persistence that pushed it to realization.

In the earliest stages, political and physical obstacles combined to threaten the capital's completion. During these months Kubitschek made frequent visits to the site—so frequent, in fact, that a group of friends built him a two-story frame house near by. They named it "Little Catete" after the presidential palace in Rio.

A few months ago, with Brasilia's future assured and the official presidential residence, the Alvorada (Dawn) Palace, completed, Little Catete was designated as a national monument.

Contest Yields Blueprint for Brasilia

The general plan for the capital was chosen in a competition open to all architects in Brazil. The selection committee included architects and city planners from England, France, and the United States, as well as Brazil. A large cash prize was offered, and the country's leading architects spent months preparing elaborate projects and models.

On the day of decision, the judges unanimously awarded first prize to an architect who had entered the contest only reluctantly and at the very last moment. His project, far from being lavishly presented, represented an investment of the 25 cents he gave an office boy to buy paper and pencils.

This man was Lúcio Costa, a leader among Brazil's architects, known for his brilliance

and his intransigent modesty. Perhaps the most famous example of the latter occurred in 1939, when Costa's plan was chosen for Brazil's pavilion at the New York World's Fair.

After the award had been made, Costa decided that a young disciple, Oscar Niemeyer, had sketched a better project. At Costa's insistence, the Brazilian Government built the pavilion from Niemeyer's sketch.

This time there was no question in anyone's mind that Costa's project was the outstanding one. And, in turn, Niemeyer was charged by President Kubitschek with designing the buildings to grace Costa's city.

Plan Shapes a City of Tomorrow

By now Costa's design has been hailed by specialists all over the world as an innovation in city planning. Imaginative, functional yet basically simple, it sets the city along two axes that cross at a right angle, one of them curved like a wing, so that seen from above Brasilia reminds you of an airplane (painting, preceding page).

Along the "fuselage" axis will be ranged the government buildings. This federal row ends in a vast triangular esplanade, the Plaza of the Three Powers, where stand the buildings of Congress, the Supreme Court, and the executive offices (page 719).

Along the curved "wings" there will ultimately be more than 100 superblocks. Most of these comprise 10 to 16 apartment buildings six stories high. Surrounded by playgrounds and gardens, the superblocks will be screened by trees. And the hundreds of families living in each will have their own primary school and stores (page 708).

In addition, nearly a thousand houses have already been built, and more are planned, but the majority of government employees will live in apartments. High officials and the wealthy are expected to build homes in the estates quarter, overlooking the lake.

Where the axes cross will be grouped the downtown sectors that make a modern city: the hotels and the shopping, banking, cultural, and recreation districts.

There will be no traffic jams at the heart of the city, thanks to spacious parking facilities. All through Brasilia, in fact, underpasses and overpasses crisscross, so that there is no need for traffic lights on main arteries.

What will happen to Rio de Janeiro? Making fun of their plight, for the last year



HIGH SPEED EPYCHROMA (EZYVEX) AND BICHROMA BY NATIONAL GEOGRAPHIC PHOTOGRAPHER DEAN CONRAD © N.G.S.

Brasilia's Builders Present the City's Key to a Distinguished Visitor

An honor guard salutes Mr. Eisenhower at Brasilia, first stop on his South America tour in February. Smiling broadly, he accepts the key from Brazil's President Kubitschek (right) and Israel Pinheiro, head of Novacap, the state-owned company charged with building the new city. Raul de Vincenzi (left), Brazil's chief of protocol, adds his greeting. Flag-waving schoolgirls (below) cheer the President on his arrival.

723





HUBERTO FRACCIANO

Newcomers set up housekeeping as Brasilia comes to life. Their spacious flat overlooks an unfinished apartment building. Planners predict some 10,000 government workers will have moved to the inland capital by the end of this year.

irrepressible *cariocas* have been calling their beloved city Velhacap, an abbreviation for "old capital."

In the first place, Rio will cease to be the capital of Brazil only gradually. Once the core of the government has been moved, there is no further need to hurry.

Rio's Light Will Not Be Dimmed

Actually, I believe that during the next few years the country will have, in effect, two capitals, and key officials will shuttle back and forth. But even when Brasilia assumes its full status, it will not necessarily mean a loss of importance for Rio.

