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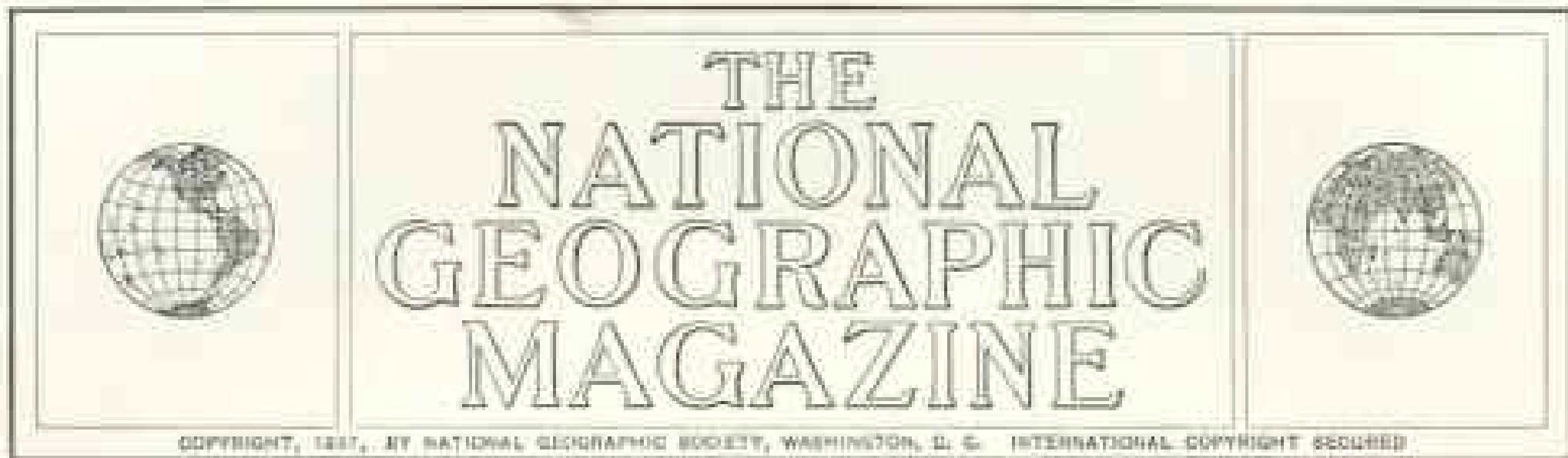
With 21 Illustrations and Map

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## THE MIRACLE OF TALKING BY TELEPHONE

BY F. BARROWS COLTON

**T**HE crash of exploding shells, falling in the heart of beleaguered Madrid, is familiar to newspapermen in peaceful London, more than 800 miles away. For months now they have been hearing the roar of bombardment in the background while listening to long-distance telephone reports from war correspondents in the Spanish capital.

When Britain's King Edward VIII abdicated, and later when George VI was crowned, reporters in London telephoned news stories across the Atlantic direct to their New York offices as readily as a local reporter might phone a story of a holdup from the corner drugstore. News dispatches now are telephoned across the Atlantic almost every day, and just as easily across the Pacific.

A London newspaper correspondent, while asking Los Angeles about an earthquake, heard the sound of a shock, 5,500 miles distant.

Thus has the telephone shrunk time and space. It figuratively has contracted our planet from some 25,000 miles to about 300 feet in circumference.

### A "SHOUT" THAT GIRDLES THE GLOBE

If you stand at one end of a football field and shout, your voice will travel to the other end, 300 feet away, in about one-third of a second. But your voice, traveling by telephone, would take less than one-third of a second to travel all the way around the earth.

The electrical waves that are created when you speak into a telephone transmitter have in effect increased the speed of sound nearly 400,000 times.

You can telephone around the world, moreover, without even raising your voice, whereas it takes a good loud shout to be heard even the length of a 300-foot field.

Today, however, even a man with a bad cold can "shout" across an ocean, and the telephone enables him to do it with as much power as if all the millions of people in the United States were standing on the beach and shouting with him as one man.

That is the estimated amount of power given to a single human voice by the amplifiers that launch transatlantic radio telephone conversations out on the air lanes overseas.

Even though it takes the energy of a nation's lung-power to "shout" across the ocean, ears of superhuman keenness are needed to hear even so tremendous a noise when it arrives. For the large amount that starts across the ocean dwindles, after traveling 3,000 miles by radio, to no more than the energy that would fall upon your outspread hands from the far-away North Star.

Yet sensitive, keen-eared antennas pick up this tiny wisp of speech and it is amplified several million fold for easy conversation.

A man may whisper into a telephone in Washington, and be heard in San Francisco. From London you may say to a girl in Cleveland, "Will you marry me?" and hear her say "Yes" as easily as if she sat beside you in the moonlight. A suitor in London really did propose that way to a girl in Cleveland, and won her, too, though he had to talk half an hour!

Radio telephone connections from the United States bridge enormous distances. The circuit to Australia, for example, consists of a radio channel across the Atlantic.



Photograph by R. I. NeSmith

#### CALLING BUENOS AIRES, BERLIN, OR OSLO? THE NUMBER IS HERE

This desk in the overseas switchboard room in New York City has 80 telephone directories from all over the world, in every well-known language. Through the left end of the switchboard in the background, under the signs saying "London," overseas radio telephone calls to Great Britain, Europe, India, Africa, and Australia are routed, for all these parts of the world connect with New York through London. The two signs over the right end of the switchboard read "Buenos Aires" and "Rio de Janeiro," and from this part of the board South American calls are radiated (p. 413).

linked with another from London that jumps eastward to Sydney a distance of 10,600 miles. And when radio transmission is better in the other direction the circuit runs *westward* from London to Sydney some 14,400 miles.

#### THE LONGEST LONG-DISTANCE CALLS

The longest telephone call you could make from any point in the United States would be from Bay, California, to Adelaide, Australia, via New York and London, about 18,000 miles. It would include both wire and radio circuits.

The longest telephone call within the United States would be from Eastport, Maine, to Bay, California, 2,910 airline miles.

Today any conversation between continents half a world apart is far easier and clearer than was the first telephone message sent over a wire stretched only between two rooms, when Alexander Graham Bell in 1876 said to his assistant:

"Mr. Watson, come here. I want you."\*

In 61 years, less than a lifetime, the telephone has grown from a scientific toy to a world-wide workaday network.

A manufacturer in Ohio tooted his new two-chime automobile horn over the transatlantic telephone to a prospective customer in England, and landed a big order.

A buyer for a New York store who never

\* See "Prehistoric Telephone Days," by Alexander Graham Bell, NATIONAL GEOGRAPHIC MAGAZINE, March, 1922.



THE TELEPHONE'S INVENTOR STARTS THE FIRST NEW YORK-CHICAGO CONVERSATION

In 1892, only 16 years after he invented the telephone (page 396), Dr. Alexander Graham Bell inaugurated this new service, speaking over 800 miles of open wire line. Today all connections between these cities are in underground storm-proof cable. The man with the full beard directly above Dr. Bell is John E. Hudson, then President of the Bell Telephone Company; and to the right of him, looking down, is Edward J. Hall, Jr., Vice President of the company. Dr. Bell was President of the National Geographic Society 1896 to 1903, and a life trustee until his death in 1922.

has been outside the United States makes purchases in half a dozen European countries in a single day, by telephone.

An Englishman in London, learning to play the bagpipes, was "stumped" by a difficult piece of music and called his teacher in Scotland.

The teacher played the piece over the phone to his pupil correctly; then the pupil played it back while the teacher listened. And so they skirled away on the pipes back and forth to each other over the wire until the composition was mastered. Presumably the pupil paid the toll charges!

In the United States, most telephone-minded of all countries, 85,000,000 telephone conversations take place every day. This means, with two people to each con-

versation, that the daily number of talkers is far greater than the Nation's population. More than 800 people talk across the United States every business day.

"Out of reach of a telephone" is almost unheard of in this country, with 19,100,000 instruments, or one for every seven people. Of a total of 38,000,000 telephones in the entire world, half are in the United States.

#### NEW YORK CITY HAS MORE TELEPHONES THAN FRANCE

New York City alone has more telephones than all France with a population of nearly 42,000,000. Chicago has more than all South America. There are more in Los Angeles than in all of Africa.





Photograph by J. Bayler Roberts

"PAGE ONE," A THOUSAND EDITORS WILL SLUG THIS "WIREFOTO"

Within an hour newsboys from Boston Harbor to the Golden Gate were yelling: "All about the Roosevelt-DuPont wedding!" Here a picture of the bridal party is mounted on a roller in the sending apparatus of the Associated Press in New York City. As the roller turns, a tiny light moves over the picture, and dark and light areas are translated into electric impulses flashing over special wires of the telephone system. At the receiving end the impulses are turned back into light, exposing a negative on another revolving roller. When developed it provides a duplicate of the original photograph. Telephone engineers perfected the "Wirephoto," one of several "picture-by-wire" systems now in use.

By merely picking up the receiver of almost any telephone in the United States, you may call any number in the Nation, and almost any number in the world. Some 35,200,000, or 93 per cent of the world's telephones, can be reached from the transmitter on your desk.

On a round desk at the overseas switchboard in New York City are 80 telephone directories from all over the world,

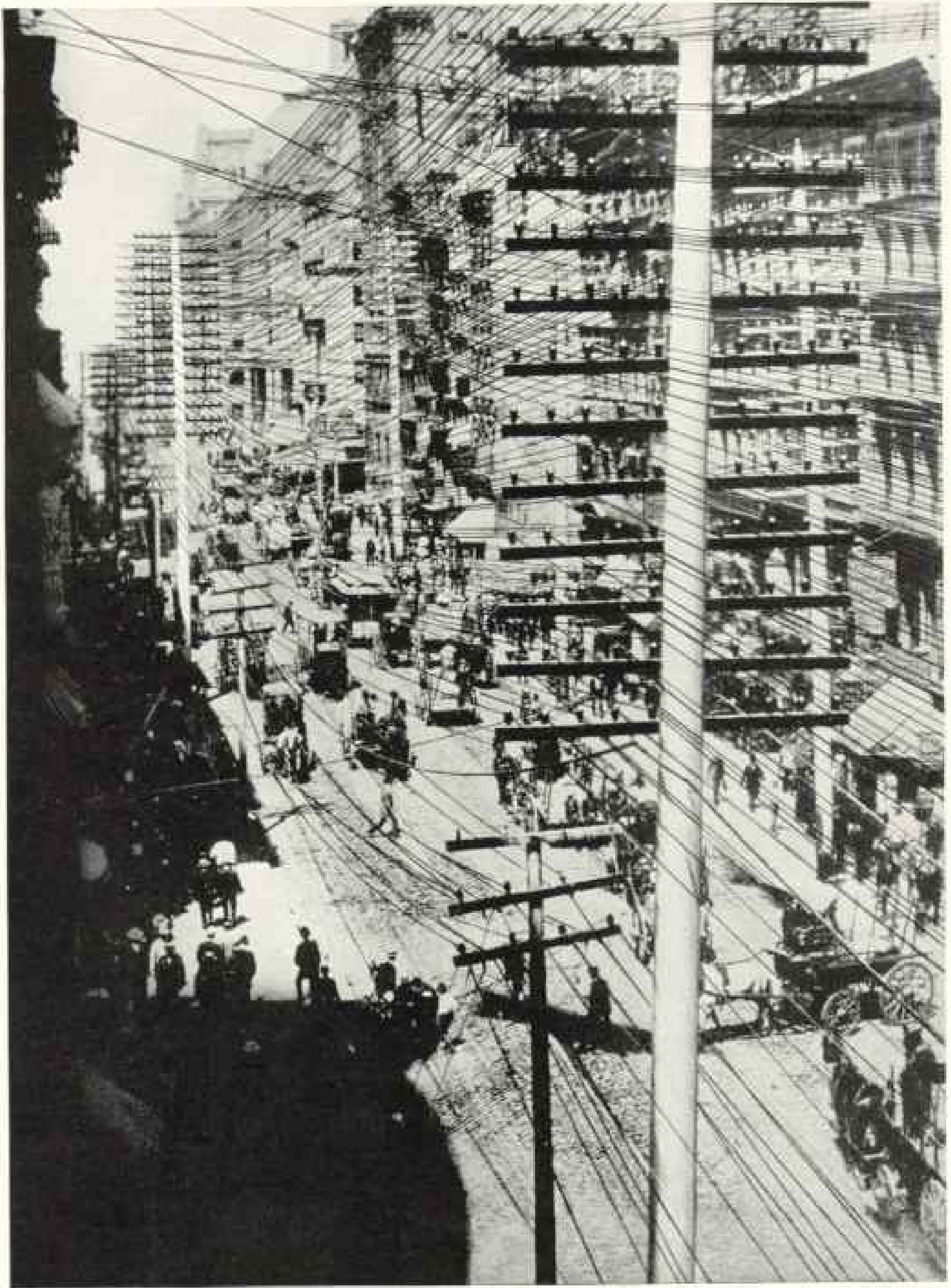
in every well-known language, but in appearance very much like the familiar American telephone book—fat ones for London, Paris, Berlin, Tokyo; thinner ones for Rome, Habana, Dublin, Madrid; some, such as those of the Netherlands and Switzerland, containing all the telephone numbers of a nation in a volume or two (page 396).

The telephone systems of some 70 countries now are connected by wire or radio to the telephone in your own home. You can telephone to Iceland's icy mountains (but not to Greenland's yet) or India's coral strand, to Chile or Costa Rica, to Palestine or Panama, to Java or Japan.

Only two large telephone systems, those of the U.S.S.R. and New Zealand, are not yet connected with the United States.

In 1878, only two years after his first successful telephone conversation, Alexander Graham Bell wrote:

"It is conceivable that cables of telephone wires could be laid underground, or suspended overhead, communicating by branch wires with private dwellings, country houses, shops, manufactories, etc., uniting them through the main cable with a central office where the wire could be



Photograph by Morris Rosenfeld

ADD ALL THE NEW TELEPHONE WIRES TO THIS MAZE OF 1887, THEN PICTURE  
LOWER BROADWAY TODAY!

Some poles were 90 feet high, with 50 crossarms. This pole line near the corner of Broadway and Maiden Lane, New York, carried 150 wires. Today, under this same section of Broadway, there are about 30,000 telephone wires in 17 cables! Farther uptown, under the intersection of Seventh Avenue and West Thirty-sixth Street, 282 cables, containing about 560,000 wires, enter manholes from four directions (page 425). Pole lines today are fast disappearing in cities but still are used in rural districts.



Photograph by Acme

"THEY'RE AT THE POST!"

These linemen outside the park at Churchill Downs, Kentucky, had reserved seats for the running of the Kentucky Derby. The pole carries electric power wires above and telephone cable below.

connected as desired, establishing direct communication between any two places in the city. Such a plan as this will, I firmly believe, be the outcome of the introduction of the telephone to the public.

"Not only so, but I believe in the future wires will unite the head offices of the Telephone Company in different cities, and a man in one part of the country may communicate by word of mouth with another in a different place."

How fully his prophecy has been realized! Nowadays so many people "communicate with others in different places" that nearly *twenty-seven billion* conversations flash over America's telephone wires in a year. In the same period only thirteen billion letters and postcards are mailed, and 190 million telegrams sent.

But conversations are only part of the traffic the telephone wires carry. Few people, perhaps, listening to nationally broadcast radio programs, realize that a large proportion of their radio entertainment comes to them over telephone wires.

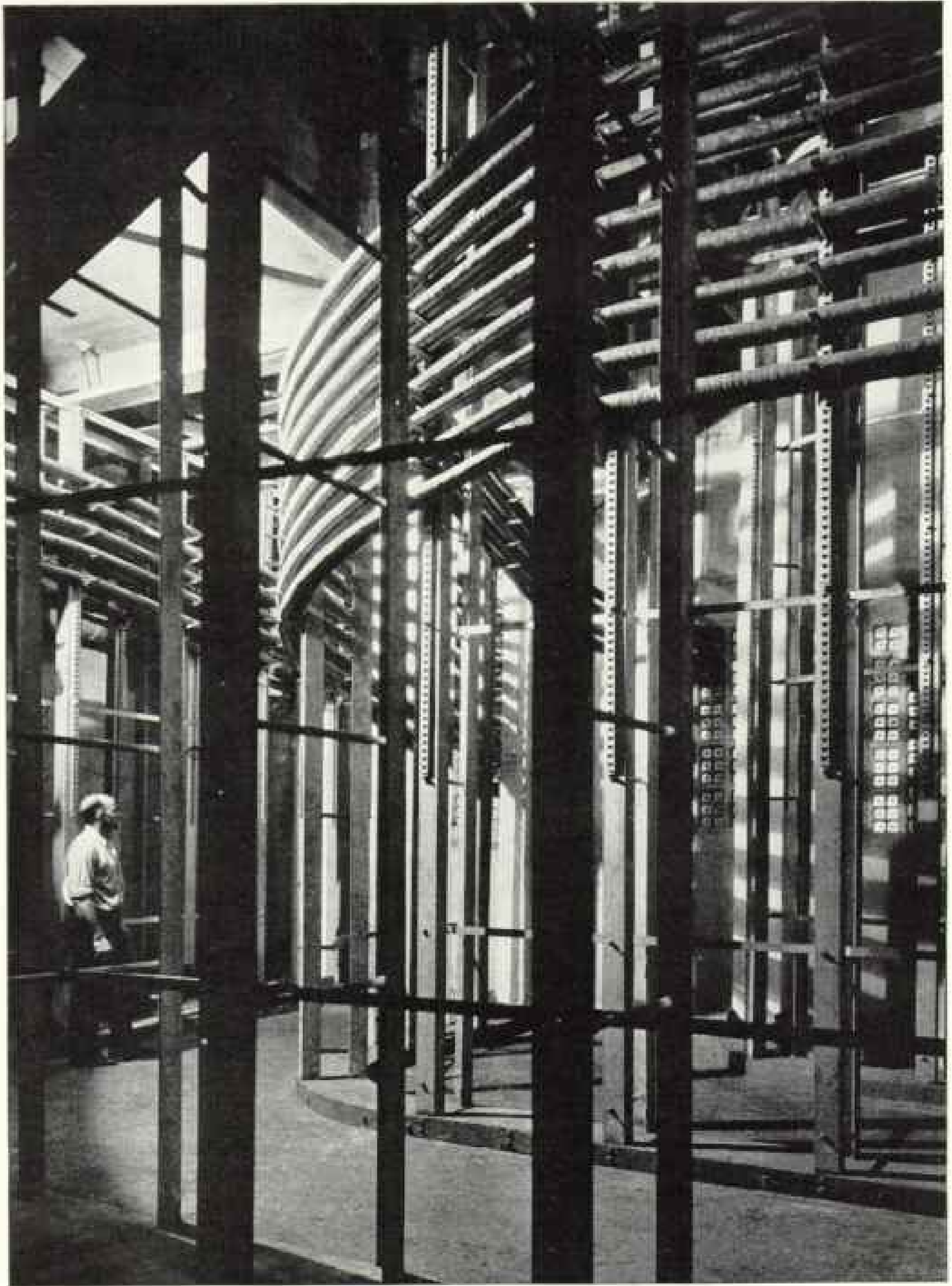
Only for a comparatively few miles from the nearest broadcasting station do network programs travel through the air, whereas they may have sped nearly 3,000 miles over a telephone wire before taking to the air at all.

News of nation and world that you read in your favorite newspaper likewise comes over telephone wires—carried not by human speech, but by electrical impulses that flash over the wires and with ghostly, unseen fingers type their message on a keyboardless typewriter at the receiving end, more accurately than many a human stenographer. Such is the press teletype, which delivers news, most perishable of all commodities, instantaneously to market. News photographs, too, are sent over telephone wires (page 398).

#### THE TELEPHONE CATCHES ITS MAN!

The police teletype flashes news of crime over telephone wires to officers of an entire State and whole groups of States linked in single systems. The largest now includes New York, New Jersey, Connecticut, Massachusetts, Rhode Island, Pennsylvania, Delaware and Ohio (page 404).

Four men broke into a jewelry shop at Beacon, New York. Surprised by local policemen, three escaped in an automobile, heading toward New York City. Alarms were flashed over the Westchester County police teletypewriter system and to New



A THIRD OF NEWARK'S PEOPLE MIGHT TALK THROUGH HERE, AND NOT A SOUND BE HEARD

From beneath the streets of Newark, New Jersey, 66 telephone cables containing 145,348 wires are marshaled in this vault, each in its niche. Engineers can locate instantly any individual line in this maze. Each pair of wires can carry one conversation, so that 72,674 conversations could pass at once through the vault, though in practice that does not happen. From here the cables pass to the floor above where the wires are "fanned out" to automatic switchboards in the new dial central office. The white squares in the background, right, are plugs in spare ducts where more cables may enter when needed.





Photograph by J. Bayler Roberts.

EVERY WIRE GOES SOMEWHERE—AND HE KNOWS WHERE

Hopeless would seem this man's job of correctly splicing the 3,600 wires in one telephone cable to the corresponding 3,600 in another, but it isn't. The wires first are separated into bundles, those in each bundle having the same color of insulation. Then each wire in a bundle is identified by buzzer signals between the splicer and men at the other ends of the cables. At least 15 other cables pass through this telephone manhole at Thirty-third Street and Second Avenue, New York City. Nearly 12,000,000 miles of telephone wire run under New York's streets to serve more subscribers than there are in all of France (p. 397).

York police. Once, on their flight southward, the robbers were sighted and a new alarm broadcast.

Officers all over the county were on the lookout for them, for the teletype alarm was relayed to police call boxes. At Yonkers a county policeman saw the bandits and waved them to stop, but they opened fire on him. Pursuing them on his motorcycle, he forced their car into a ditch and collared one bandit in a hand-to-hand struggle.

The other two eluded him, commandeered a taxicab and started a new for New York City. But the taxicab itself soon was traced, through a teletype alarm, by New York police, who killed both bandits in the resulting fight.

SOME AMAZING FEATS AND FIGURES

America is the land of bigness and its telephone industry fits into that picture: enough telephone wire in North America to tie the earth to the sun, 93,000,000 miles away, and start us circling around Old Sol like a pebble on the end of a string. Enough telephone poles in the United States to build a solid fence 30 feet high from New York almost to San Francisco. Enough underground conduit for cables to make 15 small tunnels straight through the earth from pole to pole.

But the things the telephone does are far more wondrous than its size. Consider a few examples:

The dial system, a mechanical operator with an electrical brain, which in large cities gets your number for you as speedily and efficiently as the best human "hello girl" could (page 408).

Wires that can carry several conversations at once, moving together like the people in a crowd, but each retaining its

identity, and at the receiving end separating itself from the others and reaching the proper listener (page 426).

A network of through telephone circuits between cities and sections of the country makes it as easy now to telephone a relative across the continent as to telephone your local grocer to send up a peck of potatoes. Today 92 per cent of all long-distance calls are completed while the person calling remains at the telephone, and the average time taken for putting through such calls is one and one-half minutes.

In early telephone days, when service was informal and lines were few, it was not at all unusual for an operator to receive a call from a housewife and hear her say: "Mary, please see if you can find Charles and have him bring home some hamburg steak for dinner." In some small, isolated places that still happens.

Today, you seldom know your operator by name, but she still will find people for you, across a State or across a continent.

A subscriber said: "I want to talk to a man down on Cape Cod. I don't know his name or town. But he raises Bedlington terriers and has chin whiskers like Horace Greeley's." The operator found him.



Photograph by J. Dayle Roberts

#### "SPINNERS OF SPERCH" KNOCK OFF FOR LUNCH

After a morning of work in the near-by manhole, patiently connecting hundreds of wires to join two telephone cables, this crew comes up to the street for lunch in the shadow of an elevated railroad structure. The al fresco meal is being self-served at Thirty-third Street and Second Avenue, with the Empire State Building for a backdrop. Crews such as this keep in working order the maze of telephone cables under the streets of New York. The man seated at left is shown at work in the picture on the opposite page.

A prominent business man was killed in an accident. His wife was in California, but no one knew just where. The chief long-distance telephone operator in New York set to work to locate her. Hotels in the southern part of the State were tried without success.

Finally she phoned the society editor of a Pasadena newspaper, and learned that the lady was visiting a Pasadena family. Calling that family, the lady was found, just 22 minutes after the hunt began.



Photograph by J. Baylor Roberts

"ARREST AND HOLD FOR BANK ROBBERY TWO WHITE MEN . . ."

On May 7, 1936, that message from Adams, New York, flashed by teletype to hundreds of police headquarters in eight States. It continued, "HELD UP BANK AT LACONA, NEW YORK, ABOUT 12:30 P.M. E.S.T. THIS DATE THEY SHOT THE PRESIDENT OF THE BANK." Followed a description of the culprits. Chapter two was added by Hawthorne, New York, with this bulletin: "SPECIAL ATTENTION TO BE GIVEN TO ALARM 697 SYRACUSE WHICH REPORTS FORD SEDAN LIC 7 Q 3798 MOTOR 2538199 AS STOLEN STOP THESE PLATES COMPARE WITH THOSE USED IN HOLDUP." Finale, as recorded at bottom of the teletype file sheet, "BOTH MEN APPREHENDED AND CONVICTED MURDER FIRST DEGREE AS PRESIDENT OF BANK DIED AS RESULT WOUND."

Queer things go into making America's telephone service so efficient—from soap-suds to the lack of scratches on a steer's hide.

If you see a workman painting soap-suds on a section of telephone cable it means he is meticulous, not about cleanliness, but about leaks. Even the tiniest pin-hole may admit moisture and cause trouble. So nitrogen gas under pressure is pumped into the cable, and if it leaks at any point, a bubble of soap-suds will tell the tale.

Cables have been protected in flood time, too, by pumping gas into them at high enough pressure to keep water from entering tiny holes that might exist in the sheath.

If ever you see a steer scratch himself on a barbed-wire fence, be assured that that portion of his hide never will go into the

making of a telephone lineman's belt. Scratches weaken leather, and linemen climbing poles trust their lives to their belts (page 400).

#### THE ELECTRICAL EARDRUM

The telephone works in very similar fashion to the human ear. In fact, the ear itself actually was the first "telephone," and an electrical one at that.

To make a man hear, you push and pull on his eardrum, causing it to vibrate thousands of times a second. You do the pushing and pulling, not by grasping his ear, but by using the energy of your voice. When you speak, the tiny particles or molecules that make up the surrounding air are set in motion. They exert the push and pull on the man's eardrum. They press on it only as heavily as a snip of hair 1/1000 of an inch long—but that is enough.



Photograph by W. Robert Moore

"MARCO POLO CALLING," PHONED AN IMAGINATIVE AMERICAN YOUTH FROM HERE

Telephones now used in most of the countries of the world, transmitting many languages, all operate on the principle of the first instrument constructed in 1875 by Alexander Graham Bell in a Boston workshop. China now has about 170,000 telephones. This booth and information office are at Hangchow, at the edge of glamorous West Lake. In the background rises the Needle Pagoda. Service across the Pacific between Shanghai and the United States was started May 19, 1937.

Behind the eardrum are tiny bones and chambers of liquid which are set to vibrating as the eardrum vibrates. In the inner ear the vibrations are changed, scientists now believe, to electrical impulses that travel along nerves to the brain.

A telephone works the same way. It enables you to push and pull on a man's eardrum from a distance.

The telephone transmitter is an electrical ear. It hears what you say and sends the words by electrical impulses over wires instead of over nerves.

The air molecules set moving by your speech strike against a thin, flat diaphragm which acts like a human eardrum—it vibrates. Behind the diaphragm, instead of bones and nerves, are tiny grains of roasted coal, smaller than a pinhead, in a little chamber. Through the grains an electric current is flowing.

When the diaphragm bends inward, the grains are pushed tighter together, and more current flows. When it bends out-

ward, the pressure on the grains is released and less current flows. So the flow of current is varied as the diaphragm vibrates.

The transmitter with its battery supply is an amplifier as well. It turns the energy of your voice into electrical energy a thousand times greater.

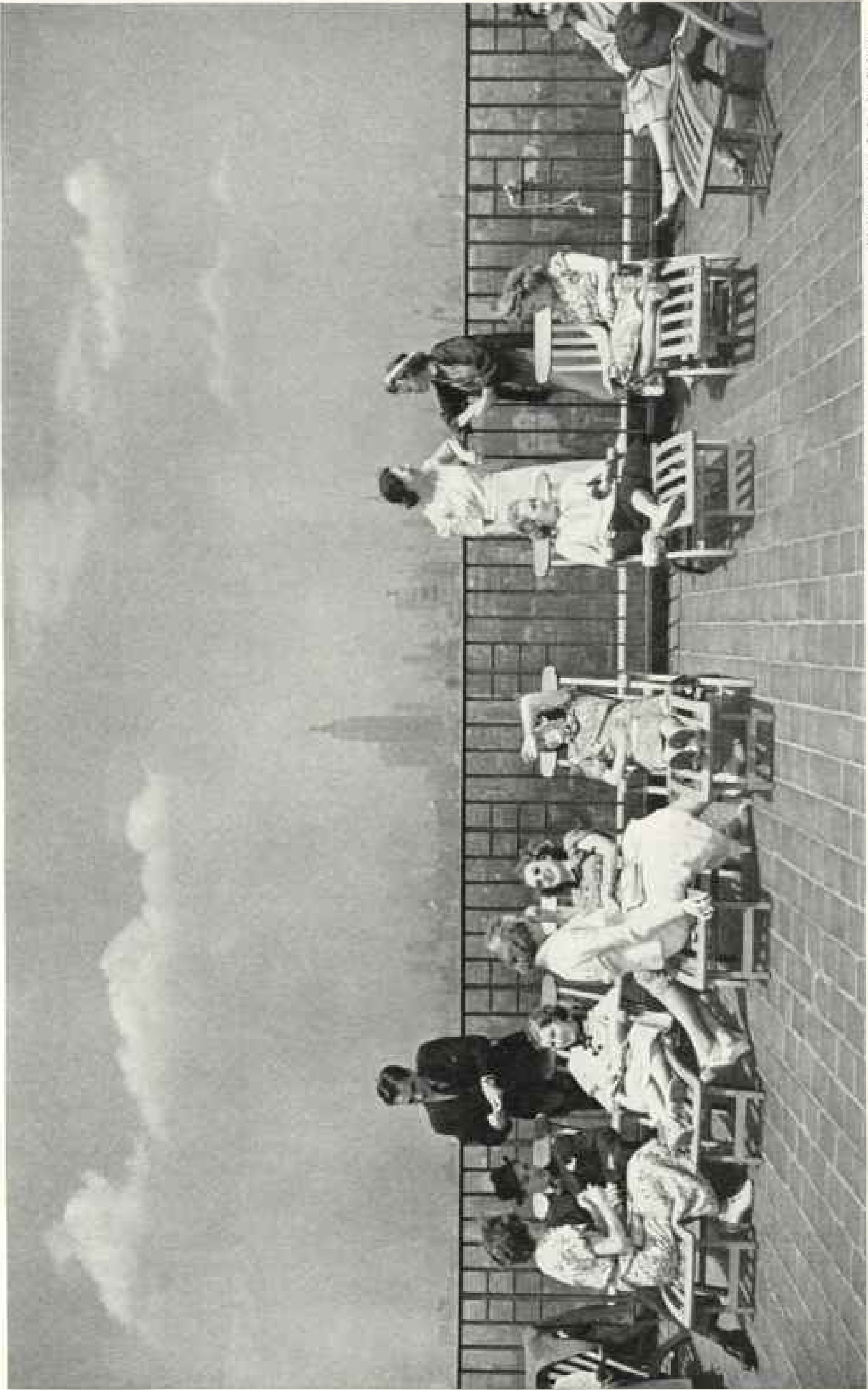
#### THE ELECTRICAL MOUTH

Through the wires current flows to the receiver, on the other end of the line. The receiver is an electrical mouth which utters human sounds. In it is an electromagnet.

The incoming current flows through wire coiled around the core of the electromagnet and the strength of the magnet's pull varies with the strength of the current. It pulls on a thin, flat disk of iron, another diaphragm, which bends just as you can bend the bottom of a tin pan.

As the strength of the current in the wire coil varies, the diaphragm bends back and forth. This also happens from a hundred to several thousand times a second.

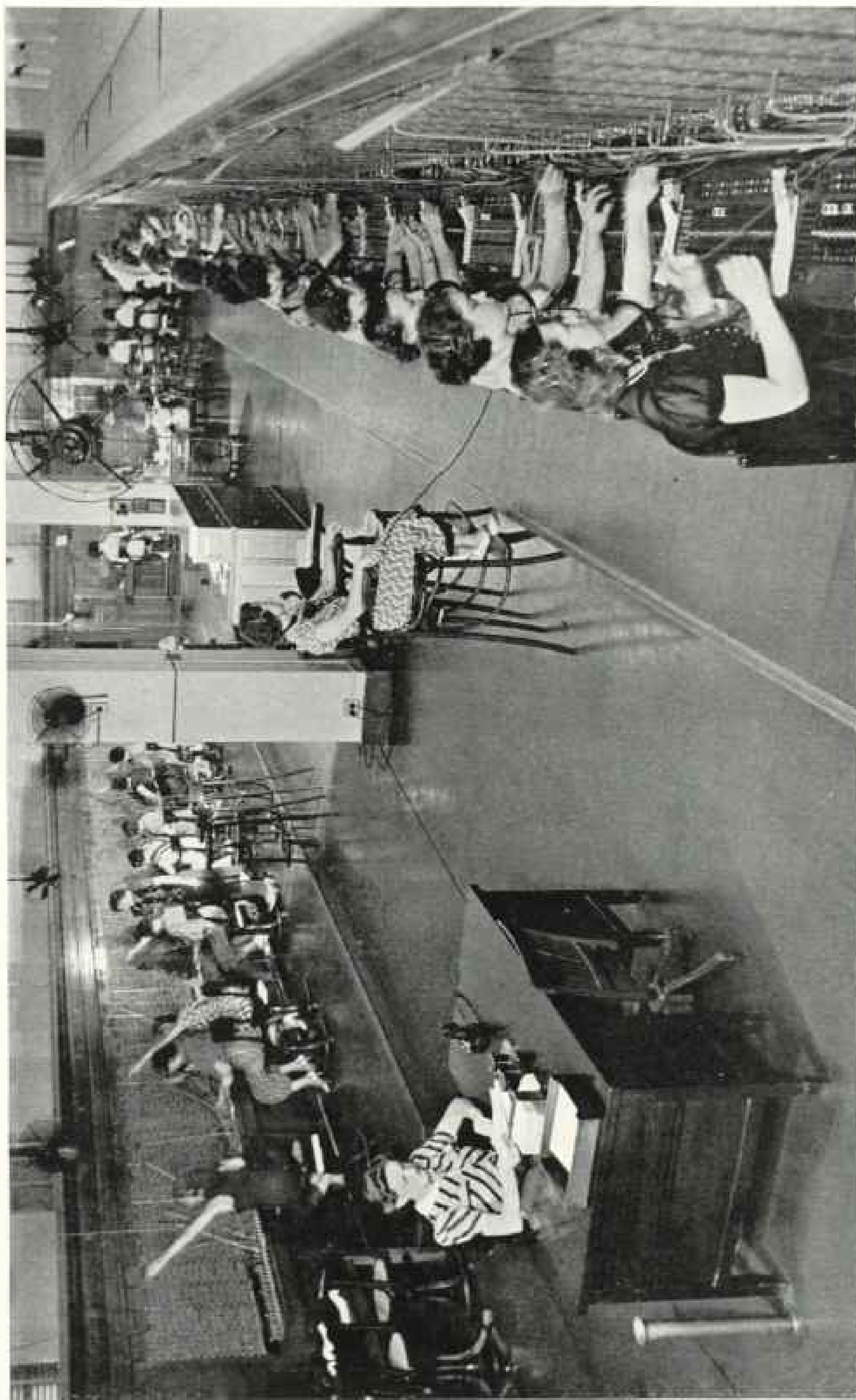




Photograph by J. Daykin Roberts

FAR FROM THE INCESSANT BLINKING OF SWITCHBOARD LIGHTS, OPERATORS RELAX ON THE ROOF.

On a sun deck 27 stories above Sixth Avenue, New York City, telephone employees enjoy fresh air, sunshine, and quiet during lunch hours and rest periods. Beyond, the tower of the Empire State Building dominates skyscrapers of mid-Manhattan.



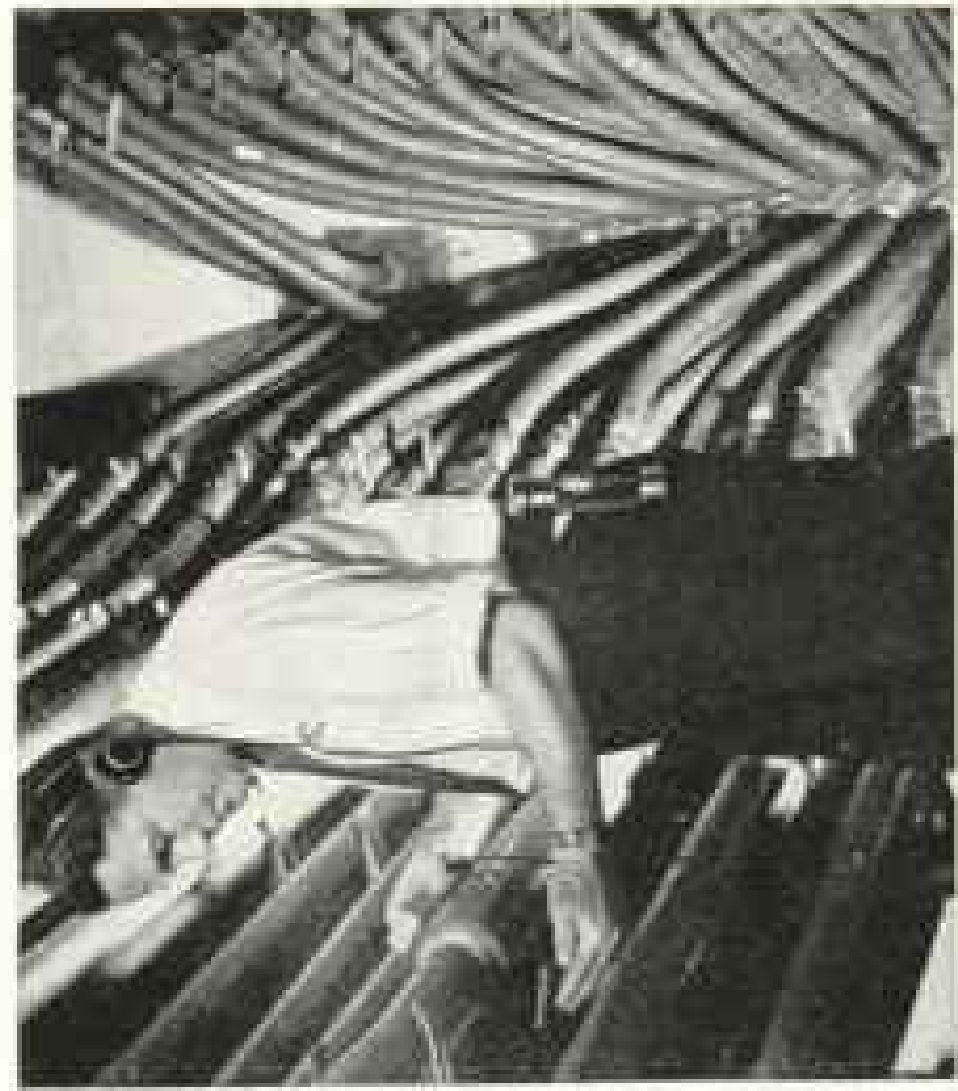
Photograph by J. Bayne Roberts

**TINY LIGHTS FLASHING, BUSY FINGERS FLYING, CORDS CLICKING, VOICES MURMURING—THAT'S A SWITCHBOARD AT WORK**

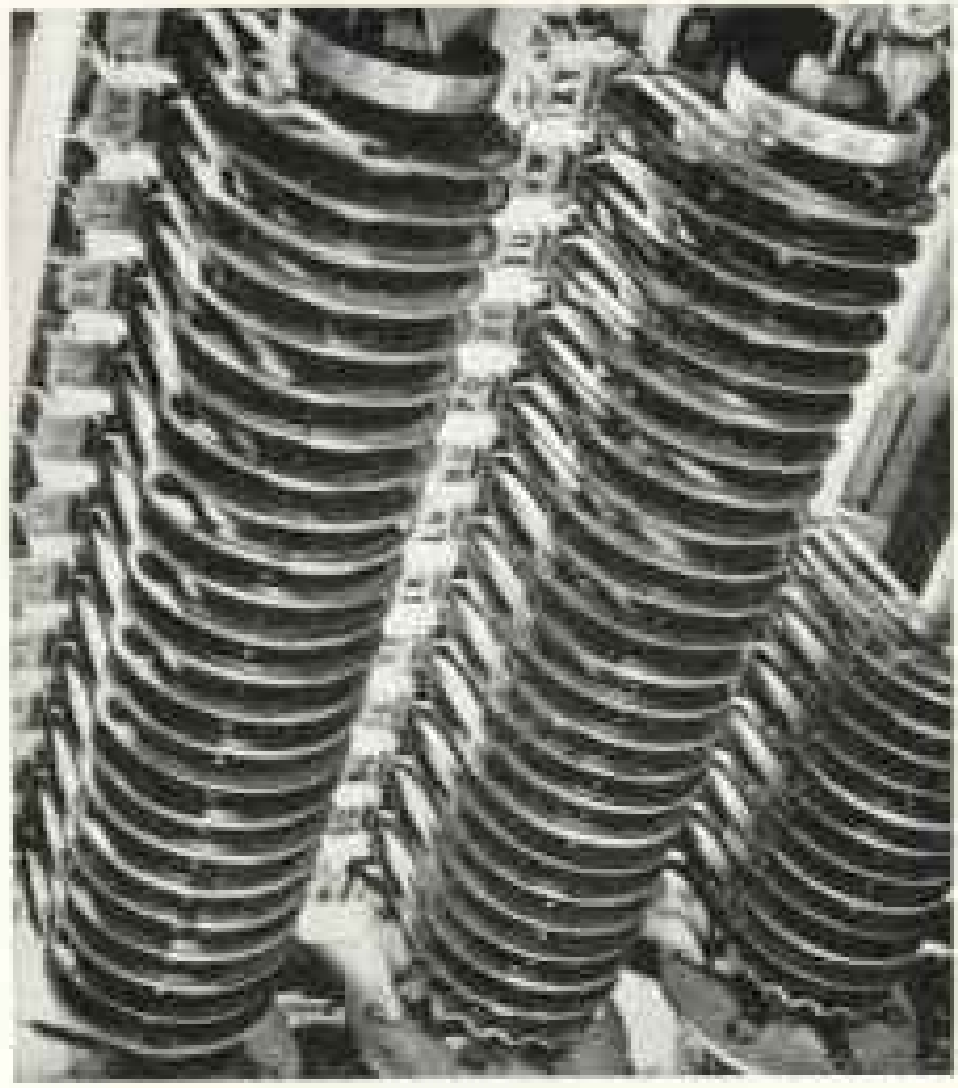
Each girl has before her rows of tiny holes, or "jacks," each one the terminal of a telephone line. By inserting the ends of a pair of switchboard cords in any two holes she connects two lines, making conversation possible. This Washington, D. C., "horsehoe" exchange has positions for 95 girls. The chief operator sits at a desk to the left. The girl in the high chair is a supervisor, several of whom are on duty in rush periods, each in charge of 10 or 12 girls.



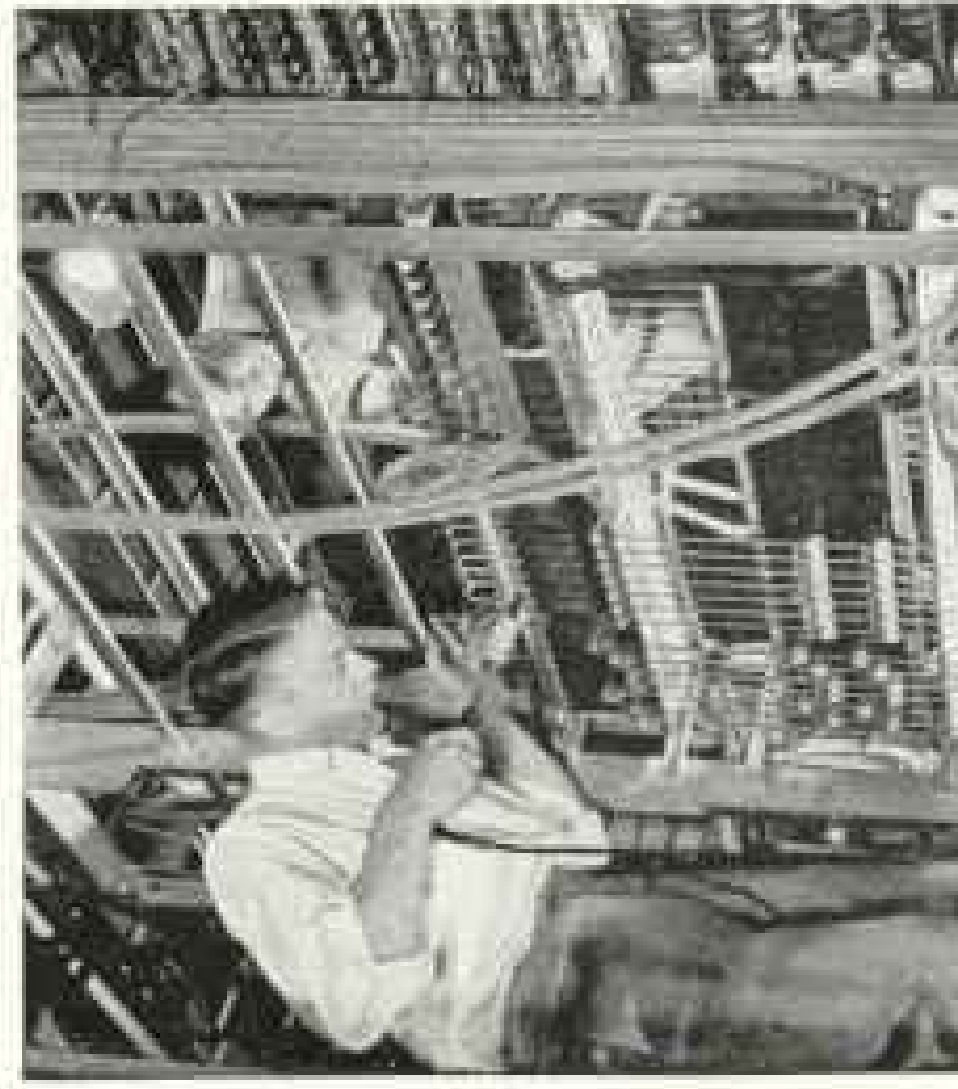
HUSBAND DIALS WO 2-1099



CURRENT FLASHES CALL THROUGH CABLES



"ELECTRIC BRAIN" RECORDS WO 2-1099



THESE WIRES FLASH "BRAIN'S" ORDERS



METAL "HAND" CONNECTS TO WO 2-1099



PHONE RINGS; FRIEND WIFE ANSWERS

Photographs by J. Taylor Roberts

These are only a few of the hundreds of intricate operations that take place in completing a telephone call by the panel type dial system (page 421). The rotary switches, upper right, form part of an "electric brain," controlled by electric relays. The link frame, shown under construction at lower left, connects incoming and outgoing wires. Like monkeys on a stick, the small metal "hands" or brushes on the rods (lower center) slide up and down automatically to select the terminal of the line desired and establish connection with it. The human hand in this picture is holding a testing tool.



Photograph by J. Baylort Roberts

"OM—WUN—TOD—THE—R—EE"

Telephone operators do not pronounce "fi-ive" or "ni-yen" to be affected, but to avoid confusing five with nine. All must go to school, where they are trained in clear enunciation of numbers and phrases, such as those on the board: "Here is your party," and "I am trying to get them." Their crisp diction and unflinching courtesy have set a national standard of politeness in business relationships. A classic story of poise is the one about an exasperated subscriber who yelled, "Are you crazy, or am I?" In even tones came the suave reply, "I am sorry, sir, but we do not have that information!"





Photograph from Keystone

**"HELLO GIRLS" OF THE GAY EIGHTIES WORE BUSTLES.**

Two "flappers" of about 1882 operate an old "lamp-shade" switchboard, a forerunner of the modern board. Early telephone operators were boys, but they "talked back" to customers and were otherwise unsatisfactory, so girls soon replaced them (page 419).

The current coming over the wires, flowing through the wire coil, thus exerts push and pull on the receiver diaphragm. As it vibrates, it imparts motion to the molecules of air in front of it. They in turn vibrate against the listener's eardrum. It vibrates, and he hears the sounds that are being spoken at the other end of the line.

**"SCRAMBLED SPEECH" INSURES PRIVACY**

The telephone is a universal linguist, though some people don't always realize it. Once an enterprising Arab merchant in the Near East had a telephone installed, and

the first customer who called spoke Greek. The Arab could not understand Greek, and in high dudgeon went to the company and told them they had given him an instrument that spoke Greek, whereas he wanted one that spoke Arabian!

The telephone not only speaks all languages, but it also has a language of its own, unlike any other tongue on earth.

Its name is "Cryptic," and it is used to maintain privacy in telephone conversations that travel overseas by radio. Some people call it "scrambled speech."

When your speech travels over a telephone wire, it is as private as if you were talking with someone in the middle of the Sahara. But when your speech goes out on the

radio waves of the transatlantic telephone, anyone might listen in to one side of the conversation simply by tuning his receiving set to the proper wave length.

Therefore, when you telephone across the ocean, your voice goes through a device that translates all your words into sounds wholly unintelligible. Your voice really is turned upside down—the high tones are turned into low ones, and the low ones into high ones. Syllables are produced with vowels and consonants that are utterly strange to the human ear.

If you heard someone say "Moshumi

Ploo-ay-gro-fuk Nogozoom," you might think that it was Japanese or Iroquois. You'd probably never guess it was "National Geographic Magazine," in scrambled speech.

If music were sent through the "scrambler," the shrill fife would be changed to the rumble of distant thunder, while the boom of the tuba and kettle-drum would sound like the squeak of badly greased wagon wheels.

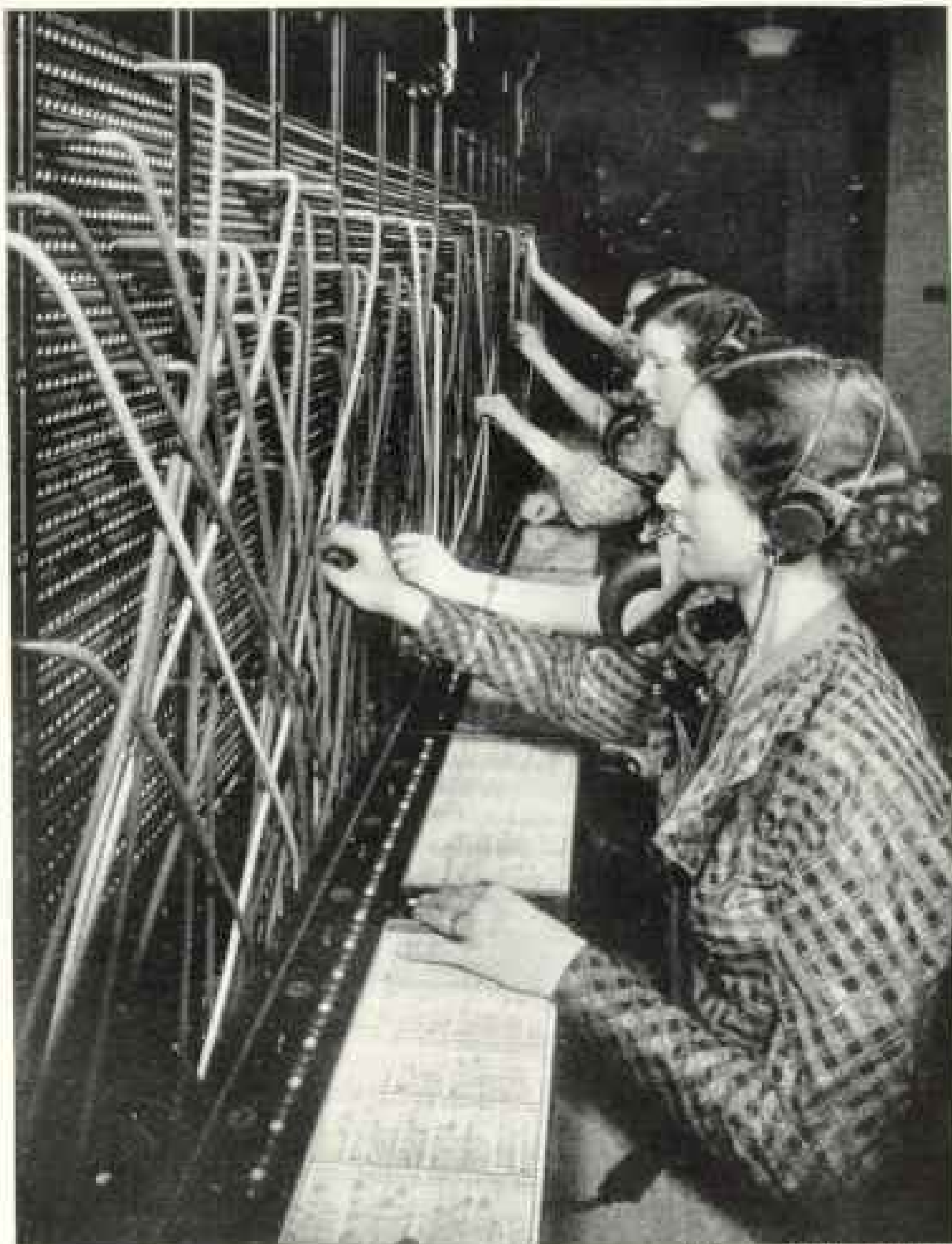
Sometimes, too, different groups of voice tones are rearranged in a wrong order, which leads to even worse confusion. An eavesdropper listening to transoceanic telephone calls could make no sense out of such gibberish.

When the scrambled speech reaches its destination, however, all tones are put back in their right order, the low tones made low again, and the high ones high, and the words you spoke originally are heard by the person with whom you are talking.

It's all done instantaneously by complex electrical apparatus which converts the various individual tones of speech into different and therefore unintelligible tones.

#### RADIO WAVES "HIT THE SKY"

Two overseas operators, one in New York, the other in London, staged a sam-



Photograph by Lasarick

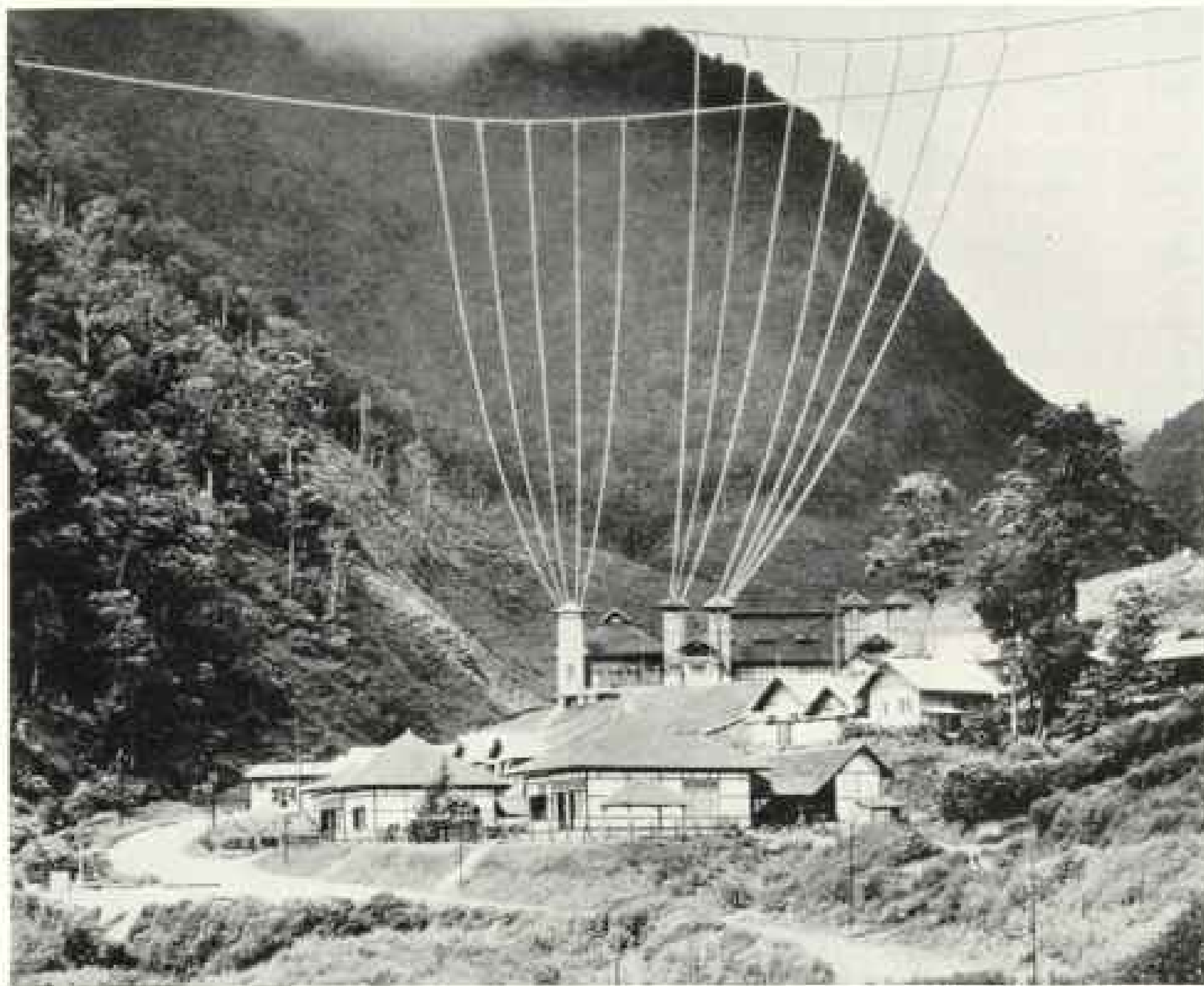
#### "CONVERSATION PIECES"—EVERY CORD A DIALOGUE

Operators' deft fingers plug in and pull out the ends of the links that tie two lines together. This is a toll tandem switchboard, at which focus hundreds of direct wires to cities and towns to speed long-distance calls and avoid putting a call through many switchboards in several towns along the route to its destination (page 420).

ple transatlantic call for me. Listening in as they talked casually back and forth, I heard their voices as clearly and evenly as if they were two village merchants chatting over the telephone.

