

VOLUME LXXXIX

NUMBER FOUR

THE NATIONAL GEOGRAPHIC MAGAZINE

APRIL, 1946

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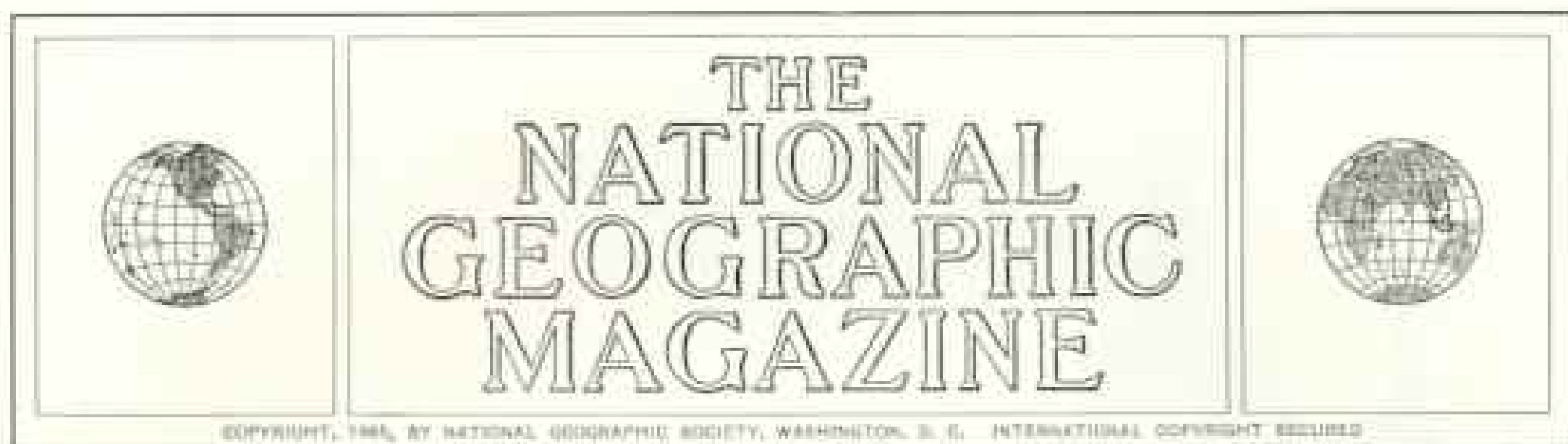
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Thirty-two Pages of Illustrations in Color

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D.C.

\$4.00 A YEAR

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A Texan Teaches American History at Cambridge University

BY J. FRANK DOBIE

With Illustrations by Staff Photographer B. Anthony Stewart

I LOOKED at the map and saw that Cambridge is some fifty miles northeast of London. My impulse was to accept the invitation before the dew dried. My brain questioned.

The invitation was to be visiting professor of American History in Cambridge University for one year.* The course in Life and Literature of the Southwest that I have been teaching at the University of Texas for years entails some knowledge of the history of the southern and western parts of America especially. I have also written some books connected with the life of those regions.

But my historical information has always been stronger on cows and coyotes than on constitutions. My brain was uneasy.

Cambridge University waited five hundred years after Chaucer wrote and three hundred years after Shakespeare before her curriculum gave English literature equal status with Greek and Latin.

She was becoming almost impetuous when in the fall of 1942 she instituted a professorship in American History.

Henry Steele Commager, of Columbia University in New York, went over and laid the groundwork for courses in the subject. Upon returning to America early the next year, he conveyed the invitation to me to succeed him.

What Cambridge needed, he said, was an American to explain the U. S. A. to undergraduates, mostly cadets, not specialists.

I wanted to get as close to the war as I could. It had been my war since the Germans set out in 1914, and then renewed their effort

in 1939, to destroy the civilization imbedded in the English language.

It has been my conviction that civilization, freedom, and good ways of life in America and elsewhere depend upon cooperation between the English-speaking democracies. I thought I might contribute something toward making some citizens of the two chief English-speaking nations understand each other better.

Literature Reflects a Way of Life

I had never been to England, but for the better part of my life I have been an eager reader of English literature, especially poetry, biography, and essays. The spirit and manners of any people are expressed in their literature. I did not expect to feel myself an utter stranger in England.

One September day I told my home at Austin, Texas, goodbye. A few days later I flew over the ocean without seeing it, and realized again the distinction between transit and travel. (Riding a mule, accompanied by another mule carrying bed and grub, through the mountains of Mexico is my idea of travel.)

It was dark when I got to London, and London was darker than a stack of black cats. A hotel man who did not have a room made one for me.

The next morning I sent a cablegram and a telegram. The cable was to my wife back in Texas. It said, "Ate a bun for breakfast."

I took it that she would know the bun was

* See "Within the Halls of Cambridge," by Philip Broad, NATIONAL GEOGRAPHIC MAGAZINE, September, 1936.



The Provost Points Out Sights of King's, One of Cambridge University's 29 Colleges

At Cambridge the author learned the difference between the English and American university systems. At the University of Texas he was accustomed to colleges which taught law, engineering, or the arts. At Cambridge he found the colleges devoted primarily to boarding undergraduates attending lectures at the University. An American might call these colleges glorified fraternity houses until, like the author, he learns they have a deeper meaning.

English. But a wary censor made me write a more literal message.

The telegram was to the Senior Tutor of Emmanuel College, Cambridge, informing him that I expected to arrive by train early that afternoon.

The route to the London station led through blocks of bomb destruction, utter destruction, around St. Paul's Cathedral.* I felt that I had come to reality. Half of the people who filled the train were soldiers—British, American, Polish, and other nationalities.

We passed peaceful grazing cows. I glimpsed wood pigeons, crested peewits, or

plover, and a few partridges in the green fields. Past hedges, houses, villages. Airplanes flew overhead.

About 1:30 o'clock a taxicab delivered me and all my worldly possessions in front of Emmanuel College (Plate VI). The possessions consisted of a portable typewriter and a cardboard suitcase crammed with every ounce that the Clipper plane would allow aboard at New York. A porter came out to the curb to take the baggage.

* See "London Wins the Battle," by Marquis W. Childs, NATIONAL GEOGRAPHIC MAGAZINE, August, 1945.

We walked through a big double gate and were inside the college. The Senior Tutor rushed to meet me. He led me to my "set" of rooms.

On a fine, old oak table in the front room a cold lunch waited. It tasted good to me. My thin southern blood chilled with the chill in the ancient stones of the ponderous walls that were to house me during the year ahead.

John Harvard Studied at "Emma"

Back in days when Shakespeare was writing plays, a young man by the name of John Harvard was an undergraduate in Emmanuel College. In 1638 he died in the Massachusetts Bay Colony, bequeathing his library, half of his estate, and his name to "that eldest of the seminaries which advance learning and perpetuate it to posterity throughout America." I quote from a tablet in Emmanuel College Chapel that American soldiers view every day.

The Harvard scholarship that Emmanuel College, in peacetime, grants annually to some American student and the Harvard rooms in which this scholar resides are symbolical of the hospitality that Emmanuel feels toward American university men (Plate III).

John Harvard, dead these three centuries and more, was responsible for my being a guest in "Emma," as the undergraduates dub Emmanuel, rather than in some other college at Cambridge. Cambridge University was toward four hundred years old when John Harvard "came up."

To understand the old English universities, it is necessary to realize the continuity of history and tradition within them.

Quarters assigned to me were representative of those occupied by both dons and undergraduates in Cambridge. The three-storied hall in which I had quarters flanks a courtyard of cobblestone walks and grass perennially green. Across from it is the big dining hall; at the back end, the Chapel, designed by Sir Christopher Wren; at the front, porticoes, the porter's lodge, and entrance doors.

To get to my rooms I stepped through a massive archway without any door, opened a door, and entered a very large, high ante-room, furnished both solidly and comfortably. Coal was scarce; the room could not be heated, anyhow. I never sat in it until summer came.

A smaller room that opened into it was my study, office, and reception room. After burning about three hours, the coal fire would get it to a comfortable temperature. As the months passed, my blood thickened.

I used to tell the dons that if I were going to spend another winter there I'd build a platform and live on it in the warmer upper air.

Another room opening into the big parlor was my bedroom. The bed had that test of civilization, a reading light. The bath and toilet were upstairs. Two undergraduates occupied a similar set of rooms next to mine. I never heard them. The honest, thick walls deadened all sounds.

Graduate students as well as undergraduates reside in college halls, but "undergraduate" is the usual designation for student, called also "pupil." Tutors give individual instruction; some tutors lecture.

There are comparatively few professors. A professor ranks high in public respect. The country does not regard him as a "long-haired" freak; it imagines that he is learned and perhaps wise. And the country places a high value upon knowledge.

Not all the Fellows of a college are on the teaching staff. They are elected and have responsibilities as well as privileges. Fellows, tutors, professors, and others who "rank" seats at the High Table are ordinarily referred to as "dons."

That first afternoon in Cambridge, conducted by the Senior Tutor, I went to the police station, presented my passport, and received an identity card, such as every civilian in the British Isles carries.

I went to another place and was issued food and clothing coupons. The food coupons I turned over to the college buttery, for I was to be a regular boarder. I learned that I would be issued a pint of jam or marmalade every four weeks; that every Monday morning I would receive an ounce of butter, an ounce of oleomargarine, and a small amount of sugar, all of which a waiter kept separate, placing it by my breakfast plate every morning.

I was told I might have breakfast brought to my rooms, but help was scarce. As I never eat breakfast before I have put my feet on the ground, it suited me fine to go to the college dining hall for breakfast, as well as for the other two meals.

"Gowned" for Dinner

The one formal meal in hall is dinner. I awaited my first dinner with some trepidation. The Senior Tutor advised me that as a visitor I need not wear a gown. Toward the end of the school year I was granted an honorary degree and after that I wore the gown to dinner. After one gets used to it, it is no more redundant than a necktie (Pl. VII and page 412).

A little before seven we gathered in the combination room, where I was introduced to the dons dining that night.

Every college has a combination room



For Dons and Undergraduates, a Gown Is the Passport to Dinner at St. John's College

Pity the Cambridge man who neglects his gown at evening meal! He is made to feel undressed. A youth seated at the extreme right is thus attired; possibly he is a visitor. Dons sit at the High Table (Plate VII). A porter (left) checks the absentees. Freshmen, who dine earlier, have departed, leaving an empty table.



By Candlelight in Their Paneled Combination Room, the Dons Enjoy Coffee and a Smoke
This is the Fellows' clubroom at St. John's. Every Cambridge college has one like it. In such a room at Emmanuel the author learned that after-dinner wine, coffee, and pipe came in the order named (page 414).

provided with various reference books, current magazines, and newspapers. It is a clubroom for the dons. The one American magazine in the Emmanuel combination room was the *New Yorker*. Every college has its library and clubroom for undergraduates also.

Grace and Benediction in Latin

As the clock struck the hour, the Senior Fellow led through a door into the dining hall. He stood at the end of the long High Table. It runs crosswise, at one end of the hall, on a slightly raised platform. It is provided with chairs. The undergraduate tables run lengthwise of the hall; they are provided with backless benches.

As the dons entered, the gowned undergraduates all stood. Then one of them read the grace in Latin.

Waiters, old men and women whom the war has brought into this service, served the food. One of them dropped a plate. All the "young gentlemen" applauded—and this is the traditional manner of applause—by stamping their feet. As the undergraduates finished eating, they unceremoniously walked out.

The diners at the High Table remained seated until the last man was through and the Senior Fellow rose. While we all stood, he pronounced the benediction, in Latin.

He led back into the combination room, where we sat in a kind of informal formality. I started to fill my pipe. The Senior Tutor quietly shooed the pipe back into my pocket.

The butler brought in port wine. After all the glasses were filled, the Senior Tutor raised his in a toast of welcome. The toast was recorded in a book where fines for being late



A Man of Influence Is the Head Porter at Trinity

Not the trunk bearer that his title implies, he carries the college keys. For visitors he unlocks a store of information. To undergraduates he is both inferior and superior; he addresses them as "Sir," yet reports their offenses. Dignified W. N. Maskell (in top hat) has served Trinity 40 years, working his way up from porter (page 425).

for dinner and for other offenses, bets (always a bottle of wine to be shared by the parlor), and other memorable events of the combination room are now and then set down.

From that night until a night somewhat over a year later when another toast was drunk—and recorded—to my safe return to America, I always felt that I really was welcome and that I had a home in England. It was after the wine that coffee came. Then we could smoke. Smoke before wine dulls the palate. Wine is for connoisseurs.

While we sat talking after coffee, any man free to leave when he pleased, some don introduced cowboys into the conversation. I said

that the word "cowboy" was an old English word in use long before Texas got on the map. A don got up, pulled a volume of the Oxford Dictionary from a case, and read out the history and definition of the word.

GP's Visit Visiting Professor

During the next few weeks reporters came up from London to interview the visiting professor of American History at Cambridge, and an article about him appeared in the *Stars and Stripes*, American Army newspaper. As long as I remained in Cambridge, American soldiers came to see me, often to leave a can of American pipe tobacco.

A majority of them remarked on there being no University "campus" and wanted to know about the connection between the colleges and the "main university." Many supposed that because I was residing in Emmanuel College I was teaching in it.

There are eighteen men's colleges and two women's colleges in

Cambridge. What the American Union and the 48 States are to each other, Cambridge University and the various colleges are to each other.

The University enterprises all lecture courses; owns all the scientific laboratories, grants all degrees. It calls upon the colleges for certain financial support and for coordination in various matters. During the centuries it has usurped certain college prerogatives, just as our Federal Government has gradually absorbed many of the original "States' rights."

One of the great publishing houses of the world is the Cambridge University Press. Distinctly, it is a University factor; yet it is a



A "Full Bedder"—and Proud of It!—Tidies Up the Author's Rooms at Emmanuel

"Thirty-five years ago I started as a helper," says faithful, efficient Mrs. Mercy Reynolds. "I worked up to be a full bedder." She motherizes the undergraduates; they often toast her at their parties. Private rooms at Emmanuel lack plumbing. Bathrooms are communal (page 411).

corporation to itself. In July, 1943, it made a grant to the University of some \$176,000 to endow the chair of American History. Every University professor is attached to some college, but the attachment is social rather than professional. The University ideal is to promote the art of living, the amenities of civilized society as well as knowledge.

In addition to the college libraries and the great central Cambridge University Library, there is a History library, Agriculture library, library of Literature, etc.

Growth of a Cultural Democracy

You must not think of Cambridge University as something that came into existence by executive decree or legislative act, each unit within it mathematically subordinated to some all-governing authority. Nobody knows just

at what date Cambridge University began. In the twelfth century it, also Oxford,* pretty well exemplified President Garfield's definition of a university—Mark Hopkins at one end of a bench and a boy at the other.

The first Cambridge college, Peterhouse, was founded in 1284. Some of the colleges supplanted monasteries. They began with endowments, and the endowments still increase annually. The colleges own farms, rent-buildings in London, stocks, and businesses less picturesque than their wine cellars.

Annually special services and a very special dinner in each college commemorate the founders and other benefactors. "The gods are known by their long memories." A

* See "Oxford, Mother of Anglo-Saxon Learning," by E. John Long, NATIONAL GEOGRAPHIC MAGAZINE, November, 1929.

mighty, far-sprawling, and diverse physical plant has grown up at Cambridge. "Mark Hopkins," however, is still more important than any building.

The chief executive of the University, elected for life, is the Chancellor, who is non-resident and largely honorary. The actual executive is the Vice-Chancellor, elected annually by the University Senate. It is mighty little that he can tell the Master of Trinity College, the Provost of King's College (page 410), or the head of any other college about running that college.

The University laws and regulations are made by the Senate, composed of what in America we call the faculty, plus alumni holding the Master of Arts and higher degrees.

Parliamentary law stipulates how the University shall govern itself, and it is almost as self-governing as Robinson Crusoe was on his island. At the same time, units within it maintain an extraordinary amount of independence. There is enough individualism in the University to satisfy a Montana frontiersman, and enough cooperation to satisfy any democracy and make the system work.

A Casual System—That Works

The manager of a factory production line would probably label a good deal in the Cambridge system as lost motion. The system consciously aims *not* to apply the factory method to brains and human personalities.

I have been asked time and again what feature of Cambridge struck me most forcibly, in contrast to the American university. It is the casualness of the system, even though combined with traditional fixedness. It is the absence of standardization, though individualism is somehow subdued into a workable unity. It is the achievement of organization machinery without making the machinery dominate the human ends it is designed to serve.

Certain medieval rituals and ceremonies still maintained seem absurd to many Englishmen. They are also picturesque; the observers of the ceremonials are not medieval-minded.

Here is a great University in the midst of a densely populated country of severely restricted area. To be free to enjoy individualism, the people have had to harmonize themselves with one another. They have come to that harmony without being machined into goose-stepping uniformity.

It is the colleges that make the University. Though the University grants all degrees and provides all classrooms and class lectures, it cannot admit a single student. The colleges, holding their entrance examinations in groups, are the only doors of admittance.

Having been admitted, a man will henceforth be a Cambridge man. More than that, however, he will forever be a Christ's man (Christ's College, Plate V), a Jesus man (Jesus College), a Peterhouse man (Peterhouse College); and so on. A woman, in addition to being a Cantabrigian, will be a Newnham woman or a Girton woman.

The Senior Tutor of a college will stand, in a very real way, to every student in the place of a parent. The dean will keep an eye on his habits and induct him into cultural ways; he will not be compelled to attend college chapel. If he does attend the services once or so a week, he will hear beautiful singing, hear wise words beautifully pronounced, and breathe the air of tolerance.

The Art of Manly Friendship

A tutor will supervise his studies (Plate III). He will eat, sleep, read, live within his college, becoming one in a fraternity of "virtues and talents," to use Jefferson's phrase. He will have friends in other colleges and move as a member of the large Cambridge community, but as time goes on he will integrate himself intimately with his own college.

It is for him more than a dormitory, a boardinghouse, or a fraternity. In these colleges, young men sharpen each other's wits, have their best instincts developed by association.

After the collegian graduates (page 429), he generally maintains an affection for and a loyalty to his college. The college hopes he will come back and claim hospitality. He frequently does.

During my residence in Emmanuel, I met numerous Emmanuel men back, mostly in line of Government duty, from India, Africa, Australia, the uttermost parts of the earth as well as from London—business men, professional men, military men, civil servants.

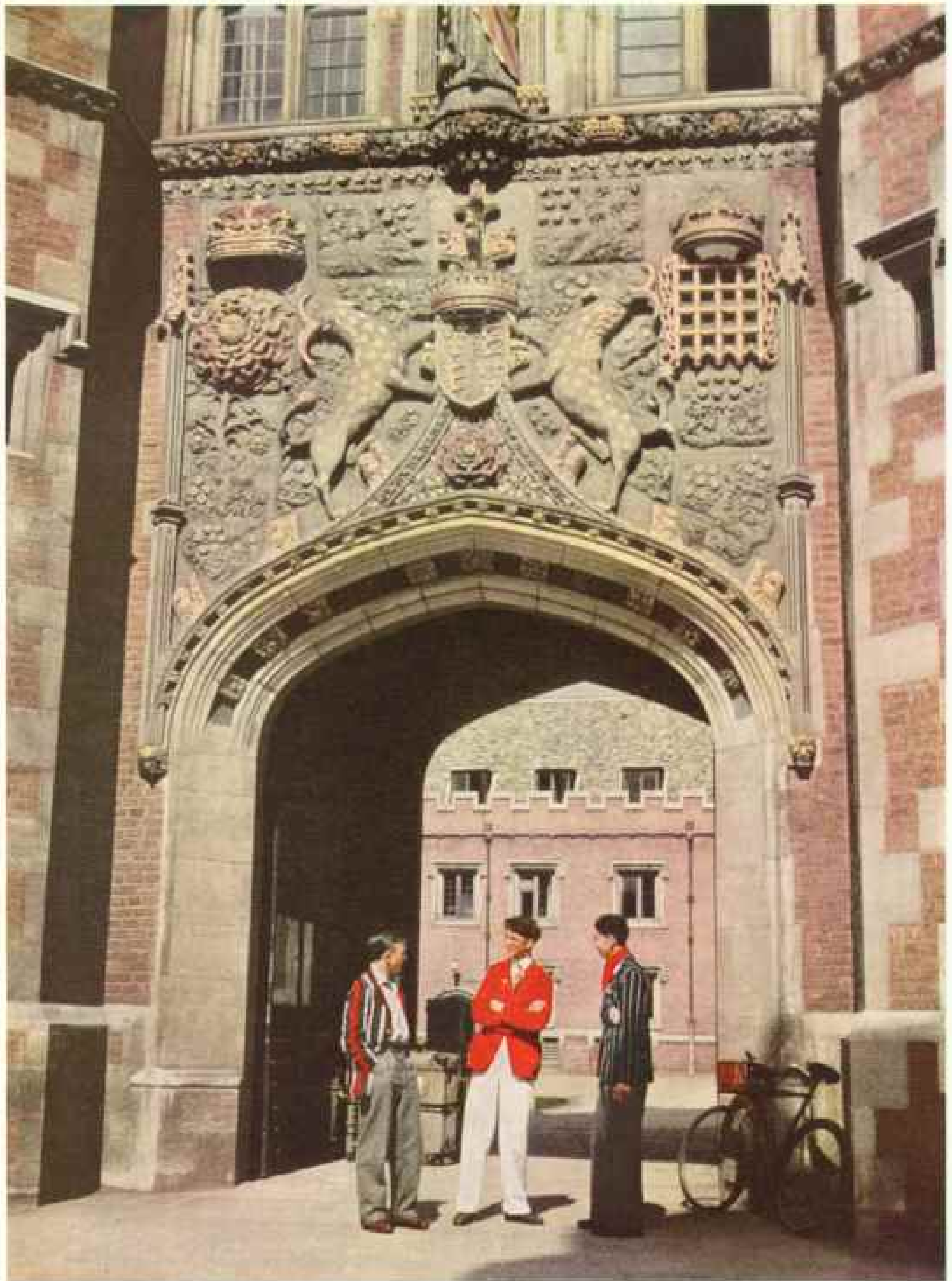
One summer night I went to see John Gielgud and his company play *Hamlet* in the Arts Theater—a distinct feature of Cambridge life.

At 8 o'clock next morning I went to breakfast, where I always met an Emmanuel Fellow doing some sort of artillery research in Cambridge and, for the duration of the war, occupying rooms in his old college. According to custom, he was reading the *Times* while he ate his porridge. I noticed across the table from him a stranger, to whom I nodded and who nodded at me.

As I sat by my friend waiting for my bowl of oatmeal to come, I remarked that I had seen *Hamlet* the night before.

"What did you think of the performance?" he asked.

Sculptured Gates to English Learning



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Arms Gifted by B. Arthur Stewart

College Year Starts at Cambridge; Old Friends Hold Reunion at St. John's Gate

St. John's is comparatively young as Cambridge colleges go. It was founded in 1511 by Lady Margaret Beaufort, mother of Henry VII. Her arms are carved on the gate; they are supported by two yales, yellow-spotted beasts of heraldry's fabulous menagerie. A St. John's undergraduate wears his red blazer.

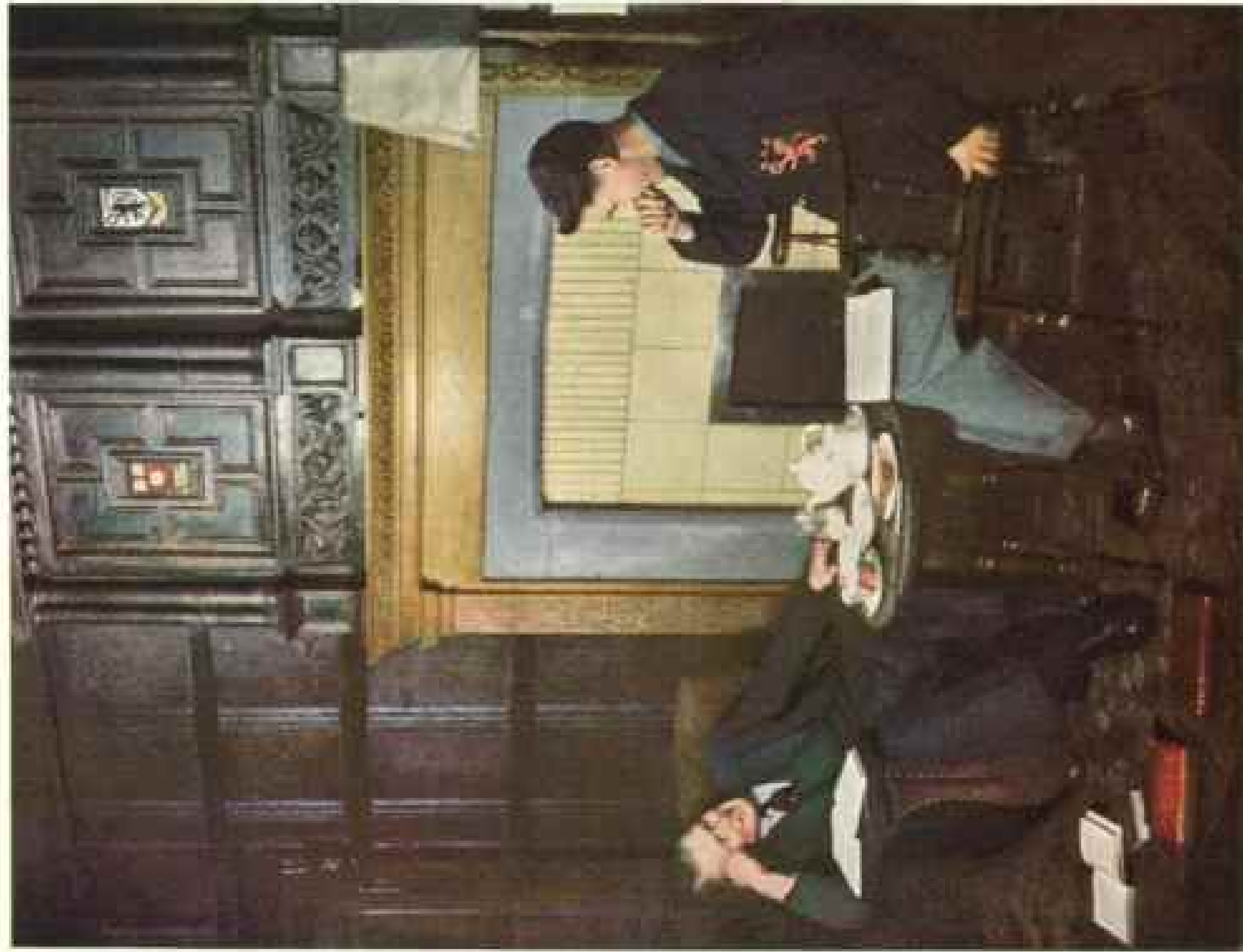


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Illustration by H. Anthony Hebert

Newton and Thackeray Had Rooms Near the Turreted Great Gate of Trinity, Cambridge's Largest College.

Here in the Great Court Lord Byron, contemptuously chained a bear. His statue, rejected by Westminster Abbey, stands in Trinity Library. Tennyson, Dryden, and Macaulay, too, were Trinity men. Mary Tudor started the Chapel (left); Queen Elizabeth finished it. Nevile's fountain dates from 1602.



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This Room Connects Cambridge and Harvard!

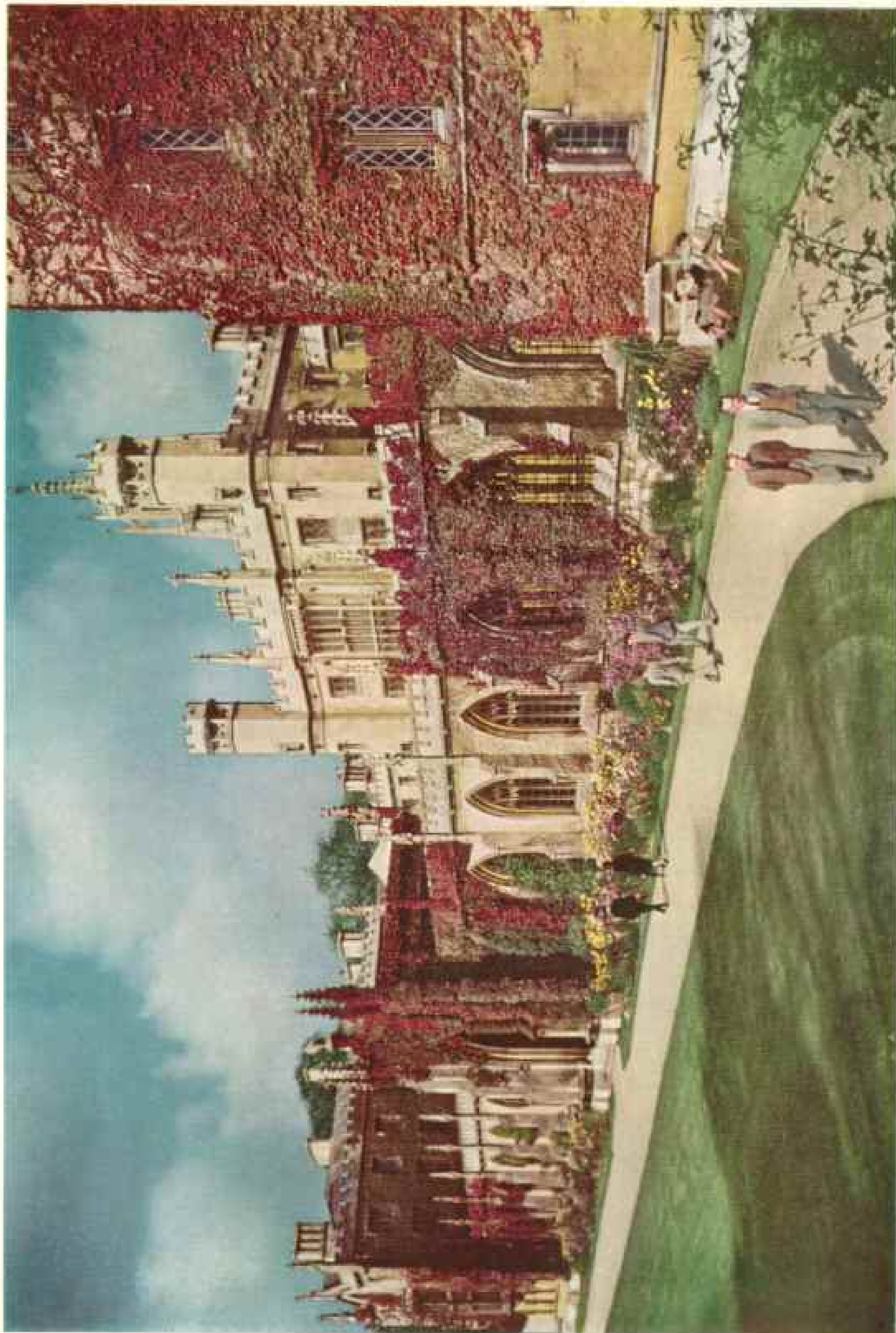
Harvard is named for John Harvard, an Emmanuel alumnus of 100 years ago. In his honor the quarters house Americans in peacetime. These beds are British. One wears the Emmanuel arms. Panels contain both schools' arms.



Contributed by H. Arthur Stewart

Like Father and Son Are Senior Tutor and Undergraduate

A New Zealand airman (right), having exchanged uniform for gown, goes to the Senior Tutor at Emmanuel for friendly counsel. The don (faculty member) is his adviser in University affairs and human relations.



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Illustration by H. Arthur Roberts

Autumn's Red Blush Creeps up the Cream-colored Face of New Court, an Addition to St. John's



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Reproduction by H. Anthony Stewart

Christ's College Door: Presents a Study in Styles

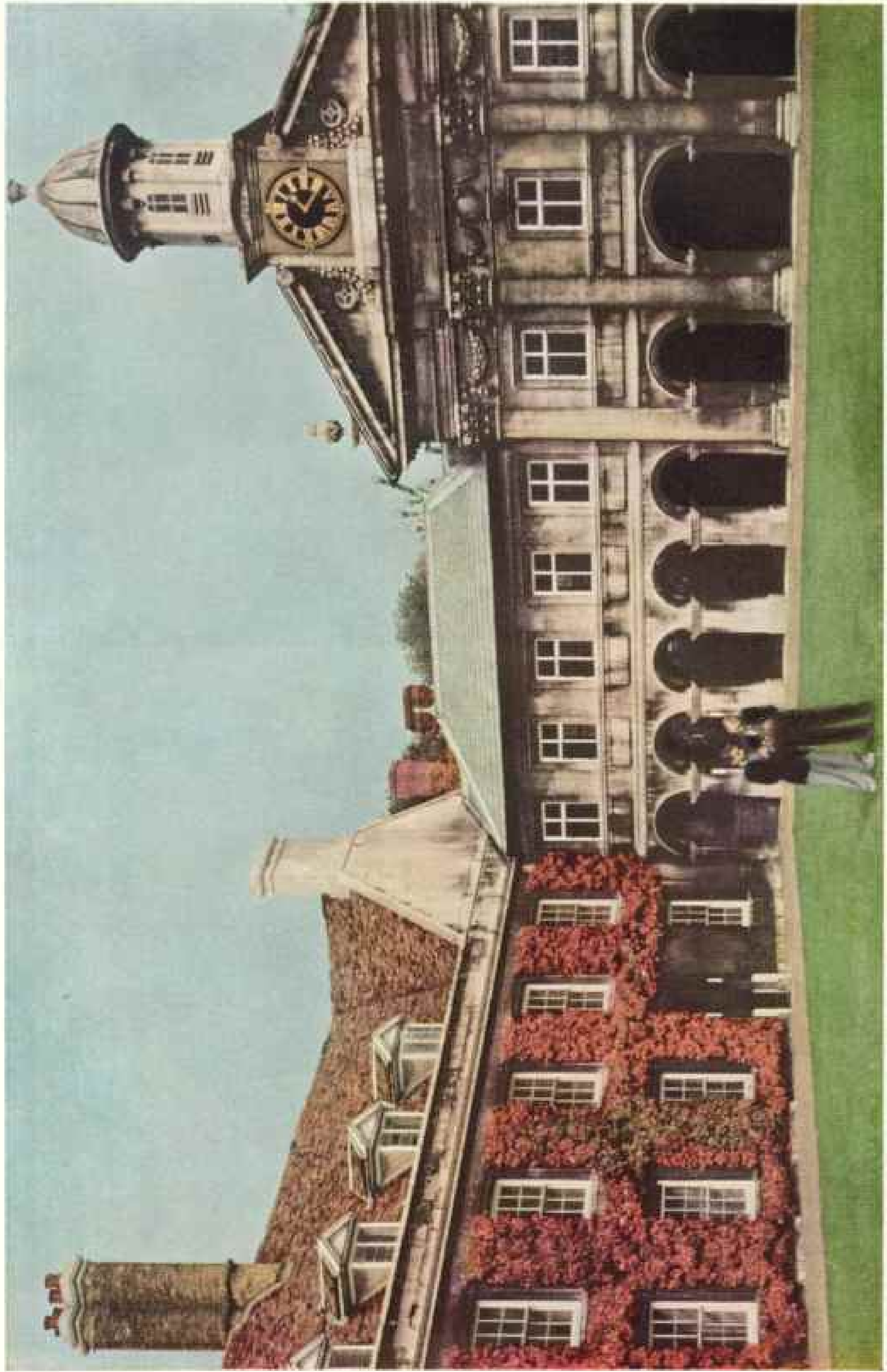
Left: "Joe College" as America knows him; his coat and trousers clash. Center: two Christ's College scarves. Right: a gown, derived from the medieval clerk's uniform. Each undergraduate must have one.



Photo Credit by H. Anthony Stewart

Here Sir Isaac Newton Measured the Speed of Sound

Newton was a student and later a professor at Trinity. Experimenting on the cloister walk behind this rose-draped arch, he roughly timed an echo's velocity. Trinity men never fail to repeat the test.



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Reproduced by H. Anthony Hewart

Cloisters and Chapel on Emmanuel Court Are the 17th-century Work of Sir Christopher Wren

On the grass, two undergraduates study a Latin inscription which the photographer asked them to translate. The author had rooms on this court. Elsewhere in Cambridge, Wren is represented by Pembroke Chapel, his earliest work, and Trinity Library.

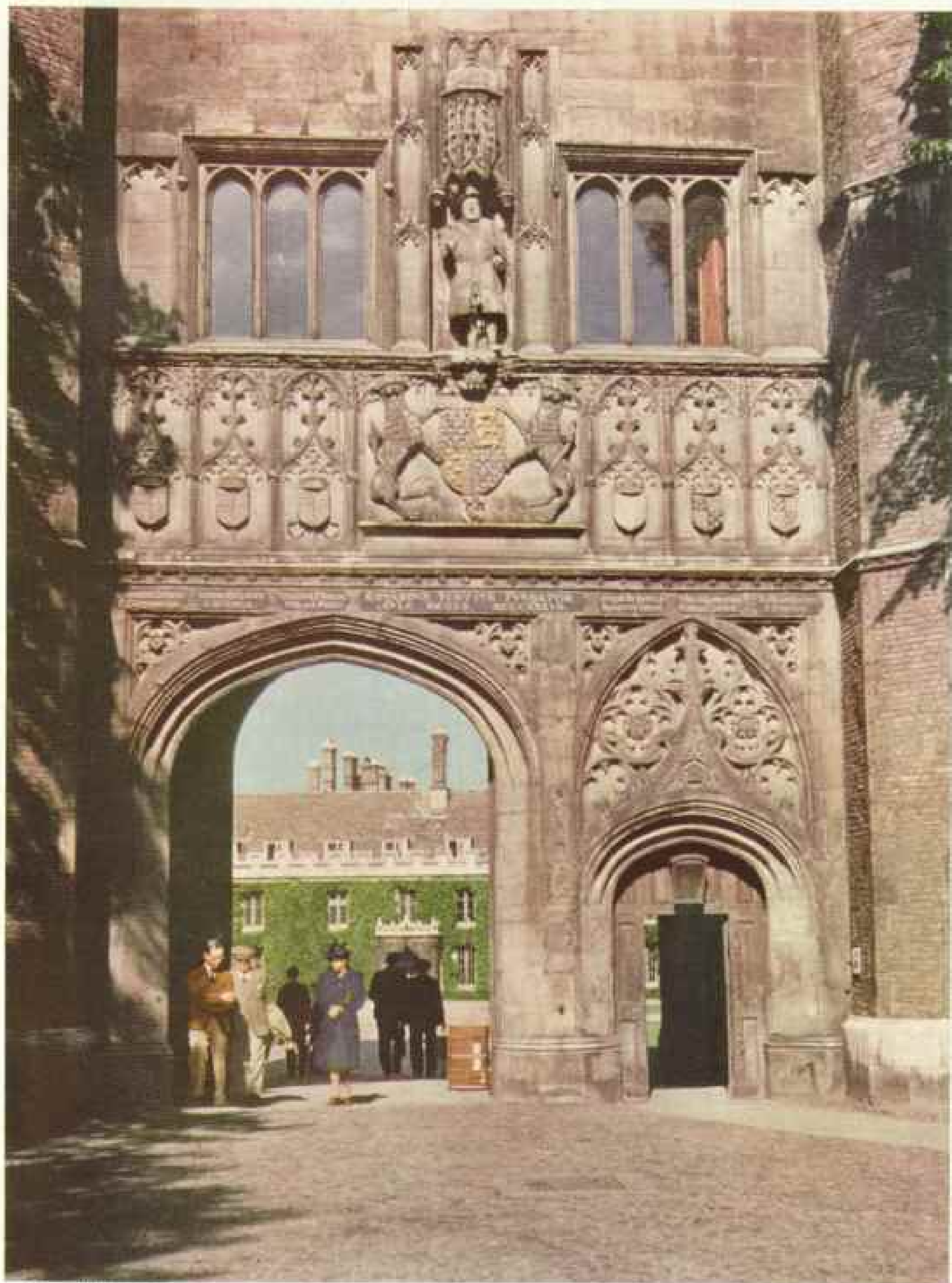


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Emmanuel's Dons Occupy Chairs at the High Table; Undergraduates Sit on Backless Benches

Reproduction by B. Antoine Aumont

It is midday; the young gentlemen wear gowns or not, as they please. Fellows, including faculty members, are gowned; guests at their table are not. Waiters are the war era's women and elderly men. A door (left) leads to the combination room; to it the dons adjourn ceremoniously following the evening meal.



© National Geographic Society

Across Court by H. Anthony Stewart

From His Post on the Great Gate, Henry VIII Keeps Watch over All Who Enter Trinity

At 10 p. m. the main arch is closed. Undergraduates returning up to 12 are admitted through the porter's lodge (right). Frequent offenders are "gated" (confined). To report in after midnight is so serious that Cambridge "alpinists" sometimes climb walls. Henry VIII expanded the "great college" built by Edward III.

"Well, Hamlet himself was too casual to suit my taste, but you never saw such a Polonius. He is just right—a 'grave councillor,' a 'tedious old fool,' both; you laugh at him, you mock him, you respect him. I have seen several Poloniuses; this one is great."

The stranger, his face shining, said, "Thank you. I am Polonius." He introduced himself as the actor Miles Malleson. He proved to be a delightful talker, told how when he "was up" (nearly forty years back), he impersonated a Member of Parliament in a Union Society debate on woman suffrage and had the whole University fooled—and might have been "sent down" but for the fact that the newspapers set the country laughing over the episode.

It was exceedingly difficult to get a room in any hotel in Cambridge those war days. Miles Malleson did not have to rely on a hotel. During the week's run of the play he had a home at his old college.

The only way for Cambridge University—or for Oxford—to expand and take care of 10,000 men instead of five or six thousand is for new colleges to be added, for the existing colleges to add to their own halls, or for the college system to be relegated. There seems to be little desire on the part of those responsible to expand.

A new college could be founded if some rich person wanted to buy land, build, and endow. Large additions of students to something so personal as a college would subtract from what the college can give.

Foster Alma Mater of American Soldiers

Cambridge University has become the foster alma mater of hundreds of American soldiers. During the war, a year-after-year succession of five-day courses acquainted enlisted men and officers on leave with the historic institution. Here they slept between white sheets in the college halls, ate at High Table, had tea with the college Masters, listened to lectures on Homer, were conducted through neighboring Ely Cathedral, and otherwise sipped the flavor proper to the ancient cloisters (Plate XV).

Cambridge itself was leave headquarters for the Eighth United States Army Air Force, and as an indication of how the University welcomed Americans, one might see every day the elderly and sprightly George Trevelyan, famous historian who also is Master of Trinity College, leading a group of GI's through the Great Court and up the grand stairway to his own noble apartments (Plate IX).

Soon after Germany surrendered, the Borough of Cambridge, breaking all precedents, conferred the Honorary Freedom of

that city upon the whole Eighth Air Force, "in recognition and grateful appreciation of the great part played by that unit in winning victory for the cause of liberty and justice in the European War, and in memory of the close and happy association with Cambridge of the whole unit during the long struggle, and in the sincere hope that this association will contribute to ever-increasing friendship and understanding between the American and British peoples in the years to come."

The Veterans' Administration has put Oxford and Cambridge on its list of institutions veterans may attend under the GI Bill of Rights. The picture is complicated, however, by the fact that thousands of British boys, whose careers have long been interrupted by the war, are expected to tax the capacities of Britain's institutions of higher learning.

Physically, a college is a walled-in space of courts, gardens, and houses.

The area of ground occupied by the Cambridge colleges is cut up by public streets; spaces between some of them are occupied by shops. Most of the athletic fields are blocks away from the college buildings.

Four or five colleges right against the Cam River have contiguous grounds divided by moats and fences. These grounds along the Cam are called "the Backs." They are back of the college buildings, and surely they are among the most gracious and most pleasant gardens in the world. In daytime, they are open to the public (Plates X, XIII, and XIV).

When flowers blossom, thrushes sing on the boughs, swallows dip over the mown lawns, young people oar and punt on the water, families of mallard ducks paying them little mind; when the green of the trees goes up into the sunshine and the sunshine falls on the ancient walls, gables, turrets, spires, and roofs of varied, but time-blended, architectural design and texture; and when, perhaps, organ music floats out of great King's College Chapel—against the Backs—then you think that surely man and Nature, the good earth and the goodly structures of man upon it, antiquity and the living present, have all achieved a harmony not surpassable anywhere else on this planet (Plate XII).

The Importance of the Porter

The main entrance, and at night the only entrance, into a college is through the doors next to the porter's lodge. Always, day and night, there is a porter in that lodge. He knows every man due to be within his doors before they close at 10 p. m.—and after they close, also. He knows enough to talk intelligently about the Polish boundary, the Labour

Party, the King of Greece, elections in the United States, and the coal mines in South Wales (page 414).

The head porter goes into the dining hall every evening and checks on the undergraduates present or not present. They must dine in hall at least five times a week.

Not all tutors live in college. Many are married and have their own homes. Nearly all of them dine in hall once or oftener during the week. Each has a room in college to which undergraduates come for consultation and, generally, get more than supervision.

This room does not look like an office. It has books, pictures, all sorts of objects of humanity as well as of art in it. It may look somewhat like a plunder room. It is a place where a civilized man has put something of himself; it is likely to invite loitering, talking, smoking.

A student may cut his lectures. He can't cut his tutor consistently without being "sent down," "rusticated," "ploughed"—in plain American, fired.

A student in medicine, physics, chemistry, any science, has necessarily to do a deal of laboratory work. In a subject such as I taught, history, his business is to read, write, and recollect—and, if possible, to think. He is his own judge as to how much lecturing he will listen to.

The students' tutor will direct his reading and require him to write numerous themes. In due time he will have to take examinations that will bring out both his mastery of facts and the quality of his mind. His lecturer will not grade his answers; they will be graded impersonally by others.

Students Must Know the King's English

Correct English is as highly regarded by tutors in a course on economics as in one on Shakespeare. Even a first-year man is supposed to have his brain sufficiently developed to interpret facts as well as assemble them.

A man may come up to Cambridge and never take a course in English composition and yet get more actual training in writing correct and effective English than he would get in several courses in composition and journalism in some large American university.

The writer of sloppy, illiterate English would not be admitted, anyway, no matter how well she could trim celery stalks in a home economics course or how well he could flex his muscles in physical training.

Traditionally, an undergraduate buys a good many books and has something of a library in his own room. Perhaps there is more reliance on the college and faculty

libraries and the great University Library than there used to be. Nevertheless, I think that Cambridge men generally buy more books to own and keep than the men, say, in the University of Texas. There are no "co-op" bookstores; the stores that sell textbooks sell also books to read and treasure.

Dons of all times and places have differed as to the end of a college education. The struggle between the classics and science still goes on at Cambridge. A certain knowledge of Latin or Greek is necessary for admission, but neither need be taken during residence for a degree.

The student specializes more than in America; yet the old Greek ideal of balance, the conception of a rounded man with "the elements mixed" in him, prevails. The late Sir Joseph John Thomson, the great physicist, thought that boys should learn to appreciate the beauty of a field of bearded barley swaying in the wind. Such things, he said, would give happiness to life.

Cambridge still thinks that education which leads to the art of living is as "practical" as a course in salesmanship.

Debates Attract Political Scouts

Universities anywhere reflect and represent national characteristics. If they are effective, they help formulate those characteristics. Nothing concerning the great English universities is to me more interesting than the way they train leaders for national life. A college tutor supervising the work of undergraduates somehow becomes infused with the idea that he is responsible for his country—just as responsible in the long run as a government official.

The Oxford Union is perhaps better known than the Cambridge Union. Both are debating societies, where young men debate the most critical subjects of state and society. They are collegiate Houses of Commons. The presidency of either Union is regarded as the highest undergraduate honor.

Members of the Union debate not only with each other but with the foremost statesmen and thinkers of the country. Prime Minister Lloyd George accepted an invitation to debate with an exponent of the Oxford Union an issue on which his government was tottering. After the debate, the members of the Union made a division (voted) on the issue. The Prime Minister won by a bare majority.

Winston Churchill also was taken on by the Oxford Union.

Scouts for the political parties—Labour, Conservative, Liberal, etc.—keep an eye on Union debaters. A young man who shows



So Narrow Is the Cam That Oarsmen Do Not Race Abreast, but Overtake by Bumping

Crews start 150 feet apart. Any shell ramming a rival gains its position for the next heat; hence these contests are called bump races. Occasionally a violent bump sinks a boat. Here at Grassy Corner two shells head upstream to their starting positions.

outstanding readiness on his feet, mastery of facts, wit, logic, and power to convince, will likely be offered a job in some Government office. If he develops, his party will in time offer him as candidate in some district holding a by-election to fill a vacancy in the House of Commons.

The political parties and the Universities cooperate in training men intellectually as well as otherwise in statecraft. Men can and constantly do get into government without having been to either of the Universities. Churchill attended neither, nor did Lloyd George.

The University of London specializes in economics. There are excellent universities at Manchester, Leeds, and other English cities; Scotland has noble universities; Wales and Ireland also have their universities. Yet the standard of British statesmanship probably owes more to the system of training at Oxford and Cambridge than to any other one factor in British life.

"The State," wrote a wise Englishman, "rests ultimately upon a way of thinking."

Individual colleges have their debating societies, though they may not be so strong as formerly. All sorts of groups for study and discussion of all sorts of subjects thrive in the colleges. Some of the groups are intercollegiate. During the year I met with a dozen or more of these clubs or societies, talking on nearly that many subjects.

The Conservative Party has a Cambridge club that meets on Sunday afternoons, has tea and a talk about anything in the world political; what they got from me was an attempt at explaining the party system in America.

The most fun I had at any club was at one in my own college. It meets in a room open day and night to all Emmanuel men and is supplied with current newspapers, magazines, chairs, and other gear congenial to civilized clubableness. The subject for debate was: "Resolved, That the strength of an Englishman



Gate of Honour Is Dr. Caius' Sermon in Stone

Three symbolic gates to Gonville and Caius College were designed by its master and co-founder, Dr. John Caius (1510-33), to typify the path of students. They were admitted through the Gate of Humility. Through the Gate of Virtue they took up residence. The Gate of Honour led to their degrees. Dr. Caius, physician to three monarchs, was a pioneer anatomist. His original name, Kees or Keys, he Latinized to Caius. Your Caius man still pronounces his college's name as "Keys."

lies in his not having to think."

Impressed into it, I refused to take the affirmative, but the judges—twenty-five or so undergraduates present—gave the affirmative the victory. After the team of four debaters concluded, volunteer speakers arose on the floor.

One rosy-faced youth so mustered and delivered his arguments that I prophesied to the Senior Tutor, my opposite in the debate, that he would one day fill the galleries of the House of Commons. "That is where he is going," the Senior Tutor said gleefully.

The lambasting that the English received that night from these young patriots, among them an Egyptian, was much more delicious and incisive than what one gets out of the habitual British-baiting newspapers in America.