In fact, with 3,000,000 people crowded be-

tween the mountains and the sea, Rio has become impossibly congested. Moving the government will make available desperately needed downtown office space, and private firms are already bidding for this.

In a larger sense, Rio will never cease to be a capital. A tangle of factories and assembly plants, a distribution center and transportation terminal, the city will remain the country's cultural and entertainment heart and its main tourist attraction.

Thus Brazil has given itself a new capital without giving up the old one. In the process, the nation has gained a fierce pride in its capacity to make its slogan "country of the future" come true in the present.



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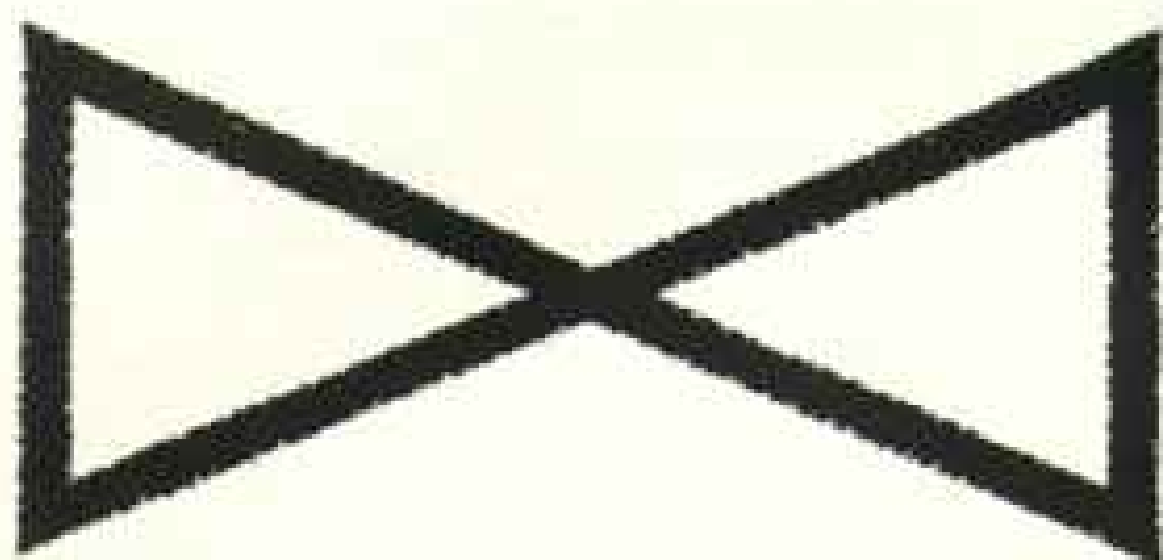
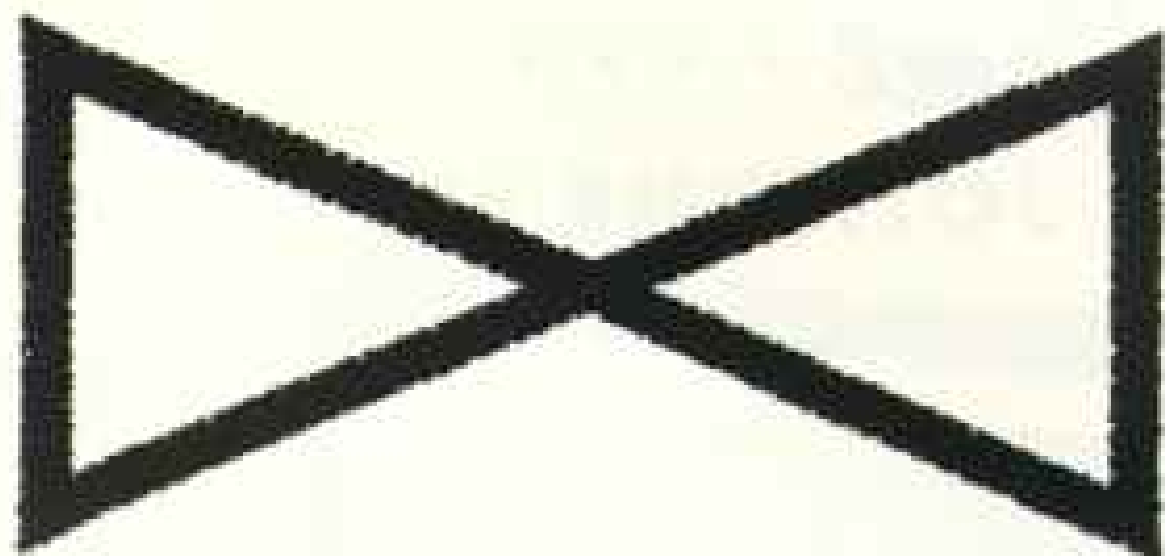
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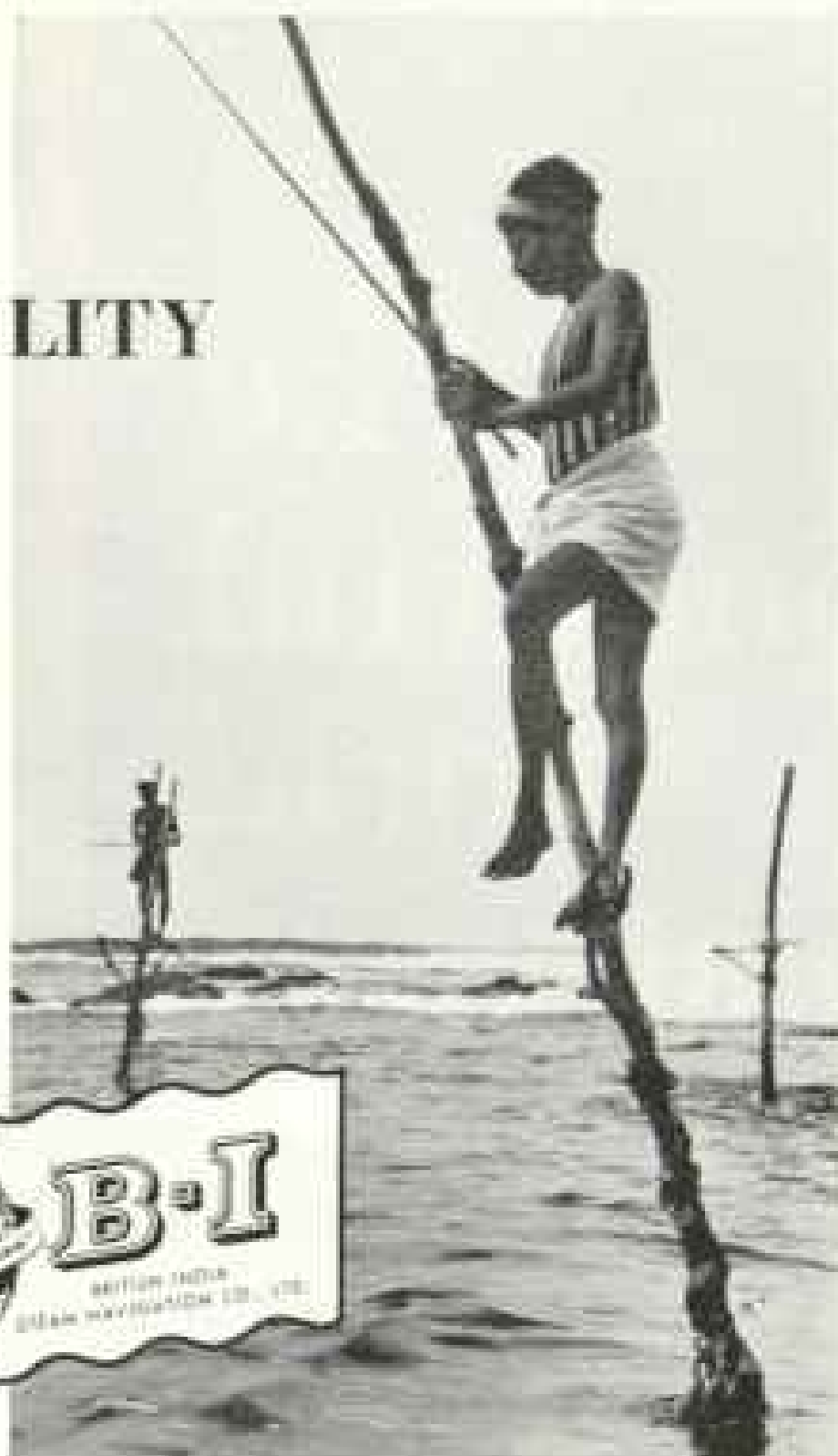