It was hard to believe that their voices not only were being scrambled and unscrambled with lightning speed, but that also, like the elephant in the rhyme, "they jumped so high they hit the sky," not once but several times.

Radio waves (especially the short ones) in crossing the ocean are not content to



Photograph by Hagstrom

FROM THIS "SPRINGBOARD" HUMAN SPEECH TAKES OFF FOR A 9,000-MILE JUMP

A big enough "push" to carry a telephone conversation all the way across the Pacific Ocean from the Netherlands Indies to San Francisco is provided by these transmitting antenna wires at Bandoeng, on the island of Java. Transoceanic telephone conversations are borne by radio waves in a series of "bounces" between earth and sky. Starting with power comparable to a combined shout of millions of people, the words dwindle to a mere wisp of energy on the way and must be vastly amplified at the receiving station to be heard (page 395).

chug along like a sedate ocean liner. They are far too exuberant for that. They must bounce up and down between sea and sky, as a rubber ball bounces between your hand and the sidewalk. (They travel on land the same way.)

What is there in the sky for them to bounce against? Not clouds, for they bounce far higher than the clouds. Looking upward, you can't see anything, but there is something there. It's a nebulous layer of electrified particles, between 100 and 200 miles up, a kind of shell surrounding the earth as the rind surrounds a melon.

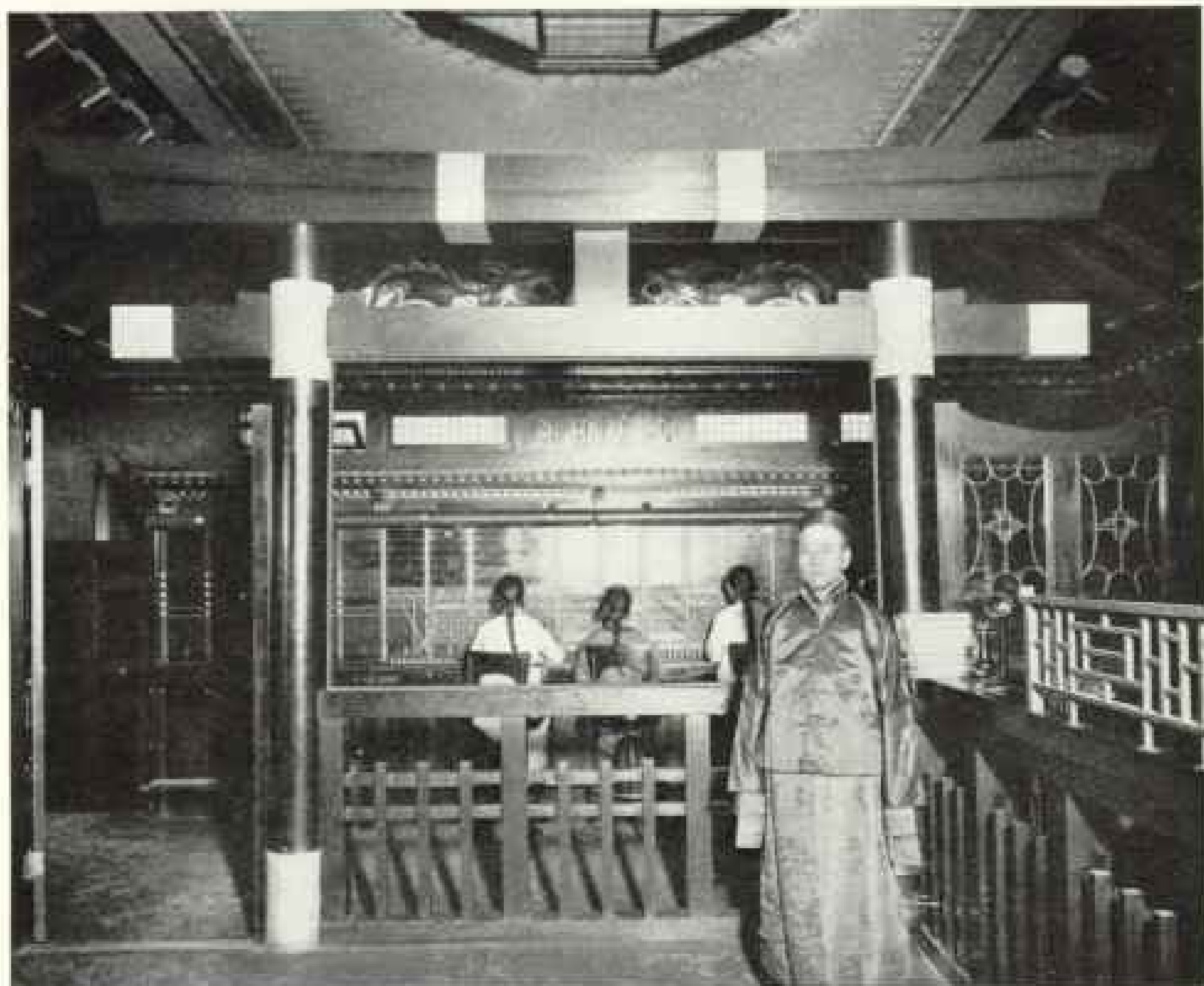
Sometimes this is called the "radio roof," or the "ionosphere." You can see through it, on out toward the stars, and if you were right in the middle of it you wouldn't know it was there. But nevertheless it stops the radio waves, and reflects them back toward

the earth as a mirror reflects a beam of light.

The earth also is a reflector, so the radio short waves usually bounce several times on their way across the ocean.

The radio roof is both a godsend and a headache to engineers. Without it, radio short waves never would cross the ocean at all, but would spirit your voice away into space to be lost forever. On the other hand, the radio waves hit the roof at various angles and so bounce along different paths. Arriving at the receiving station they may interfere with each other, as water waves from two large vessels knock each other down. This causes "fading," which does strange things to a voice.

Your Aunt Ethel, talking from London, might first sound muffled as if she were in a closet, then the next minute might seem to be shrieking in your ear. The engineers



"DAY HUEY BIN SHI AHP" MEANS "NUMBER, PLEASE?" IN CHINATOWN

But actually the telephone users of San Francisco's Chinese colony insist on calling by name instead of number, so the operators must be able to associate the name and number of every one of the approximately 2,500 subscribers. The Chinatown telephone exchange is built like a pagoda, and its interior is decorated in Chinese red, black, and gilt. The characters in the telephone directory are painted by hand with a small brush, then the pages are photographed and made into engravings from which the directories are printed. The Chinese subscribers also have their names and numbers in English in the regular San Francisco telephone directory.

come to Aunt Ethel's aid, however, with an automatic volume-control device. It tones down her involuntary shrieks and helps her shout through the "closet door."

#### OVERSEAS OPERATORS SPEAK ENGLISH

"Hello, London," "Hello, Buenos Aires," "Hello, Toyko," bouncing across vast spaces are the magic phrases that bring the world to your telephone.

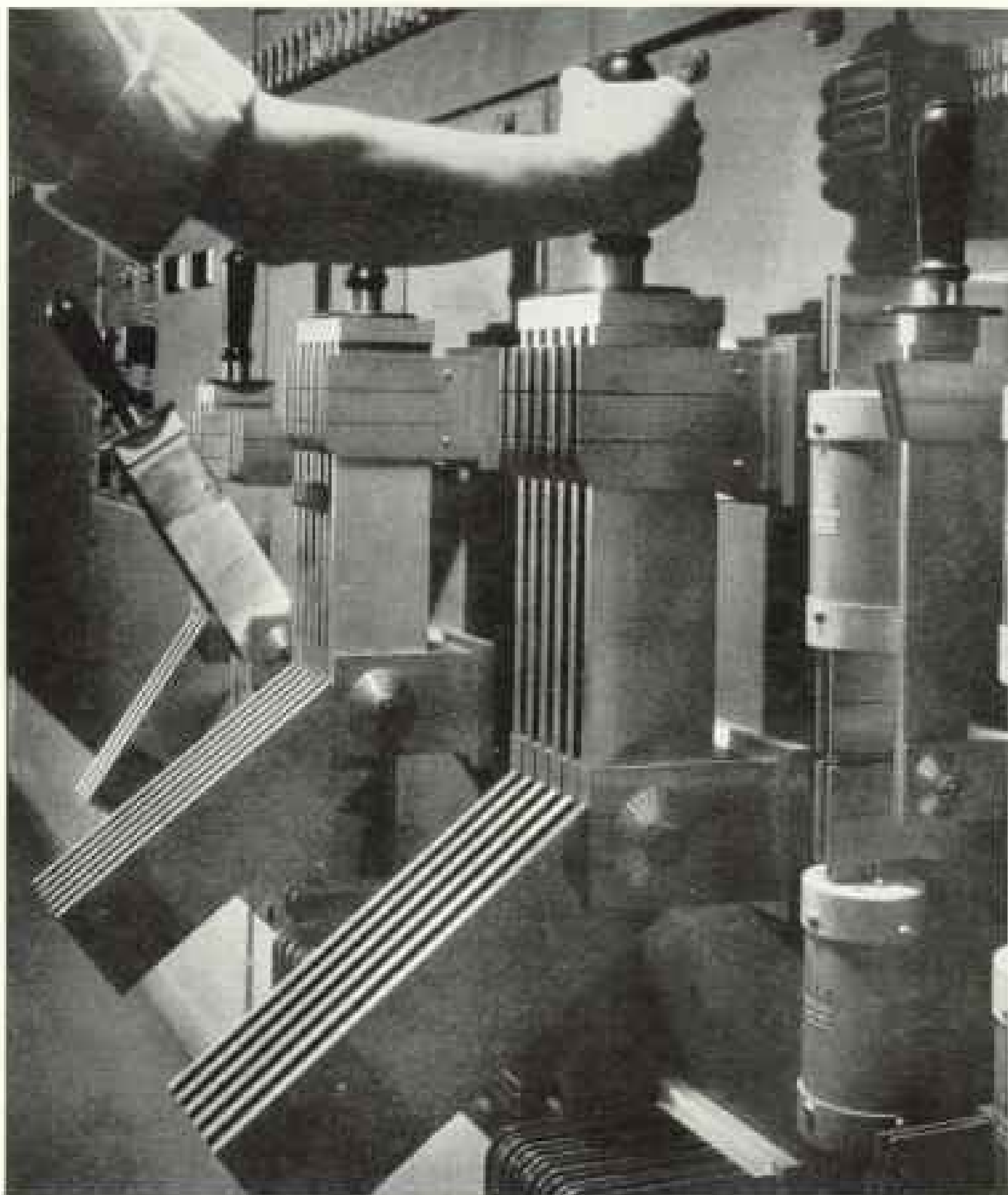
Europe, India, Africa, and Australia all connect with the United States through London or Paris by radio (page 396). With calls going to countries where a dozen different languages are spoken, you might think that the overseas switchboard in New York would be a babel of foreign tongues, with every operator speaking a different language and numbers being called in French, German, Italian, Spanish, and Swedish all at once.

Actually you will hear little but English. On the circuits across the Atlantic it is "Hello, London," or "Hello, Paris"—or "Hello, *Queen Mary*," if it's a ship you're calling. The operators at all of the foreign terminals (as well as on board the foreign ships) talk with New York in English.

Of course, if the call is destined for some more distant land, the foreign operator may pass it on in another language. For example, a call to the Netherlands would be passed in English to London, where the rest of the conversation to effect the connection might be in Dutch.

In calling South America, the operators in New York ring by radio across thousands of miles to call operators there, who speak English as well as Spanish. Calls to some South American countries are radioed from New York; other South American





THESE SWITCHES STEP UP YOUR VOICE FOR LONG DISTANCE

Through them flows power for a number of purposes, and they hurtle your voice across country. Because the original energy of the vibrations fades away rapidly there must be a new power supply and vacuum-tube "repeaters" about every 50 miles or so, each amplifying the sound 100 times (page 427). Write down 10, then add 88 ciphers, and you have the times your voice is amplified when you talk from New York to San Francisco.

countries as well as Central America and the West Indies are linked by radio with Miami.

The radiophone channels from North and South America to Hawaii, Japan, the Philippines, China, and the Netherlands Indies go out of San Francisco. These Pacific channels, too, are operated in English.

"Number, please" and "Thank you" are spoken millions of times a day by American telephone operators, trained to use "the voice with a smile." Other countries have their own ways of saying the same thing.

In Argentina it's "Número?" (Number); in France, "J'écoute" (I am listening); in Czechoslovakia, "Prosim" (Please); in Germany, "Hier Amt" (This

is the exchange); in Norway it's "Centralen" (Exchange); in Mexico, "Qué número?" (What number), and she may add "Por favor" (please); in Japan it's "Moshi Moshi" (Hello).

The British Isles, Canada, Bermuda, and Australia all use our familiar "Number, please?" In the famous Chinatown telephone exchange in San Francisco (p. 413), it's "Day huey bin shi ah?" This means, roughly, "What place do you wish?"

Almost any European telephone operator knows one American word, and that is our hard-worked "Okay."

#### ALLAH "OKAYS" ARABIAN LINE

Strange customs, and unusual obstacles,

too, have been encountered in installing telephones in foreign lands.

When the first telephone line was put in for King Ibn Saud of Saudi Arabia in the city of Riyadh, Moslem religious leaders were suspicious and went to the King to protest against such innovations and works of the Devil from the land of the Infidel. Ibn Saud listened to their complaint and then said, in words to this effect:

"If the telephone is really a work of the Devil, we shall most certainly have none of it. But on the other hand, if it is a worthy instrument we must put it to the test. Of a certainty, if it is the work of the Devil the holy words of the Koran will not pass over it, and just as certainly if the



Photograph from Acme

**ICE STORMS, BEAUTIFUL TO THE LAYMAN, ARE HEADACHES FOR THE LINEMAN**

The coating of ice that makes trees sparkle also forms on telephone and light wires, weighing them down until they often break under the strain. Here linemen repair fallen wires at Boonville, Missouri, after an ice storm last winter, which paralyzed communications in the central part of the State. Repair crews often undergo severe hardships to race against minutes in restoring service.



THE WIRES ARE DOWN: A COMMUNITY MAY BE CUT OFF FROM THE WORLD

Tiny sleet particles and a high wind lay low the stoutest pole lines. This pole, broken off at the base in a sleet storm, is being replaced by a new one (right), to which crossarms and wires will be transferred. Derricks on trucks and mechanical hole diggers make the modern lineman's work easier. A sleet storm on the inauguration day of President Taft, March 4, 1909, isolating Washington from the rest of the country, stimulated development of underground telephone cable (page 425).

holy words do pass over it, it assuredly cannot be the work of the Devil.

"So we will appoint two mullahs, one to sit in the Palace and one in the telephone exchange and they are to take turns reading a passage from the Holy Book and see what happens."

Apparently Allah "okayed" the installation.

You may pick up your receiver and talk to ships at sea, not only to proud luxury liners, but to workaday tugs, barges, and fishing boats. The owner of a fishing fleet off the New England coast or in Puget Sound now may dial a number and talk with any of his vessels to learn "how they're biting." Tugboat captains off New York and San Francisco get orders from shore by telephone.

Recently the captain of a fishing trawler was standing in two feet of water, while his vessel was sinking, 150 miles off the New England coast. He was relating calmly that all on board were to be transferred to a ship now standing by.

Over a two-way radio telephone, with which each ship in this fishing fleet is equipped, he had reported his plight to his company's office, which had telephoned other craft to go to the rescue.

For two hours the sinking ship and shore stations talked back and forth, the captain telling that his craft was slowly taking water, the shore reassuring him as other vessels phoned they were on the way to aid, and the captain finally reporting safe removal of his crew just before he himself went over the side, the last to leave.



SHE CAME TO WORK BY BOAT, THROUGH A SECOND-STORY WINDOW!

With water 18 inches deep on the second floor during last winter's flood, the switchboard at Point Pleasant, West Virginia, was raised on a platform, and service continued under these conditions for a week before the water went down. Behind the operator's chair are rubber boots, and the teapot and dishes on the desk show where makeshift meals were eaten. With regular heat and light cut off, the telephone manager rowed out to a river boat to borrow coal for a small stove, and used kerosene lamps for illumination.

The United States, with half the world's telephones, has, more than any other nation, the "telephone habit."

The network of wire and cable that penetrates even to the most remote and sparsely settled regions has squeezed three million square miles into a single neighborhood and enabled almost every American to talk to any of his 128,500,000 fellow citizens "across the back fence."

#### CALLING ALL NUMBERS ON ONE PHONE

In the United States there are no government-operated public telephone systems. France, Germany, Great Britain, Russia, Japan, and many smaller countries have their telephone systems entirely under government operation. Argentina, Chile, Ro-

mania, Spain, and Peru have no government telephone systems.

America's telephone pioneers early saw that a utility such as the telephone could be operated most successfully under a single, unified system. Today only about 75 of the 70,000 localities in the United States having telephones are served by more than one company, although among them are Philadelphia, Chester, and Johnstown, Pennsylvania, and Camden, New Jersey.

The vast majority of the country's telephones are operated under the unified management of the American Telephone and Telegraph Company, and its 25 affiliated companies, comprising the Bell System. The securities of these companies are owned by more than 750,000 different investors.



SHE'S PHONING "SHORT DISTANCE"—ONLY 30 FEET

"Are we on time for Newark Airport?" inquires a stewardess over the telephone line from the airplane galley to the pilots' compartment forward. The number, "Skyview 1-6000," is merely a joke. Radio telephones to enable airplane passengers to talk with ground points are being developed. Airline pilots already use such phones to receive weather reports and state their positions.

In addition to the Bell System there are some 6,500 small telephone companies, and about 25,000 rural lines and systems, with a total of 4,000,000 telephones. They are connected with the Bell System network for toll and long-distance service.

All but 72,000 of the 19,100,000 telephones in the United States are connected with the Bell System, and hence for all practical purposes are part of a nation-wide unified service.

There are about 1,200 independent telephone companies with less than 50 subscribers and a few of these have their wires

strung along the tops of fence posts from farm to farm, with repairs made by the subscribers themselves.

#### "WEAVERS OF THE NATION'S SPEECH"

America's network of telephone wires would lie useless, however, without the operator, "weaver of the Nation's speech," who to most Americans typifies the telephone system. Her unwritten slogan is "The message must go through."

Mrs. Sarah J. Rooke, or Sally Rooke, as the neighbors knew her, was once operator for the small telephone system of the little ranch-country town of Folsom, New Mexico. The switchboard was in the cottage that also was her home.

Late on a rainy night Mrs. Rooke received a call from a ranch

house 10 miles up the dry Cimarron valley. A cloudburst had sent a tremendous volume of water rushing down the river. At once she began calling the ranch houses upstream from the village, knowing they would be first in the path of the flood.

Next she called people in the village itself, then those farther down the valley. Repeatedly she refused the pleas of neighbors that she flee to safety.

The flood struck. Buildings were shattered, torn from their foundations, and borne like chips on the surface of the raging wall of water that raced down the



valley. Amid the wreckage of her cottage Sally Rooke was swept away. Many months later, far down the valley, they found her body half buried beneath debris deposited by the flood high above the river's normal banks.

One winter night in the little town of Hurlock, Maryland, Mrs. Ruth Shores was the only operator on duty at the local switchboard. About 2 a. m., Mrs. Shores received a call from a man who shouted: "Call out the fire department, quick! Ruth Shores' house is on fire!"

Mrs. Shores lost no time in summoning the firemen, but then, with feelings better imagined than described, she remained at her post, handling the regular business of the switchboard until relieved 30 minutes later by two other operators.

Hurrying to her home, she found that it and all its contents had been completely destroyed.

Such examples of devotion to duty are common in telephone history. In recognition of them, medals now are awarded annually from the Theodore N. Vail Memorial Fund to telephone workers who have performed unusual acts of service or heroism.

The telephone companies early found that women were temperamentally far bet-



Photograph by David Kauden

#### "DAVY JONES'S LOCKER CALLING"

Over the telephone from his steel bathysphere half a mile beneath the sea, Dr. William Beebe described new and strange sea creatures to colleagues on the surface. A deep-sea diving record of 3,028 feet was set by the expedition, which was sponsored by the National Geographic and New York Zoological Societies in 1934. Here E. John Long, a Geographic Society staff representative, and Miss Gloria Hollister, assistant to Dr. Beebe, take notes and chat about strange fishes with the "voice from the depths."

ter suited to be operators than the boys who were first employed.

#### WHERE GIRLS OUTSHINE THE BOYS

The girls were an instant success; it has been said that they paved the way for women to enter many other fields of employment. The telephone operator is a "picked woman," picked for voice quality, personality, health, and efficiency. Her courtesy has become America's standard of politeness in business relationships.



Photograph by J. Baylor Roberts

"I'VE GOT TO HURRY; MY BOY FRIEND'S WAITING OUT FRONT"

A shift is changing, with some telephone operators going off duty, others coming to work to take their places. Each girl's headset is placed in an individual bin at the right between shifts and during recess periods. At the end of the day, used sets are removed for cleaning. Headsets now weigh just over one pound, whereas in 1880 they weighed six pounds. Perhaps because operators are "picked women" the marriage rate among them is high.

All operators go to school, receiving pay meanwhile. From lectures, they go on to model switchboards, then become junior operators at the regular switchboards. A girl may be either an "A" operator who answers the customer's signal, or a "B" operator who completes calls received from other central offices. She may be at a toll switchboard, handling incoming or outgoing calls to or from near-by points, a long-distance operator handling calls to far-away cities, or an overseas operator.

Again she may be one of the many types of special operators, perhaps giving information on numbers not listed in the latest directory, or an intercepting operator ("What number did you call, please?") to whom calls are passed when a number has been discontinued or changed.

She may be a special assistance operator in a dial central office, or a rate and route operator in a toll or long-distance office.

More than 30,000 new operators were engaged by American telephone companies in 1936.

Besides training its own operators, the telephone system also often helps to train operators who handle the switchboards of the many private branch exchanges—the switchboards in hotels, apartment houses, office buildings, department stores.

A single office building at 120 Broadway in New York has as many private branch exchange switchboards as there are in a typical city of 100,000 people.

PUTTING THROUGH A CALL

You can think of the telephone operator ordinarily as a girl who ties together the ends of your telephone line and someone else's line so that the two are connected and you can talk.

If you live in a small community and wish to call a neighbor, the operator in the



Photograph by Morris Rosenfeld

#### DEAFNESS IS CAUGHT EARLY BY THIS TEST—A TELEPHONE BY-PRODUCT

With the aid of the portable audiometer, here being used to test the hearing of an entire school class, many "dull" children have been shown to be really only deaf, and many ear infections have been found in time to prevent serious deafness. In the earphones, the children hear numbers spoken with steadily decreasing loudness, and write down what they hear until no more are audible. Degree of deafness is shown by the list of fainter numbers missed. The audiometer is a direct result of telephone engineers' research (page 437).

central office plugs one end of a cord in a hole that is the terminus of your line on her switchboard, and puts the other end of the cord in another hole that is the terminus of the line you are calling. Then when the called person answers, you are connected.

In a large city two or more switchboards and operators may be needed to complete your call. The first operator ties your line to the end of a trunk line that leads to the second switchboard, and another operator there ties the other end of the trunk to the line you are calling (page 407).

On an out-of-town call several operators may be needed to tie together a whole series of wires that will in effect make one long conversation channel.

When you lift your receiver you do the same thing that you do when you flip an electric light button—you close a switch.

When the switch is closed, electric current

flows through wires that lead from your telephone to the switchboard in your telephone central office. A tiny electric lamp lights above a little hole that is the terminus of your line. It is one of hundreds of such holes and such lamps on the board.

The operator inserts the end of a cord in the hole and says: "Number, please?" Then she proceeds to get your connection.

#### HOW THE DIAL PHONE WORKS

As the telephone system grew, it became evident that eventually it would be impossible to obtain enough girls qualified to act as operators. In addition, with increasing service requirements, the methods of operation were becoming complex and difficult, especially in large centers of population.

So Bell System engineers developed a mechanical operator, the dial system, which is as fast and as accurate as the best



"THE VOICE WITH A SMILE" SMILES ON VACATION

After a year of "Number, please?" and "Thank you!" these telephone operators relax their vocal cords in song at Camp Sherwood, maintained as a vacation spot and week-end retreat for women employees by the New York Telephone Company. Here, at small expense, the girls camp out, swim, learn arts and crafts, and enjoy a healthful outdoor life.

human operators, with less variation in the speed of making connections.

Also, it doesn't need to be trained, it isn't slowed up by complex operations, and it can bring the full capacity of its equipment into action at a moment's notice—a big advantage in times of emergency.

When using a dial telephone you do not hear the operator say "Number, please?" when you pick up the receiver. Instead, you hear the mechanical operator making a humming noise, which means the same thing—that the apparatus is ready to take your call (page 408).

Instead of telling what number you want, you give it to the mechanical operator by signals. On the base of the phone is a round movable dial with holes in it, and letters and figures under each hole. You put your finger in the holes labeled with the letters and figures of the number you want, and turn the dial once for each letter and figure. Then you wait for your friend to answer.

If you hear a prolonged "buzz-buzz" in your receiver, it's the mechanical operator's way of saying, "The line is busy."

The mechanical operator of the dial system gets your call by going through the same steps as a human operator, except that it uses electrical switches instead of brains and fingers. In the dial central office of a large

city, instead of switchboards there are tall panels from which project rows of small metal strips corresponding to the rows of holes on a switchboard. The strips are in groups of three or four and each group is the terminus of one telephone line.

When you pick up the receiver a signal goes to your line's terminus and a metal hand with metal fingers attached to a rod slides up, picks out your line and grasps the little strips that form the end of it. Then you hear the hum of the dial tone. It is essentially the same as a human operator plugging in on your line and saying "Number,

please," when the little lamp lights.

When you give your number to a human operator she remembers it in her brain. When you signal it to a mechanical operator, it remembers the number equally well by recording it in an electrical "brain." Each movement of the dial that you make with your finger turns a rotary switch in the central office to a certain position. These switches record the number. Then the electrical brain is ready to get the number for you.

Suppose you are calling Worth 2-1099. In dialing you have signaled "WO 21099." The switches that have recorded the W and O and 2 control a metal hand. It is lifted by a rod until its metal fingers can take hold of the end of a trunk line to the Worth 2 central office.

If a human operator were doing it, she would plug in her cord to a trunk line to Worth 2. Next she would tell the Worth 2 operator that she wanted 1099 and the operator would connect her with that number.

The rotary switches that have recorded 1099 in the electrical brain do much the same thing. Under their control, another metal hand in the Worth 2 central office is moved upward, and its fingers take hold of the terminus of the 1099 line. When your friend answers, you are connected.



© International

#### A BARREL OF TROUBLE IS LEFT UP IN THE AIR BY A FLOOD

Débris, lodged on the crossarms of a telephone pole fully 25 feet tall, shows the height reached by a recent flood at Williamsport, Maryland, along the Potomac River. When wet, such flotsam tends to short-circuit an open wire line, even if it does not break the wires. Sometimes long lines of poles are washed out of the ground by rushing waters (page 428).

This is only a simplified picture of what happens when you make a dial telephone call. The best telephone engineers take years to learn all of it. There are hundreds of mechanical operations every time you dial a number.

Two kinds of dial systems are in common use, the "panel type," described here, in large cities, and the "step-by-step" in many other places.

Over 75 per cent of New York City's telephones now are served by mechanical operators of the dial system. On Manhat-





Photograph by J. Baylor Roberts

MODEL HOUSES AND POLES TRAIN TELEPHONE MEN IN THE PLANT SCHOOL

Type dwellings of wood, stucco, brick, and other materials give telephone men practice in installing telephones in every kind of building they may encounter. The man at the door of the model house in the background is demonstrating how to bring an outside telephone line into a subscriber's house. The man on the pole is talking over a portable telephone set at a cable terminal box while tests are being made on some of the wires in the cable attached to the pole, just as he would on an outdoor pole line. The men at the right are working out problems on mechanical apparatus.

tan Island 87 per cent are on this basis. A little more than two-fifths of the telephones in the United States now are operated by dial, a total of approximately 8,100,000.

Even with dial operation, many human operators are still needed—for toll service, for handling calls between dial and manual telephones, for helping callers when numbers have been changed or service disconnected, and for other assistance.

Probably many places in the United States never will have the dial system. It is most needed in large cities where many calls are crowded into small areas.

In New York City and its adjoining metropolitan area, with a population of nearly 11,000,000 there are 2,375,000 telephones, roughly one-eighth of all the telephones in the United States, though they are concentrated in only 1/1200 of the land area of the country.

It would take a bookshelf 50 miles long to hold the telephone directories issued in New York City alone, not including the classified directories. Even with directories available, an average of 246,000 New Yorkers call "Information" every day. In the United States more than 2,000,000 information calls are made daily.

#### IMAGINE NEW YORK WITHOUT PHONES!

New York and many other cities could not exist as they are today without the telephone. If every New Yorker had to go in person to buy groceries or theater tickets, to make appointments for bridge or the dentist, to sell stocks, bananas, or lingerie, to call the police, firemen, or doctor, the crush of struggling humanity would be unbearable.

Without the telephone, skyscrapers, apartment houses, hotels, fire and police departments, financial markets, and innumerable other activities could not function in their present forms. Imagine running downstairs from a 30th-floor apartment every time you wanted a paper of pins or a bunch of celery!

An average of 449,000 calls are made every hour from telephones in the vast nerve center of the New York metropolitan area. More than 800,000 nickels are dropped in the slots of its public pay stations daily. So many people use telephone pay stations in the busy Times Square area that the directories in some of the booths literally wear out every four days.

Two of New York City's large office buildings alone have as many telephones as the entire city had in the early nineties.

The Empire State Building, world's tallest office structure, is equipped with 3,500 miles of telephone wire, enough to reach across the continent. The length of wire serving the entire metropolitan area could be wound around the earth nearly 600 times at the Equator.

#### WHY WIRES ARE BURIED

Such big figures tell an impressive story, but equally important is the fact that all but a fraction of one per cent of this vast length of wire is enclosed in protective cable, and 73 per cent of the cable is underground. If all of its 14,700,000 miles of wire were above ground and strung on poles, New York today would be tangled in a hopelessly bewildering maze of telephone lines (page 399).

On March 4, 1909, the day of the inauguration of President William Howard Taft, broke the worst storm in telephone history. Wires, tens of thousands of miles of them, were down, the National Capital was isolated from the rest of the country, and an inkling was given of the calamity that would result if the telephone were withdrawn generally from public service.

The president of the company wrote the chief engineer: "Put those wires underground. I know that the present state of the art of telephony does not make such wire-burying possible. But experiment, experiment!"

From those experiments came today's efficient telephone cables, which have removed poles and wires from the streets of larger cities, and made even cross-country trunk lines free of the hazards of storm and other damage.

#### AMERICA'S MANY FARM LINES

Cables and wires of the telephone system now connect 70,000 cities, towns, and hamlets in the United States, to say nothing of ending the isolation of countless farms.

Some farm wives, indeed, feel they have far too little isolation when curious neighbors listen in on conversations on party lines.

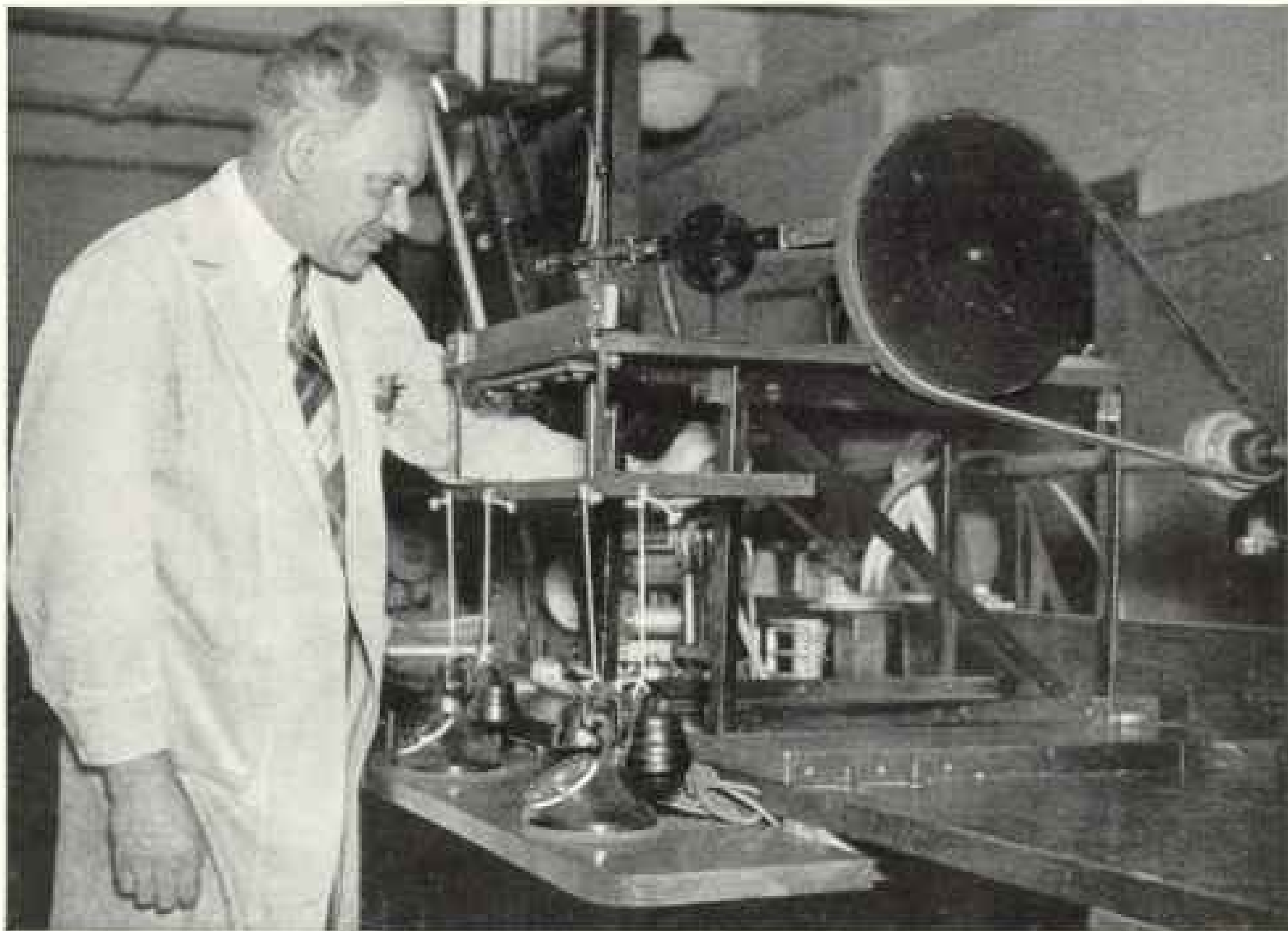
One woman, calling her doctor at 2 a.m., said: "I'm sorry to get you up at this hour, doctor, but I feel this is the only time of day when I can discuss my case with you over the phone in privacy!"

American towns of less than 50,000 people have about ten telephones per 100 population as against 20 per 100 for cities over 50,000. The United States leads the world, however, in telephone development of smaller places; nowhere else can the boy in the big city so easily telephone home to the folks in his native village. In most other countries, telephone development is almost entirely in cities.

Today some telephone cables carry as many as 3,656 fine copper wires inside lead sheaths no larger than a man's wrist. That provides 1,818 separate highways for conversations, and 1,620,000 possible conversational combinations.

To string the same number of wires out in the open in the old-fashioned way would require 60 rows of telephone poles, each pole carrying 60 wires.

Not only may so many wires be packed



Photograph by J. Baylor Roberts

"BANG 'EM, DROP 'EM, WEAR 'EM OUT!"

Scarcely in a lifetime could the most irate user slam down his handset often enough to compete with this automatic drop test in the Bell Telephone Laboratories of New York City. The bar keeps lifting the telephones off their hooks, and letting them fall back of their own weight, until they wear out or break. A counter records the number of drops. Samples of all kinds of telephone equipment, even linemen's climbing irons, are "punished" to learn their strength and durability (page 437).

into a small cable, but in some cases a single pair of wires may carry four separate telephone conversations and four telegraph messages all at the same time, without any of them getting mixed with the others. This is done only on long-distance lines, where it would cost more to build several separate wire lines than to use the complicated terminal apparatus needed for sending several messages over a single wire.

You might think that sending several conversations over the same wire would be like pouring tea, coffee, and milk into the same pitcher—they never could be separated again. Yet the conversations *can* be separated, and you never hear any but the right one. How is it done?

It works on very much the same principle as radio broadcasting except that the messages travel over a wire instead of through the air. Many radio stations are broadcasting at the same time, but each one uses a different frequency—that is, the waves that carry the program of each

station vibrate a different number of times per second. To hear one you must turn the knob on your radio so that it is tuned to the frequency of the station you wish to hear.

It's the same way with several telephone conversations on a single wire. Each is carried by electrical waves vibrating at a different frequency, but all moving in the same wire. At the end of the wire is a series of electrical gates or filters. Each is set to receive waves of a different frequency, just as you can set half a dozen radios so that each will tune in on a different station.

What carries the voice over wires, anyway? Electric current. But what is electric current? Look at a piece of copper wire. Then turn a switch so that current flows through it. It looks just the same. You cannot see that anything is happening to the wire. But something *is* happening.

We say loosely that current flows through a wire, but actually only energy flows. A



Photograph by Ranapar

TELEPHONE MEN USE A DOG SLED IN MOUNT RAINIER NATIONAL PARK

The man at the right is testing a line with earphones to make repairs in Paradise Valley in winter. He wears snowshoes, and tools hang on his belt. A reel of wire is mounted on the dog sled.

wire looks solid, but it is made up of atoms, and each atom contains much more empty space than solid matter.

In the spaces are vast numbers of tiny particles called electrons, constantly vibrating and rushing about haphazardly. They send energy through the wire much as sound travels through the air—each tiny particle bumping the next one. An electric current gives a push to the first electron in the wire. It pushes the next one, and so on, until the push has traveled to the end.

The pushes that electrons send along are really vibrations, and an electron can send along several different kinds of vibrations at once. That happens when several conversations go over a wire at the same time.

PEPPING UP YOUR CONVERSATION

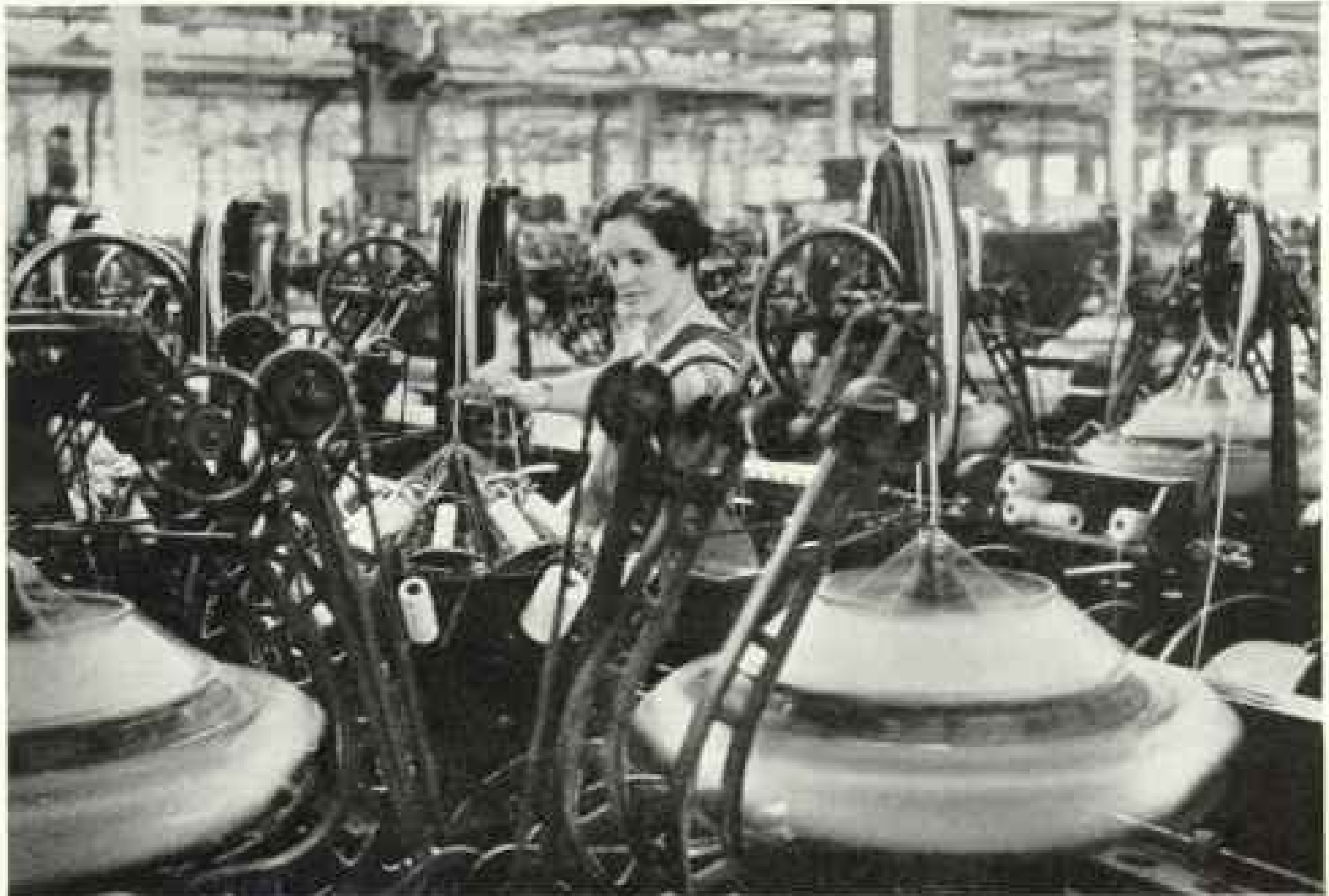
Whatever electric current may be, it loses energy as it passes through a long wire. In the old days, to talk very far by telephone you had to have a wire as big as a lead pencil. The bigger the wire, the less energy was lost by the current in going through it, but such wire was costly. Now you can talk farther and better over a far smaller

wire, because engineers have learned how to reduce the current's loss of energy, and give it a new injection of "pep" at intervals along the line.

The injections of pep are given by vacuum-tube amplifiers, essentially the same as used in your radio set. They were especially developed by scientists of the telephone industry for this very purpose of making long-distance telephoning possible, and over 400,000 of them are working in American telephone circuits today (p. 414).

The amplifier's job is to take a weakening message coming over a long line and "shout it on" with new power toward its destination. It's just as if a line of men were stationed along a series of hilltops, the first one shouting a message, the next one hearing his faint shout coming from afar and shouting it on to the next, and so on. It takes about 40 such repeating stations to carry your voice from New York to San Francisco. The voice makes the trip in not more than a tenth of a second.

But the repeaters alone are not enough to give your voice the needed energy to travel over long wires. Every mile or so



Photograph by Paul Fryer

SHE IS BRAIDING A COTTON OVERCOAT ON TELEPHONE WIRE

This girl and her machine weave a continuous braid of unbleached cotton thread on the outside of rubber-shielded telephone wire, covering 350 feet of wire per hour. Telephone wires inside cables are covered with paper pulp as insulation, while other wires may be encased in rubber, cotton, silk, or a combination of materials, according to their uses. Flexible telephone cords are made of hair-thin copper ribbons spiraled around a cotton thread. This picture was taken at the Baltimore wire factory of the Western Electric Company, which manufactures most American telephone equipment.

are loading coils, which are to weakening telephone currents what sweet chocolate is to tiring distance swimmers. They reduce loss of energy on the line.

They are coils of wire wound on magnetic cores, and you have seen the iron boxes in which they are housed on telephone poles out in the country. They just about double the distance one can talk effectively.

Cables have other troubles, too. A chunk of lead cable to chew on would seem unappetizing to humans, but not so for some squirrels. They have been known to gnaw right through the lead sheath of a telephone cable strung between poles.

CHASING CROWS OFF POLES

In Colorado, on a 72-mile section, there is a never-ending battle for possession of the line between the telephone company and a flock of crows!

Crows' nests, built on the poles, cause 95 per cent of the trouble on that section of line. Because vegetation is scarce, nest material is scarce, so the crows use pieces

of old fence wire, corroded into short lengths. This wire, rubbing on the regular telephone wires, causes constant trouble.

Bees have used cable boxes for hives; woodpeckers have built nests in them; a buzzard broke his neck when he flew into some wires, and his entangled body caused trouble. A lineman's life is not an easy one!

It is even less easy when sleet storms cover wires with a mantle of ice so heavy they break under the burden; when floods wash long sections of pole lines out of the ground and floating houses sever cables; when earthquakes toss poles about so that wires vibrate like jumping ropes; when lines must be repaired at all costs and at all speed (pages 415, 416, 417, 423, 433).

A devastating flood sweeps a wide area in the industrial East. Repair crews in New England, New York, Pennsylvania, West Virginia are swamped with the task of restoring service. Emergency calls go out to other crews in Ohio, Indiana, Kentucky, the South and West. Like a mobilizing





Photograph by J. Taylor Roberts

TODAY YOU TALK OVER A WIRE; TOMORROW YOU'LL SEE OVER ONE

On left is a section of cable, containing 600 wires, such as now is used for long-distance calls and network radio programs (page 430). At right is a section of the new "coaxial" cable, over which you can "see" by television as well as talk. It is only one-ninth as large as the other and contains two flexible copper tubes, with a thick wire inside of each. Waves like those of radio will carry 240 conversations at once through this cable, each at a different frequency. Other waves will carry television pictures over the same channel (page 433).

army the repair trucks speed from far places to the fighting front.

Soon the harassed eastern crews find strange faces working beside them, but only the faces are strange. The strangers carry the same tools, make the same splices, use the same procedure in repairing and testing lines, speak the same telephone language. Take a telephone man from Maine, put him to work in California, and he will be completely at home.

Once a single bad storm might have isolated a whole city or region, when the network of telephone lines over the country was sparse and scattered. Today, in most cases, when one telephone route leading to a locality is put out of action, calls can be routed through other lines around the disabled area, and service maintained, with subscribers usually never the wiser.

There are more than 100 through telephone circuits across the Western States which are available for transcontinental calls. Not all conversations across the continent are completely coast-to-coast, but

they do connect persons at Atlantic seaboard points and in Pacific Coast States. The average transcontinental call lasts about six minutes, but many run a half hour or hour, and at least one lasted eight hours!

In making a single long-distance call you may be using equipment costing millions of dollars.

Often in the same cable with telephone conversations, radio network programs also are speeding westward, or eastward as the case may be, over special wires placed in the cables when they were laid, and twice the size of telephone wires. The radio networks in reality are networks of telephone wires totaling 60,000 miles. Only for a comparatively few miles surrounding the stations from which they are broadcast do such programs actually travel through the air to most receiving sets.

TRANSMITTING RADIO PROGRAMS

The variation in the volume of sound in a symphony concert broadcast is much



Photograph by Acme

#### AN INVISIBLE AUDIENCE OF MANY THOUSANDS APPLAUDS RADIO AMATEURS

These girls recorded a flood of telephone votes from radio listeners who rooted for their favorite performers on a Major Bowes amateur hour broadcast. The ballots were received in a special temporary exchange in Radio City, New York, with a branch in Chicago. Widespread telephone voting is possible in the United States, where there are nearly 14 phones for every 100 people. In Canada, Denmark, New Zealand, and Sweden there are more than 10 telephones for every 100 persons. In Great Britain and Germany there are about 5; in Italy, Czechoslovakia, Chile, and Cuba the ratio is a little more than one to 100.

greater than that which must be transmitted for an ordinary telephone conversation. The weaker passages must come in clearly, but crescendos also must come through the loud-speaker naturally and without being "blasted" into distorted forms. The music is picked up by a microphone in a New York City studio, let us say. It goes by wire to a near-by room, where a radio engineer adjusts the sound waves to the proper degree of loudness before they enter a telephone cable. Then the telephone system takes over the job of delivering the musical "package" simultaneously in several directions.

The electrical waves representing musical tones travel over telephone wires to broadcasting stations in New England, Canada, the West and South, moving at a speed of from 20,000 to 180,000 miles a second, depending on the type of circuit. Like telephone messages they slowly grow weaker as they travel, and so about every 50 miles the concert goes through repeaters, where it is amplified back to its original strength.

If a network fails at any point, our symphony must not be prevented from reaching its far-flung destinations. Quickly the engineers will switch it to a detour circuit until the trouble is located and rectified.



Photograph by J. Baylor Roberts

#### IT TAKES A GOOD TREE TO BE A TELEPHONE POLE.

This "scientific wood pile" will help make telephone poles last longer. It is being tested in the Bell Telephone Laboratories to discover ways of preventing rot, and attacks by insects and fungi. Under the "bandages" on the two at the left, experimental solutions are soaking. On the bench are lengthwise "slices" of poles. One piece in the center contains a woodpecker's hole.

The telephone works so well today because engineers have worked unceasingly to improve its performance and to learn more about the operations of speech and hearing. In doing so, they not only have vastly improved the telephone but have uncovered many other useful scientific secrets.

Most of them have come from the men who are now carrying on Alexander Graham Bell's job of inventing the telephone. But, you say, the telephone is already invented, and has been for 61 years. True, but Bell

only performed the first step in the invention, though the most important one. The process of inventing the telephone still is going on.

#### THE HOUSE OF TELEPHONE MAGIC

In the great Bell Telephone Laboratories in New York City hundreds of scientists are engaged in constant research, testing and developing. Not only are they solving telephone problems that arise today, but they are anticipating future problems, solving them in advance, and pioneering on new scientific frontiers for new aids to electrical communication. Their work has saved millions of dollars in telephone costs.

One of every ten adult Americans has hearing that is impaired enough to handicap him to some extent in his daily pursuits; one of every fifteen school children is handicapped in learning by either temporary or permanent ear trouble. No one knew this until telephone engineers, studying the human ear, developed the audiometer, a more exact method of measuring noise and hearing (page 421).

You can now measure noise in decibels about as accurately as you can measure the length of a rope in feet. The intensity or power of a whisper four feet away is 20 decibels. The noise of a city street or of ordinary speech three feet away is 60 decibels, or 10,000 times as intense as a whisper. An airplane engine, roaring at full speed near by, is a million times more intense than the noise of a city street.

Make a sound much stronger than that and the human ear no longer hears it, but feels pain instead.

Better telephones have come from all this knowledge, and also new hearing aids for the deafened, installations of amplifying earphones for the hard of hearing in churches, theaters, and auditoriums, and special telephones for the deaf, with amplified receivers, though none of these, of course, are cures for deafness.

The "talkies," now so common that the old silent films seem strange to us, are the best known by-product of the telephone—born both of engineers' efforts to learn more of how speech and sound behave and of improvements in telephone equipment.

Both talkies and radio broadcasting would have been impossible without development of an improved telephone transmitter that became the microphone, and the vacuum-tube amplifier that gives needed

strength to the current carrying the voice.

Many other by-products, too, have come from the telephone: improved phonograph records, on which music and speech are recorded electrically with far greater perfection and accuracy than the old-style mechanical recording; an electrical stethoscope, which amplifies heart sounds, and aids in improved diagnosis of heart troubles; public-address systems which give any man the voice of a giant; methods of reducing and eliminating noise, which scientists now know can be seriously injurious to health.

#### MAKING NOISE, AND KILLING IT

Bell Telephone Laboratories are a scientific wonderland, where the telephone of tomorrow is already taking shape today. There is a soundproof room, quieter than any place you ever were in, because its walls absorb all sound; so quiet that when you enter you feel depressed. Another room reflects all sound—just the reverse.

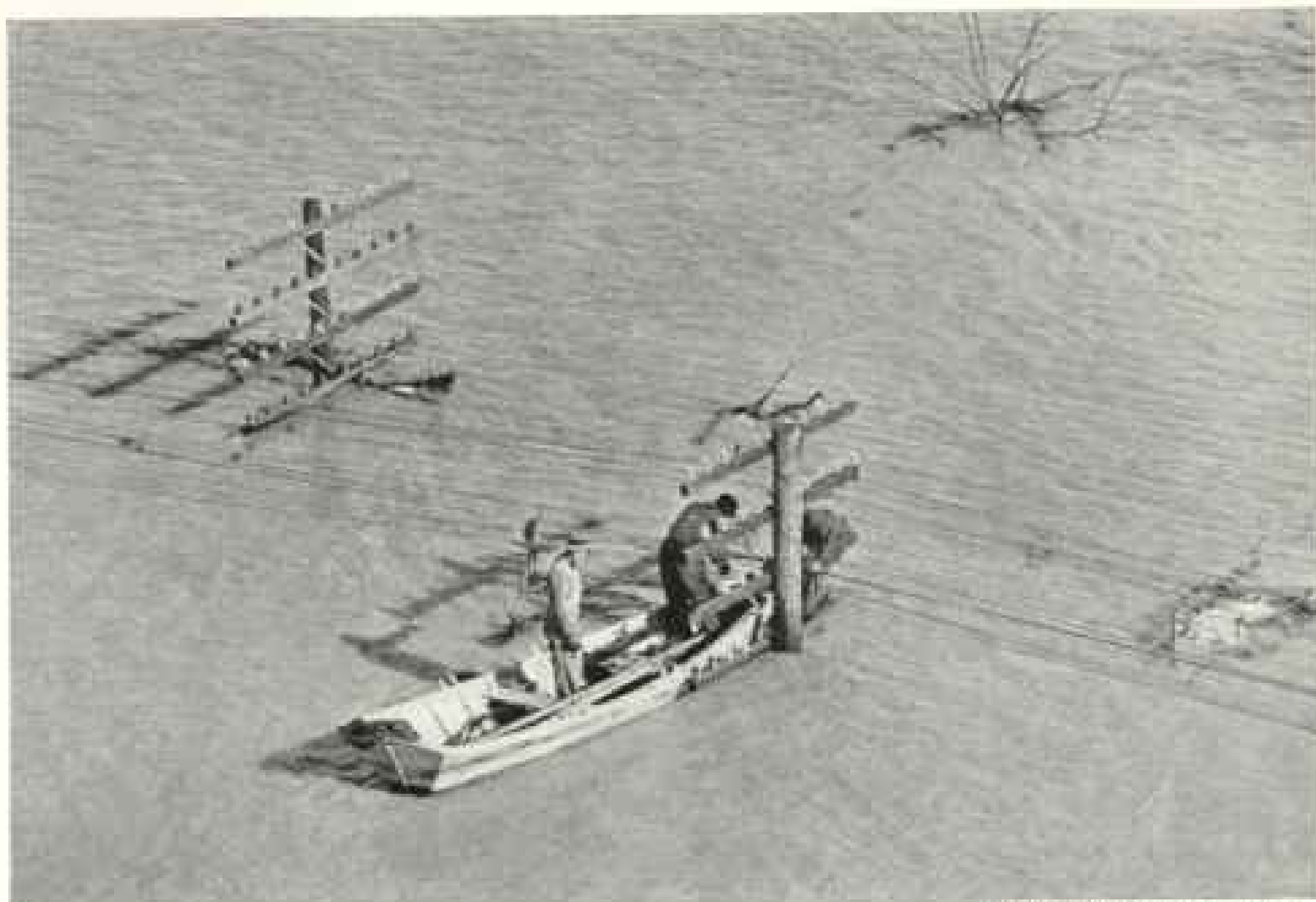
In these rooms scientists study the effect of reverberation in masking the meaning of the human voice; how to reduce unnecessary noise in telephone exchanges, so operators can work more efficiently; why some partition materials give better acoustics than others; how to stop street noise from coming through windows.

There, too, climate of any part of the world is manufactured at will. How will dial apparatus work in humid Puerto Rico, or at unattended dial stations in the far north where temperature drops to 45 below zero? No need to leave town to find out. Just "turn on" the proper climate and make your tests right here!

Here is a microscope that magnifies 3,500 times, the only one of its kind, to study the fungi that grow on telephone poles or the tiny defects in metal that may make linemen's climbing spikes break.

Telephone wire insulation was wearing out too fast by being rubbed against tree branches, soaked by rain, baked by ultraviolet rays of the sun. The scientists at the Laboratories tried out new insulations, rubbed them on special rubbing machines, soaked them with artificial rain, baked them under sun lamps, until they found an insulation that would wear well. In two months they can give a sample the wear it would receive in three years of service.

How many times will a switchboard lamp light before it wears out? In the larger switchboards there are 15,000 such



Photograph from Wide World

#### NO NEED FOR CLIMBING IRONS WITH A FLOOD LIKE THIS!

Waters near Cairo, Illinois, last winter, rising to 40 feet, enabled linemen to make repairs by boat but caused vast damage to telephone lines. Even if such a flood does not wash poles out of the ground, floating debris may break the wires.

lamps. In the Laboratories tiny lamps are blinking their lives away to answer the question.

Every moving part in the telephone system is tested until it wears out (page 426). A special machine picks up switchboard cords, plugs them in holes, pulls them out and drops them again, over and over, to learn how cords can be made more durable.

Dropping the same nickel in a telephone coin box time after time, you would wear out the nickel before you wore out the box!

Here scientists finally squelched the annoying "transcontinental echo," in which you heard your own voice echoing back from the other end of a cross-country telephone line; here they conquered cable cross talk, bothersome interference that resulted from many conversations following parallel wires in a telephone cable; here scrambled speech was developed; here the dial system was perfected.

Here today scientists study the behavior of the tiny electron, which does the real work in carrying your voice over a wire. From this already have come better vacuum tubes for radio and for telephone

repeaters on cross-continent lines.