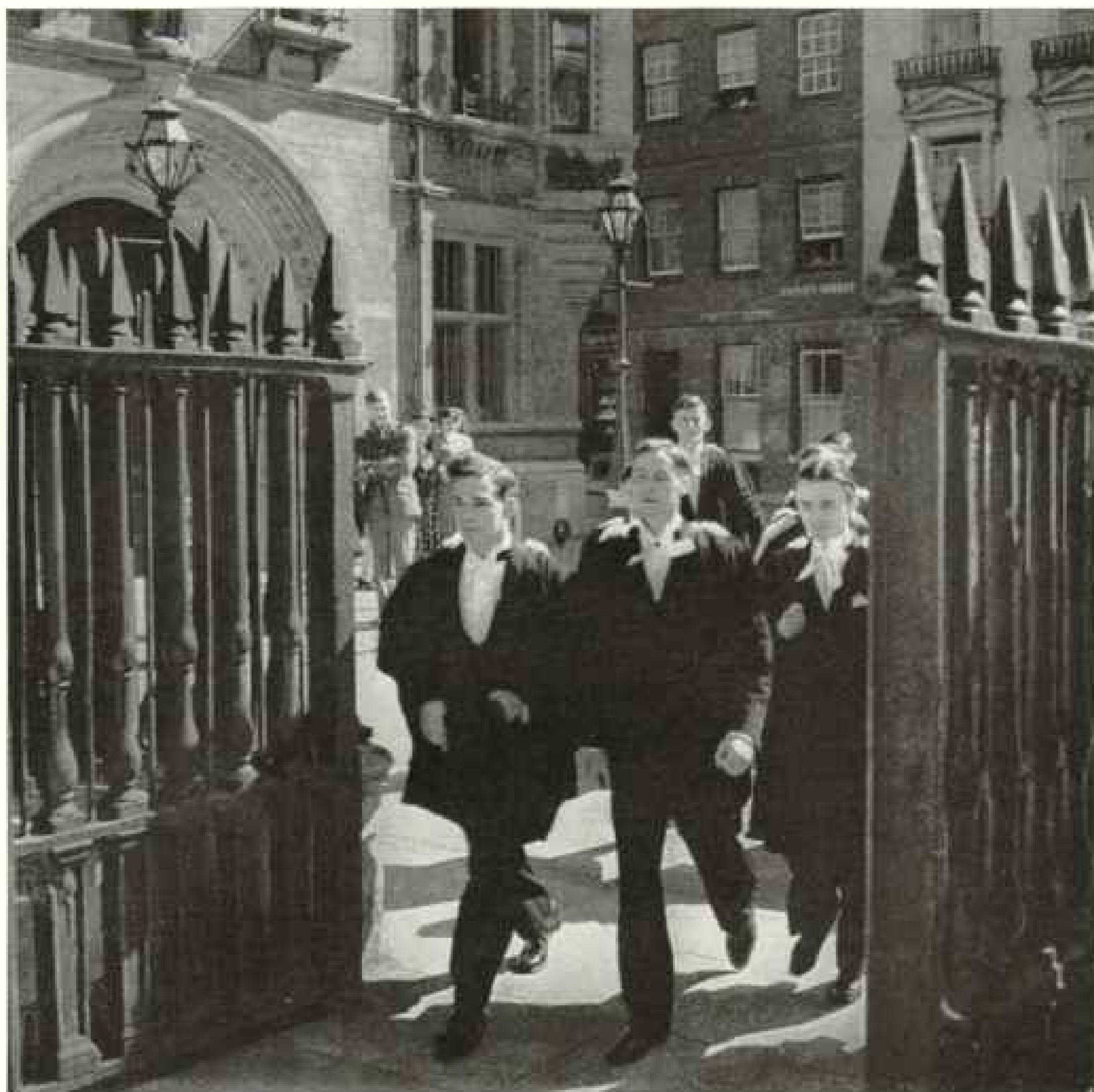
A Tutor Meets with a Club

Often some friendly tutor will meet with a club. He is in a way one of the boys; at the same time, he manages by his tolerance, sympathy, experience, and wisdom to help them develop themselves.

One night I dined in Jesus College with such a tutor and then went to his rooms for a meeting of the club. We all had coffee first; the secretary read the minutes; then a young man produced his manuscript and began reading an essay on *Punch*, the national magazine of humor and satire.

He had barely begun the first sentence when his listeners broke for a case of beer over in a corner of the room. I learned that this break is a part of the club's ritual. It must be timed with the first sentence of the evening's paper.

One member of the club was provided with a bottle of synthetic orange juice instead of beer. Most of the others drank two or three bottles apiece before we broke up.



Undergraduates March to the End of a 3-year Trail; They'll Emerge as Bachelors

These young men enter the gate of the Senate House, scene of the University's chief public functions. Soon they will kneel and hear the Vice-Chancellor recite the graduation formula in Latin. They wear evening dress, white ties, and gowns. White "epaulettes" are, in reality, the rabbit-fur linings of hoods worn over shoulders.

While beer drinking is common among undergraduates, intoxication beyond the point of a little gaiety is hardly known. I did not see a single instance of collegiate intoxication in Cambridge.

About 11 o'clock one night a very gay band of Emmanuel men called upon me. It was the night of "bump suppers" all over Cambridge. Bump suppers celebrate the end of the boat races on the Cam (page 427).

When I heard the knock, I had just come in and was still wearing the Stetson hat of modest—not ten-gallon—size that I always wear. It made me as distinguished in Cambridge as a certain Indian's turban made him.

I answered the knock, hat on head. At the entrance stood a group of grinning faces.

A spokesman said, "We want your hat."

"What do you want it for?"

"We want to put it on the flagpole."

"Why," I said, "I'd be naked and lost without this hat."

While we talked, I took my hat off and put it on the noble oak table beside which I stood. Immediately one of the lads dashed behind me and grabbed it. Then they all broke away, hurrahing for America. As they disappeared from sight in the courtyard, snatches of a song came to my ears. I took the song to be "Where Did You Get That Hat?"

The night porter rescued the Stetson from the top of the flagpole. I had an idea that the celebrators might not stand guard over it till daylight and that the wind might not leave it there permanently. When, next day, one of the gay ones called and apologized, I told him to bring his gang another time and I'd donate my red bandanna for the flagpole.

Two or three young ladies borrowed that Stetson for some festive occasion. It gathered enough coal soot to fertilize a rose garden. I shall always cherish the compliment the bump supper paid it.

The entire school system in England, from bottom to top, retains a deal of the ancient idea that while women may be capable of learning, only men are capable of using knowledge. The old schools for boys go on, though schools for girls have been developed alongside them.

Coeducation, with a Difference

Women were first admitted to Cambridge about seventy-five years ago, and then they were not permitted to take the regular courses with men. They are now, of course, but the University is not coeducational in the way that most universities in America are. A University ordinance, which could be changed, prohibits the enrollment of women to go beyond 500 a year.

There are friendships and love affairs between the college men and women, but there is nothing like the constant association between the sexes that American universities exhibit. When the young men "come up" to Cambridge or Oxford, they come with school experience limited to their own sex. They proceed in their colleges, and in most of their classes, even though women be in those classes, to do pretty well without much feminine society.

Women do not distract them from their business of getting an education nearly to the extent that women distract American lads. British lads are generally less bold towards the lassies and less glib with them than American collegians. Women are not so necessary to them as a part of routine existence.

An occurrence of the days of short-haired coeds following the last war is still indicative of the attitude of the undergraduates towards them, even though hair styles have changed.

A pupil who had called on his tutor was leaving when the tutor said, "If I were you, I should get my hair cut."

"Oh, sir," the youth answered, "I should not like to do that; short hair is so effeminate."

I recall a costume party at one of the women's colleges to which I was invited by

three young ladies enrolled in my course. Several men in the course had also been invited. A long-tailed coat and a wig rented from a Cambridge outfitter presented me as "General Sam Houston of the Republic of Texas."

"Sam Houston" Meets "Queen Elizabeth"

General Sam Houston was introduced to Florence Nightingale, Abraham Lincoln, Henry VIII, Charlotte Corday, Queen Elizabeth, and some twenty other celebrities. The games were historical in nature and called for some brain action on the part of the players.

In the beginning we were divided into two groups, each to act out in pantomime some historical figure. My group went into a side room, consulted briefly, decided to present Noah. Our first act was a representation, pair by pair as we marched around, of the animals out of Noah's ark. Here was a crowing rooster and a cackling hen, a bellowing bull, a mooing cow, and so on. The object was not to fool the other side but to be clever in representing character and event.

After this first act, we had to pantomime historical figures whose names begin successively with N, O, A, and H.

Nelson for N, and what could be more pleasant in acting than his death on board the *Victory*? While Lieutenant Hardy supported him, he whispered, "Kiss me, Hardy." Lord Nelson was a charming young lady in courtier's costume. I did not in the least mind playing Hardy.

For O, Oliver Cromwell dissolved Parliament. ("Take that bauble away!")

For A, King Arthur and his knights sat around the Round Table.

For H, Horatius with shield and blade held the bridge over Father Tiber's yellow flood—only you could not see the river.

I never have been much of a lover of games, but the play of mind and the spontaneous acting made this one delightful to me.

The Ideal of Fair Play

"What in English university life struck you most forcibly?" an American Rhodes scholar was asked.

"Three thousand young men, every one of whom would rather lose a game than play it unfairly," he replied.

This sense of fair play is the ideal of all English-speaking people. It comes near being a realized ideal in the English school system. I do not know that it is there much sermonized on. Rather, it seems taken for granted as an inherent part of life. Violation of it entails public disgrace.



An Undergraduate, His Girl on One Arm, Gown on the Other, Goes to a Ball

May Week, which paradoxically takes place in June, is the traditional time for balls, concerts, crew races (page 427), and dramatic performances. Many college dances last until dawn. These two are on their way to a medical society's ball in Cambridge town. The officer is a New Zealand captain.

At Cambridge I heard old-timers recalling by name, year, and accomplishments this man and that man of past generations who was "a blue" (letter man) in rowing, cricket, rugby, soccer.

No society or institution could place more emphasis on excelling in sports than the University men, but the emphasis is more on the playing than on the winning.

A majority of the men go in for some sport, mostly in a mild way. All seem to cycle and walk. Intercollegiate matches are everyday occurrences.

It is common for one nationality to build up a folklore of misconceptions about another nationality. Some educated Americans conceive Cambridge and Oxford to be mainly seats of the classics. It was so in the Middle Ages, with theology sharing attention.

A. E. Housman, late professor of Latin at Cambridge, was a great classical scholar of all time. His world, however, knew him principally as the poet of the *Shropshire Lad*. From the times of Queen Elizabeth, Cambridge has been adding to the grand roll call of poets—Spenser, Milton, Dryden, Gray, Wordsworth, Coleridge, Byron, Tennyson.

The list of Cambridge naturalists, historians, philosophers, advancers of medicine, and other scientists would be as impressive.

American physicists tell me that Cambridge University has been commonly regarded as a leader in physical research among the universities of the world.

I suppose that the Cavendish Laboratory at Cambridge is as well known as any laboratory on earth, and the Cavendish professorship of Experimental Physics is distinguished. I

am informed that Cambridge's rank in chemistry and medicine may be equally high.

The rooms that Sir Isaac Newton occupied overlooking the Great Court of Trinity College are still mighty pleasant (Plates II, V, and VIII). His telescope was set up near by. He discovered, 260 years ago, a natural law which is the basis of jet propulsion!

One of his noble successors, Sir Arthur Eddington, a very fine gentleman who died toward the end of 1944, revealed to me in a casual way his familiarity with the McDonald Observatory dedicated in 1939 by the University of Texas.* Laymen know him by *The Expanding Universe* and other books.

Darwin was a Cambridge man.

One day in Cambridge a Wac asked me how to get to the Botanic Gardens. I frequented them for their walks, their spring primroses, their sequoia trees, the moor hens in the pond, the goldfinches on the sunflowers, the heather in the rock gardens, the prickly pear beside a hothouse, and many other features I delight to recall.

The Wac told me that she was from Cornell University, a graduate in botany, and that her chief goal in England was Cambridge botany. Two of my friends were mature graduates from Portugal and Argentina studying plant diseases.

The Case of the Granite Chips

I learned in a curious way about the Cambridge Geology Museum.

As we sat one evening in the Emmanuel combination room, the professor of geology told me that a British Army officer had brought him a box of granite chips to identify.

The box had been taken out of a shipment of corned beef from America. In outward appearance it was like thousands of other wooden boxes containing cans of beef. But when it was opened in a camp kitchen, the beef proved to be granite.

Some of the chips had mud on them; they were packed with straw. Somewhere a thief had extracted the canned beef and substituted granite and straw. The Army officer wanted the geology professor to ascertain where the granite originated. Was it British granite or American granite?

Every granitic formation, I understand, has distinguishing characteristics, just as the characteristic patterns of every thumbprint differ from those of every other thumb. Comparing the samples in the box with the great collection of building stones in his museum, the geology professor, already familiar with granite, soon identified the chips as being from certain deposits in North Carolina.

This professor is fond of detective stories. I don't know if the F.B.I. ever ran down the thief or not.

Through another Emmanuel don, manager of the 700-acre University farm just out from Cambridge, I derived some insight into how the University is carrying the science of agriculture to the whole English farming industry. Extension service is one of the University's modern developments.

One course in American history was for cadets in the Royal Air Force and the Royal Navy, in Cambridge for six months only. I lectured to over two hundred of these cadets, 18-year-old lads affording a cross section of English youth.

Numbers of them as well as other students talked to me about studying in America after the war. It would be a fine thing for the young men and women individually and for our countries if there were a wholesale exchange of students.

In mental powers the top individuals in any reputable university approach the tops in other universities, no matter of what country. I would say, however, that Cambridge undergraduates average better disciplined minds than American students, have mental fibers better developed, more maturity of intellect.

I used to notice the numbers of collegians who read their newspapers at breakfast. They were reading the "leading articles" as well as war news. From childhood on there is this mental maturity in British life. Nor is it in opposition to playfulness, a sense of humor, vitality.

These lads were as open-minded towards facts concerning the American Revolution as any American group could be. They were more interested in the patterns of life in America today than in any past. They were anxious to learn how our political parties, Congress, President's Cabinet, Supreme Court, labor unions, corporations, public school system operate.

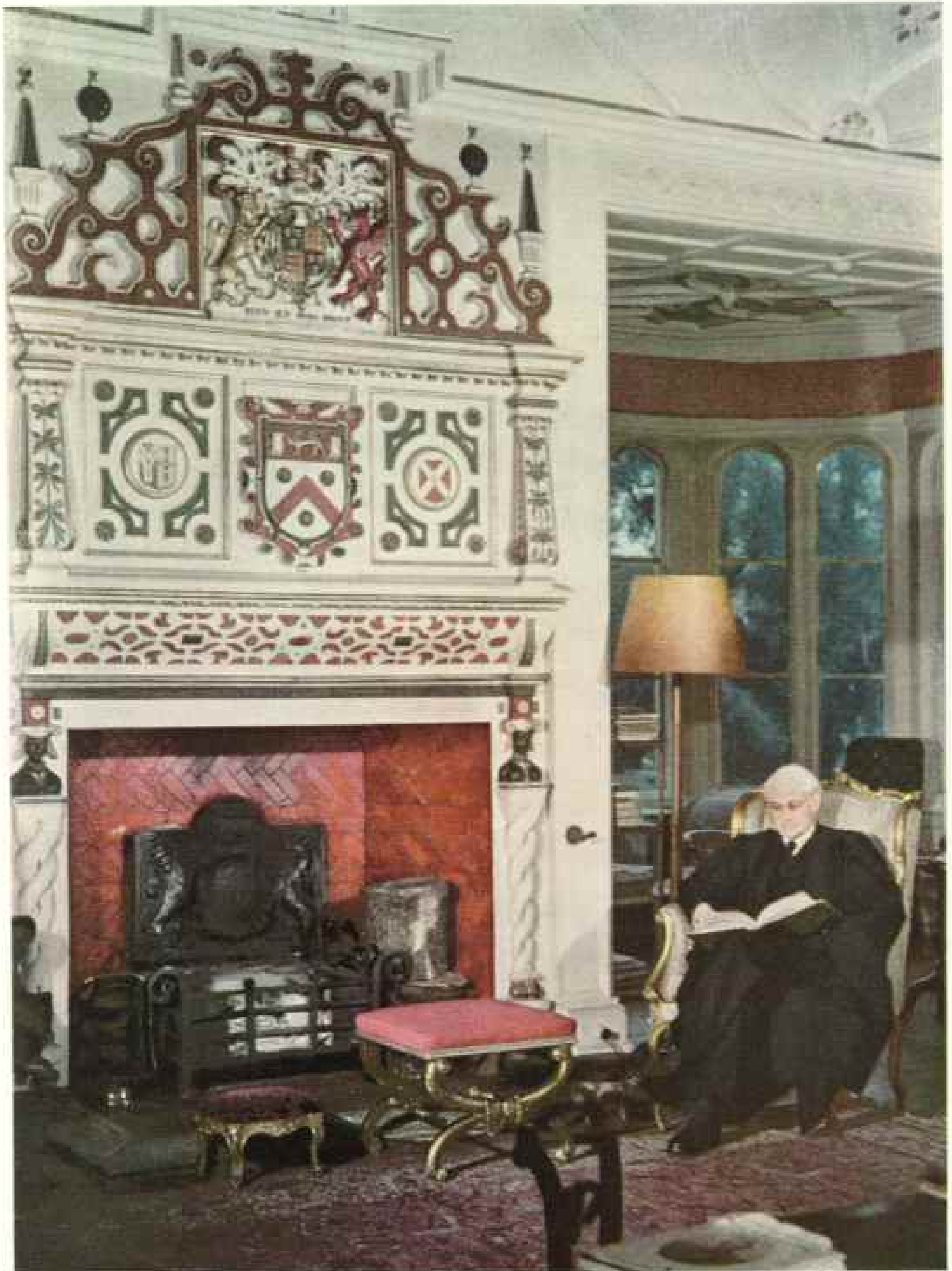
Eager to Know About America

Some of them were as concerned over the Negro problem in our South as some Americans are over India. They wanted to know about Negro spirituals, boogie-woogie, Frank Sinatra's mesmerism. They were eager for more information about the American scene.

The English realize that their destiny will be considerably determined by American policies in world affairs. They want to be partners with America. A partner is not a grabber; he is a sharer.

* See "News of the Universe," by F. Barrows Colton, NATIONAL GEOGRAPHIC MAGAZINE, July, 1939.

Sculptured Gates to English Learning



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Illustration by R. Anthony Bennett

Dr. George M. Trevelyan, Master of Trinity, Reads a Volume of History in His Lodge

This distinguished historian administers a college; it teaches undergraduates how to live. They take courses at the University; there Professor Trevelyan lectures to members of all the colleges. Above his fireplace, Trinity's coat of arms shows a lion between two Bibles. The royal arms (top) represent Henry VIII.



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Antiquity and Modernity Achieve a Perfect Harmony along the Cam. Every Cambridge Graduate Treasures the Memory

These are the famous Backs, grounds of several riverside colleges. They roughly correspond to an American university's campus. In medieval Cambridge the Cam was bordered by ugly wharves and warehouses; these have disappeared. St. John's New Court is framed by willows dipping into the water (Plate IV).

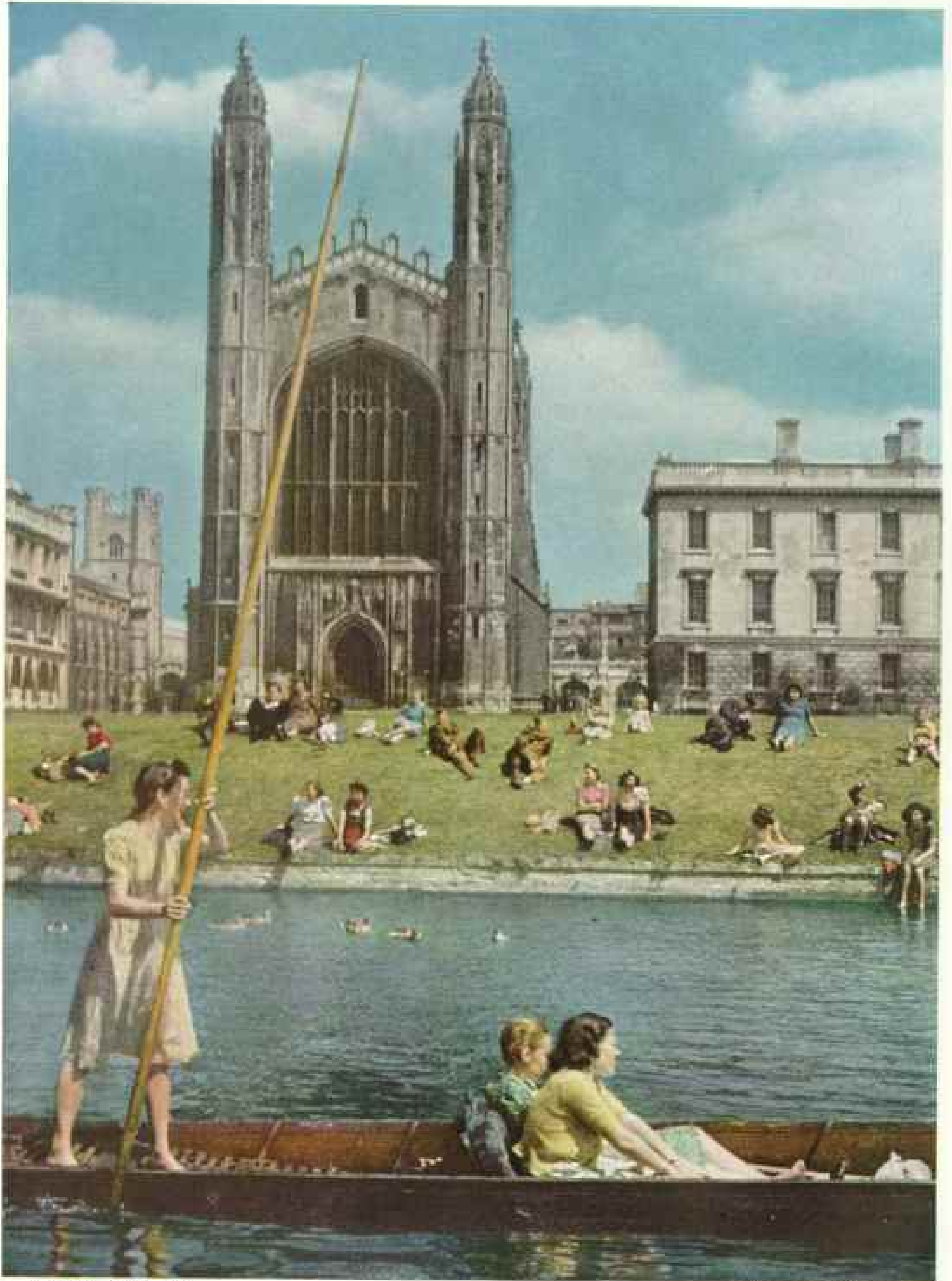


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Illustration by E. Anthony Stewart

As a Sign of His Approbation, Dr. Charles Earle Raven, Master of Christ's, Pours Tea for Two Undergraduates

Every Cambridge man expects at some point in his college career to be asked to tea with the Master. It is a great honor. Dr. Raven is professor of divinity at Cambridge. In 1926 he lectured at Harvard. He is the author of books on religion and birds. The flowers are from his garden.



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Illustration by R. Arthur Fisher

Sunday's Loungers Through the Backs and Watch Punters Poling Past King's Chapel

Pride of Cambridge, King's College Chapel is 500 years old. Wordsworth called it "this immense and glorious work of fine intelligence . . . where light and shadow repose, where music dwells." Several GPs stretch on the grass. Tame ducks swim the Cam. Leather is scarce; the punter saves her shoes.

Sculptured Gates to English Learning



What a Place for a Holiday Stroll! Across the Cam Go Boys and Girls

Two Cambridge colleges enroll 500 women a year. Though they attend lectures with the men, girls receive only "titles to degrees." Serious students, they are not too great a distraction to the young gentlemen.



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Reference to Dr. Anthony Stewart

A Cantabrigian Wears His College's Unmistakable Insignia, a Brilliant Blazer

Blazers got their name from a Cambridge scarlet sports jacket. An athlete's light blue is most coveted. Less arduous sports, such as chess, merit half-blues. Sixth man wears King's College Boat Club's blazer.



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Photograph by P. Anthony Stewart

On a Lazy Afternoon Britons and Americans Absorb Sunshine and International Fellowship on the Backs

Clare Bridge leads to Clare (founded 1126), the University's second oldest college. Tradition says Chaucer went to Clare. These boatmen paddle their square-propped punts; they may be unskilled at using poles (Plate XII). A novice, his pole stuck in the mud, is likely to be jerked overboard.



© Scamman Gossage/Alamy

© Scamman Gossage/Alamy

Bull Hotel, Given Over to Americans, Inevitably Became "Bull College," the GI's Alma Mater

Every fighting Texan who could get to Cambridge made a beeline to the author's rooms for a talk about longhorns and cactus thorns. After the war scores of Yanks took an 8-week course at Army expense. Bull Hotel owes its name to an ancestor, the Black Bull. On the right loom the towers of King's Chapel (Plate XII).



© National Geographic Society

Redrawn by H. Arthur Stewart

On Queens' Mellowed Brick Shines "a Very Elegant Sun Dial with All Ye Signs"

Painted in 1533, the dial was described as "no small ornamental to ye court to enliven it." Queens' College—note the double possessive—was supported by the queens of Henry VI and Edward IV. There are bicycles galore in Cambridge. A lecture's popularity may be judged by the bikes parked outside.

British undergraduates will learn all they can about America for reasons of enlightened self-interest if for no other. They don't want to hear what someone thinks will please them; they want to face actualities.

American soldiers visiting me, often university men themselves, would glance at some undergraduates walking by and remark, "I suppose they are snobs," or "They're some lords' sons, I guess." As a matter of fact, I met—to recognize—only one snob in Cambridge. He was very young and was in process of having his ears knocked down every day.

The scions of nobility are swallowed up in the democratic mass. The sons of many very poor parents are in the colleges. They are enabled to attend through the large number of scholarships, "exhibitions," grants of one kind and another provided by endowments.

Cambridge students asked me repeatedly how young men and young women in America work their way through college. This is a way barred to the British student. In normal times the cost of a university education in England is about the cost in America, but the price of labor is much lower.

Working one's way through college would be difficult business. A reform Education Bill passed by Parliament in 1944 will add more Government subsidies to enable more capable youths without means to go to college.

The college system in the old English universities makes a point of having "the young gentlemen" live like gentlemen among gentlemen. Theoretically, their time belongs to the processes of education, not to maintaining existence.

The poorest scholar is assigned to a set of rooms. In addition to his bedroom, he has a study or sitting room in which to work, have tea, be sociable.

Often two bedrooms, each occupied by a single man, open into a common study. Bed-makers, or "bedders," mature women, care for the rooms. These women take a great interest in their charges, and the charges are generally very fond of them (page 415).

College Newspapers Unknown

So far as I know, there is not a college newspaper in the British Isles. At Cambridge one learns of what is going on through billboard notices, the grapevine telegraph, the *Cambridge Daily News*, and the weekly *Cambridge Review*.

Politics over campus organizations, popularity contests, annuals stuffed with pictures, and other "activities" as American collegians know them hardly exist.

Many a holder of public office is so occupied with the processes of politics that he never honestly regards policies. Many an educator is so concerned with the business of education that he has little time for learning.

Many an American collegian is so active in "student affairs" that he has little time for study and contemplation.

What is this life if, full of care,
We have no time to stand and stare?
No time to stand beneath the boughs
And stare as long as sheep and cows?

Since my own freshman year, William Wordsworth has been my favorite poet. In Cambridge gardens, along deeply shadowed cloisters, out under the soaring and ever-singing skylarks over Grantchester meadows just up the Cam from ancient Cambridge town, I have many times remembered Wordsworth's idea of sitting quietly and letting "authentic tidings of invisible things" seep into him. "The thoughts of youth are long, long thoughts."

"Long, Long Thoughts"

Surely there can be few places where they are longer than at Cambridge. It seemed to me that the young men there learn to converse with themselves, to develop inner resources.

Yet it would be a mistake to regard Cambridge as provincial, insular, cloistered apart from the tides of life. It and Oxford are English, also British, to the backbone. Yet they are extraordinarily cosmopolitan.

Even in wartime, I met students from Mexico, the South American republics, Greece, Egypt, India, Portugal, Spain, and other foreign lands.

At a luncheon given by the Vice-Chancellor of Cambridge for the Portuguese Ambassador to Great Britain, this big, dark, muscular man of fifty or so replied to a toast in these words: "As an undergraduate at Cambridge, I received two things that have strongly influenced my life. I learned to respect every man's opinion. I am a devout Catholic, and I learned to respect every man's religion." We all felt that the Ambassador was sincere.

I have not had space to tell of the kindnesses and courtesies that I was constantly experiencing from Cambridge people. It would be difficult for me to analyze the feelings of spiritual and intellectual freedom that I felt there. I came to appreciate deeply the atmosphere of tolerance and of regard for the simple human decencies as well as for civilization.

Cambridge will continue to mean to me kind hearts, free minds, a place where human lives are made richer.



British Information Services

After Prayers, Moslems Must Find Their Shoes

Here followers of Mohammed from countries beyond the frontiers of India leave Bombay's Jami Mosque. The man seated at right is from Arabia; the turbaned man, shoes in hand, beside him, is from Afghanistan, and the one on the left, stooping for his sandals, is from Mesopotamia.

India Mosaic

BY PETER MUIR AND FRANCES MUIR

ON THE EVENING of March 27, 1941, in Cairo, we first understood that India was actively and enthusiastically engaged in fighting by the side of Great Britain.

That morning, supposedly impregnable Cheren, in Eritrea, had been captured from the Italians, and the success of the attack was due in large part to the 4th and 5th Indian Divisions.

When the reports of the battle began coming in, we read such phrases as: ". . . the Rajputana Rifles advanced on and captured Hog's Back . . . to the left the Maharrattas carried Flat Top . . . to the west the Sikhs were attacking . . ."

Units of the Indian Army served on the Maginot Line in 1940 and were in the Dunkerque retreat.

After Dunkerque they distinguished themselves, sometimes in defeat but more often in victory, in Eritrea, Ethiopia, the Western Desert, and Syria. They helped prevent enemy occupation of Iran, Iraq, and Cyprus. They threw the invading Japanese out of Assam, and the vast majority of troops that drove the enemy from Burma were Indian.

Indians and Gurkhas in World War II won 23 Victoria Crosses, Britain's highest award for valor in action (page 445).

Greatest Volunteer Army in History

Fighting all over the world, the Indian Army numbered more than two million men, not one of whom was forced to serve. It was the greatest volunteer army history has ever known.

Volunteers were so numerous that many acceptable recruits were turned away daily. In the summer of 1942, when invasion of India was threatened, about 70,000 enlistments were accepted monthly; the average toward the war's end was 50,000.

But why only 2,000,000 from a population nearly three times that of the United States? Why not total mobilization? The difficulty of providing equipment was one reason for limiting the number of men enrolled; but more important was the almost impossible task of training, of welding this heterogeneous group into a smooth-running war machine.

Differences of language and religion, primitive agricultural methods, the caste system, and illiteracy were inescapable obstacles to rapid complete mobilization.

In the United States, where the man from

Florida can talk to a soldier from Oregon, and the Maine sailor knows the same jokes and slang as a Marine of southern California, it is hard to understand the language difficulty involved in training men for the Indian Army.

India has 23 languages, each spoken by a million or more people, and 250-odd dialects.

Of the rural classes, farmers and laborers, who form the vast majority of Indian soldiery, few speak English, and with some exceptions this is also true of those from the cities. Therefore, a common language had to be chosen. It is one understood in large sections of India—Urdu. To avoid choosing between the Devanagari alphabet, in which modern Hindi as well as the Hindu classics are written, and the Arabic script of the Moslem invaders, still used in Urdu, the language of the Indian Army is now written in the Roman alphabet (page 447).

The training period of a soldier was two years. Little wonder, when one considers that many had never worn shoes, and that men who had never seen a motorcar had to be trained as mechanics and as tank drivers.

"The Indian Army," it has been said, "has the biggest organized system of adult education in the world." The Army must educate its recruits, and, in doing so, it bears in mind that, since the soldier normally serves only part of his youth in the Army, it must also aim to return him to civil life a better man and a better citizen.

Indian universities cooperated with the Government in providing military training courses, and large schools were opened for training boys so that when they reached army age they could join up immediately as fully qualified technicians.

Perhaps the most fundamental reason for not applying all-out mobilization was the agricultural situation. The population would starve if the manpower were drained from the farms, for agriculture has never been mechanized. There are 45,000,000 holdings of a few acres each, and these are worked crudely by the owner and his family. From the small surpluses of these farms comes most of India's food supply.

But of the many difficulties in increasing the Army from a prewar force of 182,000 to more than 2,000,000, caste and religious customs have been the hardest obstacles to overcome. In the first World War, certain sects would not sit down to meals with others.

It is a signal triumph for the democracy of the Indian Army that its soldiers will now eat together on the march or in the field, where they fraternize freely as brothers in arms. In general, however, separate cooks, kitchens, and separate eating places are maintained for Hindus and Moslems. This does not make the life of a quartermaster easy.

Some Hindus do not eat meat, and none, the Sikhs included, eat beef. Moslems will not touch pork. The meat for each class must be slaughtered according to its special customs, and by a man of the same religion. For Hindus and Sikhs the custom is called *jhatka*—slashing off the head of the animal at a single stroke; for the Moslems it is *halal*—cutting the throat. Whenever it is possible, "on the hoof" meat is supplied to the Indian Army.

There was still another hurdle of major proportions—the selecting and training of Indian officers who would command the loyalty of all classes. There were only 307 native commissions in 1939. This number had to be increased thirtyfold in a relatively short time, and at war's end there were 11,000, of whom more than one hundred held the rank of lieutenant colonel and commanded battalions. Forty-five of them served in New Delhi on the headquarters staff.

These officers, chosen regardless of religion or caste and commanding men of all sects, were mostly graduates of the Bangalore and Mhow Academies or of Dehra Dun, a military college which corresponds to our West Point.

All Indian divisions are composed of British and Indian troops. A third of the infantry and the majority of the gunners are British. There are also British signalers. Two-thirds of the infantry are Indian; all the engineers are Indian, and the Field Ambulances, Ordnance, and Service Corps are mostly Indian. In addition, there are the Gurkhas.

The men who make up the Indian Army differ physically as well as spiritually. They run a gamut from the tall, dignified, bearded Sikhs of the Punjab to the short, stocky, cheerful Gurkhas from the sovereign Kingdom of Nepal. The "typical" Indian soldier does not exist.

Hindus supply 50 percent of the troops, Moslems 34, Sikhs 10, and Untouchables make up most of the remaining 6 percent.

The vast majority of Moslems were recruited in the northern provinces of Punjab and the North-West Frontier, from which came the fierce Pathans of Kipling fame. Bengal, Sind, and Baluchistan supplied others.

The tall, bearded soldiers from the Punjab,

the Sikhs, are among the staunchest fighters. An important practice in their dogma is that no hair of the body can ever be cut, and they must never be without the five things which are the distinctive marks of their class—the five "K's." These are *kesh* (the uncut beard and hair), *khanga* (the symbolic comb), *kara* (the iron bracelet which reminds never to steal), *kirpan* (the dagger), and *kachh* (the white underdrawers, worn even when bathing). Tobacco is taboo.

The Gurkhas caught our fancy. Although they are Hindus, they are not Indians but Nepalese, who have come down from their mountain kingdom to join the Indian Army. Tales of their courageous deeds are legion. They are particularly adept in hand-to-hand fighting, using the curved knife which is called a *kukri*.

Add to these groups the delicately built, courageous Garhwalis, the tall, powerful Jats from the north, the shy Dogras from the Himalayan foothills, the Aryan Rajputs (whose ancestors came to India and conquered tribes of aborigines many centuries ago), the Mahrattas (whose forebears rose against the Mogul Empire in the 17th century), and you have a general picture of just how heterogeneous the Indian Army really is.

This Is India

One out of every six people in the world is an Indian.

Judged from the streets of Calcutta, the percentage of the bovine population is also incredibly high. A relatively small number of ascetics are regarded as holy men, but to many Hindus cows and bulls are sacred. They wander along sidewalks or stand placidly in the middle of streets, oblivious of traffic.

They confront taxi drivers with an imperturbable stare, which seems to say, "You can't touch me. If you do, every Hindu in the neighborhood will mob you."

In three languages—Hindi, Urdu, and English—signs at all drinking places remind the newcomer that in India even the source of life is contaminated by taboo. It is the Hindus who fear pollution at the hands of their fellow men.

"Water for Hindus," "Water for Muslims," "Hindu Hotel," "Hindu Coffeehouse." What was the matter with the word "Indian"?

Like most other Americans, I had heard of the *Indian* problem, of a movement for *Indian* independence, and many references to the aspirations of *Indians*. During 15 months in this country I rarely met a man who referred to himself as an Indian. I met Hindus, Moslems, Sikhs, Parsis, Indian Christians, and



India Information Service

For Remarkable Valor, This Gurkha Received the Victoria Cross

Wife, mother, and father admire Britain's highest decoration, awarded to Sgt. Tullabhadur Pun by Viscount Wavell, Viceroy of India, at Delhi. After most of his section had been killed in an attack on a Japanese-held railroad bridge in Burma, the sergeant seized a Bren gun and charged alone across 30 yards of bullet-swept terrain. From a bunker he then gave accurate supporting fire which enabled his comrades to gain the objective. Of 142 Victoria Crosses awarded in World War II, Indian soldiers have won 23.

also people who described themselves even more specifically as Brahmans, Marwaris, Untouchables, Pathans, Rajputs, Kashmiris, Punjabis, and so on ad infinitum.

While awaiting Maj. Iskander Mirza's car to take us to his house in Peshawar for dinner, I glanced at the hotel register to see whether Arch Steele, then war correspondent for the *Chicago Daily News*, had arrived. His signature was there, and above it was the name of an Indian who had written "Hindu" under the column headed "Nationality."

This, in a part of the country where Moslems are over 90 percent in the majority, seemed an unnecessary way of emphasizing the lack of unity between the two predominant religions and political parties of India. Can you imagine an American describing his nationality as Christian or Jewish?

Like many fellow Americans, we had the

mistaken impression that Gandhi spoke for all the hundreds of millions of Indians, and that the only impediment to the realization of a free unity was the existence of a British Imperial Government. The fact that India has always been, and still is, riven by geographical barriers, religious allegiances, and caste distinctions is often missed.

Every Traveler Needs a Go-between

When I arrived in India I was besieged by Indians seeking jobs as "bearers," but I laughed at the idea of a personal servant. The last applicant had prophesied: "Before one month in India, Sah'b taking bearer. Nothing properly working like America."

We soon found that the personal bearer is as necessary in India as the telephone in America.

The bearer makes the bed, straightens up

the room (except for sweeping, which is beneath his dignity and is done by a member of the sweeper caste), and is the go-between with the laundryman, cleaner, delivery boys, and messengers.

As an interpreter he is invaluable.

On trains, even in first class, no bedding is supplied. You carry your own blanket roll, and the bearer makes your bed at night and rolls it up in the morning. When you go to the dining car he stays in your carriage, which opens straight out onto the platform, and guards your baggage to prevent pilfering. This alone is worth his wages.

Good pay is about \$12 a month, with 30 cents extra per diem when on the road. You provide his transportation and his clothes, but he feeds and lodges himself.

I engaged Duki Ram, a Hindu and a careful observer of the finer points. When I ordered him a green woolen coat for the mountains, he got the tailor to change the color and appeared in a mustard one. This puzzled me until I was told, having asked about the yellow spots painted on livestock, that saffron and its variations are sacred to Hindus. Green and blue are favored by the Moslems.

The Hindu belief in transmigration of souls was vividly illustrated in connection with a Flit-gun. In a series of incarnations the Hindu soul is believed to approach or recede from a state of ultimate bliss, depending on its virtue or lack thereof. In any of these existences it may take the form of man or beast, and the killing of any living creature is forbidden to certain sects. With this doubtless in mind, Duki Ram looked up thoughtfully while Flitting a room and asked: "Only make flies sick, Sah'b? Not killing?"

Why Unity Is Hard to Achieve

Unity is difficult to achieve in a land where one half of the population will not break bread with the other half. Caste Hindus, who form about 50 percent of India's population, will eat only food prepared by other Caste Hindus; they will not sit at table with Moslems or Untouchables, who between them make up roughly the other half of the four hundred million Indians. That they are all Indians does not matter.

The Moslems are free from caste prejudices, and their chief taboos are pork and alcohol, both forbidden by their religion. Islam is a democratic religion, and its cardinal tenet is the brotherhood of man.

Thus it is diametrically opposed to the Hindu system, which is rooted in the belief that people are born unequal and remain so in this and other existences.

At a dinner in the house of the Moslem Prime Minister of Jaipur State, the Hindu woman on my right was served one sort of soup, the Moslem woman on my left another. Throughout this double meal my menu matched that of the Moslem, and our table bearers were the same. Special food and special waiters were provided for the Hindus.

In the palatial Bombay home of Mohammed Ali Jinnah, I received a glass of lemonade from the hands of an Untouchable, an immaculate and intelligent-looking fellow. "I have five Untouchables on my staff," Jinnah told me. "They make first-class servants."

But their own people, the Hindus, of which they are the lowest order, will allow them only to sweep and handle slops, although one of them, Dr. Ambedkar, is now a high Government official (pages 465, 466).

Jinnah told a story which illustrates the degree to which some Hindus carry their non-bread-breaking principles.

"We had just sat down to lunch," he said, "when a very old and dear friend was announced, a former president of the Congress party. I ran to the door to greet him; he was leaving for a long trip and wanted to say good-bye. I took him by the arm and led him into the dining room, insisting that he have lunch with us.

"He refused, and I suddenly remembered that he was a Hindu.

"'But just sit down with us,' I pleaded. An extra chair was put at the table, but he refused it."

Jinnah stopped for a moment to chuckle. Then: "Do you know, Mr. Muir, that I had to have the rug rolled up, and his chair placed on the bare floor, before he would sit down?"

I must have looked puzzled, for my host went on to explain: "He could not allow any contact with the table where we were eating—not even the contact of a rug!"

The British occupation marks one of a succession of invasions which started about 2000 B.C., when Aryan tribes descended through the northwest passes upon an already existing Indian civilization. It is believed that Hinduism was developed by these Aryans.

Greeks, Huns, Turks, Mongols (Moguls), and Persians also invaded the country.

Baber, a Central Asian of prodigious physique, swept all before him and founded the great Mogul Moslem Empire, which reached its height during the reign of his grandson Akbar, a contemporary of Queen Elizabeth. Under Akbar's two immediate successors the Empire flourished, but fanatical religious wars later rent the country, and corruption and



REAR PHOTOGRAPHER: MERRILL OWEN WILLIAMS

Movies Made in India Attract 1,000,000 Fans Daily

Here a theater near Delhi's Great Mosque offers "Drums." Pictures are made in a number of India's many languages; Urdu is the most popular. India's film industry is one of the largest in the world, with 150 companies producing 200 pictures a year. Of the country's 2,000 cinema theaters, 300 show foreign films, of which about 80 percent are American-made. Studios are located at Bombay, Calcutta, and Lahore. The billboard includes Hindi, in Devanagari script (under A), and Urdu, in Arabic script (under B).

decadence in government weakened the control of the Moguls. India had become an easy prey for the seafaring powers of the West.

The Portuguese came first, Vasco da Gama touching India on his voyage in 1498. They were driven out by the Dutch, who were dislodged by the French and the British. Finally the British beat the French.

In less than eighty years after the Indian Mutiny (1857), Indian independence became a settled part of British policy and was definitely expressed in the Act of 1935, which provided that a limited constitutional govern-

ment was to be formed prior to the granting to India of dominion status. The Statute of Westminster had previously (1931) established the right of dominions to secede from the British Commonwealth.

Whereas in America or England a minority party, by swinging public opinion, may become the majority party in a later election, in India the Moslems, Untouchables, Sikhs, etc., know that their minority positions are permanent, with the Caste Hindu population overwhelmingly in the majority.

They therefore demand safeguards, and

it is the problem of adjusting these safeguards in a manner acceptable to all Indians which has blocked the successful formation of a constitutional government, dominion status, and independence.

Give as Well as Take Is British Policy

Britain has taken much from India and contributed much to her.

British businessmen, educators, and missionaries of the 19th and 20th centuries improved conditions immeasurably.

Great progress has been made along humanitarian lines under British rule. Visitations of plague and famine no longer sweep the country.

Although the Moguls tried to discourage the Hindu practice of suttee (widow burning), it was not until the middle of the 19th century that the British were strong enough to make a determined drive against three deeply rooted customs: the *meriah* human sacrifices in Orissa, female infanticide, and suttee. "The first was confined to certain backward sects, but the other two were practised by the highest castes, and the last was enthusiastically approved by all classes."*

The *meriah* girls were reared for sacrifices. "The sacrifices were always in public. They took varying forms, all inexpressibly cruel, consisting of the cutting of the flesh off the living victim. . . . Between 1837 and 1854, one thousand, five hundred and six meriahs were rescued."

The killing of superfluous girl babies was very prevalent and impossible to suppress entirely, as the mother, inaccessible in her zenana, was usually the executioner.

As for suttee, its extermination presented a special problem, for, from the Hindu point of view, it was a popular spectacle, attended by crowds who insisted that the show go on.

"When a prince died, there was something approaching a holocaust. In 1780 sixty-four women burned at the death of Raja Ajit Singh of Marwar. As late as the middle of the nineteenth century . . . such wholesale suttees were frequent."

Both India and Britain Have Profited

One of the last-known incidents was reported in the *Times*, London, September 2, 1932: "A Brahmin of Fatehpur Sikri died on Monday. His widow was determined to commit suttee, but was dissuaded. A mob collected at her house and demanded that she should burn herself. The police locked the woman in the house, but the mob broke in and dragged the woman to the burning ghat. The mob was erecting a pyre when the police

fired, killing three persons and wounding five, and rescued the woman."

The struggle against these evils marked a deviation from British colonial policy, which stresses noninterference in matters of religion.

The building of modern communications—India's 42,000 miles of railways make it one of the large systems of the world—the construction of public utilities, and the industrialization of the country have provided large profits, as well as a higher standard of living for the average Indian.

Nearly 90 percent of India's population is rural, inhabiting some 700,000 villages scattered through regions of arid and fertile land.

Its 70,000,000 artificially irrigated acres form the largest artificially irrigated tract in the world. The increased yield from this system has helped to control famine and has added enormous stocks to the granaries of the British Empire.

Seventy years ago failure of the rains meant starvation, with mortalities ranging from one to five million. Since 1900 there has not been a serious famine in India, except for that in Bengal in 1943, which was caused by the Japs, who stopped the usual import of rice and other food from Burma and Siam.

Indian investors now hold more than 95 percent of the Indian Government securities formerly held by investors in Britain.

Ownership of the railway and irrigation systems has passed into Indian hands, and industry is becoming increasingly controlled by Indian stockholders. Indian capital was not at first inclined to invest in industrial enterprise, since the Indian has traditionally preferred to hold capital in the form of gold, silver, or land.

India pays no taxes to Britain, either direct or indirect. Her public debt was raised partly in England (the sterling debt) and partly in India (the rupee debt). The sterling debt was raised largely for such enterprises as the Government-owned railways and the irrigation system. The interest on this debt was from 2½ to 5 percent. On March 31, 1939, it amounted to £348,700,000. On February 28, 1945, it had dropped to about £11,000,000.

Today India is a creditor of Britain.

Only 50,000 British Make a Living in India

Of the million and a half nonmilitary Government employees in India, less than one thousand are British. Excluding the Army, there are, all told, about 50,000 British adults making a living in India—50,000 out of

* *Rise and Fulfilment of British Rule in India*, by Edward Thompson and G. T. Garratt. By permission of The Macmillan Company.



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Kodakman by Peter Union Alton

All Dressed Up, a Royal Elephant Advances to Receive a Potentate's Homage

Even his toenails are polished. Many hours have been spent grooming him for the climax of Mysore's *dasara* ceremonies, when the Maharaja makes obeisance to "the instruments of his reign" (Plate II). On his back he bears His Highness's bowdah. In the background is the Maharaja's palace, festooned with 130,000 electric-light bulbs.



© National Geographic Society

Photographs by Peter Upmum Blair

While Soldiers Stand Guard, the Maharaja Sprinkles Flowers upon the Sacred Elephant, Bulls, and Even His American Automobiles

Uniforms of crack regiments adorn the fighting men who turn out for the *darsit* ceremonies at Mysore. While the ruler pays homage to his household belongings, his followers offer similar tribute to taxicabs, sewing machines, and other symbols of their livelihood.



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Kodakgrams by Peter Gilman, Matt

One of "Tippoo's Tiger Men" Bares His Saber—and His Feet

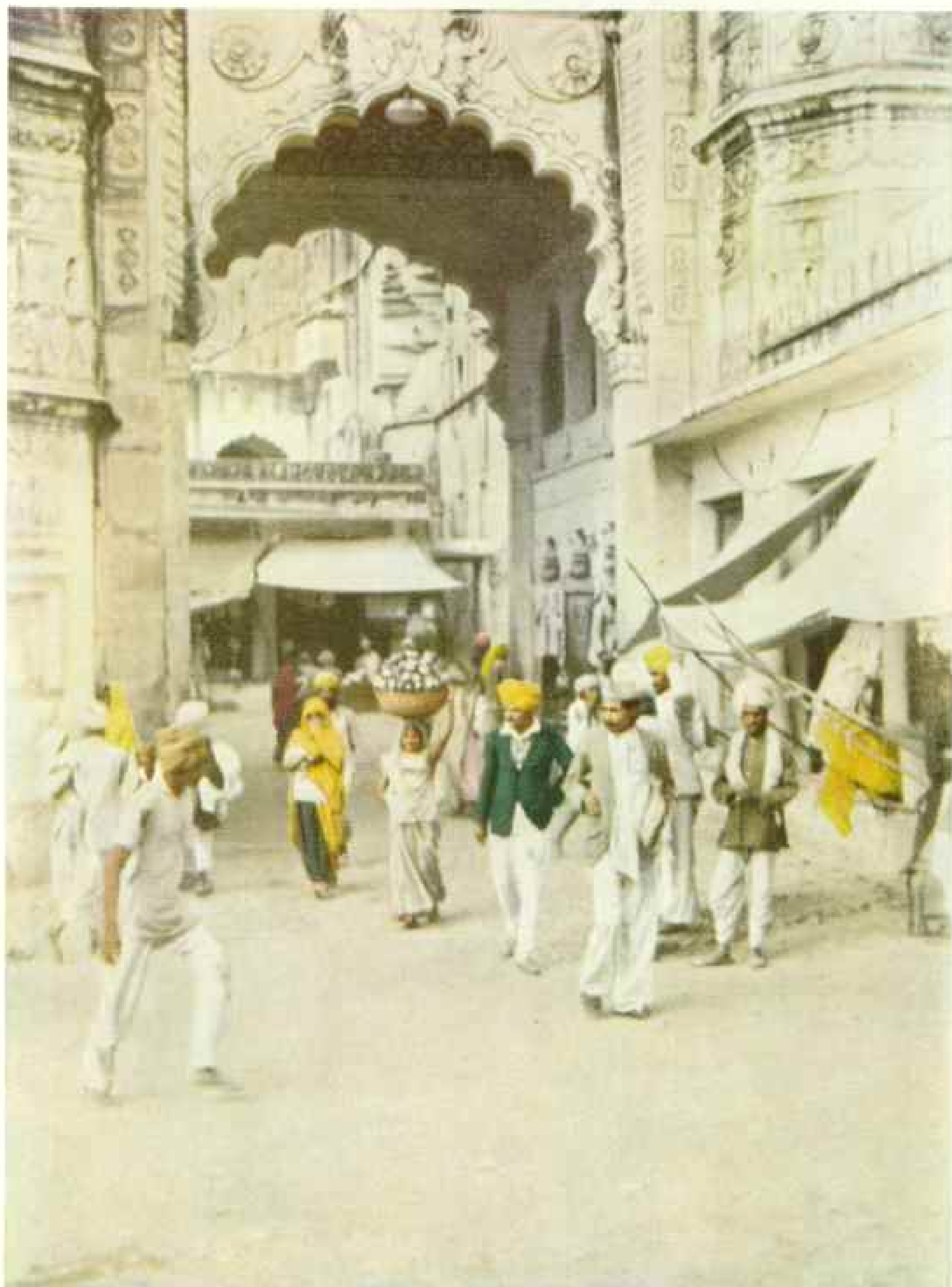
Chalk rings around this warrior's eyes make him look fierce. His uniform is worn by a small band in honor of a Mysore Moslem army led by Tippoo Sultan. Tippoo was defeated in 1799 by a British force which included Col. Arthur Wellesley, later the Duke of Wellington. Mysore now is a Hindu State.