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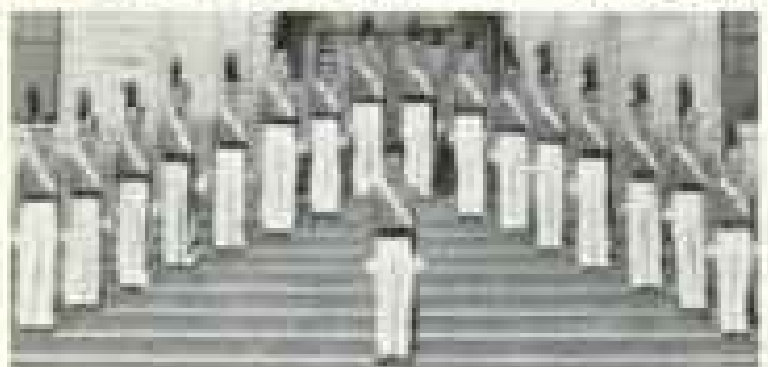
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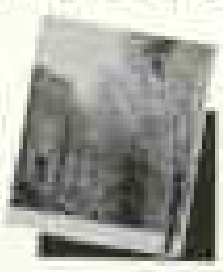
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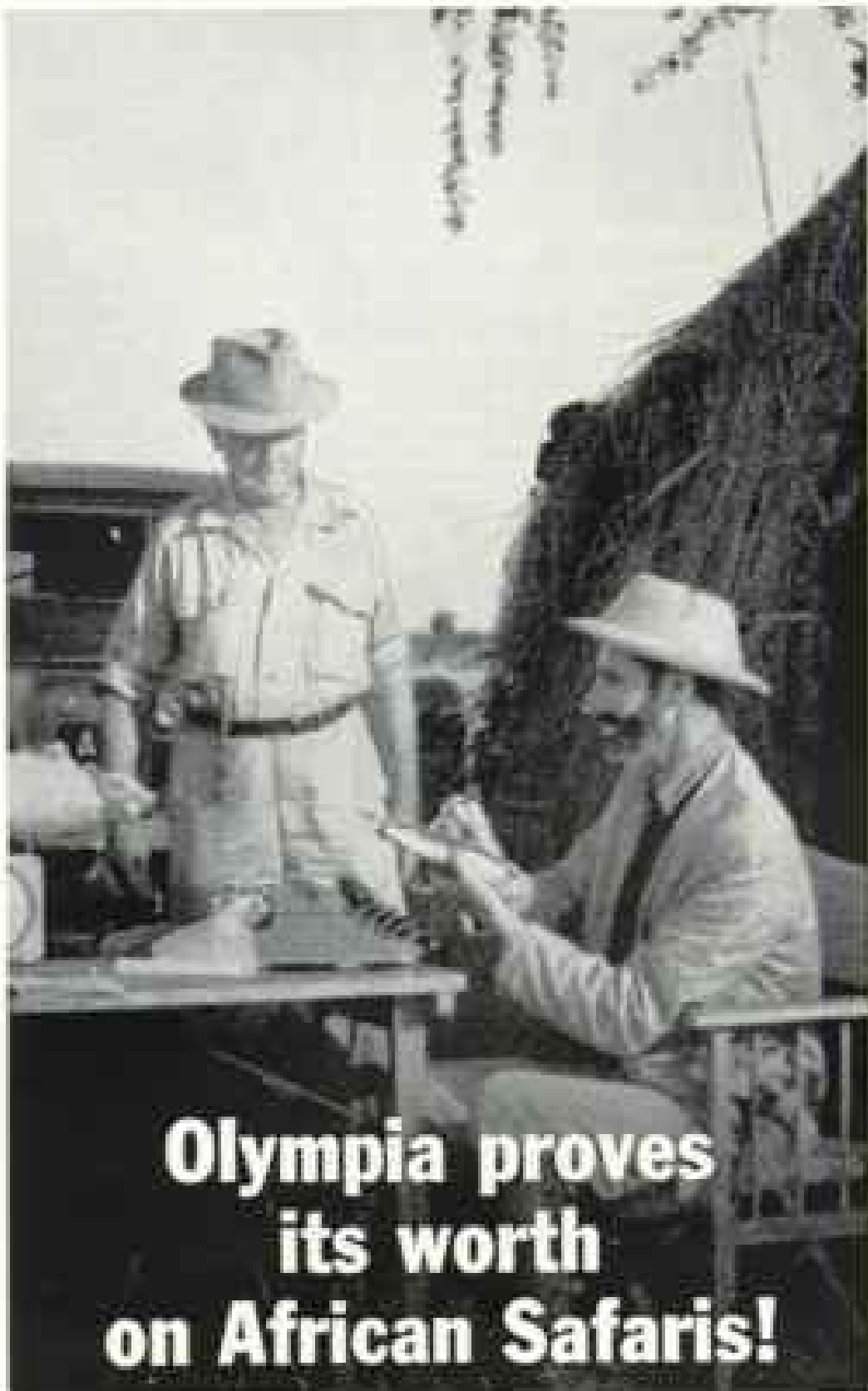