Improved tubes will go into service, but no sooner are they in use than still better ones will begin to be developed.

Already a new dial system is taking shape, better than the two kinds now in use, with its first trial in regular service soon to begin.

#### TALKING AND SEEING OVER ONE WIRE

Even television, still an experimental baby, is being fitted into the picture of the telephone's tomorrow that is taking shape in the Bell Laboratories.

Already, before television itself is ready, the engineers have devised a channel by which its pictures may flow to waiting audiences. This is the new coaxial cable, already being tested under service conditions between New York and Philadelphia (page 429).

It will still carry 250 telephone conversations at once, but, what is more amazing, it will carry the complex and intricate television currents as well. So, sometime, you may be able to talk to a man and see him, all over the same wire!



# A SKYLINE DRIVE IN THE PYRENEES

BY W. ROBERT MOORE

THE Pyrenees form a barrier that political map makers could not ignore. All the way from the Mediterranean and the Atlantic their mighty ramparts notch the sky. Like a massive Chinese Wall they set apart the Iberian Peninsula from the rest of Europe. Upon their crests has been sketched the boundary between France and Spain.

Humid winds strike the French side, loosening their moisture to irrigate green valleys and to soften the contours of the slopes by their forces of erosion. In Spain the mountain faces are more rugged and barren.

But the Pyrenees are more than a barrier. In many of the quiet glens the early Romans exploited curative baths. Now tens of thousands of visitors annually resort here to vacation in the mountains or take the cure at the numerous thermal spas.

## VERDANT VALLEYS AND LOFTY PASSES

Thanks to the efforts of industrious French highway engineers, an excellent motor road, the Route des Pyrénées, traverses the entire length of the chain.

But it is a seasonal thoroughfare. When snow lies deep on the Pyrenees, any or all of the seven main passes may have their "closed" sign up for weeks. So if you would motor across the south of France then, you must keep to the low roads of the foothills.

Our journey began at Perpignan, sunrise gateway to the Pyrenees. The countryside basks in the bright sun beside the Mediterranean and is rich with vast vineyards.

Hannibal, with his troops and his elephants, camped hereabouts after crossing the Pyrenees. Greek traders and the Romans found it a pleasant land.

Actually the Pyrenees highway starts at Cap Cerbère, so we motored down the coast past Elne, Argelès-sur-Mer, and Collioure. Elne demanded a sentimental pause, for it was the ancient Illiberis. Constantine changed its name to Helena in memory of his mother.

Collioure is a tiny seacoast town that brings joy to the hearts of painters and photographers. Its fishing boats, 14th-century church with a round stone tower rearing above the water front, and its old castle call loudly for canvas and film (Plate III).

Southward, the coast is tongued with bold promontories and deep-water bays. On one of these blue coves lies Port Ven-

dres. In Roman days it was *Portus Veneris*, the Port of Venus, and a prominent haven for their craft. Today fast boats from Algiers make regular calls here, and the small town is busy trading in wine, cork, and other produce.

Of all the wines produced in the Pyrénées-Orientales, the strong red wines of Banyuls-sur-Mer and the white vintages from Rivesaltes, village birthplace of Marshal Joffre, are perhaps the best known.

High up on Cap Cerbère we halted. We could look over into Spain, but could not go there. Because of strife in the south, the frontier was closed to all traffic.

It was a quiet Sunday morning when we reached Amélie-les-Bains and explored its baths and Gorges of Mondony, which were frequented in Roman times as today. But when we returned in the afternoon from our visit up the charming high Vallespir (the *vallis aspera*), with its quaint towns, Amélie was decidedly *en fête*.

Blunderbusses boomed, drums and flutes played strange airs, and wooden shoes clumped on the pavement. Through the main street of the town marched a rainbow-hued parade, led by Catalans riding brightly caparisoned mules (Plates I and II).

Groups from old Provence and from Balaguères (in Ariège Province) had come to vie for honors with the Catalans in their traditional songs and dances.

Dark-eyed Catalans, in their dark dresses and white aprons, showed their unmistakable Spanish ancestry as they stepped with their red-belted, red-capped partners in black velvet to the rattle of tambourines.

## A WINE COUNTRY GROWS CORK FOR BOTTLE STOPPERS

We mounted the narrow highway which loops, twists, and zigzags in sharp hairpin turns over the hills that bastion Mont Canigou. Extensive forests of cork trees cover this locality. All of their trunks showed scars where cork gatherers had cleaved off the bark, but new layers were growing to produce more bottle stoppers or perhaps life preservers.

From Villefranche-de-Conflent to Mont Louis, both fortified by Vauban, fort builder for France in Louis XIV's reign, the road follows up the course of the Têt River.

Beyond Olette the valley narrows into a precipitous gorge, with mighty boulders

COSTUME PAGEANTS IN THE FRENCH PYRENEES



THE "GRAND MARSHAL" OF THE VILLAGE PARADE RIDES SIDESADDLE WITH HIS LADY

Joining a throng of dancers in the square of Amélie-les-Bains, in the French Pyrenees, the leading man and his partner will hold aloft a scarlet sash to form an arch. Beneath it run couples holding hands, after which they wind through the streets and finish with a lively dance around the square.



© National Geographic Society

Finlay Photographs by W. Robert Moore

A SONG-AND-DANCE SEPTET TAKES THE STAGE

Out of the moth balls came these colorful old-time costumes for the festival at Amélie-les-Bains. The Government fosters such fêtes to preserve traditional folk dances. Many were photographed in color by Mr. Moore, Geographic staff representative, who motored the length of the French Pyrenees.



© National Geographic Society

**WHEN BOY MEETS GIRL AT A FÊTE, THEY DANCE**

After parading through town (Plate I), each man faces his partner, takes her hand, and does fancy solo steps in time with gay music. Akin to Catalana of near-by Spain are these merrymakers of the eastern Pyrenees.



Finlay Photographs by W. Robert Moore

**RED SAILS FLASH WHEN SHE SHAKES HER TAMBOURINE**

Dancers from as far away as Provence came the Sunday the author visited Amélie-les-Bains. The town is named for King Louis Philippe's wife and for the popular sulphur baths, frequented by ancient Romans.



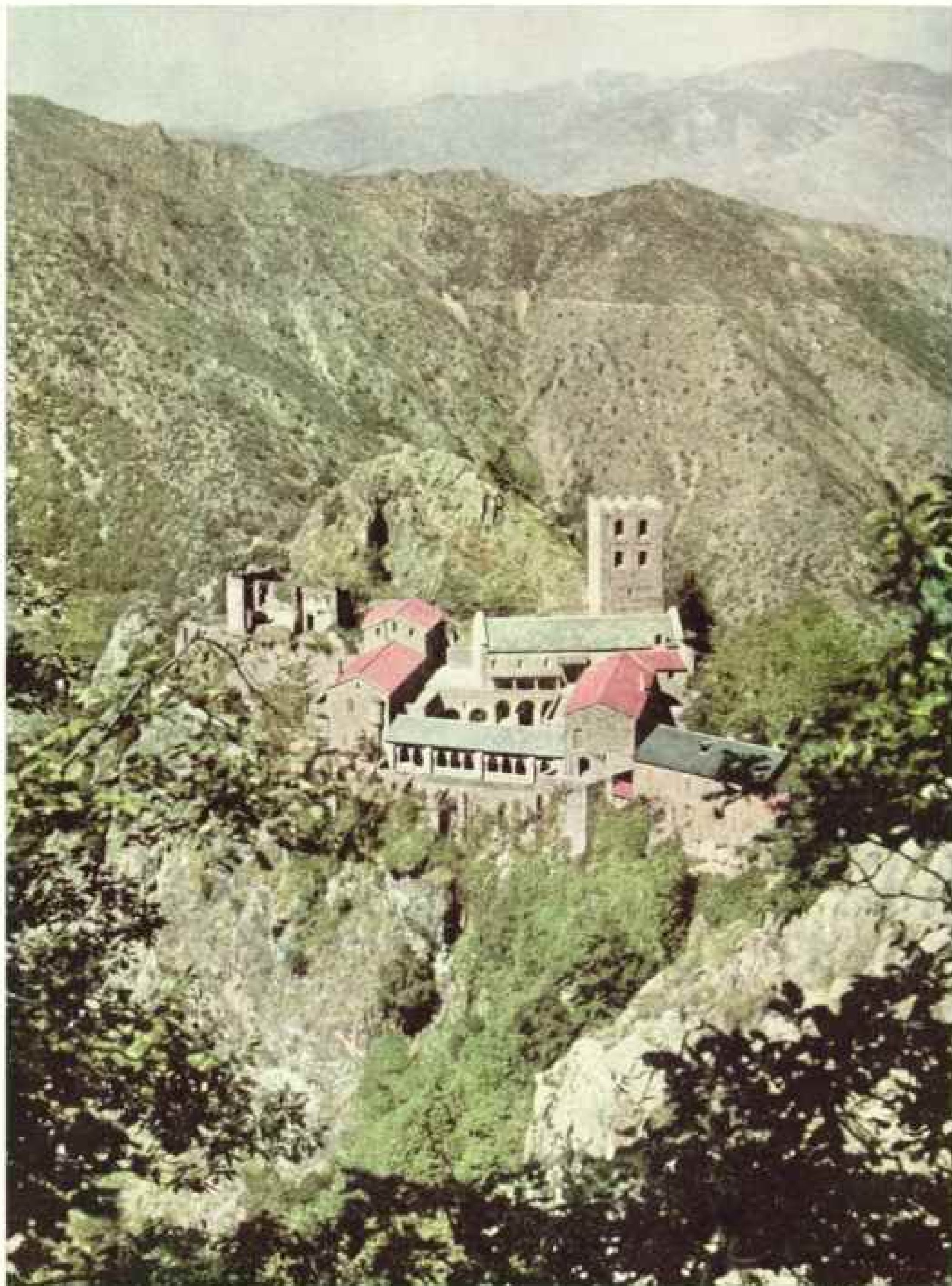
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YOUNGSTERS ON THE BEACH AT COLLIOURE ARE AS IDLE AS THE PAINTED BOATS BESIDE "A PAINTED OCEAN"

Finlay Photograph by W. Robert Moore

Three Christian saints are depicted in strange proximity to a star and crescent. Turkish symbol, on the craft in the center. The boat named *Venus* comes from near-by Port Vendres, the ancient Romans' "Port of Venus." Local fishermen catch anchovies, sardines, and tunnies in the Mediterranean. Here on the beach, near a 12th-century cistern built by Knights Templars, visitors look across the bay toward the pink-roofed village. From the bullet-shaped tower of the church, a mole runs out to the little island (center) where stands the chapel of Saint Vincent, patron of the port.





© National Geographic Society

Finlay Photograph by W. Robert Moore

SHADY CLOISTERS OF A MEDIEVAL ABBEY OVERLOOK THE SUNNY PYRENEES

A stiff half hour's climb from the village of Casteil brings puffing hikers to Saint-Martin-du-Canigou, perched on a tiny plateau on the rocky side of Mont Canigou. Begun in 1001, the abbey has been skillfully restored and now serves in summer as a place of seclusion where men of the faith may spend eight-day retreats. Rudyard Kipling wrote of Canigou as a "magician among mountains . . . Nothing that he could do or give birth to would now surprise me, whether I met Don Quixote himself riding in from the Spanish side, or all the chivalry of ancient France watering their horses at his stream."



COSTUME PAGEANTS IN THE FRENCH PYRENEES



"REDCAPS" AND THEIR GIRLS JOIN HANDS AS IF TO RING-A-ROSY

Delighted with The Geographic's efforts to record fast-disappearing traditional costumes, the president of Castellon's folk-dance society rounded up these townsfolk, who ransacked trunks for clothes in which to pose before the color camera.



© National Geographic Society

Finlay Photographs by W. Robert Moore

DANCE PARTNERS ARE CAREFUL NOT TO STEP ON THE GIRLS' TOES!

The pointed wooden "dancing pumps" were originally for looks, however, not for defense. Worn at the Feast of the Assumption (August 15) and on Michaelmas (September 29), the costumes of Bethmale differ strikingly from those of Castellon and other places only a few miles away.



© National Geographic Society

Findlay Photographs by W. Robert Moore.

LIKE A TINY LIGHTHOUSE ALMOST ENGULFED BY HUGE GREEN HILLS, A CHURCH TOWER MARKS THE VILLAGE OF TAURINYA

Farming has its ups and downs on the steep slopes of the valley that leads toward Mont Canigou (Plate IV). The Pyrenees rise like a colossal Chinese Wall, separating France and Spain. Highest mountain is the Pic d'Aneto (11,168 feet). The isolated little Republic of Andorra straddles a section of the frontier. Another geographic oddity is a piece of Spanish territory entirely surrounded by French soil (Plate XII). This enclave of four square miles is connected with its mother country by a neutral road running from Llívia, its only town, to the Spanish border.



© National Geographic Society

**SWINGING A SCYTHE WOULD BE HOT WORK IN THIS GARB**

The farmer's granddaddy, however, may have worn the wide sash and gondola-shaped shoes when he mowed his grain with the broad-bladed tool. The people of Bethmale are reputedly descended from Huns who were left in the Pyrenees after Attila's defeat some 1,500 years ago.



Finlay Photographs by W. Robert Moore

**AN OLD-FASHIONED BONNET SHADES SMILING EYES**

Her coquettish headgear, flowered shawl, bright plaid apron, and up-turned wooden shoes are treasured family heirlooms. For everyday wear the girls of Castillon prefer current styles in Paris frocks, while men of the mountain towns customarily wear sack suits.





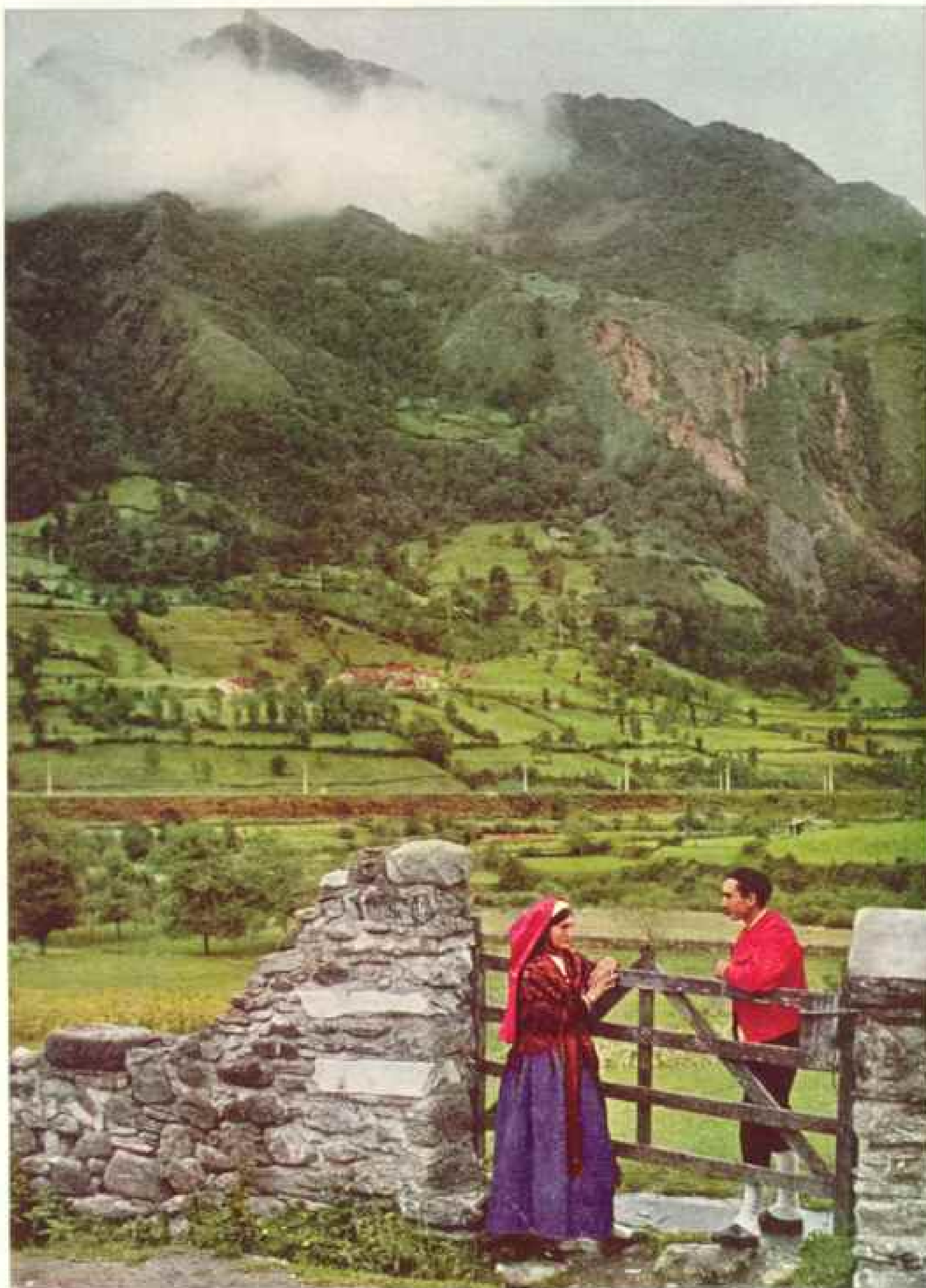
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Finlay Photograph by W. Robert Moore

A BRILLIANT BETHMALAISE FETCHES WATER AT THE VILLAGE FOUNTAIN

When dancing in the traditional local style, girls stand almost motionless in their gorgeous skirts and shawls, taking only a few short steps with the upcurved sabots. Their partners provide the action, bounding gracefully into the air, then striking the earth with their heels as if in a frenzy, but always with solemn expressions on their faces. Shiny nails are often hammered into the wooden shoes to form decorative patterns (Plates V and VII).

COSTUME PAGEANTS IN THE FRENCH PYRENEES



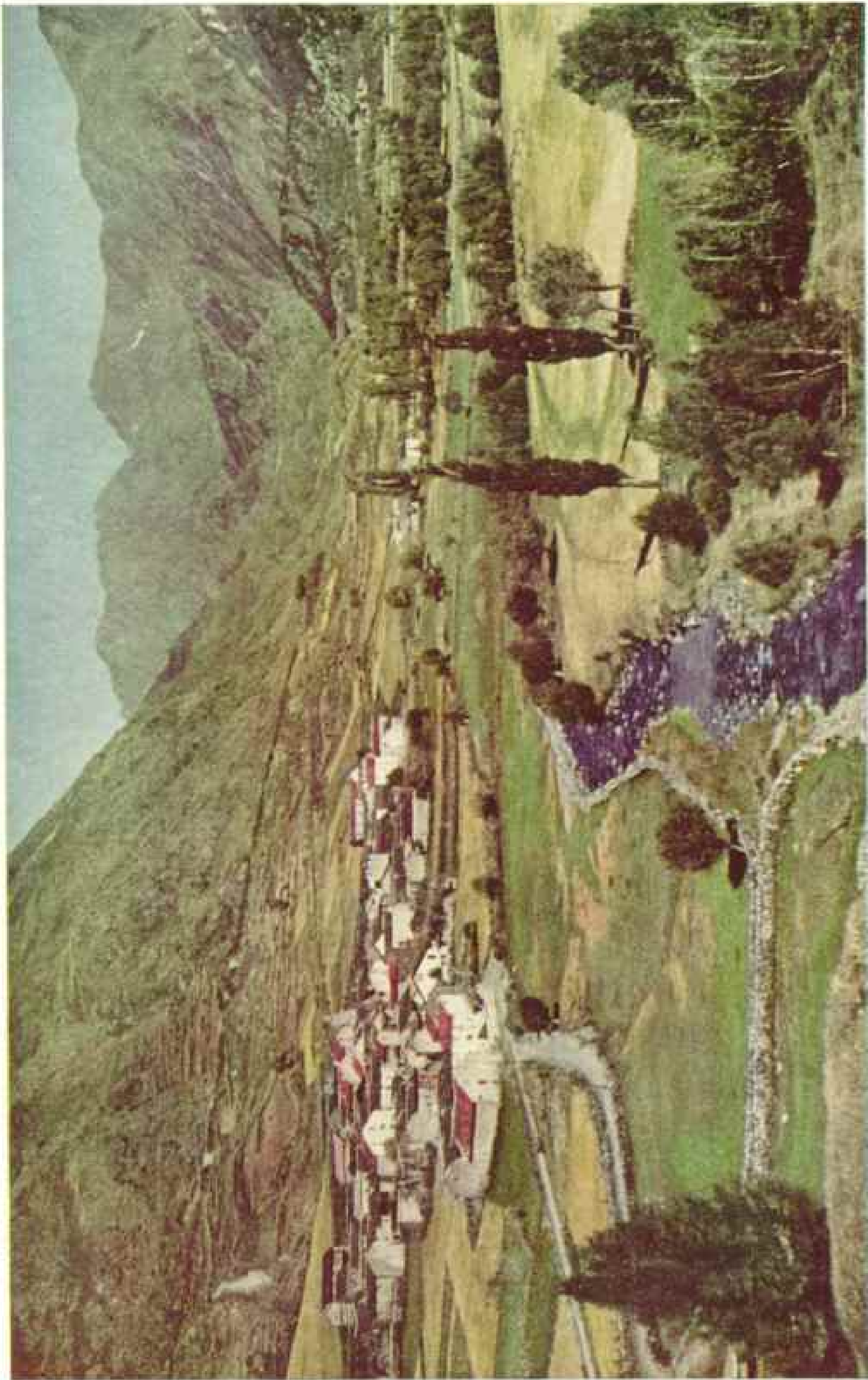
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Finlay Photograph by W. Robert Moore

VILLAGERS OF HÉOST BELIEVE "GOOD FENCES MAKE GOOD NEIGHBORS"

Costumes of bygone days contrast with the modern railroad embankment in the Valley of Ossau, near Laruns. Beyond, the towers of one of the Pyrenees' numerous electric power lines cut diagonally across steep farms on the slope of the cloud-turbaned peak.



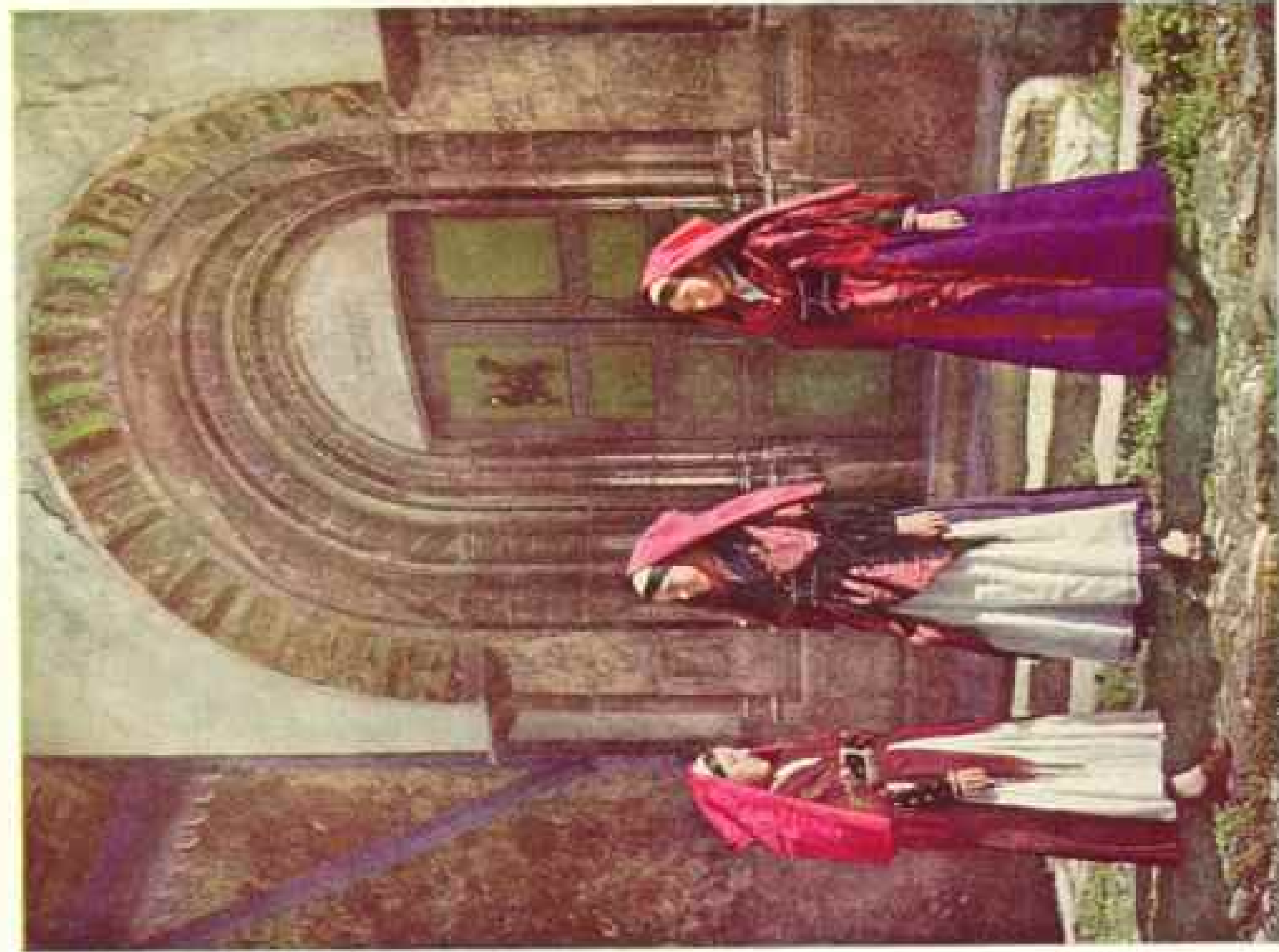


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Friday Photograph by W. Robert Moore

RED ROOFS, GREEN PASTURES, AND A STEEL-BLUE STREAM MAKE PORTÉ A TYPICAL PYRENEAN VILLAGE.

A patch of snow, surviving through summer until September, marks the Pic Carlitte (upper right), some 9,580 feet high. Behind the town, a road zigzags up from the valley of the Carol to the Col (pass) de Puymorens, which takes motorists over to the valley of the Ariège. A railroad tunnel, about three and a half miles long, pierces the mountains to connect the two valleys. Sheep and cattle are pastured in the pass after the snow melts.



© National Geographic Society  
**DEMURE YOUNG GIRLS OF BEOST SEEM EMBARRASSED BY THE BRIGHT COLORS OF THEIR COSTUMES**

The photographer, busy with his camera in front of the village church, heard a bystander ask: "What you doin' y'er? The speaker was an elderly native lady who had learned English during a long residence in California.



Family Photographs by W. Robert Mount  
**"THE QUAKER LOVES AN AMPLE BRIM" — AND SO DO THE MERRY MEN OF SENTELIN**

These were the only broad-brimmed, low-crowned hats seen among traditional costumes in the Pyrenees. Women of the secluded village wear magnificent shawls and little bonnets like old-fashioned bowdair caps.



© National Geographic Society

Finlay Photograph by W. Robert Moore

A "CHAOS" OF GRANITE BOWLDERS ADJOINS PROSPEROUS FIELDS AT TARGASSONE

Giant rocks of fantastic shapes tumbled down the slope of the Pic des Mauroux to form this famed chaos. Bullock teams draw creaking carts toward near-by Font-Romeu, where the author arrived just in time for the annual festival in honor of the town's "miraculous Virgin." To the left of the road is Spanish territory, part of the curious enclave of Llívia (Plate VI), so point of whose border is nearer than a mile to that of Spain proper.





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**MADAME SITS FOR A CLOSE-UP OF HER HEIRLOOMS**

A golden pendant hangs at her neck and a jeweled pin fastens the richly patterned, long-fringed shawl. Clothes are not the only antiques in Béret. Villagers worship in a 12th-century church and live in houses dating as far back as the time of Columbus.



Friday Photographs by W. Robert Moore

**HER CLOTHES ARE NO GAYER THAN HER FLASHING SMILE**

So rare in Pau is the traditional garb, with its laced bodice, flowing skirt, and scarlet headress, that puzzled citizens stopped to question The Geographic's photographer about it as he took pictures of specially costumed groups at the gateway of the town's historic castle.



© National Geographic Society

BERETS CLUSTER AROUND THE VILLAGE SQUARE AS MERRYMAKERS IN RED AND WHITE CAVORT FOR FELLOW TOWNSMEN

Finlay Photograph by W. Robert Moore

A gala day is this in the little Basque community of Hosta. Behind the raised dance platform, a wide-sighted woman looks on from her garden, while another householder peers out from an upstairs window (right). Performers are men, including the two giant "women" (opposite page). After clowning through town to the tune of wild, shrill music and rattling drums, the dancers jump up and down on the wooden stage. The "drum major" tosses his baton into the air and reaches out to catch it. Later the local poet will chant impromptu rhymes in the strange Basque tongue.





© National Geographic Society

**MADAMOISELLE GOES CALLING IN HER TRADITIONAL FINERY**

Her shawl, its fringed ends draped under the wide belt, takes the shape of a Gargantuan swallowtail butterfly. Broom, her native village, is in the Valley of Ossau, once a virtually independent republic. Few other sections of the Pyrenees have guarded their traditions so zealously.



Finlay Photographs by W. Robert Moore

**BEHIND WOMEN'S SKIRTS HIDE TWO MEN OF HOSTA**

Performers representing woodcutters, with axes and fancy headdresses, march beside the dummies. A Basque dance may include characters dressed as blacksmiths, knife grinders, gypsies, and a barber with a huge wooden razor. Village notables donate wine and gifts as the parade passes.



HOSTA'S PARADE LEADERS RIDE HORSEBACK; THE "COLOR GUARD" MARCHES AFOOT

The standard bearer's act consists of whirling the banner around his head and ywishing it back and forth so rapidly that the bright colors seem alive. A Basque child "can dance before it can call its papa by name," wrote a French traveler nearly 300 years ago.



© National Geographic Society

Finlay Photographs by W. Robert Moore

BEFASSELLED "SWORD DANCERS" USE LIGHT STICKS INSTEAD OF REAL WEAPONS

Striking their rods together to simulate clashing swords, the men leap into the air, then stand and kick their feet above their head, and, at the finish, lift up their leader and hold him horizontally high above the ground. Basques of Spain have similar dances, costumes, and traditions.

forming its gateway and ramparts. Deep below, in a wild ravine, the river brawls noisily over its rocky bed. Between here and Mont Louis two 270-yard-long railway bridges span the chasm.

Where the profound gap widens again, we caught fleeting glimpses of a village set high atop one of the rocky walls. It was more than a thousand-foot drop to the nearest bus stop, but what a front-window view the residents must have!

In less than 12 miles here in the upper Têt the road spirals and mounts upward 3,000 feet, like an airplane seeking elevation. And the view that one gains approximates that from a cockpit.

My hotel window at Font-Romeu commanded a panorama of the upper Segre Valley in the historic district of Cerdagne, in which is cradled an odd political story. I could not enter Spanish territory, but I discovered that I could quickly encircle it.

The possibility has existed ever since 1659, when the French and Spanish laid down their arms after the Thirty Years' War. In the Treaty of the Pyrenees that they concluded then, Spain ceded 33 villages of the Cerdagne to the French.

But in the forfeiture the Spanish protested that the old capital of Livia was a town, not a village. So Spanish it has remained, a tiny four-square-mile enclave, surrounded by French soil (Plate XII).

On the downward slope toward the Ariège we passed the road spur that leads to Andorra, quaint survivor of the old Pyrenean republics, with its loyalties united both to France and Spain.\*

Although bleak at its beginning, the Ariège increases in prosperity as it descends and widens. It was milking time in the pastures before we arrived at Ax-les-Thermes. From one of the fields came Marie, who had two heavy cans hung pannierwise on her small flop-eared donkey, Marquis.

Snow-fed rivers fret noisily through Ax-les-Thermes, but in the vicinity there are several hot sulphurous springs about which the popular spa has grown.

#### ONE-WAY PLOWING ON STEEP FARMS

On some of the steep farms I saw men plowing only downhill, then letting the cattle drag the disengaged plow back to the top of the field. Elsewhere two yokes of cattle or bullocks were being used for turning the upgrade furrows.

Foix really is off the Pyrenees route, but it is still deep in the hills and for centuries

was the capital stronghold for the Counts who ruled the district. Its venerable castle, standing boldly on a rocky hill rearing above the junction of the Ariège and the Arget, is a pleasing remnant of feudalism.

By good fortune we arrived in the town on the chief day of its autumn fair. Merry-go-rounds, bump'em and dodge'ems, catch-penny side shows, and every Coney Island attraction that young or old might wish filled the wide tree-canopied promenade.

While barkers called hoarsely and roulette wheels spun, a band blared near by and people danced in the dust. In a little roped-off area beside the bandstand, tiny chubby-legged youngsters danced, walked, and stumbled with their partners, but were gleefully happy.

The climax of the evening was a fireworks display from the towers of the castle. Torpedoes deafened the ears and necks became cramped as rockets hissed skyward and burst into myriads of colored stars.

Then lights flickered in the castle windows, smoke poured from the battlements, and the towers became red as flames leaped higher. The castle was "burning" in a most realistic manner. As darkness settled over the walls holiday makers piled into flivvers, buses, and donkey carts and went home.

#### BOBSLED RUNS AND A SKATING POND

Superbagnères is as gay in winter as it is cool in summer. On its slopes are bobsled runs, ski jumps, and even a skating pond.

Two nights while we were in Luchon it rained torrents, but the days dawned clear. When we took to the trail again, however, the moisture steamed up from the slopes and the mountains along the way became like rows of Indian women in white *purdah*. Not one lifted her veil to reveal even a fleeting glimpse of her charms.

When the September sunshine later became entrapped in the clouds and fog gathered on the highway, we drew up at the Hotel Maréchal Foch, at Arreau.

"A room with a bath?" repeated the plump matron and then threw back her head in full-hearted laughter.

"The Marshal's grandmother never had a bathroom, and this is the house where she was born! Didn't you see the plaque on the wall out in front?"

\* See, in THE NATIONAL GEOGRAPHIC MAGAZINE, "Unique Republic, Where Smuggling Is an Industry," by Herbert Corey, and "Andorra—Mountain Museum of Feudal Europe," by Lawrence A. Fernsworth, March 1918 and October 1933, respectively.

"But I have a very nice room, overlooking one of the finest valleys in the whole Pyrenees," she added as she led me upstairs.

A bath was of insignificant consequence when I could dine on trout caught from the river that surged beneath my window and on jugged chamois shot in the near-by mountains.

From Gavarnie to Argelès-Gazost, and the side trip to the summer holiday center of Caunterets, the road weaves through gorges most of the way.

#### RIDING AN AERIAL CABLE CAR

Between Argelès and Lourdes the problem of perspective has been solved by an aerial cable car that ascends to Pibest.

A storm during the night had brought snow to the lofty crests. Eastward, the Pic du Midi de Bigorre stood clear in its new robe; to the south, Gavarnie had been converted into a snow fairyland; while on the westward wing of the vast saw-tooth range rose Vignemale, Balaïtous, and several other hoary monarchs, all resplendent in their new white mantles.

Down below us to the north, at the threshold of the high mountains, was Lourdes. Mystic, miraculous Lourdes is known to the world. Countless thousands of religious pilgrims from near and far visit its shrines and its grottoes.

From Argelès-Gazost to Eaux-Bonnes and Laruns in the Vallée d'Ossau, the route is a pathway of excellent road engineering and of grandeur.

Between the twisting zigzag Col de Soulor and the Col d'Aubisque where the highway loops round blue mountains to descend to the valley, the roadbed has been hewn out of the face of solid rock that rises sheer toward the sky.

The girls at the village at Béost took long to dress in the old costumes of Ossau, but their attire was far from monochrome (Plates IX, XI, XIII, XV).

Pau, although in the Basses (low) Pyrénées, seems on the plains. When the town was capital of the old province of Béarn, it was scintillant with court glory.

Here, in a room of the altered and restored Castle, one can see the tortoise-shell cradle in which Henry IV slept as an infant, after, says legend, his mother sang Béarnais songs at his birth and his father rubbed his

lips with garlic and made him taste the local Jurançon wine.

So rare now are the brilliant Béarnais costumes that when I was photographing a group at the castle gateway, many stopped to inquire what they were (Plate XIII).

#### RED ROOFS AND PELOTA

Westward from Oloron, through Mauléon-Licharre and St. Jean-Pied-de-Port, the hills become rounder and lower.

As we sped along the road, we saw slate roofs turn to red tile. Walls flashed white in the sunshine and the houses took on red balconies and red shutters. Churches acquired differently shaped towers and every village had its *frontón*, or wall, against which the game of pelota is played. Farmers, driving oxcarts of bracken down from the hills, wore inevitable berets. We had entered the Land of the Basques.\*

On the road through Louhossoa, Ixassou, Cambo-les-Bains, Larressore, and other strangely named places we journeyed. The young boys, had they been American, would have been playing sand-lot baseball. Being Basque, they were bouncing balls against the village *frontóns*. For pelota is to the Basques what baseball is to Americans.

The game has several variations, some requiring a long field extending from the *frontón*. A soft rubber ball is used. In the play it is caught and returned to the opponent from a single bounce or directly by means of a long troughlike basket strapped to the hand.

A procession of red-roofed, white-walled villages, grouped about churches, where the men sit in tiered balconies along the walls while women occupy the center seats, rose and dropped from sight as we cruised over the rolling hills.

In a short time we were down to St. Jean-de-Luz, where bathers were basking in the sun. Although mainly a resort today, the sailors of the port once made it prosperous when they possessed the fishing rights on the Grand Banks of Newfoundland. Here, too, the Infanta Maria Theresa was wed to Louis XIV in 1660.

Seven miles down the coast was Hendaye; also the end of our contrasting panoramic route through the French Pyrenees.

Beyond the frontier, drums were sounding, guns were thundering, and castles were burning, but it wasn't for festival, fair, fun, or a pelota game such as we had seen in the peaceful mountain valleys; it was the stark realism of war.

\* See "Land of the Basques," by Harry A. McBride, in THE NATIONAL GEOGRAPHIC MAGAZINE, January, 1922.



# HARK TO THE HOUNDS\*

BY FREEMAN LLOYD

**O**F ALL the stirring sounds in Nature, none, I suppose, has a deeper elemental appeal than the bugle music of a hound pack in full cry.

Take even a confirmed city dweller and set him down in an English meadow or on a Missouri hilltop when the hounds are running, and he will probably confess to a quickening of the pulse and a prickly sensation along the spine as the strangely mournful notes come ringing across the distance.

This sense of suppressed excitement, this lifting of the hairs on the back of the neck, are doubtless throwbacks to the time when a man had to hunt down his meat on the hoof with his dogs instead of buying it by the pound at the corner store.

Or perhaps it harks back to a time even earlier, when he himself was often the quarry of the pack before he succeeded in capturing and training the young of his canine neighbors and winning their allegiance.

A few years ago I was going up to Winnipeg to judge at the dog show there, and I decided to go on to Alberta where two nephews of mine have a cattle ranch. They call it "Trevalen" after the old family homestead in Wales.

## WANTED: A HUNTING HORN

Well knowing that they lived a long way from stores and thirty miles from the nearest railway station, I wrote to the elder of the brothers, asking what they would like me to bring from the outside world. Living away off there, I thought, they must need many a little luxury—a radio, maybe, a half-dozen shirts, a box of cigars.

Back came the answer, by telegraph:

"A hunting horn."

With their horses, hounds, and a hunting horn the brothers Lloyd would be content.

Broadly speaking, there are two kinds of hounds. Both are hunters, but one possesses keener scenting powers than the other, which depends more on eyesight and speed.

The true hunting hound is a heavy-

\* This is the third in a series of articles on the dogs of the world, with illustrations from paintings by Edward Herbert Miner. The first and second, in *THE NATIONAL GEOGRAPHIC MAGAZINE* for February, 1936, and January, 1937, respectively, depicted the terriers and field dogs; the fourth will appear in an early number.

skulled, long-eared, long-lipped type, more or less suggesting the Bloodhound in form and relying chiefly upon its nose. When on the scent it gives vent to its feelings in rich, melodious baying. At the head of the pack stands that majestic-looking old master, the Bloodhound, with the best trailing nose in the business (Color Plate I).

The fleetest legs in all the canine world are included in the second group, represented by the long-headed, small-eared, long-legged Greyhounds of Europe and the long-eared, fringe-tailed gazelle hounds of Asia and North Africa.

These swift coursing dogs locate their game by sight, not scent, and they run as silently as death, using all their breath for propelling those marvelous legs.

## COURSING COYOTES IN ALBERTA

My rancher relatives in Alberta, I found, were using dogs of Greyhound and Deerhound bloods for pursuing the coyote, or prairie wolf, a pest fully capable of pulling down and killing a young calf.

These outcast sons and daughters of the plains are amazingly fast and elusive, and one of their favorite pastimes is to tease a pack of ordinary and slow dogs by running just ahead of them, then finally opening the throttle and drifting away like a wisp of smoke. The speed of the Greyhound is needed to cope with them, but other qualities are desirable too.

In the Prairie Provinces of the Dominion, accordingly, the Greyhound is crossed with the Scottish Deerhound and sometimes with the Russian Wolfhound—the English dog for speed, the Scot for hardiness, the Russian for biting and holding powers.

These "long dogs," as they are called, not only run by sight, but also, because of their Deerhound blood, can readily follow a coyote's scent.

They possess keen olfactory powers, a fact I was able to observe for myself while coyote hunting with my nephews at Trevalen Ranch. One of the six long dogs running ahead of the party suddenly stopped as some game scent reached his nostrils. Like a lot of pointers and setters, the other five stood still in their tracks.

We dismounted and walked on past the dogs. About thirty yards beyond where the first one had pointed, we flushed a covey of





© Fox

"NOW WHERE'D THAT BLOOMIN' OTTER GO?"

Men and hounds alike seem puzzled. But the quarry has doubtless ducked into his "holt" whence he will ultimately be driven by a terrier. The men who have lined up to form a "human dam" and prevent his escape would likely get a bad bite on the leg if the tough little under-water swimmer did come their way. Otters, accused of spoiling the fishing, are thus hunted with hounds and terriers in many parts of Great Britain (page 483). This scene is in Gloucestershire.

prairie chickens. Here were wolf-hunting hounds with the manners of bird dogs, one of the strangest combinations ever observed by this writer.\*

In response to the request for a hunting horn I had managed to find one at a saddler's shop, a short copper horn of English make. The boys lost no time in putting it to use, teaching their hounds the time-honored calls which are as full of meaning to a well-trained pack as bugle calls to a soldier.

Various combinations of long and short notes mean specific things: that the quarry has been located, for example, and the chase is on; that the prey has broken cover, or "gone away"; that the hunt is over and it is time to return.

Thanks to their Greyhound blood, these hounds were extremely keen-sighted for dogs and were able to spot a coyote about as

\* See "Field Dogs in Action," NATIONAL GEOGRAPHIC MAGAZINE, January, 1937.

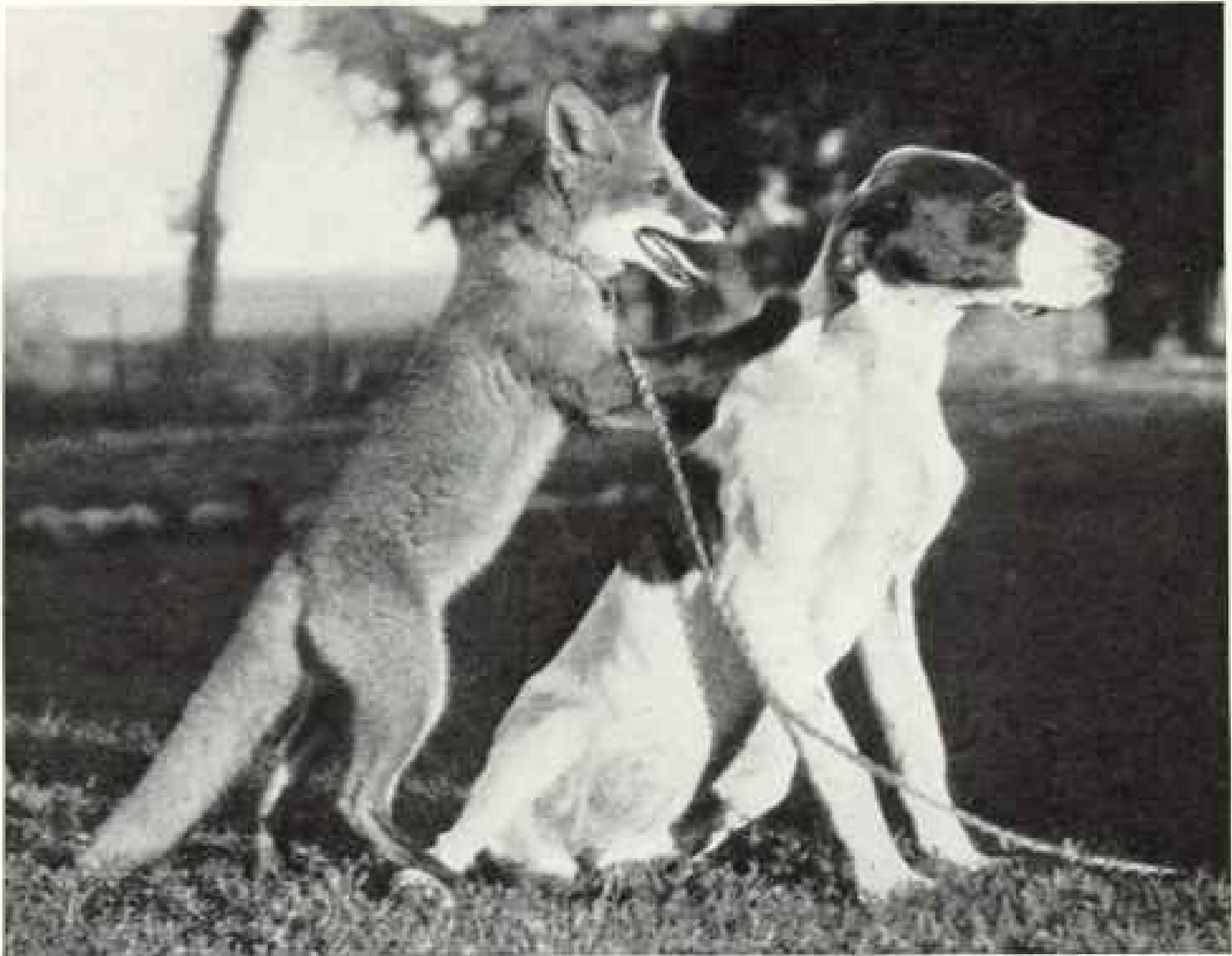
far away as the human eye could see it. Usually, however, one of the riders, being higher, would be first to spy the quarry—a tawny shadow popping out of the plain.

With a "Hou, hou, hou!" and a pointing wave of his arm, the hunter would direct the hounds' attention. One sharp-eyed dog would sight the loping form and stretch out, top speed, in that direction, the others swiftly joining him. During the chase, like true Greyhounds, they were silent as the grave.

HAND QUICKER THAN A COVOTE'S SNAP

The coyote had a fighting, or rather a running, chance for its life, as its smooth and effortless action sometimes enabled the little scourge of the prairie to wear out its rivals, especially if it had a good start and if the dogs had already been running hard.

Though no match for such a pack in fighting ability, a coyote when cornered can



Photograph by Eugene H. Wilson

## GOOD FRIENDS—BROTHER FOX AND THE FAMILY DOG

Ancestral antipathies are forgotten on the E. W. Wilson farm, Newell, Iowa, where a young fox, rescued from freezing when two or three weeks old last winter, romps with its canine friend. At times they get rough, but both can take it. Even when free, the fox does not run away; the chain is just chicken insurance. In spite of it Reynard has caught several plump hens in true foxy fashion by pretending to be asleep and then pouncing upon them when they carelessly wandered within reach.

give a good account of itself. Yet there are instances of a professional wolf-hunter capturing them alive, when run down by the dogs, by gripping the lower jaw.

One such feat was described in *Outdoor Pastimes of an American Hunter*, by former President Theodore Roosevelt, who has left some vivid descriptions of coyote- and wolf-coursing in the western wilds:

"He held the reins of the horse with one hand and thrust the other, with a rapidity and precision even greater than the rapidity of the wolf's snap, into the wolf's mouth, jamming his hand down crosswise between the jaws, seizing the lower jaw and bending it down so that the wolf could not bite him. He had a stout glove on his hand, but this would have been of no avail whatever had he not seized the animal just as he did; that is, behind the canines, while his hand pressed the lips against the teeth."

Greyhounds were used for overhauling

coyotes, Colonel Roosevelt recorded, but for coursing the big gray wolf a cross with some hard-bitten breed was used, such as Bulldog, Mastiff, or Great Dane. Even at that there were many casualties, as a wolf can snap a dog's leg like a carrot.

Perhaps the most spectacular workman of all the coursing dogs is that handsome Russian the Borzoi (Color Plate V). Nowadays, of course, the large majority of these Russian Wolfhounds live and die without ever seeing a wolf. Nevertheless, their heritage of hatred of all things lupine is ever-present.

I well remember the hubbub set up at one of the New York dog shows by a leash of Russian Wolfhounds when a dog of wolf-like appearance and remote wolf ancestry chanced to be led past their stall.

Though reared in civilized luxury as canine aristocrats, they were carried back in a flash, it seemed, to the wild, wolf-harried steppes of Russia. And the object



Photograph by Acton

#### FUTURE MACERS GET THEIR FIRST TASTE OF THE "HARE"

Part of the making of a champion racing Greyhound is this ritual at a track in Hertfordshire, England—letting the puppies sample a rabbit skin to whet their appetites for the chase. However, they are destined to spend most of their days in patient pursuit of a purely mechanical rabbit which they are never quite able to catch—a dog's life, indeed! (pages 472 and 473).

of their antagonism, if the expression in his cold eyes meant anything, returned their hostility with compound interest.

#### NEMESIS DOGS THE WOLF'S FOOTSTEPS

In their coursing days in Russia these fleet and tenacious dogs were trained not to kill the wolf but rather to pin him cleverly by the throat and hold him until the hunter could come up and either dispatch the beast or muzzle him for capture alive.

The former Tsar's aggregation of Borzois was reported to contain at least one dog that could perform this feat alone, but usually two or three were run at a single wolf.

Loping up alongside, one would collar the beast with a quick bite just under the ear and hang on while his running mate found a similar hold on the other side. Together they held the wolf powerless until the deadly jaws could be muzzled or tied shut.

The strength and tenacity required for this feat of the Borzois can be better appreciated when it is remembered that a wolf is so strong in the neck that it can toss a sheep over its back as easily as a fox carries off a duck or a chicken.

In its fleetness and grace of outline the Borzoi is a worthy member of the Greyhound clan, which includes the swiftest runners in all the world of dogs. In fact, for limited distances, the

Greyhound is one of the fastest animals on earth (Color Plate IV).

From early times and in many countries sportsmen have bred and trained these long-legged, deep-chested speedsters for coursing hares and other game, and more recently for racing among themselves.

Archeologists have unearthed monuments showing ancient Egyptians releasing their dogs at hares, using a collar device similar to that with which Greyhounds are "slipped" today at coursing meetings.

Britain had its Greyhounds even earlier than the reign of King Canute, and no one of less degree than a "gentleman" was al-

lowed to keep one.

"A gentleman is known by his horse, his hawk, and his Greyhound," went a saying in Wales.

King John of England frequently accepted a brace (two) or a leash (three) of Greyhounds in lieu of tax money or in return for a royal favor.

#### A GREYHOUND IS NO FLATTERER

A good commentary on the rather reserved bearing of the Greyhound is the story told of King Charles I.

"Sire," said a retainer, "I perceive you love the Greyhound better than you do the Spaniel."

"Yes," answered the King, "for they equally love their masters, and yet the hound does not flatter them so much."

A custom maintained to the present time is the presentation of a brace of all-white Greyhounds to the Duke of Cornwall by the people of his duchy.

A Cornish-bred all-white Greyhound, Champion White Rose of Boveaway, owned by Mr. Harry T. Peters, Jr., of Islip, Long Island, was adjudged the best of her breed at the New York dog show last February. All-white Greyhounds are exceptional.

In my own time in South Africa, Umbandine, titular king of Swaziland, would trade a wagon and a span of 16 fine oxen for a Greyhound fast and hardy enough to pull down a springbok.



© Wide World

#### IF YOUR NEIGHBOR HAS A NOISY PET, SUGGEST HE CHANGE TO A BASENJI

These "barkless dogs," silent stalkers used by remote Central African tribes, are among the first of their kind ever seen in Europe. The intelligent trio made its debut at Cruik's Coronation Dog Show held last February in London.

In 1895, while judging at the annual dog show in Johannesburg, I recognized two famous Scottish Deerhounds which I had previously seen in England. On inquiry I was told they had been brought to Africa to be presented to Umbandine in exchange for a mining concession. But, unfortunately for the speculators, the king in the meantime had joined his fathers.

The high value placed upon a fast dog in an antelope land was impressed upon me some forty years ago when I was traveling in a sparsely populated part of the Orange Free State, South Africa.





Photograph from Wide World

AN OLD ENGLISH SPORTING PRINT COMES TO LIFE

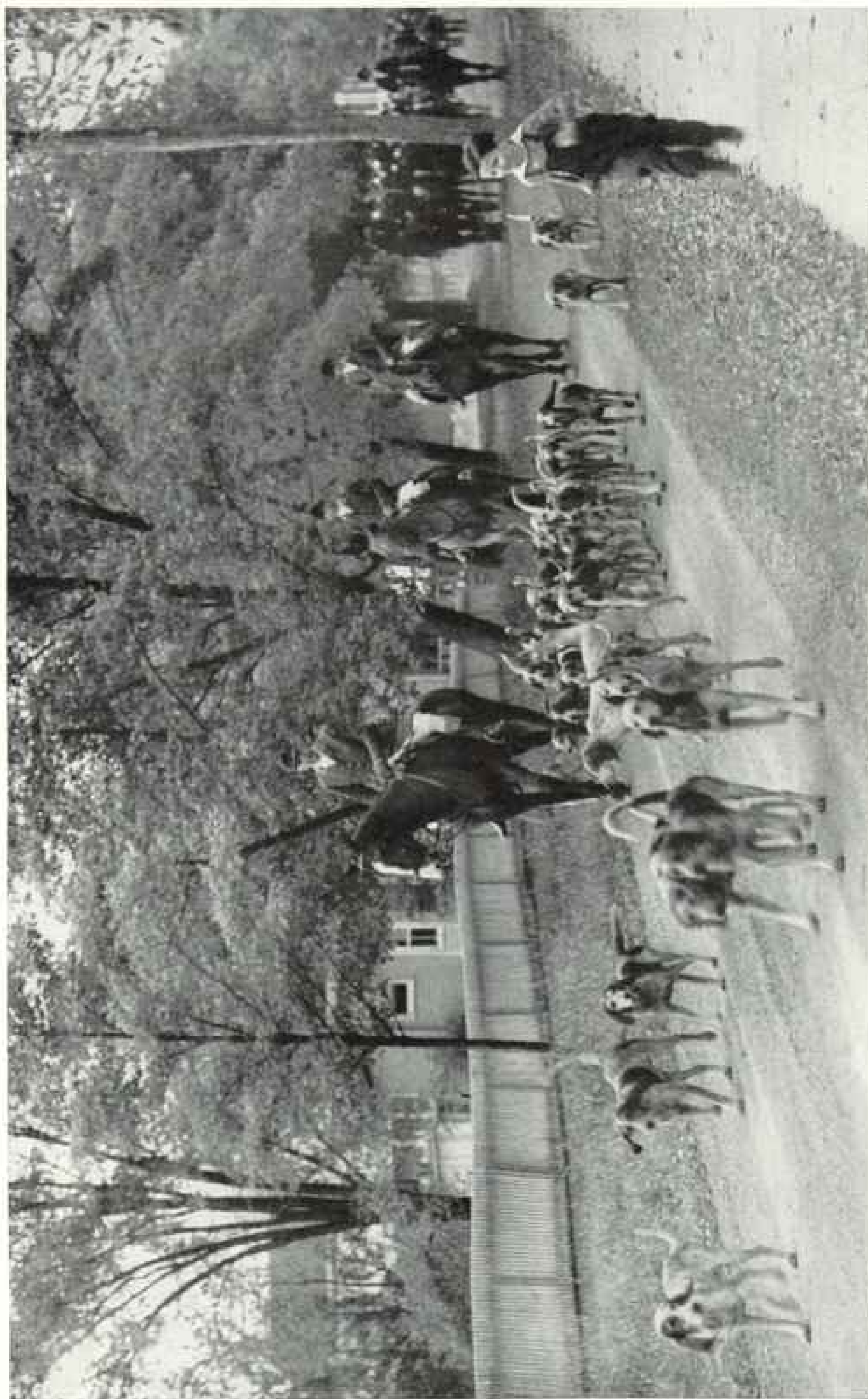
Captured by the modern camera is a scene that artists have been painting or weaving into tapestries for hundreds of years. This is a moment tense with anticipation for pink-coated men and women, for horses and hounds: the start of a hunt on a misty morning at Cabington, near Aylesbury, Buckinghamshire.