Kodakgrams by Maxwell Dean Williams

Delhi's Festival of Id Booms Trade for a Sweetmeat Vendor

Throughout the Moslem world the followers of Mohammed cast off restraint for the Id holiday at the end of Ramadan, the yearly month of fasting. This merchant, seated before the Great Mosque of Delhi, sells crullerlike cakes to a group of visitors. For the children this is but one stop in a round of fun.



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Kodakchrome by Peter Cyril Mitter

Medieval Bundi, Never Defeated in War, Boasts an Ornate Gateway

Because of the State's proud military record, a treaty signed in the 17th century with the Emperor of India permits its official representatives to beat drums when entering the Indian capital. They may even wear arms in the Council chambers at Delhi. Bundi's ruler bears the ancestral title of Maharao Raja.

India at Work and Play



Kodachrome by Francis Muir

At 80 Yards, a Shot from Mr. Muir's Rifle Felled This Tiger

A well-placed bullet broke the jungle king's back after it was driven into a dry river bed by native beaters (Plate VII). Above, the author poses with his prize, bagged while he was guest of the Maharaja of Indore.



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Kodachrome by Peter Cyril Muir

Car and Camera Combine to Attract a Crowd of Indians

Admiration, wonder, and amusement are registered by these men and children encountered in a village in the Rajputana desert of northwestern India. The Muirs drew crowds wherever they went.



© National Geographic Society

Many of India's Cattle Are Sacred, but These Bullocks Work Hard for a Living

Here they pause with their heavily laden two-wheeled carts for a breathing spell in the Bundi market place (Plate IV). Though India has 42,000 miles of railways, the fourth-largest system in the world, bullock carts still haul much of its produce.

Kishartani by Peter Upton-Mutt



© National Geographic Society

Tigers Usually Prowl at Night, but This Jungle Monarch Ventured Out in the Midday Sun

Konstantin G. Pevsner/Epstein Mann

“Stripes” was photographed from a tree blind. Tiger hunting is regarded as a royal sport, and he who bags one is hailed as a public benefactor. The beasts attack humans when unable to live by killing other animals, and have caused villages to be evacuated.

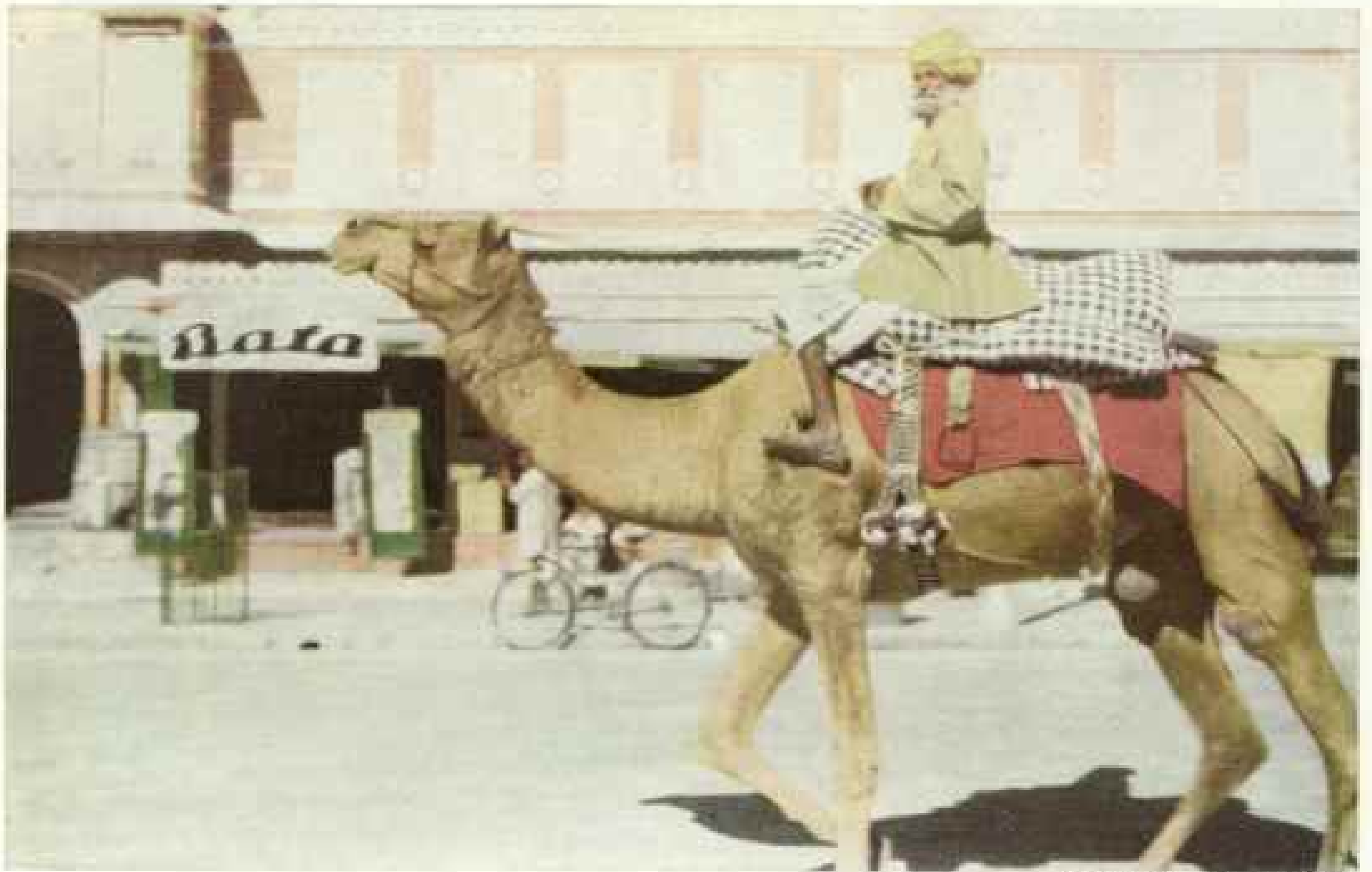
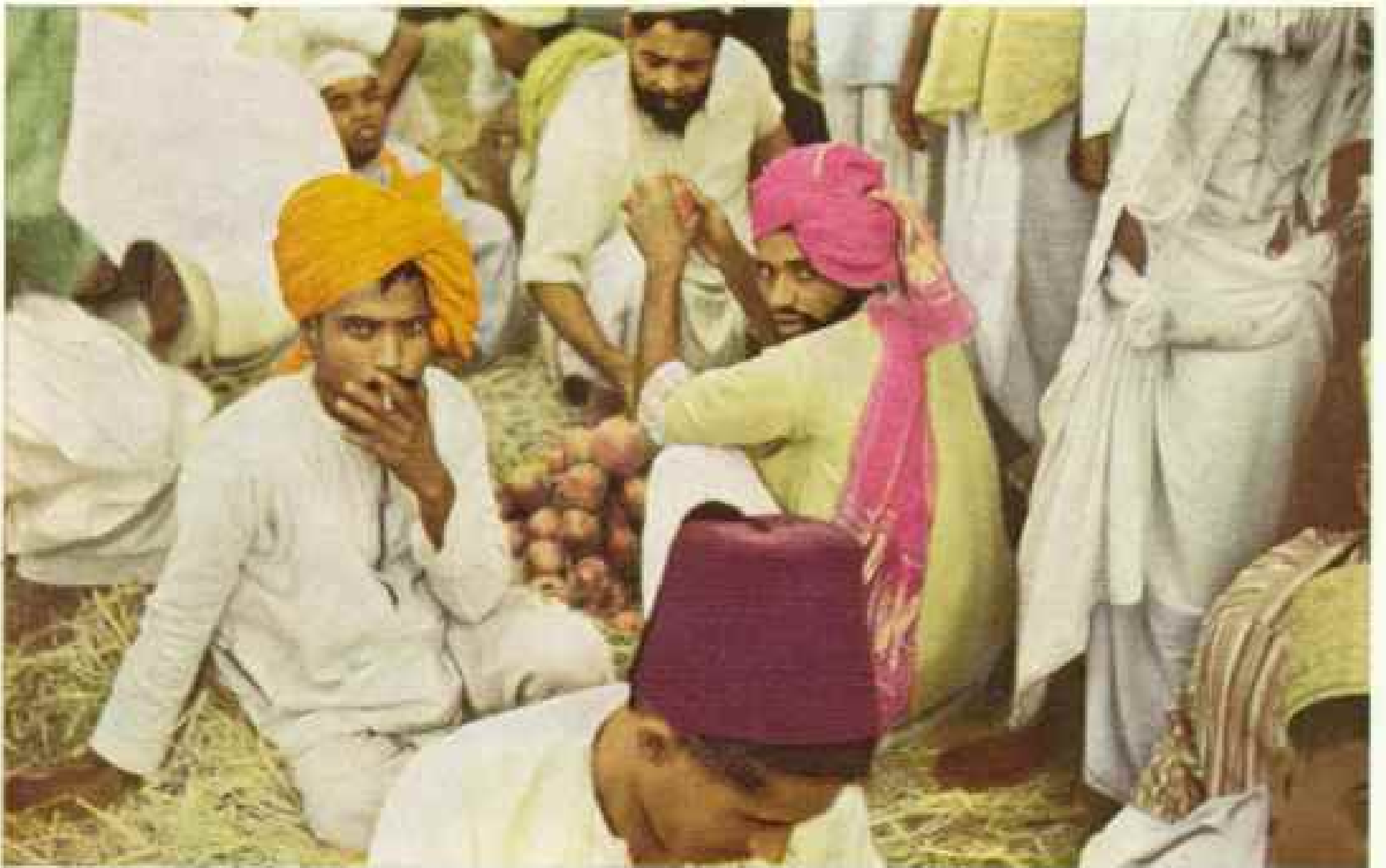


Illustration by Peter Upton, Mpls.

Camels Outnumber Automobiles in Jaipur, the Pink City

This one, with his bearded rider, ambles down the main street past a bicycle and a shoe store bearing a famous Czechoslovak manufacturer's name. Jaipur, founded in 1728, is a busy commercial city.



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Illustration by Margaret Owen Williams

Moslems Eat and Smoke Again after the Ramadan Fast

Outdoor picnics are popular at Delhi's Id festival. Between dawn and dusk the preceding 29 days the Moslems have denied themselves food and stunned boisterous merrymaking.

India at Work and Play



A Toyshop in a Suitcase Delights a Pair of Moslem Youngsters

The children wear their brightest and finest for the Id festival. The peddler offers dolls. He is one of thousands who display their wares before the Great Mosque and on Delhi's streets.

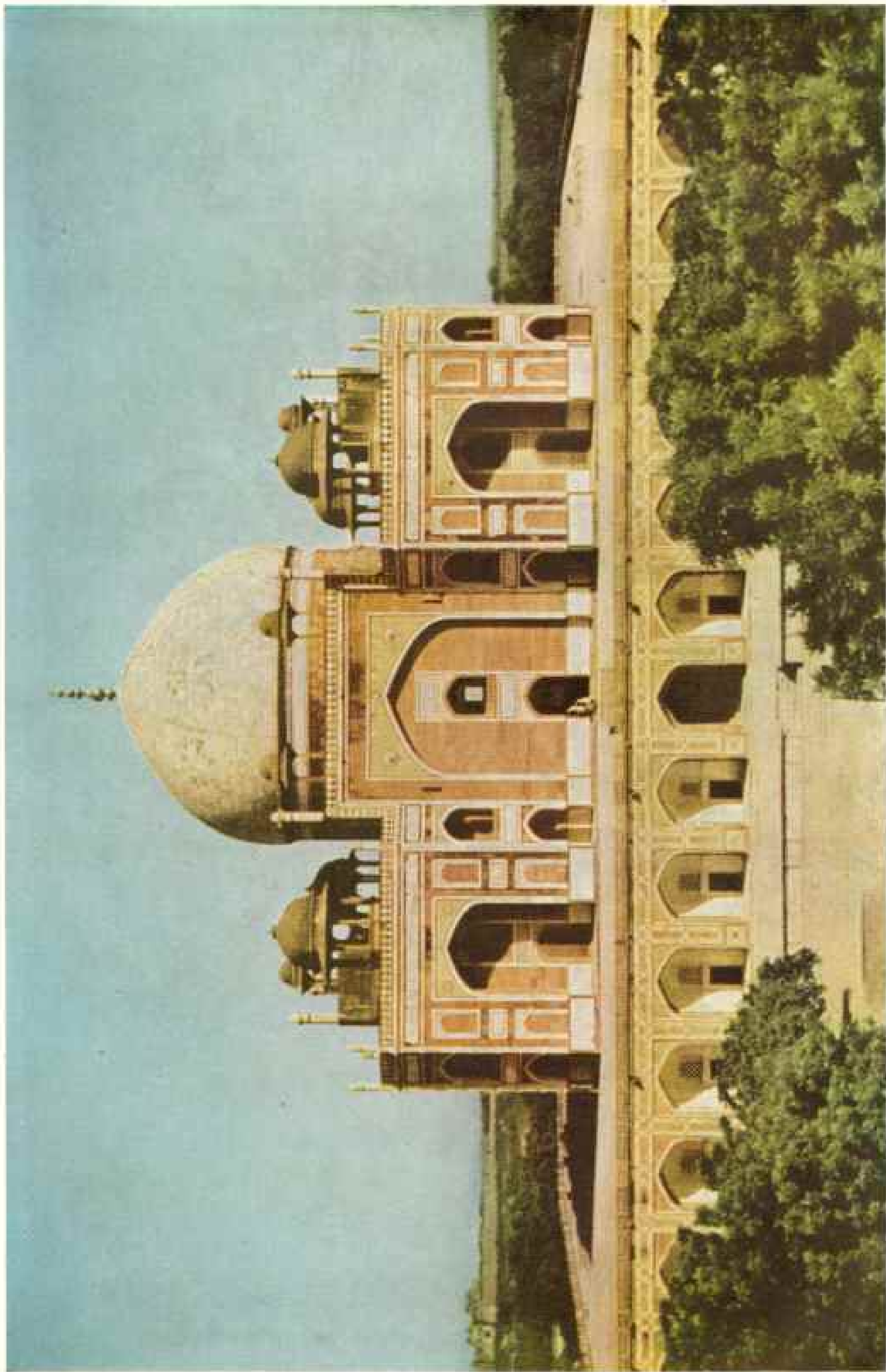


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Illustrations by Margaret Owen Williams

Furniture Is Scarce, but the Floor Serves Just as Well

This boy and his sister, playing with a doll, are the children of a Delhi guide. The girl wears a miniature bridal costume with veil, but only for display purposes, since she is far short of marriageable age.



© National Geographic Society

Reproduction by Maximal Open Windows

A Fitting Receptacle for the Remains of a King Is Humayun's Tomb, One of Delhi's Show Places

Beneath a cenotaph in this sandstone-and-marble mausoleum is the grave of Emperor Humayun, 16th-century Mogul ruler of India and father of Akbar the Great. Two miles from the tomb is the Sher Mandal, a small building which Humayun used as a library and where, in 1556, he fell to his death on the stairs.

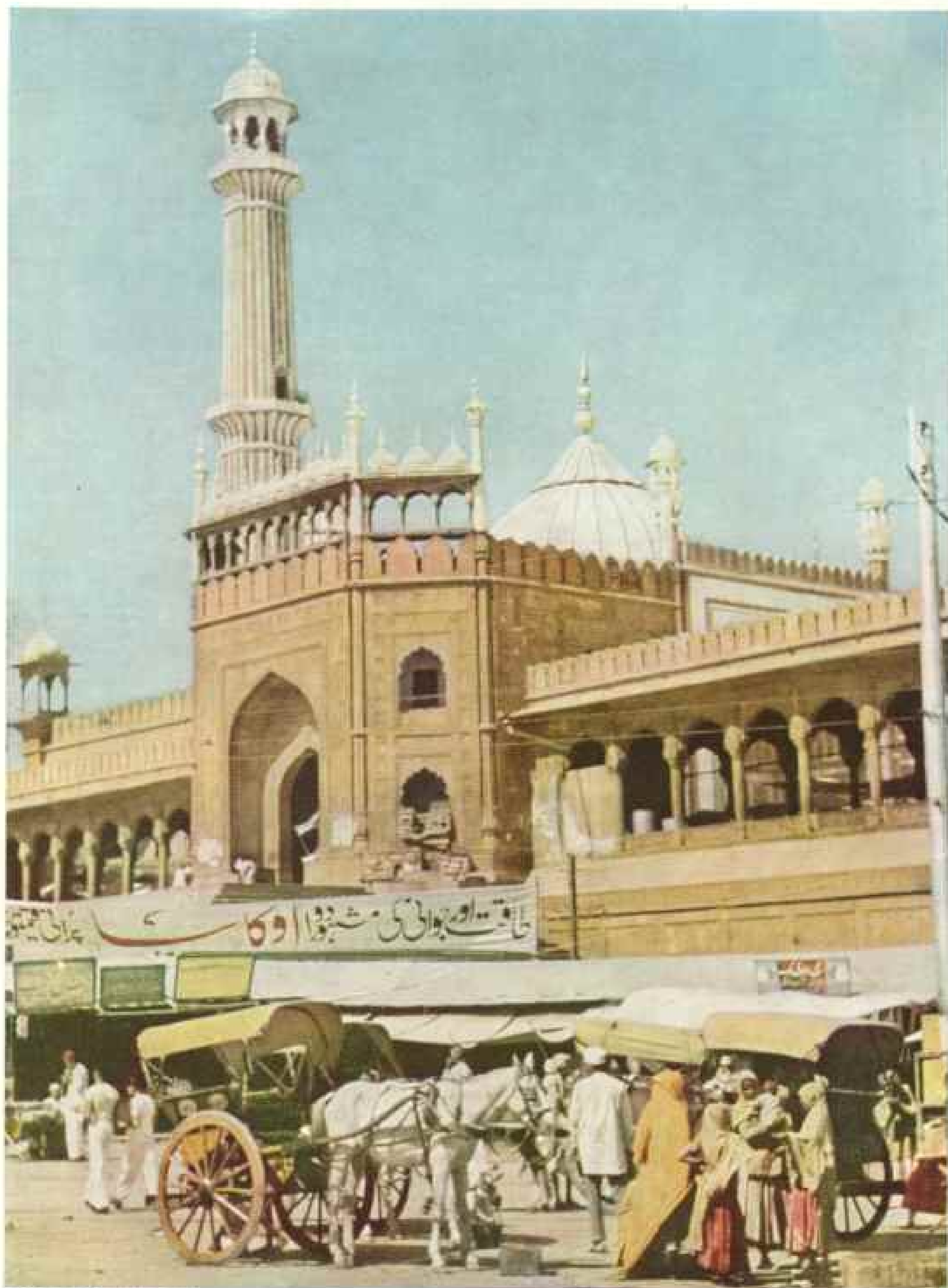


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Location—by Maynard Owen Williams

Barefoot Women Pad in a Constant Parade along Roads Leading to Delhi's Market Place

Two or three times a week farm women gather garden produce into bundles and carry them balanced on their heads to the city to be sold or traded. Many make a round trip of 30 miles, with children trudging beside them. Those above scorn the shade of trees lining a highway near Humayun's tomb.



© National Geographic Society

Reproduction by Howard Owen Williams

Minarets and Domes of Delhi's Great Mosque Tower above the Id Festival

To this temple come thousands of Moslems to offer prayers before celebrating the end of the Ramadan fast. Under the awnings sidewalk salesmen spread their wares. Above, horse-drawn *tongas* wait for customers. The sign over a shop in the center advertises, in Urdu, a patent medicine called "Okasa."

India at Work and Play



Fez and Turban Are the Favorite Headgear of Moslem Men in India

Once the national headdress of the Turks, the fez now is worn officially only in Egypt. The turban comes in many styles, and from the way it is wrapped an expert may determine the wearer's group or class.

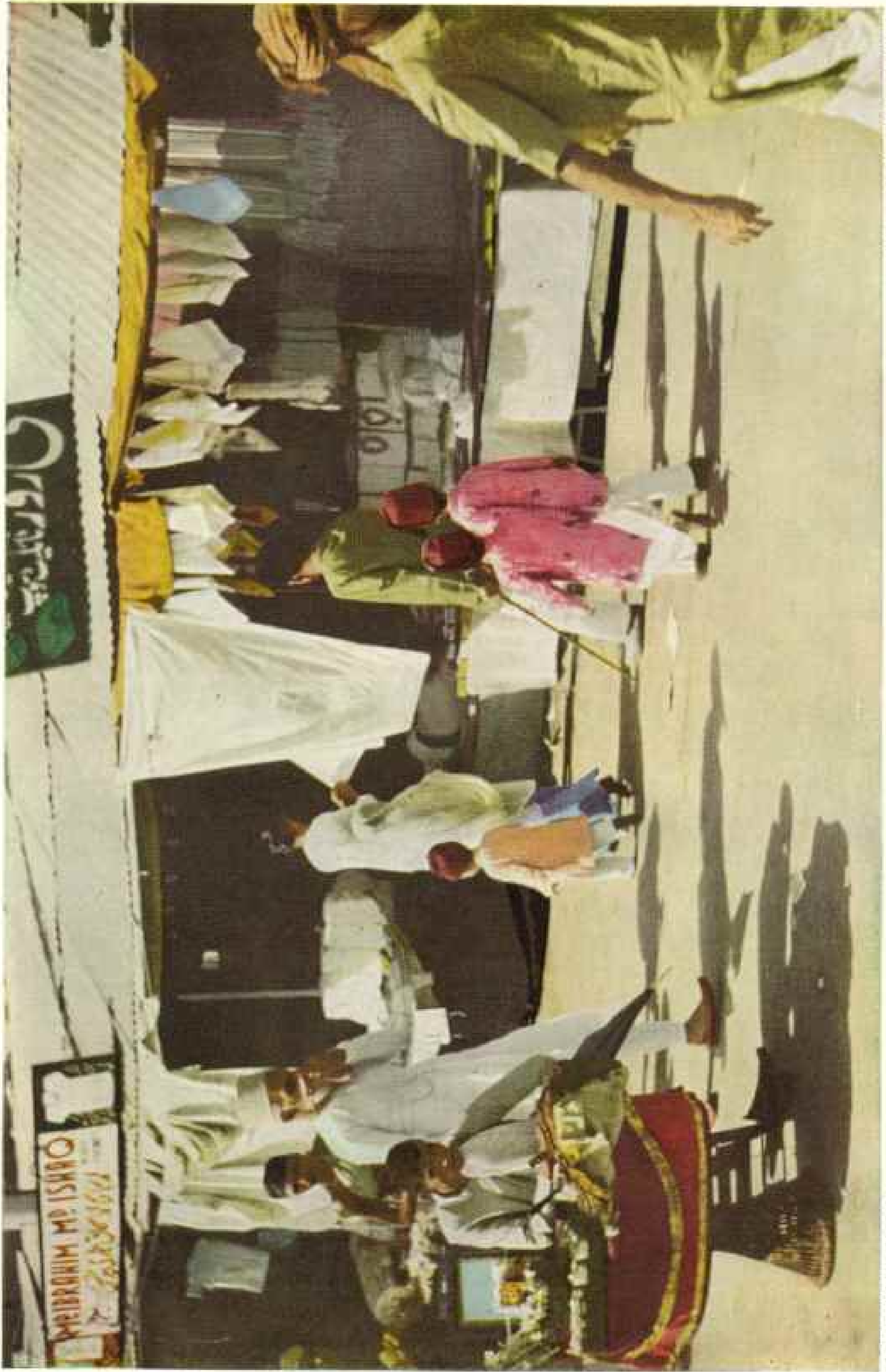


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Kodachrome by Margaret Owen Williams

An Id Festival Visitor Has His Dinner on a Delhi Street

Most working-class Indians eat out of doors, since it is cheaper and more convenient than cooking at home. Many of India's teeming millions have no homes and sleep where they happen to be. The Moslem above wears his brightest colors to celebrate the end of fasting.



© National Geographic Society

Delhi's Open-front Shops Look upon a Colorful Procession of Customers and Sightseers

On the sign at upper left, a merchant announces in Urdu and pictograph that he has shirts for sale. Soap is advertised by the shop at right. At lower left, an itinerant vendor has set up his tray of unsweetened pastries. The children, including two boys who might be twins, wear their finest for the Eid festival.

Illustration by Margaret O'Keefe Williams



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Shirttails Out Is the Fashion in Delhi

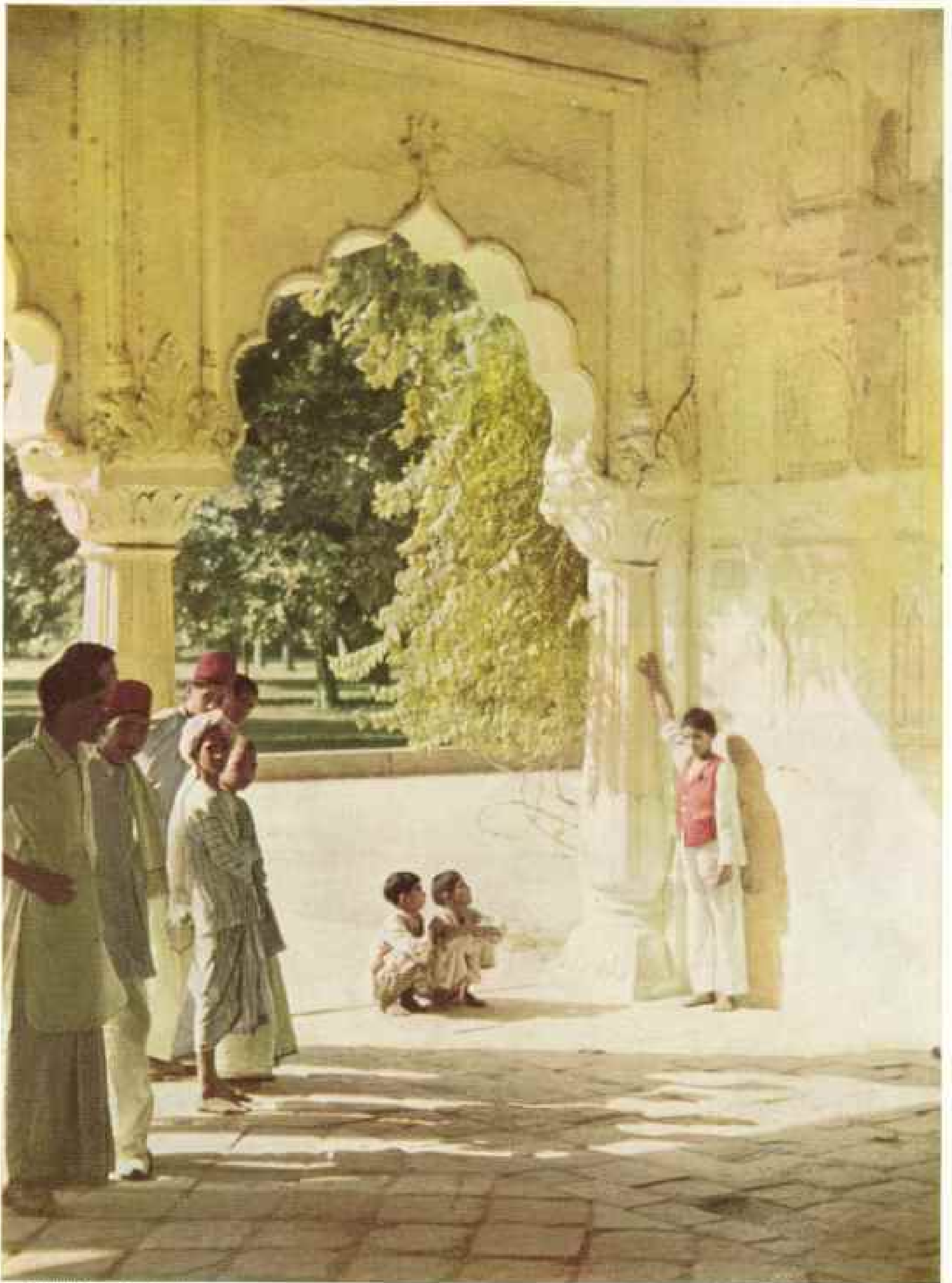
This brass peddler polishes his wares at the foot of the Great Mosque's stairs. The Moslem boy wears a tasseled turban, brightly embroidered vest, and checked *lungyi*, a wrap-around garment of Burmese origin.



Illustration by Maxfield Parrish

Daughter Takes a Ride on Father's Shoulders

Wearing arm bands, bracelets, and anklets, she is borne through Delhi's crowded streets to view the snake charmers, magicians, and countless other side shows of the Id festival. Id is the Moslem world's most important celebration.



© National Geographic Society

Enlargement by Margaret Owen Williams

Beyond the Ornate Arch Lie the Famed Roshanara Gardens

Near this pavilion is the grave of Roshanara, daughter of the Emperor Shah Jahan, who built the Taj Mahal at Agra, the Great Mosque of Delhi, and the Delhi Fort. She was also the favorite sister of Aurangzeb, the last great Mogul emperor of India. The gardens were laid out by Roshanara, who died in 1671.

Britain's population of about 48,000,000.

Since India obtained fiscal autonomy in 1921, which means that she has the power to impose tariffs upon goods from Britain as well as from non-British sources, British exports to India have steadily declined. They comprised 63 percent of India's total imports in 1914; 30 percent in 1938. By 1938-39 the balance of trade was in India's favor.

At present British taxpayers are paying more than half of India's defense costs, and in the fiscal year 1942-43 they contributed to the defense of India an amount greater than Britain's total investments in that country.

In the Indian street, nothing is considered eccentric. I have seen men, and women, too, for that matter, walking along the thoroughfares of Delhi completely naked. These "holy" men are *sadhus*, and sometimes to intensify their sanctity they cover themselves with ashes. I don't know what excuse the women have, since even the poorest possess rags of some kind.

Wealthy Indians often appear in perfectly cut Western business suits—of mauve or canary yellow.

How can you tell a Hindu from a Moslem? The men in fezzes are Moslems. Then, unconsciously, you assume that the men in turbans are Hindus; but this, you discover, is an error. Millions of turbans are worn by Moslems; the fez is comparatively rare (Plate XIII).

Since the average Hindu is clean-shaven, and Sikhs are always bearded, you are tempted to decide that the man with a beard and a turban is a Sikh. Yet this must be qualified, for many Moslems wear beards. Finally, you watch to see whether or not the beard is trimmed; if not, the man is probably a Sikh (page 444).

Foreheads painted with caste marks denote Hindus; however, millions of Hindus do not use these signs and, for all outward indications, might be Indian Christians.

One learns that Hindus are divided into four main castes: Brahmans—ascetics, priests, learned men, teachers; Kshatriyas; martial classes; Vaisyas; traders, merchants; and Sudras; servants of the above castes, with the Untouchables existing outside the social pale. Within these castes devotees worship different gods and goddesses, and hundreds of sub-castes redivide the structure of the system ad infinitum.

Religion is the cornerstone of Indian life.

* Now Minister of Labor, on the Viceroy's Executive Council.

Two leaders of the largest minority parties live in Bombay: Mohammed Ali Jinnah, who heads the ninety-four million Moslems, and Dr. Bhimrao Ambedkar,* who has the following of the fifty to sixty million Untouchables. These two men are the leaders of that other half of the Indian population with which the Caste Hindus will not break bread.

While his energy and enthusiasm make him appear much younger, Jinnah is now nearly 70. He is above average height, slender, immaculately dressed in the best European taste, and his intelligent face is thin and distinguished. His manner, alternately excited and dignified, is always that of a man of breeding and cultivation.

From the marble-paved porch of his house you look out across a well-cut lawn and flower garden to the Arabian Sea. A large, handsome room is devoted to his law library.

He has given up a lucrative law practice to devote his entire time to the All-India Moslem League, which he resurrected in 1936.

The Moslems' Idea of Freedom

"Pakistan," he said, "is the word we use to describe our desire for liberty from any possible Hindu domination. We do not wish to find ourselves free from British rule only to be governed by the Hindus, who are in the vast majority."

He went on to say that Pakistan meant the division of India, the turning over to Moslems of those parts of the country where they have an overwhelming majority: Sind, the North-West Frontier Province, Baluchistan, most of the Punjab, Bengal (with the exception of a Hindu region around Midnapore), and Assam. Contending that India was large enough to contain several countries, he cited South America as an example of a continental entity which no one insisted on uniting under one government.

"Ninety-four millions of people do not constitute a minority, but a nation." He was emphatic. "Moslems are proud and independent; they will never consent to the rule of Hindus, a people with whom they have little in common."

Jinnah asserted that India had never been united.

When Frances got a chance she asked him about *purdah*, a Moslem custom which kept women segregated (page 469).

Jinnah condemned *purdah* unequivocally.

"We are doing our utmost to wipe it out, and we are making headway.

"My sister accompanies me everywhere on my tours, sits on platforms at political meetings, talks to conservative Moslems. Its



Charles Fynn from 'Three Lines'

Recruits from Three Religious Groups Take the Oath

Here soldiers of the Royal Indian Service Corps are sworn in by their religious leaders, a Hindu, a Moslem, and a Christian (left to right). Over 2,000,000 Indian volunteers helped defeat the Axis. From India's 23 languages and 250-odd dialects, a simplified form of Urdu was chosen as the common tongue in training. Because of differing customs, separate messes are maintained for Hindus and Moslems.

disappearance is merely a matter of time."

Locating Dr. Ambedkar's home was not simple. Unlike the wealthy Moslem, this modest leader of the Untouchables lives in a populous quarter on the outskirts of Bombay. The taxi rolled and bumped past tenements with clotheslines strung from balcony to balcony, and finally the patient driver, after asking many people for directions, pulled up at a door.

The Leader of the Untouchables

Several nondescript, rather shabby men and a mongrel rose from the floor as we walked up the stairs, and one of them informed us that the doctor's flat was at the first landing.

Although he was heavy, almost given to corpulence, he looked surprisingly cool in spotless white. His face was round, his smile cordial, and large, intelligent eyes peered at us through thick-rimmed spectacles.

He is a man of wide education, having studied at Columbia University, then in London. There were books everywhere, piled in disorder from floor to ceiling, as far as you could see through the house; there was nothing decorative about them, and they were obviously there to be read—15,000 volumes.

How had he, an Untouchable, been able to get such an excellent and expensive education? He did not seem to mind personal questions and answered that, since he was the son of a soldier, the British Army had given him his primary education. Then the Maharaja Gaekwar of Baroda (one of the greatest and richest Indian princes) had taken an interest in him and financed his education at Columbia and in London.

About how many Untouchables were there in India, and how many knew of him personally?

He thought there were roughly 60,000,000

and certainly half knew of the work he was doing. Of that great mass, he went on to say, only 120 had received college or university education, but he and his colleagues were working to increase the number of literates, the percentage of whom was still minute.

In his own case, he did not seem bitter that he had been segregated in the lower Indian schools before he had gone abroad, and said that the boys had not been unkind to him.

It was true that Untouchables had once been compelled to leave the road to avoid "contaminating" a Caste Hindu, if one happened to be passing, and that a Caste Hindu would wash away the "contamination" if even the shadow of an Untouchable passed over any part of him.

Hope for the Future of Untouchables

This condition still existed in some parts of the country, but it was becoming less prevalent. The position of Untouchables, while still far from a happy one, was certainly improving.

High-caste Hindus ease their consciences by contending that Untouchables are doing penance for sins committed in previous incarnations.

"How would an educated, well-dressed Untouchable like yourself, let us say, be spotted by Caste Hindus if he went into a good restaurant or hotel? There are no outward marks."

"No, we bear no outward marks," he said, and then gave the question some thought before answering that the marks were internal. It was doubtful that he or his associates could be identified except by someone who knew them, in which case there was always the chance of public insult. This the Untouchables have for generations dreaded more than death. The veneer of higher education, even in America and England, could not wipe out an inferiority complex which had been steadily ingrained into their system of life through centuries.

Gandhi is earnestly backing the effort to put an end to Untouchability.

Gandhi a Master of Psychology

"Renunciation" is the magic word in India. Gandhi realizes this, and it is one of the reasons behind his success. Jinnah, the Moslem, will never be a very popular leader, because he lives too well and his linen is too clean. But Gandhi is a good psychologist. He has convinced the masses, by his spectacularly Spartan way of life, that he has "renounced" everything.

The Moslem community is, on the whole, less prosperous than the Hindu. Hindus may tell you that it is because Moslems have no brains and are not industrious; obviously, there is more to it than that.

After the British reduced the Mogul Empire, Hindus applied themselves to learning the English language, while the discouraged Moslems sulked.

Consequently, the Hindus, who are clever businessmen, got the jobs and became the clerks, accountants, and functionaries the British needed in setting up their administration. Later they established themselves in their own businesses. Thus they got a head start, financially, which they maintain to this day.

Hindus can be very industrious indeed when money is involved. A Moslem said to me recently: "We cannot accept interest on a loan. This is strictly forbidden by our religion, whereas nothing in the Hindu code discourages usury. Hence millions of poor Indians, both Moslem and Hindu, are in the hands of the rich Hindu *banias*."

Efforts have been made in various parts of India to break the power of these money-lenders.

In 1904 the Government introduced a co-operative movement, and 124,237 rural credit societies exist today. In Indore a proclamation has forbidden the Maharaja's subjects from spending more than a specified amount on marriage and funeral feasts, for it is on these occasions that the poor usually run into debt. But such a law is unenforceable.

Britain Promised Real Independence

The general British attitude about India was expressed by Walter Nash, former New Zealand Minister to the United States:

"The British offer to India (March, 1942) was a frank one and a fair one. It was made as a genuine attempt to achieve complete independence for the Indian people.

"I think it is a striking fact that the Dominions, who are themselves extremely proud of their independent status as well as of their association with the Commonwealth, and who well realize the extreme danger which the refusal to grant self-government to a region which is ready for it would be to the whole idea of the British Commonwealth, have never once criticized the policy of the British in India.

"That criticism has not been made because we were not able to make it; it has not been made because we believe in the sincerity and the honesty of the British offer."

Sir Stafford Cripps, in a broadcast on March 30, 1942, said:

"We want to make it clear and without any possibility of doubt or question that the British Government and the British people desire the Indian people to have full self-government, with a constitution as free in every respect as our own in Great Britain, or as any of the great Dominion members of the British Commonwealth of Nations. . . .

"Inside the British Commonwealth system there has been a definite philosophy providing for the self-development and self-government of all areas that have come under its control.

"The British Commonwealth has aimed at training up its people toward the day when they can take over their own affairs.

"The Commonwealth has remained a democratic evolutionary body which can point to the development of the independent Dominions as a great step forward in the principles of international development."

Lovely Mysore a Hindu State

Brochures describe Mysore as a "garden city," and they have a right to, literally. It is one immense park, with trimmed lawns and hedges and handsome flower beds. Streets are broad and clean, and the people are dignified, properly dressed, and neat. Even the beggars, of whom there are relatively few, wear jewelry.

Mysore State is rich, ranking second in revenues, and yet the treasury takes little in taxes from the individual.

Power dams built by American engineers distribute cheap electricity everywhere; there are excellent hospitals; and a remarkably high standard of sanitation is maintained. Model workmen's houses have been built, good, small stucco dwellings. It is a pity that their inhabitants immediately wall up the windows to keep out the pleasant air of the south. Those windows are typical of the struggle between modern development and traditional practice in Mysore.

The annual *dasara* ceremonies are the most colorful rituals surviving in India today (Plates I and II).

The *dasara* is really the end of the show. It means "tenth," for on the tenth day, after a series of *durbars* (court audiences) and religious observances at various temples, the ceremonies culminate in the *puja* of His Highness at the palace.

"Puja" means obeisance. If you are a taxi driver you make puja on this day to your car by decorating it with garlands, for it is the symbol of your livelihood. If you are a tailor you make puja to your Singer sewing machine. A *dhobi* would probably make puja

to the particular stone upon which he beats your favorite shirt to shreds.

The ruler makes puja to "the instruments of his reign," in this case symbolized by his various conveyances—the sacred elephant, two sacred bulls, the sacred white horse with dyed tail, all richly caparisoned; also, the golden palanquin, the silver and gold coaches (both made in England), and three big American cars, which looked utterly incongruous when their turn came to be sprinkled with flowers by the Maharaja as a group of priests chanted prayers.

The Stars Must Be Consulted

We had to wait an hour and a half after the ceremonies were scheduled to begin before His Highness appeared, and I heard later that this was not due to any habit of royal tardiness. On the contrary, H.H. is a very punctual person, but his soothsayers had changed their minds about the propitious moment, and we waited for the stars.

When he finally arrived I felt very sorry for the Maharaja, moving like an automaton, dignified and lifeless, through a ritual designed for a demigod.

The priests, on the other hand, were obviously enjoying an occasion which dramatized their importance as intermediaries between the gods and men. In their screamingly brilliant silks, they looked like wizened rogues, gloating over the Maharaja, their pawn. The inescapable impression that he was helpless and trapped led me to inquire whether the priestly caste did not, in fact, do the ruling.

Mysore is a very orthodox Hindu State, and it is amazing that anyone has been strong enough to effect real progress in education, public services, and industrialization, despite the reactionary power of the priests. Though a strict Hindu, the late Maharaja, a wise and beloved ruler, appointed an astute Moslem, Sir Mirza Ismail, as his Prime Minister.

As in most Oriental functions, informality characterized the *dasara* proceedings. Courtiers sauntered about, chatting within a few feet of the small pavilion in which His Highness stood. People moved, talked, and laughed freely, as at a fair; photographers were allowed to approach quite near to the dais, snapping close-ups of the Maharaja and the sacred elephant, bulls, and horse.

Only the hundreds of superbly uniformed cavalry and foot, from the crack regiments, remained stiffly at attention in their positions surrounding the courtyard before the palace. They wore uniforms of red and gold, blue and silver, blue and yellow, red and orange, with brocade turbans, shining swords, and bril-



Reproduced from *Three Lions*

Segregation of Women Is a Vanishing Custom in India

Purdah, which literally means "screen," is applied to the Moslem practice of segregating women and requiring them to wear veils. Those above wear *burkas*, or veils, in a street of Kohat, in North-West Frontier Province. "Purdah is an evil anachronism," says Mohammed Ali Jinnah, leader of the All-India Moslem League. "We are doing our best to wipe it out . . . its disappearance is merely a matter of time."

liantly polished leather boots. They were the highlights of the "Oriental splendor."

The other costumes were reminiscent of old Persian prints, for the Mogul influence has persisted to a considerable degree since the time when the Moslems held this part of the country: their rule was broken by the British in 1799 with the defeat of their great general, Tipoo Sultan, at Seringapatam, eight miles from Mysore (Plate III).

This was during Wellington's early career, when, as Colonel Wellesley, he was made commandant of the captured stronghold.

A relic of the Mogul general's entourage is still preserved in this Hindu court: a dozen men dressed like Barbary pirates stood about, listlessly fingering curved cutlasses. Bristling beards, parted in an archaic style, and white chalk rings around their eyes were intended to heighten the ferocity of their aspect.

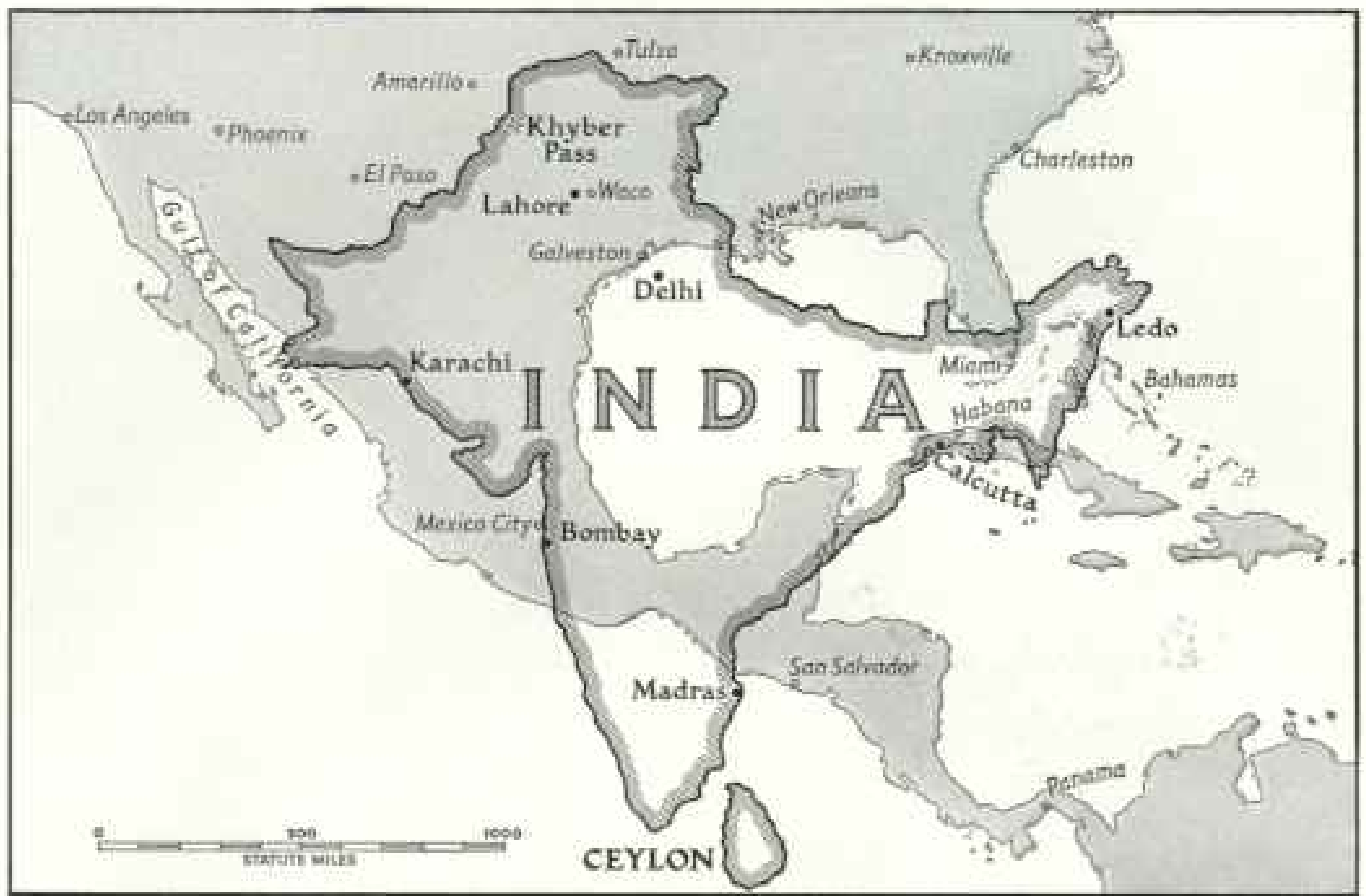
Yet they had the disconsolate air of people bored at a fancy-dress party.

The evening *darbar* combines the atmos-

phere of an audience at the Vatican and the "big tent" at Coney Island. There is the dignified formality of one and the hodgepodge confusion of the other. Servants passing betel nuts take the place of peanut vendors, and the circus effect is further accentuated by the 150,000 electric lights which outline the palace during these ten days.

A three-sided, triple-tiered gallery overlooks an enormous stage, where Indian gentlemen are seated in rows on the floor before a gilded throne. The open side of this vast hall gives onto the courtyard, thronged with soldiers and entertainers. Just below the roof hundreds of pairs of eyes peer down through slits in a canvas curtain. They belong to the women of the court, in deepest *purdah*.

Followed by the ubiquitous priests, the Maharaja entered, walked to the throne, and sat cross-legged—a grave and impassive image. One by one the courtiers filed past, making obeisance and proffering plates of gold coins in token of gratitude for their prosperity.



India, Laid over America, Reaches from Tulsa to Panama

Here India has been slipped around the world with no change in latitude. Indian names are in boldface; American in light type. Matching cities are: Calcutta-Habana, Bombay-Mexico City, and Delhi-Galveston.

These their Prince merely touched, with a gesture of supreme indifference, yet one full of meaning for his reverent subjects.

Meanwhile, wrestling matches, to which few paid any attention, went on in the court below. The wrestlers prostrated themselves toward the throne before and after each match. When they came into the ring they tore off their garlands of flowers, and when they left they backed away, in respect to His Highness, who seemed unaware of their existence.

After this rather monotonous performance had gone on for some time, the hereditary sacred elephant appeared, ambling sedately down the driveway from the main gate. She was not as large as the magnificent beast, richly caparisoned and painted with colored chalk, which preceded her and politely turned aside to let her pass. But she had a full realization of her importance and seemed perfectly at home in the presence of the great.

Approaching the throne, she fanned herself nonchalantly with a huge crimson fly brush; then, at a respectful distance, dropped the brush and salaamed deeply to the Maharaja.

An attendant placed a mass of rose petals in the curve of her trunk, and these she sprinkled over her head and back in a cascade of pink. The crowd was ecstatic. The band played exuberantly.

Finally she lumbered off, conceited, unhurried, and unmoved.

It was as difficult to watch as a three-ring circus. A girl in the purdah gallery had stuck her head out completely, between two strips of canvas, and was enjoying her daring. The air was heavy with incense. The wrestlers kept wrestling, clowns came and went, as did dancers with swords, dancers without swords, and tumblers. Athletes performed calisthenics, Boy Scouts presented complicated figures to quick time.