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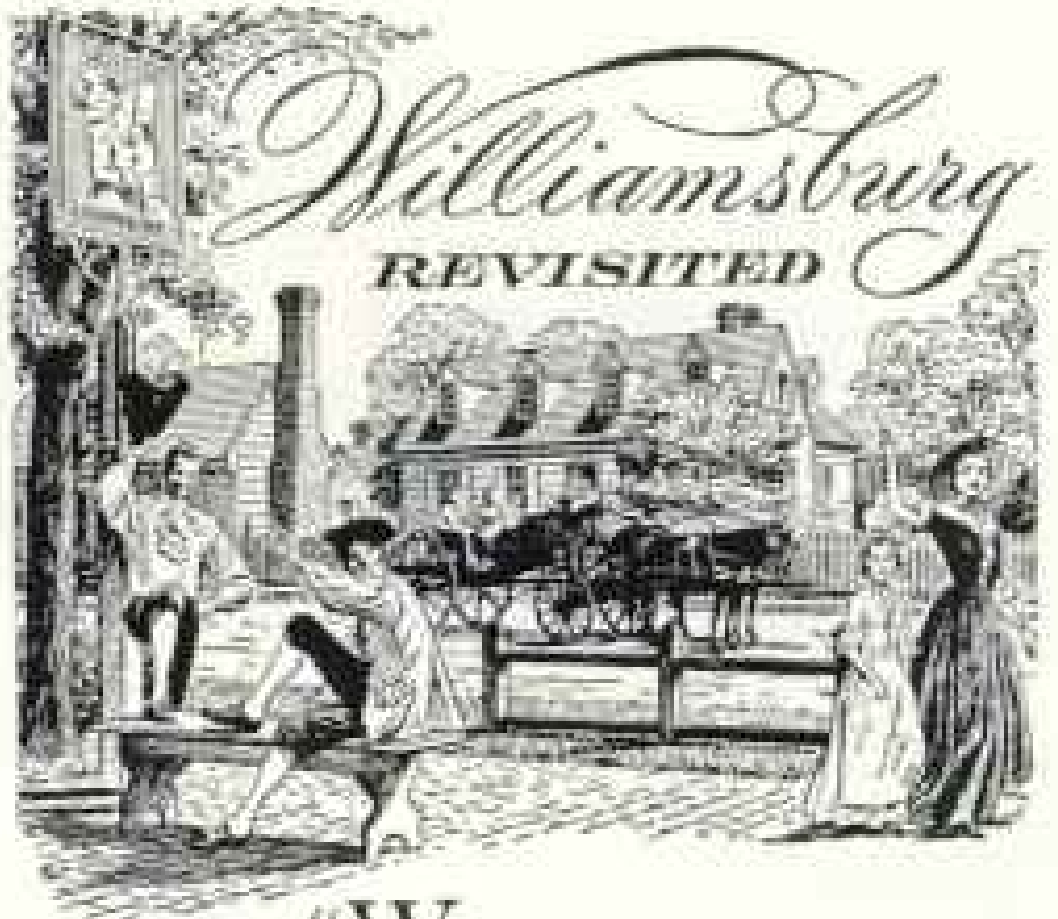
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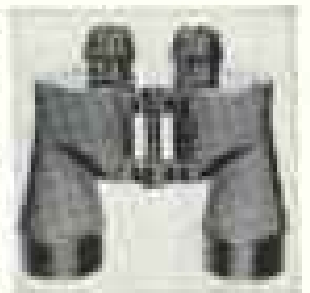
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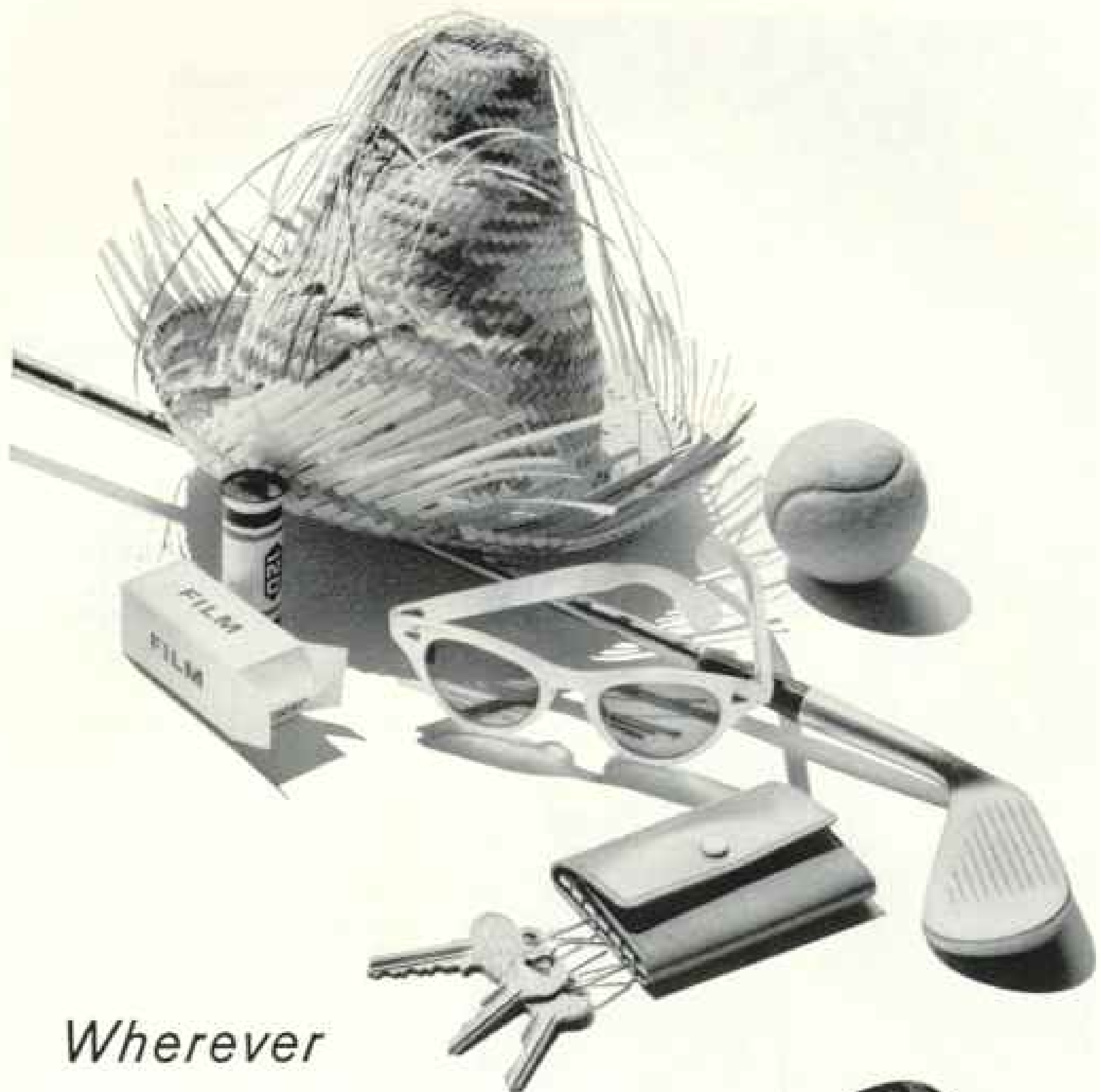
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