© Fox

AN ENGLISH DIANA OF THE CHASE TAKES HER BORZOIS FOR A MORNING RUN

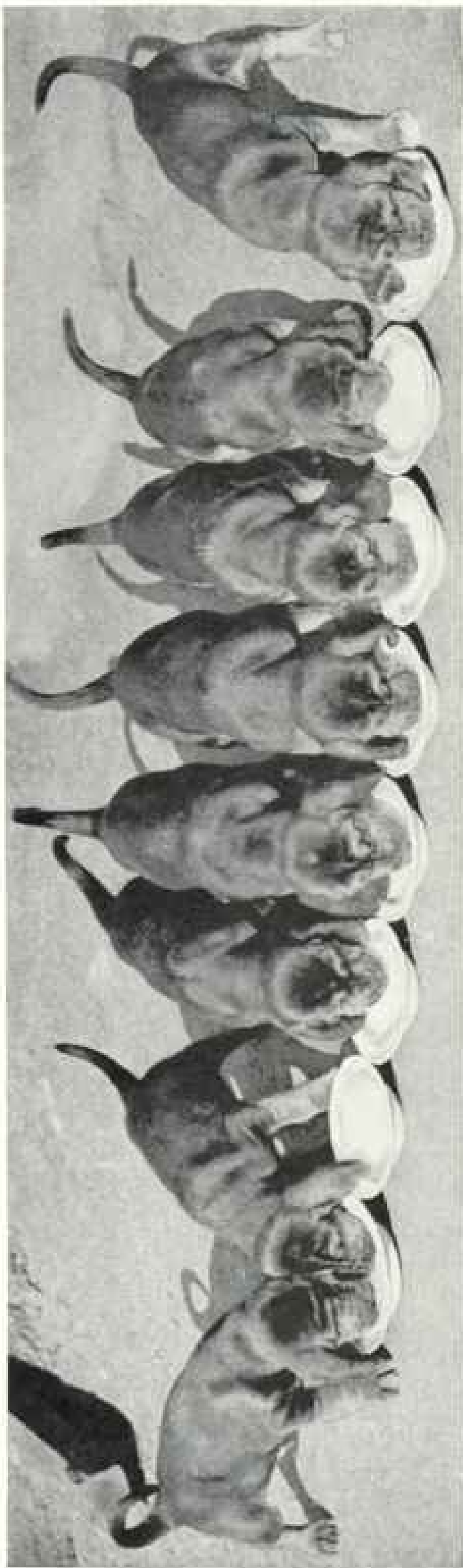
Full of high spirits as well as beauty and grace, these splendid Russian Wolfhounds make quite a handful. They are part of a kennel of more than 40 aristocratic Borzois owned by Mr. E. H. Guy, one of England's leading breeders, at "The Hollies," Ringley Park, Reigate, Surrey.



Photograph from Morgan

ALONG A NEW JERSEY ROAD THEY GO, "WITH HORSE AND HOUNDS IN THE MORNING."

In many parts of the United States, as in England, this hard-riding sport is popular. Here expectant hounds and smartly garbed riders head for the scene of a hunt of the Essex Foxhounds at Oldwick, New Jersey. Excitedly, Young America runs alongside.



© Fox

SIXEN LITTLE BLOODHOUND PUPPIES BEHAVE, BUT ONE RAIDS ITS NEIGHBOR'S DISH



Photograph by Edwin Levick

WHIPPETS, MAKING NEARLY 17 YARDS A SECOND, STREAK ACROSS THE FINISH LINE AT BELMONT PARK, LONG ISLAND, NEW YORK



As the train stopped at a siding on the veld, I noticed a native with an *arsagai*, or spear, and a "long dog," or crossbred Greyhound, on a horsehide lead. He was going on a long journey through wild country, he said, alone except for his dog.

Would he sell the animal?

"No, no!" he cried, and, turning, he actually ran away, his long dog bounding at his side. On such a trek the value of his fleet-footed mongrel, the meat-winner, would be beyond all price.

#### "THE POOR MAN'S RACE HORSE"

Today there are probably more Greyhounds in the world than at any previous time, largely because of the popularity of dog racing in many countries.

An offshoot of the Greyhound is the Whippet, a smaller dog produced by breeding terriers with Greyhounds (Color Plate IV and page 461). Terrifically fast for 200 yards, a first-class Whippet can cover the distance in approximately twelve seconds—nearly 17 yards a second!

In modern Greyhound racing the live hare of the coursing meetings has been replaced by a mechanically propelled artificial rabbit. The bunny is utterly uncatchable, and devoid of all nourishment, anyway, yet the dogs spend their days in its repeated pursuit.

Whippets are often lured on by the waving of towels, and a friend of mine from Vancouver, British Columbia, Mr. William H. Pym, recently told me he had introduced a new method of making the little racers show their best speed: the sounding of a siren or steam whistle just beyond the finish line.

Unusually interesting are the Afghan Hound and the Egyptian Saluki—Greyhounds with setterlike or spaniel-like ears (Color Plate VII and pages 477 and 481). Both are very old breeds, treasured favorites of kings and sheiks in their native lands, where they were used for coursing the gazelle.

Where the soil was sandy and more fitted for the hoof of the gazelle than the foot of the dog, hawks were sometimes used to fly at the head and eyes of the quarry, so baffling and delaying the poor animal that the coursers could overtake it.

In the United States today there are many excellent specimens of both these exotic breeds. The Afghan, which wears a coat of wool-like texture to suit the high

altitudes of Afghanistan, is a favorite among motion-picture artists in Hollywood and its environs, where its smart and unusual appearance is much admired.

#### BLOODHOUNDS MORE FEARED THAN FEARSOME

More maligned and misunderstood than any other dog, perhaps, is the solemn-faced, deep-voiced Bloodhound (Plate I and pages 461, 464, and 468). Its sanguinary-sounding name may have had something to do with this, and no doubt *Uncle Tom's Cabin* and various detective tales helped to create an impression of fierceness and to give the dog a bad name.

As a matter of fact, the purebred Bloodhound is not by nature a savage dog—quite the contrary—though much depends, naturally, upon the particular treatment the individual dog has received and the way he has been trained.

Some twenty years ago I had opportunity to observe this while visiting Mr. Manning Cleveland, of Poughkeepsie, New York, who was a prominent owner of English and American Bloodhounds and trained them as man-hunters. About 6 o'clock one morning I was aroused by hard knocking on the bedroom door.

"Come on!" a voice cried. "A man has been stabbed and the police have asked that we put Moses and the new hound on the trail of the culprit."

The hounds were given a smell of the fugitive's crumpled felt hat. As they recognized the scent they acknowledged it with sonorous baying and were off, tugging their handler along at a dead run.

The line led to a factory near the river, where the fleeing man had evidently tried to escape by boat. Finding no oars, he had turned back and finally was discovered hiding in an old barn.

When the quarry was found Moses simply bayed his loudest and showed no inclination to attack the man. The other hound, however, gave indications that she might have done so if not restrained.

Asked to explain this difference in temperament, Mr. Cleveland said the new hound was penitentiary-trained.

In some institutions of that time, he said, it was customary to order prisoners to annoy hounds in their kennels by kicking the corrugated iron fences around the dogs' sleeping and feeding quarters, thus making ardent enemies of the four-legged sleuths.



Photograph from Morgan

OVER THE FENCE IN JOYOUS CRY, FOR THE FOX IS GETTING "SWEET"

Three out of four are in the air as the leaders of the Smithtown Hounds, hot on the trail, nimbly clear the top rail during a hunt at Smithtown, Long Island, New York. A fox is said to be "sweet" when its scent lies heavy and fresh, full of promise for the eager hounds.

Even the casual observer seems to recognize the distinctive head appearance of a Bloodhound.

"A BLOKE WITH A BLOOMIN'  
BLOODHOUND"

At the period of the Jack the Ripper murders in London I took a French Basset Hound out for exercise on the street. At the corner of Tottenham Court Road and Oxford Street I was having my shoes cleaned when a boy spied my hound—a miniature Bloodhound in head and ear appearance—and set up a loud outcry: "Hi! Here's a bloke with a bloomin' Bloodhound!"

A crowd immediately collected, and the center of attraction escaped further attention by hailing a passing hansom cab.

About 50 years ago I was accompanied around the famous dog show at Birmingham, England, by a learned authority concerning dogs. Stopping suddenly and pointing to a magnificent black-and-tan Bloodhound, my mentor exclaimed:

"There you see the pillar of the Stud Book. From such a hound came all the other hounds of the several varieties. Can

there be any wonder that he is benched on the Number One stall in the world's greatest exhibition of hounds and dogs?"

The Bloodhound remains at the head of the hound family. In general conformation, in the size of head and ears, in body, bone, carriage of stern, and other hound characteristics, he remains supreme. The "pillar" has not weakened; its stability endures.

WILY REYNARD RUNS ON

In the wily fox the lighter, faster members of the hound clan found an opponent well worthy of their best efforts, and the pack has been chasing Reynard for many centuries, sometimes successfully and sometimes not, but always with plenty of excitement for hounds and men.

Fox hunting has been a national sport in England for more than 300 years, and long before that, early in the 14th century, the huntsman for King Edward II gave written instructions regarding the methods to be followed.

In England a person would be looked upon as a scoundrel if he killed a fox in any but the legitimate way—with a pack



© International News

#### TWO'S COMPANY, THREE'S A CROWD

Roly-poly but quick, two black bear cubs scurry up the slim trunk ahead of the dog. This instant of action was snapped in Alberta, Canada, where lithe, fast long dogs, or crossbred Greyhounds, are often used for coursing the swift coyote.

of hounds followed by mounted hunters.

Many years ago in Wales I was shooting woodcock when a fox suddenly broke cover ahead of my spaniels. Without thinking I gave a shout, "Hou, hou, hou!" and my Greyhound, which had followed me from home without my knowledge, shot past, quickly collared the fox, and killed it. I was overcome with shame.

Furtively I concealed the victim in a hedge and that night, with a bosom friend, I came out and buried my sin. We made it a perfect crime. Had it ever become known that I had killed a fox while shooting, I should have been ostracized; gentlemen would have turned away as I approached.

In this country the English type of fox hunting has won popularity in many States. In other sections the fox, regarded as vermin, is sometimes hunted with a single hound and a gun.

An American form of fox hunting with a genuine appeal for the dog lover—and for the friend of the fox as well—is that described so feelingly by MacKinlay Kantor in his story, *The Voice of Bugle Ann*.

The owners of the hounds sit about a campfire while the chase goes on through the dark countryside around them; from the quality of the distant tonguing they follow every move in the contest of wits and speed. At last, when tired, the fox slips into a hole and lives to run another night.

In imagination now, hark to the choir of the hounds! Here they come, in full cry, with joyous tongue—the deep-throated basso-profundo of the Bloodhound and Otterhound, the baritones of the Foxhounds and Bassets, the tenor baying of the little Beagles.

Here, too, come the coursers, the swift, silent ones, skimming the earth like swallows. Wonderful creatures all! Let's look them over, one by one.

#### Bloodhound

The Bloodhound (Color Plate I), we are told, was given that name because of the old method of training the hound to follow the trail of blood left by a wounded deer. At first he was encouraged to trail the animal in company with an old and experienced hound, and at the end of the chase he was regaled with some of the venison as a reward for his labor and as an incitement to future service.

When the hound was perfect in these in-

troductory lessons, the blood of a deer was rubbed on the shoes of a man possessing considerable running ability and perseverance. The runner then took a remote circuit of a mile or so, occasionally renewing the blood on the shoes as the scent became less effectual. These lessons were continued, and the circuit more and more enlarged, until, having afforded satisfactory proof of his progress, the hound was finally taught to hunt the "dry foot" of a man.

Bloodhounds kept for man-hunting are not allowed to run on the scent of any of the lower animals, lest it make them less proficient in their specialty.

The Bloodhound is a descendant of the Talbot or old Norman hound brought to England by its conquerors in the 11th century. Unless he is encouraged to be savage, he is quite an inoffensive and at times a man-shy dog. But he loves hunting.

Bloodhound field trials are held in England, the "clean boot" only being used. On the arrival of the hound at the end of the trail, he simply throws up his head and bays the treed "criminal."

It is recorded that the Spaniards in the West Indies and Latin America were in possession of very large and fierce dogs which they called "bloodhounds," but these



Photograph by H. Armstrong Roberts

#### THEY'RE WEARING 'EM LONG IN PARIS THIS SEASON

In fact, as Musette would tell you if she could, a good Basset Hound's ears are always long—almost as lengthy as its pedigree. She herself is a French importation owned by Gerald M. Livingston, Huntington, Long Island. In head appearance this breed so closely resembles the Bloodhound that the author, leading his Basset, was once mistaken for a sleuth (page 463).

differed very much from the old English Bloodhound.

The Spanish dog was about the same height as the Talbot, with small, erect ears (which the Spaniards generally cropped); the nose was more pointed, and the hair and skin hard. This dog's countenance was forbidding. No doubt it was because of the stories which reached the outside world that "bloodhound" became synonymous with "bloodthirstiness," an attribute which in fact the dog does not possess.

Also the term probably has been wrongly



applied to fiercer-natured mongrel, man-hunting hounds in parts of the South.

The black-and-tan color of the Bloodhound goes back to the famous St. Hubert breed of the eighth century. For bench-show hounds the colors allowed are black and tan, red and tan, and tawny. A small amount of white is permissible on the chest, feet, and tip of stern. The average height of a male is 25 to 27 inches at the shoulder; female, 23 to 25 inches.

Show Bloodhounds have never been overplentiful; the breed is kept mostly for working purposes. It is believed there are more trained Bloodhounds in the United States than anywhere else in the world. The show hounds are highly representative of their distinguished breed, and among them are international champions owned by Mrs. M. Hartley Dodge of Madison, New Jersey. Mr. Leon F. Whitney of Orange, Connecticut, has some good ones of long lineage, famed as prize winners.

The first of the fashionably bred Bloodhounds imported from England arrived around 1890. These were of the very best blood and were bred in the kennels of the late Mr. Edwin Brough, Scarborough, perhaps the leading Bloodhound breeder of all time. Their importer was the late L. L. Winchell, of Fair Haven, Vermont. The late Dr. Lougest of Boston, when he came to this country, brought along his Bloodhounds and Mastiffs; and the late Dr. Lotis G. Knox of Danbury, Connecticut, possibly maintained the largest kennel of Bloodhounds in the country.

### English Foxhound

In the British Isles there are more than 250 packs of foxhounds. Thousands of horses are kept for fox hunting and several million dollars are spent annually on the diversion. It is not surprising, therefore, that the English Foxhound should be looked upon as an institution (Plate II and p. 458).

A foxhound is seldom seen in Britain except in a pack belonging to one of the various hunts, or clubs. With few exceptions all of these hounds are of uniform type, though slightly different builds have been developed for various topographies—hilly, undulating, or flat; fast or slow. There are the level pastures and flying jumps over the fences of Leicestershire, the banks or built-up hedges of hilly West Wales, and the stone walls of Ireland, all presenting slightly different problems.

The quarry, of course, is uniformly the fox, although the larger hounds of this breed at one time were employed for hunting the stag and were known as buckhounds or staghounds. With the ascent of Edward VII to the throne, the Royal Buckhounds were dispersed. Hunting the "uncarted" or released deer was discouraged as un-sportsmanlike. The quarry was a private-park-bred stag which had been netted or lassoed, deprived of its antlers, kept in a spacious, well-protected yard, and fed on the best of fodder until time for the chase. When the quarry was brought to bay the hounds were "whipped off," the buck retaken, placed in a cart or van, and returned to his quarters.

The English Foxhound is sturdier in body and bigger in leg bones than its American cousin. The English prefer the round "cat" foot to the longer "hare" foot, contending it can better withstand the effects of the big and flying jumps the hound has to take. On the other hand, a lady master of hounds at Hot Springs, Virginia, said: "Here we prefer the hare foot. The long toes are better fitted for climbing our hills."

Judges consider the legs and feet highly important, as they have to withstand the full racket of the chase. The forelegs should be straight and strong, with the right amount of bone at the ankle. Colors are black, tan, and white in any combination; also the various "pies" compounded of white and the color of the hare and badger, or yellow and tan.

An English Foxhound may stand 25 inches at the shoulder and weigh 85 pounds.

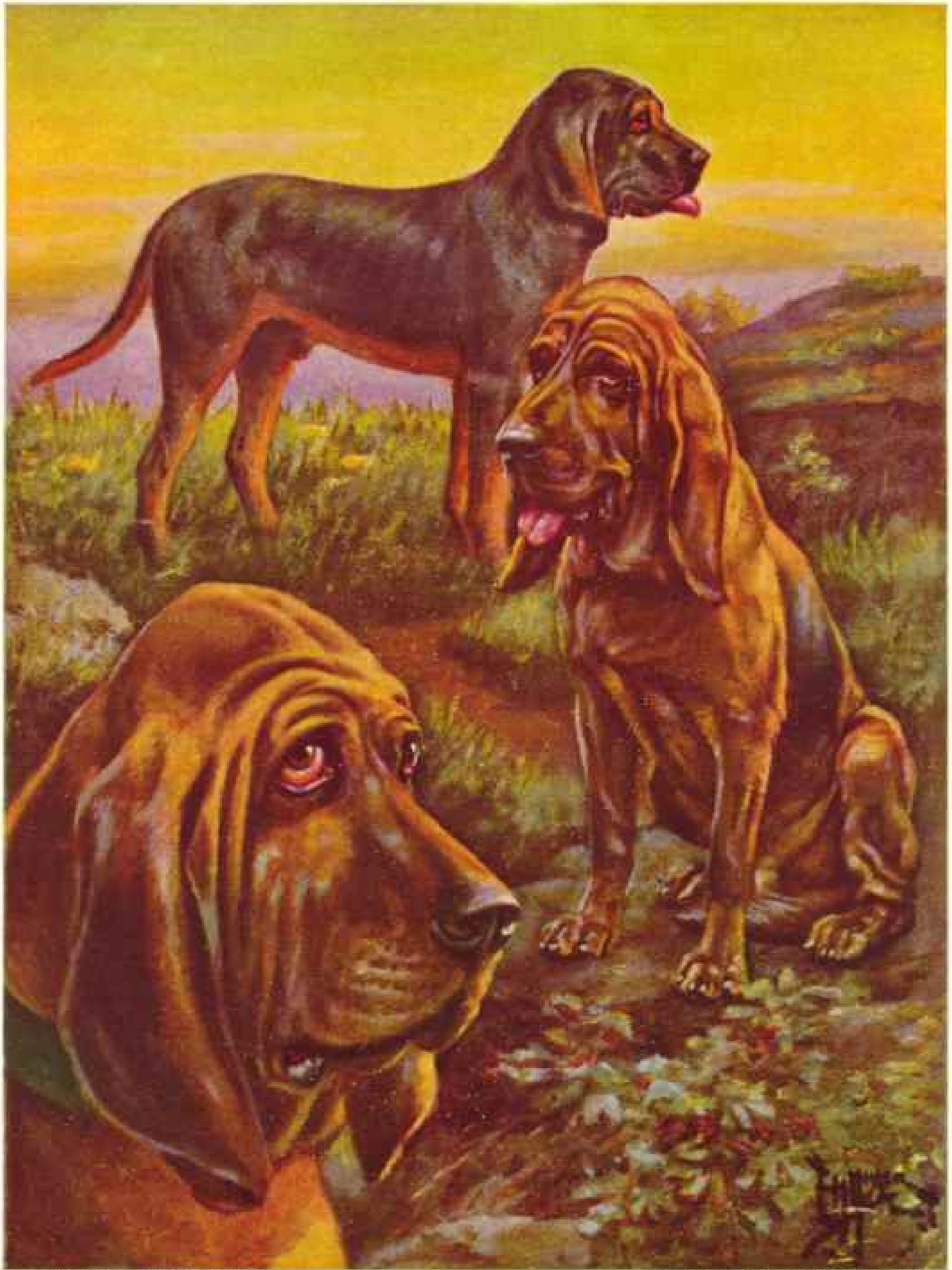
The Masters of Foxhounds Association of America asserts that the English Foxhound in its pure state has been here since the time of the first Lord Fairfax, who imported hounds from England in 1738, and it adds that there are unauthenticated records of even earlier importations.

### American Foxhound

American Foxhounds, of which there are several strains, originally were bred from European foxhounds or staghounds imported from the British Isles and France (Color Plate II).

At first they were used mostly for hunting deer, but as far back as the Revolutionary War the chief sport of the South was fox hunting. Almost every country gentleman had his own pack of hounds and stable of horses.

HUNTERS ALL: A ROLL CALL OF THE HOUNDS



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Painting by Edward Herbert Miner

BLOODHOUNDS ARE MAN HUNTERS, YET THEY RANK AMONG THE MOST DOCILE OF DOGS

Their job is to track down the quarry, not to attack him; they would be more likely to lick his hand. So mild-mannered is this breed that old-time producers of "Uncle Tom's Cabin" often substituted Great Danes to give an appearance of ferocity. Highly respected are the remarkable scenting powers of this long-eared, sad-eyed sleuth, and its identification of a criminal is accepted as evidence in courts of law. Once a bloodhound led detectives 138 miles—and found its man. Another successfully followed a trail more than four days old.



Photograph by J. Baylor Roberts

#### THREE MAN-HUNTERS STOP TO TALK THINGS OVER

For 31 years Bob Gant of Crystal Springs, Mississippi, has bred and trained Bloodhounds for trailing criminals. He and his hounds have traveled to the scene of crime by airplane, and have been on the line as long as 12 days. One of his best jobs, he says, was finding a child lost in a swamp, for he had to follow a trail 82 hours "cold." He has trained dogs for State police officials and for the Mexican Government. One couple was taken to Africa for lion hunting.

At this period there was no centralized system for registering dogs and keeping tabulated pedigrees. Each owner was proud of his own hounds and various strains arose, named for the breeders. Accordingly, as may be imagined, there are several diversities in type among American Foxhounds, which are kept not so much for killing as for trailing the fox.

The first organized hunt club on the order of an English hunt was established in 1887, according to the late General Roger Williams of Lexington, Kentucky, when ten couples of hounds were imported and drag-trial runs were made on Long Island. In this sport the lure is not a live fox but a scented bait dragged over the ground by a man on horseback. Today fox hunting and drag hunting are popular among lovers of hounds and cross-country riding in many States (page 460).

George Washington in 1770 subscribed to the importation of hounds from England, and in 1785 the first President received some French hounds from General Lafayette. The French staghounds of that and

earlier periods appear to have been higher at the shoulder and longer in ears than were the English hounds.

It may be that the two varieties, when crossed, brought forth the more pronounced type of American Foxhound as we know him today—larger, heavier skulled, longer eared, deeper voiced. In my judgment these are excellent examples and as good as any of the large hound family.

Altogether, the American Foxhound is a most useful hunting dog, especially in heavy woodlands, forests, and shallow-soiled, rocky localities where scent lies badly. Its scenting powers are good, its voice strong and musical. Males should not be under 22 or over 25 inches in height; females, 21 to 24 inches.

#### Welsh Foxhound

The Welsh Foxhound, although of distinguished pedigree and hunting powers, has not long been known to Americans (Color Plate II).

About fourteen years ago the late Mr. Erastus T. Tefft of Star Ridge, Brewster,



Photograph by J. H. Champion

#### RHODESIAN RIDGEBACKS LOAF AFTER A FULL MEAL

Comparatively new, and practically unknown in America, the breed probably was evolved from Mastiffs, retrievers, and a variety of old Boer hunting and watch dogs. The one sitting up has an exceptionally fine saddle-shaped ridge, the other a razor back. The markings of hair "growing the wrong way" give the breed its name.

New York, imported a pack of purebred, highly typical, and well-matched hounds from North Wales. These were hunted with great success on fox, near home and farther afield in Connecticut.

Five of the Tefft hounds were taken by Mr. David Newell, Leesburg, Florida, to tree jaguars in the Matto Grosso jungles of Brazil. Mr. Newell told this writer the Star Ridge hounds proved of considerable value; furthermore, their rough and heavy coats did not appear to handicap them in the trying climate. Their scenting powers and deep, loud, musical voices were of great service to the hunters in the dense forests.

It is believed Mr. Tefft's hounds were the first full pack of the breed to be imported into the United States; but previously single or stallion hounds had been introduced for crossing with English and American hounds with the idea of improving the scenting powers and voices of the homebreds.

The origin of the Welsh hound is difficult to trace, but there exists a belief that

the first of the breed was imported from the Continent by monks of an abbey in South Wales; also that a long-past ancestor of the Duke of Beaufort was interested in the foreign breed, which possibly bore resemblance to the French Vendee hound and griffons of the present day. These dogs stand 25 inches at the shoulder and scale 70 to 80 pounds, just as do the Welsh Foxhounds.

The Welsh hound usually has white as the chief color and is marked with black, dark or light tan or grizzle patches. He is a big-headed, fairly long-eared dog with a rough, hard-textured coat and a broader skull and face than other foxhounds. A persistent hunter as a single hound, he may provide just what is required in an American coon or possum dog.

#### Basset Hound

The Basset, a very old French breed, is the shortest legged of all hounds of a like weight. Its heavy hound head and long ears are highly characteristic of the true hound family, while its voice is as deep as





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FOXHOUNDS FROM THREE COUNTRIES HEAR TO THE SOUND OF THE HUNTING HORN

Painting by Edward Herbert Minner

Rangy and fast is the American variety (close-up, also at left, and upper right background). It works equally well in packs, with pink-coated riders, or singly as the hunting companion of a man with a gun. Its shape and color vary in different parts of the country. The Welsh Foxhound (upper center) has shorter legs, hence less speed. The English variety (right) breeds truer to type and color than the American, and has a sturdier body.



Painting by Edward Herbert Miner

LOW, UNDERSLUNG BASSET HOUNDS AND QUICK, NIMBLE BEAGLES ARE SKILFUL HUNTERS OF SMALL GAME.

Second only to the Bloodhound in scenting ability are the short-legged, stocky Bassets (foreground), often used for nosing out pheasants or trailing foxes, hares, and rabbits. With their long ears and big, efficient noses, they strongly suggest the sad-visaged Bloodhound (Plate I), to which they are related. Packs of Beagles (background), resembling miniature Foxhounds, are sometimes kept in America for hunting hares or jack rabbits brought east from Kansas plains. The jacks occasionally foil their pursuers by taking to paved roads and dodging among the automobiles.

it is far-reaching and melodious (Color Plate III and page 465).

As a scenting hound the Basset has no superior, and the pack moves at a pace that permits the sport to be enjoyed by those who follow on foot. Both the rough-coated and the smooth-coated varieties have been hunted in America, and as one old huntsman remarked while appraising Mr. A. H. Higginson's pack near Boston, Massachusetts, "Isn't it wonderful how they *roll* along?"

The pack owned by Mr. Gerald M. Livingston of Huntington, Long Island, is highly representative and as good as any Basset Hounds observed here or in Europe. These hounds are well-marked and when benched at the chief events are looked upon as one of the most attractive of all exhibits. Now that Mr. Livingston is president of the Westminster Kennel Club, the oldest and most important show-giving institution in the New World, it is likely that the Basset Hound will become more and more popular.

The Basset is supposed to have descended from the old French hounds of St. Hubert blood, used not so much for running down the quarry as for trailing the game and driving it out where it might be shot. Therefore, in those places where deer-hunting with dogs is permitted, this hound is sometimes used.

Bassets are chiefly employed in the United States, however, for hunting foxes, hares, rabbits, and pheasants, and have also proved successful as coon dogs. On a lead they may be used as "trackers" for following wounded game.

The head is considered nearest perfection when it resembles most closely the head of the Bloodhound. The legs, though short, are very powerful and big in bone. The fore limbs may be either crooked or straight at the knee, but even the crooked-legged dog should stand fairly and squarely on all the pads of its feet. Naturally the straight legs provide more speed than the crooked ones.

The smooth and the rough-coated French Bassets may measure 13 inches at the shoulder and weigh 50 pounds; the rough-coated Basset of Brittany, 12 inches and 56 pounds; the Basset of the Ardennes, 15 inches and 55 pounds; the rough-coated Basset of Vendee, 15 inches and 56 pounds, and the blue Basset of Gasconne, 14 inches and 56 pounds.

### Beagle

Smallest of the hunting-hound family, the Beagle possesses in miniature all the physical characteristics that denote the hound. It is very keen of scent, and has a melodious hound voice somewhat higher pitched than those of its larger relatives (Color Plate III).

Beagles are widely used for hunting rabbits and hares, sometimes singly in this country, but in Europe usually in a pack followed by hunters either afoot or on horseback. In Australia packs of Beagles are successfully used for hunting the medium-sized kangaroo.

Queens of England had their special packs of Beagles, these being of the smallest size—10 inches and less at the shoulder. The first Queen Elizabeth delighted in her "singing" Beagles, as did Queen Victoria.

Beagles and beagling have long been popular in America, especially on Long Island, New York; in New Jersey, Pennsylvania, and New England. At the various bench shows, too, these gallant little hounds add personality and color, while their tuneful voices convey a reminder of the hunting field. Beagles have a most kindly disposition, but are kept more for sport than for companionship as house dogs.

In the United States the Beagle, for exhibition or field-trial purposes, must not be over 15 inches at the shoulder. In Great Britain he may be 16 inches. Save in the United States and Canada, no field trials are held for this breed; in these tests, run on rabbits, there are stakes for Beagles of 13 to 15 inches and others for those under 13 inches in height.

In America there are two types. The more popular, apparently, is the one which suggests an American Foxhound in miniature, rather than a bantam English Foxhound. There also are rough-haired Beagles, but these are seldom seen in the United States.

### Greyhound

The Greyhound as a breed has been stabilized and perfected in the British Isles, where the sports of hare coursing and, later, Greyhound racing won wide popularity. Nowadays big crowds assemble to see the dogs race in pursuit of an electrically propelled artificial hare. There are many tracks, betting flourishes, and Greyhounds are more numerous than ever, not only in England but in other countries (Plate IV).





Photograph from Pictures, Inc.

INDIVIDUAL STALLS GIVE EACH GREYHOUND AN EQUAL CHANCE

None can "jump the gun," for at the signal the door flies upward and the dogs lunge down the track. Here "they're off" at the Miami Beach Kennel Club in Florida. They are muzzled to keep them from biting each other in the excitement of the chase. Often Greyhounds and Whippets are raced at night over floodlit courses (pages 456, 461, and 484).

In appearance the Greyhound may be placed at the head of the dog tribe, as in elegance of form he equals and perhaps excels any other breed. He has been continuously bred for centuries with a view to speed and endurance.

Carvings on ancient Egyptian tombs portray dogs of Greyhound type. In early times the Greyhound was considered a valuable present, especially by the ladies, with whom it appears to have been a particular favorite.

In the 10th and 11th centuries, the price of a Greyhound and also that of a trained hawk appear to have been the same as that of a serf.

The Greyhound now accepted as of pure blood has a smooth coat, but in the colder and hilly countries the Greyhound of early days probably had a coat somewhat similar to that of the Deerhound. More than 50 years ago I saw wire-haired or rough-coated Greyhounds allowed to run at a properly conducted coursing match in Pembrokeshire, Wales. These were not considered as being of impure blood; they were "mountain Greyhounds" from the Precelly Range.

Since the racing worth of the Greyhound has been seen and acclaimed by the general

public the world over, the breed has become more and more idolized. The dog which at one time only persons of high rank might own has now become the "race horse" of all and sundry.

The old couplets are exact in the points they emphasize as necessary to form the complete Greyhound:

"Head like a snake,  
Neck'd like a drake,  
Back'd like a beam,  
Sided like a beam,  
Tailed like a rat,  
And footed like a cat."

A Greyhound may be any color, but those preferred are black, red, brindle, fawn, and blue. Height, male: 27 inches; weight, 65 pounds.

### Whippet

The Whippet is a small dog of Greyhound type: in fact, a miniature of the English coursing and racing dog. From the Whippet handicaps run off in Britain, Greyhound racing developed (Color Plate IV).

Over a distance of 200 yards, the Whippet is the fastest of all dogs of his height or weight. He should not scale over 23 pounds; if he does, he becomes too large to run in the same race with the smaller dogs,



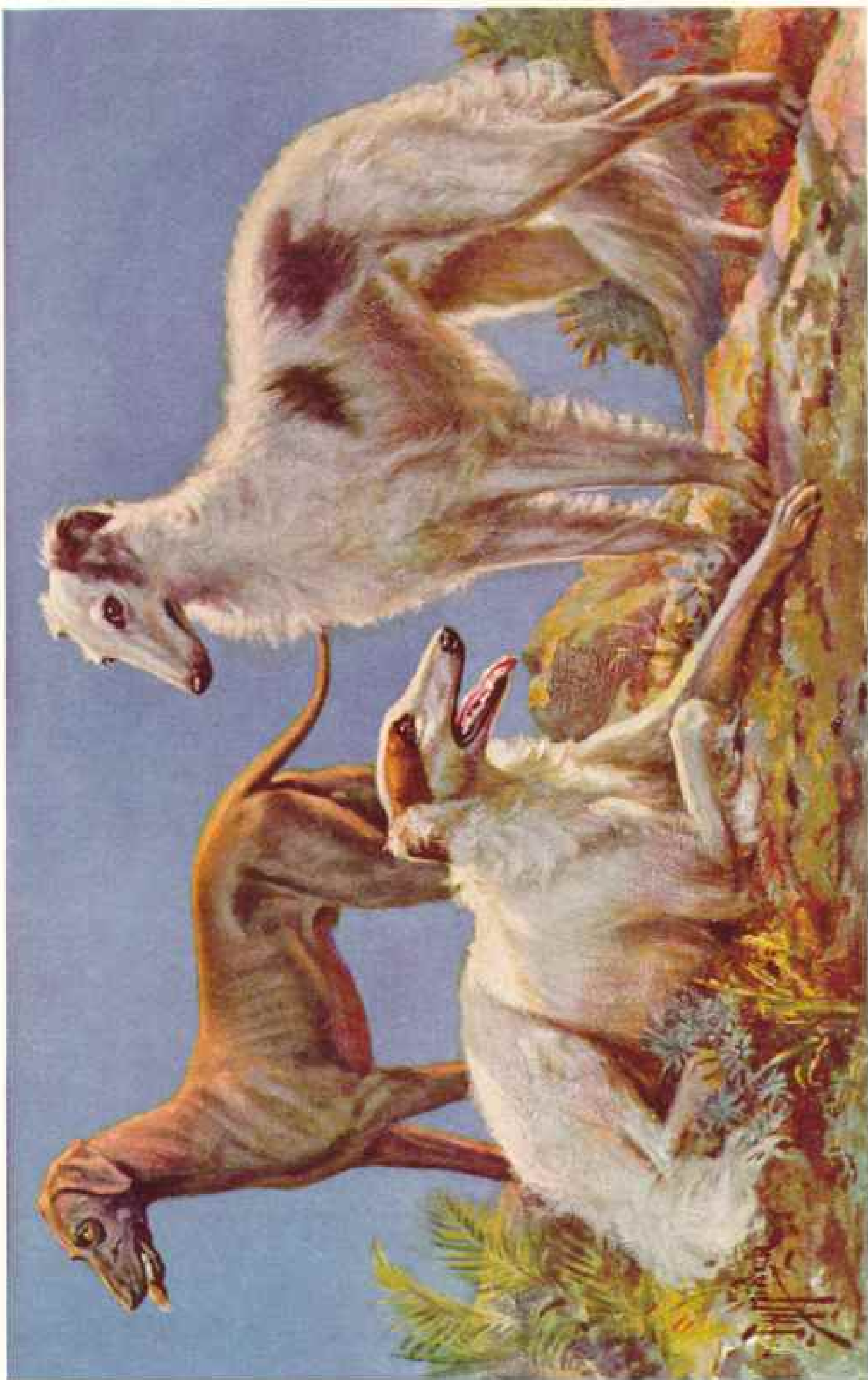


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Painting by Edward Herbert Miner

STREAMLINED FOR SPEED, GREYHOUNDS AND WHIPPETS CAN OUTFTRIP A RACE HORSE—FOR A SHORT DISTANCE

Unlike most hounds, they run by sight, not scent. The lithe, spare-ribbed speedsters have long been used for coursing hares and other fleet game, but nowadays they are most often seen in pursuit of a mechanical rabbit at elaborate, dog racing tracks. The little Whippet (left center), a miniature Greyhound, can streak 35 miles an hour over a 200-yard course. Like the Greyhound, it makes a good watchdog and pet.



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ENEMIES OF WOLVES AND JACKALS: RUSSIAN WOLFHOUNDS (FOREGROUND) AND THE LITTLE-KNOWN RAMPUR

Painting by Edward Herbert Miner

Perfect poise marks every move of the long-haired, aristocratic Wolfhound, or Borzoi. Developed centuries ago to run down the predatory wolf, it nearly died out when the marauders grew less troublesome and farmers no longer needed this hound. Breeders today find it an excellent pet and exhibition dog. The smooth-haired Rampur lives in southern Asia, where herdsmen use it to course the jackal.

as he will be likely to "savage" or bite on overtaking them. The nature of a large coursing dog is to attack a smaller animal running before it.

The Whippet was first produced in the north and northwest of England from crosses made between Greyhounds proper, terriers, and Italian Greyhounds. Sometimes the now pure breed is referred to in the vernacular as the "Hitalian."

Why the Whippet was so named is not known. The word might have been "wap-pet," as this is an English expression for "small yelping cur." The Whippet is very noisy while held at the neck before being released by his "slipper."

The Whippet has long been known as "the poor man's race horse." Many a family probably goes on short rations so the household race dog may partake of the choicest cuts from a half-cooked roast or boiled leg of mutton. There is much betting at Whippet dog racing, especially among English miners and cotton workers.

It is believed that Whippet racing was introduced into the United States by British-born residents working in New England textile factories. Philadelphia was another early center of dog racing. Whippets and the sport they afford have grown up with Hollywood, California.

Before 1895, dog racing was regarded as a plebeian sport, but early in the summer of that year the Prince of Wales (afterwards Edward VII), the Princess, and their three daughters patronized the pastime in the grounds of Ranelagh Club, near London. Whippet racing thereafter was "acknowledged" by other than the working classes of England.

When my *Whippet, or Race Dog* was published in 1895, the name of the breed was practically unknown outside the ranks of bench-show exhibitors and professional dog racers. Now all the world is acquainted with the Whippet dog's beauty and the great sport it provides—a pastime free from any cruelty.

The show Whippets of America are as carefully bred and as beautiful as any; many of them are perfect in type. As companions Whippets are most affectionate and not quarrelsome.

The weights vary from 10 to 23 pounds, the best running weight being about 16 pounds. Sixteen inches is considered a nice height for an ideal show specimen.

### Borzoi, or Russian Wolfhound

The Borzoi, or Russian Wolfhound, is not only a hound of great distinction in appearance, but one of the oldest, most carefully purebred of all the European varieties (Color Plate V).

Long the pride of Russian rulers, nobles, and their ladies, the Borzoi during imperial times was maintained chiefly for sport—coursing the hare, the fox, and particularly the wolf. While one dog could easily cope with a fox, at least two strong Borzois were usually needed to hold a wolf by the neck until the chasseur could arrive and deftly muzzle or kill the beast.

About seventy years ago the then Tsar of Russia presented the Prince of Wales (later Edward VII) with a brace of his favorite hounds, Molodetz and Owdalzka, and these were exhibited at English shows.

In 1892, when a highly representative aggregation was exhibited at Cruft's Show in the Royal Agricultural Hall, London, most of the Borzois were the property of the Grand Duke Nicholas. Others owned by the Tsar included a lovely bitch called Lasca and two dogs, Oudar and Blitzray. Oudar stood 30½ inches at the shoulder and weighed about 105 pounds.

Oudar and Lasca were sold for 200 pounds (\$1,000) each and the then Lord Mayor of London was presented with another handsome specimen. The Duchess of Newcastle purchased some of the Russian exhibits and these, added to an already strong kennel of Borzois, provided the leading aggregation of these hounds in Britain and produced specimens of great size and excellence.

In 1895, when the Princess of Wales was presented with the Borzoi Alex, from the Tsar's kennel, the already rising popularity of the Borzoi was greatly enhanced.

In the same year, 1895, the Borzoi Club of England was formed at the Albemarle Hotel, Piccadilly, London. The late Duke of Newcastle presided, and to celebrate the event a prize Borzoi belonging to the Duchess was "christened" with a magnum of champagne. The writer was elected a member of the club's executive committee.

Many of the finest Russian dogs were imported by Americans and some outstanding specimens have been exhibited here. Recently the American Kennel Club changed the breed name from Russian Wolfhound to Borzoi, the classification long ago adopted by the Kennel Club of England.

© Hans Tschira from *European*

## FAVORITE OF THE SHEIK'S BODYGUARD IS THIS YOUNG SALUKI

Squatted cross-legged on the sandy floor at the entrance of the "palace," the watchman with his puppy stands—or rather sits—guard. From Egypt have come many breeds of hounds now popular in Europe, including the Saluki and the Afghan (Color Plate VII). Greyhounds coursed over desert sands long before they saw a modern race track.

"I am glad to see English sporting papers adopting the Russian name for this breed," Prince Obelenski wrote, "for the word itself (*borzoi*, mas., *borzaya*, fem.) means swift and hot-tempered; and though poets sometimes apply the expression to a high-spirited steed, it is, with this exception, applied to greyhounds only. For this reason the English Greyhound is called, in Russia, 'Angliiskaya Borzaya,' or English Borzoi."

The general appearance, height, and elegance of the Borzoi at once command attention. He appears the embodiment of speed and strength, and the silkiness and brilliancy of the profuse coat attract lovers of the beautiful. So it is that he is looked upon not only as a sporting dog but as an elegant companion or lady's dog (p. 459).

The color ought to be white, with blue, gray, or fawn markings of different shades, the latter sometimes deep orange, approaching red. Whole colors for show purposes are unsatisfactory. Height: males from 29 inches upward; females from 27 inches.

## Rampur Hound

The Rampur Hound is of greyhound type and is named for the State of Rampur, in Central India, where it is used for coursing hare, jackal, and sometimes deer (Color Plate V). India, in all probability, is one of the first places where field sports were adopted as an amusement for civilized society; and the East Indian princes still manifest the same disposition for the chase as was displayed by their ancestors.

The peculiarity about the Rampur Hound is his coat. It is like that of a freshly clipped horse: if longer it is considered a sign of impure blood. The color is mouse-gray.

The Rampur is a powerfully built "greyhound" with a long, strong skull, flat between the ears, and with powerful jaws. His light-yellow eyes give him a hard expression. His ears are fairly large and filbert-shaped. The body is somewhat coarse, but of fair length.

A Rampur is seldom seen at European shows, and in America one of the breed has yet to be observed by the writer.





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Painting by Edward Herbert Munier

A SCOTTISH DEERHOUND AND AN IRISH WOLFHOUND DWARF A FULL-GROWN SHEPHERD PONY

Tallest of dogs is the shaggy Irish Wolfhound (right), which once protected Erin's flocks from marauding wolves. The Scottish Deerhound (left), "Royal Dog of Scotland," found favor with Highland clansmen during the Age of Chivalry. Keen of scent and strong of limb, a single hound can bring down a 250-pound deer. In the United States, where antlered game cannot be hunted with dogs, these two big hounds match their speed with wolves, coyotes, or jack rabbits.



Painting by Edward Herbert Miner

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SWIFT AND GRACEFUL, HURDLERS ARE SHAGGY AFGHAN HOUNDS AND SMOOTH-HAIRED SALUKI, ALL NATIVES OF EGYPT

Exactly how of when the topknotted Afghan—called “monkey-faced hound” in ancient Egypt—established itself in the hill country of Afghanistan, no one knows. After the World War, British officers took specimens home, and the breed spread thence to India, Iran, and Arabia, where it is now used to hunt gazelles. Its strong hind quarters give it tremendous running and jumping power. The Saluki, royal coursing dog of desert sheiks, is gaining favor in England and the United States.

### Deerhound

The Deerhound is a very old Scottish breed and one that has been bred and kept to type for centuries for running down the stag. Some believe it is a descendant of the old Irish Wolfhound, but a swifter, more agile dog better suited for overhauling a deer (Color Plate VI).

Today the Scottish Deerhound is still a popular dog, although not many are seen at shows in the United States.

In the Prairie Provinces of Canada, Deerhounds are often kept for pursuing the coyote and jack rabbit. In Australia they are used for running and "sticking up" the largest of marsupials, the "old man" kangaroo.

Usually run in twos or threes, the hounds are fast and lasting enough to overtake their quarry, which thereupon pulls up and stands off his enemies with his back to a tree until struck down or shot by the mounted hunter.

To increase its speed, the Deerhound, in both Australia and Canada, has been crossed with the Greyhound and Russian Wolfhound. In the Antipodes the Russian-Scottish crossbreds were colloquially known as "dingo killers," in reference to their occasional use against the wild dog, or Dingo.

The Deerhound should be a hard-coated, shaggy dog; a woolly coat does not shed water—the moisture soaks in. In general outline the Deerhound is like the Greyhound, but heavier. He is of various colors: dark blue-gray, brindles, yellow and sandy; red or red-fawn, especially if with black points. Height: males from 30 to 32 inches; females from 28 to 30 inches. Weight: from 85 to 110 pounds for males; 75 to 95 pounds for females.

### Irish Wolfhound

The Irish Wolfhound is the largest of hounds, the tallest of all hunting dogs, and perhaps the most active for its size. A full-grown specimen is only a couple of inches less than a yard high at the shoulder and might be described as a huge Deerhound, stronger but not quite so fleet (Plate VI).

Traditionally a protector of flocks and humans, the Irish Wolfhound must have been big, fast, brave, and strong to tackle, hold, and kill a full-grown wolf. Some authorities believe that the old Irish Wolfhound breed became extinct when the last

wolf was killed in Ireland in the 18th century. Others say it survived.

In any event, within my own memory, the English Kennel Club added a classification for the "new" or "resuscitated" breed at British shows; and the earliest of the late-Victorian Irish Wolfhounds seen at leading events were currently reported as being "resuscitated" Irish Wolfhounds made up of Scottish Deerhound and German Boarhound or Great Dane bloods. Russian Wolfhound blood was added later.

At first nearly all of the crossbreds possessed abominable cow hocks, the caps of the joints of the hind legs pointing inward. As the years passed, this deformity disappeared and the ears and skulls became smaller and finer.

Indeed, an altogether more lithesome and none the less useful wolfhound has been evolved. The physical proportions, weight, and power of the Great Dane have been combined with a greater activity as seen in the Deerhound. The Irish wolf dog of today may be looked upon as a potential wolf-catcher as well as a wolf-destroyer—a wolfhound in action as well as in name.

A desired height is between 32 and 34 inches; minimum for males, 31 inches; for females, 28 inches. Average weight for a full-grown male, 130 pounds; females, 110 pounds. Recognized colors are gray, brindle, red, black, pure white, fawn, or any other color that appears in the Deerhound.

Irish Wolfhounds have never been more popular than they are today.

### Afghan Hound

A large, heavily coated dog of greyhoundlike build, but with a stronger, more powerful head and feathered, setterlike ears, the Afghan Hound is well fitted for the very cold winter climate of mountainous Afghanistan (Color Plate VII).

The Afghan dog stands about 27 to 29 inches at the shoulder and weighs 60 pounds or more. He may be roughly described as an oversized Persian or Saluki gazelle hound, but carrying much more hair on the hindquarters, flanks, ribs, and forequarters. The hair is silky and very fine in texture. The feet are well feathered and the head is surmounted by a topknot of long, fine hair.

Altogether, he is remarkable and striking in appearance and is gaining considerable popularity in Hollywood.



Photograph by Carl Raywan

#### CHILDREN OF THE DESERT: A SALUKI AND HER YOUNG

A puppy's sleepy little head peers from under the mother's hind leg. To the Bedouin all dogs are "unclean" except the Saluki, which is considered an aristocrat and the worthy companion of the falconer. Large-eyed and lean are these gazelle hunters, like all children of the desert—men, horses, camels, falcons, gazelles (page 477).

The forbears of the Afghan may have been the coursing dogs of the early Israelites and Egyptians. Records have been found indicating the existence of Afghan-like dogs on the Sinai Peninsula and in the Valley of the Nile.

The large feet of this hound are better suited for traveling over rocks than the smaller or catlike feet of other dogs used for sporting purposes in less mountainous countries than Afghanistan.

When the first of the Afghan Hounds arrived in England they were exhibited at a Kennel Club show in the Crystal Palace, London.

A party of army officers who had seen service in Afghanistan appeared to be more interested in the feet of these hounds than in their other physical points.

Asking the reason for such an acute examination, the writer was informed that this hound's broad hind feet were essential to give added grip and climbing power; also that the toes should be arched as well as covered with long, thick hair.

The Afghan Hound may be of any color.

#### Saluki

The Saluki, or Slougui, greyhoundlike dog of North Africa, is much loved and prized by the Bedouins of the Sahara and has been known from early times as the Royal Dog of Egypt. The Saluki as a breed is believed almost as old as civilization and was of distinct type as long ago as 327 B. C., when Alexander the Great invaded India (Color Plate VII).

Bodies of Salukis were mummified and placed in tombs; the remains of dogs of this breed have been found in ancient burial places in the upper Nile region.

Among the earlier importers of Salukis into England was the Honorable Florence Amherst, Egyptologist. We were talking about the breed one day when the lady asked if I could name the three belongings that the Bedouin values most. I couldn't.

"His horse, his Saluki, and his wife's earrings," came the laughing reply.

In the Sahara, as in all Arab countries, the ordinary dog is regarded as unclean and is treated with contempt, no matter how useful he may be in looking after the flocks.





© National Geographic Society

Painting by Edward Herbert Miner

OTTERHOUNDS SPLASH INTO STREAMS IN PURSUIT OF PREY,  
BUT HARRIERS PREFER LAND

A 14th-century record of the otterhound as a "rough sort of dog between a hound and a terrier" fits the breed fairly well today. Here two of the shaggy water-lovers splash upstream after an otter, while a bewhiskered third temporarily abandons the chase. Harriers (foreground), used for hunting hares, were often followed in Britain by men on foot, providing a popular "poor man's sport," but nowadays the hunters are usually mounted. The American type of Harrier (left) differs slightly from the English in shape of head, neck, and body. Both somewhat resemble the Foxhound (Plate II).

The Saluki alone enjoys the esteem, the consideration, the tender affection of his master (pages 477, 481).

It is recorded that Salukis were first imported into England in 1840. One, a female, was owned by Sir Hamilton Smith; the other was the property of the Duke of Devonshire. These dogs came from Persia and were called Persian Greyhounds. The first Arabian Saluki was imported by Miss Amherst in 1895. In England the Saluki is being used as a hare-coursing as well as a racing dog, but in this country, so far, it has not had much chance to exhibit its speed and staying powers.

In November, 1927, the Saluki breed was given a place in the American Kennel Club Stud Book; and about the same time a club was formed to look after the interests of the breed and its owners. About twenty were seen at the Madison, New Jersey, show in May, 1937.

The Saluki makes a handsome pet as well as a useful sporting dog of the coursing and racing description.

There is a smooth variety as well as the longer-haired kind, the coat of which is soft and of silky texture. The longer-haired variety has a slight feather in the forelegs, the back of the thighs, and sometimes slight woolly feather on thighs and shoulders. The smooth Saluki has no feathering.

The colors are white, cream, fawn, golden, red-grizzle and tan; white-black-and-tan and black-and-tan. The height at the shoulder varies between 23 and 28 inches. Females are often considerably smaller than males, a characteristic typical of the breed.

### Otterhound

The Otterhound is a big, rough-coated, heavy-headed, long-eared hound used for otter hunting, an extremely old diversion followed at a time of year when the pursuit of the fox and the hare are abandoned. The season may continue from Eastertide to September, or until the water gets too cold (Color Plate VIII).

Otter hunting is a strenuous pastime, for the hounds are followed on foot. They carefully comb not only the banks of the river but every stump or large stone which raises its head above the water.

Otterhounds are noted for their keen scenting abilities; indeed, as a boy I often heard that an Otterhound could hunt a "drag," or trail, 36 hours old.

On finding the track of the otter the

hound gives tongue in a voice frequently as deep and sonorous as that of the purebred Bloodhound. Of necessity he must be a strong hound, as swimming is harder and more laborious for a dog than running.

When the otter becomes hard pressed, he seeks refuge in his "holt," or hole, and from there he is then driven out by a terrier. The present-day Sealyham Terrier is descended from the strain of rough-haired terriers especially bred by the late Capt. John Owen Tucker-Edwardes to run with his Otterhounds, maintained at Sealyham Mansion in North Pembrokeshire, Wales.\* As a boy I ran after the Sealyham Otterhounds, which, during the winter months, hunted the fox. There is considerable likeness between the Otterhound and the Welsh Foxhound, but the former has the heavier coat.

Some years ago a pack of purebred Otterhounds was imported by a New York sportsman and hunted in Maine, but it was reported the American rivers were too wide and deep for the pursuit of the otter.

Other Otterhounds were imported to hunt different kinds of game in the State of Washington. They were used in the same manner as American fox and coon hounds, and their fine scenting powers and voices made them many friends.

Standing from 24 to 26 inches at the shoulder, the Otterhound weighs up to 65 pounds. The popular combination of colors is a grizzle of blue and white, or it may be made up of shades of black and tan.

### Harrier

The Harrier, or harehound, is believed to be descended from the Talbot hound introduced into England by the Normans (page 465 and Color Plate VIII).

Judging from pictures by the trustworthy Philip Reinagle, R. A., born 1749, the Harrier appearance in part may be traced to the old Southern hound of the English, which was a good deal heavier in head, longer eared, and perhaps more muscular than the modern English Foxhound.

In England the Harriers were often followed on foot, but nowadays horses are generally used. As the hare, while being hunted, is slower than the fox, the height of the Harrier need not be so great as that of the foxhound, the most popular size being 19 to 21 inches at the shoulder.

\* See "Gallant Sportsmen of the Terrier Tribe," with biographies by Freeman Lloyd, NATIONAL GEOGRAPHIC MAGAZINE, February, 1936.



© Fox

WHIPPETS, SWIFT AS THE CAMERA'S CLICK, DOUBLE UP LIKE CONTORTIONISTS

Cleaving the air with jackknife strides, they streak down the track toward their handlers. At the start of the race, a "slipper" holds each dog by the scruff of the neck and the tail. As the pistol cracks, the animal is literally catapulted into its stride. Mechanical starting devices are also used.

At the English shows of 45 years ago, especially in Lancashire, larger Harriers were seen. Visitors were much interested when they observed specimens of the Holcombe or the Penistone Harriers, which were said to have been kept pure since the time of King John.

Big and fast enough to hunt deer and fox as well as hare, they were much more heavily developed in head, ear, and bone than the modern Harrier.

The English Harrier of today has the appearance of a miniature English Foxhound of the most fashionable and fast-going style, and apparently is judged on the same lines.

The American Harrier is somewhat sturdier.

Blue-mottled markings or tickings on a white body-ground are looked upon as highly distinctive of true Harrier blood, while they are not so liked when seen on the foxhound.

Last year the magnificent Harrier, Champion Renal's Monarch, won as the best of all breeds at the New York show held under the auspices of the Westminster Kennel Club.

### Painting the Hound Series

In painting the hound series, Mr. Edward Herbert Miner is especially indebted to Mr. Harry T. Peters, M. F. H., for his interest in and criticism of the entire hound group, and to Harry Peters, Jr., for furnishing from their great kennel of champions all the models for the Greyhound and Whippet painting; to Mr. Newbold Ely, Jr., for lending his many times champion as model for the Welsh Foxhound; and to Mrs. A. Butler Duncan for her Irish Wolfhounds and for her information and criticism; to Mr. Gerald M. Livingston, who provided the fine models for the Bassets; to Mr. E. Mortimer Ward, Jr., for the pick of his pack of Beagles, and to Mrs. D. O. Miller for her model for the Scottish Deerhound and for much useful data and general information.

Mrs. Margaret L. Nison furnished the Afghans, fine examples mostly from the kennels of Mr. Q. A. Shaw McKean.

The American-bred Harrier is from Mr. Amory L. Haskell's great Champion Monarch, which, by many fanciers, has been considered the most perfect Harrier type in the country.

The huntsman of the Meadow Brook Hounds, Thomas Allison, posed for us the excellent type of English Foxhound which is used in the breeding of their crossbred hounds; while Mrs. R. C. Bondy's Bloodhounds formed the foundation for that subject.

# CHANGING SHANGHAI

BY AMANDA BOYDEN

EXCEPTING occasional stately junks with eyes painted on either side of the high bow to enable them to "see their way," there is little to suggest the Orient on the way up the Whangpoo River to Shanghai. Before the dock is reached, however, China obtrudes itself upon the sight and its odors penetrate the nostrils.

Scarcely had the small Danish freighter on which I crossed the Pacific come to rest when four or five scavenger sampans stationed themselves beneath our after port-holes. Unerringly the occupants of these greasy craft smell out the location of a ship's galley. Hoisting their long-handled nets and uttering raucous cries, they await contributions.

When a load of garbage is caught the net is lowered and overturned on deck, where all hands hasten to sort the contents. Little is discarded, for these poor wretches rely on the refuse from ships to supplement an all too meager daily ration.

## LINERS, SAMPANS, AND MEN-OF-WAR

From our berth at a downstream wharf it was a half hour's ride in a tender to the customs jetty in the city. Shrilly tooting, we moved out to midstream. We passed close to foreign men-of-war, dignified liners, freighters from far-distant ports. Wharves, factories, and warehouses lined the shores.

Sampans filled with blue-clad workmen bound for Pootung; across the river, sculled past our bows (map, page 491). Motor-boats from men-of-war, their flags trailing, sped by with liberty parties of bluejackets.

We passed slow-moving barges loaded with cargo from ships but recently arrived. There was little color; movement and sound dominated the scene (486, 494).

To our right, immediately beyond the Japanese docks in Hongkew, appeared the curve of water front upon which three consulates now stand. On this site, that of the original American Settlement, the new United States Consulate will rise, flanked by those of Germany and Japan. Just across the street a lofty new apartment hotel towers above Garden Bridge, at the northern end of the Bund (501, 502).

At its feet lies the mouth of Soochow Creek, the crowded stream which meanders tortuously through the city. It bristles with the floating homes of innumerable Chinese

—Chinese who are born, live their entire lives, and die on the sampans which huddle together in its murky water.

Babies, toddling too near the gunwales, sometimes topple in, and, having been fished out, are set casually to dry.

Water dipped up over the side is used by the women for cooking rice and vegetables; clothes are washed in it; and it imparts that certain flavor to their tea.

A sampan gaily pavilioned and festooned in red indicates that a wedding will soon take place. For funerals the drapery is white, the Chinese color of mourning.