Four men in yellow sauntered up before His Highness on tall stilts and bowed. They were the only people who could look down on the red-and-gold-liveried royal giants—six men, all from Mysore, ranging in height from eight feet two to eight feet six. The soldiers alone kept pattern and proved that this was not a fantastic dream.

Suddenly enormous shutters were lowered in front of the balconies and across the open face of the hall. Privacy had been provided for the Maharaja's reception of the purdah ladies.

As we passed along corridors stuffed with Victorian bric-a-brac and down the back stairs of the palace, the enthusiastic band could still be heard. It was playing "Look for the Silver Lining."

Drawn by H. E. Eastwood

South of Khyber Pass

BY MAYNARD OWEN WILLIAMS

With Illustrations from Photographs by the Author

NEAR the northern tip of kite-shaped India is Khyber Pass, through which culture, conquest, and commerce came to Hindustan. To the west are mountains and deserts. To the east the Himalayas, "abode of snow," stretch like a wall. Through the famous Pass camels file between awakening Asia and its most populous peninsula, India.

Border geography is confusing because neither Afghanistan nor the Government of India usually asserts its authority in tribal territory.

Starting from settled areas on the Indian side, one can pass into and through tribal territory over four main roads, along which the laws of India are enforced.

The first—the famous Khyber Pass—is based at Peshawar and reaches to Landi Khana, near the Afghan border. The second, based at Kohat, extends to Thal and the orchard valley of Parachinar. The third stretches from Bannu to Miram Shah and Dattakhel; the fourth, from Dera Ismail Khan to Tank, Jandola, and Wana.

South of Khyber Pass the laws of India are enforced in the four frontier districts of Peshawar, Kohat, Bannu, and Dera Ismail Khan.* In each of these districts the principal town has the same name.

Mortised into these settled areas, along saw-toothed lines set by crag and valley, armored-car route and ambush rock, are the Political Agencies of Khyber (Tribal Areas), Kurram, North Waziristan, and South Waziristan, where the King's law is enforced on the highway, tribal law in the hills.

Threats of Invasion

At times India could not control the routes, and invading hordes have poured in.

During World War II, when India was again threatened with invasion, the British strengthened their border forces. They also successfully overcame the influence of professional agitators using Axis funds to spread unrest along the border.

In a settled area, an adventurous visitor may walk through the fields. In a tribal area he sticks to the King's Highway or is considered an outlaw. Naturally, the authorities do not encourage reckless wanderings across this stern stage.

From the Khyber to South Waziristan, I watched the thrilling game of nerve and pa-

tience between Civil Service experts and tribal chiefs, not from the side lines but in the thick of it.

My route through the North-West Frontier Province, large as Kentucky, led from Peshawar up the Khyber and back, thence south to Kohat, Bannu, Miram Shah, Razmak, Jandola, Wana, and Tank. These are meaningless names to many, but outposts of empire for which many a good Britisher has given his life.

A Keeper of the Peace

Few maps show which regions are tribal territory and which are settled areas. But when a tribesman enters a settled area he parks his gun. If the men I met off the highway bore guns, I was a fair target and a burden on the conscience of His Excellency Sir George Cunningham, K.C.S.I., Governor of the North-West Frontier Province, on whom be peace!

For years he has striven for that end. But for him, this tale could not be told.

The Durand Line,** which separates India from Afghanistan, does not separate Indians from Afghans.† It is the stony backbone of a Pushtu-speaking area, north of which the tribesmen are loosely grouped as "Afghans" and south of which their tribal cousins are loosely called "Pathans."

A border which neither government can adequately defend, this artificial frontier favors shifty tribesman more than it does ordered government. Afghan or Pathan can follow his enemy across the line and try to kill him.

If the fighting gets too tough, he can retreat into home territory in the hope of avoiding pursuit. I heard no hint of extradition.

Europeans live in cantonments, inside a perimeter of barbed wire.

In the native bazaars, dark-eyed hillmen listen for gossip of rich cargoes that may pass where a man with a well-trained trigger finger can take his toll (page 487).

Nine miles beyond Peshawar, where plain

* See Map Supplement, "India and Burma," in this issue of the NATIONAL GEOGRAPHIC MAGAZINE.

** In 1893 a British mission to Kabul, headed by Sir Mortimer Durand, set up by direct negotiation with the Amir the political boundary between India and Afghanistan. Details were later worked out by a joint Anglo-Afghan Commission.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Afghanistan Makes Haste Slowly," by Maynard Owen Williams, December, 1933.

meets hills, what seems a stranded battleship is the fort of Jamrud, guarding the inner mouth of the Khyber Pass.

A "Sword Cut in the Hills"

This historic highway is actually a low way, carved by two otherwise insignificant streams. When the English came, they built good roads and a daring railway through this "sword cut in the hills."

Peshawar's fires were sending up smoke wisps through the chilly air when a captain of the Gurkha Rifles came to Dean's Hotel to conduct me through the Khyber, where Afridi tribesmen had given up gun stealing and murder for fun to build tank traps and improve the defenses of India. For the moment, at least, industry and virtue paid off better than highway robbery or tribal revolt.

Near Jamrud a captain of a Sikh regiment joined us. Before our ride to the border was over, and side trips had been made to hidden defense positions, I gathered at various times that one smooth-faced Gurkha is worth three Sikhs and that one bearded Sikh is worth three Gurkhas.

Each officer loved his own troops.

At the Afghan frontier a dozen trucks, outrageously overloaded, awaited customs inspection before proceeding to Kabul. Others entered India with their roofs piled high and wide with baled karakul pelts for New York.

Beside the chugging machines hairy camels silently shuffled along, as nonchalant as if they realized that a scarcity of motor fodder and tires made automobiles as ludicrous as themselves.

At the huge caravansery at Landi Khana, where India-bound caravans spend their last night before filing down to Jamrud, man-sized hamburgers sizzled in boiling oil and tribesmen laid aside their guns to kneel in the mosque. A full belly and a clear conscience shorten the trail.

Beside the gate an Afridi fondled a shiny new rifle, made in tribal territory but with all the earmarks—counterfeit, of course—of the genuine article (pages 477, 497).

The British officer—smiling—extended his hand. The tribesman—smiling—passed over his prize.

I asked the obvious question. "That gun was made to kill Englishmen, and is a fake at that. Why do you allow it?"

"Why, this is tribal territory. We have nothing to do with it; no rights whatever," was his answer.

What a place! No-man's land and he-man's land at the same time!

British officers, engaged in the strange con-

test of wit, wisdom, and bullets, like the hair-triggered hillmen. Having survived several visits among them from Herat to the Himalayas, I do, too.

A paradoxical analysis of tribal personality is that of Mr. E. B. Howell, formerly the Foreign Secretary to the Government of India, in his *Story of the North-West Frontier Province*:

"This man may be a swashbuckling braggart; he may be cruel, treacherous, fanatical; he may have other vices, but he bows the knee to none, save to him who can uphold his right to be obeyed.

"To set against his vices, the Pathan is brave, sober, religious according to his lights, and, on the whole, clean-living; he has a ready sense of humour, and great traditions of hospitality; he is a lover of sport and athletic outdoor games, and when his respect and esteem have been won, he is capable of great devotion."

A Stop at a Hilltop Fortress

Returning from Landi Khana, Landi Kotal, and Ali Masjid, after a busy morning along the Khyber, we stopped for lunch at the hilltop fortress of Shagai, where a ramrod-straight Gurkha, with knife-edge creases in his shorts, ushered us in (page 499).

Around this frontier mess table good talk flashed back and forth. British and American periodicals, including warm-skinned pin-up girls, were ready to hand.

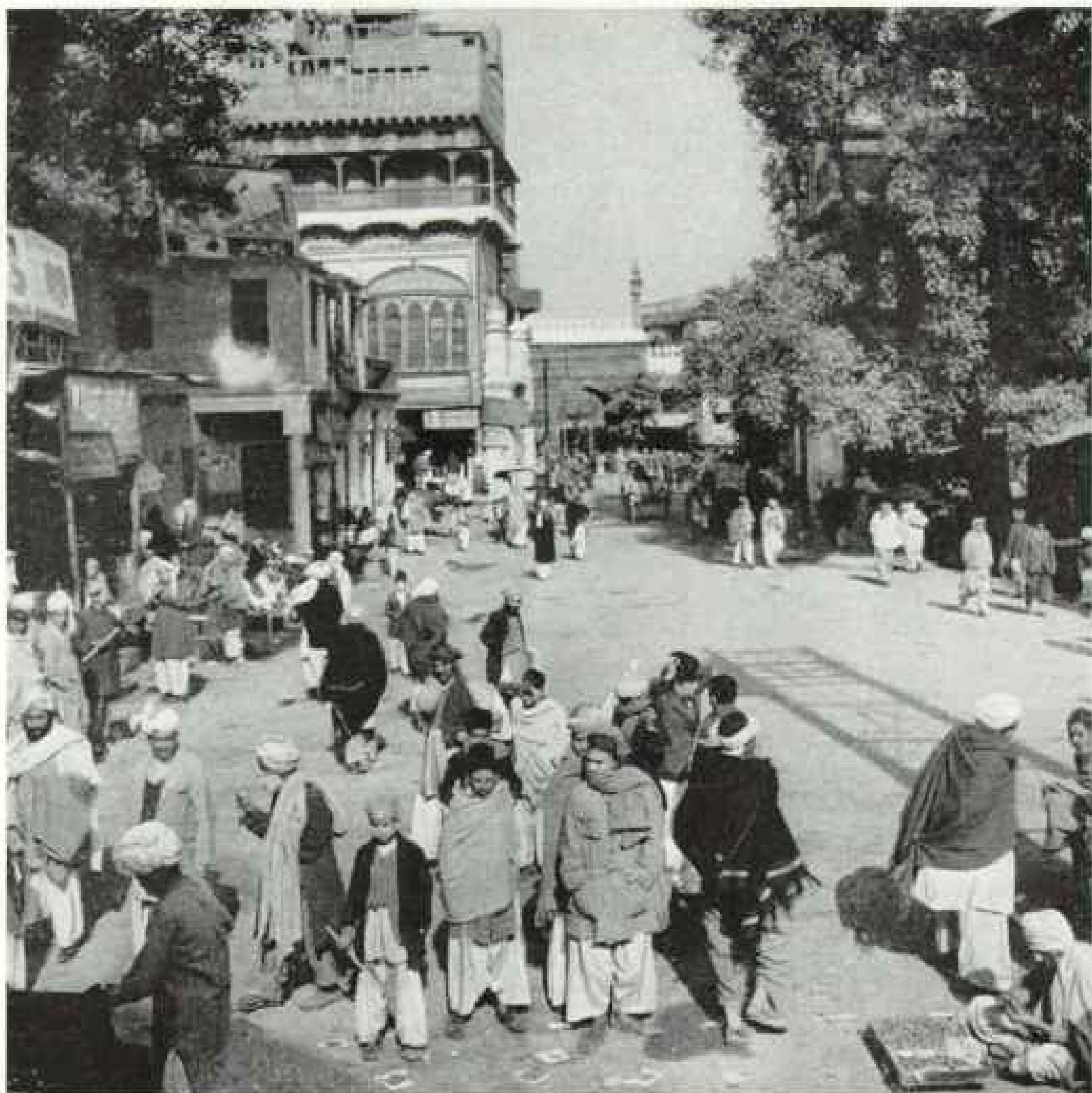
There were plenty of such well-worn books as men of action love when the last flat-faced hillman has saluted and the day is done for all but the guard. Yet, there in the heart of Khyber adventure, in that perfect setting for Kipling's memorable tale, not one officer had read *The Man Who Was*.

Back at Peshawar Cantonment, well inside the barbed wire, I roamed the wide streets of this pleasant border station. I watched a wild quail scratching in the tanbark bridle path, then running to its mate in a cage carried by a bearded servant.

I listened to the wailing of pipes in a shop whose proprietor assured me that here, not in Scotland, were the bagpipes born.

I shopped amid an amazing collection of canned goods, candies, cough drops, toothpaste, shoe polish, perfumes, and soaps, brought from America to Peshawar, railhead showcase for Central Asia (page 500).

At one of the finest bookstores east of Suez I bought prized volumes of frontier lore. Passing such a little church as one sees in England, I came to the club, gay center of frontier hospitality, tennis, and tea.



In Peshawar, Goal of Asia's Caravans, a Hundred Types Mingle in a Racial Pageant

Into this *Arabian Nights* city the Khyber funnels the commerce of a continent. Here the camel bales give up Turkistan carpets, Bukhara silks, and Khurasan lambskins. Streets swarm with Tajiks, Urbeks, Kabulis, Ghilzais, Pevindahs, Jews, and Hindus. Tall Afridis and Swatis swagger past dwarfs, beggars, barbers, shoemakers, goldsmiths, curry-powder grinders, and thieves (page 500).

Fascinating, too, is the native city, in whose shadowy lanes tribal revenge has swift teeth of steel and on whose roofs Moslem women hide their forbidden faces behind wattle walls.

From the roof of the police headquarters one can look down into this hidden woman's world, or, better, look out over ancient Gandhara, where Greek culture met that of India and the voluptuous fertility of Hindu art was tempered by classic restraint. Here Hellenistic artists for the first time carved statues of Buddha.

Dips in the hills show the routes of invasion, the highways of culture and religion,

The fertile Peshawar plain, three-fourths as large as Connecticut, has been an oft-sought prize. And no wonder. From the hungry hills its lush productiveness is as attractive as the desert-set gardens of Damascus.

Peshawar's Street of Storytellers

In the Peshawar bazaar, between riots, pageantry runs riot.

Here, to the jitterbug tempo of mortar and pestle, curry powder is ground.

Here sturdy loop-toed footwear, embroidered with gilt, is hobnailed for the rocky climb to ambush. Here painted male dancers



To Mend Chinaware, a Peshawar Repairman Whacks the Pieces with a Hammer

After drilling holes like dentists' cavities in broken dishes, he inserts soft copper staples. These he taps until the china fragments are firmly joined. He takes an artist's pride in repairing fractures. For example, a false silver nose has been added to the broken spout of a teapot (lower left).

shake their skirts before less effeminate men, and two-wheeled *tongas* bring supersize green and white bouquets of incomparable cauliflower to the crowded vegetable market.

Where the busy bazaar echoes the tap-tap of hand-hammered copper, one can observe the stern-faced Pathan (pages 475, 476). Fewer now are the Bukhariots and Turki-speaking visitors from Sinkiang, dressed in

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Land of Lambskins (Bukhara)," by Robert K. Nabours, July, 1919; "Russia's Orphan Races," by Maynard Owen Williams, October, 1918; "By Coolie and Caravan Across Central Asia," by William J. Morden, October, 1917; "Desert Road to Turkestan," by Owen Lattimore, June, 1929; "With the Nomads of Central Asia," by Edward Murray, January, 1936; "First Over the Roof of the World by Motor," March, 1932, and "From the Mediterranean to the Yellow Sea by Motor," November, 1932, both by Maynard Owen Williams.

such vivid gowns as an interior decorator would design in splashy chintz.*

Tribesmen appreciate a smile as well as anyone. Theirs is a virile friendliness. But mufti is best if one is to roam the narrow lanes away from the Street of the Storytellers. Young British officers envied me my freedom to ramble around on foot, taking pictures.

Tolerance in No-man's Land

As I went to lunch at Government House, a dozen handsome old tribesmen came away. Any one of them was worthy of careful portraiture, but one does not shoot a camera at the Governor's guests.

Were Sir George Cunningham an American, he would be Phi Beta Kappa and All American. In England, it was a Double First in classics and a captain of International Rugger



Sun-bright Brass Dazzles the Eye in Peshawar Coppersmiths' Bazaar

Into this quarter the master craftsmen crowd. Tap! tap! tap! go their hammers in a daylong din. Sheets of flat metal are shaped into rounded vessels. Old pots, melted down, become new. This lamb-skin-capped merchant displays water jars on the curb. His stacked cooking pots form a graceful pagoda.

(Rugby football). After graduation from Oxford, he entered the Indian Civil Service, where he came to fraternize with and discipline lesser, but prouder, chiefs.

Many rough barbarians, nominally his enemies, would give their lives to save his. The tough customers whom I met at the gate had dropped in to thank their Governor for flying over their bombed village and personally seeing that the humane British rules of frontier warfare had been observed (page 479).

The Frontier Problem

Hollywood pictures India's North-West Frontier Province as a jungle of sun-baked rocks and cobras, where Pathan and British play war games for keeps and where mayhem is almost a pleasure. Feeling that the facts

should be more widely known, Sir George made arrangements for me to visit Waziristan.

Whole volumes have been devoted to the frontier problem, but the general situation is something like this:

About 13,000,000 tribesmen—Afridis, Bhitannis (Battannis), Ghilzais, Mahsuds, Mohmands, Orakzais, Wazirs, Zakka Khels, and many more—are roughly grouped under two names: Afghans, if they live in Afghanistan, and Pathans, if they live in India.

The 7,500,000 Afghans and 5,500,000 Pathans range all the way from utter brigands to knightly gentlemen. They follow the democratic principles of Islam and value freedom above all else. More than 2,000,000 tribesmen, their guns forsworn, live in India's settled districts, a shock-absorber area between tribal territory and Indian riches.



Fierce Glance and Hawklike Eye Tell the Pathan Character

Seen at Bannu, this young blade wears an inverted lambskin jacket. On his turban he keeps an amulet to ward off snipers' bullets. Some of his friends may reach 6 feet 9. Tribal legend tells him he is a descendant of Israel's lost tribes. What a Hollywood villain he would make!

Were Afghanistan to include the Pathans, its frontier would advance to the hot valley of the Indus. In the event of Moslem solidarity against a Hindu-dominated India, it might even reach Lahore.

Were India to add the Afghans to its racial medley, the frontier would be pushed out more than 100 miles to follow the snowy range of the Hindu Kush, as it did when Kanishka ruled in Peshawar and traded with Rome, 1,800 years ago.

To many tribesmen, both Afghan King and Viceroy of India represent a way of life trammled by labor for hire and justice by law. To free-ranging individualists, whose home is the hills and whose gun is law,

such ideas are odious.

Where land is poor and marksmanship excellent, the looting of well-filled shops and the kidnaping of well-fed townsmen has to them an almost moral appeal. Until respectability pays as well as crime, freedom may express itself by gunplay. In the entire area there is not one target worthy of an atomic bomb.

"If Men Are Unfriendly—"

A British friend allowed me to transcribe, from the latest confidential report, a rule for making friends and influencing people as stated by Mencius, thousands of years ago. The ancient preaching, which modern Britons still practice in Waziristan, is this:

If you love men and they are unfriendly, look into your love; if you rule men and they are unruly, look into your wisdom; if you are courteous to them and they do not respond, look into your courtesy. If what you do is vain, always look within.

Against this humble strategy, seemingly ill-fitted for dealing with killers, the Axis-subsidized

Fakir of Ipi, despite his spy system, slush funds, and bull's-eye riflemen, has waged a losing fight.

In a nine-day trip to see how the British officials were working out a way of life for the wayward tribesmen, I rode from fort to fort inside a circle of tribal flesh and guns, missed ambush twice, saw a goodly haul of misguided Robin Hoods, and learned of the killing and beheading of a young British officer at a spot we had recently passed.

Short-haul "Taxi Caravans"

As we headed for Bannu in a brand-new Chevrolet, driven by a giant Sikh, members of the Peshawar Vale Hunt were heading back

through the frosty morning to the day's work inside the barbed-wire perimeter.

We whizzed past what my driver called "taxi caravans," thus differentiated from the long files of recurrent traders who come down each year to sell produce and lend money across the width of India, with sharp knives as insurance of payment.

The patient camels seemed indifferent to our dust. But the Pathan tribesmen are suspicious of men in big cars.

A swift ride brought us to the fortified homesteads, whitewashed with Mr. Churchill's famous V for Victory, in the Kohat pass.

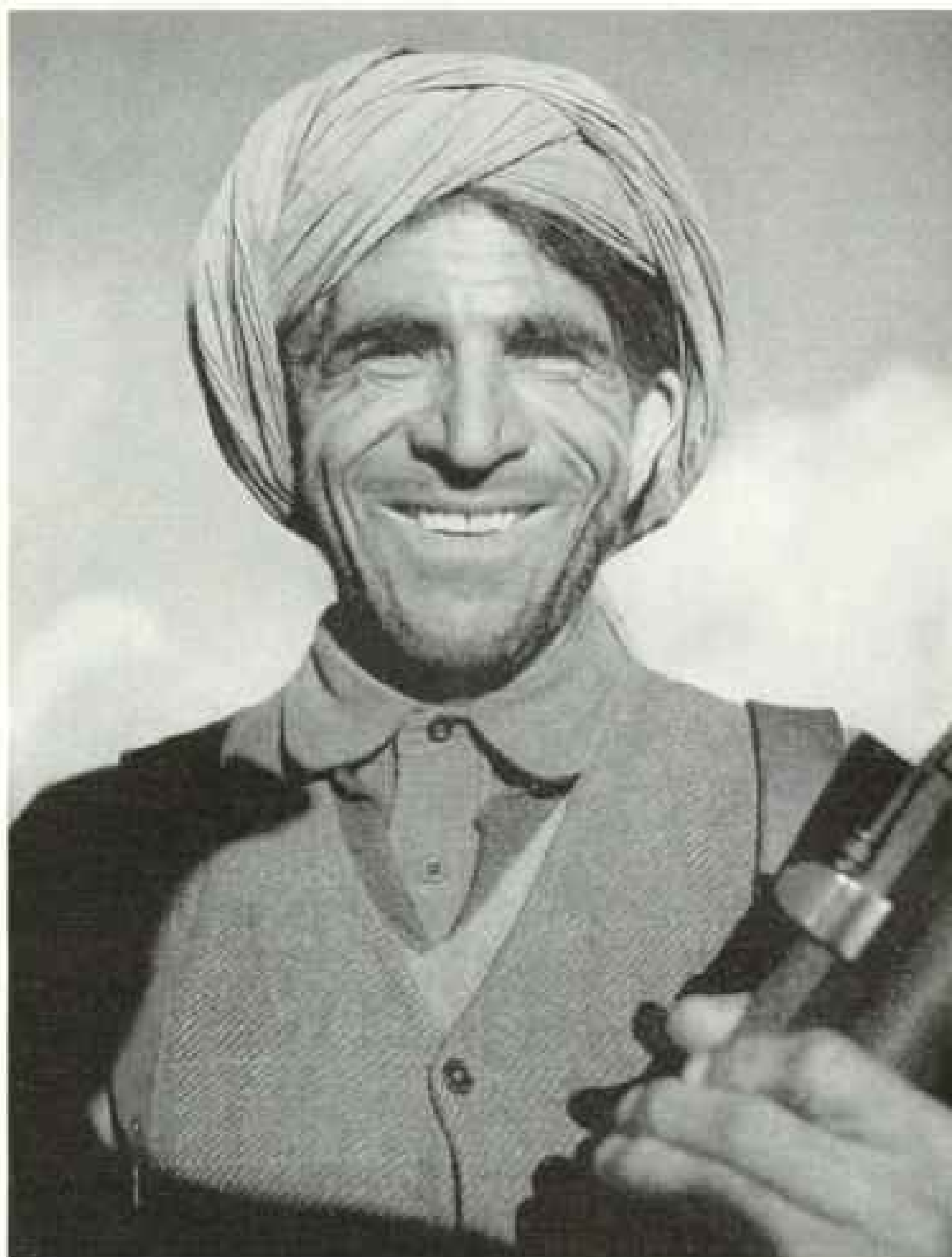
Of course I wanted to photograph the clandestine rifle factories. The tribal headman showed me a framed order that a government pass from Kohat was necessary.

Luckily my chauffeur convinced the makers of contraband arms that my trip, having been sanctioned by "His Excellency the Governor," was "regular."

Since Pathans will do almost anything to get a rifle, the theory is that it is better to let tribesmen make their own than to have them murder good men to steal one.

A more primitive arsenal than that now operating in the Kohat pass would be hard to find. Boys turned rude drills with wagon-tire flywheels, and at antediluvian forges dark-bearded mechanics fashioned the parts of rifles which, when misstamped, could hardly be told from the real article (page 497).

It is all very well for the Adam Khels to make deadly firearms. But when they began to counterfeit Afghanistan currency, the Government of India intervened.



"George," a Smiling Pathan Giant, Bears a British Nickname

He is an army runner. When a convoy drives into ambush, when officers fall and telegraph wires dangle—then George goes for reinforcements. This brave man has been under fire scores of times, often by members of his own tribe, the Tori Khel. Years ago an officer hailed him as "George." The name stuck (page 480).

Since the village had a furtive air, I was glad to make my pictures and roll off toward Bannu, past the flag-fluttering tombs of local saints.

The Honor of Working Alone

True to my promise to be off the road before lunch, I went through Kohat without stopping, but halted briefly at Lachi, near where young women were burrowing for water in the dry bed of a seasonal stream (page 496). I arrived early at the house in Bannu where John Nicholson, nearly a century ago, was deputy commissioner. His local fame remains, not as the hero who took Delhi



Unveiled!—A Bad Man Disguised as a Good Woman

This "bearded lady" took refuge in a watchtower with fellow desperadoes. Breaking in, South Waziristan Scouts found only shrouded "females." Risking death, an officer lifted a veil. Out popped this hard, bushy face. Thirty-three captives were dubbed "the Gaiety Chorus" (page 482).

from the mutineers of 1857, but as the administrator during whose last year at Bannu not a crime was attempted—a record never equaled since.

Almost equally famous was Maj. (later Sir) Herbert Benjamin Edwardes, whose two-volume *A Year on the Punjab Frontier in 1848-1849*, gives an amazing picture of his high-handed but high-minded administration. While forcing the local leaders to destroy their

forts, nearly a century ago, he built one which still controls what he phonetically called the land of the "Bunnoo-chees."

With Deputy Commissioner A. P. Low, I had a twilight walk on the combined golf course and parade ground. But it was too late to have tea with the lonely wives of absent officers who live together in what they facetiously but bravely call the "Home for Abandoned Women."

Back at John Nicholson's house, I fingered the favorite Bannuchi weapon. Heavy-headed as a tomahawk, but ending in a sharp point, this adder-tongued instrument is in general use as a sickle.

The next morning Commissioner Low paid me the high honor of letting me roam through Bannu alone, photographing the native sugar and salt merchants, ambulant sugarcane mills, the choice fruits, the armored police post high above the bazaars, an outdoor meeting which might be praising the Lord or spreading deep sedition (page 485), and great piles of fine timbers.

As we rode west from Bannu in a well-armed convoy, sentries stood stark on the skyline to show their officers that they were on the job (page 485). No added risk was involved, since attacking a picket would put us on our guard and, worse, invite a blood feud.

I looked forward to Miram Shah, my first stopping place in North Waziristan. In this almost legendary outpost, Thomas Edward Lawrence, calling himself Aircraftsman Shaw, hid away from his legendary fame as Lawrence of Arabia. I first knew him as a towheaded

archeologist beside the Euphrates. But I messed, not with Lawrence's outfit, the RAF, but with the Tochi Scouts (pages 482, 488), who take their name from the local river.

Around the hand-rubbed table, polished through scores of years, dinner remains a formal affair, in dress uniform.

I carried no firearms in Waziristan, but I wore my dinner jacket every night. And these small groups of fighting men furbish their minds, as well as their buttons, for long evenings of good cheer and urbane, wise, and witty talk.

Breakfast, after such brilliant evenings, had a morning-after grimness. To each officer the turbaned waiter brought an individual reading rack, behind which he could retreat until coffee and toast had brightened the day.

The Tea of Truce

In the well-walled fort I watched the Political Agent chatting with a bearded elder whose tribe's crimes, if committed in a settled area, would call for the death penalty (page 480). After a heart-to-heart talk, during which he was quite at ease, the old fellow walked unhindered out of the well-guarded fort.

Having come in of his own free will, he was just as free to go. But during his visit British logic and influence had been brought to bear. Between Political Agent and tribal chief the courtesies of a white flag prevail.

As a punitive measure, tribal villages are sometimes bombed. Before this is done, a warning is sent ahead, so that women and children may be evacuated. Since roof timbers are scarce, they are sometimes evacuated, too, leaving the adobe walls of an abandoned village as a target for modern war from the air.

When the planes have gone and the walls are reduced to dust, the addition of water turns the dust back into walls. Then the roof timbers, women, children, and cattle return, and life goes on as if nothing had happened to disturb the quiet.

In rainy weather the hillsides are so slippery that some bombs fail to explode. The tribesmen carefully dig them up, put them under a bridge, light a fire under them, and run. I saw the tangle of steel where bridges had been.

Waziristan is an incomparable training school for military officers. The tribesmen, reputedly the best tactical umpires in the world, never let a leader make the same mistake twice.

Added to the purely tribal problem is that of imperial defense. As long as India is coveted, its border must be defended. Many

a Pathan fought for the United Nations, and army pay checks play a considerable part in border economics. When the right of enlistment was restored to the Afridis, joy reigned in the tribal blockhouses, with better pickings at the tribal tables.

Good airfields serve the border. Over Miram Shah's wide landing strip I watched fighter planes pepper a sleeve target while a lumbering old transport slowly bumbled in.

Bricks, Cabbages, and Camels

The RAF kindly invited me to fly along the frontier, but rain closed in the view. So we made a foray to Dattakhel by truck, carrying loads of bricks and cabbages to lonely outposts.

Several truckloads of riflemen swung into line as we left Miram Shah, with a crate of homing pigeons to carry back messages if we were ambushed and our radio failed (page 494).

Down the trail came a long string of camels, each bearing two splendid timbers (page 481). To prevent too rapid destruction of the forests on the Afghan frontier, it is forbidden to carry timber by truck. The tribesmen profit to the tune of \$3 a camel-load from the forest to Bannu.

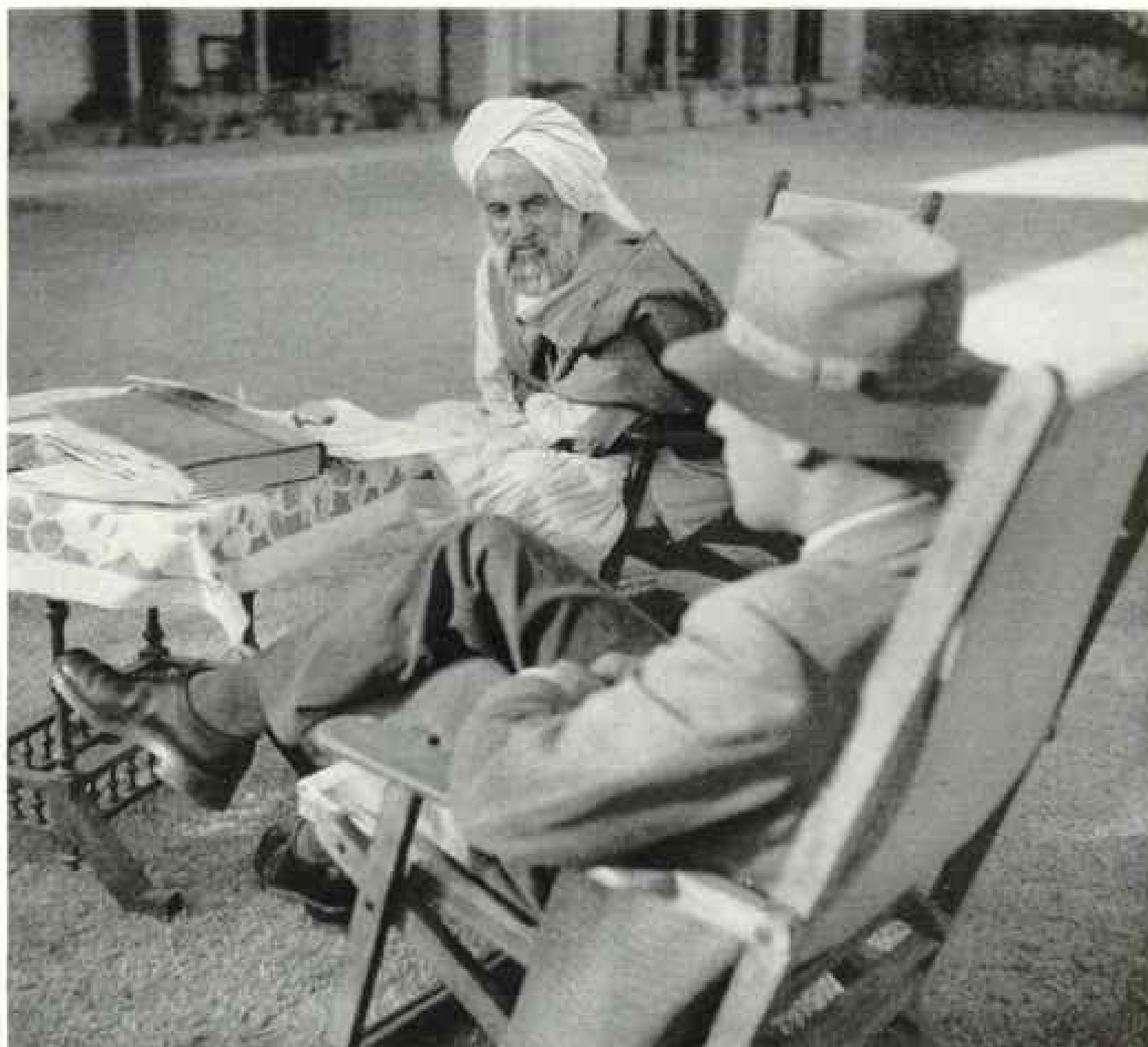
Back at Miram Shah, where we learned that we had narrowly escaped ambush, I photographed tribal recruits.

Stripped to the waist, the frontiersmen seem a scrawny lot. Thin and boyish in build, they win more admiration for spirit than for body. They can outwalk their weight in camels, but almost none of them, on recruiting, can chin himself once on a horizontal bar.

After a few months of training and good food, the Tochi Scouts develop a better physique. But the bearded old men, their wiry bodies wrapped in graceful cloaks, are better models for the lens.

On the shiny mantel at Miram Shah, around which we sat, discussing the world from the Khyber to Kalamazoo, stood a shell which had landed in the post. The frontier officers had added a gently ironic inscription: "Presented by the Fakir of Ipi." But capturing that wily enemy, whose real name is Haji Mirza Ali Khan of the Tori Khel, is easier said than done.

Pacifying he-man's land is a he-man's job in which might is not always the right solution. In 1937 a determined attempt was made. About 40,000 troops fought for the British. Not less than \$6,000,000 were spent. The British Indian forces lost almost a thousand men in killed and wounded, although no more than that number of tribesmen figured



On the Frontier, a Tea Table Is Often Mightier than the Sword

Sitting inside the fortress walls at Miram Shah, the British Political Agent, Mr. C. B. Duke, holds a friendly discussion with a Tochi elder. Since the chief came of his own accord, a truce prevails and he is free to leave when he wishes. A good orator and clever diplomat, he does not go in for gunplay (page 479).

in any one action. It was a bit like hunting mosquitoes with a rifle.

From Miram Shah I rode with Political Agent C. B. Duke to Razmak, on a short cut to Jandola.

At a dangerous bit of road a group of Wazirs signaled us to stop. Just above us was a tribal block tower; behind us, a considerable tribal village. On our way up we had found the telephone wires uselessly dangling from bent poles. We were "on our own."

Armed with a smile, the P. A. walked up to the tough-looking Wazir leader. Voices were raised. There was a determined insistence in the attitude of the villagers.

Down the bank and along a path went my rosy-cheeked friend, surrounded by gesticulating tribesmen. When they returned, there was a general shaking of hands, cheery salutes,

and an air of great cordiality. As we rolled on, I said:

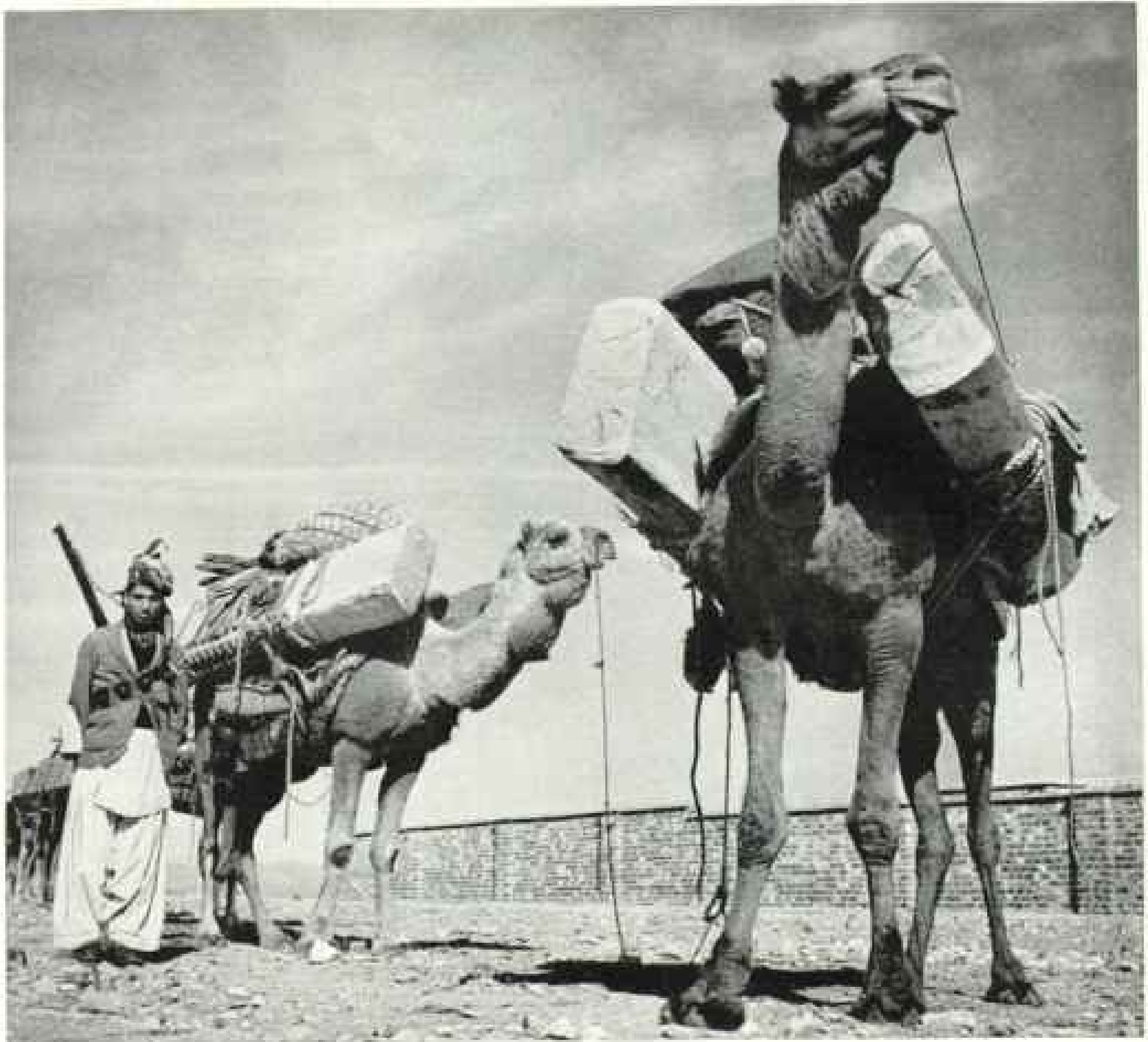
"It was a good show. What's the plot?"

"Oh, that? Why, a recent freshet carried away a dike. Inasmuch as the whole area is involved, the villagers sought my assistance in making repairs. Their case seemed just and I promised help. That's all."

Bazaar, Movies, but No Women

Mile-high Razmak, under a clear, cold sky, is a well-built camp of thousands of men, without a woman in sight. It has a well-supplied bazaar and a barnlike but comfortable movie palace with a daily change of pictures—if the films come through.

Mr. Duke thought I might care to photograph "George," a local giant, renowned for carrying messages under heavy fire (page 477).



Cranky, Blasphemous Camels Appear Ennobled by the Sky into Which They Tower

From Afghan frontier to Bannu they tramp long hot hours, cursing drivers and heavy timbers. Each load nets \$3. Trucks could do a cheaper job, but the law forbids their use lest forests be depleted. These beasts rest outside the fort at Miram Shah. On the return trip they'll carry cereals, salt, tea, kerosene, and matches (page 479).

Armed with knife and gun, George struck a conventional pose, adding a most disarming but virile grin of his own.

Meanwhile, through the bars of the Razmak hoosegow the P. A. carried on an amiable conversation with two of his prisoners:

The pair had set out to rescue a woman of their tribe who had been abducted, with or without her connivance. According to tribal psychology, this is a highly praiseworthy procedure. But in the ensuing fracas these luckless gallants had been so forgetful as to shoot *across* the road.

Abduction, revenge, and murder are tribal matters. But the road is the King's Highway, and shooting along, on, or across a road, even if you miss, is a crime.

By shooting across the road, the jolly jail-

birds had broken British law. By missing, they had violated tribal tradition. On two counts their faces were red.

"But," confided one, "our 20-rupee (\$6) fine will soon be here. Then we'll kill the men who stole our gal."

"And," added Mr. Duke, with sympathetic understanding, "next time, you won't shoot across the road."

As we came out from the mess, shortly before midnight, with the mercury near zero, this army outpost looked like a tinsled Christmas card. Phantom pillars of smoke rose from the massed roofs into the quiet sky. Yellow gleams marked the windows and a blanket of snow covered all.

Although I rose before the shivery dawn, I was a bit late leaving Razmak. A con-



His Keen Eye and Steady Trigger Finger Serve the King

Such Tochi Scouts, recruited from the local tribesmen, are loyal troops. Since shooting such a man might involve his assailant in a blood feud, he exerts a great influence for law enforcement in tribal areas.

siderable sum of money and I were to have shared the same convoy. A treacherous Mahsud had planned to ride our rooftop and give signal to his fellow bandits in ambush.

If our riflemen should take personal offense at having their own pay roll lifted, shooting would have been inevitable.

While I photographed a substitute and, supposedly, trustworthy rifleman on the roof of our truck, the Intelligence arrested the treacherous guard, removed the cash, and let us proceed (page 495).

Thus Feuds Are Born

By request of my hosts, I sat in the center of the truck, surrounded by a score of tribesmen. If I had been hit, it would have been bad, but if any member of my armor belt of human flesh were harmed it would have been worse, for thus are blood feuds born.

It might be well worth a bandit's time to snatch a pay roll, but, circled as I was

by possible blood enemies, I wasn't worth a cartridge. I hoped the enemy realized it.

The South Waziristan Scouts owe something of their improved physique to fresh vegetables. From the high-perched fort at Sararogha one looks down on a model garden in the valley, hundreds of feet below. Amid the barren hills, that tiny patch of vegetables has been paying off in the better health and spirits of the Scouts.

As we sat at lunch, a bullet hit the walls and after it another.

"We call such shots 'court fees,'" said the assistant political officer. "If you present a petition without paying the court fees, you get no action. That tribesman has some grievance and wants attention. The shots are his court fees."

The arrival of a guest at a Waziristan post is usually an event. Royalty couldn't get a better welcome. But at

Jandola an orderly showed me to my room in a deserted compound.

At 2:30 that morning the Scouts had left with mountain guns, mortars, and armored cars to round up a lot of bad men in the tribal villages near the Baluchistan border. At each, loyal tribesmen were sent ahead to tell how overwhelming was the Scout force. The Wazirs allowed search parties to enter their villages, but with no result.

In one case the central tower was locked and the door blocked from inside. Sappers broke in, while riflemen stood ready to fire. But no men were visible. Only women squatted about or went on with their work, sure of the protection of the veil.

Despite the weight of bangles on its thin brown wrist, one hand seemed more accustomed to a trigger than to the "dog's life" of a tribal woman.

A native officer took the risk. If the face he uncovered was female, a whole countryside



A Holy Man Reads the Koran, a Human Square Forms, and Bannu Has an Outdoor Revival

Oldsters are lost in meditation; younger men eye the camera. Among them are Zadrans, Tori Khels, and Bannuchis. Waziristan's itinerant mullah does not pass his turban, but he accepts donations. He interprets his Mohammedan holy book to suit modern conditions (page 478).

might punish the insult. He lifted the veil.

To the vast relief of the Scout officers, this "lady" had a beautiful black beard (p. 478).

Unveiling of Bearded "Women"

That justified a general unveiling, and more "bearded ladies." The total haul was 33 male prisoners, 18 of them wanted, not for tribal crime but for murder, kidnaping, and other indignities on the King's Highway.

Back at Jandola's mess table, the jubilant officers cut deep into a comb of wild honey, served with a bit of the limb on which it had hung, and drank their tea with the satisfaction of a day's work well done (page 499).

Looking in through the bars of the Jandola jail, I saw the captured men, ranged along the wall, with their footgear neatly lined up at the edge of the matting.

White of teeth, haughty of eye, and unashamed, the prisoners had no air of sulking resentment. They had played a desperate

game, for which the maximum penalty is 14 years, and hadn't gotten away with it.

Not only is there a rich vegetable garden and a shady tennis court in a little valley beside the Jandola fort, but there is the beginning of a shady grove on the barren hills.

"My father started the garden. I helped plant the trees. My son may sit in their cool shade," said one of my hosts.

Behind the fort I found some exceptionally fine milch cows, one clue to the super-thick coffee cream which was served to me at frontier mess tables.

"I wish we could fly some of it to London," mused the mess officer at Wana, at peace with the world after a dinner of fresh prawns flown in from Karachi, 500 miles away.

At Jandola the Political Agent of South Waziristan, Maj. A. J. Dring, had taken me in charge. He "had an inspection tour to make." But our trip to Wana was no coincidence.

After the capture of two nights before, the

tribesmen were restive. We had a convoy of riflemen, but nothing would have been easier than an assassination in the notorious Shahur defile, where 50 truckloads of British troops were ambushed in 1937.

Villagers stood on the roadside and waved at the familiar car of their friend, around whose sharp eyes there played a perpetual smile.

Sometimes a goat was dragged up, protesting, as a nominal tribute. Sometimes an unrolled turban was tossed down like a writhing serpent across our path. Always we halted, tribal talk poured in through the car windows, the P. A. spoke a few calm, friendly words, and we moved on. There was no servile pleading. "Yes" or "No," a tribesman would rather shoot than beg.

British Officials Play the Good Samaritan

Time and again I saw British officials play the Good Samaritan.

"After all," said one, "these lifelong nomads are fighting for such a way of life as many a millionaire chooses for his vacation. Fresh air, old clothes, the open trail, and a good gun—it's a good life, and the Mahsuds and Wazirs enjoy it, even on empty stomachs."

Wana spreads its barracks in a wide plain, where native troops were toiling like slaveys to make themselves a football field.

After a bodyguard had been sent ahead, the commanding officer and I rode across the shallow river and climbed on foot to a hilltop fort. There we were challenged by a sentry. My escort, in "civvies" that Sunday, had to phone to headquarters before even he could pass. He was proud as Punch at the sentry's alertness.

Atop the fort, men stood behind automatic rifles. At the heliograph instruments stood a turbaned soldier with a Gurkha face. Since the usual Gurkha headpiece is a felt hat, I was surprised. But this Gurkha, being in a Kashmiri regiment, wore a turban.

In "Johnny" Dring's attractive home at Tank (pronounced Tonk) we ran over a few statistics. But for tribute goats, ribbons of turban, and humane officials the figures might be more impressive—and more tragic.

There are about ten raids and notable offenses a month along the tenuous border between tribal territory and the settled area. About ten men are kidnaped a month, but only about eight are ransomed in a whole year. This on a border where every tribesman has a gun and every shopkeeper or moneylender a relatively well-filled purse.

We missed one tragedy by a few hours. In practice maneuvers one British officer led a

mock attack on the constabulary, was repulsed, and, using bandit tactics, hid in a cornfield. There he and his small party stumbled on an overwhelming party of *dacoits* (gangsters) and were killed on the spot. The head of an Englishman was carried away.

During the maneuvers, pickets had been posted. They marked the flight of the dacoits. Retribution was swift. Refusing to surrender, 11 of the tribesmen were bombarded in their tall tower and killed (page 493).

Two Ways of Life

Waziristan is the frontier between two ways of life—that of the town dweller and that of the nomad. Since time immemorial, seasonal migration between Central Asia and India has been going on. Their very nomadism works against the migratory herders. The flocks depend on winter grazing lands in India. If the nomads break the peace, these green pastures can be denied them.

India also has opportunities for money-lending and trade in lustrous furs and rugs, and the annual migrations of millions of Pathans can be controlled.

Sometimes a single group of Povindahs, moving between their summer and winter pastures, is strung along the King's Highway for six woolly miles. To close the frontier to so many hungry flocks would be punishment indeed. To offer them refuge is to spread good will and hunger-fighting rupees through needy he-man's land.

With Major Dring and a Zenana Mission nurse, much beloved by black-eyed ruffians for the wives she has saved, I motored down to Dera Ismail Khan and lunched with the Resident and Mrs. A. D. F. Dundas.

"Did we do right in letting you visit Waziristan?" asked these fellow members of your Society.

"Why ask me? Father Time is the only one who knows all the answers. But if you had a sneaking hope that I'd admire what you're doing, you've had your wish."