More than once since the Sino-Japanese hostilities of 1932 Shanghai has experienced a war scare. For a few days streams of terror-stricken Chinese, burdened with household goods, pour into the foreign settlements. Before long, the tension eases and confidence is restored; hundreds return to their homes in Hongkew or the Native City; shops reopen; and business as usual resumes.

In accordance with arrangements concluded between the Chinese and foreign governments, the latter maintain units of their troops at several points in China, one of the most important of these being the International Settlement in Shanghai.

## EVER READY FOR EMERGENCY

In addition to the British, American, French, and Japanese troops, there exists the Shanghai Volunteer Corps, numbering about 2,000, international in composition. This body is under the control of the Municipal Council, which governs the affairs of the International Settlement. The city is ever ready for emergencies.

Great Britain was the first of all the nations which now have such valuable commercial interests in the city "above the sea" to recognize the vast potentialities of the little fishing hamlet on the muddy shores of the Whangpoo.

In 1842, emerging victorious from the so-called "Opium War," she concluded with China the Treaty of Nanking by which Shanghai and four other coastal cities were established as treaty ports.\*

Within two years the United States and

\* See "Cosmopolitan Shanghai," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, September, 1932.





Photograph by Alfred T. Palmer

"WELCOME TO SHANGHAI" IS BETOKENED BY WATER TAXIS, SCURRYING TOWARD AN INCOMING LINER IN PEACETIME, BEFORE BOMBS AND SHELLS CHURNED THESE WATERS

The big American ship, arriving from San Francisco, is moored to buoys in the Whangpoo River (page 485). Company tenders will take passengers to the dock, but during the vessel's stay in port travelers may hire the little native sampans to ferry them between ship and shore. A fleet of junks, suggesting huge butterflies, puts in toward the opposite bank near a modern industrial plant. Before foreigners secured trading privileges here in 1842, Shanghai was a minor fishing port with a wall to protect it from pirates.

France, realizing that Shanghai's geographical position made it the natural outlet for products of the rich Yangtze River Valley, followed suit and signed trade pacts with China. Ninety-five years ago, when the foreigners first obtained areas for settlement, land on the water front brought only \$200 (Mex.) an acre. By 1935 an acre of Bundside property was valued at more than four millions.

An amazing variety of traffic throngs the Bund, that splendid water-front boulevard which is the center of Shanghai's bustling activity (page 498).

As one proceeds south from Garden Bridge, the dignified gray buildings of His Britannic Majesty's Consulate lie to the right. Opposite are the shaded walks and flower beds of the Public Gardens.

Time was when anyone might freely enter the Public Gardens and the extensive Jessfield Park, in the Western District. But after it was discovered that coolies used the benches for siestas, the area was restricted to the use of foreigners. When, a few years ago, Chinese, as well as foreigners, became members of the Shanghai Municipal Council, pressure was brought to remove this limitation. It was agreed that a nominal entrance fee should be charged and no race excluded from the parks.

Imposing buildings, reminiscent of London, line the Bund; banks, business houses, newspaper offices, clubs. The conveyances of the East, rickshas, handcarts, and wheelbarrows, bearing an unbelievable variety of loads, make way for lumbering double-decked buses, trams, and sleek foreign cars.

Not many years ago sedan chairs were common sights, and the colorful wedding and funeral processions were far more numerous than they are now. Then foreign official bodies, hongts, and well-to-do individuals had distinctive liveries for their carriage drivers, who wore gay sashes and curious round hats covered with fringe.

Today the only horse-drawn vehicles seen on the Shanghai streets are the open victorias used by some brokers to make business calls (page 495). Enormous numbers of automobiles, chiefly of American make, are owned by Shanghai Chinese.

While I was living in the city, a local American automobile agency, seeking to discredit the product of a competitor, passed the word that the other car, with its ultra-modern, streamlined aspect, looked for all the world like a turtle.

Now "turtle" is a term of opprobrium in China. For a Chinese to refer to another as a "turtle" is to heap abuse upon him. It is a fighting word. No Chinese wants to drive a car which resembles a turtle.

So complete was the response to this whispering campaign that the rival concern, dependent almost entirely upon its sales to the Chinese, was threatened with bankruptcy.

#### PIDGIN ENGLISH FOR BUSINESS

The Chinese have proved remarkably adaptable in adjusting themselves to contact with English-speaking nations. They have adopted automobiles, foreign clothes, jazz, and golf. The natives of the Treaty Ports have evolved a bizarre speech based on English with which they can communicate satisfactorily with the stranger.

Since the average occidental resident of Shanghai will not take the trouble to learn the local dialect, the natives use pidgin, or "business" English. In fact, two Chinese from different provinces often resort to this jargon, for each is almost sure to have difficulty in understanding the dialect of the other.

In pidgin English one word often does duty for three or four. Thus "my" signifies also "I, me, mine" and their plural forms. "My no savvy," of course, means "I do not understand." "What thing have got?" is to say "What have you?" When the supply of butter is exhausted your cook will come to you with the complaint, "Butter have finish, missie."

When I stepped ashore at the customs jetty that bitter March afternoon at the end of a "four-coat" winter, several coolies in quilted blue clothing, cotton-padded against the cold, fought for possession of my luggage. "All li, missie. Wantchee go hotel side? Can do."

#### "BOARDING WITH THE COOK"

My household system was based on the convenient custom followed by many foreigners in China, that of "boarding with the cook." For a definite number of local dollars a month my cook boy contracted to feed me. Each guest cost a dollar extra.

Of course I was aware that he put a part of the monthly allowance in his pocket, but I ignored the fact, knowing that whatever arrangement I made he would inevitably obtain his "squeeze," or commission. It was worth something to be relieved of the



Photograph courtesy U. S. Navy Recruiting Bureau

**OLD GLORY PARADES DOWN NANKING ROAD, WHERE TRAFFIC "COPS" WEAR TURBANS**

In trench helmets, worn only when trouble threatens, a color guard from our Asiatic Fleet seems to pass in review before the Sikh policeman, on duty at the busy corner in front of a big American-style department store. The bearded Hindus, brought to China from India by the British, serve also as bodyguards for wealthy residents, and as pirate fighters aboard coastwise steamers.

task of ordering meals and of checking the amount of foodstuffs used. So long as the boy was clean and the quality of food was good, I was satisfied.

I had a little trouble persuading him to serve me chicken. When fowl appeared on my table, it was inevitably pheasant, which was cheaper than the homely barnyard bird. Curiously enough, his flair was for cooking foreign food rather than Chinese "chow."

I did not expect him to know how to prepare chop suey. It is not a Chinese dish, and I saw the word only once during my sojourn in China. It was in the window of a native restaurant on Nanking Road, the street largely devoted to the interests of

visitors. It was a large sign, prominently displayed: "American Chop Suey."

My cook was strangely reluctant to serve me rice.

"Chu, no wantchee potatoes all the time. Wantchee rice."

"Yes, missie."

Days went by, sometimes weeks, and no rice appeared at any meal.

"Chu, where is that rice?" With emphasis, "Wantchee rice two, three times every week."

"Yes, missie."

When I thought of the matter again a month or so later, during which time I had not once tasted rice in my own home, I



Drawn by Ralph E. McAleer

NORTH CHINA, OFTEN A BATTLEGROUND, TODAY IS AGAIN INVADIED FROM BEYOND THE GREAT WALL.

Peiping, now occupied by Japanese troops, was conquered by Mongols and Manchus centuries ago, but after each invasion it eventually reverted to Chinese rule. The Peiping-Tientsin area adjoins Japanese-controlled Manchuikuo, but Shanghai, scene of fighting between the two nations five years ago, is the nearest Chinese seaport to Nippon proper. New names, shown here in parentheses, have been given to many cities by China's Nationalist Government, whose capital is Nanking.

decided that there must be a showdown.

"Chu, I want you to serve me rice to-night for dinner."

The cook's face fell. He wanted his missie to have only the best of everything.

"Missie no wantchee lice. Lice belong coolie chow."

SERVANTS ARE SPECIALISTS

There is the tradition of "face" which governs the duties of each employee within ironbound limits. Your cook will not mix cocktails. He leaves this to the number one boy who, in turn, will not clean shoes or run

errands. These tasks are the coolie's "pidgin." The wise foreigner does not attempt to change customs which have existed for centuries.

Chinese servants are justly famous. As a class they are unsurpassed in loyalty, industry, patience, and cheerfulness. They sometimes wonder at the strange customs of the foreigner, but they bear with him.

In China the housekeeper's chief concern is to make sure that the food is prepared in a sanitary fashion. One of my friends took pains to explain to her kitchen staff that fruits and vegetables which are eaten





Photograph by Alfred T. Palmer

#### A BILLBOARD HAS ITS FACE LIFTED

Slapping on new sheets of "sales talk," the boy has covered up part of the original advertisement, which sang the praises of a near-by photographic studio. Shanghai billboards blaze with colors and, like American posters, often depict pretty girls.

raw must be treated with especial care. She expatiated on the sterilizing properties of boiling water, and instructed them that the food also must be carefully washed in a solution of potassium permanganate.

Uncomprehending, but obedient, one and all replied that it should be done. Entering the kitchen one morning, she was horrified to discover her coolie scrubbing the lettuce with a toothbrush.

"Wang, what do you mean by using my toothbrush on that lettuce?" she cried.

The coolie, who would not have thought of touching her personal property, looked as astonished as she. "It's all li, missie. No belong you, belong my."

One proud housewife boasted to her friends that her kitchen was always kept spotlessly clean, even during the preparation of a meal. Several guests having assembled for luncheon, she offered to prove her statement.

Sure enough, there was the clean stove, the gleaming sink, everything in perfect order. But there was no sign of food. Investigating, she found that to be prepared at any moment for visitors, according to missie's instructions, meals were cooked on braziers in the number one boy's room, the bed and chairs being used to hold the dishes and utensils.

#### GUESTS WHO OVERSTAY CURFEW REMAIN ALL NIGHT

Even during "trouble" the famous night life of this cosmopolitan city of Asia continues with vigor. At such times private entertaining is somewhat curtailed. Pity the poor hostess whose guests have been caught by the curfew and who has them on her hands until dawn!

Hotels and night clubs offer the usual diversions, profiting by the increased trade which results from the enforced stay of those who are caught by the curfew. At such times, as well as under normal conditions, the conservative old Palace Hotel on the Bund and the Cathay, its up-to-date counterpart across the street, present pictures of gaiety at cocktail time.

The bar at the Cercle Sportif Français, the popular sports' club in the French Concession, is noisy with sprightly conversation in a half dozen languages. Chinese boys in long white gowns, their black pantaloons bound tightly about the ankles, move silently through the crowd with chits and laden trays.

The 20-story Cathay Hotel offers diverse amusement. The glittering shops in its arcade are stocked with Peking rugs, jewel jade, silks, and curios. For swank one dines in its grill under the lofty black pyramid which surmounts its roof. The orchestra which plays in its air-conditioned ball-room pleases even blasé American tourists, and imported singers and dancers entertain the guests.

It is a Shanghai custom to dine about nine, and then, if you are going to "do the town," proceed to the Little Club or the Paramount around midnight, and eat scrambled eggs at Del Monte's just before dawn.

The less fashionable dance halls provide Russian or Chinese hostesses, who look askance when male patrons arrive accompanied by ladies. "One small bottle wine, please," is the order when these girls and their partners finish a dance. Although they make a pretense of drinking, the girls rarely touch the champagne. But it is to their advantage to keep it flowing, for they are allowed a commission on each bottle bought by their companions.

Chinese dance halls have opened in large numbers in the last two or three years. The native musician has not yet become a master of American syncopation, and the orchestras are usually Russian. Frequently scenes from the life of *Mickey Mouse* or *The Three Little Pigs* decorate the walls.

A modern young Chinese in foreign clothes, complete with horn-rimmed glasses and brilliantined hair, executes elaborate

steps with his slender, narrow-eyed companion. She is gowned in high-necked brocade, dainty, exquisite. Sometimes as she sits sipping her drink, she renews her make-up with the contents of a compact.

#### THE GEOGRAPHY OF MODESTY

Until well into the 20th century Chinese women of the better class were not seen in public. When they did leave their homes, it was only in sedan chairs, concealed from the eyes of the world. With the influx of Western ideas of women's freedom the Chinese woman emerged from her isolation. Foot-binding, possibly an expedient for keeping women at home, not only went out of fashion but became illegal.

The transition period had its amusing aspects. Today the emancipated Chinese woman has her hair permanently waved, smokes, works in offices, frequents night clubs, and drives a car if she has a mind to. But with all her modern ideas she still is



Drawn by Newman Dunstead

#### SHANGHAI IS GATEWAY TO HALF OF TEEMING CHINA

Nearly as large as Chicago, this vast city is so located that it is the only major seaport for the fertile Yangtze Valley where live more people than the population of all the United States. It is as if New Orleans were the sole outlet for all the wealth of our vast Mississippi Valley.



Photograph by Ada Iron: Black Star

A MAGICIAN DOES TRICKS ON A HUMAN STAGE

With a wand in one hand he waves the other to command the little bowls on the cloth to leap into the air. Children at a Shanghai market, attracted by the performer's drum and gong, watch spellbound as springs inside the bowls are automatically released, and, one by one, the dishes jump off the ground, landing right side up.

reluctant to adopt foreign dress. She wears silk stockings, discards her flat, embroidered satin slippers for uncomfortable spike-heeled shoes, but she resolutely clings to her long gown with its stiff, high collar and straight lines.

The gown may be split to the knee, as are modish gowns in the Western World when the designers so decide, but her modesty still forbids her to expose her throat.

Western music is becoming more and more popular with the Chinese. I heard Maestro Mario Paci, the volatile Italian

leader of Shanghai's Municipal Orchestra, conduct symphonies and concertos in a crowded hall during the winter. In summer the outdoor concerts at Jessfield Park are enthusiastically attended by foreigners and natives, many of the latter not much above the coolie class.

Radios, bursting upon the ear in a crowded street, blare out popular songs in English between strident advertising in the native tongue. The strains of "There'll Be a Hot Time in the Old Town Tonight" and "Dixie" enliven many a shop opening and funeral procession.

When a shop is opened, a Chinese band sits on a second-story balcony and plays furiously all day long without relief.

The majority of Chinese shops flaunt gay red banners bearing in gold characters the description of goods carried within or announcements of bargains. These banners have almost entirely disappeared from Nanking Road, but they hang in profusion the full length of the congested cross streets in the heart of the city (page 506).

Many stores in the Western District struggle manfully to express themselves in English. Often have I passed that automobile paint shop on Weihaiwei Road with its name above in gold letters, "Squirt Var-

nish on Motor and Company"!

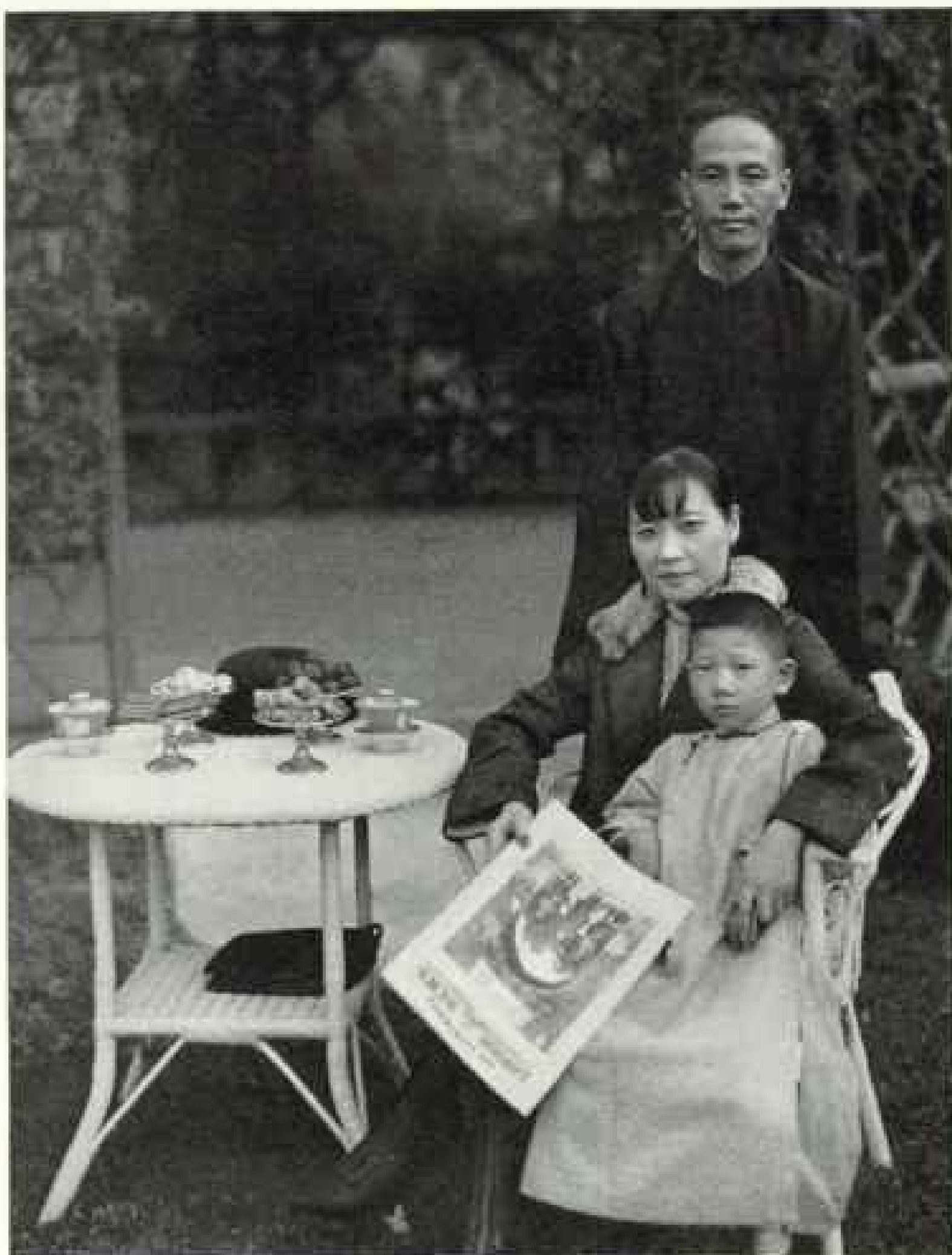
GRASSHOPPERS  
AND ROOF  
GARDENS

Several blocks west of the Bund, where a turbaned Sikh policeman directs the flood of traffic on every side, are three large Chinese department stores. They deal in everything from shoes to alarm clocks of both native and foreign makes. In their food sections one can buy "thousand-year-old eggs," dried grasshoppers, Russian caviar, Camembert cheese, and Hormel's soups.

At night these emporiums thrust polychrome neon lights into the sky, and diners gather in their restaurants on upper floors. They are frequently the scenes of fashionable wedding receptions. On summer evenings one sips tea on

the roof of the Wing On Store, and marvels at the view spread out below.

Theatrical performances are given in some of the rooms. While the gaudily costumed actors posture and intone in shrill nasal falsetto, there is scarcely a vacant seat on the narrow benches facing the stage. Chinese of every class go there for entertainment. They parade, drink tea, converse with the accompaniment of rapid gestures. In cold weather the women keep their fingers on small hot-water bottles



Photograph by Merl La Voy

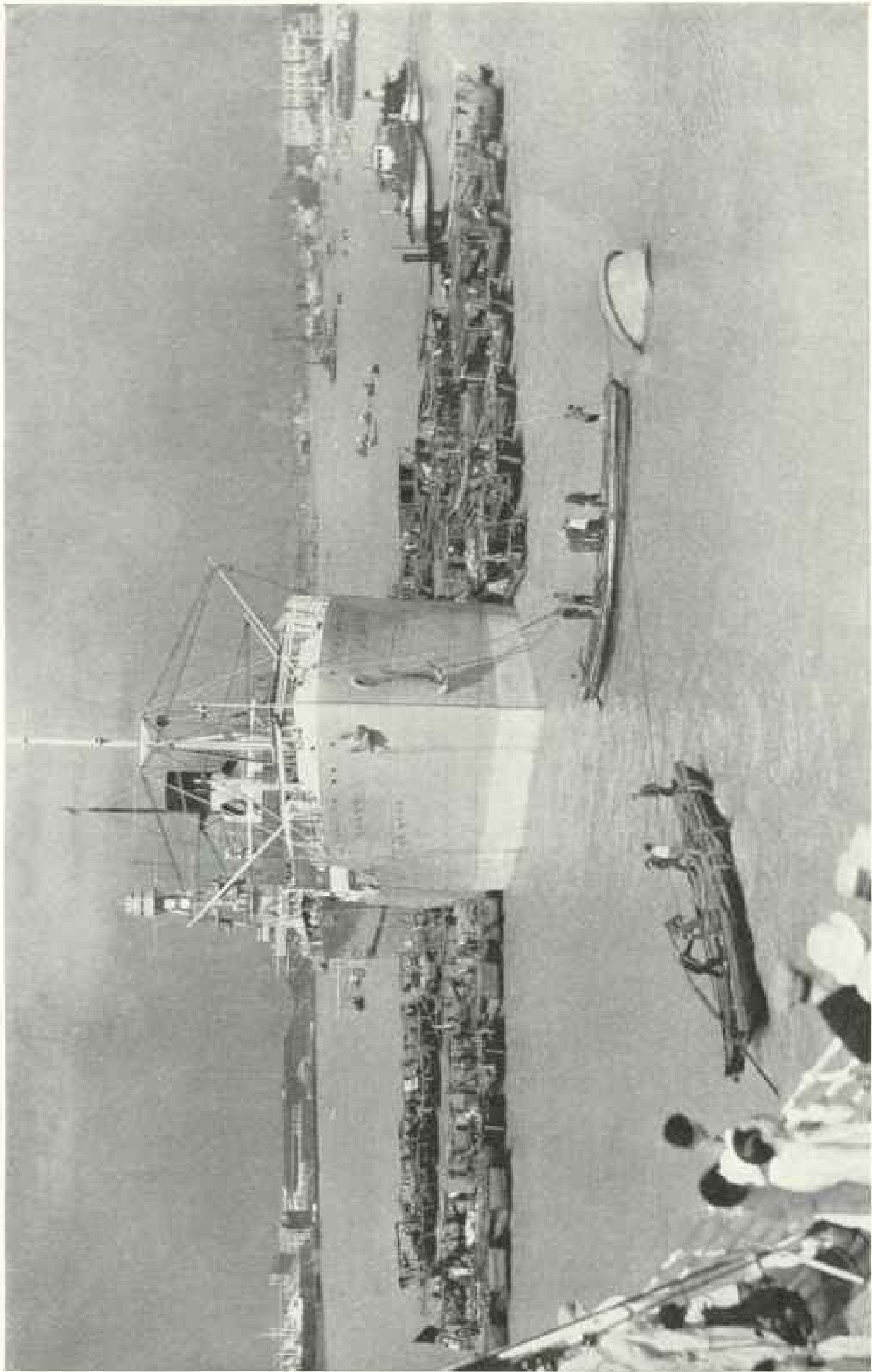
TEA FOR TWO AWAITS CHINA'S "STRONG MAN" AND HIS WIFE

Generalissimo Chiang Kai-shek has labored to unify his country and build up its war strength to resist foreign aggression. Madame Chiang, daughter of a Christian family, attended Wellesley College in Massachusetts. She holds here a copy of *The Illustrated London News*, opened at a photograph of her husband. The youngster, her nephew, is the son of Dr. H. H. Kung, Minister of Finance, who recently visited the United States (page 508).

held in the folds of their padded gowns.

The Chinese, by and large, are inveterate gamblers. The State lottery, drawn every month, tempts rich and poor alike. Many a coolie, dreaming wistfully of the bliss of having plenty of rice, silk gowns, and foreign shoes, exchanges hard-earned cash for the pitifully remote chance of winning one of the fat prizes. Chinese of all classes flock to "the dogs" to place their dollars on lean, lithe whippets which flash after a mechanical rabbit, as in America. One may





Photograph by Alfred T. Pabner

SHELLS SPRAYED THIS STRETCH OF THE WHANGPOO WHERE SAMPANS SWARM AROUND A STEAMER.

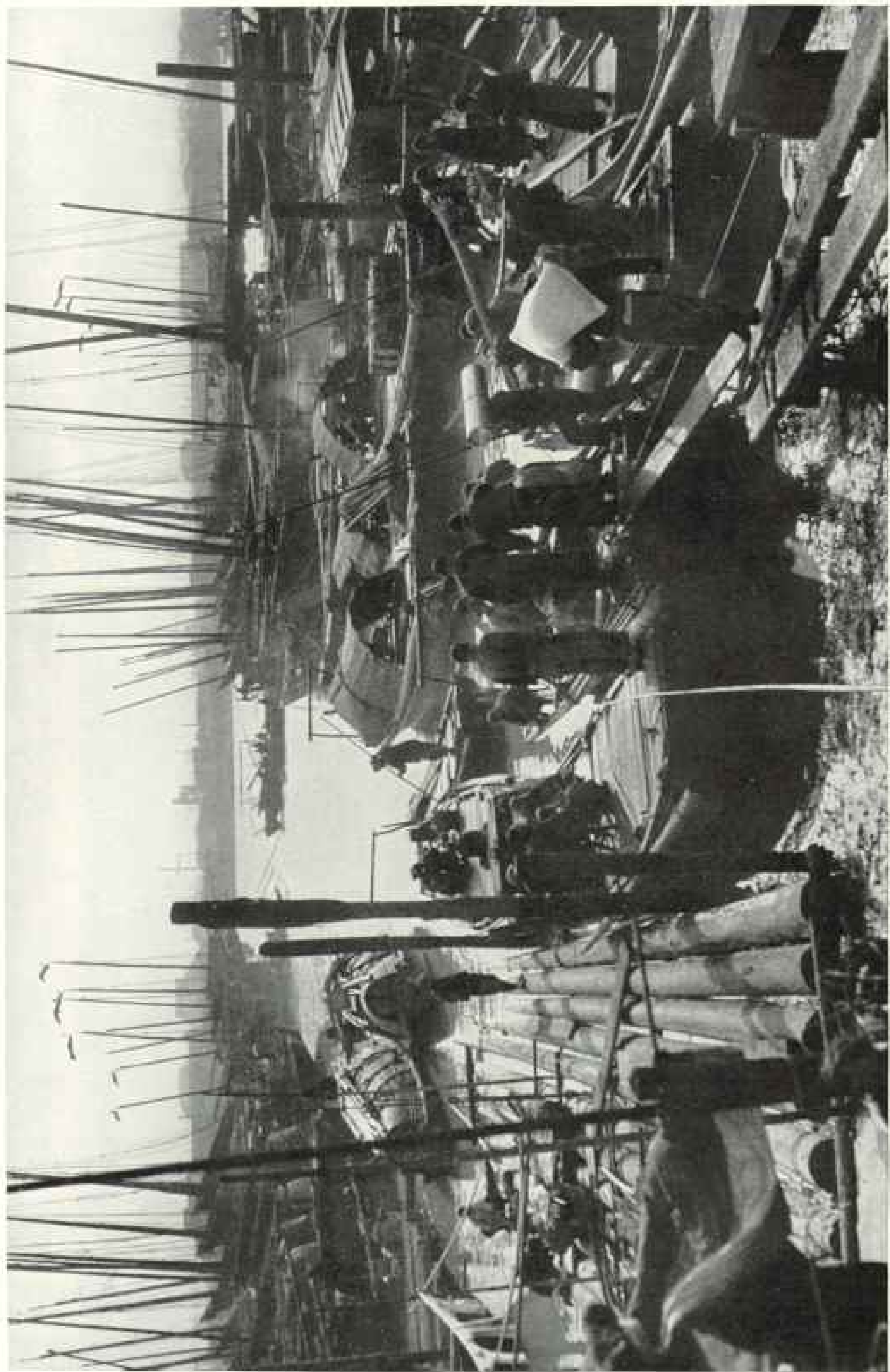
The discharging freighter is moored to buoys. Astern is the U. S. S. *Argonaut*, flagship of the U. S. Asiatic squadron. Men in sampans moor the ship, whose passengers crowd the rail (left). Dredging keeps the Whangpoo deep enough for most ships, but the largest liners have to discharge at Woosung (map, page 491). Shanghai, built on mud and silt brought down by the Yangtze, could erect no lofty skyscrapers until builders discovered how to lay huge concrete rafts as foundations in the soft soil.



Photograph by Alfred T. Palmer

HUNDREDS WERE KILLED BY BOMBS AT CORNERS LIKE THIS, WHERE RICKSHAS AND BICYCLES TANGLE WITH STREETCARS

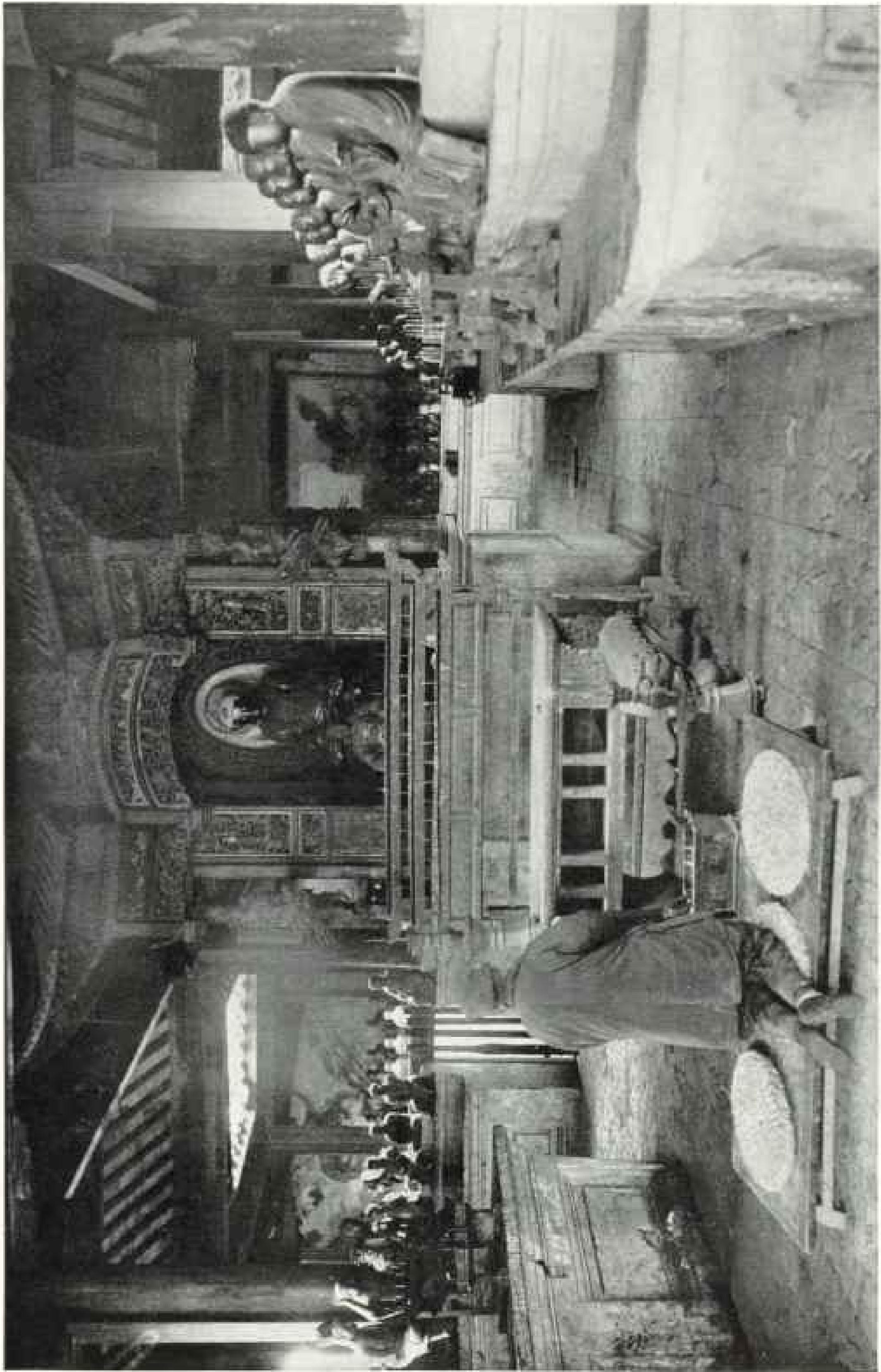
Traffic is sometimes much worse than this at Nanking and Chekiang Roads. Often it seems as if Shanghai's 40,000-odd rickshaws were all jammed at the intersection.



Photograph by Alfred T. Palmer

DAWN REVEALS WHANGPOO RIVER FOLK ALREADY ASTIR

Smoke from a breakfast fire rises from a hooded craft; a woman poles her sampan into the stream; men bring cargo from shore across boats, rafts, and planks.



Photograph by George R. King

LIKE A SILENT CONGREGATION, BUDDHIST IMAGES SEEM TO LISTEN INTENTLY AS AN OLD WOMAN PRAYS

Kneeling on tressed legs, she burns incense in a metal receptacle before the shadowy altar where the Enlightened One sits. The seated figures ranged in long "pews" around the temple represent the Five Hundred Lohan, or disciples of Buddha, whose ancient faith has many devotees in Shanghai's native districts.





Photograph by Alfred T. Palmer

**THE BUND, SHANGHAI'S FRONT DOOR, BECAME A NO-MAN'S LAND WHEN BOMBS CRASHED AND SHRAPNEL BURST**

The spacious river-front boulevard, seen from a window in the 20-story Cathay Hotel, is lined by big banking houses, headquarters of steamship lines, office buildings, and a British club which claims the longest bar in the world! Travelers, coming ashore by tender, usually set foot in China for the first time when they leave the landing stages (upper left) and enter the two-story customs examination shed. Across the Bund is the lofty building of the Chinese Maritime Customs, whose clock (upper right) is nicknamed "Big Ching." A mariners' landmark is the tower with a cross (upper center), where weather and time signals are displayed.



Photograph by Alfred T. Palmer

## ALWAYS ROOM FOR ONE MORE ON THE "SHANGHAI EXPRESS"

At the races advertised on the streetcar poster, amateur and professional jockeys ride fast Mongolian ponies at the big Recreation Ground in the heart of the city. Chinese bet heavily, too, on jai alai (hai-alai), a speedy game imported from Spain, and on the greyhound races held at the Canidrome in the French Concession.

lose or win a good sum in a few hours at jai alai (hai-alai), the swift game imported from the Basque country.

Shanghai turns out spring and autumn to try its luck at the horse races. The "horses" are sturdy ponies bred on the plains of Mongolia. Banks are closed and many business houses observe a half holiday.

Some prominent Shanghai business men not only own ponies but ride in the races.

These are operated on a pari-mutuel basis and a lottery accompanies each. Large sums are at stake, particularly on the Champions' Race, which is the climax of every Race Meeting. The Chinese jockeys have their own club on Bubbling Well Road.

Riding occupies an important position on the sports calendar. If you are a light sleeper, you may be awakened any morn-

ing very early by the clop-clop of hoofs on the street as ponies led by *mafous*, or grooms, wielding fly switches, pass your window. They gather at the Race Course or far out on Great Western Road so that their owners may have an exhilarating canter before office hours.

Paper hunts are great sport over the winter fields. For a small sum, good-natured farmers allow the Hunt Club to erect jumps and construct ditches on their land, where the chief hazards are the grave mounds that dot the fields. Interport hunts are held in the season, and pink-coated horsemen come down from Tientsin and Peiping to compete for the coveted silver cups.

The polo games played at the Race Course or at Kiangwan are important social events in Shanghai. Frequent contests take



NO GUARDS, NO ARMORED CARS, NOT EVEN A CROWD TO LOOK ON AS A FORTUNE IN SILVER SPILLS ON THE STREET

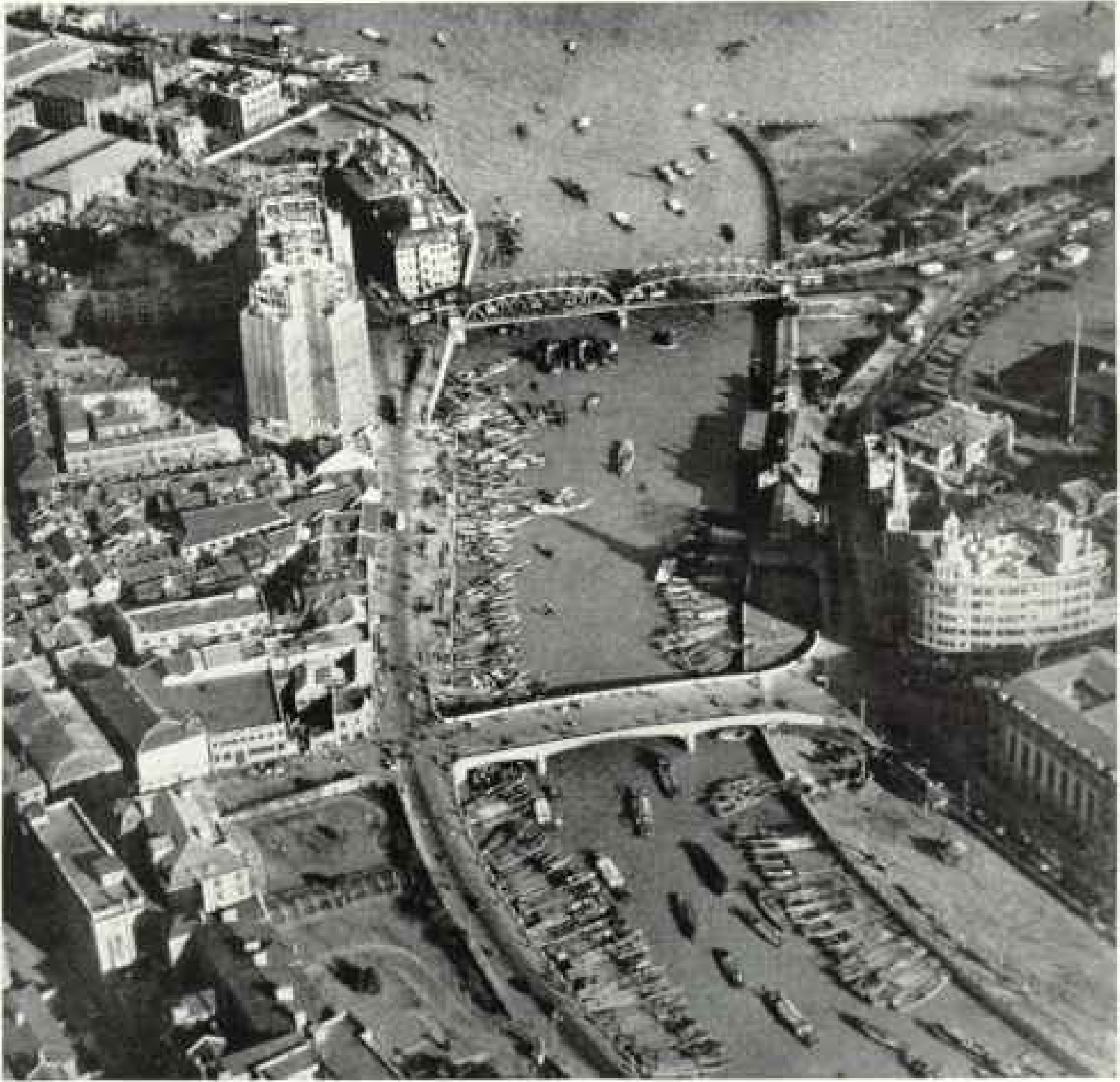
The heavy load became unbalanced and the bars tumbled onto the pavement as the coolies carried them across the Bund from a bank to one of the river landings. In the background is the tall Cathay Hotel in front of which bombs dropped, killing an American and many Chinese.



Photograph by John Oliver La Gorce

UNCLE SAM'S SEA SOLDIERS RIDE A "BOAT TRAIN" ON SOOCHOW CREEK

In native houseboats towed by a small tug, groups of U. S. Marines stationed at Shanghai were taken on a few days' cruise from time to time that officers and men might become familiar with conditions along the important waterways leading from Shanghai to the interior. For centuries Soochow Creek has served as a watery highway for thousands of small native cargo craft of infinite variety going and coming in a never-ending procession day and night.



Photograph from Acme

PLANES RAINED DEATH FROM THE SKIES NEAR WHERE SOOCHOW CREEK JOINS  
THE WHANGPOO

Aimed at an enemy warship lying near the Japanese Consulate (beside the moored steamer, upper left), Chinese bombs missed their mark and landed near the Cathay Hotel on the Bund, upper right (see opposite page). The spire of Union Church towers between the British Consulate General and the many-windowed Capital Theatre Building. Across the creek rises the tall Broadway Mansions apartment house. Grouped beyond the Garden Bridge (upper) are the Consulates of the U. S. S. R. and Germany, and the site of the projected United States consular headquarters.

place between International, U. S. Marine, and Chinese teams. Outport polo teams often come to Shanghai to meet the local players.

SHANGHAI MEN LIKE WESTERN SUITS

Although foreign male attire is more expensive than native gowns, it is being adopted more and more generally by Shanghai Chinese. Shanghai tailors are excellent. They work rapidly and can make a suit of clothes in two days. They copy accurately the cut and workmanship of any garment.

There is a familiar story of an Englishman who took to his tailor a length of Harris tweed and his favorite old suit, which, as it happened, was patched in the seat of the trousers.

"Make one piece suit all same this," were the instructions.

"Can do, master."

When the new suit was delivered it was exactly like the original—with a patch on the pants!

Chinese tailors do not work with patterns. You take them your material and a picture

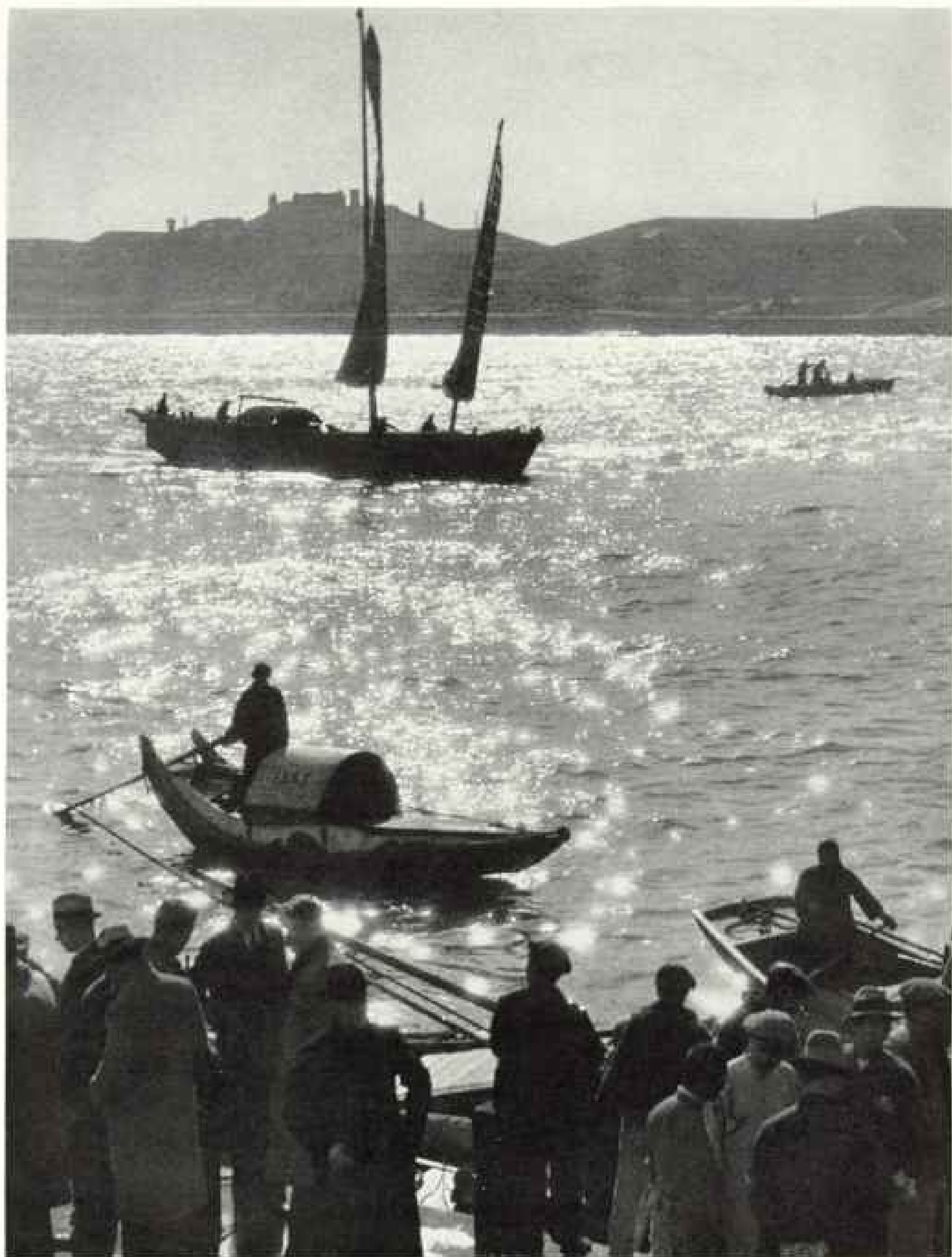




Photograph by Acme

**HIGHLANDERS IN KILTS, WHITE SPATS, AND SUN HELMETS SWING ACROSS SOOCHOW CREEK**

Colorful uniforms of British regiments have been a familiar sight since Shanghai was opened to foreigners as a treaty port nearly a century ago. Uncle Sam's Fourth Marines are among the troops of different nations now stationed here. Garden Bridge, whose slightly humped roadway is one of the steepest hills in town (page 501), was brightly illuminated in honor of King George VI's coronation. Shanghai streetcars tow trailers. Big buses are driven by White Russians, thousands of whom came here after the Tsar's overthrow (page 505).



Photograph by Alfred T. Palmer

HOMEROUND WORKERS WAIT FOR FERRIES TO CROSS THE SUNSET-GILDED WHANGPOO

Launches and sampans take crowds of Chinese daily between Shanghai and the suburb of Pootung, across the river. The buildings that line the water front like a low range of hills are called "godowns," from a Malay word meaning warehouse. About 13 miles below Shanghai, the Whangpoo joins the mighty Yangtze near the latter's mouth in the East China Sea. Much of the fighting during the Sino-Japanese hostilities of 1937 took place along the river between Shanghai and Woosung (map, page 491).



Photograph by Alfred T. Palmer

**BOATMEN LEAN ALMOST HORIZONTAL AS THEY PUSH AT THEIR POLES**

Each plods toward the stern along a precariously narrow runway as the heavy scow, loaded with fine coal dust, is pushed through the shallow, muddy waters of Soochow Creek (page 501). An amazing variety of craft, from tiny sampans to big steam launches towing strings of passenger barges, enters Shanghai on this "main line" waterway, which is linked up with a vast network of canals.



Photograph courtesy U. S. Navy Recruiting Bureau

**CHOPSTICKS ARE HARDER TO HANDLE THAN AN 8-INCH GUN!**

There's many a slip 'twixt the bowl and the lip as a gub from the U. S. S. *Augusta* tries to enjoy a Chinese meal of bamboo shoots, greens, and bits of meat. His companion in a Shanghai restaurant holds a dish of rice near his mouth, scooping up the contents as with a spoon.

of the garment you wish made. Once an American woman sent to the United States for a pattern of an evening gown which caught her fancy, thinking the cut was so intricate that her tailor would not be able to achieve it with only a picture.

Six weeks later the pattern arrived. With extreme care she explained its use, telling her tailor to follow it exactly. When the white satin gown was finished, down one side near a seam appeared the words, executed in blue embroidery, "Vogue Pattern No. 3468. Straight of material."

Yates Road, off Bubbling Well, is known as "Lingerie Street." In the back rooms of its small shops half-grown Chinese sit in the gloom embroidering silk destined for exquisite underwear. Although every stitch is done by hand, the finished product is sold for an incredibly low price. "Better sell for small profit than fail in business," runs an old Chinese proverb.

The tennis courts, cricket fields, swimming pool, and bowling greens encircled by the Race Course compose the largest public recreation ground in the city. There are several sports' clubs, notably the Columbia Country Club established by Americans in the new residential district, and the Cercle Sportif Français, near Avenue Joffre, the principal street of "Frenchtown."



Photograph by Ada from Black Star

#### RICE IS MEASURED IN THE TIME-HONORED WAY

The old hollow measure holds one picul, a weight which varies greatly but for purposes of foreign trade is considered to be 133 $\frac{1}{4}$  pounds. When the box is full, coolies empty it into bags. Rice is the staff of life in central and southern China; wheat and millet are staples north of the Yellow River.

Although the latter club was organized by members of the French community, its membership is international. On Bastille Day the French members are hosts to other nationals at a reception and *soirée*. Then the tricolor appears in lights and bunting on the streets of "Frenchtown," and the Concession is en fête.

The White Russian population of Shanghai has invaded Avenue Joffre to a considerable extent. Having no consulate and no political rights, the 25,000 exiles enjoy no enviable lot. Those who can scrape together a little capital open shops and restau-





Photograph by Alfred T. Palmer

## SHADOWY LANES IN THE NATIVE CITY GIVE VISITORS A GLIMPSE OF AGE-OLD CHINA

Not far from the Bund (page 498) is this noisy, banner-draped quarter, where gowned figures in slippered feet crowd along stone-paved streets that are too narrow and tortuous for automobiles. Beneath the overhanging second floor of a shop are suspended bundles of paper money, each piece shaped like an old-fashioned silver ingot. People buy these to burn as offerings at their ancestors' graves or in temples. "You use good copper cash," runs a Chinese saying, "to buy sham silver with which to cheat your ancestors."

rants. Comely young Russian girls, employing their natural talents for dancing and singing, become cabaret entertainers and dance "hostesses."

#### THE "LITTLE TOKYO" DISTRICT

The Hongkew district, north of Soochow Creek, is a veritable "little Tokyo." Here factories built with Japanese capital abound, the clack of *geta* echoes on pavements, and shops do a brisk business in kimonos and the shiny ornaments which decorate the heavy hair of Japanese women.

The Japanese community has even elected a mayor, and although his office is held by no legal right, his constituents respect his authority.

The Chinese were the first printers, and Shanghai is today the publishing center of China. In addition to foreign newspapers and periodicals of every description published there, well-established ones and "fly-by-nights," there is an increasing number of native publications printed in English as well as in the vernacular.

In recent years, this growing metropolis of the East has been enjoying an unprecedented building boom. Shanghai has spread westward out of all bounds, and the Race Course, originally established on the outskirts, is now in the heart of the city. For many miles on extra-Settlement roads new residences have sprung up. Lofty apartment buildings, hotels, and modern cinema palaces accent the rows of older structures.

Chinese war lords are not the only members of their race who maintain up-to-date establishments in Shanghai. Prosperous citizens are moving into apartments equipped with electric refrigerators and stoves.

Although far outnumbered by Chinese, foreigners dominate Shanghai. To escape the Western influence, to receive an impression of China untouched by the outside world, you have only to enter Nantao, the Chinese city extending south of the French Concession. It is a compact, congested area, which, until the Nation became a republic, was enclosed by a wall. This squalid, odoriferous, teeming district is a maze of crooked, cobblestoned streets and stone or tile houses.

Near the center of the city is an artificial lake in which stands the Willow Pattern Tea House. It is dirty and down-at-heel, and one wishes it were painted some color, if not blue like the famous willowware.

Yet the zigzag bridge by which it is approached is as artful as one could desire.

In Nantao shops of every kind are pressed and massed together. Silks, porcelain, ivory, curios, mah-jongg sets, live birds, and fighting crickets are displayed. In the food shops the red-varnished carcasses of ducks and unidentifiable parts of animals hang exposed in the germ-laden air.

Dentists ply their trade in full view of the passers-by, selecting false teeth for their customers from dusty shelves. Gold teeth and jade fillings are popular because they attest the prosperity of their wearers. Although the Chinese are among the least hirsute of peoples, itinerant barbers are rarely idle; shaving heads is in high fashion.

In tea shops eager groups gather to listen to tales of ancient days related by storytellers. Since a large proportion of Chinese are illiterate, public letter writers do a brisk business.

#### MODEL HOMES REPLACE HOVELS

Even Nantao is undergoing renovation. In accord with plans formulated by the Government of Greater Shanghai for the betterment of the district, model homes for workers are replacing squalid dwellings, and sorely needed schools and nurseries are being established.

On January 1, 1934, the City Government of Greater Shanghai removed to its new offices in the Civic Center at Kiangwan.

The new development is admirable in construction and administration. The plan of the Civic Center is a harmonious blending of Chinese and Western architecture. Here the Mayor of Greater Shanghai, by which is understood all parts of the city except the International Settlement and the French Concession, has his offices.

Former Mayor Wu Te-chen, who was a close friend of China's national hero, Sun Yat-sen, staunchly upheld the new nationalism. He controlled Greater Shanghai independently of Kiangsu Province under a mandate from the Central Government, and he pursued an intelligent and progressive policy.

The buildings already completed at the Civic Center include the City Hall and the Bureaus of Public Works, Social Affairs, Land Administration, Health, and Education. Other buildings will house the Bureaus of Finance and Public Utilities. Later on the Bureau of Public Safety will exchange its old office in Nantao for a mod-



© Paul Du Gaston

#### A CHINESE AMOS AND ANDY TALK BIG BUSINESS OVER THEIR CIGARETTES

A candid camera caught the two partners as they carried on an animated discussion in the midst of worshipers at a Nanking Road temple, whose roof was open to the sunlight. Heavily padded winter clothes give the men a deceptive stoutness.

ern home in Kiangwan. The completed Civic Center will have also a library, courthouse, museum, and municipal auditorium.

#### THE NEW LIFE'S CREED

The New Life Movement initiated by Chiang Kai-shek (page 493) aims to bolster the respect of foreigners for the Chinese people. Inspired by principles laid down by Confucius, the Generalissimo conceived the following precepts:

Regard yesterday as a period of death, today as a period of life.

Let us rid ourselves of the old abuses and build up a new nation.

Let us accept the heavy responsibility of reviving the Nation.

We must observe rules, have faith, honesty and shame.

Our clothing, eating, living, and traveling must be simple, orderly, plain, and clean.

We must willingly face hardships; we must strive for frugality.

We must have adequate knowledge and moral integrity as citizens.

Our actions must be courageous and rapid.

We must act on our promises, or act without promising.

Mayor Wu's comprehensive civic program gave a strong impetus to the New Life Movement in Shanghai.

One example of his cooperation with his chief's idea of economy was his sponsorship of mass marriages. Bound by tradition to preserve face, poor families often went deeply into debt to provide what they considered a suitable display when their children married.

Mayor Wu's innovation made it possible for a large number of couples to be married on the same day with greatly reduced cost to each. The ceremony used at the mass marriages was far simpler than the old form.

Since one April day, when 57 marriages were celebrated at the Civic Center, many other couples have followed suit.

Enterprise, energy, new life—thus is Shanghai, mighty, vigorous, dynamic, as she keeps pace with the increased tempo of life in the West, typifying the swiftly changing face of the East!

Of tomorrow who can say?

# PEACETIME PLANT HUNTING ABOUT PEIPING

BY P. H. AND J. H. DORSETT

*Agricultural Explorers, United States Department of Agriculture*

IF YOU like a food market; if there is a thrill for you in the soft reds, creams and yellows, the orchestra of odors, and the labels in strange languages at the cheese stand; if you pride yourself in ferreting out the merchant who knows and buys the best lettuce or the best Malaga raisins; if the discovery in a stall of some bright-skinned, tropic-grown fruit excites your enthusiasm; if for you the large municipal markets at Seattle, at Indianapolis, on Fulton Street, New York, and on Lexington Street, Baltimore, hold charm—then you would be entranced with the peacetime markets of Peiping.\*

More nearly like occidental markets in arrangement is the big Hata Men Street market within a block of the Legation Quarter.†

## ARGUMENT THE SPICE OF BARGAINING

Chinese cooks from the legations and upper-class homes crowd the aisles early in the morning arguing purchases of *pe-tsai* (Chinese cabbage), blanched dandelion, radishes as large as a child's head, golden persimmons bigger than Georgia peaches, long cucumbers straight as a rule, bean sprouts and water chestnuts, garlic, Chinese onions, golden flower vegetable, Egyptian lotus, eggplant, ginger, and *goba*, a fungus growing on wild rice.

Many cooks carry their own scales. In this practice there is no implication of dishonesty, but cooks do prefer to check a merchant's measures. It helps prolong an argument which is part of a Chinese purchase.

North of the Legation Quarter also is the Peiping Bazaar, a raucous, tumultuous market, diverse as an American food show and offering everything: vegetables, cut flowers, grain, ornamental and fruiting plants, cloth, preserved eggs of a few

\* See "New Plant Immigrants," "Our Plant Immigrants," and "A Hunter of Plants," all by David Fairchild. NATIONAL GEOGRAPHIC MAGAZINE, October 1911, April 1906, and July 1919, respectively.

† See, in THE NATIONAL GEOGRAPHIC MAGAZINE, "Peking, the City of the Unexpected," by James A. Muller, November 1920; "The Glory That Was Imperial Peking," by W. Robert Moore, June 1933; "Approach to Peiping," by Maj. John W. Thomson, Jr., February 1936; and "Peiping's Happy New Year," by George Kin Leung, December 1936.

months to several years old, lanterns, coal oil, confections, fruits, nuts, books, hardware, and fighting crickets (page 531).

West of the Forbidden City, the emperors' city within Peiping, there meets on certain days a wholesale grain market.

Farmers bring in by donkey or wheelbarrow samples of their grain, corn, millet, barley, buckwheat, cowpeas, mung and soy beans, wheat and kaoliang, the last a species of sorghum which supplies China with food, fuel, and shelter. In the noisy, pushing street, buyers purchase the solid foodstuffs for Peiping's kitchens.

South in the Outer City through Chien Men, a main gate (page 515), is the wholesale fruit market.