In a jack-rabbit car we bumped over the sandy bed of the Indus, with green crops growing where one of the greatest of rivers would rampage as soon as Himalayan snows released their power. Bundled reeds corduroyed our trail and pontoon bridges crossed the arms of water. Beside us, almost-naked Hindus, toiling at building causeways, straightened their lame backs to watch us bounce away from the he-man's land of gun-bearing Pathans along India's North-West Frontier.*

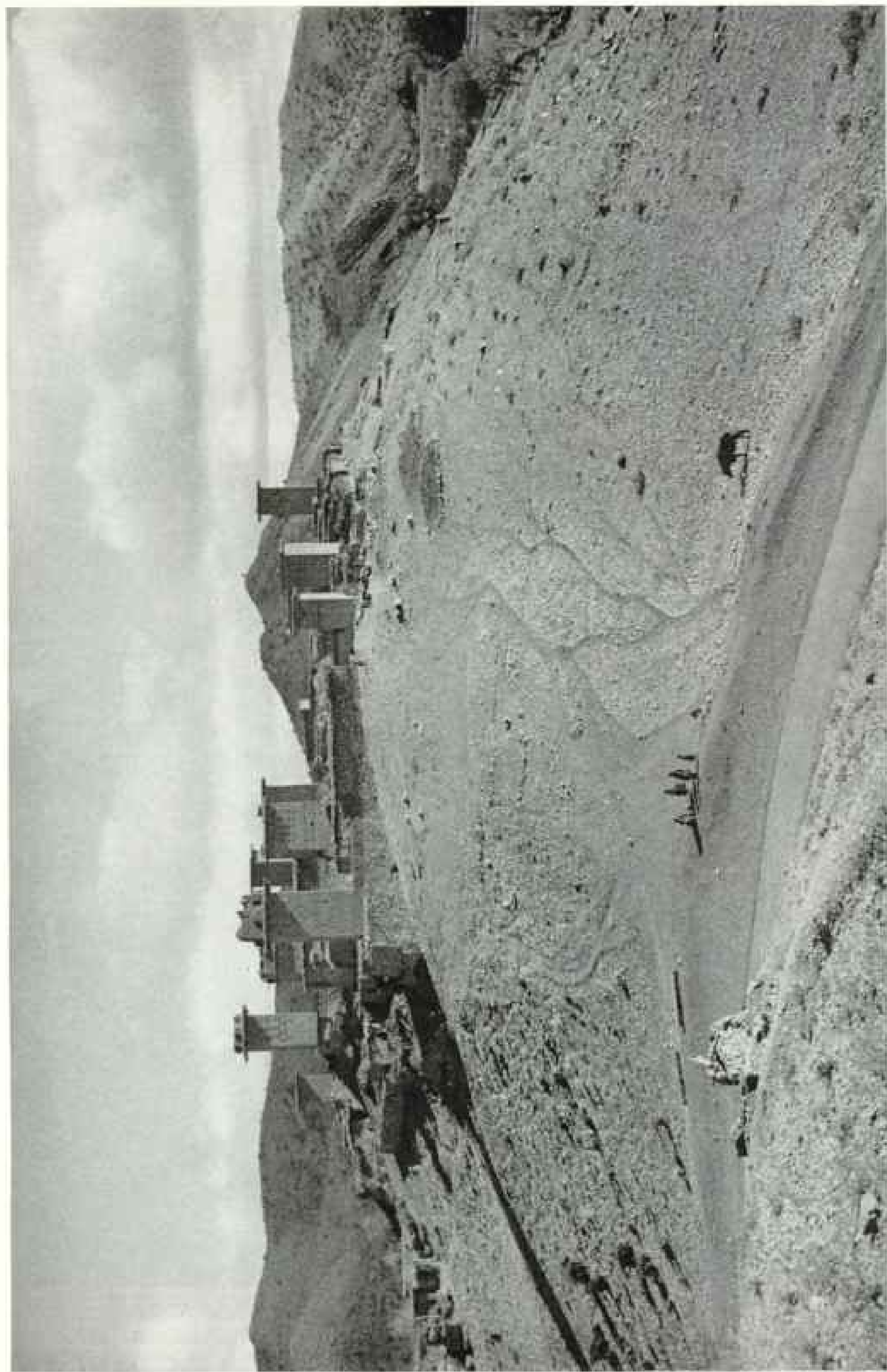
* For additional articles on India, Afghanistan, and Central Asia, see the "Cumulative Index to the NATIONAL GEOGRAPHIC MAGAZINE, 1899-1945."

South of Khyber Pass



A Gun Is the Law in Waziristan, No-man's Land Between India and Afghanistan

Every tribesman is a potential highwayman, for barren crags deter farming and encourage ambush. Assassination and kidnaping for ransom are routine. Britain exercises an influence in Waziristan, but tribal law prevails (page 471). This picket guards the author's convoy on the road to Razmak.



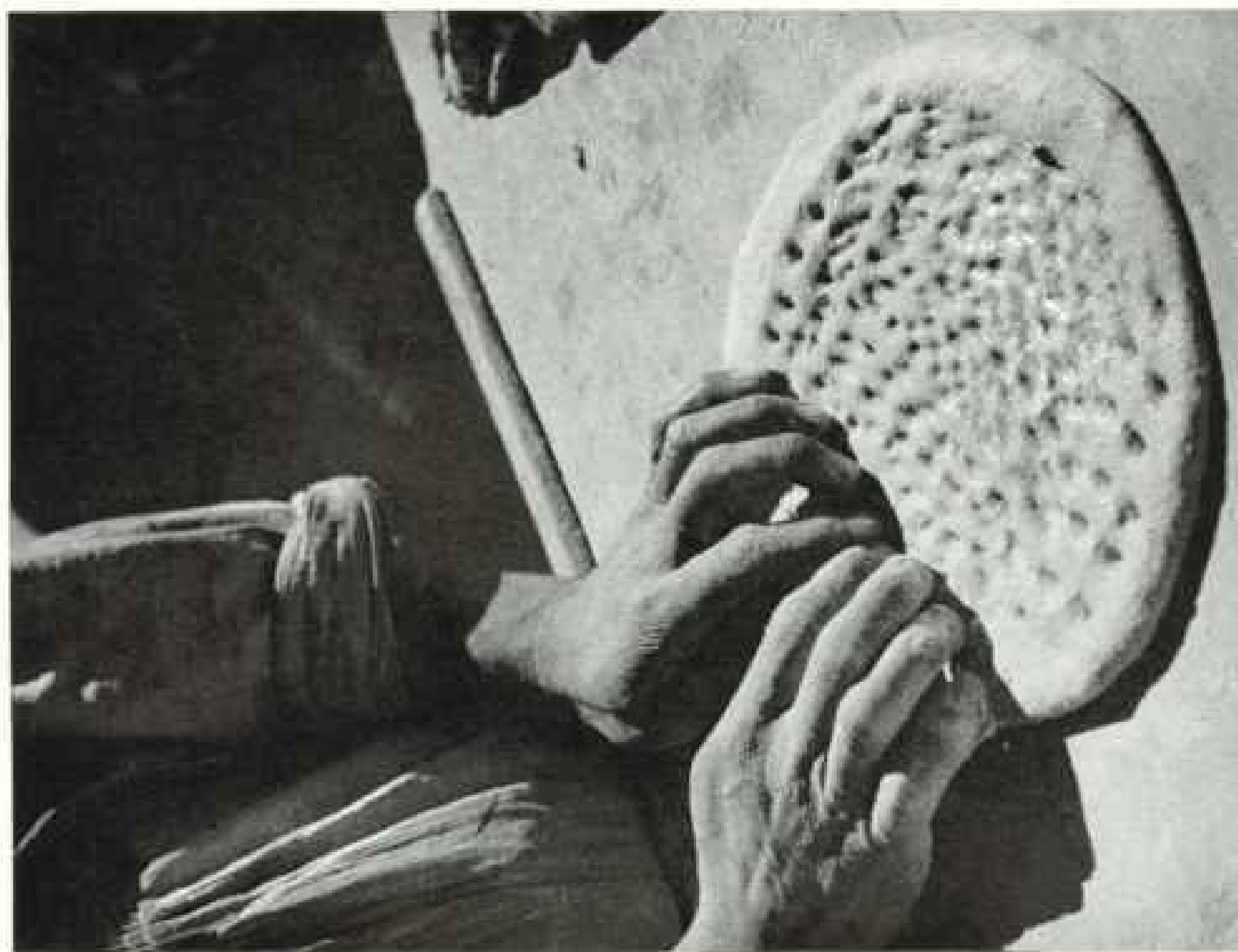
Each Village Is a Fortress, Each Watchtower a Fort Where a Fendist May Hide for Months to Take Pot Shots at an Enemy

When forced to bomb a Wazir bandit town, the British first warn women and children to leave. With the villagers often go the house timbers, for wood is scarce. Rebuilding, they make fresh adobe from the rubble and plaster it over the salvaged timbers. Tribesmen treasure unexploded bombs to blow up bridges.



Hot Tea, Not Alcohol, Stimulates the North-West Frontier

In Peshawar's Street of the Storytellers, cameliers from Central Asia meet traders from India's plains. Caravan gossip is the spice of the barbers. In wartime "military secrets" flow from lip to ear.



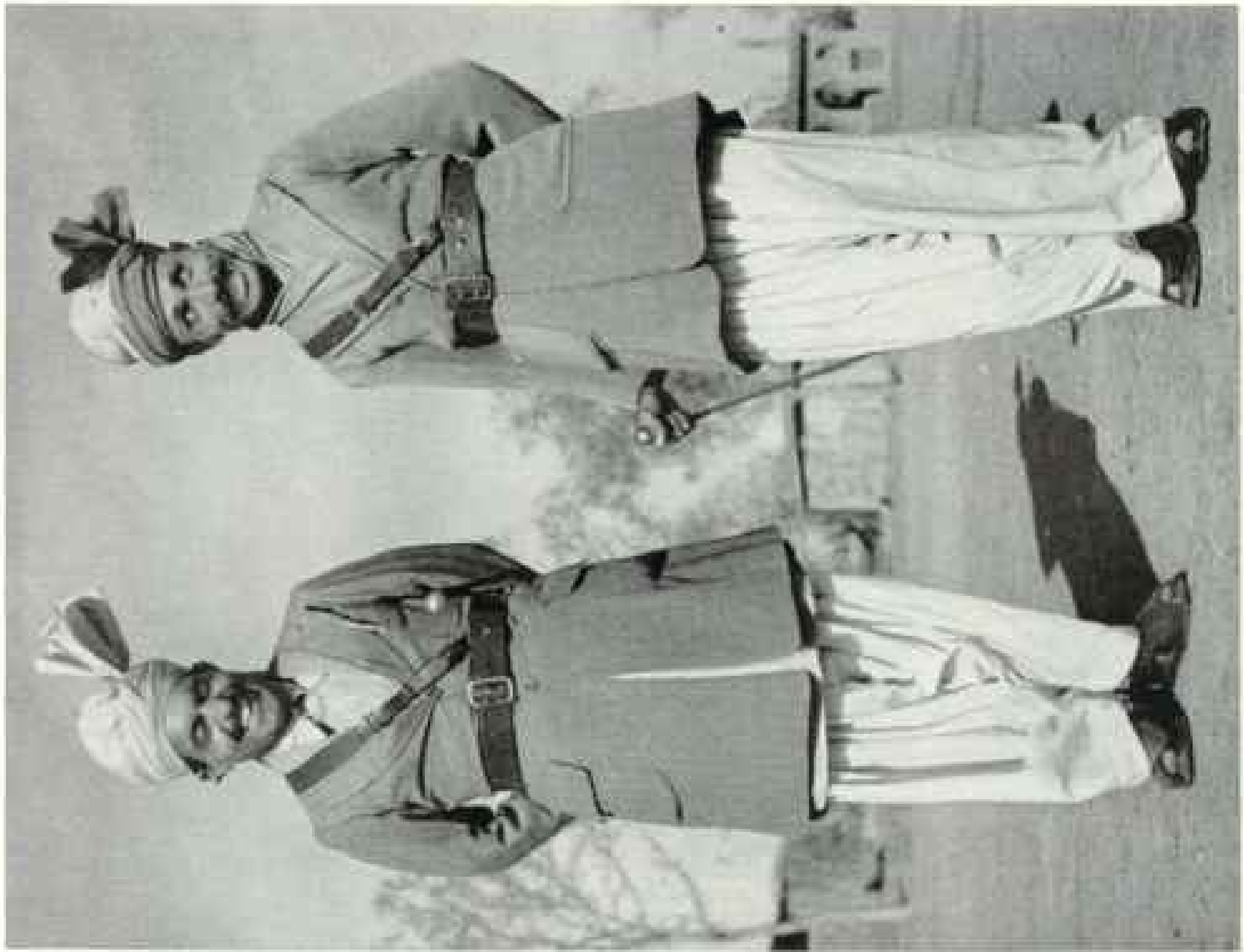
Fingernails Mold a Pattern in the Baker's Dough

But for such indentations, the bread might swell into a pillow rather than flatten into a pancake. From flour to loaf takes but a few minutes. This disk when baked will serve as bread, napkin, and tablecloth.



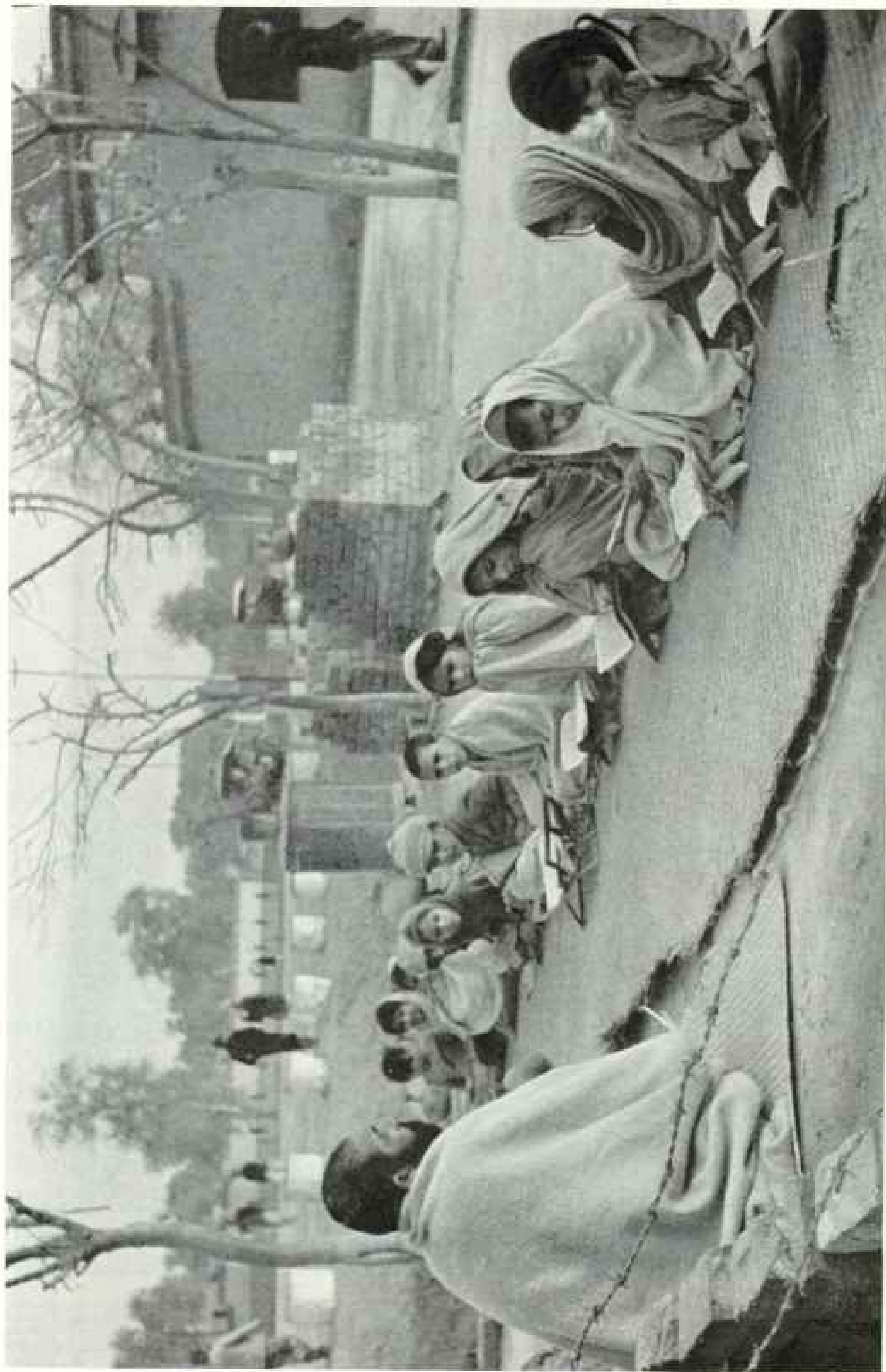
"Look at That Man—and Don't Smile"

This cheery water carrier on the cold plateau near Raazmak had his own idea about how his donkey should look. His sandals are fine for snow climbing.



Merry Grins Mask Fighting Hearts

These officers at Miram Shah train Tochi Scouts. Waziristan is a proving ground for a soldier. Outlaws never let him make the same mistake twice.



On a Freezing Morning near Khyber Pass, Moslem Scholars Memorize and Chant Their Lessons for All Outdoors to Hear

Bookreads take the place of desks. Boys and girls are taught together until they reach 10 to 12 years. Past the class flows the pageant of Asia—the fat-famed caravans of the Khyber Pass. Whitewashed barrels (left) curb the traffic.



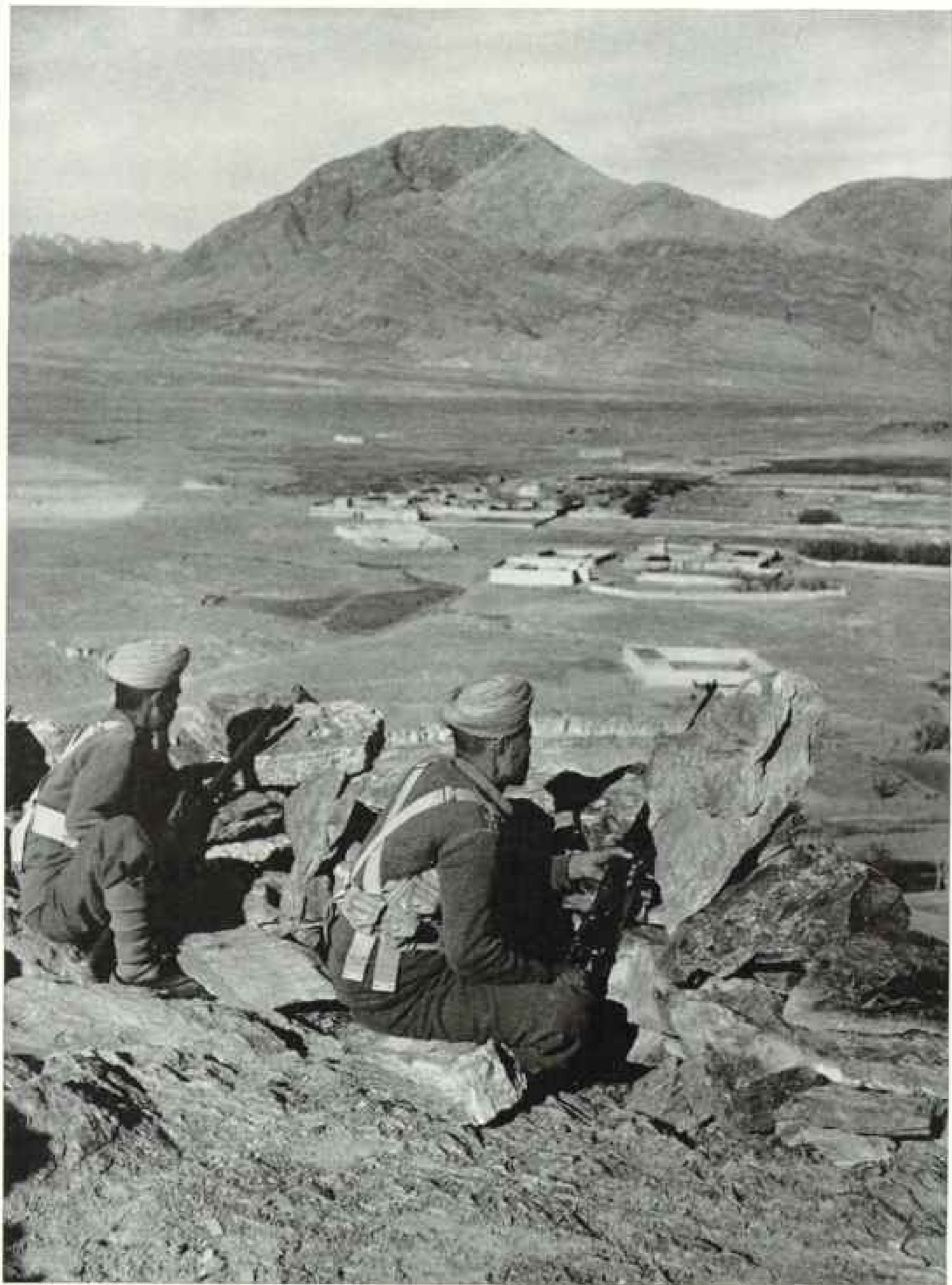
Homeward Plods the Plowman with Two Plows and One Bullock

Rocky, arid scenery indicates why so many Wazirs prefer gun and horse to tool and ox. The single-handled wooden plow can be lifted aside when it comes to a rock. Since no moldboard is used, such a plow merely scratches, rather than turns, the soil. Some cultivated land is so hard that spades are used instead of plows.



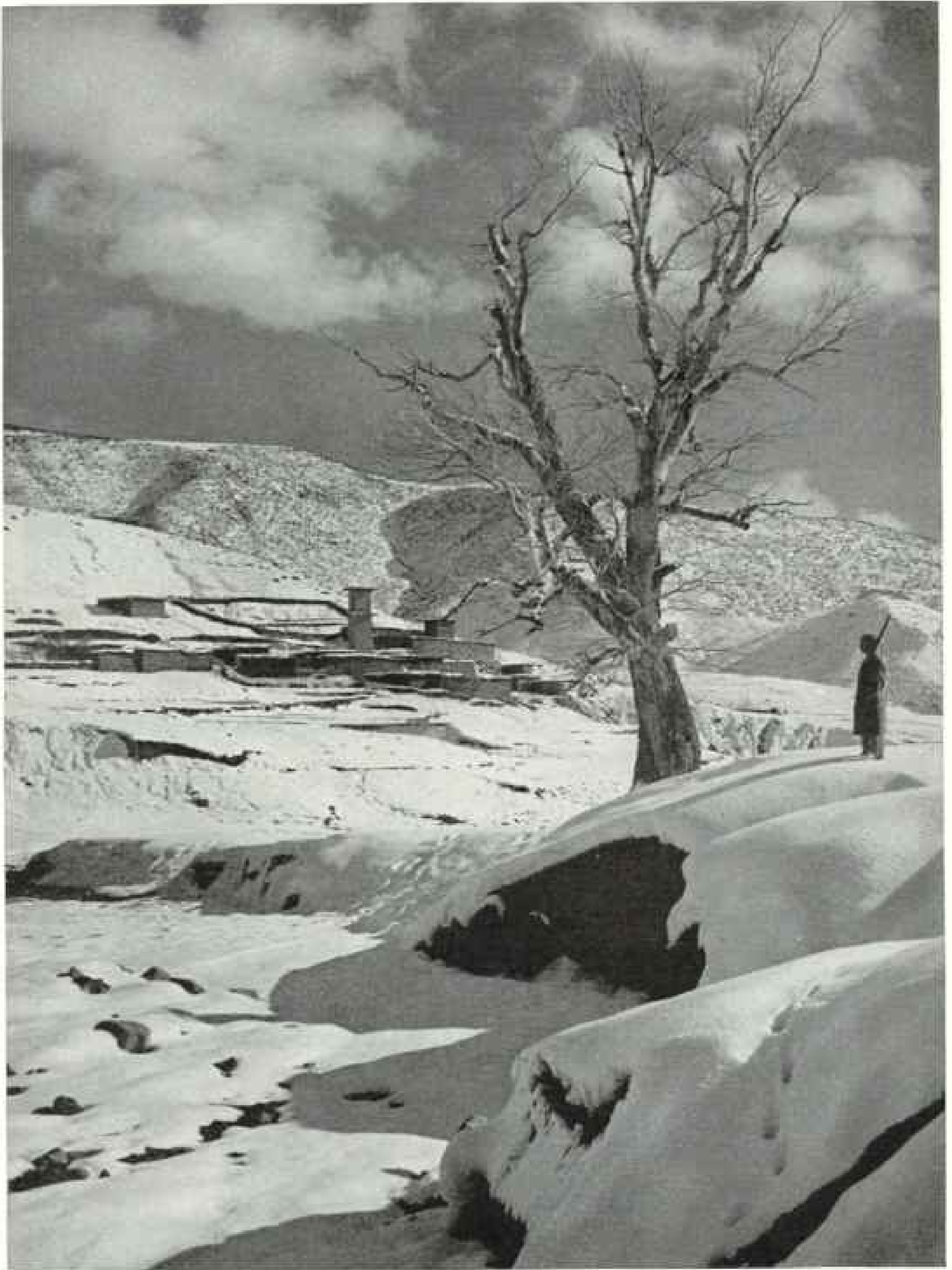
Slowly a Caravan Threads the Khyber, Bloodstained by 35 Centuries of Invasion

This gorge is Central Asia's chief gate to India. Through it came invading Aryans with tamed beasts and iron tools. These hills were known to Darius' Persians, Alexander's Greeks, Tamerlane's Tatars, and the Moguls from Afghatistan. Each year some 100,000 tribesmen migrate through India's northwest passes.



Gurkha Sentries at Wana Are Brothers of the Heroes of Hangman's Hill, Cassino

Bracketed by German fire, an isolated band of Gurkhas held out for 12 days in Italy in March, 1944. They drank a muddy bomb crater dry; got K rations by American parachutes. Ordered to abandon their post, they were indignant. Attached to a Kashmir regiment in Waziristan, these two wear turbans.



In a Snowbound Dream World Sits a Waziristan Shangri La

Peaceful as the community appears, triggermen in the watchtower grow restless at sight of the motor convoy's sentry (right). During the author's visit to no-man's land, eleven assassins of an English officer took refuge in such a citadel. To artillery its walls were as paper. The eleven paid with their lives.



Winged SOS Carriers, Homing Pigeons Ride with Every Convoy

At Miram Shah they perch at their home base. To it they have brought more than one appeal from military caravans beleaguered by native sharpshooters.



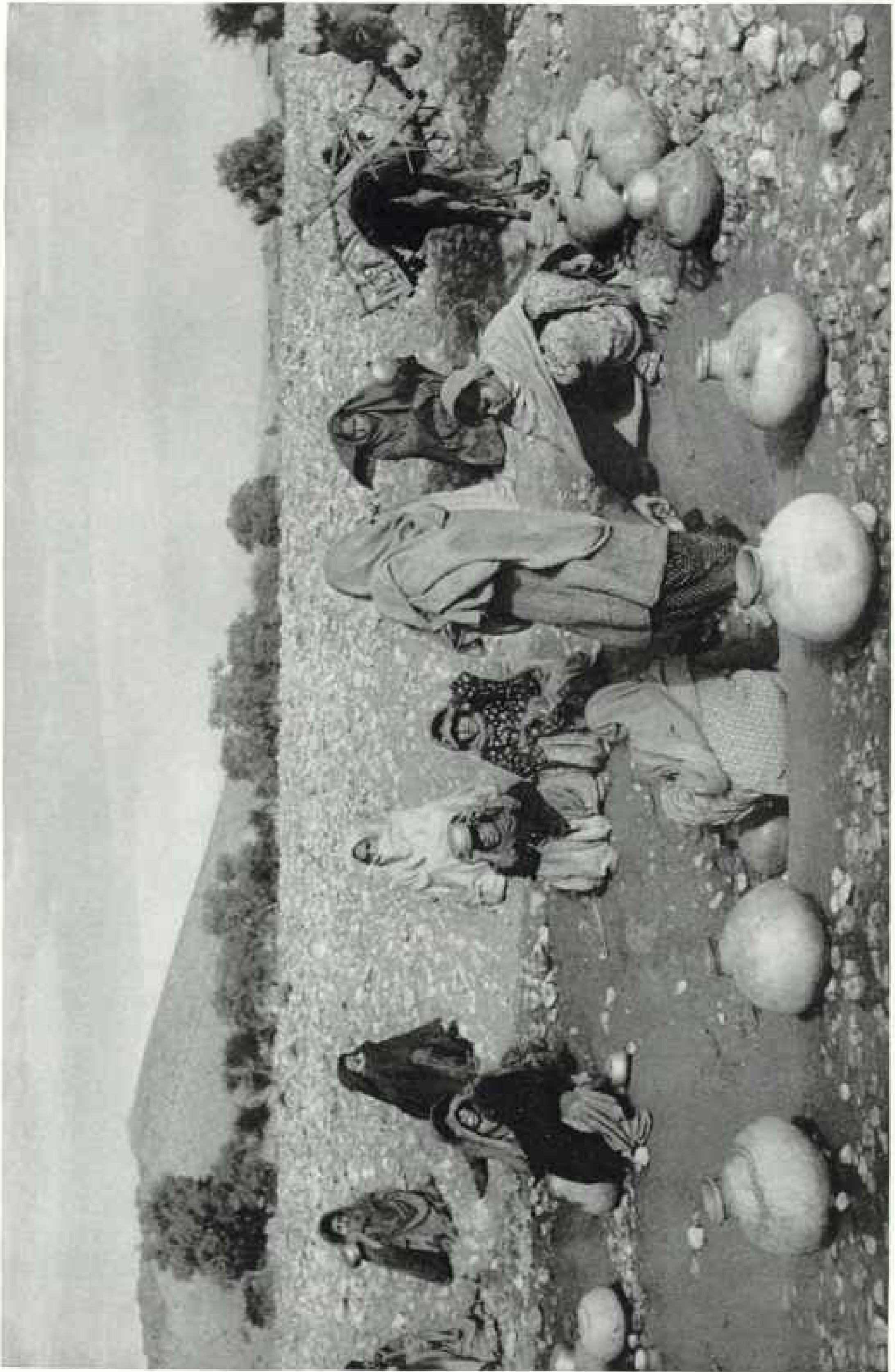
Near Peshawar Court an Indian Law Scribe Types a Veiled Woman's Tale of Woe

She is not a divorce seeker but a property litigant. He wears a homespun cap from Swat, and beside him is the ever-present tea tray. Like salesman and barber, the Oriental typist goes outdoors.



Armed Like a Wild West Stagecoach, a Royal Mail Bus Runs the Outlaws' Gantlet

As the author got aboard at Razmak, Army Intelligence learned a guard had plotted to betray the payroll cargo to fellow Mahsud tribesmen. With loyal riflemen riding the roof, the mail got through to the troops at Jandola. Their wages, however, were left for a less hazardous bus trip.



By Digging a Well in a River Near Lachi, Women Obtain Water in the Dry Season

For the sake of gossip, they linger longer than necessary. As country women, they wear no formal veil. Their brightly colored garments tell chivalrous enemy snipers to hold their fire. Spring thaws will make the rocky bed a torrent.



A Young Apprentice Learns to Make Bogus Rifles

Since tribesmen will smuggle, plunder, or kill for a gun, the British wisely let them make their own. As the handmade weapon is inferior, its stock is stamped with the counterfeit markings of a trustworthy import.



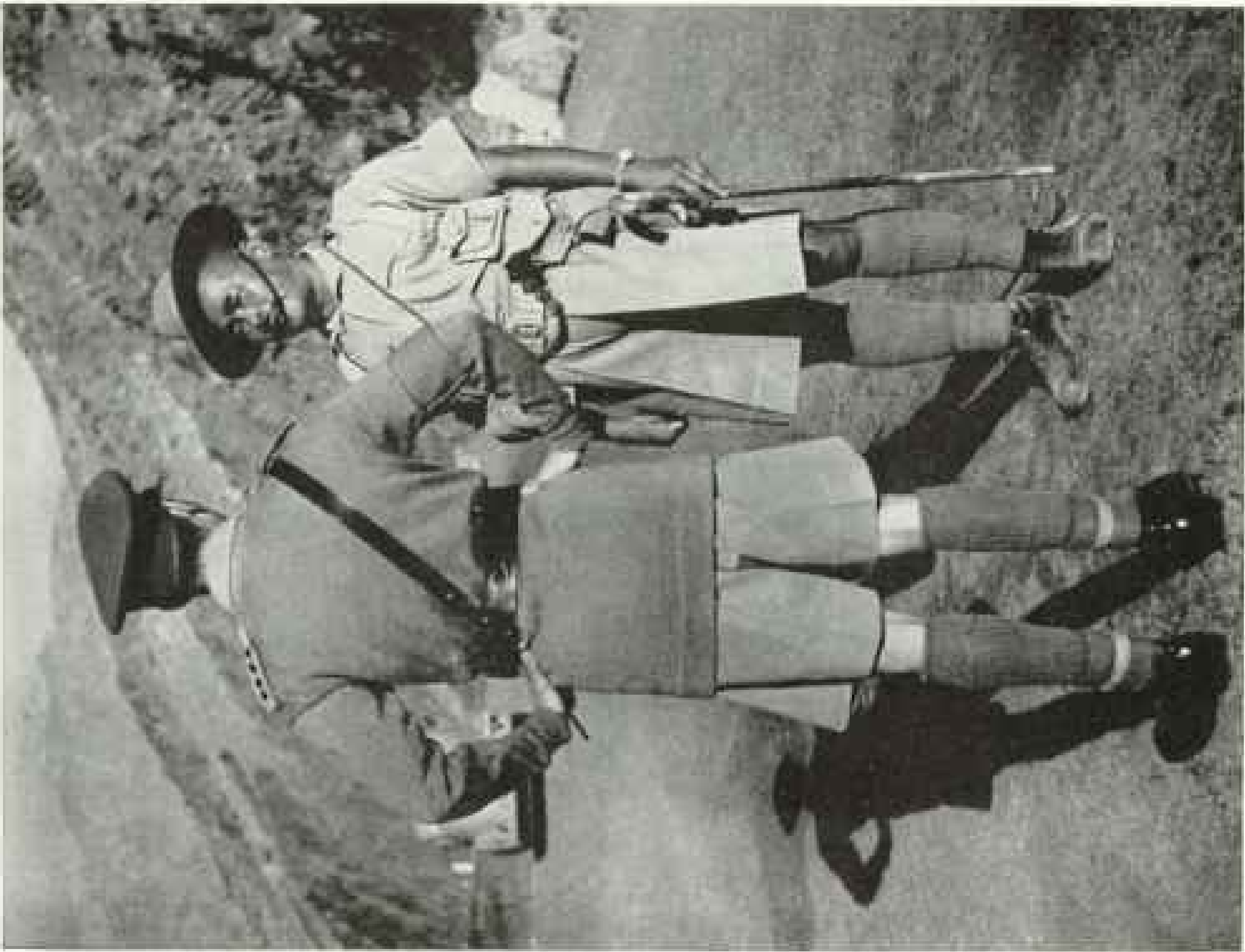
A Dissatisfied Customer Does His Own Barbering

Held as he is, he is vain about his closely trimmed mustache. In a Peshawar open-air shop, he borrows the barber's scissors and mirror to complete the job. With his tongue he puffs out the spot to be clipped.



A Fighting Clan of Marksmen Receives the National Government Min as a Neutral. British Officers Could Not Accompany Him

Although this Bhattanni village is almost under the walls of the Government fort at Jandola, it is out of bounds to British troops, and tribal law prevails. The Bhattanni (Battanni), like other Moslems south of the border, are called Pathans. North of it, they'd be Afghans. Both Pathan and Afghan speak Pushtu.



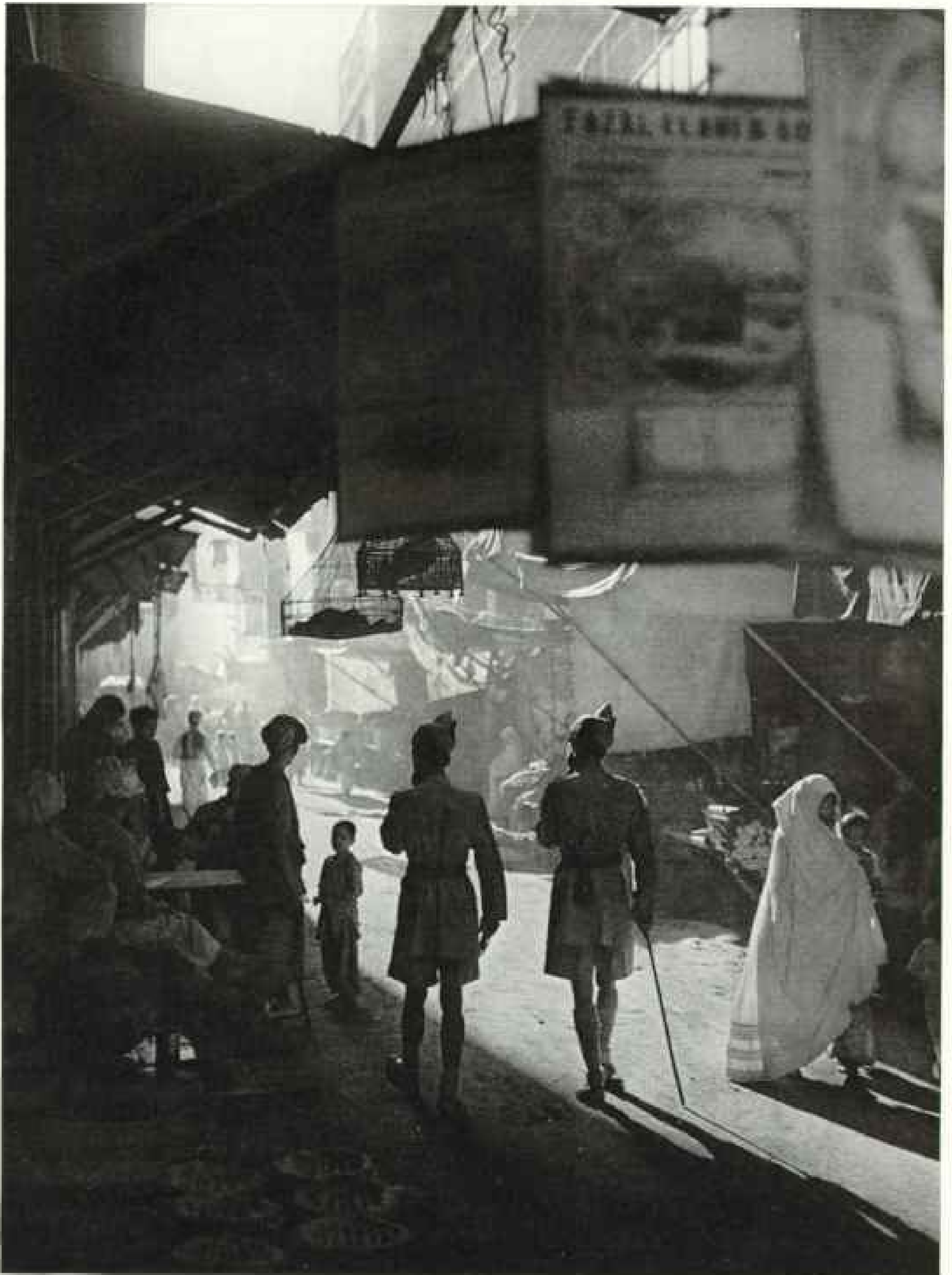
Swagger Stick, Creased Shorts, Mongol Face Are a Gurkha's

Knife-fighting Gurkhas form the ruling caste of Nepal. Loyal to the British during the Indian Mutiny and World War I, Gurkhas were in the vanguard at El Alamein and Mareth Line. British Tommies like to fight beside them.



At a Victory Feast, Wild Honey Is Served on the Branch

The author found this fort at Jandola deserted; the South Waziristan Scouts had moved out to round up a lot of bad men. They caught the gang hiding in women's clothes (page 478). This waiter serves the home-coming officers.



Peshawar—the Khyber's Guardian, Shopper's Treasure House, Adventure's Climax City

Centuries ago a Buddhist art center, the Moslem city now is capital of India's North-West Frontier Province. Asia's rares, shouting and gesticulating, mingle here. Cages (center) hold fighting quail, the gamecocks of the East, ruin of many a gambler. Their beaks and claws are trimmed for combat.

India's Treasures Helped the Allies

BY JOHN FISCHER

THREE of India's ancient treasures helped the United States build the most modern and deadly weapons of war. They are beryl, a gem which can be alloyed with copper and aluminum to make them as hard as steel, and which also was used in making the atomic bomb; sheet mica, indispensable for every aircraft engine and military radio; and block talc, a substance which is especially suitable for making radar and other electronic equipment.

America's wartime need for these strategic materials was so urgent that hundreds of thousands of pounds were flown from India by the Air Transport Command, sometimes with priorities higher than those given to major generals. They made up a small but critically important part of the fabulous resources, ranging from goatskins to high-grade steel, which India poured into the war machine of the United Nations.*

Beryl Treasured by Fabulous Princes

Beryl, a gem closely related to the emerald, has been treasured by Indian princes for centuries, and necklaces of this milky-green semi-precious stone still are the chief adornment of many a Rajput lady. In more recent years, however, scientists have discovered that it is even more valuable as an alloying metal.†

Many of our American fighting planes were equipped with beryllium bronze bearings, which wear ten times as long in some uses as bearings of the traditional copper alloys. In explosives plants, where a spark from a steel hammer or screw driver might cause a disaster, beryllium copper tools can be substituted; and in a long list of other uses the jewel alloy has proved valuable (page 502). Most important of these was its use to start the flow of uranium neutrons producing atomic fission.

Although scattered deposits have been found in Argentina, Brazil, and Australia, a great part of the United Nations' supply of this vital mineral came from the arid Rajputana hills of western India. In this region, production of beryl resembles an Easter-egg hunt more than it does ordinary mining.

Throughout some 10,000 square miles of dusty, thorn-covered semidesert, chunks of beryllium ore may turn up almost anywhere—among the gravel of a dry stream bed, in the shaft of an abandoned mica mine, or embedded in the stony outcroppings of the low ridges which are known in this part of India as "dykes."

Moreover, although beryl of gem quality is easy to recognize, ordinary beryl may look much like any other kind of rock, except that the crystals are six-sided. Frequently the hardest problem of the native beryl prospector is to learn to tell a piece of valuable ore from a worthless lump of quartz or feldspar.

When the first American buyer, a tough, good-natured Texan named Harry Witt, went into Rajputana in 1942, he stirred up more excitement than most of the villagers had known since the last Mogul invasion. By word of mouth the news got around fast.

Even Women Went "Rock Hunting"

"The crazy foreigner is paying good money for rocks. He has been touched by the gods, no doubt, or perhaps driven mad by the sun, but his pockets are full of rupees. If we hurry, we may get some before he regains his wits or the money runs out."

Within a few months, thousands of Indian peasants became beryl hunters. The graceful Rajput women, with their flowing red-and-yellow skirts and silver anklets, searched the stream beds and gravel banks.

Their naked brown children squatted all day long on the piles of debris at the mouths of old mica mines, picking through the broken stones for the particular kind of greenish-gray pebbles which seemed to please the strange American most.

By suppertime a lucky youngster might hope to fill his shallow reed basket with perhaps ten pounds of rock, which would sell for eight annas, only 15 cents in American money, but an almost fantastic wage for an Indian boy.

Eventually beryl collecting became organized on a less romantic but more efficient basis, under the leadership of an elderly but dynamic little Arab, Abraham Futehally, of Bombay. He trained a staff of bright young Indians to travel through the villages, teaching the peasants how to recognize good-quality ore and where to look with the best chances of success.

With the help of the Geological Survey of India, he undertook systematic prospecting

* See "India—Yesterday, Today, and Tomorrow," by Lord Halifax, in the NATIONAL GEOGRAPHIC MAGAZINE, October, 1943; "British Commonwealth of Nations," by Eric Underwood, April, 1943; and "In the Realms of the Maharajas," by Lawrence Copley Thaw and Margaret S. Thaw, December, 1940.

† See "Metal Sinews of Strength," by Frederick G. Voshburgh, in the NATIONAL GEOGRAPHIC MAGAZINE for April, 1942.



Staff Photographer Willard R. Colver

Humble Relatives of Rajput Gems Are These Bricks of Beryllium Ore

At Reading, Pennsylvania, the crystalline ore, which is akin to emerald, has been ground into powder and mixed with chemicals for baking into beryllium oxide. A small quantity of beryllium alloy makes copper tough. Pure beryllium metal also is used in the splitting of uranium atoms in the process which produced the atomic bomb. Some beryl crystal deposits exist in the United States, but most of the mineral comes from India and South America.

and mining operations in the gravelly dykes where beryl was embedded like raisins in a fruit cake. His miners' equipment was primitive—sledge hammers and iron drilling rods to break up the rock, and broad-bladed hoes to scrape out the dirt. But they were effective enough.

The Arab hit a real bonanza. On a sun-parched ridge near the border of the native State of Alwar, his agents found a single massive cluster of beryl crystals weighing nearly 3,000 pounds. From other diggings they hauled out tons of ore where they would have been grateful for a few pounds.

Before the war ended, Abe Futebally had become the Beryl King of India and probably the largest producer of this mineral in the world. Thousands of American flyers who never heard his name owed the high quality of their equipment to this frail, bearded old man.

Unfortunately, most individual deposits of beryl, both in India and elsewhere, are small and are quickly exhausted. Unless new reserves are developed to replace them, there is danger that the supply may be interrupted.

Consequently, both the Government of India and the American agencies working in that theater are continuing their explorations in spite of the end of the war.

Father Lyons, a Catholic missionary who has traveled and taught for many years in the Ganges Valley, reported to the U. S. Foreign Economic Administration offices in New Delhi that he had stumbled across a promising vein in that area.*

Andrew Corry, an outstanding American geologist and mining engineer, was assigned to help investigate the missionary's find and to run down reports of other beryl lodes in the State of Kashmir † and in Nepal, high in the Himalayas.

Mica Once Mined as Semiprecious Stone

Unlike beryl, mica has been produced on a large scale in India for many years. Originally it, too, seems to have been mined as a

* See "New Delhi Goes Full Time," by Maynard Owen Williams, in the NATIONAL GEOGRAPHIC MAGAZINE, October, 1942.

† See "On the World's Highest Plateaus," by Hellmut de Terra, in the NATIONAL GEOGRAPHIC MAGAZINE, March, 1931.



Staff Photographer Bernard Green Williams

Thirst Is Quenched at a Hand-tilted Drinking Fountain

In caste-conscious India purity of water often is judged by who has handled it, not by its source. Such caste scruples have been broken in some mills, so that all workers drink from the same fountain (page 520).

semiprecious stone for purely ornamental purposes. The glistening sheets were used as inlays in the walls of palaces or were cut into sequins to decorate the robes of dancing girls.

During the last fifty years, however, it has come into increasingly heavy demand by manufacturers of electrical equipment, who found that the mountains of Bihar and Madras, both in eastern India, produced some of the highest-quality mica in the world.

Under the pressure of war needs for aircraft spark plugs, radio condensers, and other electrical components, the mines in these two areas reached the greatest output in their long history (page 506).

A typical mica mine is a narrow, twisting tunnel scraped into the side of a heavily wooded hill (page 504). Usually it is braced haphazardly with a few teak logs, and accidents are common in the monsoon season, when rains up to 100 inches in five months may start landslips in the waterlogged earth.

These heavy rains are the worst obstacle to steady production, since they often flood the mines and bog the rough mountain trails until they are impassable even to heavy two-wheeled bullock carts which are the customary means of transport for all food and supplies.

Since no prolonged lapse in production could be tolerated during wartime, the British and American purchasing agents, working together in a Joint Mica Mission, brought in a considerable number of pumps to keep the mines dry in spite of the monsoon. They also introduced a revolutionary new tool, the jackhammer driven by compressed air.

Closely resembling the pneumatic tools used to break up pavement in American cities, one of these automatic hammers is able to pound through more rock in an hour than a gang of native laborers can handle in a day with their traditional sledges and chisels.

That was as far as mass production was able to go, however. The earth and broken rock are still removed from most mines by a slow procession of half-naked coolies, each carrying a 20-pound load in an iron bowl balanced on his turban.

Nor is there any mechanical substitute for the skilled miner who takes out the mica itself. This strange mineral usually is found in "books," or bundles of thin sheets, tightly pressed in a crevice of the surrounding rock. It must be pried loose with the utmost care, to avoid damaging the leaves, which range in color from black through ruby to almost glassy transparency and sometimes are as



Osmington Survey of India.

Working as a Family in a Mica Mine, Men Dig Ore, Women Carry It on Their Heads

In addition, the wives split the mineral "books" into thin sheets; an operation still not done satisfactorily by machinery. This open pit in Bihar illustrates the author's observation about India's typical mica mine: "Usually it is braced haphazardly . . . accidents are common." Rains may start a landslide or flood the shaft (page 503).

large as 80 inches square. In most cases the mica is trimmed, cut to the desired shape, and split into sheets or films a few hundredths of an inch thick in open-air sheds or "factories" within a mile or two of the mine.

In its role of most interested customer, the United States Army gave all the help it could to the mica miners. It even provided some jeeps—far more precious than jewels in India—to haul supplies to the mica diggings and bring out the finished product during the monsoon season when no other vehicle could get over the sodden roads.

Monkeys Hindered Mica Hunting

There was one other obstacle to production which even the Army dared not tackle: monkeys. Large colonies of the little rhesus

monkeys roam through the jungles and villages of Bihar, and occasionally they do serious damage to the scanty fields of rice and millet. During the 1943 famine, in particular, such damage became a matter of real concern, and many a miner left the mica pits to guard his few acres of growing crops.

Because of Hindu feeling about monkeys, however, no one dared kill them.*

One day a mine owner walked into the Mica Mission headquarters at Calcutta and announced that he had solved the monkey problem.

"It was simple," he explained. "I just hired three boxcars, set them on a railway siding

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, by William M. Mann, "Monkey Folk," May, 1938, and "Man's Closest Counterparts (Apes)," August, 1940.



These Tall Stalks Provided Jute Fiber for Wartime Sandbags

Bundles of harvested stalks are soaked in water to loosen the fibers between the surface bark and inner woody sticks. Bales of the cleaned jute then go to Calcutta mills for manufacture into burlap bags, tarpaulins, hessian cloth, and other products. Most of the world's supply is grown on rain-drenched delta lands of the Ganges and Brahmaputra Rivers (page 507).

near the mine, opened the doors, and scattered a little grain and fruit on the floors. In a couple of hours every car was full of monkeys, squealing and fighting for the food. We just slammed the doors and told the railway people not to open them until the cars were across the Bengal border 50 miles away."

What Bengal farmers thought of this monkey-disposal system was no concern of his.

Talc for Beauty and Electronics

One of the most amazing of India's war materials was block talc. Ever since the first Hindu beauty discovered, back in the dawn of history, that she could enhance her complexion with a little talcum powder, this mineral has been mined on a small scale in almost every section of the peninsula.

A few years ago, American electrical laboratories discovered that a certain kind of talc has a peculiar property. This soft, white, fine-grained stone, which looks rather like the meerschaum commonly used for pipes, can be carved or machined with great accuracy. It then can be heated in an extremely hot furnace until the talc recrystallizes as hard as porcelain, and in the process it neither shrinks nor expands nor sags out of shape appreciably.

The right kind of talc for electronic use proved to be extremely rare. One such deposit was known to exist in Sardinia, then in Axis hands. The only other was in a tiny, primitive mine near Madras, which was capable of producing only a few tons a month.

In response to almost frantic cables from Washington, the American representatives in



India Supplies Mica for Vital Motor Parts

At Pittsburgh, this Westinghouse Electric employee inspects mica rings used in small motors for bombers. She flicks imperfect ones into the slot at the left and perfect ones to right. India exports large quantities of this insulative, heat-resistant mineral, from which spark-plugs, radio condensers, and other electrical parts are made.

India started to search for new mines which could produce ample tonnages of electronic-quality talc. They tested scores of samples, all of which turned out to be useless.

Then Clarence E. Macy, the American consul at Karachi, heard of an old talc quarry in the native State of Udaipur, which was reputed to contain hundreds of tons of some of the purest, whitest stone in India. Long before the war it had produced talc not only for the cosmetics industry but also for native sculptors, who used it for carving idols and temple ornaments.

When the Maharaja of Udaipur heard the story, he offered his private railway car to

take Macy to a station on a little narrow-gauge line near the mine. From that point the consul traveled by antiquated autos and a mile-an-hour bullock cart through 15 miles of sandy desert to the quarry site.