There are jujubes from the country round about Peiping, bamboo baskets of grindstone persimmons and black dates from the Western Hills and Ming Tombs valley, Paili pears from above Mentowkow railhead, apples from Hwailai, large freestone apricots, plums, cherries, and tiger paw chestnuts from Fa Hua Temple vicinity, grapes from Anshan, northeast of Tientsin, large bright-red hawthorns from south of the former capital, sacks and sacks of peanuts, and English walnuts, from Anshan and Hundred Flower Mountain (page 527).

For my son and me the markets of Peiping held more than pleasure of strange sights, sounds, and odors. For nine months we practically lived in them when we were not making expeditions of agricultural discovery to the mountains, plains, and numerous narrow valleys.

## PLANT HUNTERS PICK UP THE SCENT IN THE MARKETS

We were plant hunters from the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry, sent out from the United States Department of Agriculture, Washington, D. C. To a plant hunter city markets hold the clues which start him on the trail of plants potentially valuable to his own country.

Every plant trail is worth following, for at the end may be a new vegetable to grace the American table or a new pear tree which will rescue the American pear industry from destruction by blight. There



may even be a hardy chestnut which will permit the re-establishment of our chestnut industry on the eastern seaboard, or a luscious new persimmon to be cultivated in some part of America.

Before we could begin work, we learned that we had to be christened with Chinese names to go on Chinese business cards. The hotel offered to send a translator.

As we opened the door to a knock, Peter Liu blocked the entrance. He looked less like a translator than a heavyweight pugilist dressed in a nightshirt. Since he was 27 years old and weighed more than 200 pounds, we thought he must pay attention to food as well as translation.

"Good morning," said Peter in first-rate American accent.

Before he left on our mission, we learned that his father was a Princeton man. Peter himself had learned English before completing his high-school course. He gave me the name of Tu Erh Shih Ti, which phonetically became "Duarshtee," the nearest equivalent to Dorsett; and my son became, during our entire stay in China, Tu Ya Ke, "Duyagu."

#### BUTTON, BUTTON, WHO HAS THE JUJUBE?

Following the trail of the large jujube was our first plant hunt. On our way to the Hata Men market I saw a bamboo basket of very fine, large jujubes different from any previously introduced in the United States.

"Peter, I am very anxious to find the particular tree on which these jujubes grew," I explained, telling him where they had been purchased.

Next day Peter returned. The merchant had not known; the jujubes might have been grown 60 miles away, or near Peiping.

But he had given Peter the name of the dealer who sold them. The dealer had sent him to a wholesaler. The wholesaler, not knowing, had called a wheelbarrow carter. By this house-that-Jack-built process, the tree had been located, Peter believed, not 40 miles beyond the Tatar Wall, but just four miles.

In rickshas we went through one of the city gates and arrived in due time at the less-than-one-acre farm of Mr. Fan. Rising over his modest dwelling were two large jujube trees. Mr. Fan was good enough to permit me to cut a number of scions, or bud branches, and dig up a few small rooted suckers from the bearing tree.

In consideration of his courtesy, we took a photograph of him and his family and returned to Peiping to pack the scions and suckers for shipment to the United States.

This was the harvest season, and such quantities of fruits and vegetables were coming into the markets that it made our heads swim to catalogue the varieties. Each day Peter and I returned laden.

Most conspicuous on the street vendors' wheelbarrows and in the markets were the large golden persimmons. Piles of them splashed color on Peiping streets. We had seen persimmons growing in the Ming Tombs region north of the capital, but we learned that a more important producing district lay in the Western Hills near Toli.

We obtained a letter, two American flags, two carts, two donkeys, and two drivers, and set out over the worn flagstone road toward the Marco Polo Bridge which spans the Everlasting Peace River (Hun Ho) even as it did in the days of the famous Venetian explorer (page 516).

Every growing thing excited our attention. Our course led through a dry, deforested countryside with a general topography resembling that of eastern Pennsylvania, but with agricultural similarity to Sacramento Valley, California.

At first we passed through level truck gardens. We stopped to photograph the carefully dug pits in which Chinese store cabbage for the winter. One farmer was laying down his rose grape vine to be covered with dirt for the winter, and we obtained some cuttings for trial at home.

In the sun sat a Chinese skillfully cutting reed grass, an important plant and an essential of an important industry in this land of baskets and mats.

At a railroad siding lay bags of English walnuts, some of them destined, we conjectured, for American tables. Farther along a farmer permitted us to make cuttings of the red grape and "milk" grape.

#### AN ANCIENT TOMB AND A NEW TREE

Late in the afternoon we came to Tsuchiawoo and the tomb of Chuang Wang, a Manchurian prince of some 200 years ago, whose tomb protects an unusually splendid stand of whitebark pine.

Picturing those pines gracing some American shrine, their dark-green needles contrasting with white trunks and branches, I gathered seed.

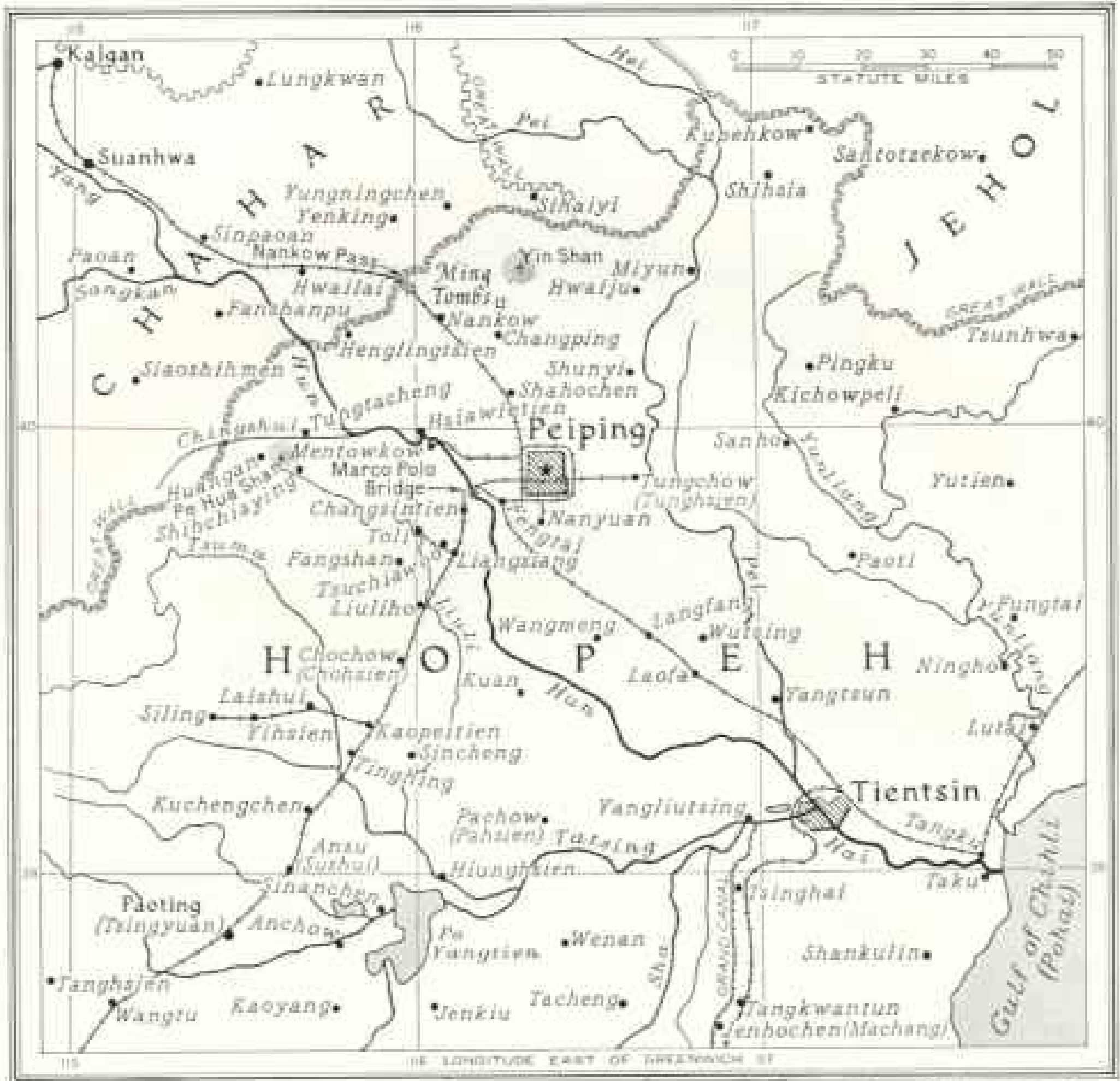
China and the world owe a considerable



Photograph by Gilbert Grosvenor

EMPERORS WORSHIPED "OLD GRANDFATHER HEAVEN" IN THE TEMPLE OF THE HAPPY YEAR

Sight-seers, Chinese and foreign, ascend the gleaming marble steps to the blue-tiled, gold-capped shrine where rulers came annually to pray for national prosperity. The "engraved stone," referred to on the sign, depicts a dragon which was supposed to guard the sacred precincts. Armed forces of China and other countries have frequently been quartered in the 700-acre enclosure known as the Temple of Heaven, of which this building is a unit (page 529).



Drawn by Ralph E. McMeer

#### SENTINEL CITY OF NORTHEAST CHINA IS VENERABLE PEIPING

About it are glamorous names—the majestic Ming Tombs; Marco Polo Bridge, crossed by the Venetian explorer six centuries ago; teeming Tientsin, of Boxer Rebellion fame; the Grand Canal, longest man-made waterway. The Great Wall writhes snakelike about the Celestial Empire's former Capital. Japanese troops, fresh from their entry into Peiping, assailed this ancient barrier (page 525). Railroads from southern China (lower right and left), from Manchukuo (right), and from frontier Kalgan converge on Peiping and its seaport, Tientsin, making these cities strategic. The authors, in their search for rare and interesting plants, explored north to Yin Shan (Silver Mountain), west to Huanggan, and south to Wangmeng.

debt to the old emperors and their gardens, tombs, and temples.

A weeping ginkgo tree at another wayside sacred place recalled to me that this tree, which is cherished as a survival, along with pines, certain ferns, sharks, and lizards, of life existing millions of years ago, owes its preservation perhaps to its use as a temple tree by the Chinese.

It is more than an accident probably that the grindstone persimmon, a perfect product of skillful agriculture, grows near

the famous Summer Palace of the Manchus.

This persimmon may well be the Chinese farmer's answer to the emperors' demands for the "best of everything." Certainly the cream of the crop of the Feicheng peaches developed at Feicheng in Shantung Province went direct to the imperial table. How the extremely perishable fresh lichees were transported by royal command from down near Canton is still a mystery.

Many of our own interesting plant captures, such as Mongolian oaks, seed of



© Hartung

#### A STONE FORWARD BALANCES THE VEGETABLES ASTERN

The cheerful little farmer is his own delivery van, bound for one of Peiping's teeming markets (page 509). At the bottom of his basket are some Chinese cabbages, resembling fat, cream-colored bunches of celery with broad, light-green leaves.

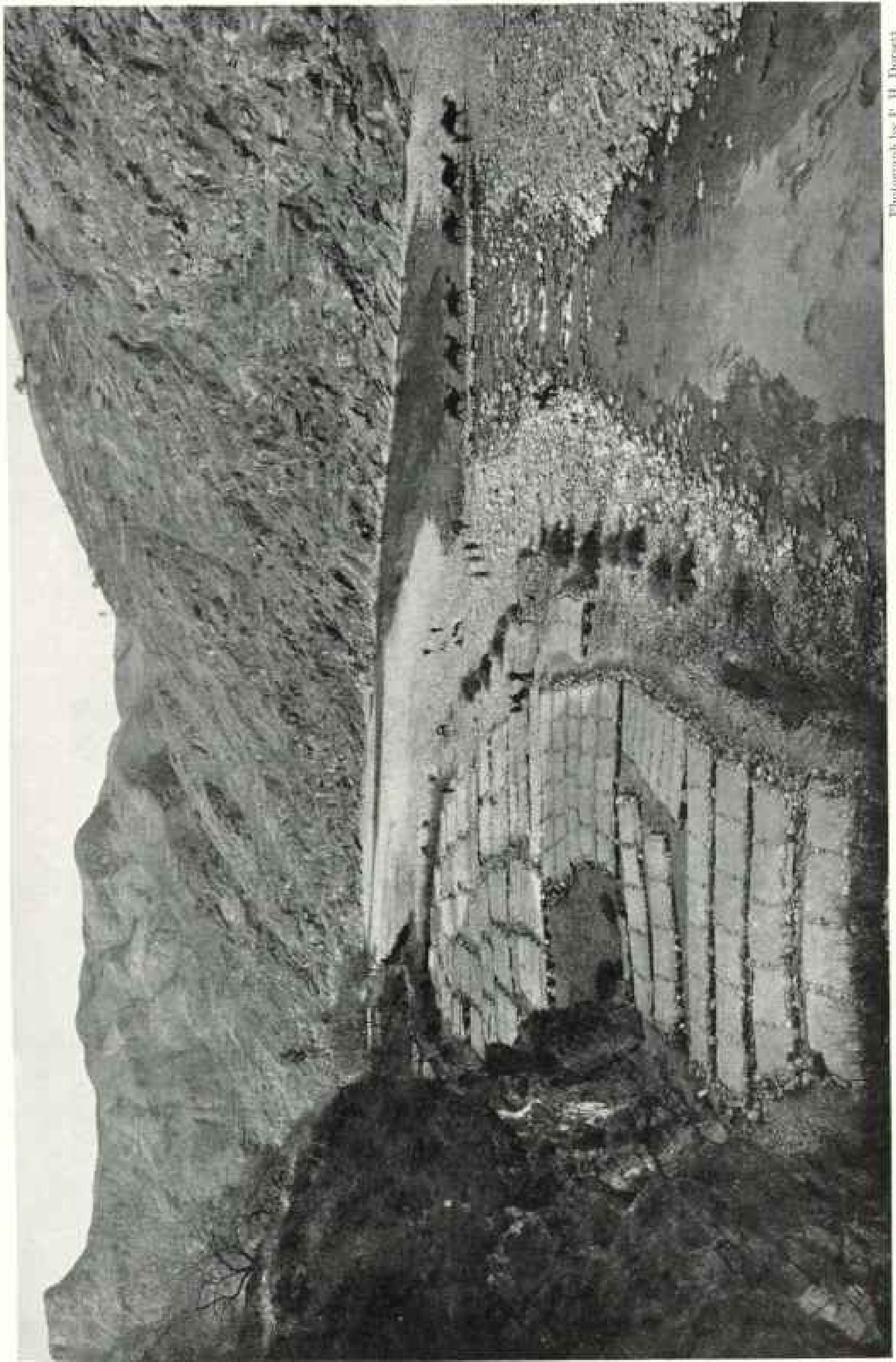


Photograph by James Dorsett

#### NATURE'S COLD STORAGE PLANT PRESERVES PERSIMMONS ALL WINTER

Growers in the Toli region bed down their large, golden fruit on kaoliang mats placed over furrows, which drain off water and snow and allow cold air to circulate, freezing the persimmons. A winter in the open improves the flavor of the fruit. It is shipped frozen to Peiping and thawed out as the demand warrants, making it possible to serve persimmons for breakfast as early as March (pages 514 and 520).

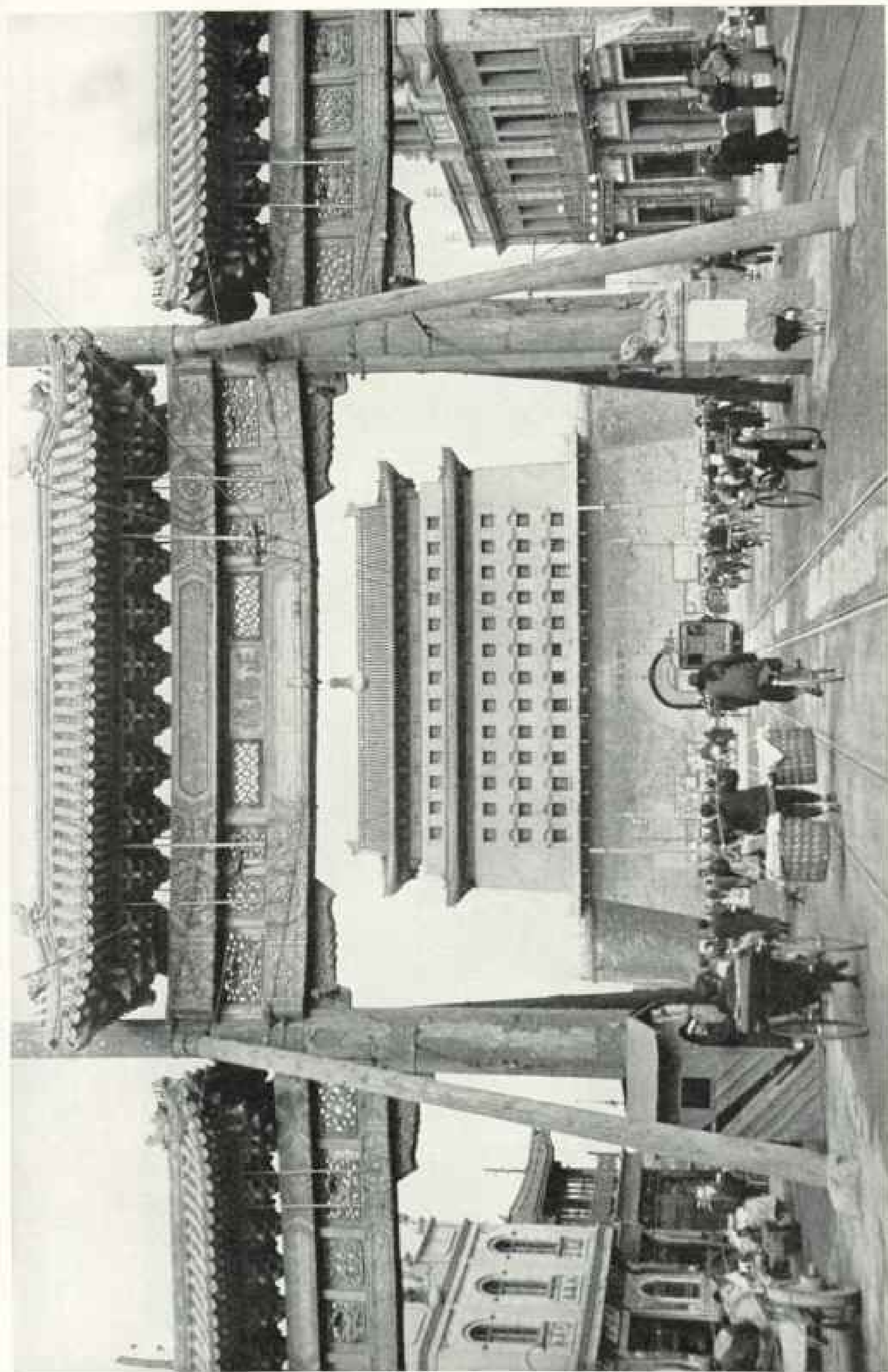




Photograph by F. H. Dorsett

**A MILLION AND A HALF PERSIMMONS ARE STORED IN THIS OUTDOOR "REFRIGERATOR"**

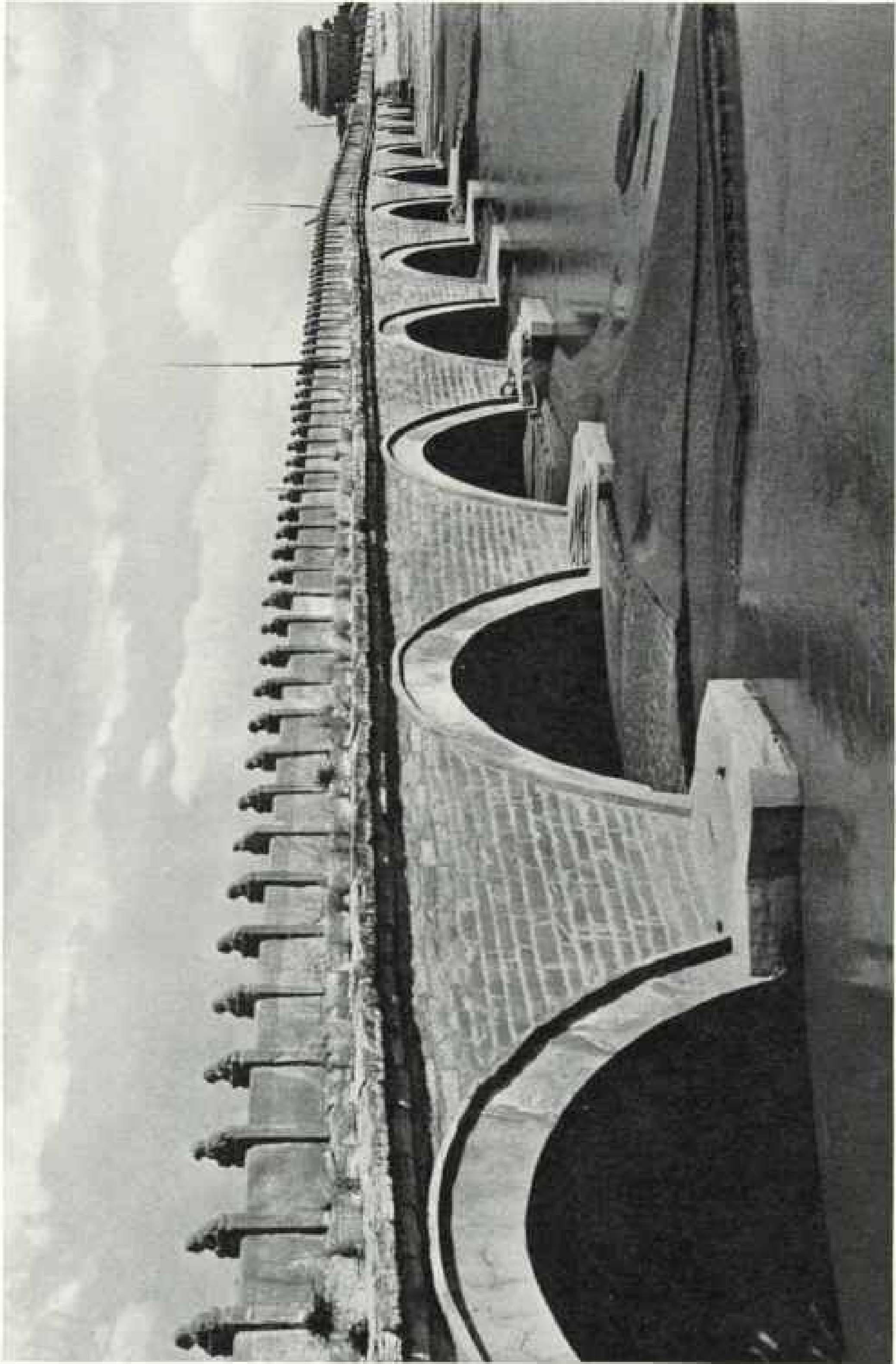
The spacious freezing beds (page 513) are covered with thin reed grass matting to protect them from sun, storms, and drying winds. A camel train plods across the river on its way to orchards in the Toli region, where it will load up with more fruit to bring to these storage grounds.



Photograph by Alfred T. Valmet

THROUGH PEIPING'S FRONT DOOR, THE CHIEN MEN, MARCHED JAPANESE TROOPS WHEN THEY TOOK OVER CHINA'S FORMER CAPITAL

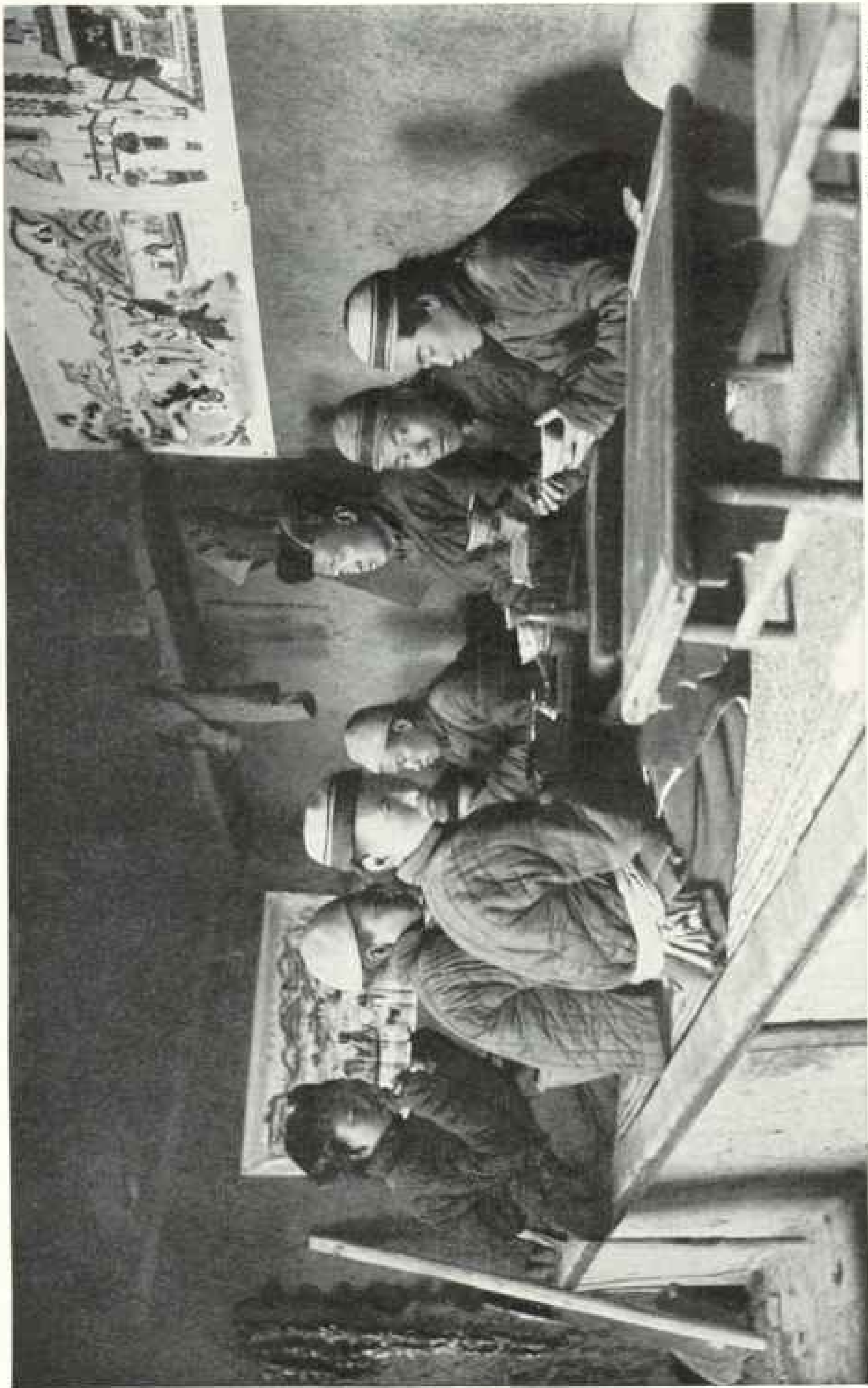
A brigade of 3,000 men, entering the city on August 8, paraded up the wide boulevard leading to the Forbidden City, with its relics of China's past glories (page 529).  
Passing under the archway are four types of transport: a cart, two rickshaws, a bicycle, and a man with two huge baskets on a yoke.



Photograph by W. Robert Moore

THE MARCO POLO BRIDGE, FOR CENTURIES A VITAL HIGHWAY LINK, WAS THE SCENE OF RECENT FIGHTING

First clashes between troops of China and Japan, early in July, took place nine miles southwest of Peiping, near this 11-arched bridge which foreigners named in honor of the Venetian adventurer. Returning to Europe after his long visit at the court of Kublai Khan, more than 600 years ago, Marco Polo described "a very fine stone bridge," which "ten mounted men can ride across . . . abreast." This structure over the silt-laden Hun Ho is guarded along its railings by a double line of stone lions, so numerous, according to tradition, that to count them drives men mad.



Photograph by A. Hegets

DINNER MAY GET COLD, BUT THE DINERS KEEP WARM BY SITTING ATOP THE FURNACE, SOON TO BE THEIR BED!

The heating plant in taverns and homes of North China is built of masonry and warmed in winter either by a fire on the inside or by a flue passing through it from the kitchen. After dinner, family and guests remove the low tables, place mats on the hard, hot surface, and "turn in" side by side, resting their heads on small, hard pillows stuffed with millet. In cold weather the whole row of sleepers is covered with a long, wadded coverlet.

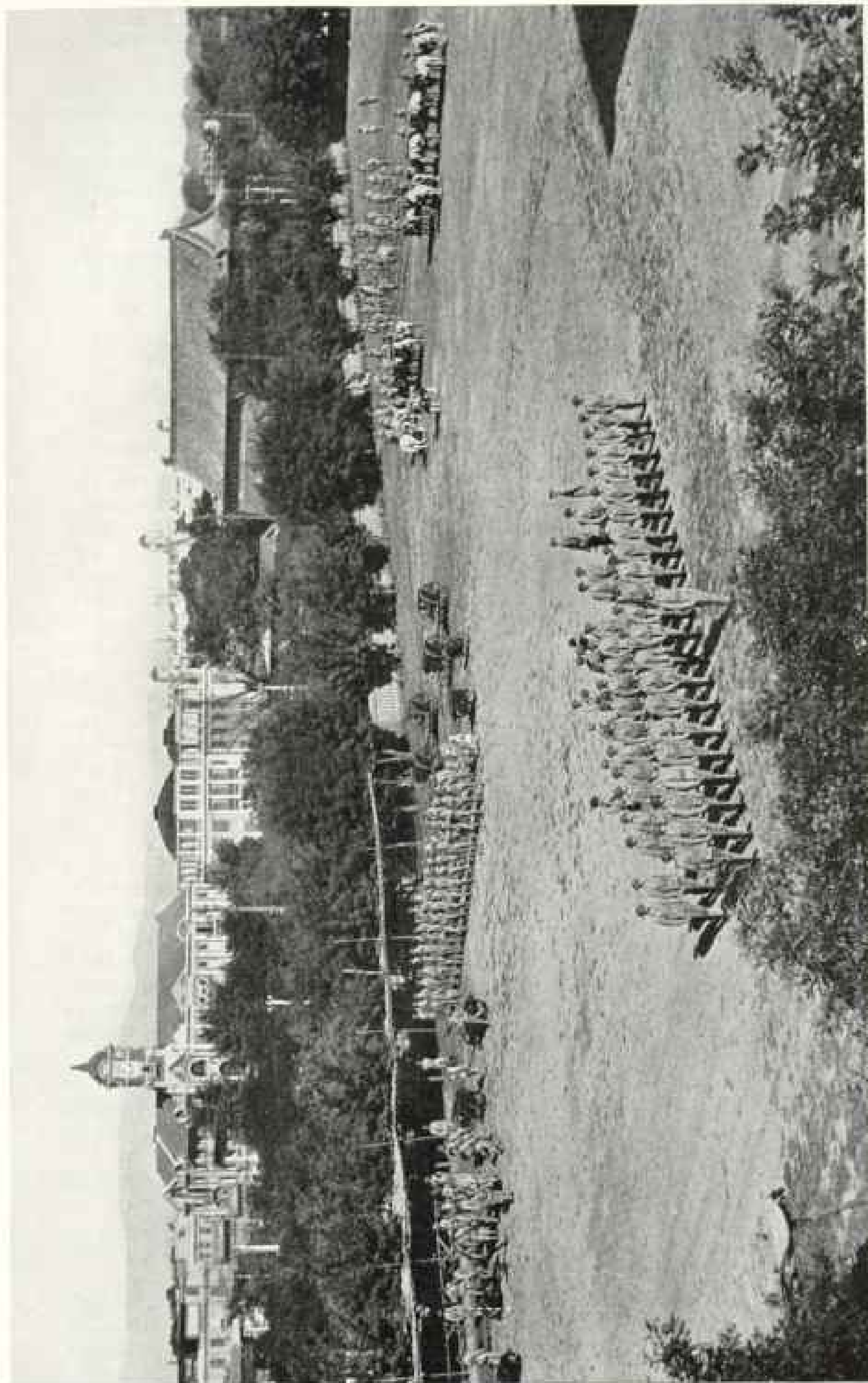




Photograph by Gilbert Grosvenor.

**"HORSE MARINES" ON MONGOLIAN PONIES PASS IN REVIEW UNDER PEIPING'S OLD TATAR CITY WALL.**

The only mounted unit in the United States Marine Corps is this special detachment of the Embassy Guard, parading here in blue dress uniforms and white caps, with red saddle cloths on their mounts. Trained and equipped like cavalry, the "soldiers of the sea on horseback" date from the days before motor transport, when their duty was to round up and protect American citizens in case of trouble. Today the Horse Marines, 36 strong, patrol the city weekly, taking a census of Americans.



Photograph by W. Robert Moore

**"TELL IT TO THE MARINES!" IS THE MOTTO OF U. S. CITIZENS IN CASE OF TROUBLE IN PEIPING**

The American Embassy Guard, numbering 514 officers and men, lines up in "tin hats" on inspection day, with the mounted unit and band (right). Since the Boxer uprising in 1900, when Chinese besieged the foreign legations, garrisons have been maintained in Peiping by the United States, Great Britain, France, Italy, and Japan. At Tientsin, some 80 miles distant, is stationed Uncle Sam's Fifteenth Infantry. Most of the foreign embassies and legations remain in Peiping, though Nanking became China's capital in 1928.



Photograph by Mrs. Branson De Cou

MOTHER SMILES UPON THE LATEST COIFFURE!

This chubby youngster has just had his head shaved in the "Hair Dressing Saloon" across the street, but the much-admired tuft remains. Chinese believe shaving produces thick black hair. Boys are so highly prized that often they have feminine names and wear earrings to make evil spirits mistake them for girls, who are not considered worth molesting!

the whitebark pine (*Pinus bungeana*), yams (*Dioscorea batatas*), a species of euonymus, a beautiful ornamental, weeping, or pendulous ginkgo, lindens, elms, maples, and wild pears came from royal tomb inclosures.

So rich were the Ming Tombs from a botanical point of view that we passed a whole week there.

All along the way into the Western Hills, dimly seen from Peiping, we passed caravans of camels, and donkeys. Caravans going to Peiping carried either coal or persimmons. Caravans coming out were laden

with Chinese cabbage or nothing at all.

At Toli we sent the carts back in accordance with our agreement with Peiping officials. Peter Liu arranged with the innkeeper for donkeys to take us next day to the persimmon orchards.

OUTDOOR COLD STORAGE FOR PERSIMMONS

Since we did not have much equipment with us, it did not take long to make up our donkey packs. About 7 o'clock next morning we started up Liuli Ho canyon and arrived at the first orchard and persimmon-storing ground in the late afternoon. The fruit, we found to our great disappointment, had been picked.

Imagine then our astonishment when, after a day's tramp, we saw stored on terraced river

banks, in orchards, and on gravelly river bottoms 10,000,000 or more large, luscious, golden persimmons!

Agricultural explorers had circulated in Peiping's hinterland before, but none, so far as we could discover, had ever given an account of this astonishing open-air cold storage (pages 513, 514).

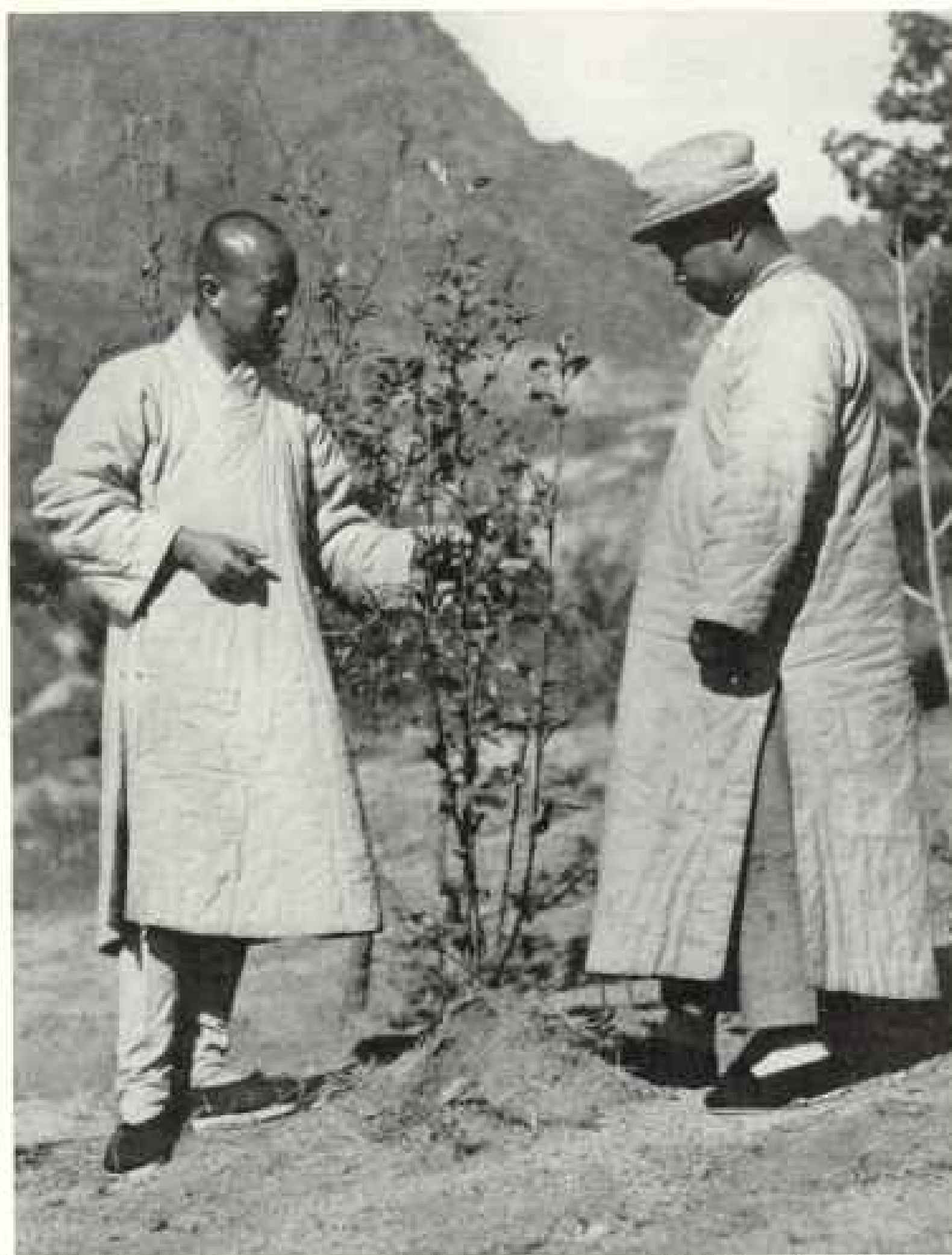
Few fruits are as adaptable for use as the grindstone persimmon. It takes its name from its peculiar flattened form and large size. Occasionally it reaches four and a half inches in diameter.

This variety is seedless and when fully ripe gleams with a rich golden color. Non-astringent, and of excellent quality, it is very popular among the Chinese, and Europeans in Peiping favor it as a breakfast fruit.

Early in October the fruit begins to ripen, and the harvest is well under way by the middle of the month. Fruit first picked goes to market as fresh fruit. Fruit not marketed at the time of harvest—by far the larger proportion of the crop—is stored in beds out in the open without protection of any kind except a covering of a single thickness of thin reed grass matting, supplemented later, after the fruit is frozen, by a small amount of dry grass, loose mountain hay, or other litter.

Few customs of Chinese life offer more humor than the practice of picking persimmons. In certain localities pickers work in pairs. One climbs into the tree branches, gripping a short pole on the end of which is fastened an iron hook. By placing the hook over the fruiting branch and giving it a quick twist, the picker can detach the persimmon.

The picker's partner below, head back, watches every movement. Imagine a Chinese, wearing two long, skirtlike coats (three if the weather happens to be chilly), grasping two short sticks which support



Photograph by James Dorsett

"THIS APPLE TREE CAME ALL THE WAY FROM AMERICA!"

Chueh Meng, priest and horticulturist at Fa Hsa Temple (page 534), shows the authors' guide, Peter Liu, one of the gifts sent him by the U. S. Department of Agriculture in acknowledgment of his kindness in allowing scions of the temple's pears, apricots, plums, and peaches to be shipped to Washington, D. C. The immigrant apple tree was doing nicely after one season's growth.

an improvised net of cloth or sacking. His task is to rush forward to catch a falling persimmon.

#### PERSIMMONS FALL LIKE POP FLIES IN A BASEBALL GAME

The picker in the tree does not always wait for his partner to get into position. The persimmon falls; the partner lunges. Sometimes he trips on the grass or his coat, and the fruit squashes on the ground. Picker and partner burst into argument.

The abuse turned loose by two Ameri-



can truck drivers over a near collision is mild debate compared to the torrent of high-pitched protest over a lost persimmon. But no matter how violent the argument, picking and catching go on without ceasing.

On a trip the following autumn to get a motion-picture record of the remarkable storage process used by the persimmon growers, we returned to the Toli region a few days early. The Chinese had built a number of storage beds, but had not picked or stored any of the fruit.

Through our interpreter we explained to the old Chinese owner of a storage yard that we were anxious to get some pictures of the persimmon storage process and that we would gladly pay him the regular price for a thousand persimmons if he would pick them and show us just how he stored them in the beds. This he gladly agreed to do.

The price of 1,000 persimmons in this instance was \$4 Mex., which the Chinese use as standard. In United States currency its equivalent was then \$2. Before our interpreter paid for the fruit, we instructed him to tell the old fellow that he could have the persimmons, for which we had no further use.

#### HUNTERS LOSE FACE BY GENEROSITY

The money changed hands, but we noticed that something was amiss. Our interpreter explained that the old man was angry because we did not take the persimmons we had purchased. He declared that they were just as good persimmons as we could find anywhere.

While Peter Liu was translating to us, the farmer paced about, a persimmon in each hand, trying to tell us in Chinese that all we had paid for were quite as excellent as the two he was showing us.

Finally our interpreter was able to explain that it was not because we thought there was anything wrong with his persimmons, but because we could not use them that we were giving them back to him.

This seemed to make the old fellow feel better, but Peter told us that we had lost face. The persimmon grower had always suspected that foreigners were crazy, he told Peter; now he knew it, because no sane man would pay for 1,000 persimmons, look at them through a little black box for a few minutes, and then go off without them!

Our lack of sanity preceded us by the "grapevine radio," for when we reached

the next village possessing a persimmon storage yard six growers greeted us, all offering to sell us 1,000 persimmons at a reduced price.

Large red persimmons now often appear in American markets, fall and winter. Both Chinese and Japanese varieties grow in California, Alabama, Florida, and Virginia, and are shipped to city shops and markets.

#### "FOREIGN DEVILS" UNDERGO INSPECTION

Every place we tramped, in the valleys and plains, we were the center of local interest. Especially is the foreigner who carries a tent and camps, as we often did, a marked man in China. His party is a one-ring free circus at every stop from dawn to the hanging out of the night lantern.

If you don't mind 10 to 40 people watching you dress, wash, scrub your teeth, comb your hair, eat breakfast, pack, unpack, and undress, you will enjoy traveling with a tent in China.

An old Chinese woman, fourscore perhaps, who hobbled down with the aid of a cane five miles from the hills to see her first "foreign devils," gave us the most thorough inspection. She was very polite about it.

She asked Liu if she might touch our skin. She patted our hair. She wanted to know why our eyes were light instead of dark. She felt the material of our coats, trousers, socks, shoes, and shoestrings.

When we shaved, she asked why we put white suds on our faces and then immediately scraped it off. She put her finger in the lather on Jim's face—and then in her mouth!

She had lived in this valley all her life, 40 miles from the old capital, but she had never been to Peiping.

No article of our equipment attracted more attention than our high leather boots.

#### "PAY 9,000 PERSIMMONS FOR A PAIR OF SHOES? CRAZY!"

When we came to a stream, Jim and I waded through. Each Chinese, of course, had to take off his shoes before wading. Didn't our shoes get wet inside, they inquired? We explained that they were waterproof. Then they wanted to know how much a pair of high shoes cost.

When we told them, they would look at each other and laugh. All the merits of the shoes they could concede, but they could not believe that anyone would be



© Harming

#### DONKEYS WITH "OUTRIGGERS" TRANSPORT MILLSTONES TO A FARMHOUSE

A man holds up one end of the axle and guides the cumbersome "sidecar" as it bumps along a dusty road. Farmers use such stones, placed one on top of the other, to grind beans and grain. Sometimes a blindfolded donkey operates the primitive mill; usually the motive power is a woman.

so foolish as to pay the value of 9,000 persimmons for one pair of shoes.

Hundred Flower Mountain (Pe Hua Shan) was not so inviting at this season as its name implies. It lay across our path up the canyon, a barrier nearly 8,000 feet high.

Leaving the village of Shibchiaying early, we began our climb. Every foot of the way became more rough and precipitous, and by 11 o'clock we were moving up by zigzag stages. It was hard on the little donkeys with their packs and hard on Peter with his 200 pounds.

On the way up we cut scions of the last walnut tree growing in the canyon, thinking that it might, because of its elevation and exposure, prove more hardy than those at home. Surely a tree braving such winds and weather must have a strong constitution.

Reaching the summit, we had lunch in the old Temple of War before starting down into the valley of Clear Water River (Chingshui Ho), which we knew would lead us back toward Peiping.

Although it was only 4:30 when we marched into Huang'an, a mountain village, I was too tired to write up our collections and notes for the day before I turned in.

Next day we passed on down the river valley, which proved to be more fruitful than the valley we left behind Hundred Flower Mountain. Numerous terraces supported by stone embankments circled the hillsides. At their bases were English walnut trees serving the double purpose of preventing erosion and providing a money crop.

Experience had taught us that surprising scenes might lie beyond any cliff shoulder in the canyon. Yet we were scarcely prepared for Tungtcheng. The trail led down the valley of a stream, clear as crystal and flowing over almost continuous beds of bright-green moss. It wound around the bases of mountains which have been denuded through the ages of all vegetation save wild jujubes and brush.

#### MAKING INCENSE BY WATER POWER

When we came upon a crude dam of cobblestones, we inferred that it diverted water for irrigation.

But as our party entered the village of Tungtcheng, we saw that the "irrigation" channel was a millrace for the only industry which we came upon in all our travels around Peiping that used the wealth of potential water power. Tungtcheng manufactures Chinese incense.

Incense is made up entirely of plant materials, the chief constituents being elm and cedar powder. Citizens of Tung-tacheng grind limbs, branches, roots, and bark of the elm and cedar between large grindstones operated by water power. The milling process resembles flour making.

Elm powder supplies the binder for incense and also gives body to it. The cedar powder spreads a pleasant fragrance through a room as the incense burns.

Special odors such as rose, cassia, sandalwood, orange, and lilac require the addition to the elm-cedar base of small amounts of *Rosa banksiae*, cassia bark, sandalwood, orange peel, or lilac.

We looked in at the building where Chinese sift cedar and elm powders to remove unground particles or foreign matter. A worker sat on a stool, his feet on a rocker, raising first one foot and then the other. A shaft transformed this patient effort to a sieve inclosed in a canvas-covered frame.

We saw them mix the elm and cedar powders dry. Adding water, they stirred the whole into a doughlike mass of the consistency of putty.

The next step requires a wooden cylinder, closed at one end save for a hole three-eighths of an inch in diameter, and a plunger to fit the cylinder. After the device has been filled with the mixture, it is operated on the principle of a grease gun or pastry tube.

The operator forces from the cylinder a continuous spaghettilike string which he coils in fantastic loops on shallow baskets.

Other men then take the baskets to inclined canvas trays on which they lay long, wet strings of incense side by side, snipping off the strings to desired lengths with their thumbnails.

Over a canvas tray carrying 128 strings goes a wire tray and the whole is inverted. We saw row on row of these wire trays, each with its load of incense strings, drying in the sun on the river bank.

Because we were eager to make railroad connections at Mentowkow, we pushed forward rapidly. It was nearly dark when we reached the village of Hsiawietien.

Not one of the three inns could give us accommodations. Since sleeping in a Chinese inn is no high privilege, we went on without regret to a temple on the outskirts of the little town.

A dried-up old priest met us at the stone gate to the temple inclosure. He had no

room for us, he told Peter. All guest space was occupied by a party of coolies. The wind was very cold. We urged Peter to put our case strongly. Finally the old priest gave permission for us to billet ourselves in the main temple room.

While we disturbed the gods and their drums, our cook Kao busied himself scrambling eggs and boiling coffee. Six eggs apiece was Kao's idea of scrambled eggs. Each of us took extra cups of coffee that night, for the wind whistled coldly in the ancient cedars around the court.

At dawn we left a gift with the priest and were off to Mentowkow, a railroad terminus, although it is only 20 miles from Peiping.

We distributed ourselves, our sacks and cases in an open boxcar at 1:45 o'clock. By 4 o'clock we were back in our cottage, resting from the 150-mile trip, developing our pictures, and packing the seed and plant material for shipment to Washington.

#### CHINESE DINNER—FROM NUTS TO SOUP

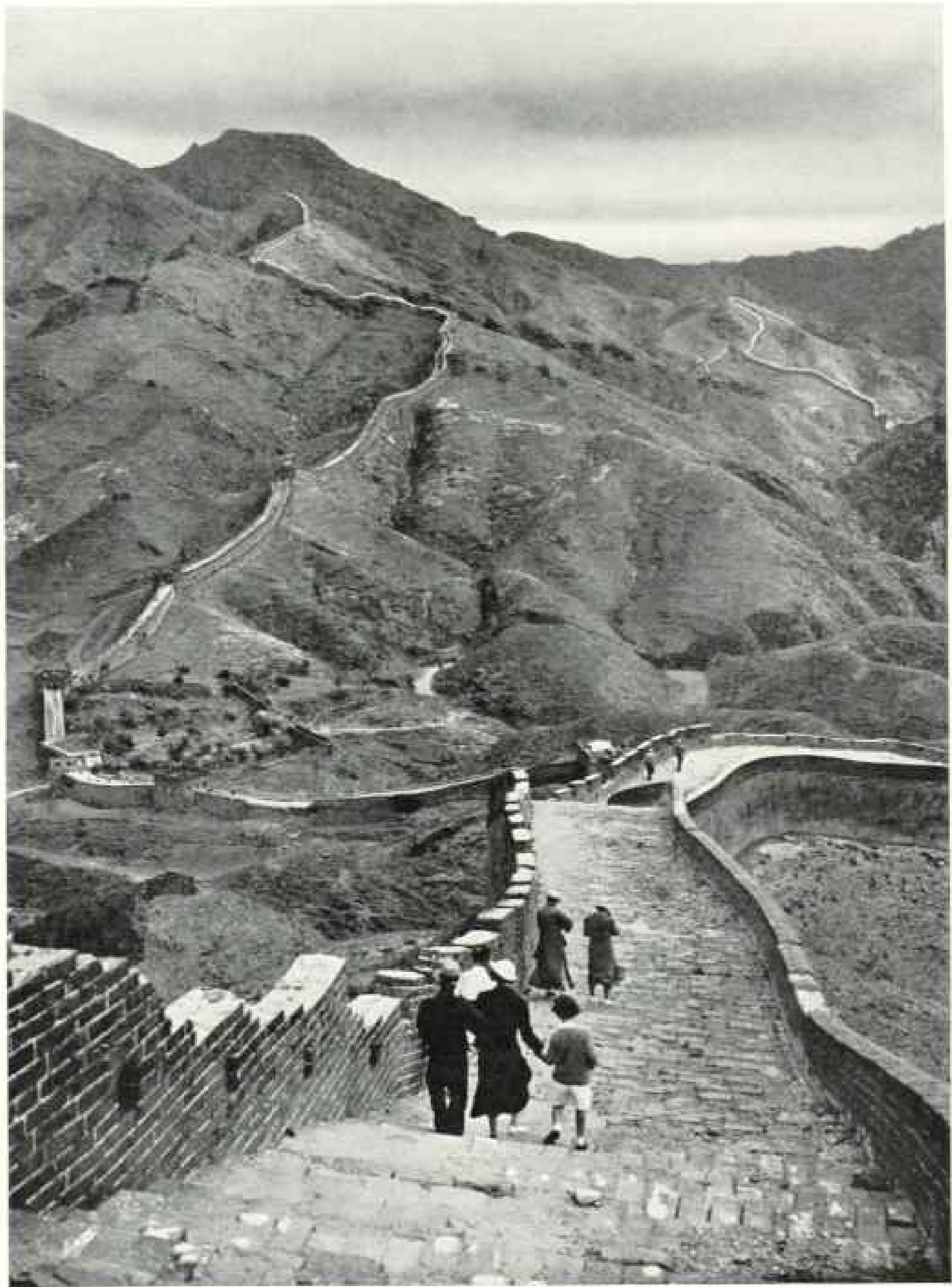
Shortly after this trip, we made up a party of seven to take dinner in a fashionable restaurant. We were eager to find out how the Chinese used some of their rarer fruits, vegetables, nuts, and watermelon, sunflower, and other seed.

A dragon screen confronted us as we entered from the street. We circled the end of the screen, passed through a moon gate (round man-high hole in a wall) and were conducted to one of many private dining rooms surrounding a large open court.

Once seated on stools without backs, placed about a round-topped table, we had time to examine our chamber. The court could be viewed through a single glass pane mounted in the center of a paper-paned window. Cushioned window seats with yellow pillows and a service table completed the furnishings.

At each place were a shallow plate, a few slips of paper in the bottom of it, a small china ladle, and a pair of red-lacquered chopsticks. Following the example of Peter Liu, we carefully wiped our ladle, our chopsticks, and our plate with the pieces of paper.

Through a door came a servant with a bowl of boiling water and an armful of new towels. Dexterously he dipped the towels, wrung them out and handed to us these steaming hot napkins with which we mopped our faces and hands.

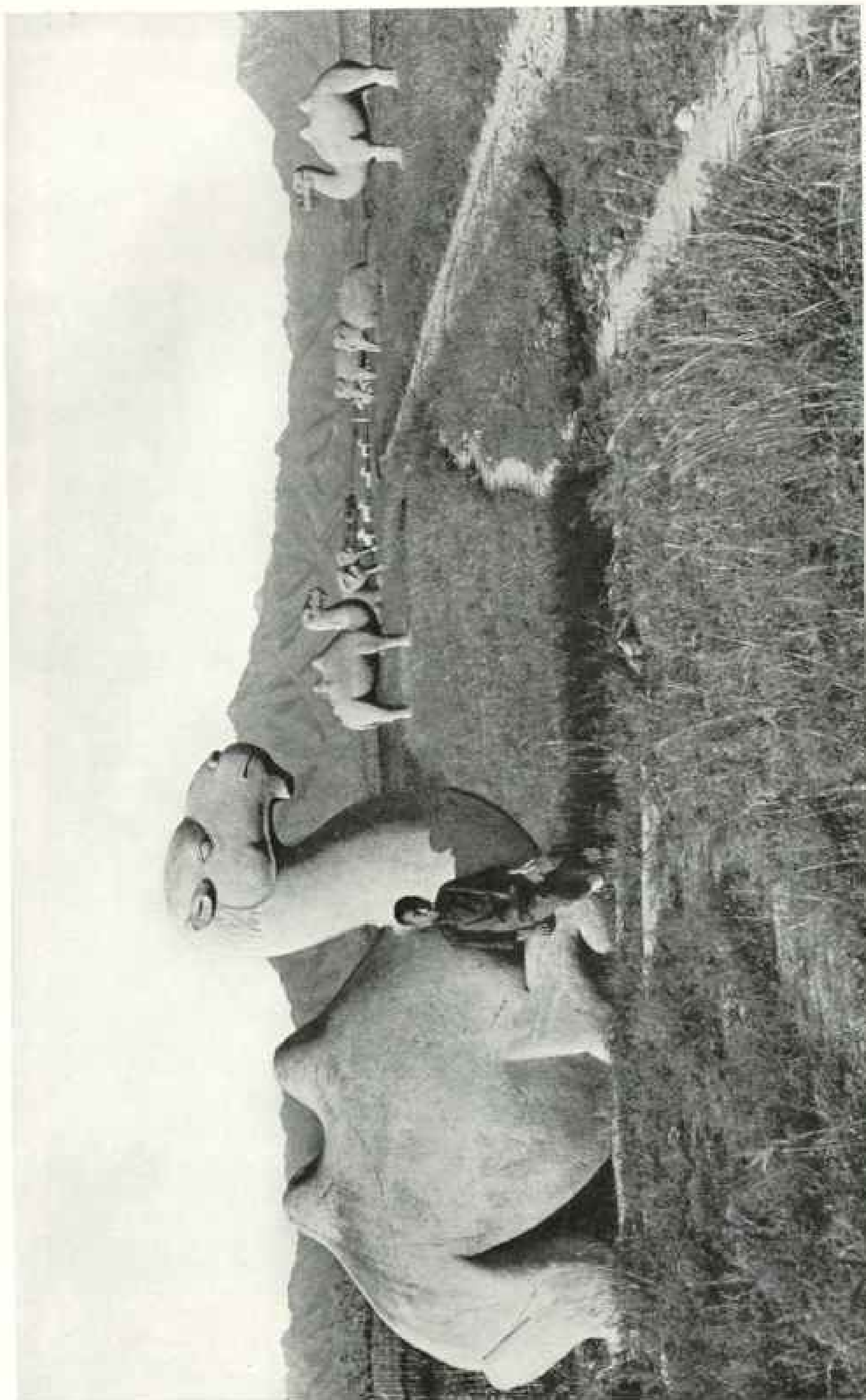


Photograph by Gilbert Grosvenor

A GLORIOUS PROMENADE, BUT INEFFECTUAL DEFENSE, IS MAN'S MIGHTIEST RAMPART

Never in its more than 20 centuries has the 2,000-mile Great Wall withstood a major invasion. Genghis Khan's hordes and other fierce tribesmen poured down from the north onto the fertile plains surrounding Peiping. Japanese troops of 1937 reversed the direction, marching with tanks, planes, and heavy artillery northward from Peiping to dislodge Chinese defenders here at strategic Nankow Pass, where the highway and railroad to Kalgan pierce the massive barrier. Visitors who set out for a stroll along the wall soon start to puff as they climb the many steps, for this engineering marvel shoots uphill and down dale without regard to the steepness of the slopes.