There he found a deep pit, unworked for many months, and near its rim a great heap of talc in crude lumps, left without a market when the outbreak of war cut off the overseas cosmetics trade. He loaded a gunny sack full of samples from this mound and hurried to Delhi as fast as the plodding bullocks and leisurely railroads would carry him.

ATC Flies High-priority Freight

By fast transport plane, the samples were rushed to the United States, where they underwent tests in the laboratories of two big electrical-equipment companies.

A few weeks later the old quarry was back in operation, and scores of bullock carts were mobilized to move the talc to the nearest railway station for

shipment to an Air Transport Command field. There the 4-inch blocks of soft stone, each carefully wrapped in burlap to safeguard it against chipping, were packed into 80-pound bags and loaded on the giant four-engine planes for a 10,000-mile flight to America's war factories. Within three months, hundreds of tons had been delivered safely to the United States.

Carrying such high-priority freight in large volume became almost a matter of routine to the India wing of the ATC. In addition to block talc, it hauled large tonnages of top-grade mica, which was too precious to risk on submarine-infested seas. Moreover, the

planes which carried, by January, 1945, some 44,000 tons a month of life-giving supplies into China across the famous Hump Route—most hazardous airline in the world—also brought out cargoes of Chinese goods which were urgently needed by the other United Nations.* Most important of these were tin, tungsten, and—curiously enough—feathers.

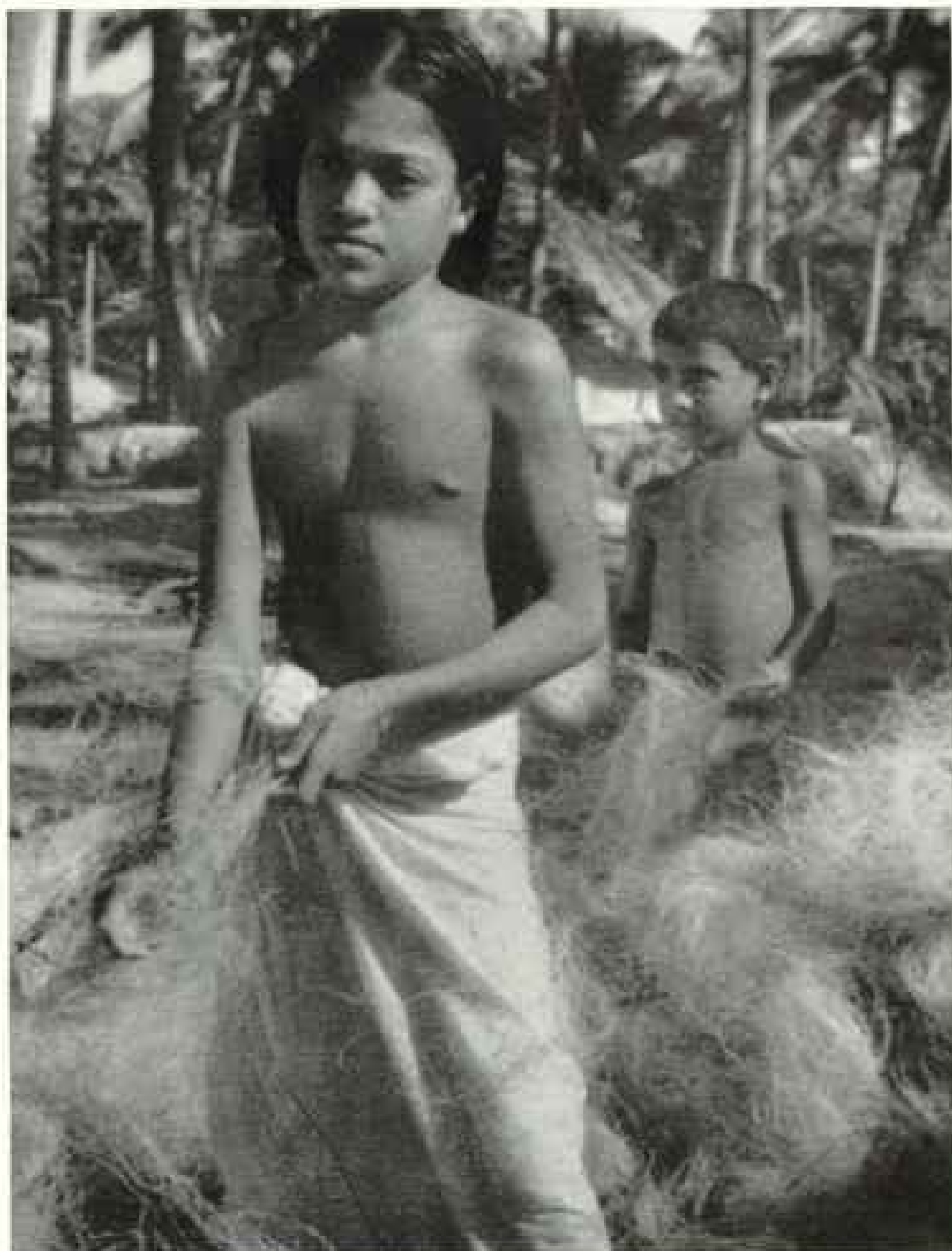
Feathers for Fighting

In peacetime, China produced in large quantity the soft down from the breasts of ducks and geese which is the most satisfactory material for padding aviators' clothing and the sleeping bags issued to Arctic troops. Despite wartime difficulties, thousands of bales of feathers were flown across the mountains to northern Assam, where they were transhipped by rail and by barges on the silt-choked Brahmaputra River to Calcutta for dispatch by sea to the United States.

In terms of both dollars and tonnage, India's output of such special items as beryl, mica, and talc was overshadowed by her traditional exports—notably burlap and manganese—which were consumed by America's war industry on a tremendous scale. Almost the entire world's supply of jute, the coarse fiber used for making burlap and gunny sacks, centers in a few hundred square miles of the rain-drenched delta lands near Calcutta.

The jute plant, which looks somewhat like a cross between sugar cane and an overgrown cattail, thrives only in a combination of heat and extreme moisture, a climate which the monsoon of the Bay of Bengal furnishes to perfection.

Every year some two million acres of this



© Stan Harding

Malabar Youngsters Shred and Sift Fibrous Coconut Husks

This stiff, resilient fiber is called coir. Woven into mats and twisted into rope, it was used extensively as buffers to protect landing craft and lighters. Coconuts also provide oil-rich copra (page 515).

crop are harvested by natives, who frequently work in flooded fields yanking the plants up by the roots from three or four feet of water (page 505).

After pounding and soaking them, they strip the fiber from the rest of the stem and ship it in evil-smelling bales downstream to the ninety jute mills on the banks of the Hooghly River north of Calcutta. Here, in addition to the usual burlap and sacking, much of it was manufactured into tarpaulins, sandbags, camouflage nets, asphalt-impregnated strips for jungle landing fields, and a dozen other

* See "American Wings Soar Around the World," by Donald H. Agnew and William A. Kinney, NATIONAL GEOGRAPHIC MAGAZINE, July, 1943.



India Information Bureau

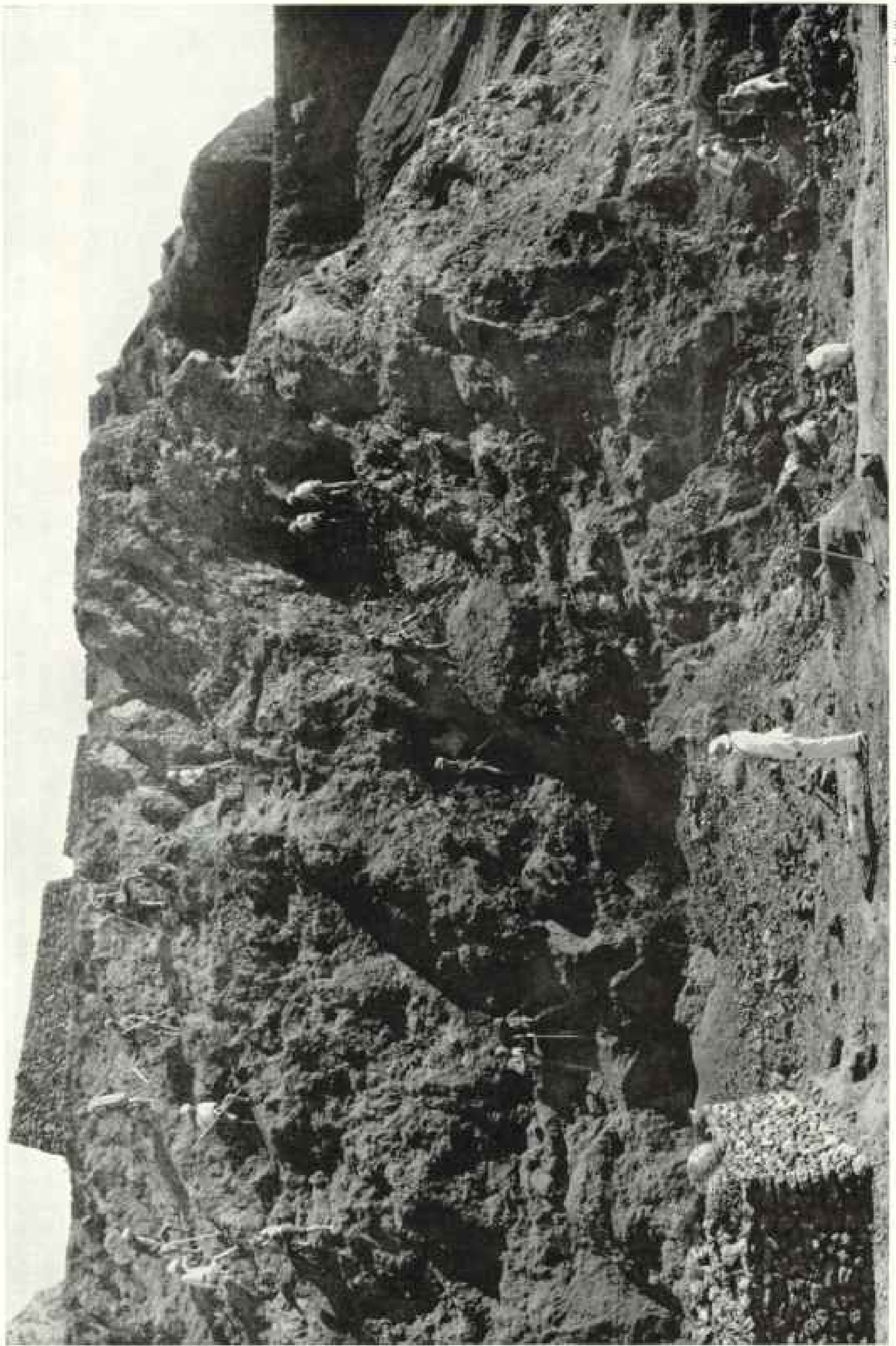
Terrace by Terrace, Southern India Miners Shovel Away a River's Banks for Manganese, Steel's Cleansing and Hardening Alloy

On the distant road (center) men walk to work. At the right they have left pillars indicating the depth of cut. Steam operators stand near a crushing mill's boiler. The ore may go by cart up the zigzag trail or flow into barges below. Hand labor in Indian manganese mines has little machine competition, yet it turned out amazing wartime tonnages (page 515).



H. H. H. H.

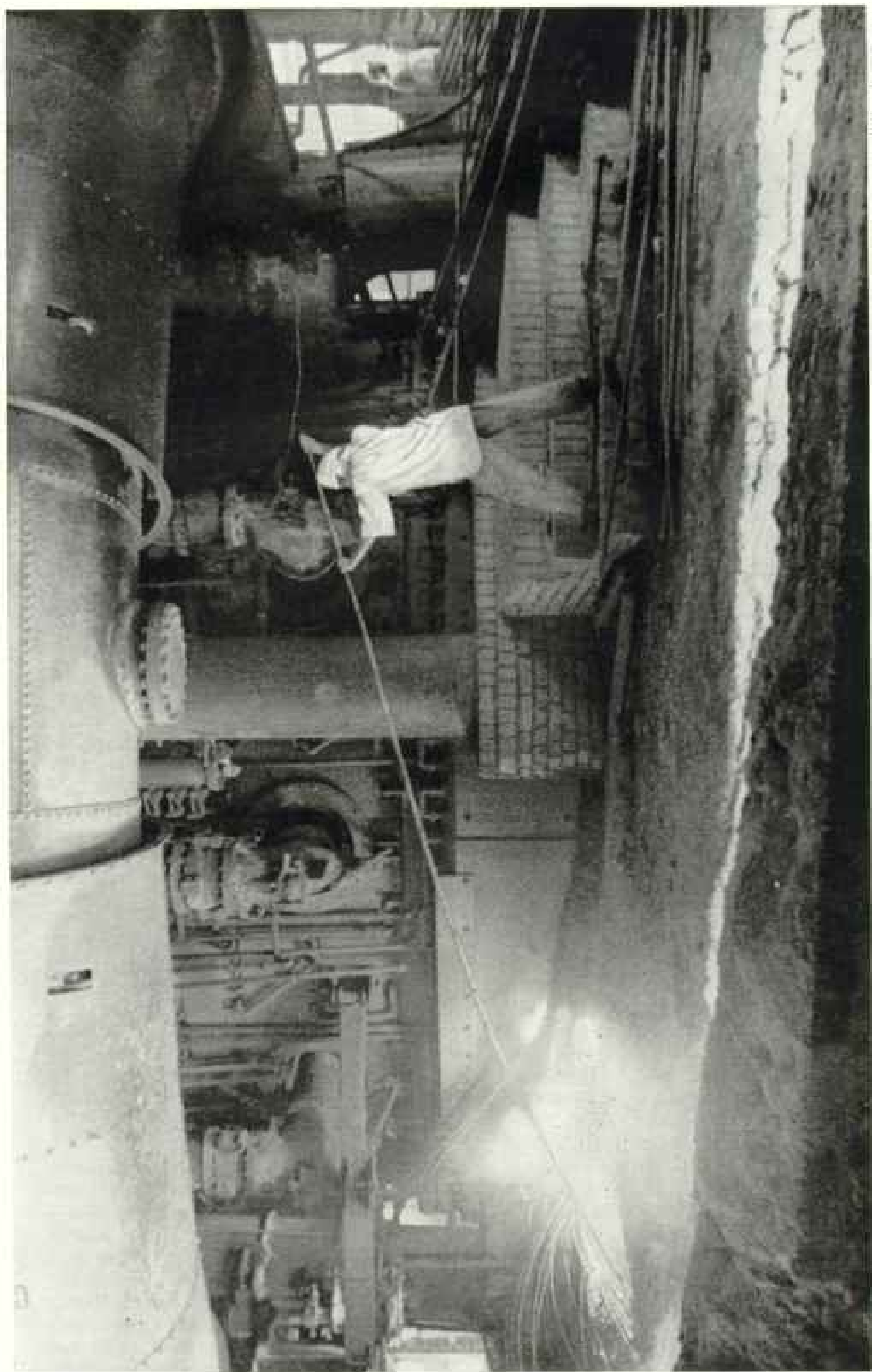
Porbandar, a Port on the Arabian Sea, Transfers Peanuts from Train to Ships—India Is a Leading Producer and Exporter of This Crop. These groundnuts, as they are called in India, will go into peanut butter, cooking and salad oils, soaps, margarine, and cattle food. In wartime they were used in making glycerin for explosives (page 515). Shells of India's palatable cashew nuts also performed an important war service (page 519).



H. Nathan

In the Wake of Dynamite Blasts, Crowbar Miners Whittle Down an Iron Mountain in Mysore State

As larger lumps tumble down, workers at the base break them for loading into the stack beside the railroad tracks. A similar heap sits on top of the hill.



British Press Bureau

With a Bamboo-handled Rod, an Indian Worker Diverts Slag from a Blast Furnace's Fiery River of Iron

To force the fire, the large pipe overhead conveys preheated air in the Tata Iron and Steel Company at Jamshedpur. In the blast, iron ore and limestone are fused by coke. Top slag, formed by stone's impurities, has already escaped through the trough (right). Now the residue floats on a stream of iron (left). The heavier metal runs on; its crust is poled into the stream on the right (page 519).



Jindan (official)

Smiles Gleam in India's Land of Cotton

Sari-clad land girls work with the menfolk in the vast cotton fields near Bombay. This boll-filled basket is made of split bamboo. Climate helps make the bulk of the Indian crop a coarse, short-staple fiber.

products consumed by our armies at the rate of several hundred million yards a year.

The laborers in these mills—Bengalis dressed in loose cotton *dhoti* (long loin-cloth) and white skullcap, a highly practical garb for such a climate—are skilled workmen, and their specialized craft paid them an unexpected dividend during the famine of 1943. Bengal, cut off by the Japanese from its normal source of rice in Burma, suffered the most widespread starvation in fifty years.

But while thousands of peasants and unskilled laborers were dying in the streets of Calcutta, the jute mill workers usually were able to get at least a bare subsistence ration. Because their skills were vital to the war effort, most of the factories managed to arrange

special food supplies for their employees.

Another group to which the war brought surprising good fortune is the tribe of Mughs (Maghs), an obscure hill people who once lived in almost complete isolation in western Burma. Many of them emigrated to Bengal. Late in the nineteenth century, these tribesmen had an opportunity to render a handsome service to the British Army by serving as guides and scouts in the last of its wars with the Burmese. In reward the Government of India proposed to give to each of them the customary bounty of a handful of silver rupees.

A British officer, however, had a better idea.

"We have never had enough servants in India who understand European cooking," he pointed out, "and many Europeans simply can't keep in good health on the fiery, highly spiced curries of the native cooks. Why not reward the Mughs by training them to be a tribe of

expert European-style chefs? Instead of a cash bounty which would be spent in a few weeks, they will have a skill which will provide security for them and their children for many generations."

Wild Mughs Trained as Chefs

The suggestion was approved enthusiastically by officials of the Political Department—most of whom suffered from indigestion—and the young men of the Mugh villages were brought down to Calcutta a few at a time for training under the best British and French cooks the city could provide. Today the Mughs form a special kitchen caste, which has scattered over many parts of India and whose reputation has grown with the years.

When the first United States troops reached India, many of them were on detached service, without messes or a supply organization of their own. They quickly learned that while the Mugh cooks might not be able to bake an apple pie just like grandmother's, they could turn out steaks and roasts and even hamburgers which were at least as good as those of the average American restaurant, and often a good deal better.

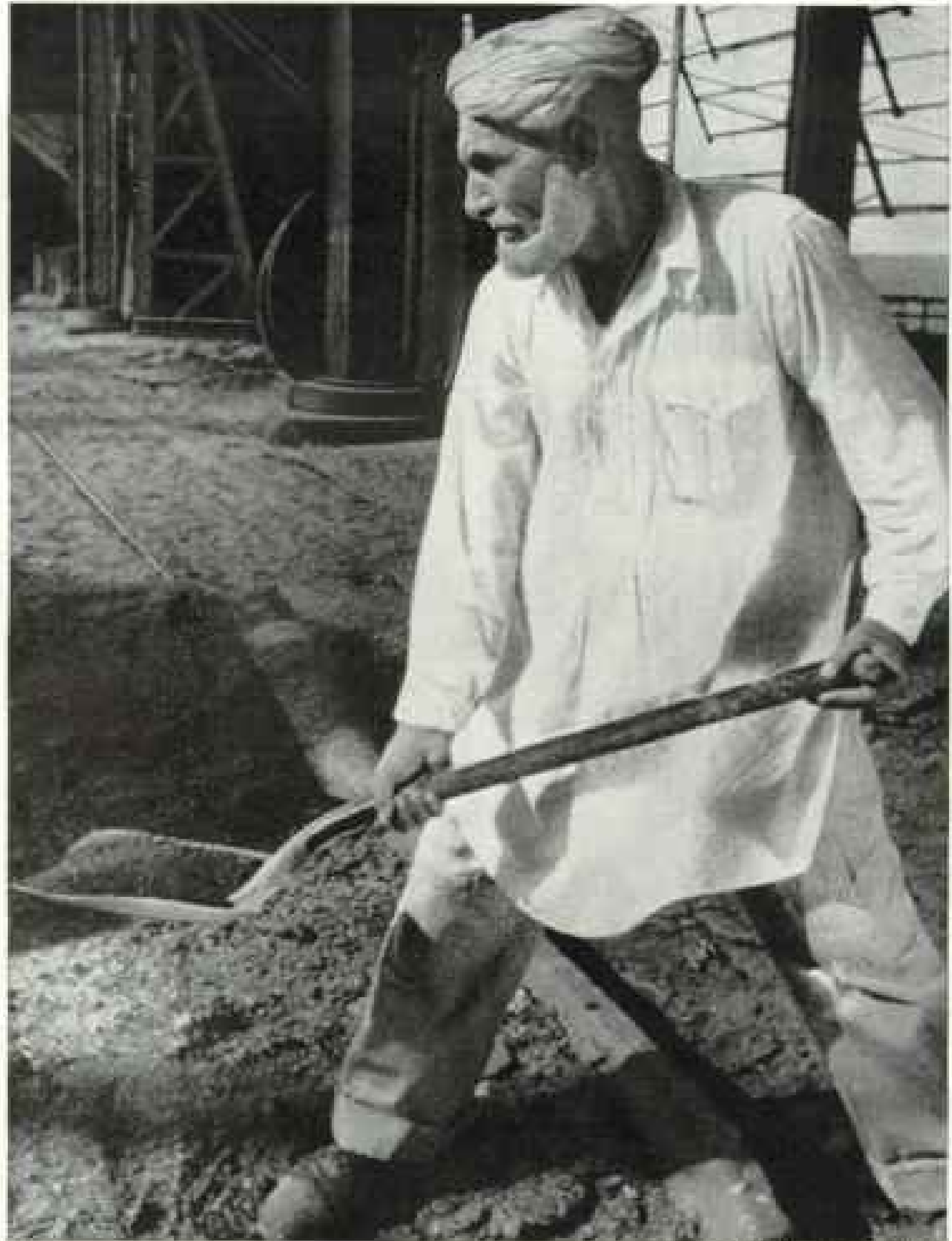
The market for Mugh cooks boomed, and under the pressure of American demand their salary scale almost doubled in the last two years of the war. It was still not very high by our standards. One American colonel in New Delhi once boasted to me that his cook had been able to produce a new kind of dessert on 85 consecutive nights.

"And his pay," the colonel added, "is only 60 rupees, or about \$20 a month."

Such wages would seem fabulous, however, to the manganese miners of the Central Provinces, whose services were even more important to the United States Army than those of the Mugh cooks. For pay of 15 to 25 cents a day, they loaded entire hills into freight cars for shipment to America by way of the ports of the Malabar Coast. These hills are solid manganese ore to a depth of several hundred feet below the grass roots, and the quality of the ore is as good as, or better than, any yet discovered in the Western Hemisphere.

Indian Manganese Replaces Russian Ore

When the German invasion of Russia cut off our usual sources of high-grade manganese, the Indian mines became vitally important to



India Information Services

A Tough Old Tribesman Shovels Slag, a Job for a Strong Man

This devout Moslem from the North-West Frontier Province has made the pilgrimage to Mecca. Nevertheless, he works in harmony with Hindu fellow employees. At Jamshedpur, he and other Tata steelworkers enjoy an 8-hour day, good housing, equality of promotion, bonuses, and profit sharing (pages 511 and 519).

our steel mills, which could not make a single pound of steel for armor plate or guns without this key alloy (page 508).

Like most Indian mining, manganese production is still carried on by methods which might be regarded as primitive elsewhere, but which turn out amazing tonnages in an area with almost unlimited supplies of labor.

A hill of manganese ore usually is nibbled away by an antlike army of coolies, both men and women, who organize production teams on an informal family basis. The head of the family swings a broad mattock, which serves as both pick and shovel. His wife, and sometimes two or three children, load the loosened



Major H. Stollatz

Malabar Coast Wears the Dreamy Look of a South Sea Island Lagoon

These matting-covered wooden barges take copra and bales of coir (page 507) to the markets of Cochin. Returning, they bring cargoes of rice. Just south of this canal extend the black sand beaches of Travancore. The sand is rich in titanium, used in blending special paints and making welding rods and stainless steel (page 515).

ore into baskets or metal bowls and carry it on their heads to the railway siding nearest the terrace they have been assigned to work.

Such toil is strenuous enough, but it is by no means so exhausting as it sounds. The Indian coolie learned long ago to adjust the tempo of his work to the climate and to his own modest needs. He never hurries. In fact, he can't be hurried by any threat of penalties or promise of rewards, and the wise foreman never tries.

When a miner feels tired, he squats on his haunches and chews a wad of lime-smeared betel leaf until he feels like picking up the mattock again. His wife, laden with a few pounds of ore, ambles with slow grace toward the empty freight cars, and all the urgencies of warfare—if she had ever heard of them—could not speed up her gait by a single step.

Such Oriental placidity may provoke an American, eager to step up production, but the Indian survives and flourishes in a climate which has broken down many an American in a few months' time.

At least in wartime, offers of higher pay were received by many Indian laborers with polite indifference. The village shops were almost bare of goods, and, even if his wages were doubled or trebled, the average peasant could buy little except the few pounds of rice and the three or four yards of cotton cloth which meet his basic needs.

High Pay Slows Down Work

All kinds of paper money are still viewed with widespread distrust. The typical peasant prefers to hoard his savings in the form of silver bangles or anklets for his wife. Following the outbreak of war silver became increasingly scarce; consequently, a coolie whose wages were doubled might simply decide to work three days a week instead of six.

In the face of this attitude, the openhanded generosity of the American GI had some queer results. In the summer of 1944 a British officer visited a United States Army post in Assam, to suggest tactfully to the commanding general that he might ask his troops to be a little more careful with their cash. Trailing behind the Englishman was a grinning, dark-skinned youngster of about twelve, dressed in the loincloth and ragged turban of the Untouchable, lowest and usually the poorest group in the caste system. In his hands the boy carried a can of shoe polish and a brush.

"This child has been polishing shoes for the American enlisted men," the British officer explained. "Every time he finishes a pair, the soldier tosses him a coin—apparently any coin that's handy. Last month he collected

285 rupees, which is more than most grown men of his caste can earn in an entire year.

"As a result, his whole family has retired. His father, mother, two brothers, a sister, and heaven knows how many cousins and in-laws have quit their jobs and are living comfortably on the earnings of this one boy. And that is serious, because most of these people were coal miners, and both the American and British Armies desperately need more coal to run the locomotives on our supply lines."

Within the hour, the shoeshine boy was placed on a regular and much reduced wage, strict orders were issued against indiscriminate tipping by American troops in that locality, and the youngster's family was headed back for the coal mines.

In addition to such basic war materials as manganese and burlap, dozens of India's other peacetime products found unexpected war uses.

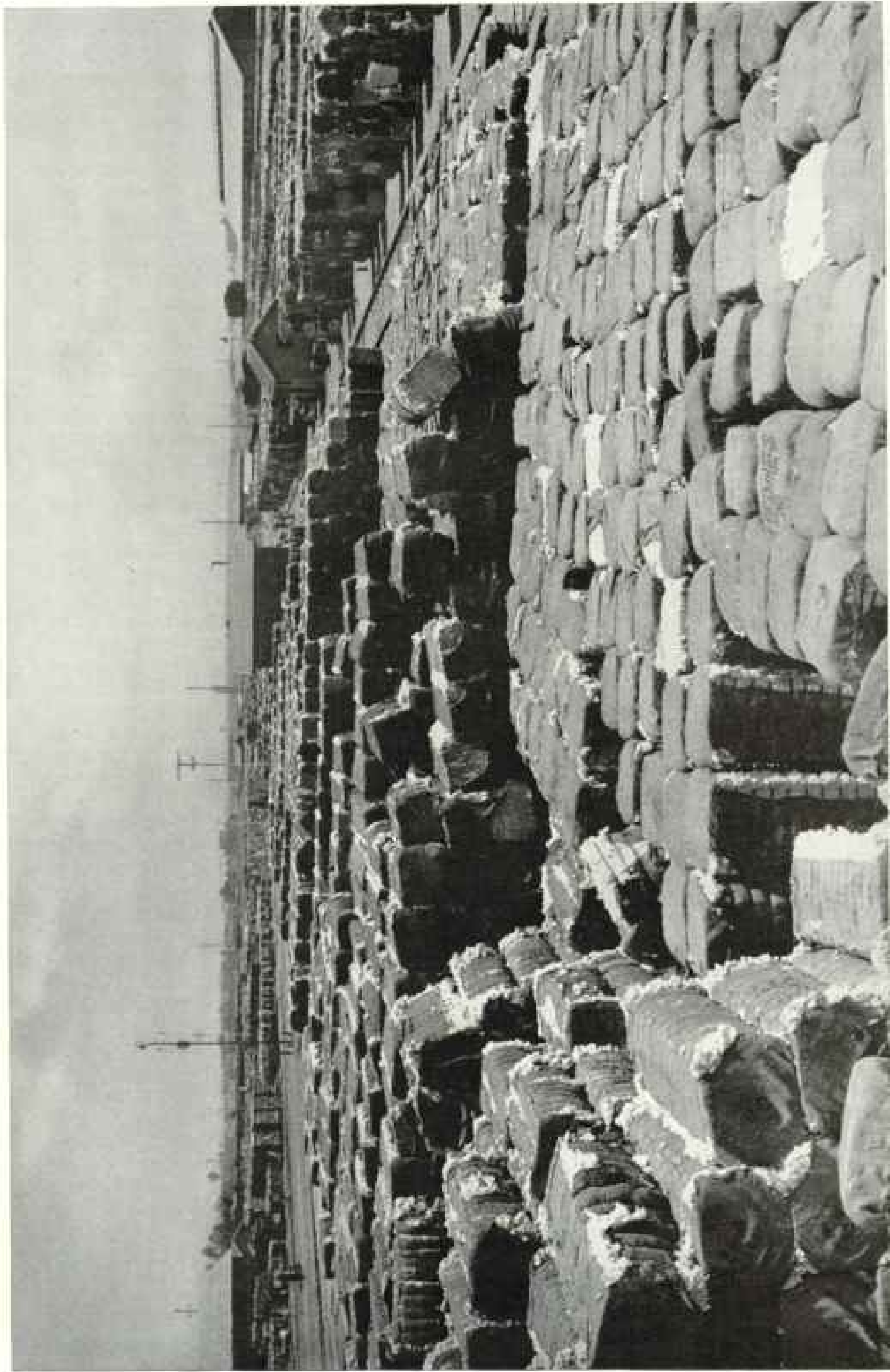
For example, coir rope woven from coconut fibers was used in large quantities to make mats and buffers, or "fenders," to protect landing craft and lighters from bumping against the sides of larger vessels while loading (507).

Buffalo hides were dispatched to the United States to be used chiefly as rawhide products in industry. Goatskins from the tanneries of Madras were used for flyers' jackets and for gloves. Peanut and coconut oils, both produced in south and central India on a large scale, provided the raw material for glycerin, a basic ingredient in certain kinds of explosives (page 509).

The Trivandrum coast,* near the southern tip of India, shelves off into many miles of sandy, palm-shaded beach. Unlike most beaches, however, this one is composed of black sand, a sand containing some of the less well-known elements usually described as "rare earths." Associated with them here is titanium, a mineral valuable for certain types of paint needed for special uses, particularly on seagoing vessels.

The mining of this black sand is perhaps the simplest operation in the whole field of mineral production, and in many cases it is carried on not by miners but by sailors. A *dhow*, or small native sailing craft, is simply dragged up to the beach, and the crew loads it with the sand alongside, using shovels, buckets, large clamshells, or even their bare hands. The cargo is reloaded onto ocean freighters, either lying at anchor a few miles off the shallow coast or at the port of Cochin a few days' sail to the north.

* See Map of India and Burma, supplement to this issue of the NATIONAL GEOGRAPHIC MAGAZINE, and Map of the Indian Ocean, March, 1941.



H. H. H. H.

Cotton Bales Once Destined for Japan Went into War Material for the United Nations

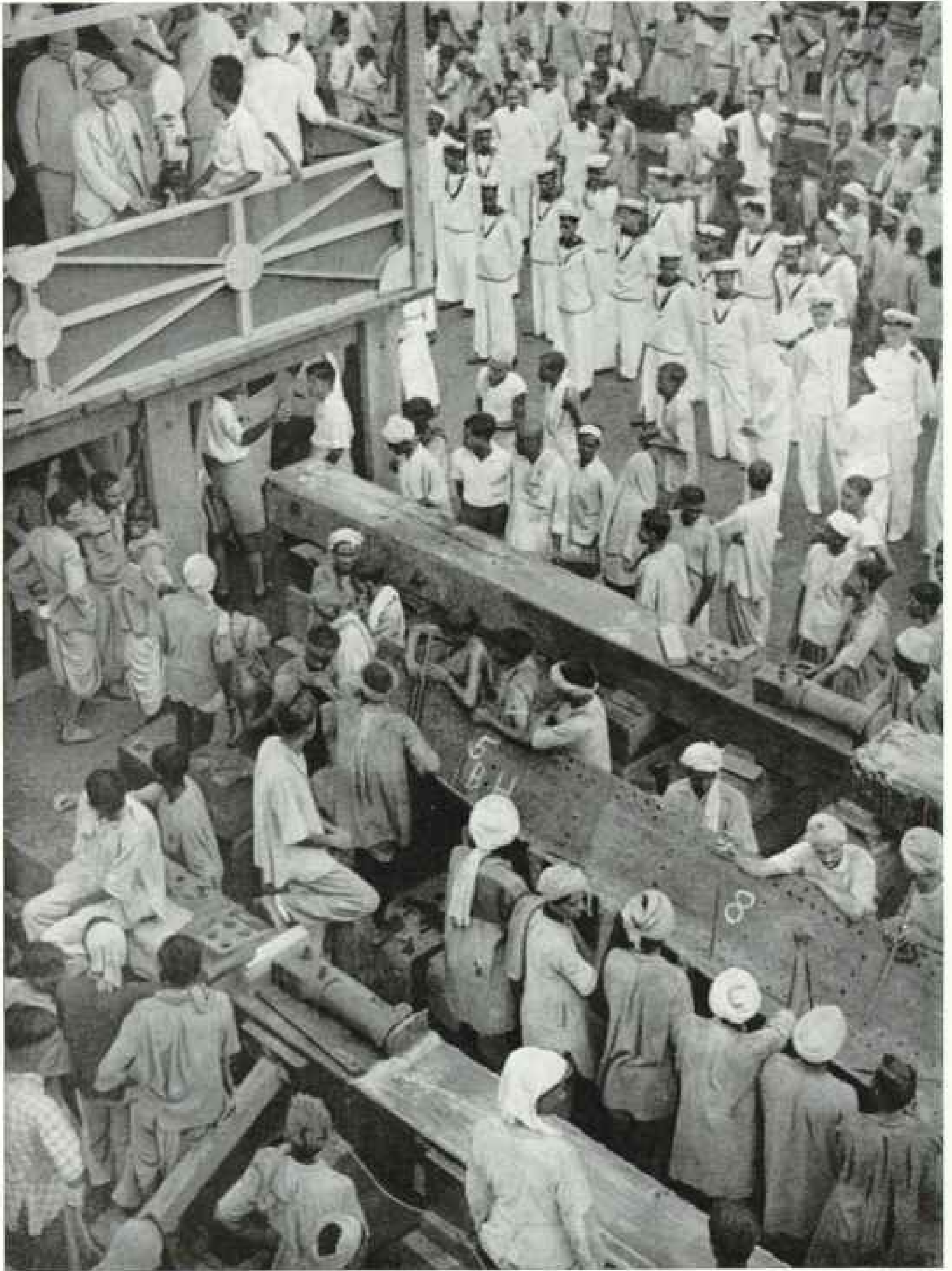
During the war India wove much of its 7,000,000-bale cotton crop into uniforms, tents, web belts, and numerous other military supplies. Normally, nearly half is available for export. Much of the crop is grown in Black Earth districts of western India, with large processing centers at Bombay and Ahmedabad.



U. S. Army Signal Corps. (Methel)

Supervised by an American, Indian Workmen Give Airplane Belly Tanks a Final Checkup in Bangalore

The Hindustan Aircraft Company made these supplementary fuel tanks for Allied planes in the China-Burma-India theater. When the extra gas was used up, the tanks were dropped. Early in the war, fighter planes were made in this plant; later it became a repair center (page 519).



British Official

Calcutta Launches Another Unit of the Royal Indian Navy

During the war the Royal Indian Navy grew 20-fold. It patrolled the coast, hunted submarines, swept mines, and convoyed ships of the United Nations. Here H.M.L.S. *Travancore*, first large seagoing vessel built in Indian yards, has gone down the greased ways. The Maharaja of Travancore bore the entire cost.

During the war, this traffic became a lucrative source of revenue to the native State of Travancore, which has a virtual monopoly of the mineral-bearing black sand.

Cashew Nuts Became a War Material

This same State, one of the most densely populated and progressive of the native kingdoms, also developed a new war industry from the cashew nut. The nut itself won a considerable market in both America and Europe more than a decade ago, since it is one of the tastiest of Oriental foods. Only recently, however, it was found that its shell contains an oil which can be made into an excellent insulating film for induction coils and other delicate electrical parts in marine and aircraft engines.

Pressing out this oil between hot steel plates is now a thriving little industry along the Malabar Coast. (The machinery used is completely modern, but most of the workmen are still members of the *tohi* caste, which has a traditional monopoly on the pressing of oil from peanuts, castor beans, and other oil-seeds.) It also is a moderately hazardous industry, since the cashew oil contains a corrosive substance which raises painful welts wherever it touches the skin, somewhat like the rash produced by poison ivy.

Several times barrels of cashew nutshell oil, loaded on the decks of steamers bound for America, became overheated under the tropical sun and exploded, showering the vessel with a sticky and highly unpleasant mess which took days to clean up.

Travancore, walled off from the rest of India by the formidable mountain barrier of the Western Ghats, was never conquered either by the Mogul invaders or by the British, although it of course recognizes the suzerainty of the British Raj. It is still ruled by a Hindu dynasty which traces its ancestry in an unbroken line back to the period where history merges with legend.

Although the Maharaja is regarded as the viceroy of Vishnu, the great Hindu deity, and his authority is almost celestial, he rules as a constitutional monarch. He has proved an enlightened and efficient one, with the result that nearly half of the male population and many of the women can read and write—a literacy record which is far better than that of British India.

Here, too, the women enjoy a freedom and scope of opportunity which is unknown in most of the rest of the peninsula. They go unveiled in the streets, attend an excellent college of their own, and practice law and medicine on equal terms with the men.

The flood of raw materials which India poured across the seas to the war plants of England and the United States made up only a small part of her contribution to the Allied cause. The major share of her resources was used within her own borders and to a considerable extent by American troops. By June 30, 1945, India had provided under Reverse Lend-Lease nearly \$640,000,000 worth of food, clothing, munitions, equipment, construction, and various types of services to the United States forces fighting in India and Burma.

Eggs in the "Grocery Run"

The supplies included almost every conceivable item from mosquito nets and sun helmets to barracks and airfields. The textile factories of Bombay, for example, turned out many thousands of parachutes, which made it possible for Gen. Joseph W. Stilwell to supply his battalions fighting in the Burmese jungle largely by air. The transport crews on this "grocery run," incidentally, developed their delivery service to such an art that they even parachuted fresh eggs, packed in rice hulls and straw, to front-line units with a breakage rate of less than two percent.

Many types of light weapons, such as grenades and Bren guns, were fabricated by the metalworking plants in the Calcutta area, and some of the big railway shops successfully produced armored vehicles.

At Bangalore, in the wealthy native State of Mysore, the Hindustan Aircraft Company built fighter planes early in the war and later used its large modern factory as a repair center for both British and American military aircraft. Although it was designed and built under the direction of an American, William D. Pawley, it was staffed almost entirely by Indian workmen and technicians, whose skill has been warmly commended by our Air Force commanders (page 517).

The heart of India's war industry, however, was the huge establishment of the Tata Iron and Steel Company at Jamshedpur, 140 miles west of Calcutta. Here, in the largest single steelworks in the British Empire, more than a million and a half tons of pig iron poured out of the blast furnaces every year to feed hundreds of war factories. Although American and European technicians helped establish the steel plant in 1911, today nearly all the top management, as well as the labor force, is Indian (pages 511, 513).

Tata employees are the best paid and best housed industrial workers in the country, and many families register their children at birth for Tata jobs, just as a baby in England might



Associated Press

India Made Shell and Fuse Gauges, Some Capable of Measuring 1/5000th of an Inch

Inspectors gather in a railroad toolroom. Most of India's rail workshops were converted to the war effort. On one road serving the Burma front, Americans taught native crews to double the tonnage carried (page 522).

be enrolled for admission into an exclusive school ten years later.

In this community the shackles of the caste system have been broken more successfully than anywhere else in India. Brahmans, Untouchables, Mohammedans, Buddhists, and Christians work together in the same rolling mills, eat in the same restaurants, play games on the same sports field, and often develop a democratic spirit of teamwork which is quite new in this tradition-ridden land.

Caste and Drinking Fountains

Kish Naoroji, husky, hard-driving vice president, who now represents the firm in the United States and who handled Tata's labor problems for many years, described how it was done:

"We wanted to install a drinking-fountain system to provide fresh, cool water throughout the plant," he said, "but everybody told us it was impossible. We were warned that bad feeling would be aroused if we asked men of all different castes and races and religions to drink out of the same fountains.

"It was a risky business, since nobody had ever dreamed of attempting such a thing before, but we went ahead, anyhow. The first

day the fountains were put into operation, I walked around the plant to see what would happen.

"Sure enough, within an hour a Brahman from the blooming mill department ran up to me and complained with a good deal of indignation that a low-caste Hindu had been using the nearest fountain, so that no Brahman could drink there without spiritual pollution.

"I sympathized with him until he calmed down a little, and then I told him: 'Just outside there is an ordinary water tap. The water from that tap may not be quite fresh, and it certainly isn't cold, but you can be absolutely sure that it will always be spiritually undefiled. No low-caste workmen will ever drink there, because they like to get good cold water from the fountain. So long as you are worried about caste-purity, you can drink out of the tap with complete safety.'"

"The Brahman grumbled a little, but as soon as he thought I wasn't looking he sneaked off to the new fountain. We've never had any caste trouble since. Caste and steelmaking just don't mix" (page 503).

Naoroji had an advantage in handling such problems, because, like many of the top management group at Tata's, he is neither Hindu



Indian Official

Carrying Heavy Bobbins Is Made Easier by Using One as an Elbow Support

Much of the weight is thus borne on the hip. About two-thirds of India's huge cotton-milling industry is concentrated around Bombay. In its nearly 400 mills, the country operates some 10 million spindles and 200,000 looms.

nor Mohammedan, but a Parsi. Some 1,200 years ago, when Islam swept throughout the Middle East, a small group of Parsis migrated from Persia to India rather than give up their religion, derived from the ancient sun-worshipping Zoroastrian creed. Many of them settled eventually around Bombay, which is still the center of the Parsi community.

Parsis in Industry and Poker

Although there are only about 115,000 Parsis in all India—an infinitesimal percent of the total population, now estimated at nearly 400,000,000—they have risen to a dominant place in the country's industrial and commercial life.

Perhaps their greatest assets are tolerance and common sense, which make it easy for them to deal on friendly terms with people of all religions and nationalities, including the British and Americans. They are famed among the American community, incidentally, as the best poker players in India.

It was a Parsi, Jamshedji N. Tata, who re-discovered an enormous deposit of rich ore, containing 60 to 65 percent iron, in the Central Provinces, which had been worked by forgotten ironmasters centuries ago. It was perhaps

from this bed that the ore came for the wrought-iron pillar, thick as a man's body, which stands among the ruins of a Hindu temple close to Delhi. In spite of uncounted years of exposure to rain and sun, it has never developed a trace of rust.

Later, deposits were found in the Gorumahisani area, in the State of Mayurbhanj, and at Noamundi, in Singhbhum district. These two deposits are now being worked.

Jamshedji and the other members of his brilliant family raised \$10,000,000 from Indian investors and obtained the help of American steel men in putting up the first furnaces and training native workmen to operate the strange equipment. Some foreign workmen were also recruited, from England, Germany, and other European countries. Today the Tata Company has its own technical school, where able Indian youths can learn metallurgy, chemistry, and the related sciences.

Tata's main steelworks have developed subsidiary industries, such as agricultural implements, tin plate, steel wire, and wagon building. Tata also controls large hydroelectric works near Bombay, a heavy-chemicals plant, a number of cotton textile mills, copra oil refineries, and two airlines. There was a war

research laboratory at the main steelworks.

Steel from the Tata mills, summer-weight uniforms from the Bombay textile factories, space in hotels, and almost every conceivable kind of equipment and accommodation were turned over to the American troops without stint. One American request, however, almost provoked an international incident.

Sacred Pasture for Holy Cows

A young American captain was searching desperately for warehouse space in the Calcutta area to provide storage for the growing stream of weapons and munitions flowing into that port. A few miles outside the city he discovered a field which looked like an ideal warehouse site. Except for a small peak-roofed Hindu temple and a few grazing cows, it was entirely vacant. He promptly filed a requisition and got ready to move in a construction crew.

The next morning a storm broke around the captain's ears. Delegations of gesticulating Hindus crowded into Army headquarters. Important Hindu industrialists called to protest at the American Consulate General, and the native-language newspapers printed columns of indignant editorials.

At the captain's office it took some time for the bewildered Americans to quiet down their angry guests enough to find out what was really the matter. Then, after a long conversation in Bengali, the interpreter reported:

"You simply can't take that pasture," he told the captain. "It is sacred. For many years it has been a home for old cows. Those cows are holy animals, and they cannot be moved without giving offense to all Hindus."

The captain apologized handsomely to everyone concerned and went off to look for another—and nonsacred—warehouse site.

Such incidents, however, are rare. On the whole, the Americans, both military and civilian, managed to get along on excellent terms with their Indian hosts. The process, of course, involved a good many adjustments on both sides. The Army commissary, for instance, learned that when it slaughtered cattle, the butchering had to be done in an isolated spot and usually at night, to avoid offending any Hindu; and most soldiers soon knew better than to ask a Mohammedan cook to fry bacon.

The Indians, on their side, learned to jump with a good deal more than their normal agility when a jeep came down the road, and they usually were tolerant when an American unwittingly broke one of the caste rules.

One reason for the Indian's friendliness

lay, perhaps, in the fact that he learned many useful things from his American visitors. On the Bengal and Assam Railway, for example, a battalion of American transportation specialists taught native crews the most modern methods of railway operation, and as a result the tonnage carried more than doubled.

Technical representatives from the United States factories showed Indian student mechanics how to assemble and repair all kinds of machinery, from a jeep to a four-motored air transport. Throughout the country, American industrial engineers and their British colleagues demonstrated new techniques and improved equipment in hundreds of little machine shops and factories.

Under the stimulus of military demand, Indian industry made more major strides during the war years than it could reasonably have expected in twenty years of peace. It is true that many nonessential consumers' goods industries closed down because of the shortage of materials and spare parts; but wartime restrictions are gradually being relaxed.

India's demand for industrial goods is almost bottomless, and there is little prospect that the new skills and new machinery acquired for war purposes will go to waste.

A typical example is a little brick building with a tall chimney on the outskirts of Lahore.* It looks strange among the mud huts of the peasants and the delicate marble balustrades of the famous Shalimar Gardens near by, but the people of Lahore are as proud of this modest factory as they are of any relic of the past. It is the first dry-ice plant to be erected in India, and it was built entirely by Indian technicians and with Indian capital.

The machinery includes a German Diesel motor, odds and ends of secondhand pipe, and homemade insulation—but it works. So long as the war lasted, all of its output went to the American, British, and Indian Armies, to preserve meats and other perishable foods during shipment to the troops in Burma. When the fighting was over, however, it could expect to find a ready market for its dry ice in a land where refrigeration often proves to be a life-saver.

Together with numerous other war-born industries, such as the cashew nutshell oil plants in Travancore, to cite one instance, it may help provide a gradually rising standard of living for India's hungry millions in the postwar years.†

* See "Through the Heart of Hindustan," by Maynard Owen Williams, in the NATIONAL GEOGRAPHIC MAGAZINE, November, 1921.

† For additional articles on India, consult the Cumulative Index to THE GEOGRAPHIC, 1899-1945.

The Maine American and the American Lobster

BY JOHN D. LUCAS

With Illustrations by Staff Photographer John E. Fletcher

WATER-FRONT watchmen on Commercial Street, Portland, Maine, looked me over as I waited for the lobstermen to arrive.

"Hi," I said, as a car pulled up. "I thought you would never get here. I'm the man who is going lobster fishing with you."

The high rubber boots of the two men in the car thudded on the pavement. The younger fisherman, buttoning his yellow oilskins about his wiry body, slapped his canvas gloves under his arm and yanked his worn gray hat more securely on his head to resist the brisk wind.

The elder man, who was the skipper, scrutinized me searchingly. My voice sounded muffled by the voluminous clothing which made my breathing difficult.

Lobster Catchers Wary of Landlubbers

The skipper unfastened the lock on the gate leading to his lobster dock.

"Kind of choppy out there, Chubby," he said at last.

"Chubby?" I weigh only 130. It must be the extra clothes.

"Why the lock precaution? Afraid of sabotage?" I asked the skipper jokingly.

"Yes and no," he replied, stopping at a huge pile of reserve lobster pots that were drying in the sunlight. "Saboteurs could have done a lot of damage here during the war. These lath pots cost a lot of money, too."

"Then why not put them in some sheltered place?" I asked.

"Worms," he replied. "Like evil, they work best in dark, dank places away from the sun. They die when out of the water."

The sunshine helps kill the worms, as well as bacteria and fungus growth.

The "worms," I found out later, are the shipworm (*Teredo*), which is not a worm but a marine clam, or one of the species of small boring crustaceans, troublesome during certain seasons.

"Here's a pot over here that has been destroyed," the skipper said, pointing to a 30-inch-long and 26-inch-wide semicylindrical object resembling a badly riddled beehive.

The leather straps that hinge the four laths running the entire length near the top of the pot forming the door had disappeared. For some unknown reason the single wooden button in the center, on the outside, which is

used to fasten the door, remained untouched.

The two funnel-like openings, one at each end of the pot, through which the lobster enters, showed not a trace of the coarse twine mesh used to prevent the lobster from escaping. These funnels, about 6 inches in diameter, extend some 12 inches almost into the center of the pot. Obliquely placed, they form an inclined plane which the lobsters must climb in their search for bait.

Once a lobster reaches his objective, the bait, the fisherman's objective, the lobster, is realized (pages 527, 533).

"The only part of this trap we can salvage," said the skipper, pointing to the center of the bottom of the trap, "is that 10-inch iron spearhead we fasten our bait on (page 531). We had better take these three bricks with us, too. We fasten them on the bottom of the pot, on the inside, to furnish weight enough to hold the pot at the bottom."

Off for the Lobster Grounds

"Time to shove off" ended our discussion about lobster pots.

We approached the gasoline-powered lobster smack as it rocked easily in about one fathom of water at low tide. It took only a few minutes for the men to check their four lard tubs filled with bait—redfish (rosefish) carcasses, from which the filets had been removed. Slatted pots were inspected for loose laths to prevent the lobsters from escaping.

The converted automobile motor's damp spark plugs were wiped dry of the penetrating early-morning wet wind, and the crankcase was filled with oil. The gas tank read "full."

Bushel baskets for the lobsters formed a semicircle in the center of the boat. On many boats a salt-water well is used.

I clambered down an old iron ladder, embedded in the rotting wood of the sagging wharf, into the boat. The lines were cast off, and we got under way.

The noise of the sputtering cold engine was intermingled with the screeches of disgust from the sea gulls as they flew out of our way, letting us head for the open harbor.

The clouds shifted, and the sun streamed down. An intoxicating clear breeze engulfed us as we left the pier behind.

Open blue waters surrounded us. Sea gulls now floated lazily above us, some stealing a ride on the stern.



Two Comely Girls Select Fine Lobsters Just Out of the Cooker

Daily this Rockland plant prepares for shucking from 300 to 500 pounds. The crustaceans are placed alive in an airtight box and cooked for 20 minutes in live steam. Exposure to the heat turns them from greenish brown to orange red. From the steam chamber they go to the shucking tables where men remove the meat (p. 533).

We passed Spring Point Ledge Lighthouse, half-covered with huge boulders to resist the buffeting waves. The immaculate white top with center rail looked prim as a penguin.

At the stern, the skipper, in worn yellow oilskins, shaded his eyes from the sun as he looked to the south toward Portland Head Lighthouse, the rocky coast of Cape Elizabeth, and the open sea which for 50 miles out yields lobsters.

"Looks like the storm has snarled up our pots that we put out two weeks ago," said the skipper to his son, the pilot. "There ought to be several sets around here." (Ordinarily, the pots are hauled daily, weather permitting.)

Landlubber Spots the First Set

I wiped the fine salt spray from my glasses as I unsteadily rose to my feet, then peered into the endless expanse of ocean.

"There it is!" I excitedly shouted, pointing to a bobbing object to port.

"Looks like it," replied the skipper. "It has our red and white marking all right."

The pilot throttled the engine. The skipper grasped a stick about four feet long with a hook on one end, leaned over the wooden bulwark, and hooked the cedar buoy. He hauled it inboard and fastened the trawl rope to the niggerhead on the winch.

"Better get into the house forward out of the way," he said to me. "We want to haul the set in."

The first pot was pulled in from the rocky bottom 50 feet below. I leaned forward anxiously to see the contents. No luck. Seaweed and a few crabs were removed. Out of the ten pots in the set, only three lobsters!

The wind was chilly now and slapped about us as we raced on into the choppy seas that were curling about the boat. Off Portland Head Lighthouse was the next stop. The skipper shouted to slow down as he sighted another buoy.

"This ought to be a good set with big lobsters. It looks like the storm didn't snarl this up. We set the trawl across the tide."

"Why across the tide?"

"So the lobster can smell the bait."

When traps are set on a trawl placed across the tide (that is, parallel to shore), the catch is greater than when trawl is set in the direction of the current.

It is generally known that the lobster is both carnivorous and omnivorous, and the way it feeds is an indication of what it eats. The lobster passes much time backed in under a rock, with its claws sticking out to ward off enemies and to grab any passing fish or lobster larvae.

The lobster pots placed across the tide gather food of all kinds, such as scups and skates, dead or alive, and clams and other mollusks which are swept in by the tide. Here is an ideal picnic ground for the lobster, for, although he is known to be a scavenger, he seems to prefer fresh food to stale. The task of procuring food is simplified.

Emerging from the dark crevice in the rocks, the lobster moves nimbly about on the tips of its legs, on the bottom of the ocean. The long sensitive "feelers," or antennae, continuously sweep back and forth to sense the presence of enemies or food.

When alarmed, the lobster swims rapidly backward by flexing its muscular tail. When the coast is clear, it exhibits its carnivorous traits by savagely pouncing upon helpless fish or other shellfish prey.

The lobster grabs the bait with its larger, or crushing claw, frequently the right (pages 540, 543). Then with the smaller tearing claw the fish or shellfish is torn to pieces and propelled toward the mouth with the forelegs, which are equipped with pincers. At the mouth, forklike fingers break up the food, and it is then eaten. Lobsters will eat nearly everything that lives in the ocean, even small quantities of algae and common eelgrass.

Angry waves split themselves on the rocky shore line ahead. I watched, fascinated, as I huddled in the house forward and saw these rugged lobstermen pit their wits against the seas. I pulled on the heavy overcoat the pilot handed me and thanked him gratefully.

I watched the men as we approached our rocking cedar buoy. The motor was again throttled, and we swung off to leeward. The relief from the violent wind was like being immersed in warm water in my own bathtub.

Up came the second string of pots. The buoy was again snagged by the skipper, the line fastened to the winch.

Pulling in a Lobster Pot

As the first pot broke water, the powerful hand of the pilot, wrapped in a water-soaked canvas glove, went over the side and grasped the edge of the waterlogged 50-pound oaken cylinder. With a mighty swish he swung it to the gunwale. His arm brushed away the muck and sea growth that covered the door.

The skipper grasped the wooden button in the center of the lattice door. With a jerk he opened it, as one would open a canary cage turned on its side, reached in through seaweed, and extracted a lobster that was feeding on the bait fastened to the spearhead almost in the center of the pot. He threw the lobster into a bushel basket at his feet.

Besides the lobster, the pot had trapped other creatures. Some of the larger crabs were saved for bait. The sculpins, other fish, and whelks were thrown overboard.

While the pilot hauled the next pot, the skipper speedily baited the emptied trap. His ungloved hand tore loose a bunch of partly frozen redfish carcasses from the lard tub. With a flashing 6-inch needle he dexterously pierced a squirming crab. He tied this bait on the barb inside the pot, fastened the twine on the wooden knob, and closed the door.

The baited pot was pulled to the platform about a foot above the deck to starboard. The other pots continued to be hauled by the pilot and baited by the skipper until the ten pots of the string were in.

I noticed that some of the laths on the lobster pots were loosened and asked the skipper the reason.

"Fishing is about 80 feet deep, and it's rocky down there."

Lobster fishing is not restricted to any particular coastal depth. Lobsters are caught in 15 feet as well as 100 feet of water, on hard gravel, sandy, and rocky bottoms around ledges of the Maine coastline.

Lobsters prefer rocky bottoms, though they also bury themselves in hard mud or in mud and sand. Most of the shellfish are caught on the grounds which are washed by fresh tide water, and these are usually hard or rocky bottoms because of the tidal abrasion.

The muddy bottoms of the Maine coast are almost always found some distance from the sea in bays and inlets which contain a certain amount of fresh water from inshore or surface drainage. The lobster will not, or cannot, live in areas greatly diluted by fresh water.

During the spring flood season hundreds of pounds of lobsters are lost because their ponds become diluted with fresh water.

I asked the skipper about a large dull-brown lobster—why it moved so sluggishly in the basket and if something was wrong with it.

"Nope. He's getting ready to molt," he said, picking up the lobster. "Molting usually comes between June and September, but soft-shelled lobsters may be trapped any time of the year. They don't trap well, either. See the deep-red tints at the joints and the hollowness of the shell? That's a sure sign of molting."

The Reason for Molting

The lobster does not grow by molting, but molts or sheds because it has grown. Molting begins from the second to the fifth day after hatching and continues at intervals throughout life, or at least as long as there

is growth. Lobsters shed from 14 to 17 times the first year. Growth of the small lobster is about 20 percent at each molt and the larger lobster about 9 percent (pages 536, 537).

Lobsters can be caught the year round in Maine, except for a few spots restricted by local conditions. The time of shedding varies with different parts of the coast. It is about four to six weeks earlier off Portland than off the extreme eastern Maine coast.

Immediately after molting the animal is soft-shelled. In a few days it is paper-shelled and, in a week or two, rubber-shelled. A little harder condition of the shell is known as "buckle shell"; and in about six or eight weeks, depending upon the size, the lobster is again a hard-shelled lobster.

Lobsters fight among themselves continually, breaking off claws and other appendages. This creates a handicap in procuring their food as well as protecting themselves. Therefore, shedding or molting has a double effect.

The time required to grow new appendages has not been set, but it is believed that several sheddings of the shell are necessary before the claw reaches full size again.

Love Life of a Lobster

Male lobsters mate freely with soft-shelled females within a few hours after the females have molted. However, mating of lobsters can occur at least as late as twelve days after the female molts.

The female is relatively passive or helpless for a few hours after molting, and mating will occur if the right-sized male is present.

Among all of Nature's intricate ways for reproduction of its creatures, few are so exacting, so minutely perfect in detail and coordination as that of the lobster.

The first pair of male abdominal appendages which are inserted into the annulus of the female ordinarily lie horizontal and point upward. They are elevated to about a right angle when a locking device prevents them from swinging backward. The fifth pereopod is projected several inches across and beyond the body.

The legs form support for the first appendages, lifting them and making them rigid enough to be inserted. Only part of the sperm supply is used by the female in fertilizing one batch of eggs.

Since the seminal receptacle of the female has a gelatinous solution which hardens and makes it impossible for impregnation to happen, the female not fertilized within a few days of molting remains unfertilized until the next molting.



Many Heads for Lobster Pots Are Knitted by Hand

Although commercial nets are available, old-timers still like to make their own. They use strong cord and either a homemade or plastic shuttle. Completed, with all the knots cunningly tied, the fabric is immersed in a waterproofing liquid (page 533).

Shortly after molting, the lobster's body increases in size, partly through absorption of water. This expansion should be distinguished from the change that has taken place because of cellular growth, primary cause of the molt. After the old, rigid shell is discarded, the soft, flexible new shell growing under it is easily distended.

The men were busy the next 15 minutes in hauling all the pots which were spread over a radius of 700 feet. There are 14 fathoms between pots, and the pots are fastened to a single trawl line with short lines, or "gang-ings," resembling somewhat the teeth of a rake. One cedar buoy about four inches in diameter and 30 inches long is placed on each end of the line (page 529).

When the ten pots were baited and the broken one replaced, the motor was accel-

erated. Then the pots, one after another like the Whip at the carnival, were tumbled into the churning ocean, followed by the buoy.

We got 20 lobsters from this set of ten pots, which was a far cry from 5,000 pounds, the capacity of this 30-by-10-foot boat.

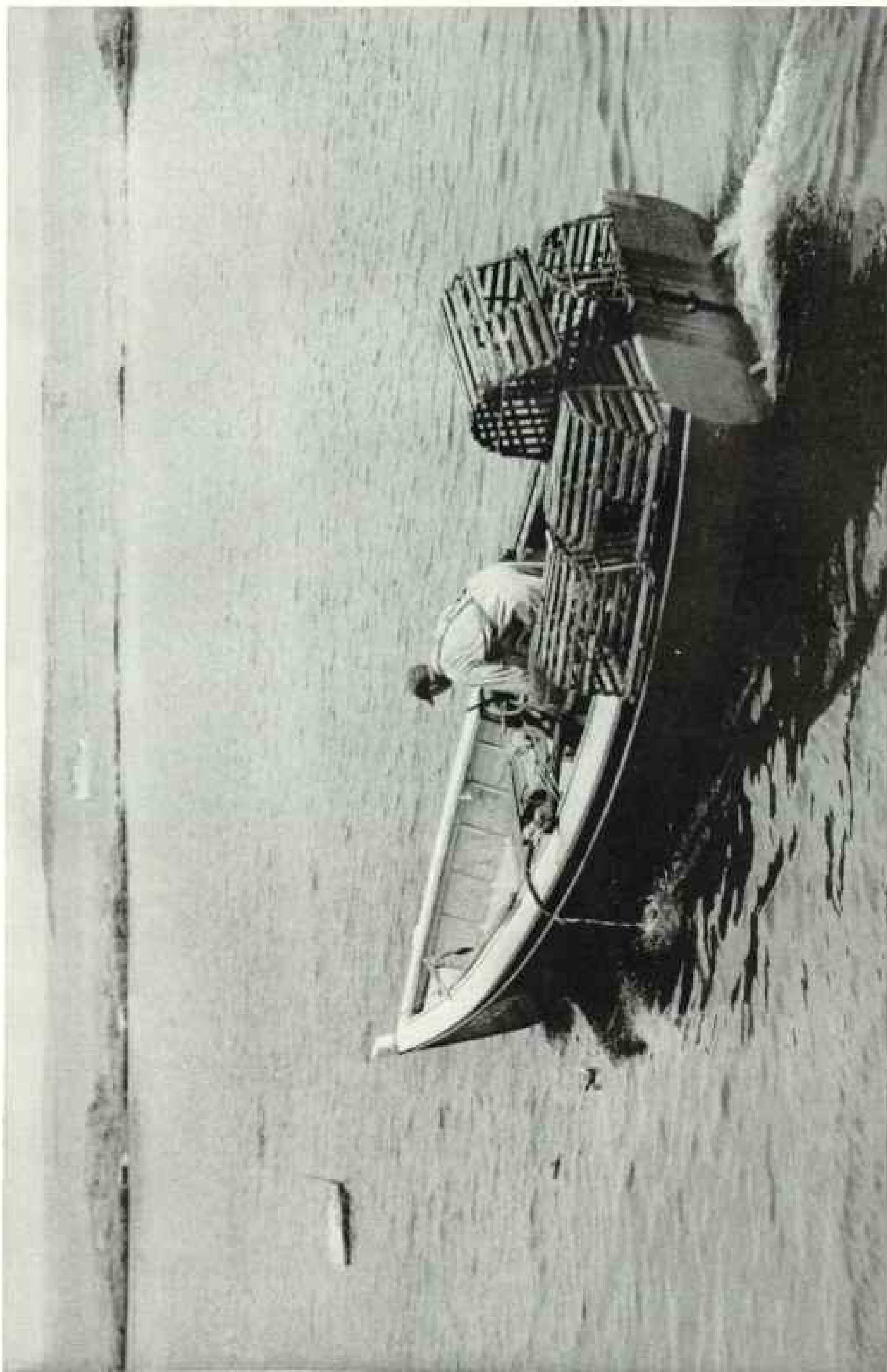
By 11:30 a.m. we had hauled in six sets, averaging one lobster a pot, or 60 lobsters in all. We still had 12 sets to haul in a radius of five miles.

I asked the skipper jokingly if a cup of hot coffee wouldn't hit the spot right now.

"Had one at breakfast."

"We don't eat again until we get in," added the pilot.

There I was, starving slowly with dozens of 10-legged, brownish-green lobsters grimacing wickedly at me from bushel baskets as if enjoying my plight. I stared at them as



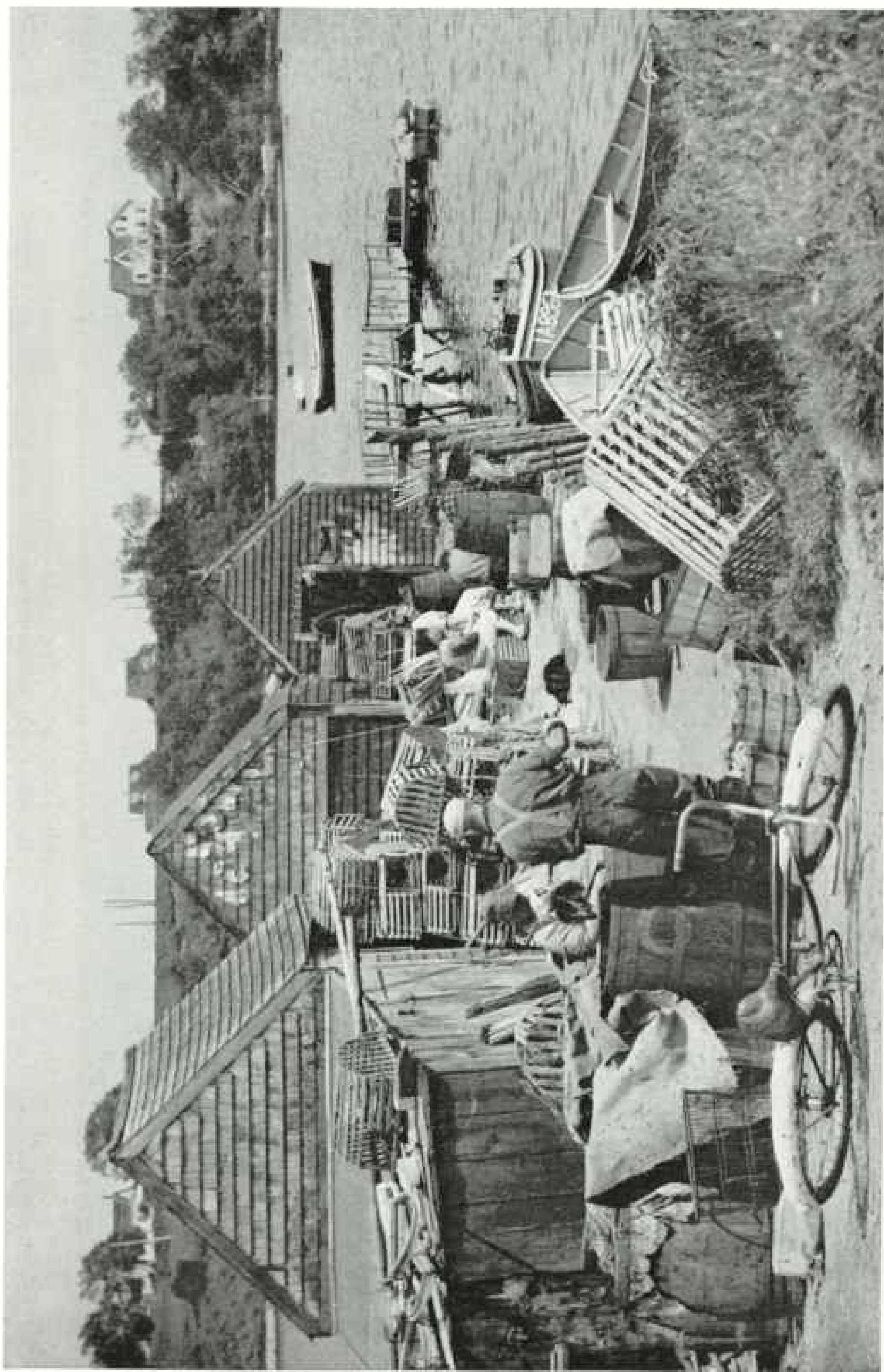
Everything Shipshape, a Bailey Island Lobsterman Starts on His Run with a Sternload of Repaired Pots

He will return to service the gear found damaged on the preceding haul. Lobster catches are made in coastal waters, 15 to 100 feet in depth, and on both smooth and rocky bottoms. In Maine, the largest catches are made from August to November, when more than nine-tenths of the year's total is taken.



Sitting on a Double-headed, or "Parlor" Trap, a Lobsterman Paints His Buoys

These floats are distinctive in color and design and therefore, like western cattle brands, they are easily identifiable by the owner. There is usually one marker for each trap, and the average fisherman sets from 150 to 200. Between trips the fisherman is kept busy repairing gear found damaged when he makes his hauls.



Typical of the Maine Coast is Bailey Island with Its Busy Lobstermen's Pier

The State has 5,000 licensed fishermen, and a thousand of them live on this and similar large coastal islands. The insular population is not dependent entirely on the lobster industry, but its major income is from that source. The men in the foreground are taking from a barrel baskets of bait to be carried aboard their boat.



Spray Hood Up on the Bow, the Lobsterman Heads Out to Sea

Even in 1944, despite storms, scarcity of equipment, loss of men to the armed services, and drydocking of boats for weeks at a time, Maine fishermen landed 14,056,795 pounds of lobster, more than double the 1939 total. A 200-pot lobsterman in that year earned about \$3,660.



Putting Bait on the Bait Spike at Sea Is Tricky Business

When the weather is stormy, the fisherman has to fight to keep his footing, and a sudden lurch may cause him to stab his hand. Redfish carcasses from which filets have been removed are threaded on the blade through the eye sockets. Some crabs are also used.



Pick Your Lobster; Have It Cooked

At the lobster pound in Pemaquid, the customer selects from a car—i.e., a floating crate—full of live crustaceans the one he fancies; then waits for it to be served with drawn butter—if that luxury is available. Maine epicures steam their lobsters over a hot fire for 10 to 30 minutes, depending upon the size. They put the live fighters upside down in a steaming kettle and then jam the lid down tight. Only a little water is used. This preserves the full flavor of the lobster.

they walked over each other; looked at their compound eyes on movable stalks; at their abdomen, thorax, legs, and similar characteristics of human beings, and thought what a shame they weren't cooked.

The lobsters moved slowly, and I asked the skipper what they were doing now.

"Breathing."

"I thought lobsters couldn't—"

"Chubby, you're just like the rest of the landlubbers. Here, I'll show you."

He reached over and pulled a lobster from a basket to the deck. In the usual position, the lobster is partly erect, long legs bent, large antennae raised, the small antennae stretched out in two lines. The eyes stick out under a big spike which acts as an eyebrow.

In this position, with the head nearly upright, most of the parts which frame the mouth, the mandibles, and jaws swing backward and forward in a chewing manner, extracting oxygen from the air through the gills located on either side of the body under the shell, or carapace. Lobsters can live out of water about two weeks, provided the gills are kept moist to allow an exchange of gases and the air is kept cool.

How Lobsters Get Oxygen Under Water

In water the chewing motion of the lobster sends a continually fresh supply of water back over the gills, the blood in the gill filaments absorbing oxygen dissolved in the water and giving off carbon dioxide.

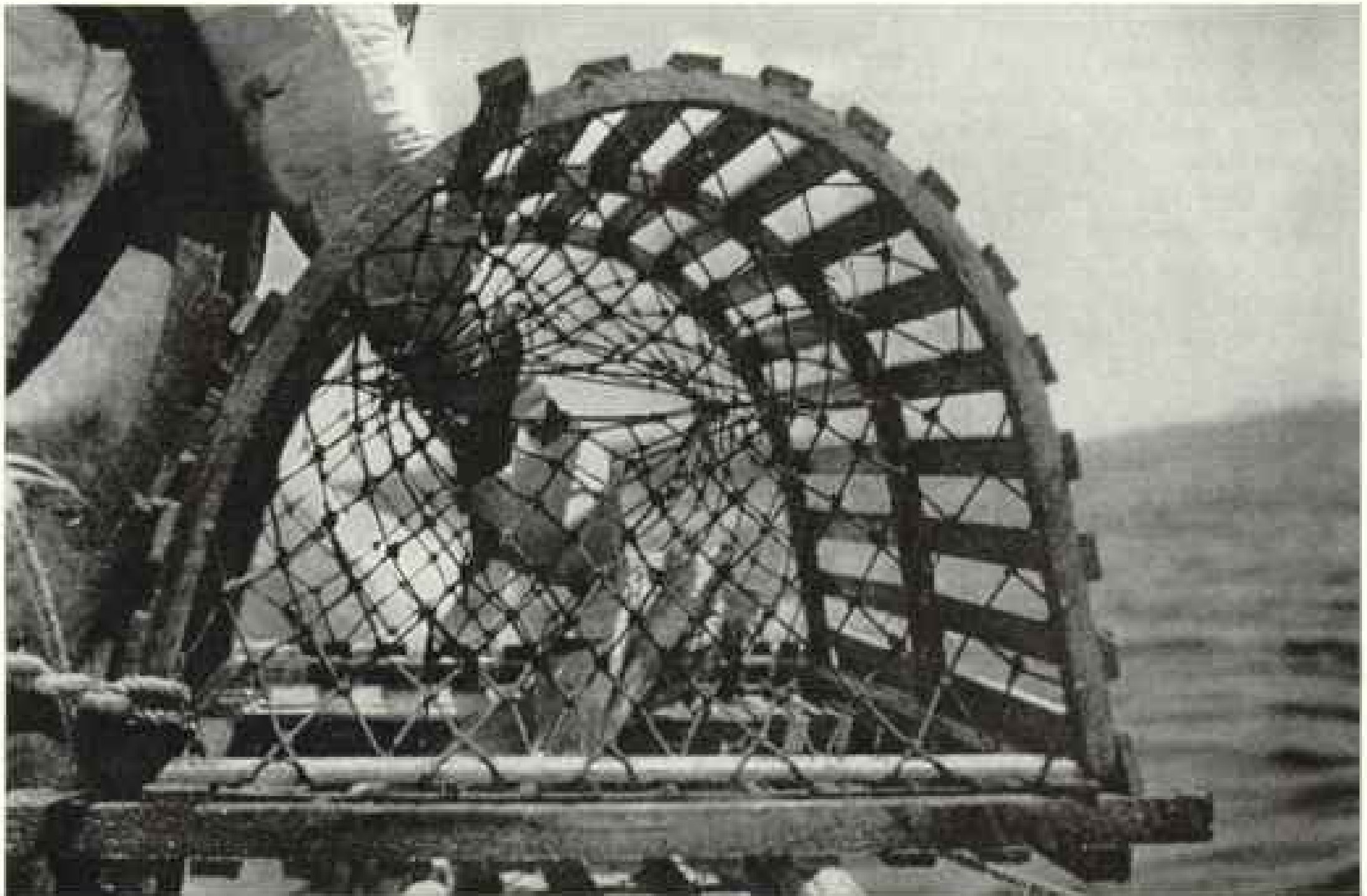
Another large lobster with a headlike bunch the size of buck-shot on its underside aroused my curiosity.

It is seldom that the average person sees eggs on a lobster. It is against the law to sell egg-bearing lobsters and almost impossible to scrape the eggs off after the female has stuck them underneath her tail.



The Expert Shucker Fills a Gallon Carton with Lobster Meat in 20 Minutes

First he breaks off the claws, splits them with a knife, and removes the large portions of flesh intact. The tidbits in the joints he forces out with his little finger. Next he tears off the tail, twists the end away, and with his hand pushes out the meat. Waste goes through the hole in the table into a receiving barrel.



Bait Is Pushed Down into the Bottom of the Pot Where It Cannot Be Stolen.

Through two funnel-like openings, one at each end, in the knitted heads, lobsters enter in search of food. The bait has been threaded on strings by means of a needlelike bait spike (page 531).

Sometimes the average-sized female will have 8,000 to 10,000 eggs, or more, under her tail during the incubating stage, which lasts 10 to 11 months, the length of time depending probably upon the temperature of the water. Lobsters from 15 to 16 inches long may carry nearly 97,000 eggs, a load weighing almost a pound (page 539).

At this stage the eggs resemble caviar. As soon as the eggs are hatched, the larval lobsters float to the surface of the water where they stay until the fourth shedding stage. Then most of them sink to the bottom.

A small proportion don't sink until the fifth stage (page 537).

Rough Going for the Smack

The pitching boat was taking issue with its adversary, the sea, and was getting the worst of the deal. The plunging seas began to play teeter-totter with our smack.

With a mighty shove and swoosh, the high seas would send the boat, and me, gasping for breath, down its foamy, laughing sides into seeming oblivion. Up and down we came. I grabbed the gearshift to brace myself.

Skipper and pilot were in a difficult spot, too. Both men were working desperately to untangle the snarled pots from powerful kelp which wove itself about the pots. Seaweed wound like an octopus, yet looked like a lily pad. It covered the entire trawl line and pot. The kelp must be removed, or the warp, notwithstanding its six-thread, one-fourth-inch strength, would be parted, causing the loss of all pots at a cost of about \$40.

The kelp and strong tide kept dragging the pots from the men's numb hands back into the icy waters. Finally, with a sucking noise the last of the kelp was removed and the pots were hauled to the rail, followed by the rest of the set in rapid succession.

"Lucky we didn't lose this set," said the pilot, lighting a cigar. "Kelp is worth a lot of money these days to some people, but it's one of the worst enemies of the lobster fisherman."

"A lot of money?" I questioned. "It looks like worthless sea growth to me."

"Well, it doesn't look like much, but we use it and other seaweeds in making ice cream, toothpaste, and pharmaceuticals, and in lots of industrial ways."

"How do you make ice cream from that stuff?" I asked skeptically, pointing at the seaweed.

"Does sound funny," the college-educated pilot continued. "But the Maine fisheries make kelp into algae gums to be used in stabilizing ice cream and as nonfatten-

ing thickening agents in some gravies and sauces.

"From another seaweed, Irish moss, which we also get along our coast, comes a suspending agent used in lots of foods—chocolate milk drink, for instance—and in some drugs, cosmetics, and industrial liquids. We use anything and everything—kelp, fish meal, oils, pearl essence from herring scales, and lots more. Helps make Maine fisheries one of the largest industries in the State.

Saved from Starvation

"Chubby looks a little rough," he continued to his father. "He better have some of the stew Mom fixed for him."

He pulled a large vacuum bottle from under a pile of debris and poured me a cup of hot lobster stew. As the creamy liquid stimulated my body, the delicious aroma brought to mind the warmth of home.

Slowly I rolled the tiny morsels of flavorful meat on my tongue as the pilot told me how his mother makes lobster stew.

She uses four cups of milk and scalds it with one slice of onion. Then she removes the onion and adds the meat from two steamed lobsters, which has been sautéed in three tablespoons of butter to bring the natural red color from the meat to the stew. Adding one tablespoon of salt and a dash of pepper, she heats to boiling again. Serves when nourishment is of paramount importance.

"Plenty boats stove up out to sea," said the skipper, wiping his chin with the back of his ungloved hand. He pointed to a group of boats nearing us with their deckhouses covered with battered and torn pots to be repaired before putting to sea again.

The Lobsterman Ventures Far and Wide

"How far out do you trap for lobsters?"

"Well now, Chubby, a lobster is a lot like a human being. When they're little, they stay close to home and we trap them in the bays and coves as shallow as a fathom deep. But when they grow larger, usually in the fall, they go out to sea, and we trap them in water 100 fathoms deep. Some of them go as far as 50 miles out from the shore, but they try to come back in the spring.

"Yes, sir," continued the skipper reminiscently, "I have trapped lobster the width and length of the bald, rocky, uneven coastline of Maine from Portland to Eastport! I've trapped them in the vicinity of Monhegan Island, also near Boothbay Harbor, at Vinalhaven, and near Matinicus, too!

"I've ridden many a tide bringing fresh sea water into our deep channels, far-



From the Top of the Pilothouse a Wife Watches Her Husband's Catch Unloaded

The man stooping over the cask is Bert Witham of the Rackliff and Witham Company at Rockland. After a run of several days, the boat owner has brought in nearly \$700 worth of lobsters—enough to excite the veteran dealer. Net profit from this haul is more than \$600. The little boy fearlessly helps his father.



Day-old Lobsters Nearly Ready to Shed Their First Shells

They were hatched at the Fish and Wildlife Service's lobster station, Boothbay Harbor, in tanks of sea water kept constantly flowing to prevent their clinging together and eating one another. Later they will be transferred to the State's rearing station. After the initial shedding within two or three days after birth, they remain in the second stage for five days. Then they discard the second shell and go into the third stage for about seven days. Within three days after reaching the fourth stage, they are carried out to sea in State boats and planted. At this age most of them sink quickly to the bottom and take refuge in crevices among the rocks (page 537).

reaching bays, over granite rocks. As a natural breeding ground for our lobsters, we have bays, rocky coast, rocky, sand, and gravel bottom, and fresh sea water.

Maine Waters Good for Lobsters

"I can remember my father's telling me the Government was going to put us out of business when they made another effort to transplant the American lobster to the Pacific coast about 1890. Other attempts were made later. But the lobsters never grew to com-

mercial proportions out there—didn't like the atmosphere, I guess.

"Guess there isn't much use to bother with the ones over to the channel—probably all snarled up on the rocks," he continued. "We'll pull a few more trawls and call it a day. Come back next week and pick the rest up. End our season."

His words were like grand opera to my ears. Not that I was getting seasick—much. It was just that I was a little off form.

My unsteady legs nearly buckled under me as I leaned over several gasoline tanks to extract a box of rubber bands that are used to plug the lobster, the last chore of the lobsterman before docking. Wooden pegs or plugs the length of a toothpick and as round as a pencil are also used to plug the lobster's claws (pages 540, 541).

The men placed the bands over the right crusher claws, as usual. But, as with humans, there are portsiders among lobsters. I found out when I cautiously wove my hand through the waving bunch of claws (page 543).

I reached for a full-grown lobster that looked harmless. The lobster moved. As my hand came closer, it struck a defensive attitude, poising itself on the tip of its walking legs.

Suddenly it lifted its powerful claws over its head like an infuriated rattlesnake preparing to strike. The left claw with fine saw-sharp teeth closed lightninglike about my landlubber fingers. I howled, but since I had on a pair of canvas gloves, I was not cut.

The feeding habits of the lobster should

be reorganized, I thought, by instilling discipline at an early stage. I found out that this technique would be impractical, since very little is known of the lobster from the time it hatches from the egg until it is three or four inches long.

Consequently, not much is known of its feeding habits during that time, except when it is in captivity. Most of the research work on this shellfish has been done in the hatcheries and at the stage when the creatures are large enough to be caught in commercial traps.

In the hatcheries the first-stage lobsters are fed ground liver (pig, beef, or calf) and recently have been fed ground mussels, a food which has worked advantageously. From the time the lobster hatches from the shell until it reaches the fourth stage (about 15 days, though the time varies depending on temperature and food), it is fed every two hours; otherwise, the cannibalistic lobster would eat its brothers at the earliest opportunity. This gives an indication of its ferocious carnivorous habits when food or danger such as my fingers is present.

Revenge and a Recipe

I started my revenge when I measured the lobsters for shorts. Hooking the iron ruler's edge into the eye socket, I measured $3\frac{1}{2}$ inches to the end of the hard shell or body for the minimum, 5 inches for the large ones. (Overall length doesn't count here.) Under or above this size I threw overboard, in compliance with the law (page 538).

The lobster that had crushed my fingers



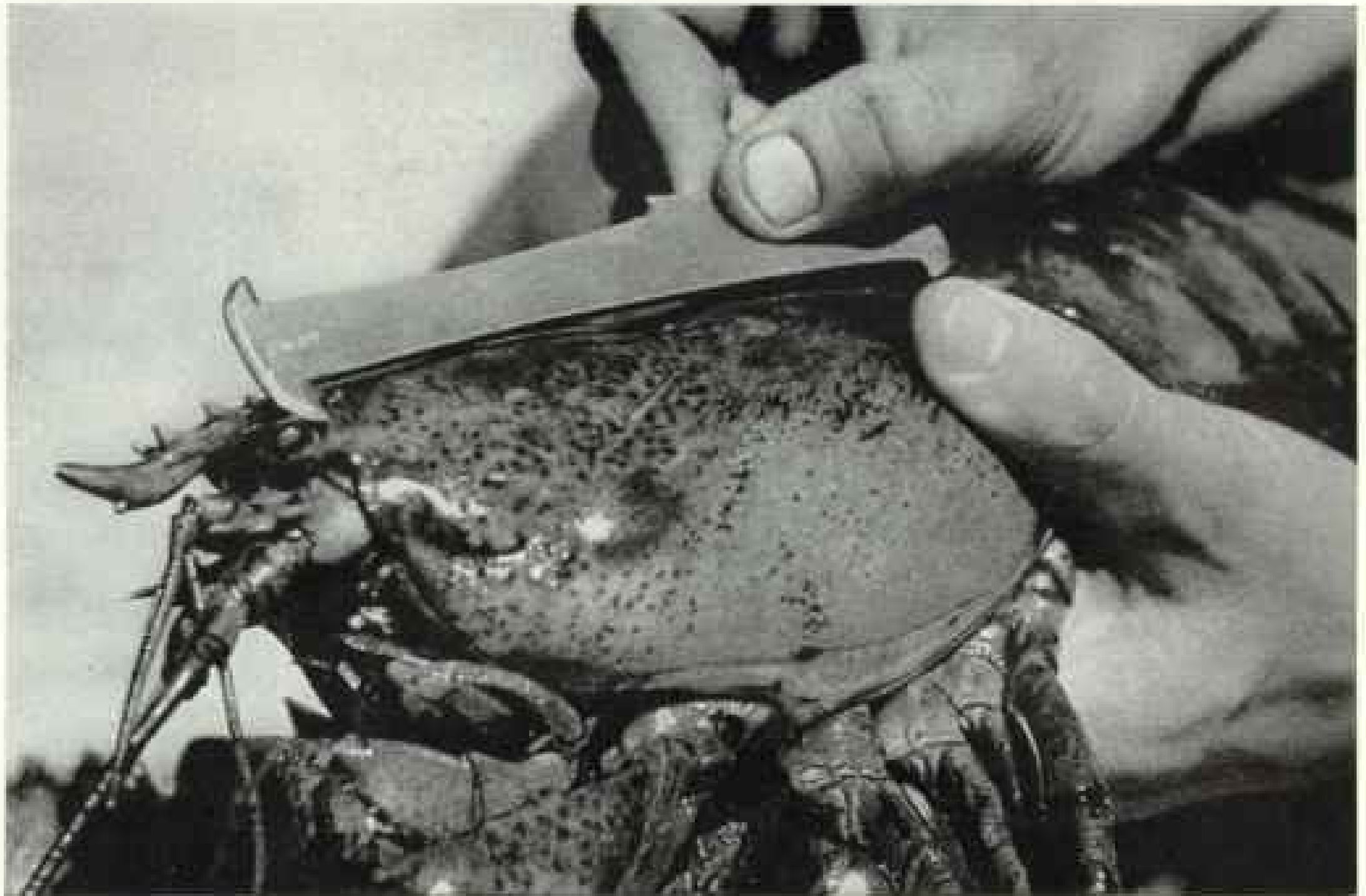
These Little Lobsters Wear Their Fifth Shells

Since most of the hatch are sent out to sea while in the fourth stage, only a few of this next larger size are found in the tanks at Maine's Department of Sea and Shore Fisheries lobster-rearing station at Boothbay Harbor. Every two hours from the moment of their birth they are fed a raw paste. Liver was used exclusively before the war, but during the meat shortage steamed flesh of mussels found on the shores near the fisheries was substituted. The lobsters gobbled the new food in preference to liver. When released, they feed on plant debris and bottom organisms.

I saved to be used later as a succulent baked-lobster treat. Here is the recipe:

Lay the live lobster flat on its back on a board. Place hand firmly over the waving claws. Using a sharp knife, cut the lobster, beginning at the head, down the belly, through the tail. Hold the lobster over a bowl of finely crushed crackers (1 cup to the lobster).

The salt water runs from the lobster into the crumbs. Remove the liver, or "tamale," and place with the crumbs. Season the crumbs to taste, add two tablespoons melted butter for each lobster. Mix thoroughly



Every Lobster Caught Must Meet Legal Size Measurement

In Maine the minimum length from eye socket to end of shell is $3\frac{5}{8}$ inches, maximum 5 inches. Specimens smaller or larger than these limits are tossed back into the water. Young lobsters are protected during the period of rapid growth; the larger ones because they produce more eggs.

by hand, using enough milk to moisten crumbs and tamale. Stuff dressing firmly into split lobster. Add a strip of bacon over the belly, cross claws Buddha-fashion, and place lobsters and broiler pan in oven to bake 5 minutes at 375° .

Remove lobster from oven and place in broiler for 15 minutes with temperature at 450° . Put another spot of precious melted butter over the dressing.

That was the sweetest revenge I ever ate!

As we were finishing cleaning preparations before docking, I gingerly felt my sensitive fingers and thought of my recent issue with the lobster. I wondered about the largest lobster, a 45-pounder, I had heard about: what would he have done to my fingers?

Hard Work for Small Profit

I felt almost like an equal of the fishermen as they told me this was rough weather and about wound up the season for them.

The big catches are made from August to November. During these months the fishermen catch ten times as many lobsters as during the rest of the entire season.

Our trip netted 130 pounds, or 4 bushels, at 35 cents a pound. This is above average.

However, 35 cents a pound after battling with the elements for seven hours is not the easiest and most convenient way to earn a living.

"How do you feel, Chubby?" asked the skipper as the pier came in sight.

"Frankly, another two hours would have finished me."

The men put the lobsters in cages of 100 capacity. These cages had been fastened by ropes to the piles of the wharf. They were loosened, then lowered into the sea, Nature's lobster pound; then the ropes were refastened to the piles.

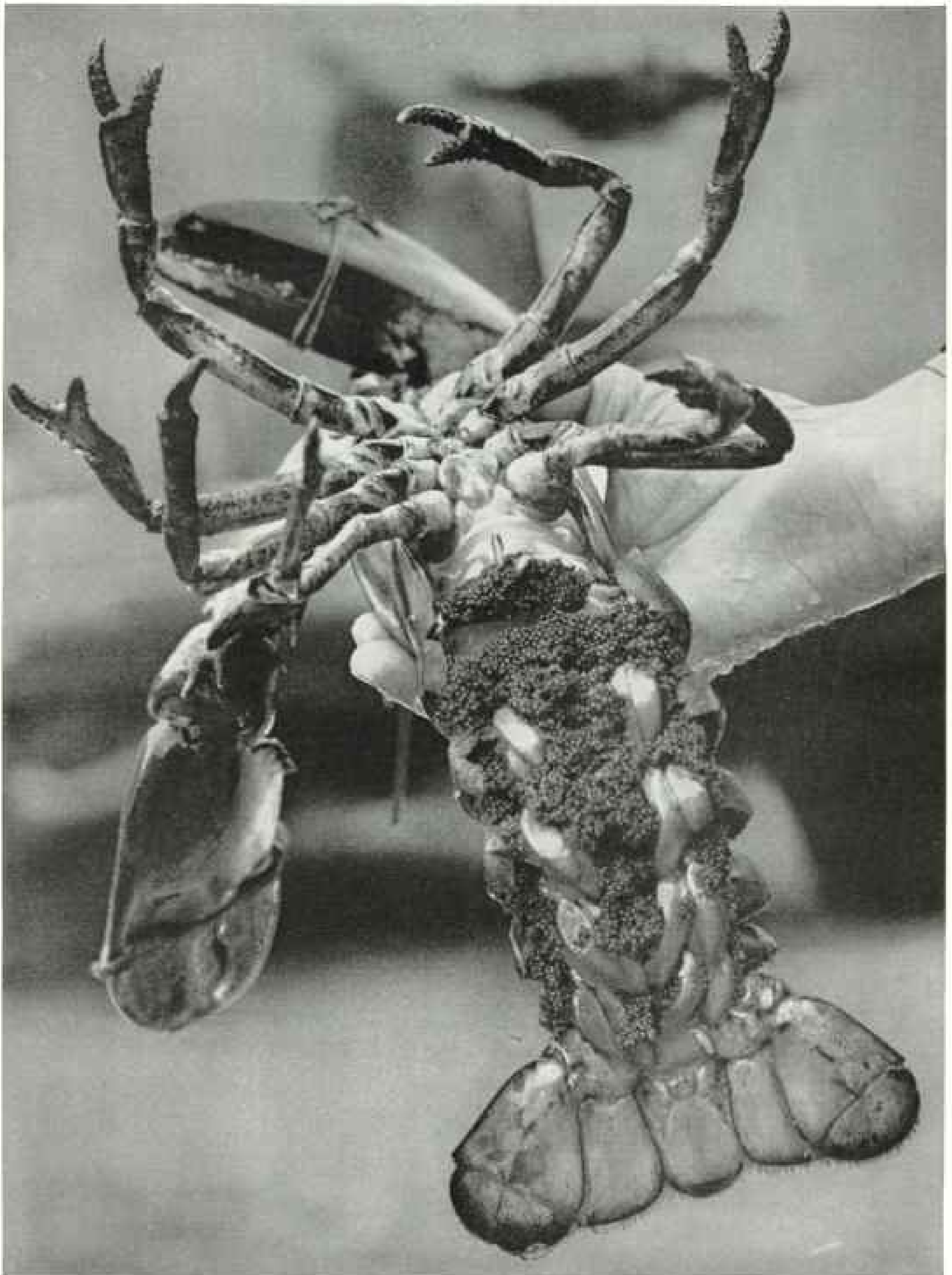
The skipper selected a dozen pound-and-a-half average lobsters and set them in a bushel basket. He turned to me and said gruffly:

"Here, Chubby. Take these along as your contribution for the lobster bake your friends are having for you tonight. I'll be darned if you didn't turn out to be a pretty good sailor."

I felt as if I were wrapped in cellophane as I mounted the iron ladder to the wharf.

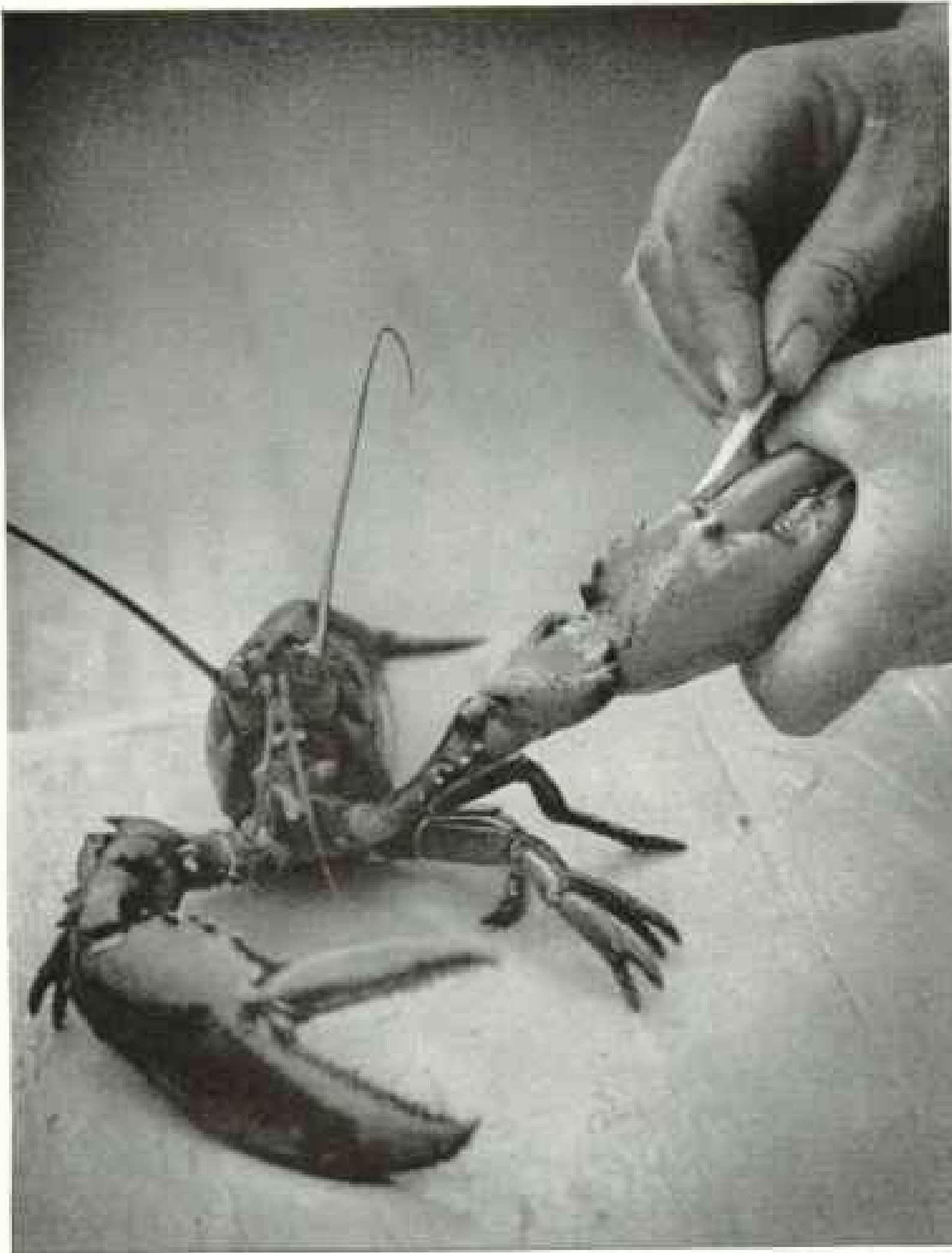
"What are you going to do for the next four months?" I asked him.

"Going to Florida," he replied, "for three



The Average Female Lobster May Carry 10,000 to 35,000 Eggs Under Her Tail

Deposited in a body secretion which hardens quickly and acts as a cement, these tiny eggs weather many hazards. They are carried for 10 or 11 months before hatching. The young emerge usually in July. When a fisherman captures an egg-bearing female, he sells it to the rearing station at Boothbay Harbor at the pound price.



A Peg in the Joint Renders the Crusher Harmless

If the lobster could get a grip on the pluggers' hand, it could clip off a finger. A 17-pound specimen can inflict severe injury. Instead of pegs, cords and rubber bands are also used to disable the pincers. A lobster of marketable size is about five or six years old.

months. Come back in late March or April and repair the pots and boat and be ready for another lobster season in May."

"How can you go to Florida? This trip of ours, after all the time and labor, netted only 130 pounds. Even at 35 cents a pound, that is only \$45.50 for the two of you. In fact, it's the first set you have landed in two weeks.

"How about the cost of the lobster pot, which before the war was about 90 cents and now is \$4 or \$5? How about the hardwood sugar barrels that formerly cost 90 cents and now about \$1.50? Transportation charges have doubled and tripled. Good rope for trawls is almost impossible to buy.

"Yet you are going to Florida for the winter. I don't get it."

A Lesson in Economics

"Well, let me put you straight about a lot of things. Today's catch may be snarled up some, but it's not a true picture of the entire season's catch," he explained.

"You inlanders like to present all of us lobster catchers as a group of submarginal people. Fifty years ago a lobster fisherman did have a tough time. Today he is just as important in his community as the doctor, lawyer, or businessman. As a matter of fact, every lobster fisherman has to be a mighty good businessman.

"You know, we have children who are college graduates, too. Take my son there—he was graduated from the University of Maine. He doesn't go in for store clothes or drive a 1941 car. But he has a nice business investment right here. He tucks his money away in the bank and he bought war bonds.

"The equipment here cost about \$5,000. He is on his own. He doesn't have to take orders from any syndicate or belong to any union, either.

"So, even if prices should begin to fall, a good many of us will stand by the lobster industry and our way of living, come high or low tide."

"What time will you arrive at the bake tonight?" I asked.

"About seven," answered the men.

Several other lobster fishermen friends of mine were waiting for me outside the dock.

Getting into the car, we headed for Pond Cove, one of the rockiest parts of the Maine coast, to gather seaweed for our lobster bake.

We slushed through pools of water left by



Nowadays Only Old-timers Cut Lobster Pegs by Hand

Most fishermen purchase machine-made pegs, but a few still prefer those whittled at home in off seasons. The pointed sticks are thrust into the joint of the lobster's crushing claw (pages 540, 543). Once inserted, the plugs are seldom removed; to draw them away may cause fatal bleeding.



Fightin' Mad! This Big Lobster, His Claws Flailing, Tail Flapping, Won the Battle

About two miles off Spruce Head the fisherman pulled this especially fine lobster out of the trap, but his joy at the capture was short-lived. It measured more than the maximum size permissible under Maine law and had to be thrown back into the sea (page 538). Other States protect only the smaller-size lobster. This living battleship of the deep sheds its armor plate periodically, growing larger between molts. It replaces claws and legs amputated in battle or through accidents (page 526).

the tide in our quest for the seaweed that covered the rocks.