Photograph by W. Robert Moon

**PAIRS OF STONE ANIMALS, ALTERNATELY SITTING AND STANDING, HAVE LINED THIS "ROYAL ROAD" SINCE BEFORE AMERICA'S DISCOVERY**

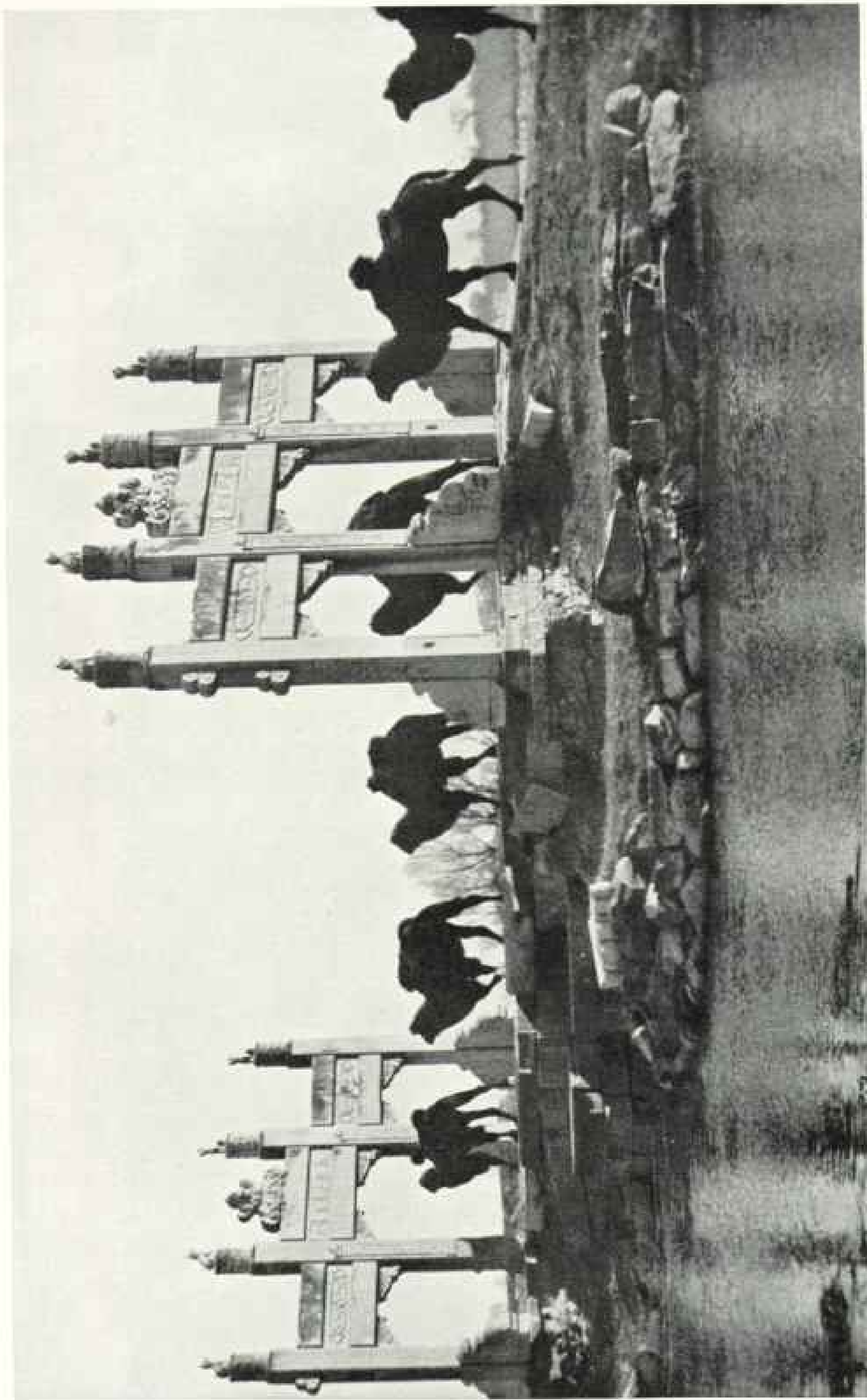
More than five centuries ago, Emperor Yung Lo built his magnificent tomb in the hills at the end of this avenue, some 26 miles north of Peiping, and twelve subsequent sovereigns of the Ming Dynasty erected their sepulchers near by. Among the stone figures along the approach are camels, elephants, lions, unicorns, and civil and military officials. Many visitors come here from Nankow on donkeys, which are so small that the riders' feet almost drag on the ground.



Photograph by James Dobson

CITY MERCHANTS BARGAIN NOISILY FOR FRUITS AND NUTS BORNE BY CAMEL TO A BIG WHOLESALE MARKET

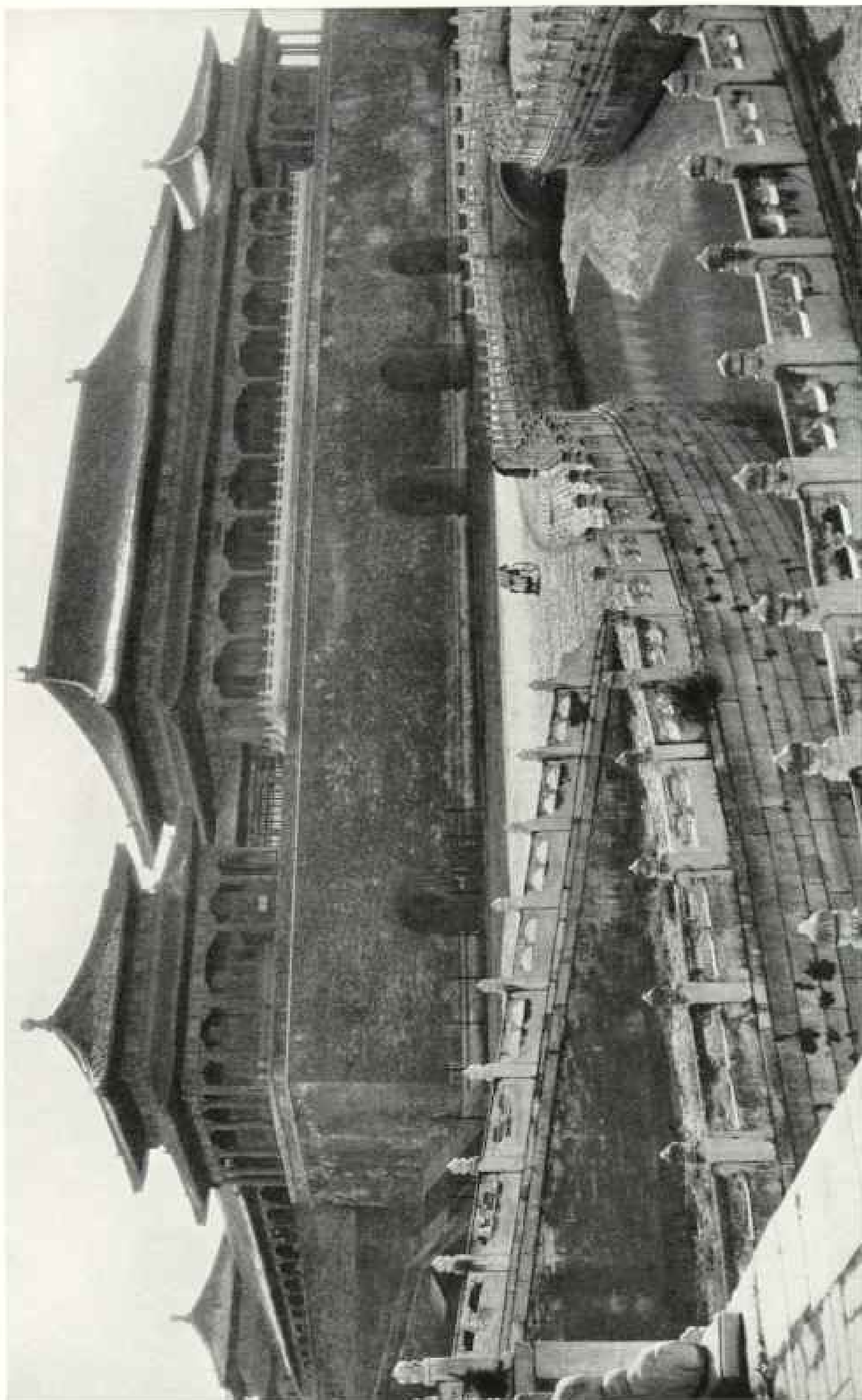
Fragrant odors of persimmons, grapes, jujubes, peaches, and other fruits, heaped up in big baskets, fill the crowded Peiping street, where local dealers are brought by ricksha men (left) to buy their day's supply of produce. Dark, shiny pears are prominently displayed (right background). Sold also are peanuts, originally imported from America, and sweet apricot kernels, which are eaten like almonds. The kneeling camel (left) seems like the stone beast on the opposite page "come to life."



© Heine van Perckhambert

A CARAVAN, NEARING PEIPING, TRAVELS A HIGHROAD WORN SMOOTH BY GENERATIONS OF CAMELS AND MEN

The ungaily, two-humped Bactrians still provide the principal transport for fuel and food to the city from near-by villages, as well as furs and other merchandise from distant Mongolia. Carved stone arches, or *pa-tou's*, familiar features of the Chinese landscape, were formerly erected by private families or by the Government in honor of chaste widows, filial sons, philanthropists, and other virtuous individuals. The man receiving the highest grade in the Imperial Examinations might be memorialized with a *pa-tou*.



Photograph by Ewing Galloway

CHINA'S DRAGON EMPEROR PASSED THROUGH THIS CEREMONIAL GATE WHEN HE LEFT HIS PALACES IN THE FORBIDDEN CITY

The Son of Heaven rode in a golden chair when he went from the imperial "city within a city" to worship at the Temple of Heaven (page 511). Since the formation of the Republic, in 1911, sight-seers enter through this Meridian Gate and cross the canalized stream into a spacious, stone-flagged courtyard.





Photograph by Serge Vargassoff

CHINESE MACHINE GUNNERS GUARD PEIPING'S WALL, WHERE MEDIEVAL  
WARRIORS KEPT LOOKOUT

Of little avail against modern artillery and aerial bombs are the massive, crenelated ramparts enclosing the Tatar or Inner City, which Japanese troops recently entered. Built about 70 years before Columbus sailed to America, the masonry fortifications extend 13 miles and are wide enough for several automobiles to drive abreast along the top.

Chinese menus are topsy-turvy from our point of view; they begin with fruit and nuts and end with soup! Our courses in the order in which they were laid before us were:

First course: *Ssu Hsien Kuo*, four plates of fruit, apples, pears, oranges, and persimmons in season; *Ssu Kau Kuo*, four plates of nuts, walnuts candied in honey, blanched almond meats, peanuts salted in the shell by being soaked in brine, and melon seed; pork; *Liang Pau Tien Hsin*, two plates of sesame seed cakes.

Second course: *Pai Mu Er*, white fungus akin to corn smut which grows in wild rice stalks (both foreigners and Chinese enjoy this odd vegetable); *Chuan Lung Hsu Tsai*, asparagus; *Kuo Ta Kuei Yu*, fried fish; *Cha Ya Kau*, fried duck livers; *Cha Hsia Nai*, shrimps; *Tsao Wei Tung Sun*, bamboo sprouts; *Fu Jung Chi Pien*, broiled chicken; *Chi Jung Yu Tu*, fish roe.

Third course: *Ching Cheng Yen Tsai*, glutinous nest of certain sea birds; *Hung Shao Yu Chih*, shark fins; *Ping Tang Lien*

*Tze*, sugar lotus seed soup; *Kao Ya Tze*, roast duck, which comes with a papery skin covering meat mostly fat. The fowl is consumed by rolling chunks of duck in Chinese pancakelike bread.

Fourth course: *Chuan Chi Pieu Huan Kuo*, chicken-cucumber soup (Chinese make wide use of cucumbers); and *Chuan Sau Hsien*, fresh vegetable soup.

In addition, there were light wine and ancient duck eggs. Chinese pack duck eggs in straw, mud, and lime for two or three years. At the end of this time both yolk and white have solidified like a hard-boiled egg. The yolk has turned to a beautiful jade green, while the white has become a translucent amber. Ancient eggs are served sliced as hors d'œuvres. They are very agreeable to many European palates and are without objectionable odor.

All the solid foods came to the table in communal bowls. The transfer of food with chopsticks from bowl to plate was always accompanied by loss in transit, so that the table at the conclusion of the meal

looked less than neat. But in China that is proper.

It is correct also to rinse one's mouth with hot water from a cup presented at the conclusion of a meal and spit on the floor. We finished off the dinner with more steaming napkins for our faces and hands.

Like American markets, those of Peiping change constantly as to the variety of vegetables and fruit offered to the public. It was a rare day, indeed, when neither Peter nor I returned without some new pear or apple or green.

#### LOTUS LEAVES USED FOR WRAPPING

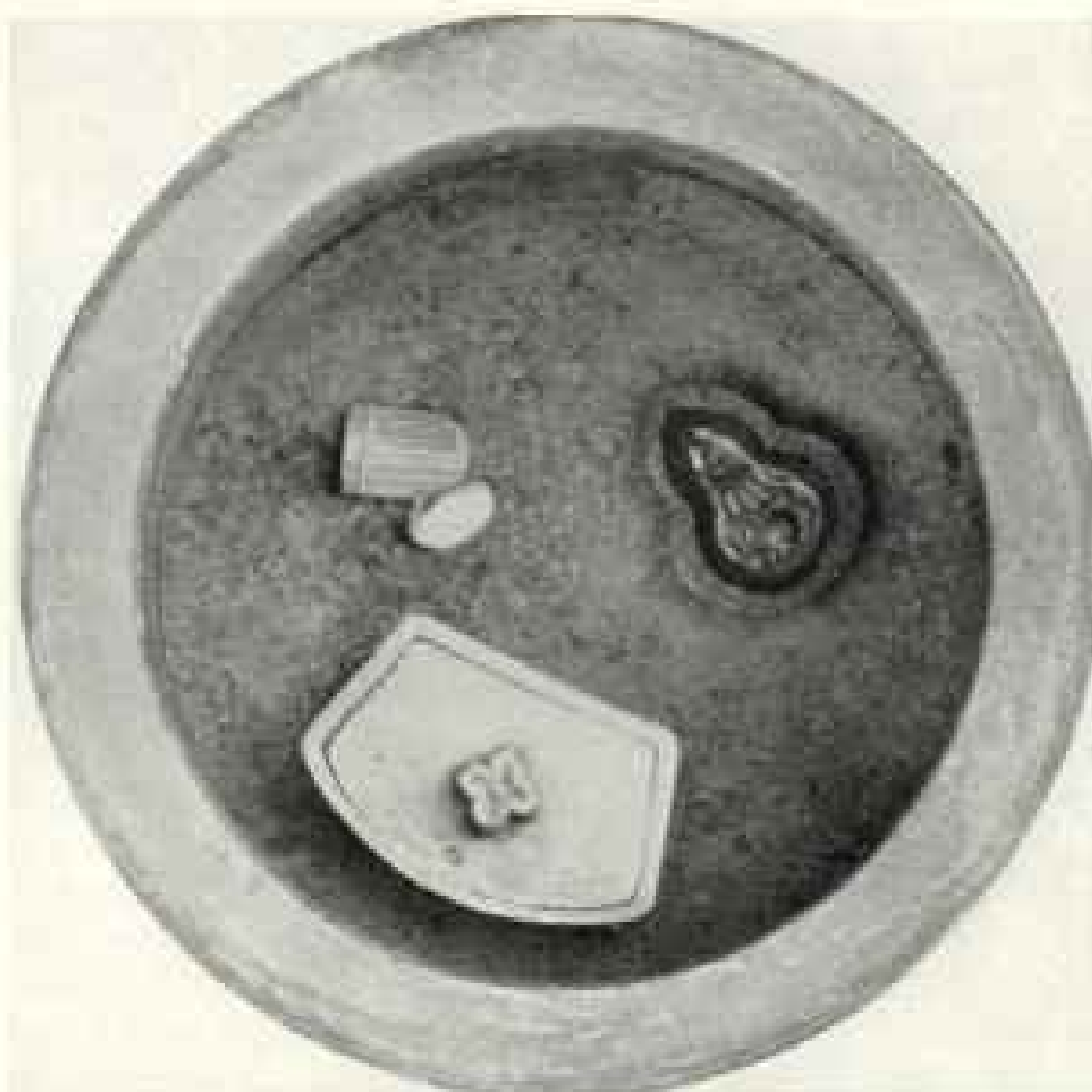
We had seen barrow loads of Egyptian lotus leaves being brought into Peiping, and one day when a merchant wrapped up a dozen peaches neatly in a lotus leaf we understood why.

In one market I saw Chinese buying short lengths of reed stalks. The vender's selection did not look appetizing. I inquired if the stalks were used as food. Yes, for food, all right, but food for pet thrushes and other birds; each stalk contained many juicy worms.

The chestnut seller on Peiping streets stands over a charcoal brazier stirring and stirring with a ladle a big bowl of heated sand. His chestnuts are in the sand and they have been roasted to perfection.

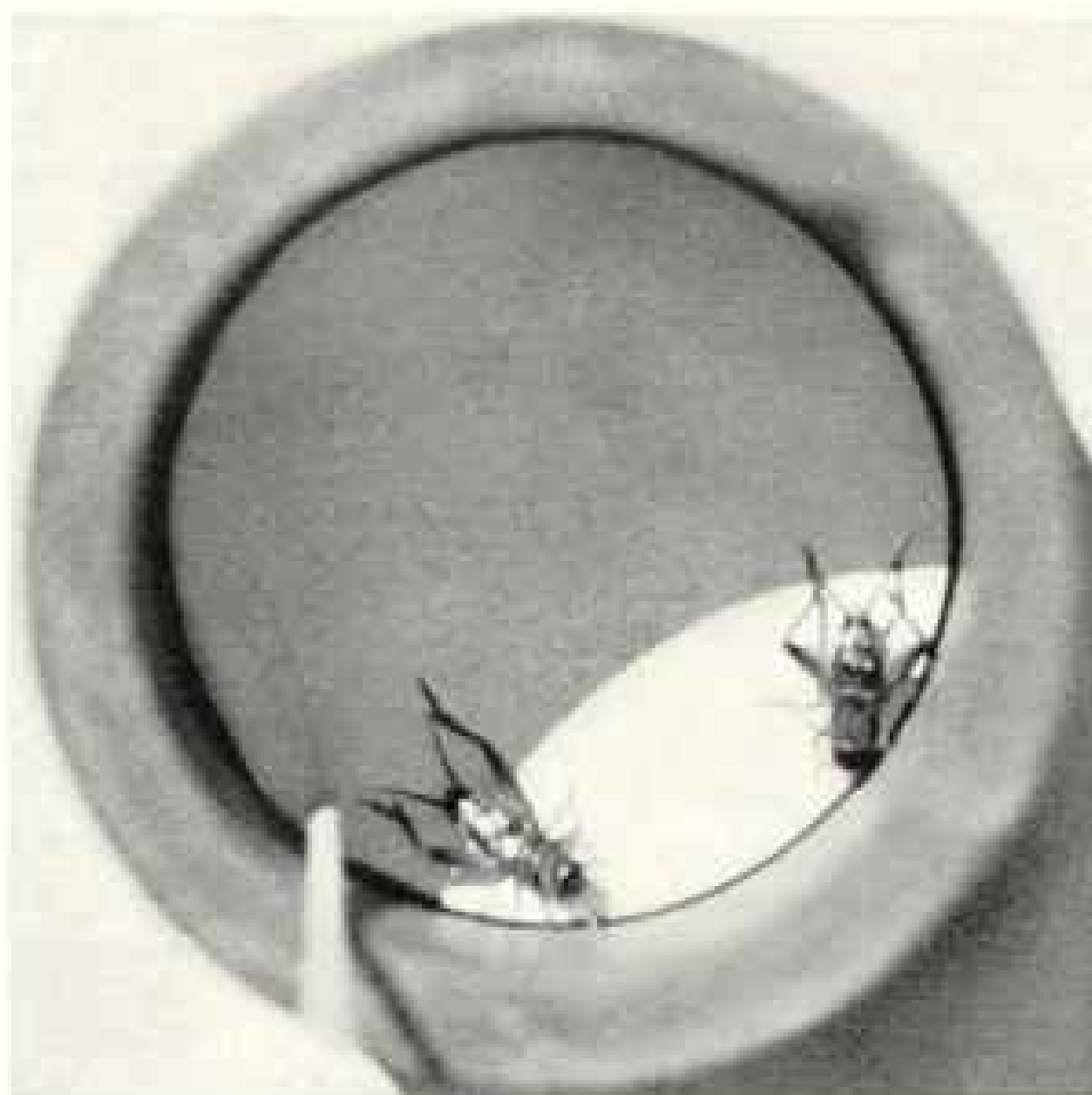
We saw bunches of table grapes the stems of which had been buried in radishes, fresh and delicious six months after harvest season. Cabbage-leaf wrappings apparently keep vegetables as crisp as an ice-box.

Ingenious Peiping florists cut away sections of Chinese lily bulbs, so commonly used in this country, to dwarf the flower stalk. They also cut a



A FIGHTING CRICKET HAS ALL THE COMFORTS OF HOME

In the bamboo bowl that serves as battle arena is the insect's house, covered with a lid. A bean lies beside the food rack across from the tiny water trough (right). Spectators bet heavily on their favorite crickets (page 532).



Photographs by James Dornett

#### CRICKET GLADIATORS ENTER THE RING

The keeper rouses their fighting spirit by tickling them with antennalike hairs on a stick. Once in contact with each other, they scrap like bulldogs until one "throws in the towel." Then the victor chirrups a "Ye-e-e-e-e" of triumph.

thin shaving from one edge of the young leaves so that the leaves, instead of growing straight up, curl gracefully over the bulbs and the top of the bowl while the flower stalks shoot up in lonely beauty.

Jim excused himself for being taken in by a Chinese huckster's trick on the ground that he studied mechanical engineering, not botany.

Going through the Peiping Bazaar on Morrison Street one morning, he saw Chinese buying some very attractive little gourds, the smallest he had seen. He grasped at the opportunity of making a plant find. The gourds had a fine, shiny yellow skin, and at one end a stalk still held a green leaf or two.

Shaking the gourd, the merchant proved to his prospective patrons that the gourd had seeds within.

Jim proudly presented the find upon his return. My suspicions were immediately aroused by a gourd that grew a morning-glory leaf! We split the "gourd" open and found the shell to be composed of ground wax and paper and the "seeds" to be small iron pellets.

The merchant, let it be said in justice to him, was selling his gourds as children's toys.

It was in the same bazaar that we first watched cricket fighting. The bazaar occupies a whole block.

Take a section of the orderly Legation market; add a section out of the wholesale fruit market; include some Hata Men Street stores, open-air restaurants, barbers, shoe menders, a liberal assortment of street vendors, magicians, florists, and musicians; put them all under one roof, and you have the Peiping Bazaar.

#### AN EXCITING CRICKET FIGHT

Here one day we saw an intent crowd. We asked why and learned that a cricket fight was in progress. I had heard of dog fights, bullfights, Siamese fish fights, cock-fights, but never of cricket fights. We wedged our way near enough to view the scene of battle (page 531).

A keeper put two fighting crickets in a clay jar six inches in diameter and four inches high. At first nothing happened. The fighters appeared not to see each other. Crickets have very poor eyesight.

The keeper took a small pencil in which were mounted two antennalike hairs. With these he taunted one cricket toward the

other until their antennae crossed. Then the fight was on!

They jumped at each other like bulldogs.

They clamped jaws. They circled. They hopped. They feinted.

For two minutes the cricket battle raged. Considerable money had been bet on the insects by jabbering Chinese around us.

At last one cricket ducked to the side of the jar. He lowered his antennae over his ears, so to speak. He was the picture of utter defeat. The victor proudly hopped to the middle of the arena, struck an attitude, and chirruped "Yeeeeeeeeee-eeeeeee," the most triumphant paean I have ever heard. Not a peep from the loser.

The keeper then put each cricket in its private compartment and brought on two more miniature gladiators. Even before they reached the fighting jar, they chirruped lustily at each other like barking dogs.

Crickets are never required to fight more than once in two days. A strong fighter with a reputation, we learned, would sell for \$50 Mex.

#### ONE GETS CLOSE TO PEOPLE IN THIRD CLASS

Nine rickshas transported us and 17 pieces of baggage early in February to the Water Gate station in Peiping, where we bought tickets for Fengtai Junction and piled into a third-class coach. We were embarked on another short plant-hunting expedition.

There is no limit apparently to the amount of baggage an individual can carry traveling third class. Four of us with all our gear did not prevent 60 or more Chinese and their baggage from wedging themselves into the coach.

Chinese coaches are much shorter than American coaches. Bench seats parallel the car walls, and a double bench occupies the space usually allotted to the aisle.

We were pawed over. We were poked in the ribs with bamboo poles. Bundles fell from the luggage racks and mashed our hats. Sleepy Chinese slumped against neighbors, smoke clouded the unventilated car. But the common man takes inconvenience with good humor in China. If he jostles you, he will make it right according to his own standards.

A burly farmer spat accidentally on Jim's boot. He was most ashamed and apologetic. He looked about for something



© Herbert C. and J. Henry White

"SOUP'S ON!" AT A CORNER CAFETERIA IN PEIPING

Thin gruel, piping hot, is "inhaled" without spoons; steamed corn cakes are eaten with the fingers; noodles are managed with chopsticks, aided by powerful suction. Ricksha men and other workers, with whom time and money are at a premium, patronize the outdoor cafes that are found all over the city. An elaborate Chinese dinner at a fashionable restaurant is described on page 574.

with which to wipe the shoe. His own coat was too short. He seized the corner of Jim's slicker and wiped off the shoe!

As the engine slowed down for Fengtai, we crawled over any number of Chinese and finally climbed out a window. Some kind-hearted Chinese threw off the last baggage bundle as the train started up again.

On this trip we came on many hedge-rows of willows, but paid little attention to them, thinking that they were grown for fuel. Not until we entered Wangmeng did we discover that this village and its neighbor, Luichatze, are devoted to the manufacture of Chinese pitch-forks from "the harvest fork willow."

That is the Chinese name for the willow because it has a tendency to branch, at four to seven feet above the ground, into three branches usually close together.

Cutters watch the trees closely, and when one of the three major branches grows large enough they cut it back and trim all other branches except the two opposite major branches. The latter are permitted to grow until all three branches of the fork become approximately the same size. Then the laborers cut the trunk which serves as a handle supporting the three tines.

After the bark has been skinned off, a number of forks are heated in a kiln. Kiln steaming permits the branches to be



beni to the proper angle in a frame without danger of breaking. In six weeks they dry.

Early in the fall of our first year in China we took a train north to Nankow, debarked, and started for the Ming Tombs.

For two days we explored agriculturally and botanically these ancient grounds and slopes under which the famous Emperor Yung Lo, who made Peking a capital worthy of his greatness, lies sealed in a granite mountain (page 526).

Two days later we came upon the temple of Fa Hua on Silver Mountain (Yin Shan) where we were cordially welcomed by the Reverend Chueh Meng. He was a priest then only 29 years old, we learned, sent up there from Shantung.

#### AMERICAN APPLES GROW IN CHINA

Before leaving Harbin, homeward bound, I received a letter from him, from the peaceful seclusion of Fa Hua Temple, thanking me for cuttings from some of our best American apple trees.

A skillful horticulturist, as well as a priest, he successfully grafted American apple scions on Chinese root stock (page 521). He should be picking Missouri pippins, Delicious, Grimes Golden, Stayman Winesaps, and others on the temple acres by this time.

Late in November of that year we revisited Fa Hua Temple and procured scions of about 100 different kinds of fruits and nuts, a duplicate of our collection made on the initial trip, which did not reach Washington in good condition.

At that time Chueh Meng showed us a number of the young apple trees of which he had written me. I had had them sent out by the United States Department of Agriculture. With pride and apparently

much pleasure he told us that he had about 100 healthy new plant immigrants from America growing in his temple orchard.

It is a privilege for America to contribute apple trees to Fa Hua Temple, because this venerable institution, organized about the year our Savior was born, has given to us in abundance scions of fruits and nuts for trial in the United States.

Seven pagodas and the temple buildings were last repaired 800 years ago. Nevertheless, the guest rooms which we occupied on three trips to the Ming Tombs region were among the cleanest and most comfortable habitations we occupied in China.

Fa Hua Temple depends for its support not on benefactions or on guest fees so much as on horticulture. Chueh Meng kindly showed us through his 1,000-acre orchard with the temple's heavily bearing winter pear trees, white pear, gold handle pear, cherry trees, cow pear, walnuts, and tiger paw chestnuts. Corn and beans also grow in the temple acres.

When we cut scions of a cherry tree, the priest cracked a joke about George Washington and his hatchet!

It was necessary for us to get the best budded branches from the best trees in a farmer's orchard. Yet our requests were never refused. Never were we asked to pay for the liberal cuttings that we made.

But we always tried to repay courtesy in some way. Sometimes we sent seed or scions from America, as we did to the priest at Silver Mountain. Usually Jim would make a portrait picture of the farmer and his family or his home.

We made many friends and, so far as we know, no enemies. We came away with a deep appreciation of the sterling qualities of the common man in China.

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*Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your December number, The Society should be notified of your new address not later than November first.*

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## ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded forty-nine 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 which The Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

Immediately after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting features. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

The Society cooperated with Dr. William Beebe in a deep-sea exploration of undersea life off Bermuda, during which a world record depth of 3,028 feet was attained August 15, 1934, enabling observations of hitherto unknown submarine creatures.

The Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed \$100,000 to Admiral Byrd's Antarctic Expeditions.

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.

The Society's notable expeditions to New Mexico 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 have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an ornithological survey of Venezuela.

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 an officially recognized altitude record of 71,395 feet. Capt. Albert W. Stevens and Capt. Oryll A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

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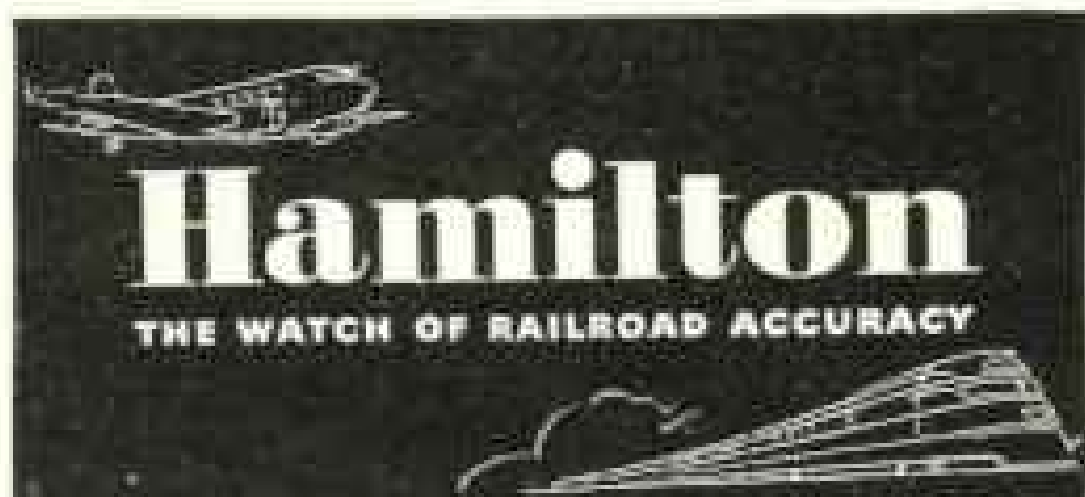
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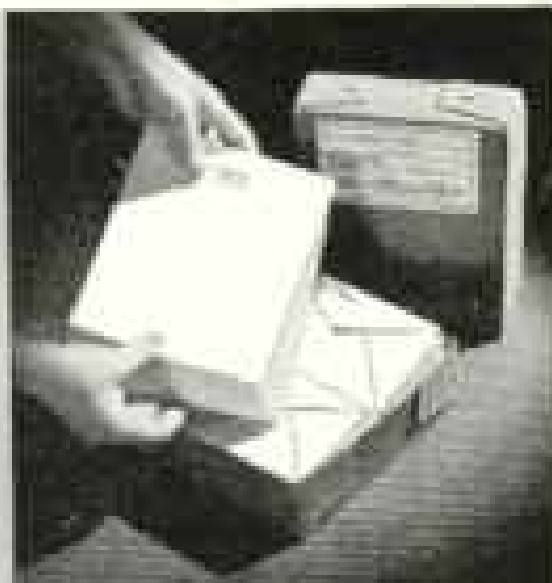
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"Without warning, my car



plunged into a snowbank and stalled. In spite of shoveling, I could not budge. Other cars came up behind me one by one and stopped, unable to get by.



Henry Frahm, Jr.

"With women and children in that party stranded on the plains in this bitter storm, the situation looked desperate. Death from exposure is a constant menace in this country; something must be done, and quickly!

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"Looking about, I realized we were near the railroad track, and remembered that a train was due to come by shortly. I grabbed the "Eveready" flashlight from the pocket of my car and pushed through the drifts and icy blast to the tracks.

"Fortunately, I hadn't long to wait. Soon the crossing whistle came down the gale. It was music no symphony can ever recapture for me. With the headlight of the great locomotive boring through the storm, I stood between the tracks and waved my flashlight back and forth.



"The locomotive and the heavy train kept coming. Could the engineer see my little light in the storm? Apparently not, I leaped from the tracks to safety in the deep snow as the engine thundered past. But as I did, I heard the wel-

come scream of air-brakes quickly act, and the train lurched to a stop.

"In a few moments our little party found warmth and shelter aboard the train. But without my flashlight, and the fresh DATED "Eveready" batteries that retained their power in spite of months of use and 20 below zero cold, hands, feet and faces would have been frozen, perhaps some lifeless bodies would have been found among those stalled cars when morning came.

(Signed) Henry Frahm, Jr.



# Goodbye Winter!

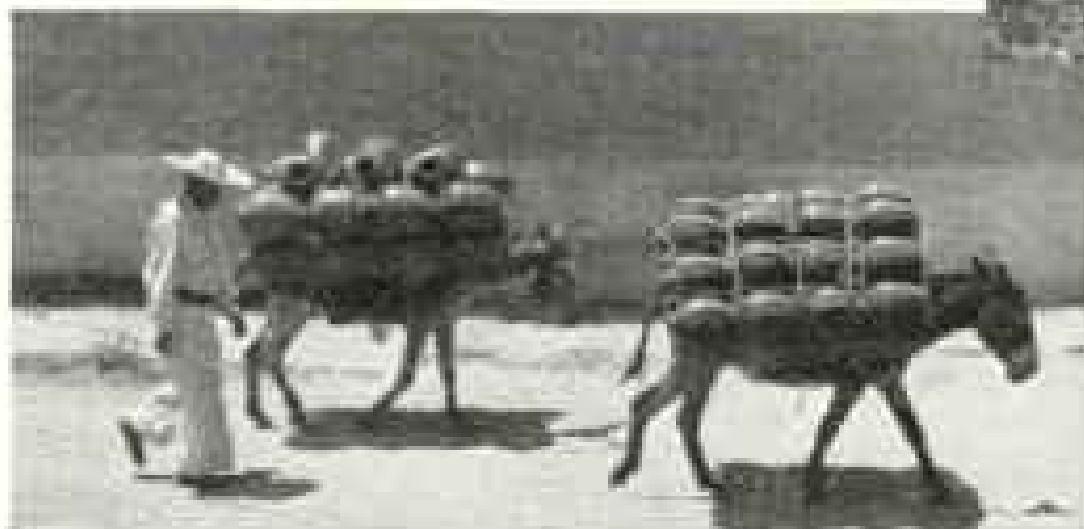


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countless lovely voices to interpret your music . . . a  
whole new world of tone colors that will banish monotony  
from your playing—will lend exquisite new richness to  
your favorite melodies.

Your Hammond dealer, the leading musical merchant  
in your city, will be delighted to have his staff organist  
give you an impromptu concert any time you drop in. Or  
write The Hammond Organ, 2959 N. Western Ave.,  
Chicago. In Canada, Northern  
Electric Co. Ltd., Montreal.



Over 1000 churches use the  
Hammond Organ . . . It is an appro-  
priate donation for your church

# THE HAMMOND ORGAN

**\$1250** and up f. o. b.  
Chicago—slightly  
higher for large installations

THE HAMMOND IS THE LARGEST SELLING ORGAN IN THE WORLD



**The Sun never sets on the World-wide empire of  
 . . . AMERICAN EXPRESS TRAVEL SERVICE**

With a chain of offices reaching from New York to Bombay, and from San Francisco to Singapore, the sun never sets on the world-wide empire of American Express Travel Service.

Wherever they go—Europe, Africa, Asia, America—American Express travelers are expected and welcomed by the world-wide organization of the American Express. Recognized for years as a great international travel and financial company, the American Express Travel Service translates its resources, experience and successful method of doing business into the most modern, de luxe service for travelers.

Whenever you are planning a trip anywhere, a visit to the American Express with an outline of where you desire to go is all that is necessary. Travel experts will

plan an itinerary *with you* point-by-point according to your specifications . . . reserve your stateroom on the ship of your choice . . . book hotel reservations and secure confirmations by cable. Your preferences in sight-seeing are followed and reservations for trains, planes or private cars made just as you desire. You leave an American Express office with your trip prepared as you wish it and you become a de luxe, freelance traveler free from care and worry. En route, American Express offices act as your headquarters for mail and cables.

Uniformed couriers meet you when your steamer or train arrives. From the time you leave until you return home, you are in the care of an American travel company with travel service offices around the world for the use of American travelers.

**AMERICAN EXPRESS** *America's Finest Travel Organization*

Offices in Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Miami, Milwaukee, Minneapolis, Montreal, Newark, New Orleans, New York, Philadelphia, Pittsburgh, Portland, St. Louis, Salt Lake City, San Francisco, Seattle, Toronto and Washington and in all principal cities throughout the world. Ask your Travel Agent for American Express Travel Service.  
**AMERICAN EXPRESS TRAVELLERS CHEQUES ALWAYS PROTECT YOUR FUNDS**



## AN INVESTMENT PLAN FOR EVERY MEMBER OF THE FAMILY

In providing funds for *Retirement*; for *College Education*; for *Travel and Recreation*, the Regular Purchase Plan of United States Savings Bonds affords a safe and convenient way to satisfy the future financial needs of every member of the family.

The head of a family may invest as much as \$7,500 or as little as \$18.75 in the purchase

of Savings Bonds each calendar year, for himself and each member of his family. Each bond, if held for ten years, increases in value 33 1/3%.

United States Savings Bonds are free from price fluctuation, grow in redemption value every year, and are tax exempt to the same extent as other Treasury bonds.

# UNITED STATES SAVINGS BONDS

DIRECT OBLIGATIONS OF THE UNITED STATES GOVERNMENT

### HOW TO SAVE SYSTEMATICALLY

To provide funds for the future, select the program best suited to your needs, then buy a bond each month.

If you invest each consecutive month any specific amount shown below

Beginning in ten years there then will be payable each month for as many consecutive months

|                           |                 |
|---------------------------|-----------------|
| <b>\$18.75</b> . . . . .  | <b>\$25.00</b>  |
| <b>\$37.50</b> . . . . .  | <b>\$50.00</b>  |
| <b>\$75.00</b> . . . . .  | <b>\$100.00</b> |
| <b>\$93.75</b> . . . . .  | <b>\$125.00</b> |
| <b>\$187.50</b> . . . . . | <b>\$250.00</b> |
| <b>\$375.00</b> . . . . . | <b>\$500.00</b> |

Savings Bonds are sold on a discount basis. They mature in 10 years from issue date for 3/4 more than their purchase price. They may be redeemed for fixed cash values by the owner at any time after sixty days from issue date.

— FOR SALE AT POST OFFICES AND DIRECT BY MAIL —

### TO ORDER BY MAIL

TREASURER OF THE UNITED STATES, N-10, Washington, D. C.

- Please send me without obligation your Regular Purchase Plan and forms for my consideration and optional use.
- Send me the following bonds for which I enclose check, draft, or money order.

|        |                                      |                          |
|--------|--------------------------------------|--------------------------|
| NUMBER |                                      |                          |
| .....  | <b>\$25</b> U. S. Savings Bonds at   | <b>\$18.75</b> \$ .....  |
| .....  | <b>\$50</b> U. S. Savings Bonds at   | <b>\$37.50</b> \$ .....  |
| .....  | <b>\$100</b> U. S. Savings Bonds at  | <b>\$75.00</b> \$ .....  |
| .....  | <b>\$500</b> U. S. Savings Bonds at  | <b>\$375.00</b> \$ ..... |
| .....  | <b>\$1000</b> U. S. Savings Bonds at | <b>\$750.00</b> \$ ..... |
|        | <b>Total</b>                         | <b>\$</b> .....          |

It is understood that not more than \$10,000 maturity value of these bonds issued during each or any calendar year (Jan. 1 to Dec. 31) may be held by any one person.

Register in } Name { { Miss \_\_\_\_\_  
{ Mrs. \_\_\_\_\_  
{ Mr. \_\_\_\_\_

the name of } Street address \_\_\_\_\_

and send to } City \_\_\_\_\_ State \_\_\_\_\_

Make all remittances payable to Treasurer of the United States

# The Inside Story



A TYPICAL PRIVATE VERANDAH SUITE

## of a Lido Crossing...

ANOTHER Italian Line advertisement without a picture of a Lido Deck! Strange? Not if you know the other side of the story—the “inside” story—of Lido Life at sea!

Night after night, an Italian liner is just as delightful as it is day after day. Lido life goes on . . . in different costumes, in different surroundings: Cocktails on a private verandah deck, perhaps. Then a sumptuous dinner . . . dancing . . . idle talk, gay chatter . . . leisured travelers amusing themselves as they

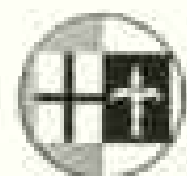
please, after a day in the open air and sunshine of the Southern Route!

Choose the great Rex, the gyro-stabilized Conte di Savoia, or the popular Roma . . . for an express crossing. Or enjoy eight or nine extra ports on the Vulcania or Saturnia, if you have time to see and do things en route!

### ANOTHER “INSIDE STORY”

Because you spend so much time on the Lido Deck, even in midwinter, you’ll find an inside room on a lower deck to be perfectly comfortable, as well as economical!

The leading TRAVEL AGENTS in your city are our representatives. Consult them freely—their services are gratis. Or apply 624 Fifth Avenue, New York City, or to our nearest office: Philadelphia, Boston, Cleveland, Chicago, San Francisco, Los Angeles, New Orleans, Montreal, Toronto.



# ITALIAN LINE



# TO THE MAN WHO PLANS ... AIR CONDITIONING HOME HEATING

*Before you decide on any Heating or Air-Conditioning Equipment Read these facts:*

REMEMBER... you have to *live* with the heating equipment you buy! It means a lot to your comfort, health and pocketbook, to make sure you get every modern heating feature!

Airtemp invites you to compare its air conditioners, its oil burners, its boilers, with any on the market.

You'll find Airtemp equipment has many exclusive, Chrysler-designed features that mean greater economy and dependability. Read the facts on this page. Mail coupon for more details. Compare... *be sure*... before you buy!

## CHRYSLER'S AIRTEMP WINTER 1 AIR CONDITIONER

COMPLETE WINTER AIR CONDITIONING AT THE COST OF HEATING ALONE!

GREATEST heating and air conditioning unit ever built for private homes... the *Airtemp Winter Air Conditioner!*

Filters, humidifies and heats the air... *at cost of heating alone!*

Four sizes. Oil and gas burning models. Coupon brings more details.

- 1 *Automatic Humidifier* adds correct amount of moisture to the air... for health and comfort!
- 2 *Overstar Filters* remove dirt, soot, pollen, from the air.
- 3 *Extra-Surface Heat Chambers* get extra heat from fuel.



8 *All Sheet Metal Surfaces "Bonderized"* by exclusive process used to prevent rusting of automobile finishes.

4 *Airtemp's "Suspended" Fire Box* permits air to flow under box as well as on sides. More direct heating surface... greater fuel economy.

5 *Airtemp's Thrifty Oil Burner*... produces most dependable kind of heat at lowest cost.

6 *Big Fan* handles large volume of air. Dynamically balanced by electric eye at factory.

7 *Heavy, One-Piece Steel Base*. Eliminates the need for a special foundation.

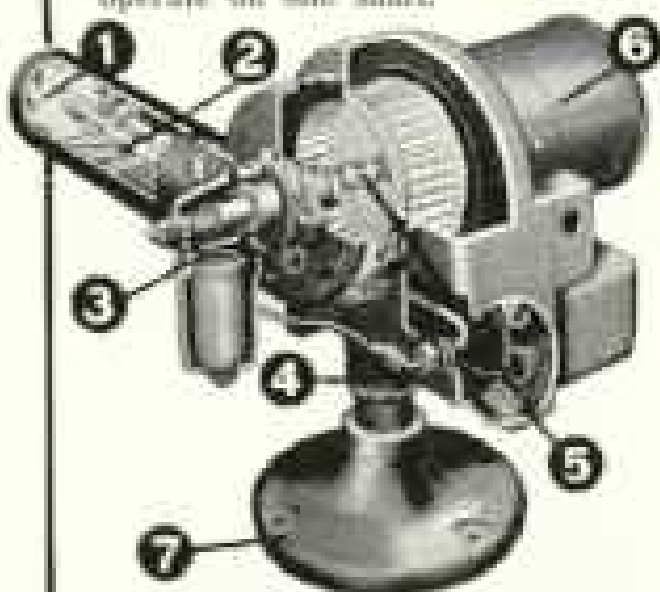
## CHRYSLER'S AIRTEMP THRIFTY 2 OIL BURNER

UP-TO-DATE HEATING PLUS BIG SAVINGS

THIS GREAT Airtemp Burner brings you modern automatic oil heat at the lowest possible cost!

It's suited for new or existing homes. Ideal for converting old-fashioned heating equipment. Coupon brings full details!

- 1 *Clean-Burning Nozzle*—Stainless steel. Wastes no oil. Will not smoke.
- 2 *Whirlwind Oil Mixer*—Mixes oil and air for best combustion.
- 3 *Automatic No-Waste Carburetor*—Prevents wasteful "after-drip" at nozzle when burner shuts off.



4 *Focused Flame*— Easily adjusted to fit various sizes and shapes of fire boxes. Heats better... saves fuel!

5 *Long-Life Duprene Coupling*—Eliminates wear on pump and motor.

6 *Overstar Motor*—Totally enclosed. Costs no more to run. Operates quietly.

7 *Balanced Base*— Heavy enough to properly balance weight above it. No top-heaviness. No vibration.

*Airtemp Power-Saver*— Current turned on only as needed.

*Dependability*—No complicated mechanism. Motor, fan and pump operate on one shaft.

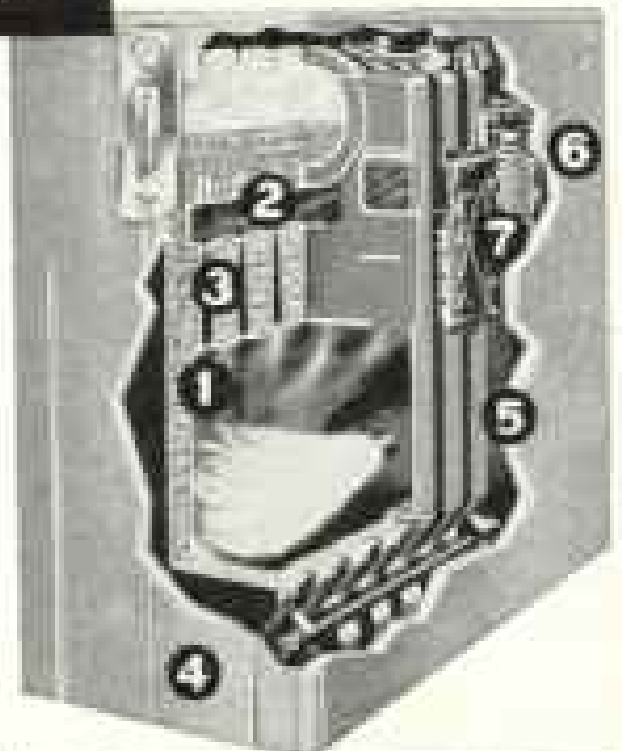
## CHRYSLER'S AIRTEMP 3 THRIFTY BOILER

ECONOMY FEATURES:

- 1 *Special "Island" Combustion Chamber*—completely surrounded by water. Saves on fuel.
- 2 *Heat Economizers*—Special flue passages get extra heat from fuel.
- 3 *Quick-Heat Water Passages* conserve fuel... heat your house in a jiffy.
- 4 *Boiler and Burner Completely Enclosed* in attractive steel cabinet.
- 5 *Special Lining* of indestructible asbestos prevents loss of valuable heat.
- 6 *Sealed doors and sections*... airtight construction... for greater economy, dependability.
- 7 *Built-in Hot Water Coil* supplies plenty of hot water... the year round.

**BUDGET PAYMENT PLAN**  
Easy terms arranged. Ask your Airtemp dealer.

THIS BOILER gives you all of the latest developments in automatic heating. Oil and gas burning models. Mail coupon for more facts.



MAIL THIS MONEY-SAVING COUPON

AIRTEMP, INC., Dayton, Ohio  
Gentlemen: Please send me the details on (check which)  
 Airtemp's Oil Burner  
 Airtemp's ( ) Oil ( ) Gas Burning Boiler  
 Airtemp's ( ) Water ( ) Summer ( ) Year-Round Air Conditioning (Dept. 11-11-10)

Name \_\_\_\_\_

Address \_\_\_\_\_

City & State \_\_\_\_\_

# CHRYSLER'S AIRTEMP

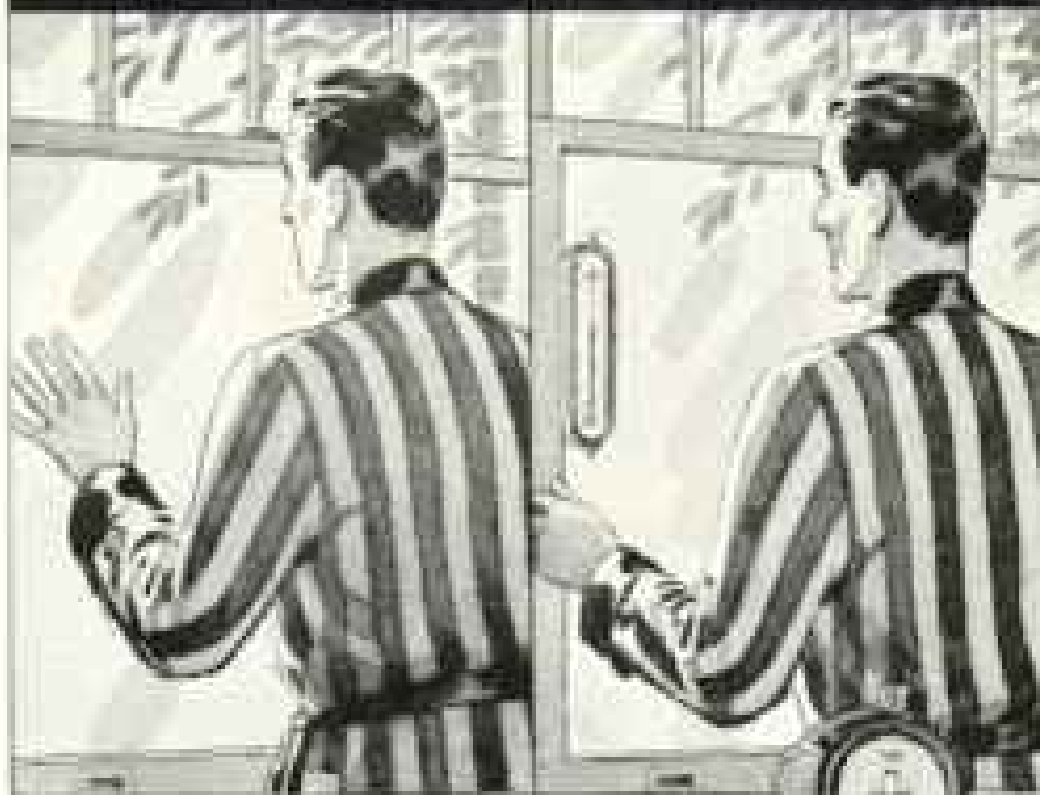
HOME HEATING AND AIR CONDITIONING

# PREPARE NOW

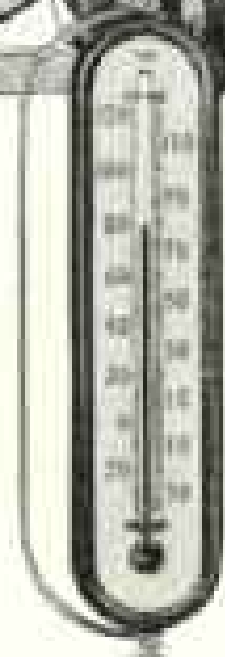
for October Chill or  
Late Summer Heat

NOT THIS WAY

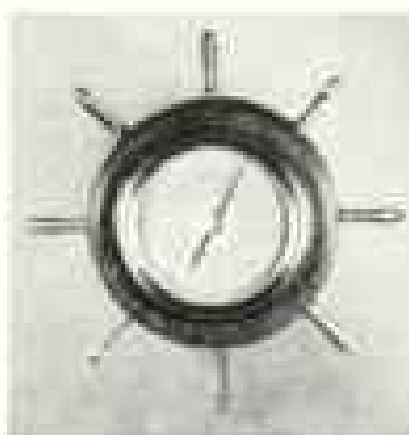
BUT THIS WAY



**RELY ON A TAYLOR WINDOW THERMOMETER** to tell you how to dress during changeable days this month. It's the sure way to help avoid colds and discomfort. The Taylor scale, easily read from inside the house, shows exactly what the temperature is outdoors. Taylor thermometers resist all kinds of weather. Their accuracy is guaranteed for five years. If your dealer can't supply you, write direct to Taylor Instrument Companies, Rochester, N. Y. Plant also in Toronto, Canada.



Taylor Window Thermometer, ivory enamel-gray border-bracket stainless steel, \$2.50\*



**PREPARE FOR WEATHER 24 HOURS AHEAD** with a Taylor Stormguide. Beautiful Yacht model shown. Walnut case...brass spokes. \$10.\* Write Taylor if your dealer can't supply it.

**PREPARE FOR WINTER**  
Nov. 6th to 13th  
**NATIONAL WEATHER WEEK**

# Taylor

## INSTRUMENTS

**IN INDUSTRY:** Other types for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.

\*Prices slightly higher west of the Rockies and in Canada. Every Taylor Instrument bears the Taylor name.

# ITALY

—From snow-tipped mountains to verdant plains where smiling azure lakes nestle—  
—From modern cities to sunny coasts . . .

**ITALY** offers variety and contrast in natural and artistic beauty.

## 100 LIRE for \$4.75

Available through  
**TOURIST CHECKS or LETTERS of CREDIT**  
on sale at all  
**BANKS and TRAVEL AGENCIES**

HOTEL and  
GASOLINE  
COUPONS

50% to 70%  
RAILROAD  
REDUCTIONS

For information apply to  
**ITALIAN TOURIST INFORMATION OFFICE**

NEW YORK: Palazzo d'Italia, 626 Fifth Avenue

CHICAGO: 333 N. Michigan Avenue

SAN FRANCISCO:  
604 Montgomery Street



"Mention the Geographic—It identifies you."

# SMARTEST • SMOOTHEST RIDE IN AMERICA!

*Little reasons why  
the Super-Coach  
is the biggest  
value in travel.*



The body lines of the Super-Coach are smooth and modern.



This entirely new type chair reclines to any of four restful positions.



*"I'LL SAY IT IS...  
and the lowest in cost!"*



Clever pull-down aluminum shades shut out bright sun.



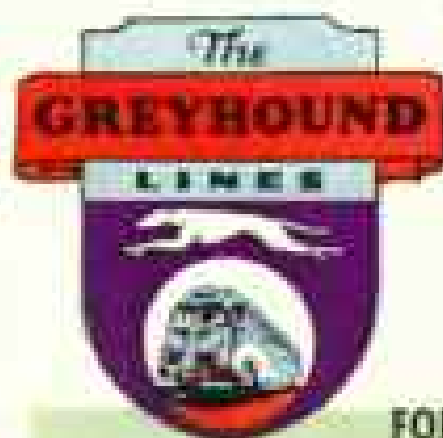
In the newest coaches, there are ice-cooled drinking fountains.



Baggage stored safely in locked compartments, underneath.

That's what they're saying . . . the millions who have traveled in Greyhound's new Super-Coaches

**Y**OU step up ten years ahead of today's conventional transportation when you step aboard a Greyhound Super-Coach. And you are pleasantly reminded of a favorite easy chair when you sink into one of the deeply upholstered seats, with its quick adjustment to four reclining positions. The little things that make for comfort and smooth travel are all present . . . pull-down sun shades, wide safety-glass windows, diffused tubular lighting, parcel rack overhead, baggage in locked compartments underneath. *Greyhound is the ONE travel system serving all America, along the finest scenic highways, at rates far lower than any other transportation.*



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|                     |                                 |                    |                                     |
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| Cleveland, Ohio     | East 9th & Superior             | Charleston, W. Va. | 112 Summers St.                     |
| Columbus, Pa.       | Broad & High Streets            | Chattanooga, Miss. | 509 Fifth Ave., N.                  |
| New York City       | 145 W. 34th St.                 | Lexington, Ky.     | 801 North Lexington                 |
| Dallas, Tex.        | 1215 & Walnut                   | Memphis, Tennessee | 327 N. Main St.                     |
| San Francisco, Cal. | Five & Battery Sts.             | New Orleans, La.   | 410 N. Rampart St.                  |
| Fort Worth, Tex.    | 826 Commerce St.                | Richmond, Va.      | 620 Walnut St.                      |
| Boston, Mass.       | 222 Boylston St.                | Richmond, Va.      | 412 East Broad St.                  |
| Washington, D.C.    | 1410 New York Ave., N.W.        | Toronto, Ont.      | 1911 Bloor Street West              |
| Detroit, Mich.      | Washington Blvd. at Grand River | London, England    | A. B. Woodhouse, of London Hall St. |
| St. Louis, Mo.      | Broadway & Delmar Blvd.         |                    |                                     |

## FOR YOU—A BRILLIANT NEW BOOKLET ABOUT THE SUPER-COACH

Do you want a brand new and attractive pictorial booklet telling all about the new Super-Coach? Just mail this coupon to the nearest Greyhound office, listed above. For fares and information on any particular trip, jot down place you wish to visit on margin below.