An Old-fashioned Maine Lobster Bake

Having filled our bushel baskets with the seaweed, we drove back to Portland. The rest of the guests had arrived and were gathered about a roaring fireplace.

The heat from the huge stone-enclosed fireplace felt good. It was snowing lightly. The clambake festivities were begun.

Two of the husky lobster fishermen placed a 3-by-5-foot iron sheet about a foot above the roaring fire. An opening at both ends made an excellent draft. A layer of seaweed followed. About a bushel of clams that I had washed with a garden hose were

dumped on the seaweed. Another layer of seaweed went over the clams, then came a layer of eggs. Another layer of seaweed followed and then a layer of sweet potatoes.

Somebody deplored the fact that corn in the husk was not available. Another layer of seaweed was put on and then about 24 lobsters were tucked into the seaweed. A wet canvas tarpaulin was placed over the entire contents to keep the steam in. In one hour and a half the steam-cooked meal was completed—the gourmet's dream of heaven.

"Hurry up," the women called from the back porch. "The clam broth is ready."

In ten minutes one group of hungry men carried in the hot food and placed it on the dining table.



Both "Southpaws" and Right-handers "Pack a Mean Punch"

A lobster has two claws—a crusher for killing its prey, and a ripper for tearing the victim into pieces small enough to be eaten. Here Wayne W. Buxton of the Maine Development Commission holds up the safely tied lethal weapons of a "portsider" and a "starboardsider." The author had a painful experience with a specimen because he did not know some of the shellbacks are left-handed (page 525).

The spicy hot clam broth the women had prepared while we cooked the food in the garden warmed us thoroughly. The clams, dipped in an utterly "different" type of Maine sauce, were gulped down by the dozen. The steamed eggs and sweet potatoes took on an unheard-of palatableness. The steamed lobster is so tender and flaky it defies description. One must taste it to appreciate it.

Three hours later I bade good-bye to my Maine friends.

For more than half a century the Maine lobster fisherman has made a good living. He is usually a man of stature in his community as well as in the industry.

In normal times these men figure a "good living" in 150 traps, but the median is

often higher and, in some cases, around 300.

In October, 1943, in Portland, there were about 90 boats with some 11,700 traps (130 traps to the boat). This condition of depleted lobster-catching equipment is typical with many of the 5,000 licensed lobster fishermen in Maine, fishing out of Rockland, Friendship, Eastport, and other ports.

In 1944, despite obstacles of storms, scarcity of replaceable equipment, lobster men lost to the armed forces and shipyards, and drydocking of boats for weeks at a time, these lobster men of Maine landed 14,056,795 pounds of lobster (more than double the figure of 1939), with an average price of .3326 cents a pound for a grand total of \$4,675,290.

This represents more than 50 percent of the total fishing industry of Maine.

The Society's New Map of India and Burma

THE ancient face of India, with all that man has added up to early 1946, is brought to the 1,450,000 member-families of the National Geographic Society in the remarkable map supplement to this issue of their Magazine.*

Complete to the latest hydroelectric power reservoir, the new "Map of India and Burma" gives members a clear cartographic picture for following news in this important part of the world. With your Society's large maps of China, Japan and Korea, U.S.S.R. (Russia), the Philippines, and Southeast Asia, all published within the last year and a half, members now possess up-to-date maps of the vast Asiatic Continent.

The scale of 1 to 6,000,000—94.7 miles to the inch—permits the showing of the island of Ceylon off India's southern tip, the border States of Nepal and Bhutan, remote Afghanistan, and even more sequestered Tibet.

All roads, railroads, towns, and villages of importance are delineated on this ten-color 30-by-25-inch map, compiled from many new sources. India's two largest cities, Calcutta and Bombay, are shown, with their environs, in special insets.

Shows Intricate Mosaic of Native States

Of India's million and a half square miles—about equal to the United States east of the Rockies—55 percent is British India, divided into 17 provinces and administrative areas. The other 45 percent, shown in green, comprises 562 Indian States under British supervision, each ruled by its prince or potentate who holds absolute power in his own domain.

So complex is the mosaic of political subdivisions in India that The Society's cartographers have used the back of the main map to print another chart demarcating the boundaries of the Indian States.

These range in size from tiny Bilbari, one of the Dangs States, which has an area of 1.65 square miles and a population of 82, to Hyderabad, which is larger than Kansas, with an area of 82,313 square miles and a population of more than 14 million.

Plotting this geographic jigsaw puzzle required many months of extensive research and the utmost skill in compilation. In all, 598

* Members may obtain additional copies of the new "Map of India and Burma" (and of all other maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ each, on paper; \$1 on linen; Index, 15¢. Outside United States and Possessions, 75¢ on paper; \$1.25 on linen (postal regulations generally prohibit mailing linen maps outside Western Hemisphere); Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

political subdivisions are shown, the smaller ones being identified by reference numbers.

In preparing The Society's map of political subdivisions of India, generous cooperation was given by the Department of State, Division of Geography and Cartography.

Like the maps of China (June, 1945) and of Japan and Korea (December, 1945), the new India-Burma map is constructed on the Albers Equal-Area Conic Projection. It is based upon the new 1:1,000,000 (16 miles to the inch) sheets published by the Survey of India.

For more than a century the Survey of India, established and directed by the British, has been one of the world's finest mapping agencies. Probably none has contributed more to the science of geodesy and topographical survey in difficult frontier country. Many of Britain's best surveyors have received their training in India, while native Indian surveyors have attained high reputation.

In eastern India and Burma are shown important towns where Americans were based in World War II, the Stilwell Road from India across Burma to China, the turbulent mountains of the "Hump" over which supplies were flown to the Chinese, and other features which will not be forgotten by history or by the men who made it.

Slightly smaller than Texas, Burma has more than double that State's population.

Names on this map come from many languages and hint at the history of the land. Place names in English, such as Black Mountain, in Bhutan, stand beside others harking back to the days of the Moguls or earlier.

Many town names end in "pur," which is Sanskrit for "city" or "town," or in "pore," the Anglicized version. Also common is "abad," as in Allahabad, west of Benares, or Mahmudabad, farther north; in India the suffix signifies "abode," or "city," from the Persian "abad," or "abadan," meaning "cultivated lands," "populous," "inhabited."

"Stan," as in Afghanistan, is Persian for "place." "Patam," or "patanam," as in the name of Masulipatam, on the Bay of Bengal, means "city" in Tamil, old Dravidian tongue.

Even French-sounding names are here, such as Pondichéry, for the French, like the British, came as traders, and both France and Portugal still have small footholds in certain ports, marked on the map.

American baseball seems remote from India, but here in the North-West Frontier Province is Swat, which inspired some erudite sports-writer punster to bestow the title "Sultan of Swat" upon the home-run king, Babe Ruth.

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Department of Agriculture

ALEXANDER WETMORE
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Associate Editor of the National
Geographic Magazine

ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded fifty-eight years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, the Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, the Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 15, 1919, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,102 feet. Capt. Albert W. Stevens and Capt. Cyril A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Navy Expedition camped on desert Canton Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,025 feet was attained.

The Society granted \$25,000, and in addition \$75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

"I lived a lifetime

... in those few moments!"

IN JUST A few minutes I'll be a Bachelor of Arts. I guess I should be looking ahead. But my mind keeps going back . . .

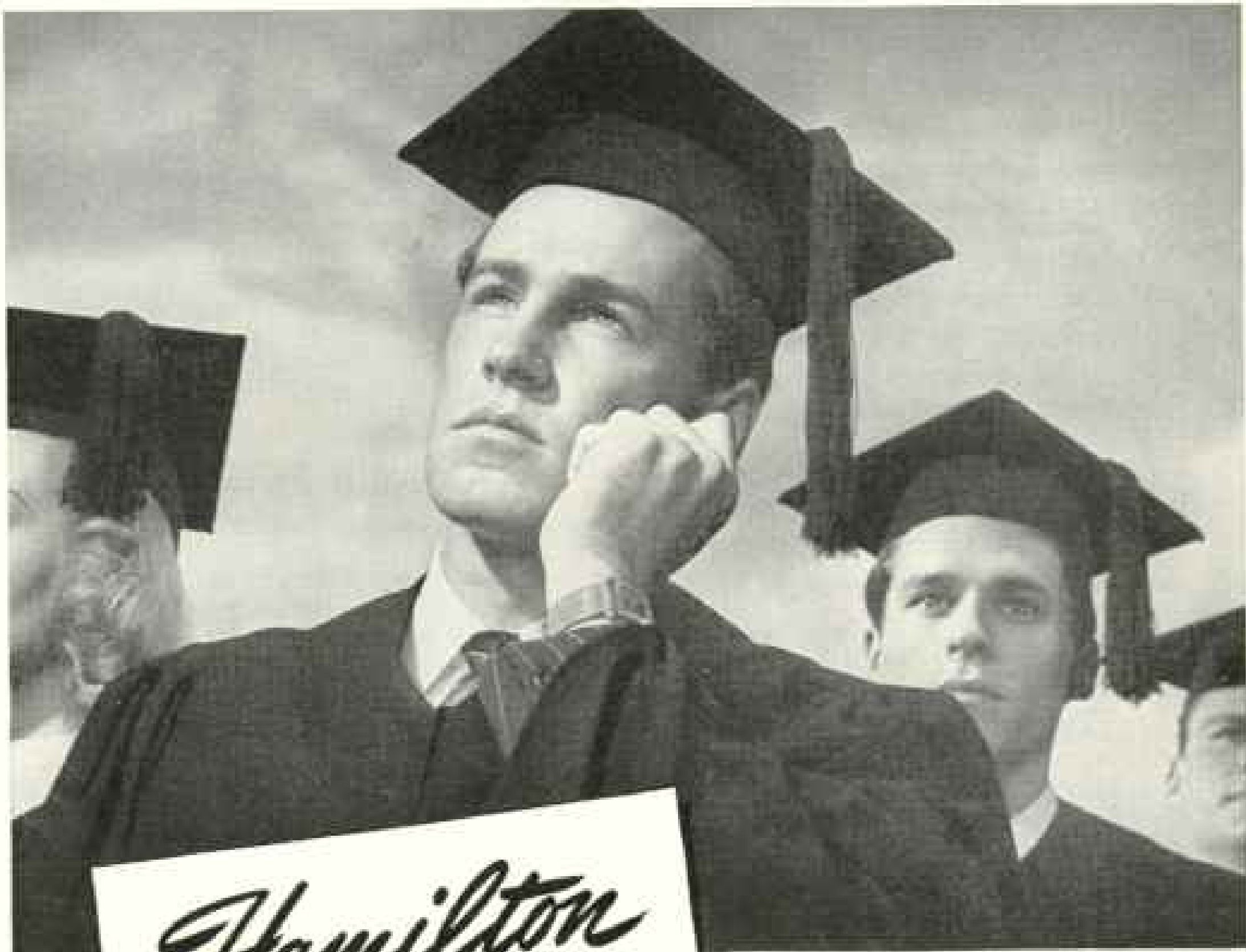
Back to the Christmas morning long ago when I found Blackie under the tree. (The folks must have seen me with my nose against the Pet Shop window.)

Back to the time I caught pneumonia. Mom wouldn't leave my bedside until the fever broke.

Back to the day I skidded on the ice and wrecked Dad's new sedan. All he said was, "Never mind the car—are you all right?"

Mom and Dad gave up a lot to send me through college. Do you wonder why I couldn't find the words to thank them this morning? On top of everything, they gave me the graduation present I've always longed for—a brand-new Hamilton Watch!

Why is a Hamilton in a class above other watches? Because this world-famous American watch is made with greater care from the finest materials. Hamilton's high quality assures you the greatest watch value and the finest time-keeping accuracy.



Hamilton

THE WATCH OF RAILROAD ACCURACY

HOW MUCH steel makes 620,000 tiny watch hairsprings? About 5 pounds. Yet to produce this small ingot in the exact alloy-mix desired, Hamilton has its own miniature steel mill. By such infinite care, Hamilton engineers maintain Hamilton's reputation as America's Fine Watch.

Hamilton's experience building watches for railroad men and navigational timepieces for the armed forces assures greatest possible accuracy in every size and grade. Hamilton Watch Company, Dept. C-14, Lancaster, Pa.



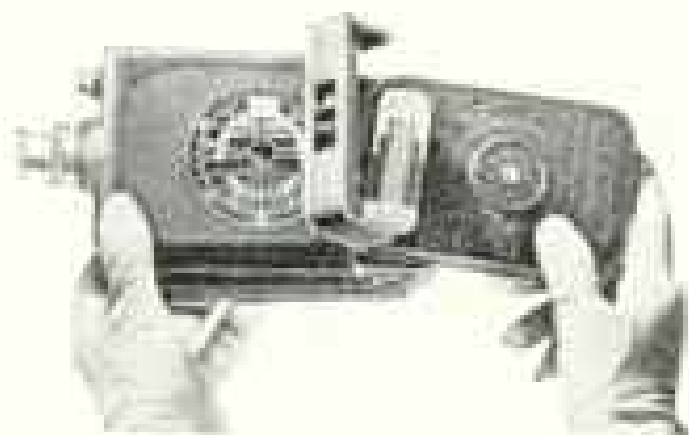
"Deeppers!"

Hasn't a Guy Got Any Privacy?"

Not when it's home movie time, mister! You're the *star* in home movies, and Mom and Pop the cameramen.

They'll invade your privacy at breakfast, they'll film you at the beach, in your first school suit...everywhere you do those wonderful things growing kids do.

For your Mom and Pop know the endless joy of pleasure in home movies—the lasting record they make of every cherished family occasion.



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Remember, if it's worth the film, it's worth a Filmo—the personal Bell & Howell movie camera precision-built by the makers of Hollywood's professional equipment. You just sight, press a button, and *what you see, you get*—in true-to-life full color or in sparkling black-and-white.

See the new, improved Filmos at your B&H dealer's today, or send the coupon below. Bell & Howell Company, Chicago; New York; Hollywood; Washington, D. C.; London.

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Bell & Howell

The Magic Carpet

rolls out again

IT'S Century time! A minute ago, outside the station, you were in the heart of a great city, with crowds, blaring taxis, newsboys shouting the evening headlines. Now you're in a different world as you follow that crimson carpet down the platform of Grand Central Terminal toward the softly lighted, streamlined cars that will be your club on wheels for tonight.

RELAX BY TWILIGHT

Magically, the day's tension vanishes as you step into the Century's Observation Car. Easy chairs invite you to relax. And outside the wide windows, the twilight beauty of the Water Level Route unrolls a background for repose.

THE FACE IS FAMILIAR

There is a fascination about your "dinner of the Century." For nearby may be a face you last saw in technicolor, or one that would be news on any financial page.



AWAKE REFRESHED

You arrive at your best. For all night, in the quiet privacy of your room, a spacious bed, a rubber-foam mattress, and the smooth Water Level Route have conspired to give you deep, refreshing sleep.

The only all-room extra-fare train between New York and Chicago.



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The Water Level Route—You Can Sleep





Control Center **FOR EXECUTIVE ACTION**



At ease and completely relaxed, he talks his daily work away. His decisions, instructions, plans and ideas are spoken in a natural, conversational voice to a small microphone on his desk.

That microphone is his Control Center for Executive Action. It is the heart of Dictaphone Electronic Dictation, and it speeds the flow of work throughout his entire organization. This magic microphone even records his important over-the-desk conversations.

Dictaphone Electronic Dictation frees him

from dependence upon his secretary; frees her from notetaking and thus enables her to protect him from interruptions and to do other important work. It doubles their ability to get things done.

Why not learn how this modern business method can help you? Consult your local phone book, or write for descriptive literature, Dictaphone Corporation, Dept. B-4, 420 Lexington Avenue, New York 17, N. Y. In Canada: Dictaphone Corporation, Ltd., 86 Richmond Street, W. Toronto 2, Ont.

DICTAPHONE *Electronic Dictation*

The word DICTAPHONE is the registered trade-mark of Dictaphone Corporation, makers of Acoustic and Electronic dictating machines and other sound recording and reproducing equipment bearing said trade-mark.



Gown designed by Mildred O'Quinn exclusively for Gunther.

Living music—matchless tone—from this amazing new radio-phonograph

Hearing records on the Musaphonic is a thrilling new experience. Every fragile shading is recreated in all its exquisite beauty. Each vibrant tone glows with the living warmth of the artist's personality.

Neither surface noise nor needle scratch intrudes to break the enchantment. You hear only music—all the music—the subtle phrasing—just as the artist recorded it for your delight. This is the magic of that sensational development—the new G-E Electronic Reproducer.

And you'll never know how truly alive a radio program can be until you hear it on the Musaphonic. Voice and instrument are recreated with such fidelity that the very tones seem to take on a third dimension. Static, fading, and station inter-

ference are reduced to the vanishing point by the miracle of General Electric FM. In the Musaphonic, at last, you hear glorious natural color tone in all its flawless beauty.

Soon you can choose between Musaphonic's beautiful period cabinets of rare woods, designed and built by master craftsmen to harmonize with your finest furniture. Soon you can prove to yourself that this superb radio-phonograph is truly one of the great musical instruments of all time.

GENERAL  ELECTRIC

179-12

**\$64 QUESTION BRINGS
A
Billion Dollar
Answer**

Coming out of the war—in which they were called upon to carry more than 90 per cent of the military transportation load—the railroads are being asked this question:

“What are you going to do about peacetime equipment and services?”

And here's the answer for 1946:

A billion dollars' worth of new passenger and freight cars, new locomotives, new and heavier steel rail, new operating facilities, new equipment, materials and supplies of all sorts.

This means new ideas in cars—whole new trains—providing the utmost in safety, comfort, and luxury. New motive power. Better tracks and roadbeds. New standards of dependable, all-season freight service.

For the future, the answer is to be found in a continuation of railroad research for better transportation service, carried on more actively and on a broader front than ever before.

And all of it—not just the cars and engines, but the roadbeds upon which they run and the fixed facilities they use—is paid for with railroad money—no government subsidy—no federal, state, or municipal aid—no money from the taxpayers.

Operating on this self-supporting business basis, the railroads provide America with the greater part of the transportation upon which its future prosperity depends—at a cost averaging well below that of any comparable service anywhere in the world.

AMERICAN RAILROADS



IN PARTNERSHIP WITH ALL AMERICA

THIS SUMMER AND FALL...
VACATIONS AGAIN IN

Southern California

YES, during the coming summer-fall season, Southern California will start welcoming vacationers again. As the flow of returning Pacific veterans tapers off, our hotels will have more and more rooms available for visitors. Of course, it will be essential to have confirmed accommodations in advance...and the later you can come, the easier it will be to get reservations.

In Southern California, summer continues to November...bright, warm days...cool nights...little or no rain. Send for a FREE COLOR FOLDER that's packed with information about this year-round vacation land. Mail the coupon today!



Prepare for contrasts: lush orange groves beneath high mountain peaks...tropic fruits — date palms, cherimoyas — but a few miles from alpine flowers beside glacial lakes...ancient fossil pits near ultra-modern shops...latest jet planes flying over historic Spanish ranchos.



Get out for magnificent views...for boating on mile-high lakes...ride, climb, relax. Sleep soundly under blankets. Adventure, variety, sun, rest — these make a vacation in Los Angeles County and all Southern California an unforgettable experience.



Bring a camera for beach shots: sun-lazing on clean, white sand, riding a surf-board, sailing to pleasure isles...close-ups in Chinatown, the unique Mexican quarter, the old Spanish missions...action shots at the races, tennis and polo matches, or on palm-bordered fairways.



Bring a light coat for cool nights. Thrill to symphonies, movie previews, premieres, hilltop views of millions of lights in sixty cities far below, gay night spots where top-flight bands, spectacular floor shows entertain movie stars and you.

ALL-YEAR CLUB OF SOUTHERN CALIFORNIA, LTD.

This advertisement sponsored by the Los Angeles County Board of Supervisors for the citizens of Beverly Hills, Glendale, Hollywood, Long Beach, Los Angeles, Pasadena, Pomona, Santa Monica and 110 other municipalities. Copyright, 1956, by All-Year Club of Southern California, Ltd., a non-profit community organization serving multiracial.

FREE FOLDER • MAIL COUPON TODAY!

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629 S. Hill St., Los Angeles 14, Calif.

To help me plan my vacation, please send me your free color folder: "What to Do and See in Southern California."

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City _____ Zone _____

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Please print name and address.



➤ **Magic Yellowstone** with its amazing array of mud volcanoes, geysers, canyons

The Black Hills of South Dakota, steeped in the romance of the early West ➤



➤ **Colorful Colorado**, snuggled in the heart of the Rockies

Glorious Glacier National Park in all its scenic grandeur ➤



Soon you'll be planning the vacation you've been waiting for...and the West will be ready for you!

And what a variety of places to go and things to do in the Great West! Colorful Colorado, in the heart of the Rockies. Magic Yellowstone, with over 3,000 square miles of natural



beauty. Glorious Glacier National Park in all its scenic grandeur. The Black Hills of South Dakota, steeped in the romance of the early West. The Dude Ranches of Wyoming, Montana and Colorado, where rest and relaxation abound in an atmosphere of boots and saddles.

It won't be long until thousands of vacationists will head toward the West. And we of the Burlington look forward to helping make those vacations events to be remembered a lifetime. For further information — write A. Cotsworth, Jr., Passenger Traffic Manager, Burlington Lines, Chicago, Illinois.



BURLINGTON LINES

Everywhere West



CHICAGO, BURLINGTON & QUINCY RAILROAD • COLORADO and SOUTHERN RAILWAY • FORT WORTH and DENVER CITY RAILWAY
THE WICHITA VALLEY RAILWAY • BURLINGTON-ROCK ISLAND RAILROAD



There are two sides to this picture!

Each boy in each bed is being helped back to health by a new medical development. Each of these developments owes much, surprisingly enough, to milk—and each does a completely different job!

Billy, on one side, will soon be on his feet, thanks to the antibiotics. Their job is to attack infection, destroy "bugs." In short—kill. One of these is today's miracle-working penicillin, which is derived from a mold nourished by milk sugar.

Jimmy, on the other side, is gaining strength from a group of "builder-uppers." Their job is to restore tissues, replenish organs. Concisely, to *give life*. These are the amino—basic elements of protein, furnished in abundance by milk.

Both sides of this picture illustrate a story of extensive milk research. At National Dairy plants, proteins, sugars and amino acids are produced from milk and supplied for pharmaceuticals which are making great contributions to the nation's health and knowledge of nutrition.

Similar research has resulted in a brand-new kind of baby food—in a smart textile fiber—in a delicious flavoring agent. By this means, National Dairy constantly works to extend the usefulness of milk—nature's most nearly perfect food—so that it may perform an even fuller service to you and your family.

Dedicated to the wider use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of health and enduring progress on the farms and in the towns and cities of America.



**NATIONAL DAIRY
PRODUCTS CORPORATION**
AND AFFILIATED COMPANIES

is you is .. or is you



ain't my baby?



Get a clear picture with **argoflex***

Sharp pictures depend on exact focus. And for precise, easy focusing, the Argoflex method offers the most accurate way yet devised. Accurate—because there is no guesswork. Simple—because the large sized view finder shows

Actual Size view shows here

Synchronized matched lenses one focuses the other "takes" the picture



exactly when the subject is in pin-point focus.

The Argoflex method shows you, *in full size*, the picture *before* you take it, as it will be *when* you take it.

Argoflex is the *twin-lens* camera. For color or black and white, for better pictures better use an Argoflex. Have your dealer show you the Argoflex. You'll see why it is so popular with people who know cameras.

ARGOFLEX MEANS—

Better Composition because you see the picture before you take it. The picture you see... is the picture you get.

Exact Focus: Turning one simple control until the image is sharp, *automatically gives the right focus*. Then snap the picture!

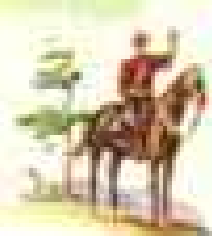
Actual Size: View finder shows the picture in full negative size.

Other Argoflex Features: Film size 120 or 620. Negative size: 2 1/4 x 2 1/4. That means not just 8 exposures, but 12. Shutter speeds up to 1-200th. Lens f 4.5. Focusing range: 3 1/2 feet to infinity. Price: \$54.80** includes a \$6.50 genuine leather carrying case.

*Reg. U. S. Pat. Off.

**Includes Federal excise tax on cameras.

AMERICA'S FIRST TWIN-LENS CAMERA



Banff Springs Hotel Welcomes You Again

Here is news for your holiday-hungry heart! Glorious Banff Springs Hotel in the Canadian Rockies will reopen on June 15 this year . . . golf, riding, swimming, hiking!

That isn't all. Other world-famous Canadian Pacific resort hotels in Eastern and Western Canada will reopen this summer too . . . Chateau Lake Louise, Emerald Lake Chalet and Mountain Lodges in the Rockies, the Algonquin Holiday Colony in New Brunswick, the Digby Pines in Nova Scotia . . . and many others.

These Canadian Pacific resorts are famous for hospitality, courtesy and service. They have been host to countless thousands of visitors from every part of North America and many foreign lands.

For full information consult any Canadian Pacific Railway office or your own Travel Agent.

Canadian Pacific



SPANS THE WORLD

**The best news
in the world!**



"HOMEWARD BOUND" TELEGRAMS are coming every day to thousands of American homes, speeded by special Western Union services for returning veterans.

• Even before his foot touches the dock, his first "homeward bound" telegram is on its way ... rushed ahead by the Western Union man who meets the boat.

At reception centers, telegraph officials are alerted. By debarkation time Western Union is ready. All is set for a jubilant exchange of telegrams between reception centers and thousands

of happy homes. Soon, a battery of Teleprinters is flashing a flood of the gladdest words ever written . . . *He's coming home!*

Whatever the hour, whatever the problem . . . soldiers, sailors and marines are getting all possible help from Western Union, ably and generously assisted by the military authorities.

And looking ahead, recent

Western Union developments in automatic telegraphy and electronics foreshadow a new era in the transmission of good news.

**WESTERN
UNION**



"Look, Daddy, trees with whiskers"

No wonder the youngster is excited, for his exploring eyes have just discovered that curiosity of nature...trees bearded with Spanish moss.

Now he can hardly wait to thrill the kids next door with stories of what he has seen along the 8,000-mile Southern Railway that "Serves the South"—King Cotton reigning over large domains...fields green with growing tobacco...famous resorts and friendly people...landmarks of history—and a Southland vastly different from the one he read about in his school book.

Mild climate...agricultural might...a wealth of raw materials...and the depend-

able, efficient mass transportation of the Southern Railway System. Yes, they're still here.

But there's more, too—cheap power and fuel...skilled workers...a huge, expanding consumer market...and *inspiring industrial growth*. Vacant fields are sprouting busy factories galore, as forward-looking managements "*Look Ahead—Look South.*"

Thus, when business or pleasure brings you to the Southland, you'll find a fascinating land of greater opportunity...and you'll be as excited as the lad who sees, for the first time, a tree with "whiskers."

Ernest E. Harris
President



SOUTHERN RAILWAY SYSTEM



Fashioned for Pleasure - Surpassing in Charm

Instantly, as the first musical notes sound from a Meissner, you will listen in awed wonder to this inspiring instrument. Quickly you will sense that nothing is missing. Lifting trebles and throbbing basses, whispering overtones and sweeping crescendos, simple and difficult passages encompassing the entire tonal range . . . all are reproduced in the glory of the original performance. And with the *Meissner Automatic Record Changer* you can hear a complete musical program without touching a record.

Yet Meissner is more than a musical miracle. Each luxurious cabinet is surpassing in dignity and charm . . . a constant source of pride to every owner. True to the traditional craftsmanship of Sheraton and Chippendale,

the English Regency and 18th Century Periods or the outstanding contemporary designs . . . these cabinets are a perfect stage for the glorious entertainment Meissner provides.

Illustrated above is the Meissner Sheraton. Its simplicity of contour is relieved by beautifully figured mahogany veneer and the oval panels of selected mahogany crotch in the lower doors. Only by hand rubbing can its luminous depth of finish be achieved.

All the finest in radio features . . . Improved Standard Broadcast FM (Frequency Modulation), sensationally free from static, station interference and fading . . . Super Shortwave and many other new electronic im-

provements make Meissner the outstanding key in deluxe entertainment.

For the name of your nearest Dealer, write today to Meissner, 936 North Michigan Avenue, Chicago 11, Illinois.





"Best Ever"

JUST TRY THE GREATEST TEXACO

***FIRE-CHIEF* GASOLINE IN HISTORY!**

LIGHTNING STARTS . . . five-alarm response . . . smooth, rapid warm-up!
 It's *Fire-Chief* . . . *better than ever before* . . . thanks to
 Texaco's intensive wartime research.

New car or old . . . you'll get a thrill from *Fire-Chief's* alert, smooth
 performance. Just drive in to a Texaco Dealer's and say,
 "Fill 'er up . . . with *Fire-Chief*."

You're welcome at

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 you get . . .*



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 MOTOR OILS



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THE
 TEXAS
 COMPANY

TUNE IN . . . Texaco Star Theatre every Sunday night starring James Melton.
 See newspapers for time and stations.



● Your first post-war vacation must be one to compensate in its all-out benefits for the summers you have conscientiously given to vital war work. Plan to come to Maine, the nation's favorite summerland. Vacation in the mountains, the lake country, on a farm, or by the seashore, enjoy every form of outdoor recreation, eat your fill of delicious seafood and farm-fresh foods, relax completely in our perfect summer climate. Yes, in Maine the sky is the limit to summertime pleasures—and the sky is high.



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Travel Service,
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Supreme in the arts of
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The watch band
of lasting
satisfaction

Thin as a dime—
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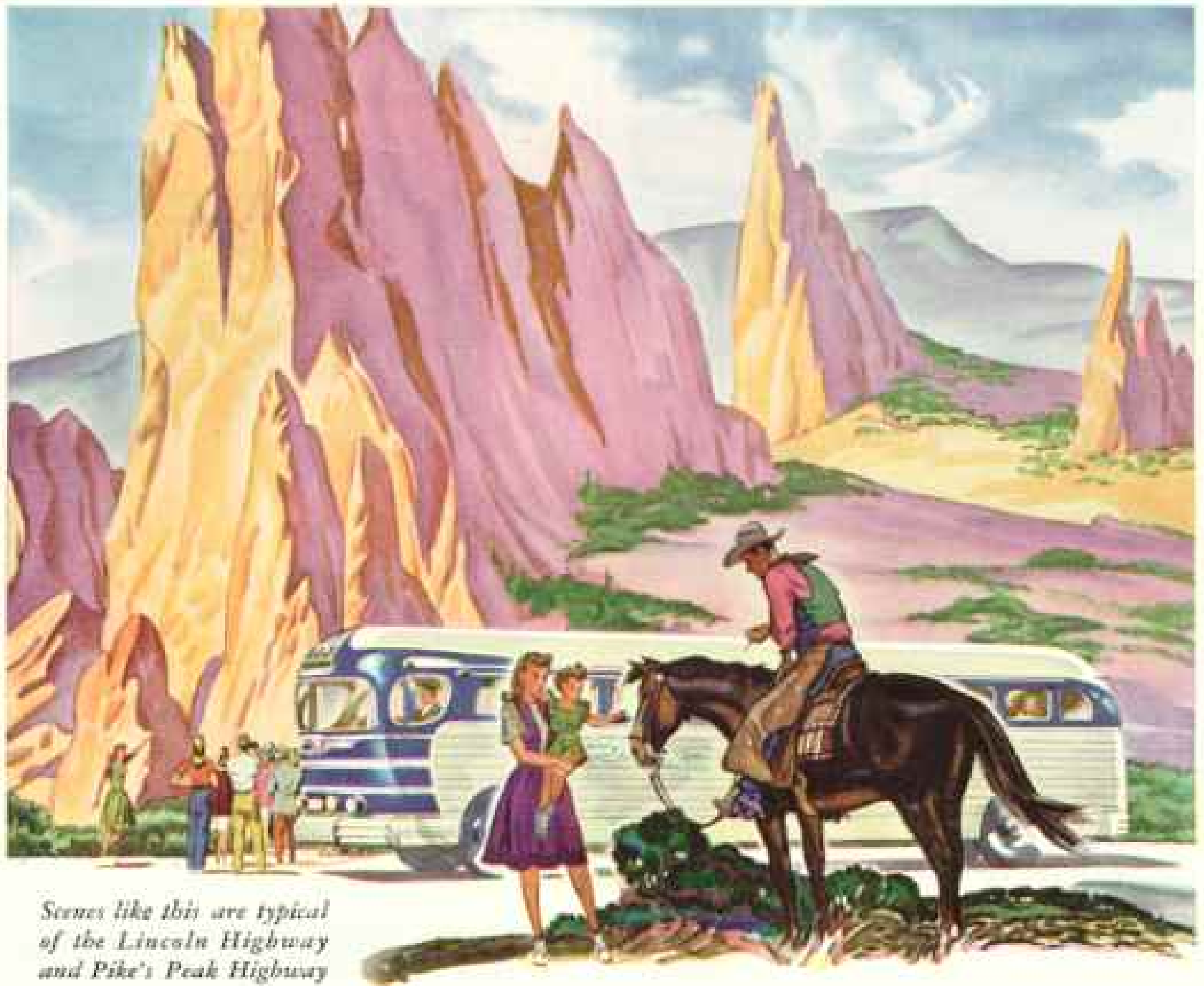


Natural 14 Karat Gold—Stainless Steel Lined \$85.00

Natural 10 Karat Gold—Stainless Steel Lined \$50.00

Prices do not include 1947 Federal Tax

Ask your jeweler. If he cannot supply you, write for information.
FORSTNER CHAIN CORPORATION—Irvington II, New Jersey, U. S. A.



Scenes like this are typical of the Lincoln Highway and Pike's Peak Highway

ONLY BY HIGHWAY

you meet the real America!

There's just one way to know and enjoy the magnificent Country in which you live. That's to see it close up, face to face, within hand-clasp range of its friendly and interesting people—in the very shadow of its trees and mountains—along its lively and pleasant residential streets.

That way is the *Highway*. Which is the same as saying, "By Greyhound"—because Greyhound alone serves nearly all the famous-name National Highways of the U. S. A. and Canada, plus thousands of miles of other equally

interesting highroads that reach to every corner of This Amazing America.

Greyhound's cost-per-mile is amazingly low—there's relaxation as a skilled, safe operator handles the wheel—there are no parking or storage bothers—you can sit back and fully enjoy the passing scene. The millions who go by Greyhound get an *extra* bonus of scenic travel—the experience of meeting the real America close up . . . for these are pleasures you'll find *Only by Highway*.

GREYHOUND





PENMAN for the PEOPLE

"Old Hickory" in the war of 1812 won the battle of New Orleans a few days after the declaration of peace—later became the seventh President. Representing frontier views, he stood for "the" not "these" United States, championed the common man, wrote "I have confidence in the good sense of the people."

Andrew Jackson had only primitive writing aids, the sharp quills of heron and wild fowls...but to-day every person can have a far finer writing instrument, The Inkograph...which does everything that an ordinary fountain pen can do—and much more! The secret of its performance is in its 14kt solid gold ball-like point...that glides smoothly, writes with the ease of a soft lead pencil...The Inkograph pleases the eye, has the good looks and fine workmanship of higher priced pens, but costs only \$2.

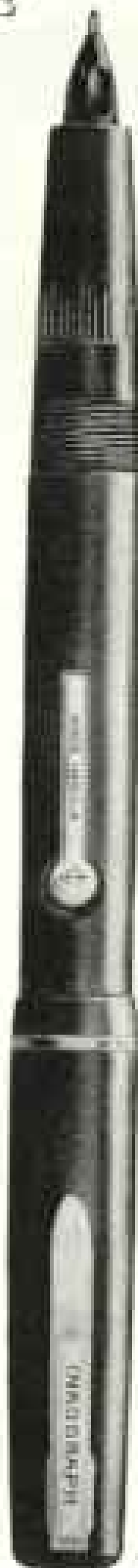
At leading dealers. Inkograph on barrel and clip marks the genuine.

Exclusive features...

Suits any hand or style of writing...Writes smoothly on any quality paper...Withstands child's roughest usage...Unequaled for clear carbon copies with original in ink. Point won't bend or spread...Does lettering and ruling without smudge or blot...Gives years of unfailing service...Fully guaranteed.

INK-O-GRAPH \$2

Inkograph Co., Inc., 200 Hudson St., N.Y.C. 13



Now Available

Acrosonic Pianos
by Baldwin



Small, compact, exquisitely styled—a delight to play, a revelation to hear—this is the ACROSONIC, built by Baldwin. See it and be charmed by its lasting beauty. Hear it and be thrilled by its amazing tone.

Write us for the name and address of your nearest Baldwin Dealer. He will show you the ACROSONIC and tell you how easy it is to own one.

THE BALDWIN PIANO COMPANY • CINCINNATI 2, OHIO
Makers of Baldwin, Acrosonic, Hamilton and Howard Pianos



PATEK PHILIPPE

THE WORLD'S FOREMOST WATCH
ESTABLISHED 1839

THE HENRI STERN WATCH AGENCY, INC.
587 Fifth Avenue at 48th St., New York 17, N. Y.
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"Mention the Geographic—It identifies you."

GENERAL SCIENCE

Ten Important Science Developments of Year

► THE TEN most important advances in science made during 1945, as picked by Watson Davis, director of Science Service, are:

X 1. The atomic bomb and the practical release of nuclear energy of potential industrial use.

X 2. Discovery and verification of the trans-uranium chemical elements 93, 94, 95 and 96, and the large-scale production of 94, plutonium, for use in the atomic bomb.

3. Use of the antibiotic, streptomycin, for the treatment of many diseases, especially those not cured by the sulfa drugs and penicillin.

X 4. Development of the proximity fuze.

5. Development and use of loran, which allows determination of exact positions at sea and in the air through use of exactly timed radio signals.

6. Use of psychological warfare methods in hastening the Japanese unconditional surrender.

7. Development and use of BAL, a kind of alcohol, for the treatment of arsenic and mercury poisoning.

X 8. Development and use of the chemicals, ANTU and 1080, for killing rats and other rodents.

9. Successful transplantation of hearts in warmblooded animals.

10. Steps taken in Congress for the establishment of a National Science Foundation.

Some of these developments were actually made before 1945 but on account of war secrecy were not announced until 1945.

Science News Letter, December 22, 1945

"X" Marks the Spots where Monsanto Served

Monsanto Chemical Company's slogan, "Serving Industry...Which Serves Mankind," finds practical expression in the list above. The scope of Monsanto chemical research, engineering and production is indicated by the fact that this organization shared in *four* of the ten scientific achievements selected by Mr. Davis as outstanding for 1945.

ATOMIC POWER — In the words of an army message of commendation: "Monsanto completed vital research and solved production problems of extreme complexity without which the atomic bomb could not have been."

More than 200 scientists worked on special research phases of the program at Monsanto's Central Research Laboratories. At Clinton Laboratories, Oak Ridge, Tenn., Monsanto is carrying on additional atomic research.



TRANS-URANIUM ELEMENTS — Monsanto's contributions to this scientific accomplishment paralleled its work in other phases of atomic power.

PROXIMITY FUZE — New plastics materials developed by Monsanto's Plastics Division were used in this device.

"1080" RODENTICIDE — Monsanto is the world's sole producer of this effective new rodent-killing chemical, developed by the U. S. Fish and Wildlife Service. Available only to pest-control operators because of its lethal qualities, "1080" is expected to reduce materially the annual damage caused by rats . . . estimated at \$500,000,000 a year in the United States alone.

MONSANTO CHEMICAL
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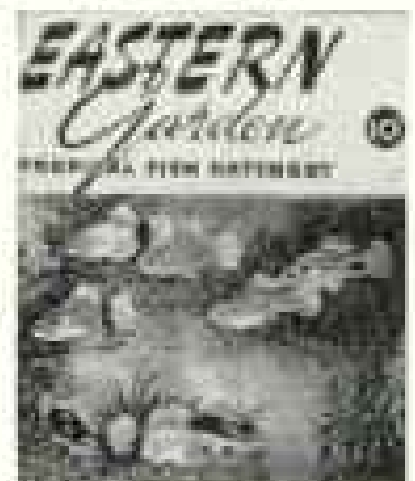
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RCA Victor home television receivers will be available in two types. One model will have a direct-viewing screen about 6 by 8 inches. The other type will be similar to the set shown above—with a screen about 15 by 20 inches. Both instruments are being readied for the public with all possible speed and should be available this year.



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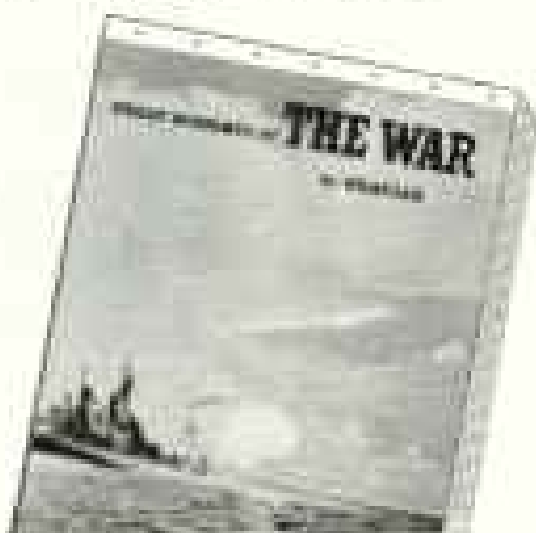
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Its formidable thorns are hollow. And living comfortably inside them you are liable to find numbers of stinging, biting ants, which swarm forth viciously at an intruder's touch and warn you to seek closer contact at your peril.

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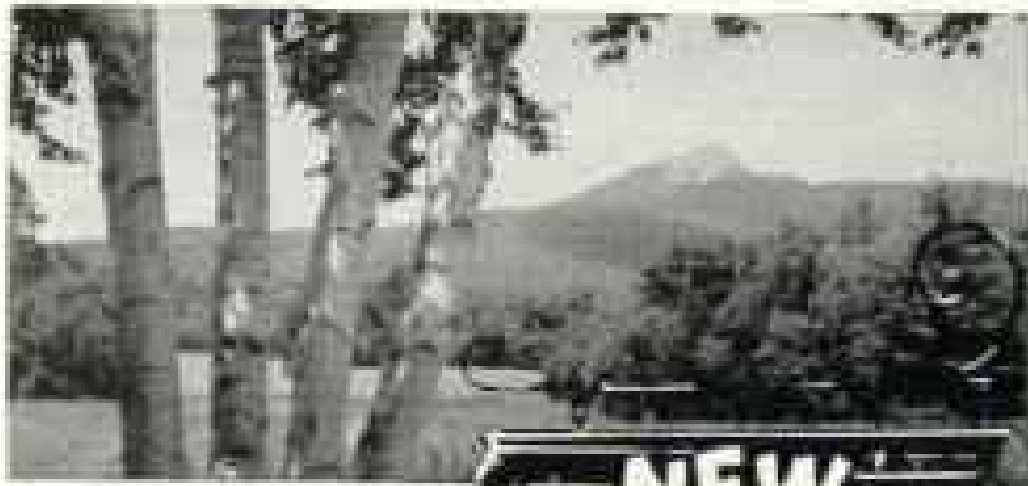
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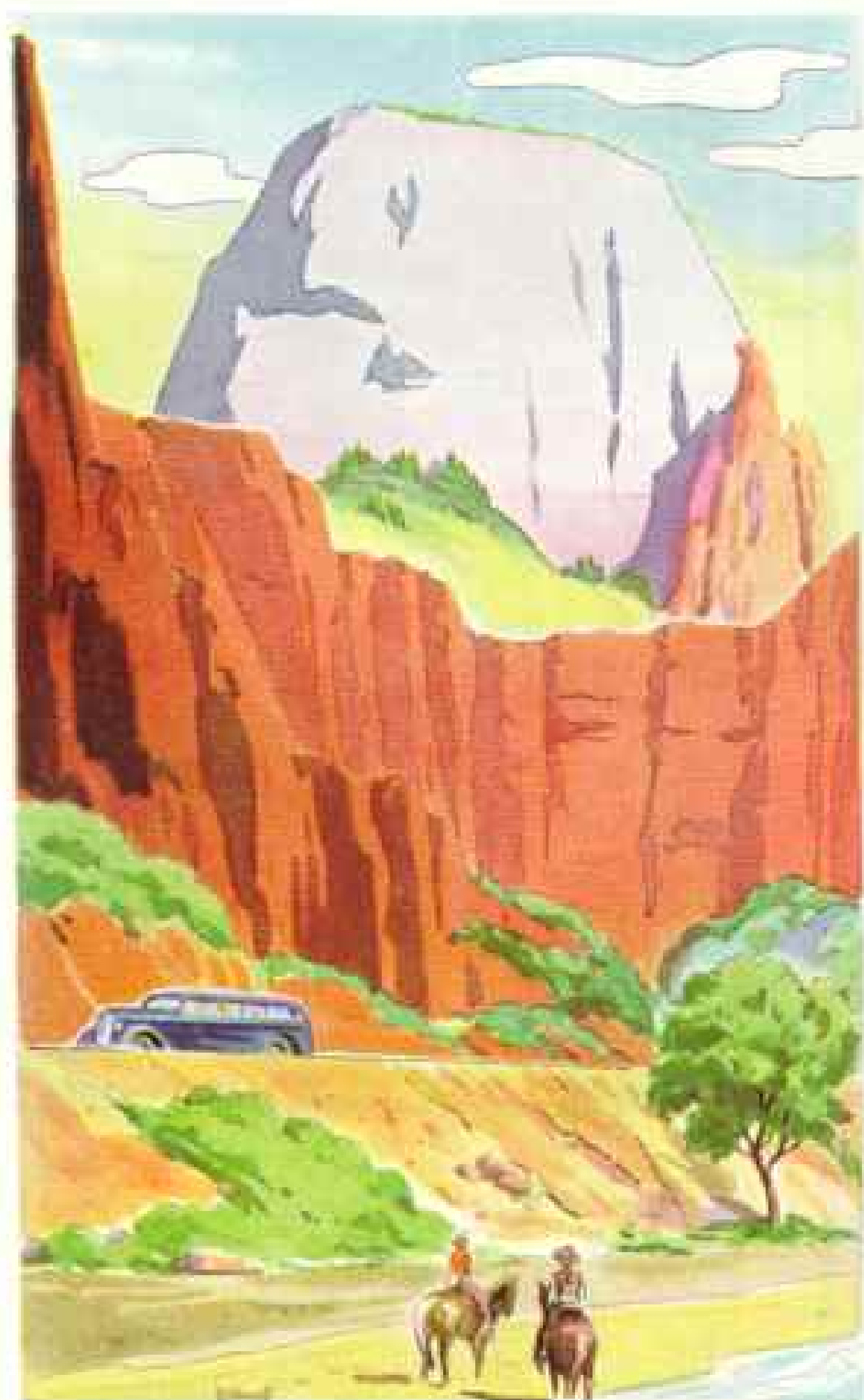




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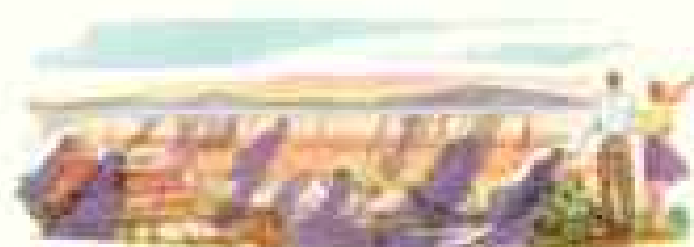


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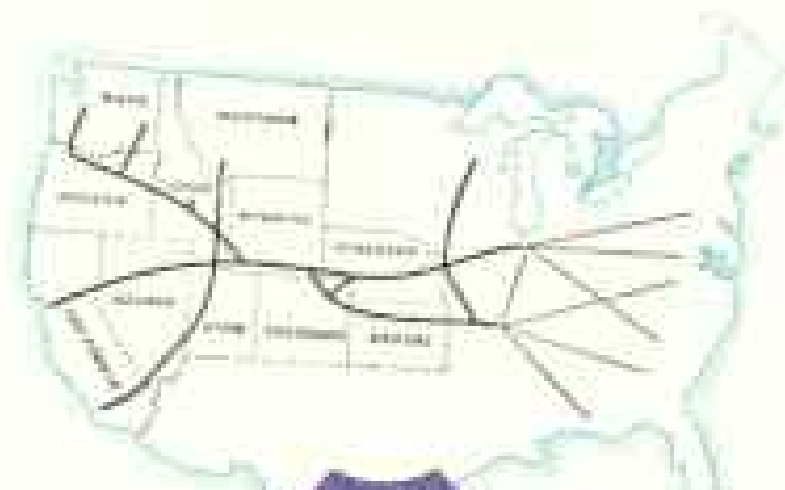
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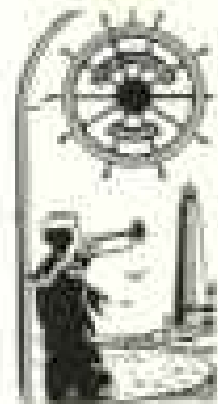
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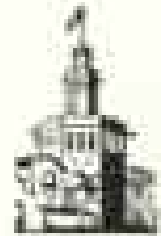
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—Highly corrosive acids help refine America's oceans of high octane gasoline. But today's refineries withstand fierce acids, high temperatures and pressures—because CHROMIUM stoutly fortifies their metals.



WHY CAN THIS TRUCK "take it"?

—The steels of many truck and automobile bodies, springs, gears and other parts contain CHROMIUM—for chromium helps give these steels amazing resistance to shock, fatigue, wear.

CHROMIUM is well known to many people for the powerful influence it exerts upon steel. Most of the alloy steels relied upon today for beauty, durability, and resistance to heat and corrosion now contain this interesting element.

Many years ago Units of Union Carbide discovered how to extract chromium from its native ore. They since have been constantly at work on the ever growing list of chromium alloys and their uses.

Union Carbide does not make or fabricate steel.

ELECTRO METALLURGICAL COMPANY and other Units of UCC, however, supply to industry such wonder-working metals as chromium, manganese, and vanadium. With these, and the many other basic raw materials produced by UCC, industry improves a thousand and one products that serve all of us.

FREE: "PRODUCTS AND PROCESSES OF UCC," Booklet E-4, tells an illustrated story of many basic materials industry uses to build this world about us. Send for a copy.

UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street  New York 17, N. Y.

Principal Units in the United States and their Products

ALLOYS AND METALS—Electro Metallurgical Company, Harnes Stellite Company, Kemet Laboratories Company, Inc., United States Vanadium Corporation

CHEMICALS—Carbide and Carbon Chemicals Corporation

PLASTICS—Bakelite Corporation

ELECTRODES, CARBONS AND BATTERIES—National Carbon Company, Inc.

INDUSTRIAL GASES AND CARBIDE—The Linde Air Products Company, The Oxwell Railroad Service Company, The Frost-O-Lite Company, Inc.