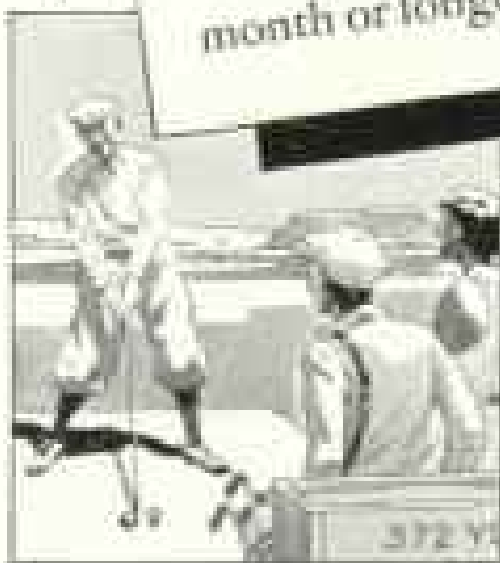
Name \_\_\_\_\_

Address \_\_\_\_\_

# Here's what you can do this winter in *Sunny* TUCSON



Picture blue skies from morn till night - constant sunshine - out-of-doors living all day - every day. That is "winter" in Tucson. Come for a week, month or longer - there's much to do.



Find new life, new energy, in this half-mile-high land of sunny days and cool nights.



Relax hour after hour under natural health-giving ultra-violet rays of the desert sun.



Play in dry air that adds zest to your game. There's sport and diversion for every mood.



See Indian rites, strange caves, cliff dwellings, vast cactus forests, romantic Old Mexico.

PLAN NOW TO COME . . . COSTS ARE MODERATE

**FIND OUT** Write or mail coupon today for complete information. This non-profit club renders you personal service without obligation.

*Sunshine Climate Club*  
1704 A RIALTO BUILDING TUCSON, ARIZONA

• Send me your illustrated booklet "NEW LIFE IN THE LAND OF SUNSHINE."

Name \_\_\_\_\_

Address \_\_\_\_\_



## "Eastward still . . . beyond Cathay"



Sail Eastward to all those lands you long to see . . . and sail by P & O — the Line whose very name has, for a full century, evoked the glamour of the world beyond Suez. It's more inexpensive than you might think. Just cross to England by Cunard White Star . . . and there embark in any liner of the P & O and British India fleets, led by the new, 22,500-ton Strathnaver, Strathaird and Strathmore. Regular service to Egypt, Sudan, the Persian Gulf, India, Japan, Australia, East and South Africa, Mauritius. *Round-the-World Tours* — P & O and associated Lines offer varied world tours, sailing eastward or westward, tickets good for two years. Itineraries as low as \$816 with Top Class in all ships, \$553 with Second and Tourist Classes. With British India steamers between Europe and the Orient — \$732 Top Class. *P & O Cruises* — Elaborate programs of cruises from England . . . to Northern Wonderlands, Atlantic Islands, Mediterranean . . . in season.

Book through your local travel agent or

**CUNARD WHITE STAR LINE**

GENERAL AGENTS:

25 Broadway and 638 Fifth Avenue, New York

**EAST OF SUEZ**

*is the realm of*

**P&O**

**PENINSULAR AND ORIENTAL  
AND BRITISH INDIA STEAM  
NAVIGATION COMPANIES**





DARRYL F. ZANUCK, Vice-President in Charge of Production, 20th Century-Fox

*Darryl F. Zanuck,*  
FAMOUS MOVIE EXECUTIVE-PRODUCER,

*Says: "Even amateurs are making wonderful color movies with this Filmo"*



Parties of 20th Century-Fox studios, where Shirley Temple's latest picture, "Wee Willie Winkie," was produced

*Filmo*

\$55

AS LITTLE AS \$11 DOWN

DARRYL ZANUCK, famous 20th Century-Fox executive-producer, makes his personal movies with a Filmo. He knows that a good camera is essential for good movies . . . that Filmos are made with the same precision as the finest Bell & Howell professional equipment.

Filmos are even easier to use than still cameras. You always see the subject clearly through the spyglass viewfinder, and *what you see, you get.*

**INEXPENSIVE:** Filmo uses the inexpensive 8 millimeter film. At still-picture cost, you get movies in exquisite color or brilliant black-and-white. Palm-sized, it carries easily in the pocket. With F 3.5 lens, good indoors as well as out, only \$55.00 at camera stores everywhere. Other 8 mm. models to \$85. 16 mm. models: \$65 to \$115.

**BELL & HOWELL COMPANY**  
Chicago • New York • Hollywood • London

*For thirty years the world's largest manufacturer of precision equipment for motion picture studios of Hollywood and the world*



**BELL & HOWELL COMPANY**



**Mail Coupon for Interesting Booklet**

How easily and economically you can have your own movies is told in "How to Make Movies." Mail the coupon.

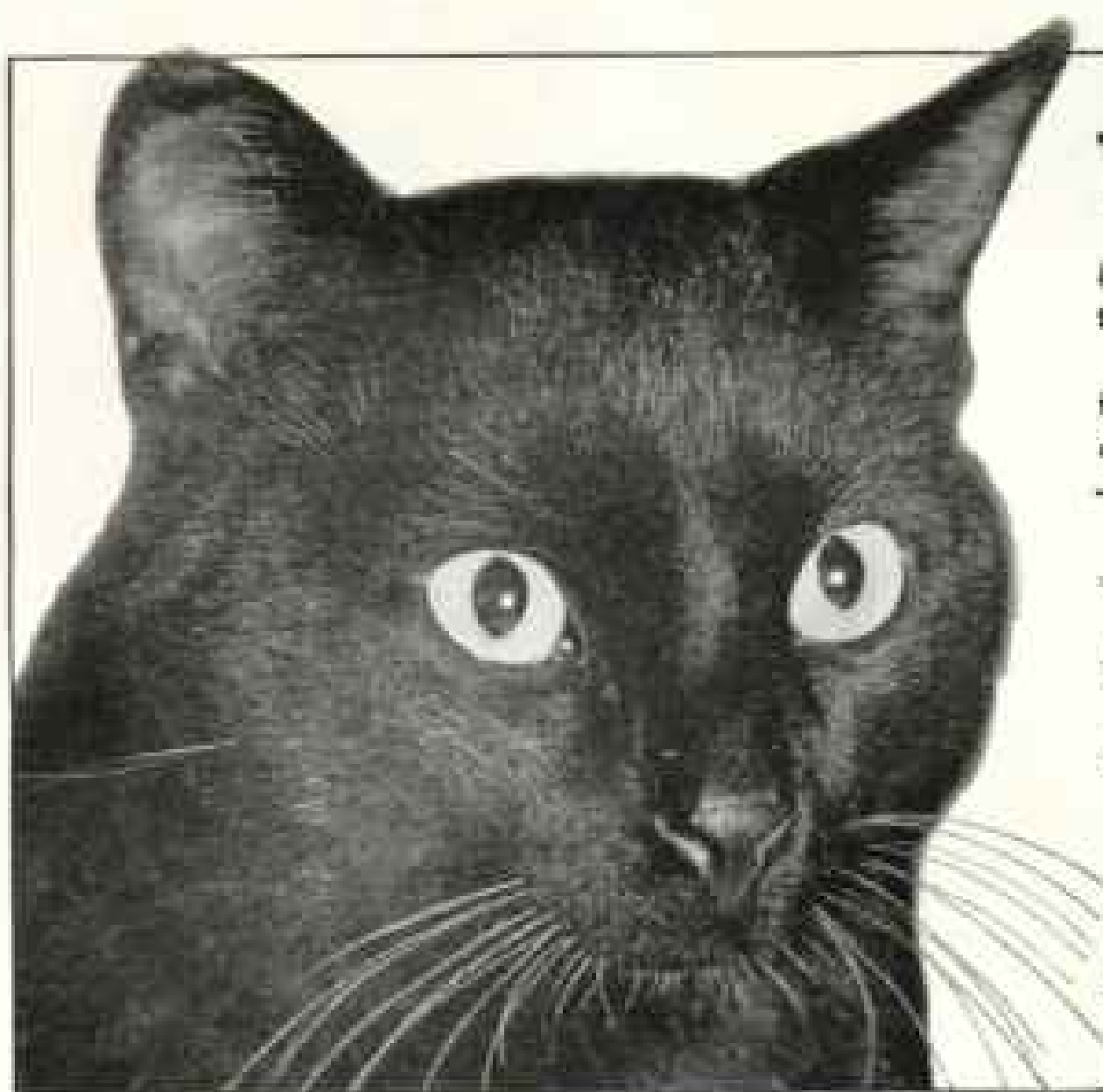
BELL & HOWELL COMPANY  
1804 Larchmont Ave. Chicago, Ill.  
Please send me the book.

Name.....

Address.....

City.....

Gate.....  
NO. 10-10



## The battery with 9 lives

Many an extra life is needed in auto batteries today.

Thank your battery for Jack Benny, a light for your Lucky, warmth for your feet—and a dozen other conveniences of modern motoring.—besides starting the car itself.

For the heavy load modern batteries must carry you need extra strength, power and life.

You get them all in Prest-O-Lite—built stronger to last longer.

Prest-O-Lite Battery Company, Inc., Indianapolis, Ind.—Oakland, Calif.—Toronto, Canada



# Presto-lite

—built to stand the strain of modern battery drain



How long would YOU have a good healthy appetite if you had to eat the same old meal month in and month out? Your dog wants variety, too. Feed him RED HEART'S 3 flavors in rotation . . . beef, fish, and cheese! RED HEART provides the *nourishment* your dog needs for robust health. Laboratory-tested and kennel-proved. No cheap fillers. Rich in vitamins and minerals . . . contains Fleischmann's irradiated yeast. Start your dog . . . or cat . . . on RED HEART . . . now! John Morrell & Co., Ottumwa, Iowa.



## RED HEART DOG FOOD

Three Flavors • Feed in Rotation

AFTER SUMMER'S  
"HAIR HAVOC"

## X·ER·VAC

### TREATMENTS

(ALTERNATE VACUUM AND PRESSURE)  
TO REVITALIZE AND RESTORE  
FALLING, LIFELESS HAIR

IN BARBER  
AND BEAUTY  
SHOPS, HAIR  
SALONS OR IN  
YOUR HOME



Licensed for use under the methods of André A. Caste, M. D., Cincinnati, Ohio, and according to U. S. Patent No. 2035126. Other U. S. Patents Pending.

Summer sun robs hair of the vitality that scientific XERVAC treatments can restore. Through alternating vacuum and pressure, the XERVAC tends to produce a normal circulation in the deep network of capillaries that nourish the hair cells, and to stimulate normal and vital hair growth. Your barber or beauty shop can supply treatments. If you wish to purchase an XERVAC for home use, see your local Crosley radio and refrigerator dealer—or write direct to

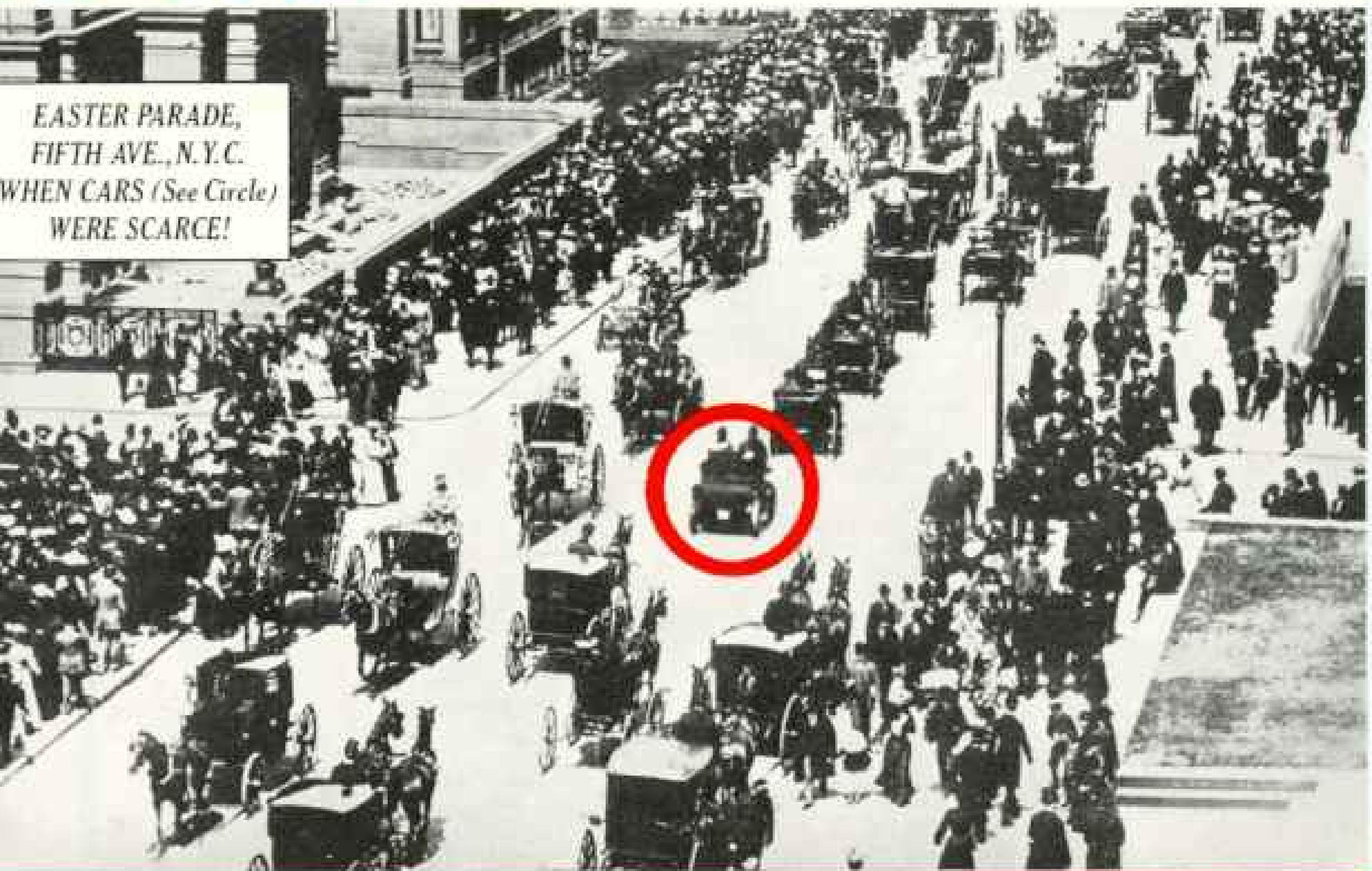
THE CROSLLEY RADIO CORPORATION, Dept. L167-G, Cincinnati, O.  
Copyright 1937, The C.R. Corp.

# WHEN N.Y. CITY HAD 19 "AUTOS"

*MOBILOIL WAS THE ONLY OIL...AND  
IT'S THE WORLD'S FAVORITE OIL TODAY!*

SEE THAT lonesome little "auto" among all those handsome cabs? In those days, New York didn't have many cars...but probably all of them used Mobiloil!

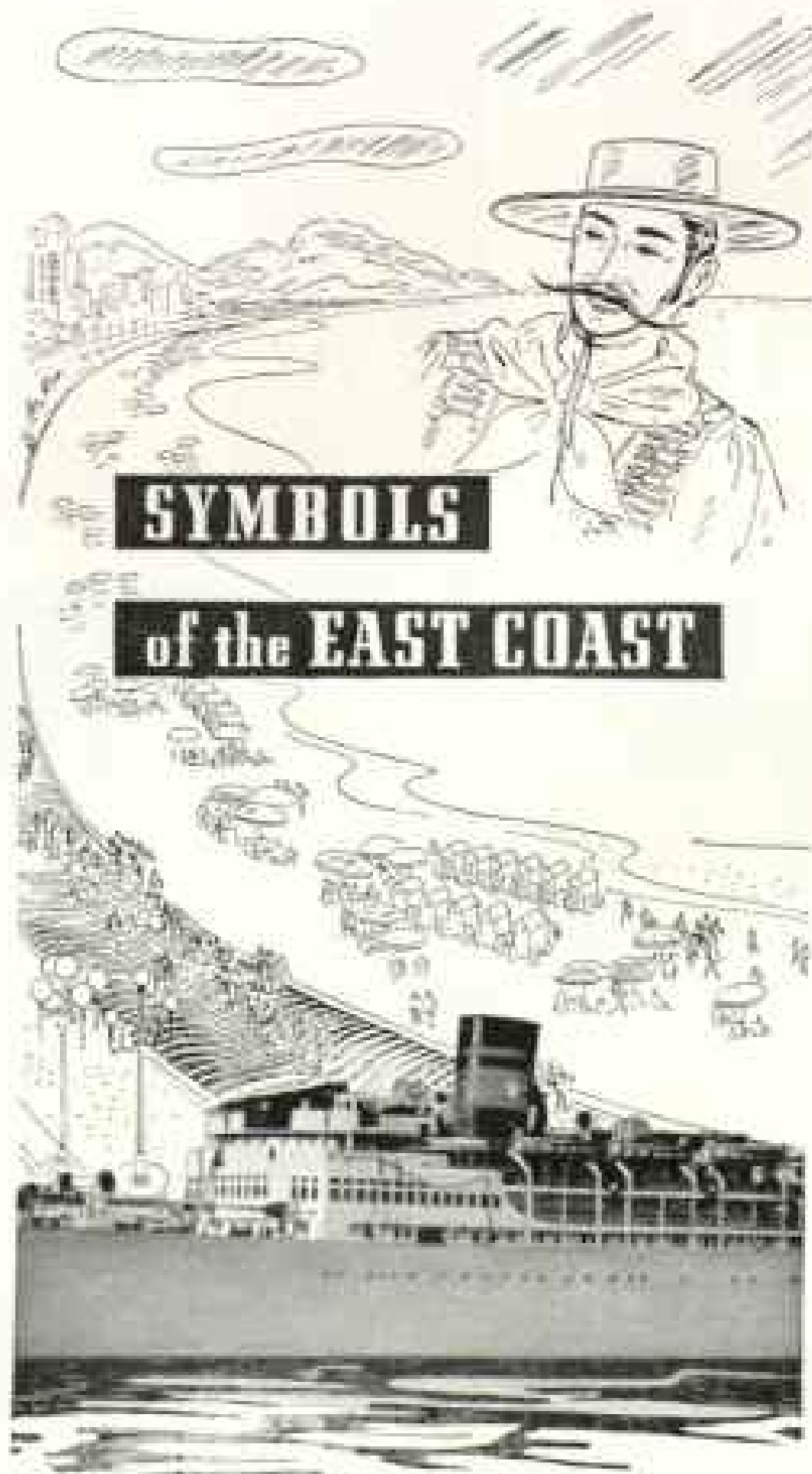
Today, backed by 71 years' experience, Mobiloil is the finest motor oil you can buy...the world's largest seller! Use it in your car and save money.



EASTER PARADE,  
FIFTH AVE., N.Y.C.  
WHEN CARS (See Circle)  
WERE SCARCE!

**MOBILOIL AND MOBILGAS**  
SOCONY-VACUUM OIL COMPANY, INC.





THE gauchito from the pampas . . . and the famous beach at Uruguay's play-city, Montevideo . . . equally are symbolic of a South American world that is both Old and New. A world that combines the sparkle of Paris with the primitive, vivid color of W. H. Hudson's own "purple land" and "green mansions". Jungle and jockey-club stand within a few hours of each other in this region of amazing contrasts!

Symbolic also is the fleur-de-lis on the Furness Prince funnel. Another cogent reason for choosing the East Coast trip when you visit South America! These brilliant, able, "well-mannered" motorships . . . Southern Prince, Northern Prince, Eastern Prince, Western Prince . . . embody the grace and courtesy, as well as the seamanship, of British marine traditions en route to Rio de Janeiro, Santos, Montevideo, and Buenos Aires.

*Sailings every fortnight from New York, with call at Trinidad on return voyage. Reservations and literature at AUTHORIZED TOURIST AGENTS or Furness Prince Line, 34 Whitehall Street, or 634 Fifth Avenue, New York City. Phone BChiling Green 9-7800.*

**FURNESS Prince LINE**

*Leads the way to*

**SOUTH AMERICA**

When Buying  
**TRAIN  
TRAVEL**  
look for this  
*"trade mark"*



*... the symbol  
of the Finest Transportation  
in the West*



Only 39½ hours between Chicago and the Pacific Coast on superb Streamliners, Five "sailings" each month, each way.

*The Streamliners*

CITY OF LOS ANGELES  
CITY OF SAN FRANCISCO  
CITY OF PORTLAND

And overnight, every night service between Chicago and Denver on the Streamliner "City of Denver."



**THE FORTY-NINER**

New air-conditioned all-Pullman steam train of streamlined design. Observation-Lounge, Bedroom car and open section cars. Beautiful Dining Car. Registered Nurse-Stewardess. Five departures each month, each way, Chicago-San Francisco.

And, in addition, these famous daily steam-powered trains between Chicago and the West Coast.

LOS ANGELES LIMITED  
SAN FRANCISCO-OVERLAND LIMITED  
THE PORTLAND ROSE  
PACIFIC LIMITED  
THE CHALLENGER

*Remember! Union Pacific serves all the West!*

W. S. BASINGER  
Passenger Traffic Manager  
Room 555, Union Pacific R. R.  
Omaha, Neb.

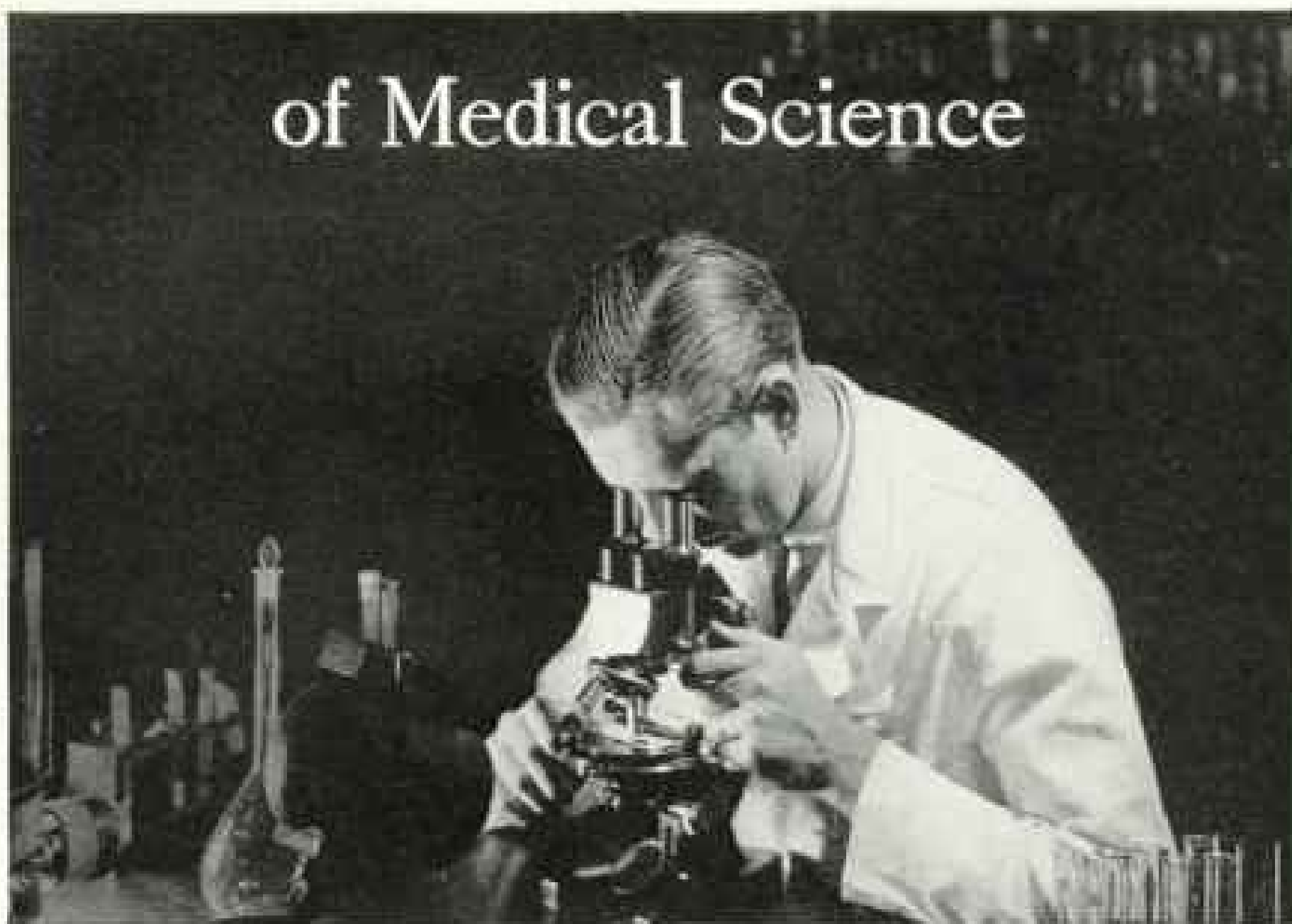


**UNION PACIFIC**



# "G-MEN"

## of Medical Science



*M*ORE lives have been saved by the "G-Men" of medical science than were destroyed by Alexander, Caesar, Napoleon, and all the other would-be world conquerors put together. Perhaps you, yourself, are alive and well because Pasteur discovered the nature of germs; Jenner, the vaccine for small-pox; Wright, the preventive for typhoid; von Behring, the means for ending diphtheria.

The determination of these heroes is proverbial. For example, Ehrlich made 605 unsuccessful experiments before he discovered "606"—now used in the treatment of early syphilis.

Many outstanding "G-Men" of medicine have received recognition for their great victories. Many more, unknown and unsung, are giving their lives to exploring, probing, unearthing the secret causes of disease. You hope, with everybody else, that they will discover how to prevent or cure cancer; how to stop the destructive waves of influenza; how to check the early onset of heart disease.

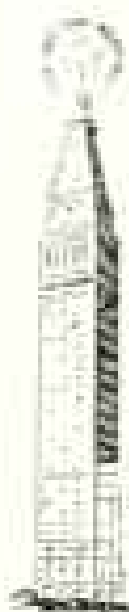
Scientists are already producing effective serums to combat several types of pneumonia. They have made great strides in the fight against tuberculosis. They now treat successfully certain types of blood infection formerly regarded as deadly.

The "G-Men" have shown us how to control

diabetes with insulin, and pernicious anemia with liver extract. Today they are perfecting methods to ward off or lessen the severity of whooping cough, scarlet fever, asthma, hay fever, and other diseases which have baffled doctors throughout the centuries.

Largely because of their work, the average length of life of children born in the United States this year is expected to be at least 61 years, although the children born in 1900 could hope for about 49 years and those born a century ago, considerably less.

Thanks to the "G-Men" of medical science, you live in an age when more has been done to protect human life from disease than ever before. You can prove your gratitude by warmly cooperating with health officials, physicians, civic organizations and hospitals that bring these great discoveries to you and your neighbors.



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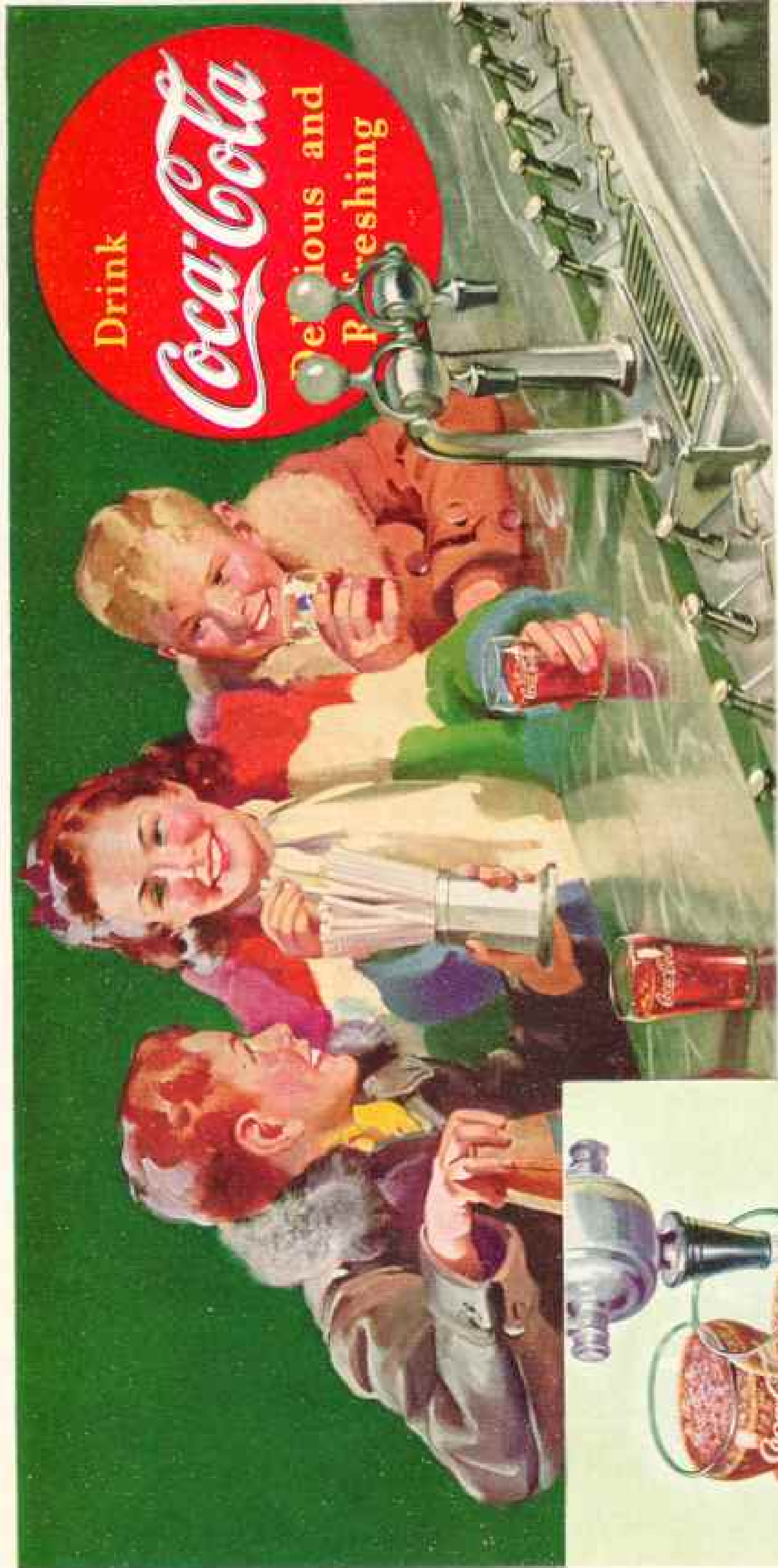
# GRACE LINE TO SOUTH AMERICA



Grace Line South American cruises visit Chile where Ivan Dmitri made this natural color photograph of a gaucho last November (springtime below the Equator as our seasons are reversed).

Modern Grace Line "Santa" ships sail to South America from New York every week—from California every other week. Cruises include 31 day trips to Lima, Peru; 38 day tours far into the Andes to Cuzco and the interior of Peru; and 38 day cruises to Valparaiso and Santiago, Chile. Stop over privileges permit visits to the lovely Chilean Lake Region and Buenos Aires. En route Panama Canal, Havana and 12 to 17 other Caribbean and South American cities, depending on cruise selected. Connections at all ports with Pan American-Grace Airways (flying time Santiago to New York three days, from other points proportionately less). For illustrated literature, itineraries, fares and all-expense cruises, consult your travel agent or Grace Line, New York, Boston, Pittsburgh, Washington, D. C., Chicago, San Francisco, Los Angeles, Seattle.





# “The All-American Pause”

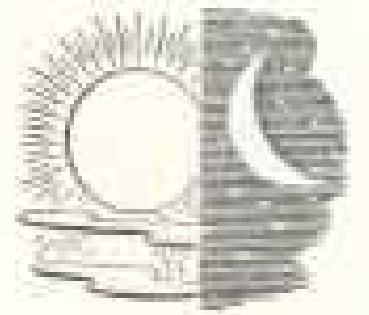
A note on the football season:

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*the pause that refreshes with Coca-Cola.*”



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*This is the Singapore Bund*

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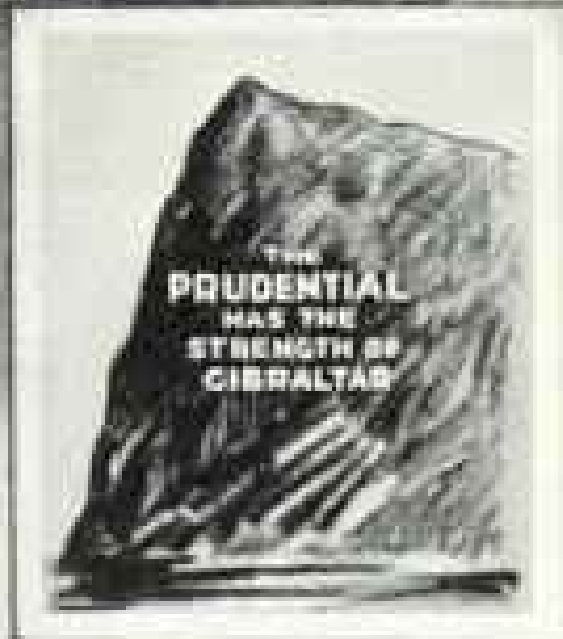
Her first thought is for her husband's safety—but if the accident proves fatal

*how will she meet the sudden expenses?*

*what will become of the children?*

*where can she look for income?*

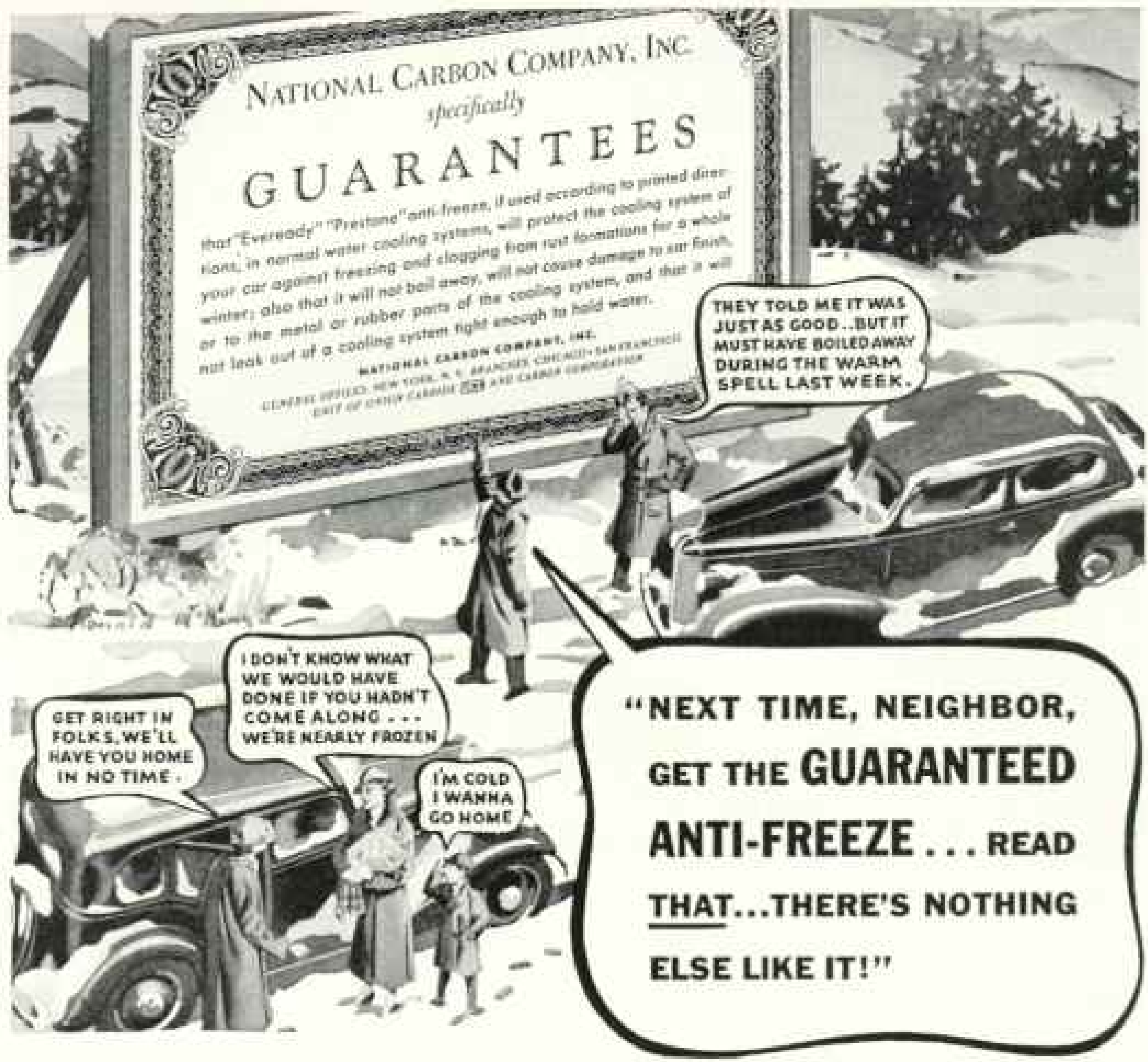
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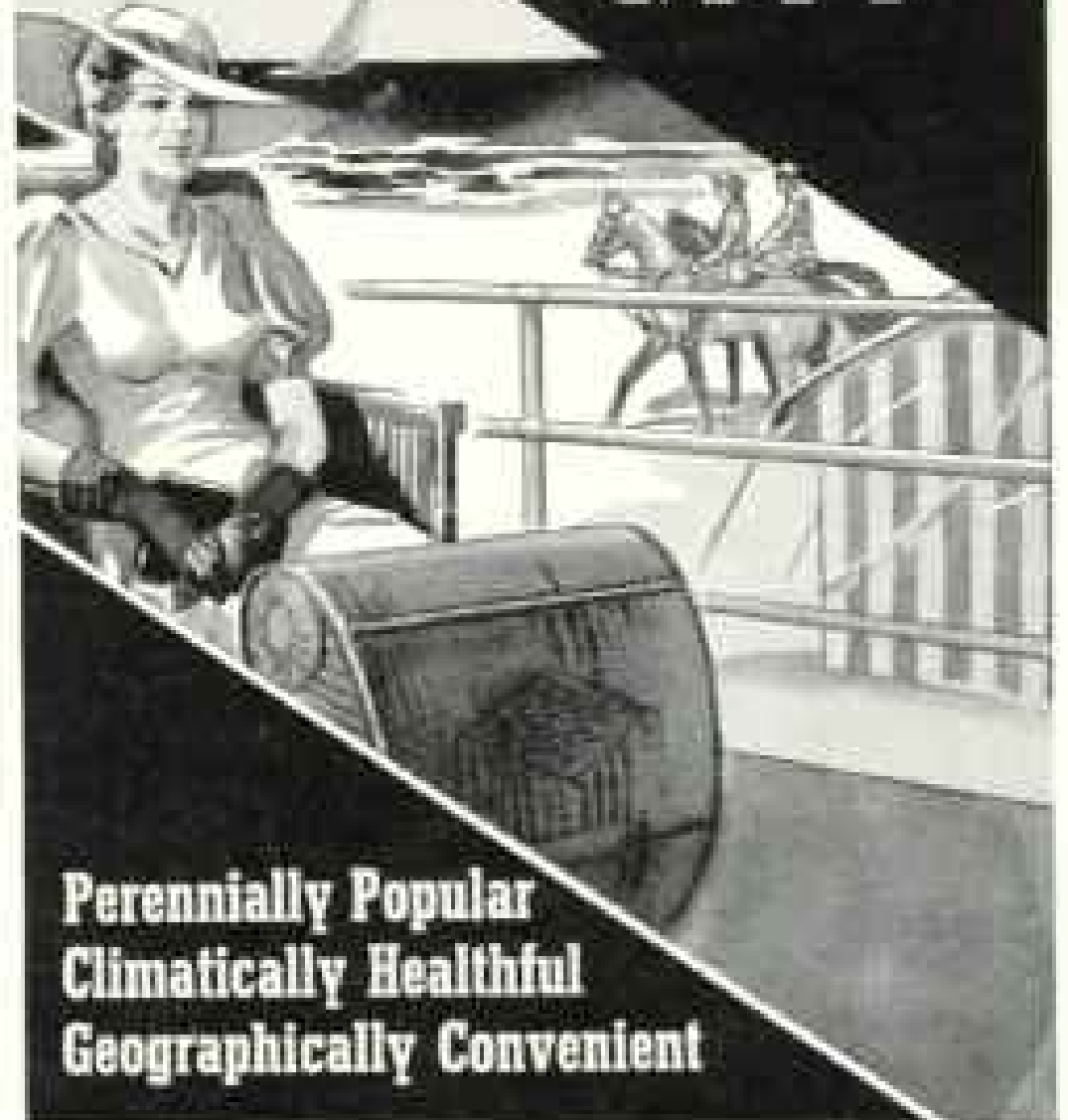
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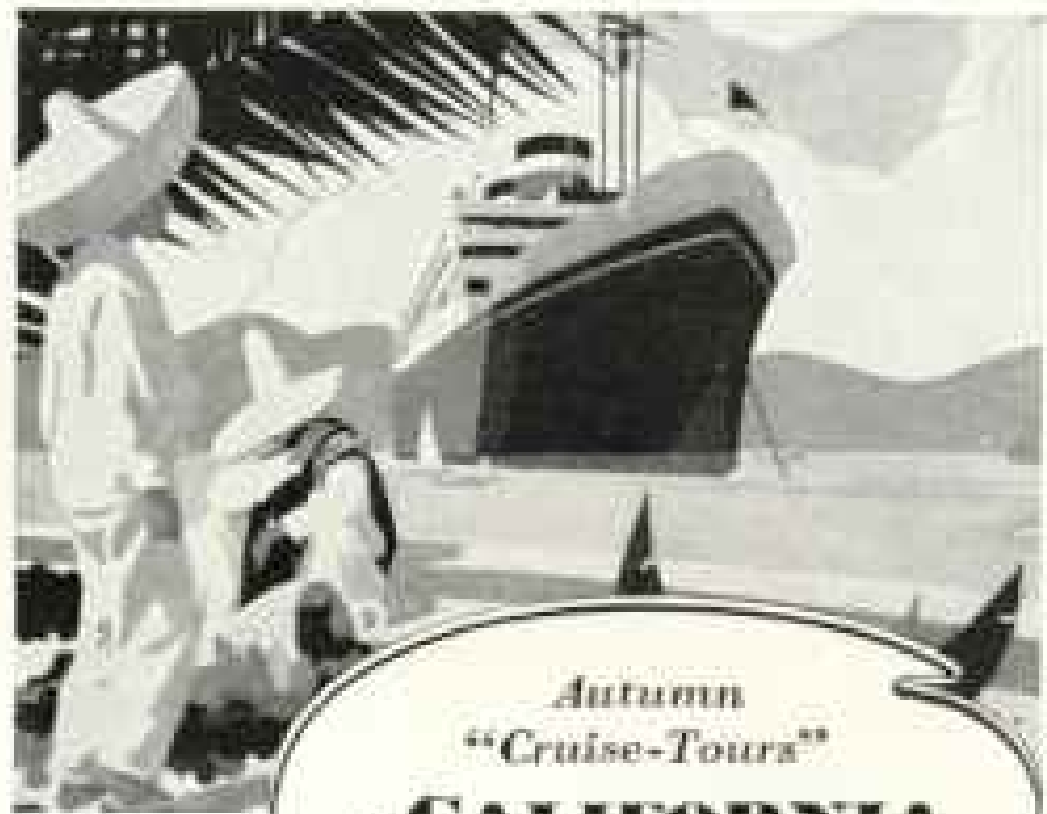
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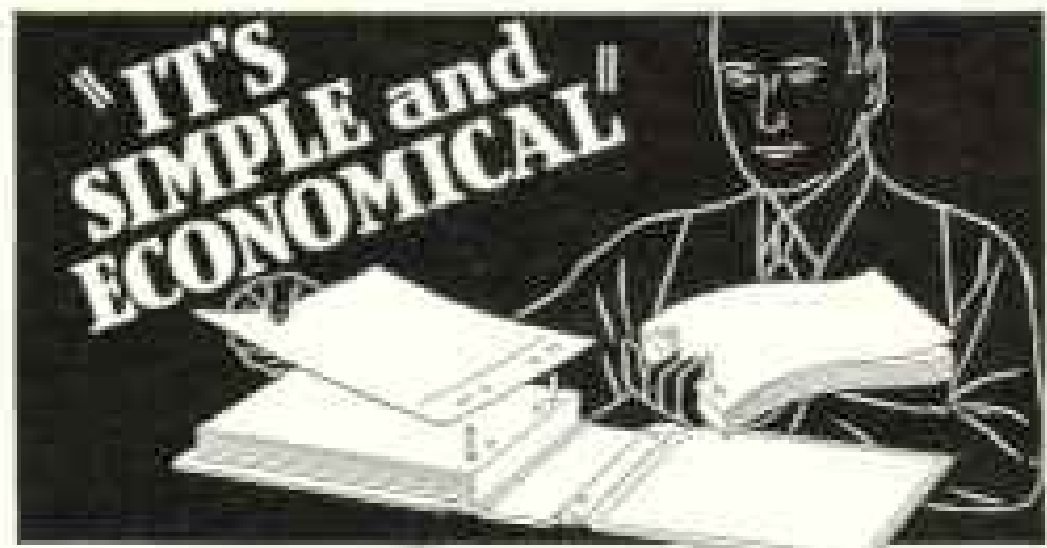
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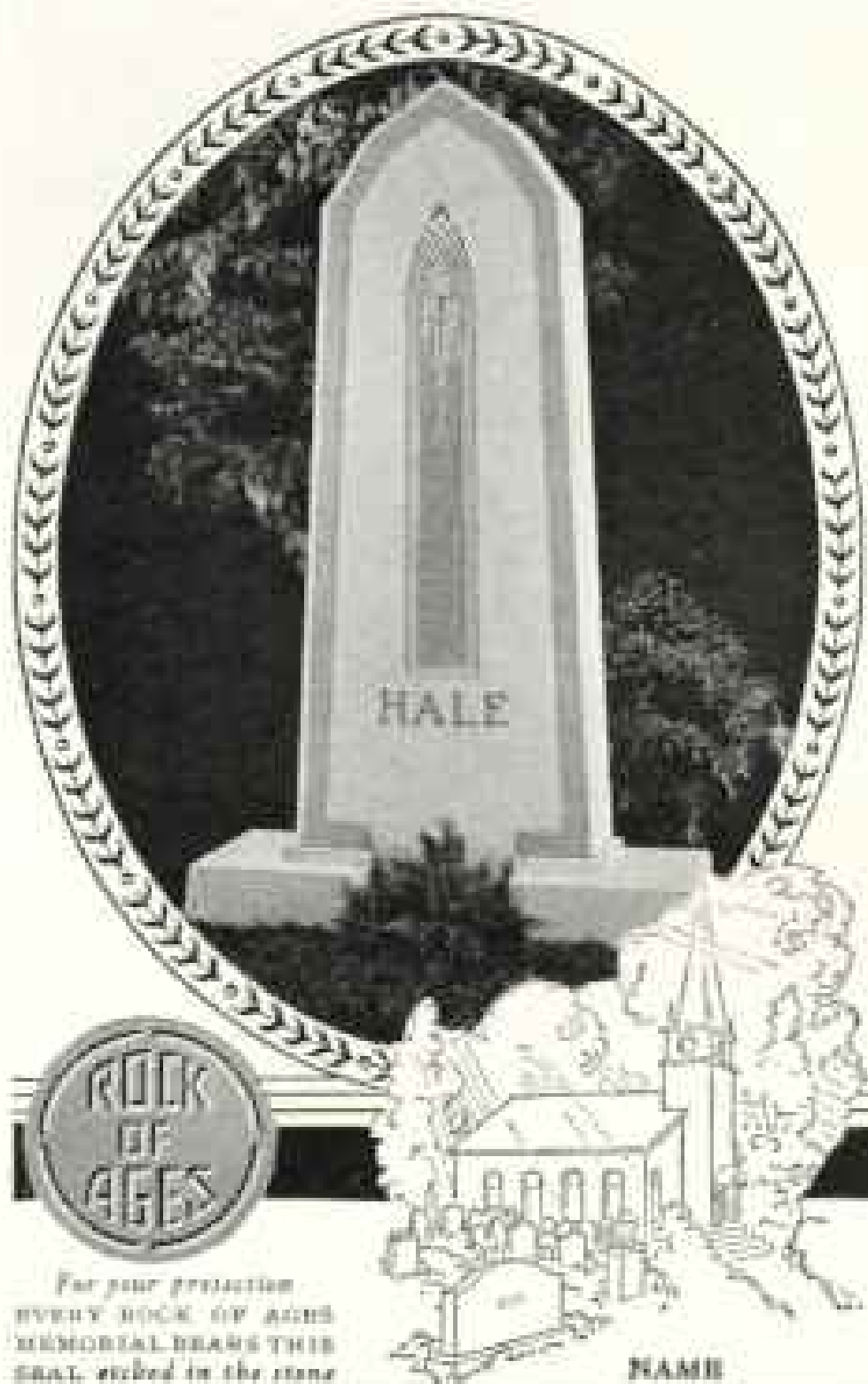
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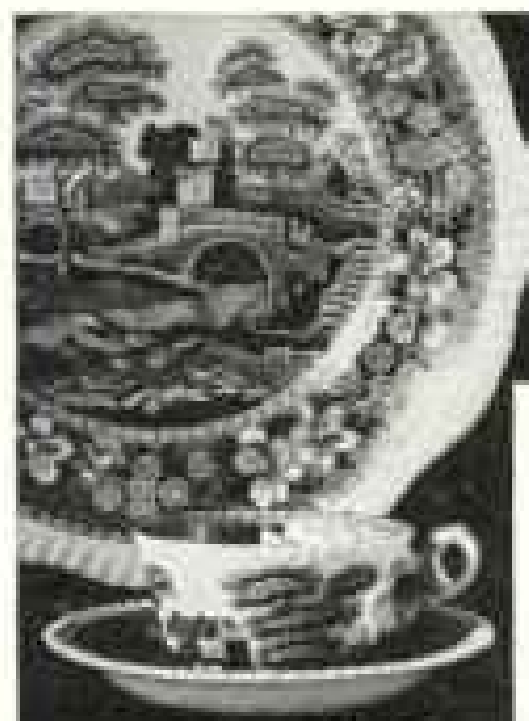
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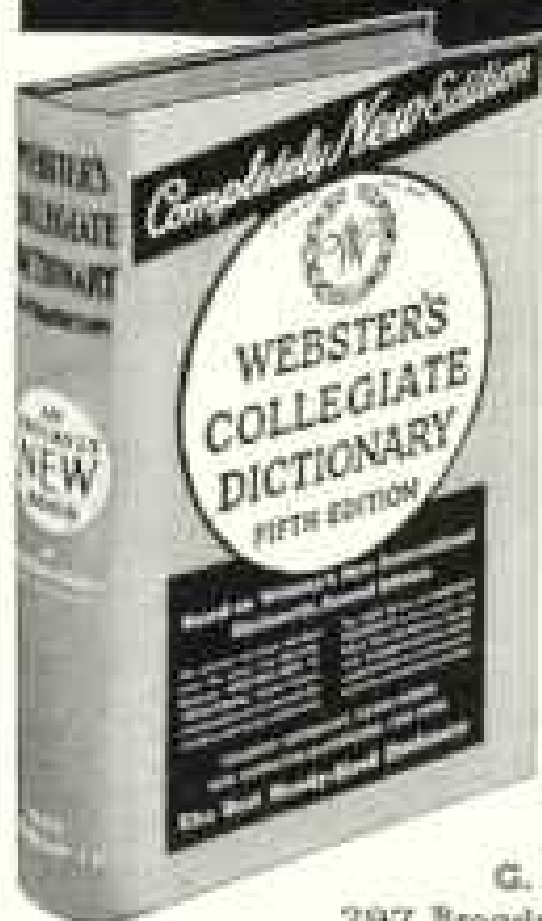
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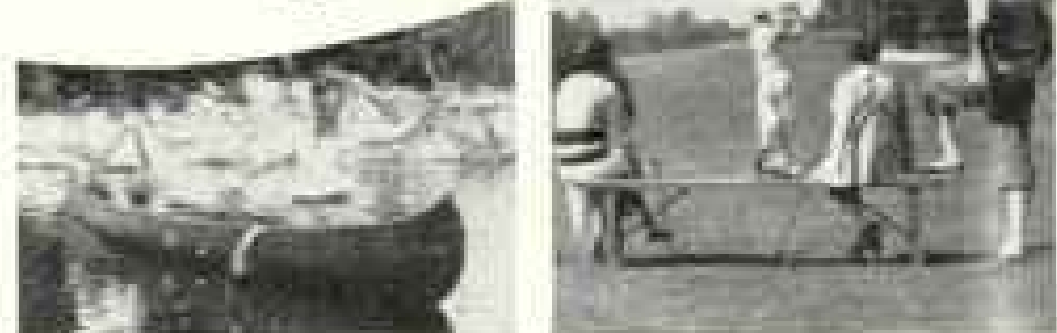
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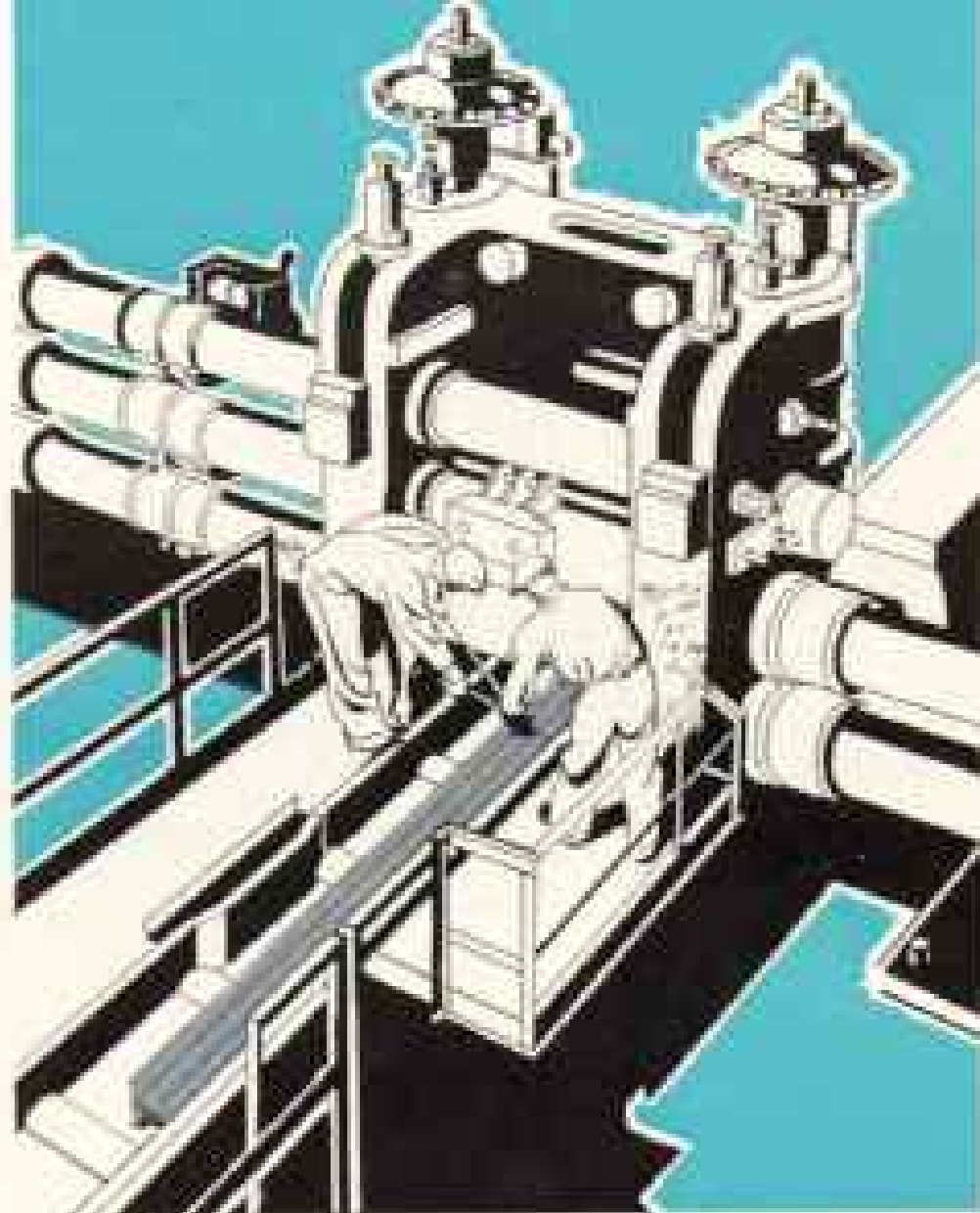
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The railroad man would counter, "If you will build a mill, make some beams and plates, and prove them to be satisfactory, then we will begin to consider your good idea." One is reminded of the ancient riddle: Which came first, the chicken or the egg?

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